

# ATTACHMENT 80



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#### Cover image

Shell is supporting a global energy transition to a low-carbon future. We invest in areas such as carbon capture and storage, biofuels and hydrogen as a transport fuel.

#### New Lens Scenarios

This publication contains data from Shell's New Lens Scenarios. The New Lens Scenarios are a part of an ongoing process used in Shell for 40 years to challenge executives' perspectives on the future business environment. We base them on plausible assumptions and quantifications, and they are designed to stretch management to consider even events that may only be remotely possible. Scenarios, therefore, are not intended to be predictions of likely future events or outcomes and investors should not rely on them when making an investment decision with regard to Royal Dutch Shell plc securities.

#### Cautionary note

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this report, "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. "Subsidiaries", "Shell subsidiaries" and "Shell companies" as used in this publication refer to companies over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations" respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect (for example, through our 23% shareholding in Woodside Petroleum Ltd.) ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.

This report contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "anticipate", "believe", "could", "estimate", "expect", "goals", "intend", "may", "objectives", "outlook", "plan", "probably", "project", "risks", "schedule", "seek", "should", "target", "will" and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this report, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks

of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shored costs; and (m) changes in trading conditions. All forward-looking statements contained in this report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell's 20-F for the year ended December 31, 2015 (available at [www.shell.com/investor](http://www.shell.com/investor) and [www.sec.gov](http://www.sec.gov)). These risk factors also expressly qualify all forward-looking statements contained in this report and should be considered by the reader. Each forward-looking statement speaks only as of the date of this report, 18 April 2016. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this report.

We may have used certain terms, such as resources, in this report that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. US investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website [www.sec.gov](http://www.sec.gov).

## INTRODUCTION FROM THE CEO



It was a significant year for the global community in 2015 with the adoption of the historic Paris Agreement by 195 countries demonstrating a commitment to bring about a lower-carbon energy system.

The year also presented Shell with a difficult business environment. A low oil price meant making some tough choices about our long-term investments. As we continue on this path, I am determined that operating our business responsibly – with respect for people, their safety, communities and the environment – remains a priority. Sustainability, for me, is essential to our responsible operation and to being a valued and respected member of society.

### IMPROVING OUR OPERATIONS

At Shell, we have long had a strong focus on safety and, in 2015, our safety performance improved in many areas. However, seven people lost their lives at our operations in Nigeria. This deeply saddens me and my thoughts are with the families of those involved. Incidents like these are simply unacceptable.

We made progress in our environmental performance: spills were reduced by around 30% while our total greenhouse gas emissions decreased. We are also making headway to end continuous flaring by 2030, which helps to reduce our methane and carbon dioxide (CO<sub>2</sub>) emissions. Another achievement was the start of Quest – our carbon capture and storage (CCS) project in Alberta, Canada – that is designed to capture up to 1 million tonnes of CO<sub>2</sub> a year from our oil sands operations.

### THE ENERGY LANDSCAPE

The shift to a low-carbon energy system is critical but will take time. The meeting of states at COP 21 in Paris at the end of 2015 has set the ambition to limit the increase in global temperature to under 2 °C, even if countries move at different paces to achieve their targets. Long-term solutions probably include a hybrid of energy sources where countries will rely on a combination of renewable energy, hydrocarbons and CCS.

We all need to take steps to achieve a sustainable world economy. To achieve a low-carbon society, three main areas must be addressed. Firstly, the world needs to become more energy efficient. This means adopting fundamentally different approaches in areas such as city planning, infrastructure and transport, and better energy efficiency standards. Secondly, there is a need for more renewable energy in the system, working in combination with gas to provide reliable electricity. This involves significantly increasing the use of electricity, including providing electricity to the 1.1 billion people who currently do not have access. Thirdly, the world needs to reduce the carbon intensity of the fossil-fuel share of the energy system.

Today, fossil fuels meet more than 80% of global energy needs. This share will be reduced over time but hydrocarbons will remain a substantial part of the world energy system in the coming decades. Renewable energy sources have a key role to play and should, in future, provide a large part of the world's electricity demand. But electricity is only a part of our energy system: today it accounts for almost 20% of total energy use. There are still many areas that cannot be met by renewables alone – such as the chemicals used to make so many everyday products.

### SUPPORTING THE ENERGY TRANSITION

Shell can presently best support the transition to a lower-carbon world by working to reduce carbon in the energy system. We urge countries and industries to make the switch from coal to lower-carbon natural gas and we share our knowledge of CCS technologies to keep CO<sub>2</sub> out of the atmosphere. We also invest in hydrogen and advanced biofuels as transport fuels.

“I believe that greater co-operation across society is needed for a successful energy transition.”

We continue to work to reduce our own greenhouse gas (GHG) emissions over the long term. A screening value for GHG is included in our planned projects to inform our investment choices. Natural gas already makes up about half of the energy we supply. The acquisition of BG Group in 2016 brings more gas to our production. It is likely that over the next few decades, through the global energy transition, Shell will emerge as a different company.

### WORKING TOGETHER

Governments can also make choices that enable the transition: we support energy policies that incentivise businesses and consumers to choose low-carbon options. I believe that greater co-operation across society is needed for a successful energy transition. More cross-sector coalitions – where business, government and civil society work effectively together – will accelerate the pace. The Energy Transitions Commission, of which Shell is a founding partner, brings together leading individuals from the public, private and social sectors to make recommendations that will contribute to the energy transition.

Our Sustainability Report details our activities during 2015. I would like to thank the members of the External Review Committee, consisting of leading sustainability experts, for their input to the report this year. They play an important role in developing our reporting and our thinking on sustainability. We were a founding member of the UN Global Compact and continue to support its 10 principles.

Ben van Beurden  
Chief Executive Officer

## TOPIC SELECTION FOR 2015

The Shell Sustainability Report 2015 focuses on the key sustainability challenges the company faces and explores the many ways that we are responding. The topic selection identifies the sustainability subjects that were relevant or prominent in 2015.

Each year, we use a structured process to select the report's content and confirm its validity. We engage with various groups and individuals to understand specific concerns about our business and its impacts around the world, particularly in relation to the environment and society.

This includes speaking with community representatives, business partners, customers, non-governmental organisations, investors, shareholders, the media, academics, contractors and suppliers, rating agencies and members of the public. We also talk to teams within Shell. All opinions and advice are gathered in various ways including formal and informal meetings, workshops and online surveys.

The main steps involved in selecting the topics are (see diagram):

**Step 1:** identifying and understanding topics that are important to our stakeholders;

**Step 2:** identifying topics that are important to Shell's business strategy;

**Step 3:** collating all the topics identified as of high importance by our stakeholders – these topics determine the report's content;

**Step 4:** identifying the topics for 2015 that will be covered on [www.shell.com](http://www.shell.com) rather than in the report;

**Step 5:** submitting details of the topic selection process for review and approval by the External Review Committee to ensure that coverage is balanced, relevant and complete (see page 54); and

**Step 6:** informing Shell's Executive Committee of the chosen topics.

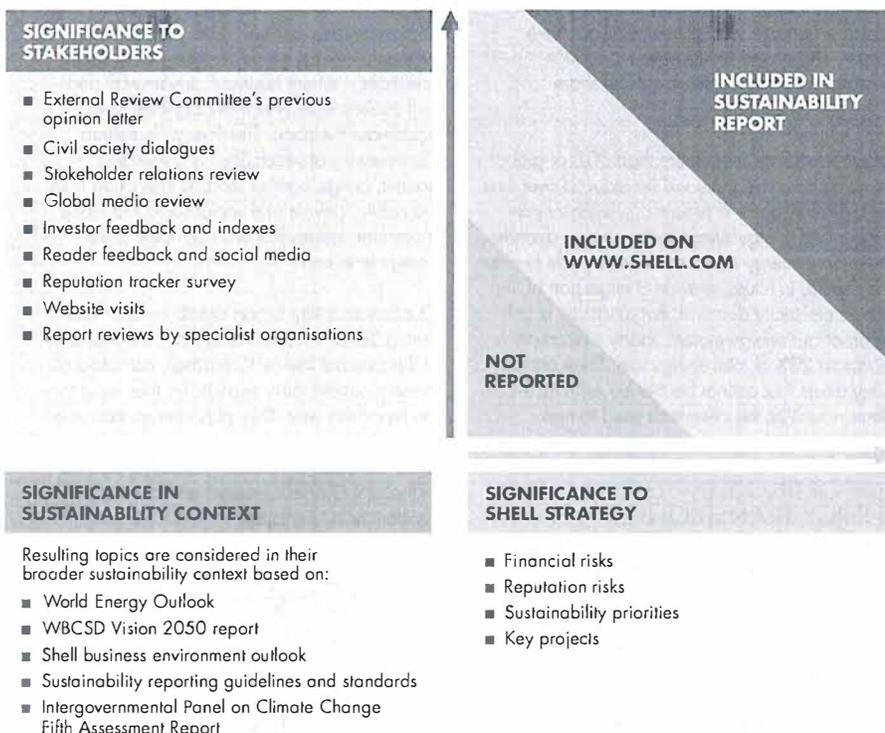
We have listed the selected topics in alphabetical order rather than prioritising them. The topics consistently ranked as of high importance in 2015 are energy transition and climate change; we have a section dedicated to these topics.

We report in accordance with the Global Reporting Initiative (GRI) version G4 and in line with the oil and gas industry guidelines developed by IPIECA – the global oil and gas industry association for environmental and social issues. We also use the guidance on voluntary reporting from the American Petroleum Institute and the International Association of Oil and Gas Producers.

The GRI content index is available on our company website, [www.shell.com](http://www.shell.com). Shell supports the United Nations Global Compact and its 10 principles covering human rights, labour, the environment and anti-corruption. Sections of this sustainability report cover Shell's performance in 2015 across these areas. We also follow the progress of the United Nations' Sustainable Development Goals through our membership of IPIECA.

More detailed information about Shell's approach to sustainability, our processes and work around the world, is available on [www.shell.com](http://www.shell.com). Links to specific information on topics discussed in the report are published on page 56.

### TOPIC SELECTION DIAGRAM



**ARCTIC**

- Alaska
  - Community relations
  - Environmental initiatives
  - Science
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**BUSINESS ETHICS, TRANSPARENCY AND CORPORATE GOVERNANCE**

- Business integrity Page 43
- Executive scorecard Page 48
- Governance Page 08
- Revenue transparency Page 49

**CLIMATE CHANGE & ENERGY FUTURE**

- Carbon pricing Page 14
- Carbon capture and storage Page 19
- Climate change policy and risks Pages 13 to 15
- Energy efficiency Pages 15 and 36
- Lower-carbon alternatives Pages 20 and 21
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- Our performance Pages 27 and 36

**ENVIRONMENTAL IMPACTS**

- Biodiversity and green infrastructure Page 34
- Decommissioning Page 35
- Environmental policy Page 34
- Flaring Page 28
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**LOCAL COMMUNITIES AND SOCIOECONOMIC IMPACT**

- Community engagement Page 38
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**NIGERIA**

- Education Page 25
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- Oil spills & remediation Pages 24 and 36
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**OIL SANDS**

- First Nations
  - Greenhouse gas emissions
  - Tailings
  - Water usage
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**PARTNERS AND COLLABORATIONS**

- Collaborations Page 45
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**SAFETY**

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- Groningen Page 33
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- Security Page 33

**SUPPLY CHAIN**

- Contractor management
  - Human rights
  - Local content and procurement
- Page 46

**TECHNOLOGY AND INNOVATION**

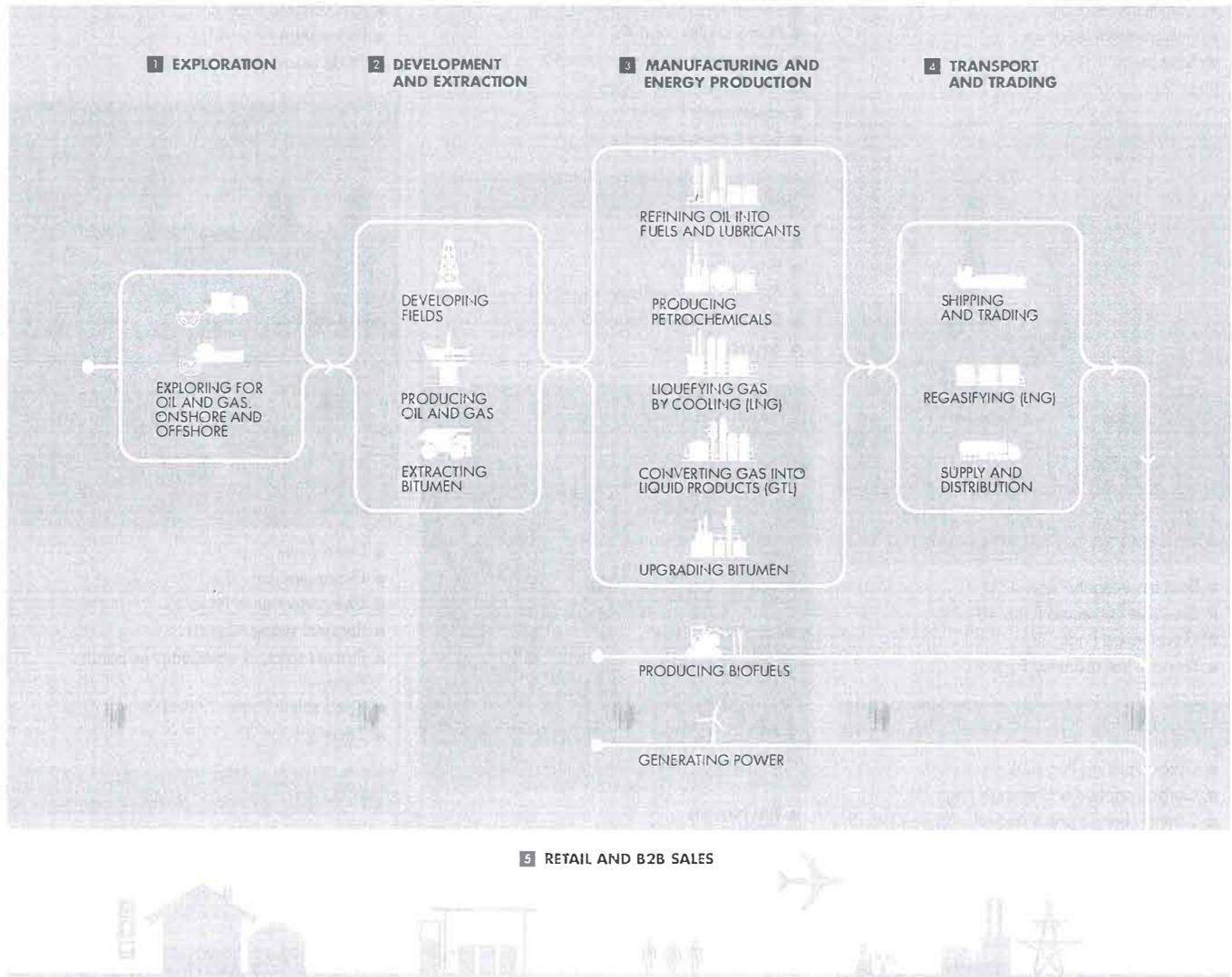
- Advanced biofuels Page 20
- Lower-carbon alternatives Pages 20 and 21
- Research & development Page 18

**PEOPLE**

- Human rights Page 43
- Labour practices Pages 43 and 46
- Our people Page 47
- Worker welfare Pages 43 and 46

## ABOUT SHELL

Royal Dutch Shell plc is an integrated international energy company with expertise in the production, refining and marketing of oil and natural gas.



You will see some of the icons from the diagram throughout the report, to identify in which part of the business the described activities take place.

Shell is one of the world's largest independent oil and gas companies in terms of market capitalisation, operating cash flow and production. Our business explores for gas and oil worldwide, both from conventional fields and from sources such as tight rock and shale.

We work to develop new oil and gas supplies, and have a global network of refineries and chemical plants. We also transport and trade oil, gas and other energy-related products and serve around 25 million customers a day through our global network of 43,000 branded retail sites. Shell invests in alternative energy as well as biofuels production and retail.

In early 2016, we reorganised our upstream activities into Upstream and Integrated Gas.

**UPSTREAM**

Upstream explores for and recovers crude oil, natural gas and natural gas liquids, transports oil and gas, and operates the upstream and midstream infrastructure necessary to deliver oil and gas to market. The Upstream organisation co-ordinates all of Shell's conventional oil and gas businesses, including our deep-water operations. Upstream also includes our heavy oil and shale activities.

**INTEGRATED GAS**

Integrated Gas (IG) manages most of Shell's conventional natural gas operations, including the manufacture and distribution of liquefied natural gas (LNG) and gas-to-liquids products. The division includes IG's marketing, development and trading activities to bring natural gas to our customers around the world; it also includes our wind activities. Establishing IG as a stand-alone business reflects its further potential for growth.

**DOWNSTREAM**

Shell's Downstream business manages Shell's refining and marketing activities for oil products and chemicals. It is divided into five core businesses: refining, retail, chemicals, lubricants, and trading and supply. In Downstream, we convert oil and gas resources into valuable products, and market and sell them around the world. Downstream also oversees Shell's interests in trading, shipping and low-carbon fuels, including biofuels.

**PROJECTS & TECHNOLOGY**

Shell Projects & Technology (P&T) provides technical services, technology capability and major project delivery across both Upstream and Downstream activities. P&T drives research and innovation to create technologies for finding and developing oil and gas. P&T also provides leadership in contracting and procurement, as well as in safety, environmental and carbon dioxide management.

**BG GROUP**

In April 2015, Shell announced an offer for BG Group plc and the transaction was completed on February 15, 2016. It should add significantly to our business, particularly in LNG worldwide and deep-water oil and gas in Brazil. BG Group's activities will be included in our next sustainability report.

**93,000**



Average number of people employed by Shell

**70+**



Countries in which Shell operates

**3 MILLION**



Shell's oil and gas production in barrels of oil equivalent a day

**2%**



Our approximate share of world oil production

**9%**



Shell's approximate share of LNG sold across the world in 2015

**1%**



Our share of the global supply of energy

## HOW SUSTAINABILITY WORKS AT SHELL

Sustainability at Shell means providing energy in a responsible way, in a manner that respects people and communities, their safety and the environment.

Our approach to sustainability stems from our goal to manage and grow a safe, efficient and profitable business. Shell's core values of honesty, integrity and respect for people – first laid out in the Shell General Business Principles nearly 40 years ago – underpin everything we do. A commitment to contribute to sustainable development was added in the late 1990s. These principles apply to the way we do business and to our conduct with the communities where we operate.

When we invest in energy projects, we seek to balance the short- and long-term interests of our business. For investment decisions, we consider the economic, social and environmental risks and opportunities as well as the political and technical. Our commitment to safety, the environment and to communities plays a crucial role in how we plan, design and operate projects.

Shell's long-term success relies on our ability to provide the energy and related products people need, in a way that is competitive and socially and environmentally responsible.

### INTEGRATING SUSTAINABILITY Helping to shape a more sustainable energy future

At Shell, we believe the world needs to produce more energy and emit less greenhouse gases if society is to meet its development and environmental goals – achieving these goals requires an energy transition. We have acknowledged man-made climate change for many years and called for action by our industry, governments and energy customers.

Today, the energy transition presents opportunities to develop new ways of producing, distributing and consuming energy. As part of our strategy, we intend to make investments in large-scale and commercial forms of lower-carbon technology and energy, such as natural gas, carbon capture and storage, biofuels, wind and solar energy. We continue to develop advanced biofuels and hydrogen-based fuels for electric transport and energy storage. We also collaborate with others to support the transition – for example, we are part of the World Bank's coalition to support governmental carbon-pricing mechanisms.

### Sharing wider benefits where we operate

The long-term nature of the energy industry means that we can be part of a community for decades. An open dialogue with communities is fundamental to the way we operate – it helps us to identify

any environmental and social opportunities and challenges. We have teams that work closely with communities throughout a project's lifetime to listen to and address people's concerns. (See page 9).

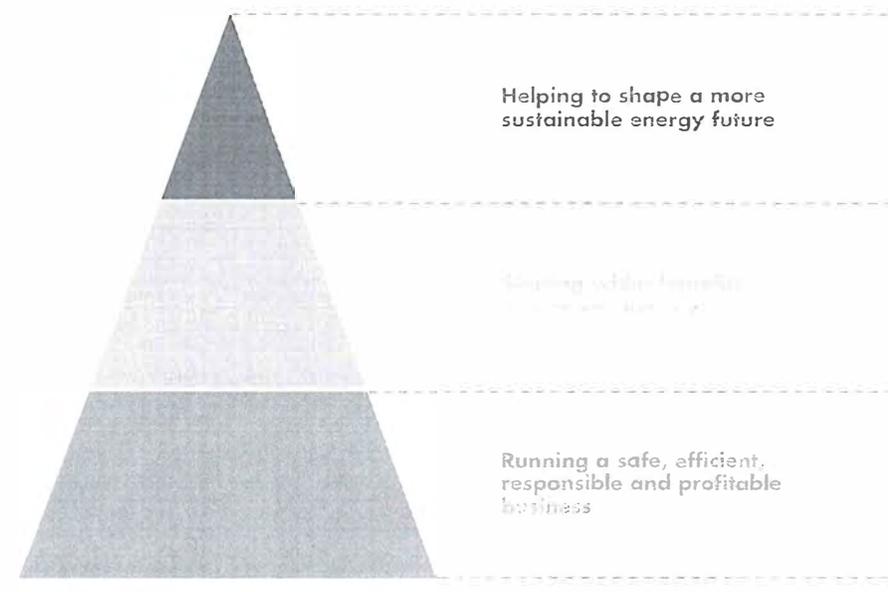
We also help to develop local economies by creating jobs, sourcing from local suppliers, supporting business development, and paying taxes and royalties. In China, for example, 99% of Shell's more than 20,000 employees and contractors are Chinese. Our social investment programmes aim to improve road safety, access to energy and encourage local enterprise where we operate. (See page 39).

### Running a safe, efficient, responsible and profitable business

Safeguarding and respecting people – our employees, contractors and neighbours – is fundamental to how we conduct business. We aim to continuously improve the way we operate to prevent incidents, and identify and minimise adverse impacts at our projects and facilities. We report publicly on our performance using a range of indicators.

We share our experience in sustainability by working with trade associations and others to improve operational standards and practices in safety, community engagement and environmental management. (See pages 44 and 45).

## INTEGRATING SUSTAINABILITY



REPORTING AGAINST ASPIRATIONS

This table represents a selection of global metrics that we track within Shell. It helps us assess our performance as we continue to integrate sustainability across our business. It shows our goals and progress in 2015 and our focus for 2016.

For example, Goal Zero was introduced for personal safety in 2007. Since then, we have broadened the goal to aim for no harm to people and the environment across our business. More information on our performance, definitions of the indicators and the referenced goals are provided on pages 52 and 53.

GOALS, PERFORMANCE AND PLANS FOR 2016 AND BEYOND

|                 | Goals  | Progress in 2015   | Priorities in 2016  |      |      |      |      |      |             |
|-----------------|--|--|---|------|------|------|------|------|-------------|
| PERSONAL SAFETY | <p><b>2015 goal: achieve total recordable case frequency (TRCF) below 1.13 for employees and contractors.</b></p> <p>Goal Zero has been our ambition for personal safety since 2007.</p>   | <p>☑ We continue to make progress towards Goal Zero. For more information see page 33.</p>   | <ul style="list-style-type: none"> <li>■ Work with contractors in our safety improvement programmes and simplify contracts.</li> <li>■ Support the development and application of common industry safety standards.</li> </ul>    |      |      |      |      |      |             |
|                 |  | <table border="1"> <tr> <td>2005</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>2.5</td> <td>0.99</td> <td><b>0.94</b></td> </tr> </table>  |   | 2005 | 2014 | 2015 | 2.5  | 0.99 | <b>0.94</b> |
|                 |  | 2005   |   | 2014 | 2015 |      |      |      |             |
| 2.5             | 0.99   | <b>0.94</b>  |   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |
| PROCESS SAFETY  | <p><b>2015 goal: achieve a number of operational leaks below 65 (classified as "Operational Process Safety Tier 1 events").</b></p> <p>Since 2011, we have extended our ambition of Goal Zero to process safety.</p>   | <p>☑ The number of process safety events has decreased. For more information see page 33.</p>  | <ul style="list-style-type: none"> <li>■ Strengthen our process safety risk awareness.</li> <li>■ Keep a strong focus on asset integrity and operational discipline.</li> </ul>   |      |      |      |      |      |             |
|                 |  | <table border="1"> <tr> <td>2012</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>91</td> <td>57</td> <td><b>51</b></td> </tr> </table>   |   | 2012 | 2014 | 2015 | 91   | 57   | <b>51</b>   |
|                 |  | 2012   |   | 2014 | 2015 |      |      |      |             |
| 91              | 57   | <b>51</b>  |   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |
| ENVIRONMENT     | <p><b>2015 goal: achieve operational spills below a volume of 1.2 ('000 tonnes) (Classified as "hydrocarbons reaching soil or water").</b></p> <p>Goal Zero also extends to the environment with our goal of no operational spills.</p>  | <p>≈ The volume of operational spills slightly increased but we continued to reduce the number of operational spills. For more information see page 36.</p>  | <ul style="list-style-type: none"> <li>■ Continue to invest in improving the reliability of our facilities to reduce operational spills.</li> <li>■ Ensure we are effective in learning from spill incidents.</li> </ul>          |      |      |      |      |      |             |
|                 |  | <table border="1"> <tr> <td>2005</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>3.4</td> <td>0.7</td> <td><b>0.8</b></td> </tr> </table>  |   | 2005 | 2014 | 2015 | 3.4  | 0.7  | <b>0.8</b>  |
|                 |  | 2005   |   | 2014 | 2015 |      |      |      |             |
| 3.4             | 0.7  | <b>0.8</b>   |   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |
| GHG & ENERGY    | <p><b>2015 goal: reduce flaring in our upstream business (million tonnes CO<sub>2</sub> equivalent).</b></p> <p>Our policy is to reduce any continuous flaring or venting to as low a level as reasonably practical. In 2015, we signed the World Bank Zero Routine Flaring 2030 initiative.</p> | <p>≈ We continued to implement measures to reduce our operational flaring. Overall, reductions in some locations were partly offset by higher production. For more information see page 28.</p>  | <ul style="list-style-type: none"> <li>■ Implement the flaring reduction projects currently underway.</li> <li>■ Work with the World Bank to find solutions to host-government funding for flaring reduction projects.</li> </ul> |      |      |      |      |      |             |
|                 |  | <table border="1"> <tr> <td>2005</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>20.8</td> <td>13.0</td> <td><b>11.8</b></td> </tr> </table>   |   | 2005 | 2014 | 2015 | 20.8 | 13.0 | <b>11.8</b> |
|                 |  | 2005   |   | 2014 | 2015 |      |      |      |             |
| 20.8            | 13.0   | <b>11.8</b>  |   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |
| GHG & ENERGY    | <p><b>2015 goal: achieve a refineries energy intensity below 96.3 (based on the Refineries Energy Index).</b></p> <p>We aim to achieve top level energy-efficiency performance in our refineries. Improve energy efficiency to reduce our greenhouse gas emissions.</p>                          | <p>≈ Our refinery energy intensity level increased slightly. For more information see page 36.</p>   | <ul style="list-style-type: none"> <li>■ Monitor existing energy efficiency projects.</li> <li>■ Share best practice within Shell.</li> <li>■ Continue to focus on reliable and efficient operations.</li> </ul>                  |      |      |      |      |      |             |
|                 |  | <table border="1"> <tr> <td>2012</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>98.4</td> <td>94.9</td> <td><b>95.4</b></td> </tr> </table>   |   | 2012 | 2014 | 2015 | 98.4 | 94.9 | <b>95.4</b> |
|                 |  | 2012   |   | 2014 | 2015 |      |      |      |             |
| 98.4            | 94.9   | <b>95.4</b>  |   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |
| SOCIAL          | <p><b>2015 goal: improve effectiveness of community feedback.</b></p> <p>Since 2012, our community feedback mechanisms (CFM) have been used to address community concerns. We track the effectiveness of CFMs to improve the quality of our reporting.</p>                                       | <p>☑ We strengthened the quality of our data, and as a result we:</p> <ul style="list-style-type: none"> <li>■ included noise as a category in relevant monitoring programmes;</li> <li>■ used the data to inform our social investment in Nigeria, to increase the participation of local community groups.</li> </ul> <p>For more information see page 38.</p> | <ul style="list-style-type: none"> <li>■ Introduce an online community feedback tool to improve the quality of reporting and tracking of community feedback.</li> </ul>   |      |      |      |      |      |             |
|                 |  |  |   |      |      |      |      |      |             |

## SUSTAINABILITY GOVERNANCE

We have put clear and effective governance structures in place throughout Shell, supported by standards, policies and controls. These are the foundation of the decisions we make and actions we take at every level of the company.

Our governance procedures are applied to all areas of decision-making across Shell. This involves the Board of Royal Dutch Shell plc, four Board committees, the Executive Committee (EC), and the teams and people who work across our operations. We make sure that decisions are communicated and implemented within the business.

The Corporate and Social Responsibility Committee (CSRC) is one of the Board committees. Its views and findings about our sustainability practices are integrated into Shell's business to strengthen our procedures and operations within countries.

The overall accountability for sustainability within Shell lies with the Chief Executive Officer (CEO) and the EC. They are assisted by the health, safety, security, environment and social performance (HSSE & SP) executive team. Our standards are set out in our HSSE & SP Control Framework and apply to every Shell company. The process safety and HSSE & SP assurance team, with a mandate from the CSRC, provides independent assurance on compliance with the Control Framework.

### CORPORATE AND SOCIAL RESPONSIBILITY COMMITTEE

The CSRC was established in 2005. The Committee's role is to review and advise on policies and performance against the Shell General Business Principles, the Shell Code of Conduct and mandatory HSSE & SP standards.

In 2015, the CSRC visited an LNG-powered supply vessel at our deep-water operations in the Gulf of Mexico.



The Committee's members bring a variety of experience from industry and national government. In the first five months of 2015, the Chairman of the CSRC was Charles O. Holliday, former CEO and Chairman of DuPont. He was succeeded in May 2015 by Hans Wijers, former CEO and Chairman of Akzo Nobel. Other members of the Committee in 2015 were Sir Nigel Sheinwald, a former British diplomat; Patricia A. Woertz, a business leader with extensive experience in the oil sector; and Gerrit Zalm, a former Minister of Finance of the Netherlands, who stood down from the CSRC at the end of 2015.

"The CSRC has a responsibility to review and assist Shell to continuously improve its business practices," says Hans Wijers. "As a Committee, we apply our own individual experience and combined knowledge to review Shell's standards and the sites we visit. It is a critical role that can lead to improvements in implementing safety and environmental standards and in Shell's work with communities."

### ACTIVITIES IN 2015

The Committee met five times in 2015. During these formal meetings, the CSRC undertakes in-depth reviews of key exposure areas of our business, monitors any major issues of public concern and Shell's strategy to address them, especially with respect to environmental and social issues. Some topics are reviewed on an annual basis, such as sustainability performance, process safety, and management and audit results.

Other topics are reviewed on a rotational basis – for example, maritime risks were reviewed in 2015. There are also subjects that are discussed because they are current. The Committee continued to spend time on topics related to climate change and the energy transition and also discussed developments in Alaska, Nigeria and seismic activity in Groningen, the Netherlands.

The Committee visits locations to meet Shell employees, contractors and suppliers and to help review whether we are adequately putting our standards into practice. During these visits, the Committee meets members of the local community and other interested parties, such as non-governmental organisations, to hear their views. After each visit, the Committee shares its observations with the Board of Directors.



### External opinion

"The International Audit Protocol Consortium (IAPC) was founded by the global infrastructure firm, AECOM, to focus on promoting excellence in global environmental, health, and safety auditing. Shell has demonstrated outstanding leadership in the IAPC by participating across all consortium activities. This participation has included benchmarking key elements of its world-class HSSE & SP audit programme and sharing best practices and continuous improvement concepts."

The consortium's 57 multinational member companies collaborate to advance audit practices. Much of the consortium's success is based on open forums that enable the sharing of experiences. The future challenge for Shell – as a leading company within the IAPC – will be to promote critical insight and knowledge to even greater levels of assurance among internal and external stakeholders."

**John Nagy, CPEA**  
Vice President, IAPC  
AECOM Global EHS Management  
Consulting Practice  
Chicago, Illinois USA

In 2015, the CSRC visited Shell deep-water operations in the Gulf of Mexico and the Raizen biofuels business in Brazil. During each visit, the Committee met employees and representatives from government and non-governmental organisations. In 2015, individual CSRC members also visited the Peterhead carbon capture and storage project in the UK, the Moerdijk chemical plant and the Nederlandse Aardolie Maatschappij joint venture (NAM, Shell interest 50%) sites in the Netherlands.

## EMBEDDING SUSTAINABILITY INTO PROJECTS

### ASSESSING OUR PROJECTS

When we plan or develop new activities, or make changes to existing ones, we apply a staged project development process (see diagram) and seek to be consistent around the world. We embed sustainability across our projects by:

- conducting integrated assessments on the potential environmental, social and health impacts. These may include specialist studies on topics such as water, cultural heritage or security, and
- engaging with communities to understand concerns they may have and discuss possible ways to address these concerns.

These assessments help us to manage and reduce potential impacts at all stages of the project. We also draw on international standards, such as those of the World Bank and the International Finance Corporation, to guide our engagement with communities.

### OUR PEOPLE

We train our teams to understand how to embed sustainability into our projects. They are supported by specialists in the areas of, for example, environmental management, health and social performance including, but not limited to:

- biodiversity, waste, energy and water management; and
- indigenous peoples' rights, cultural heritage and resettlement.

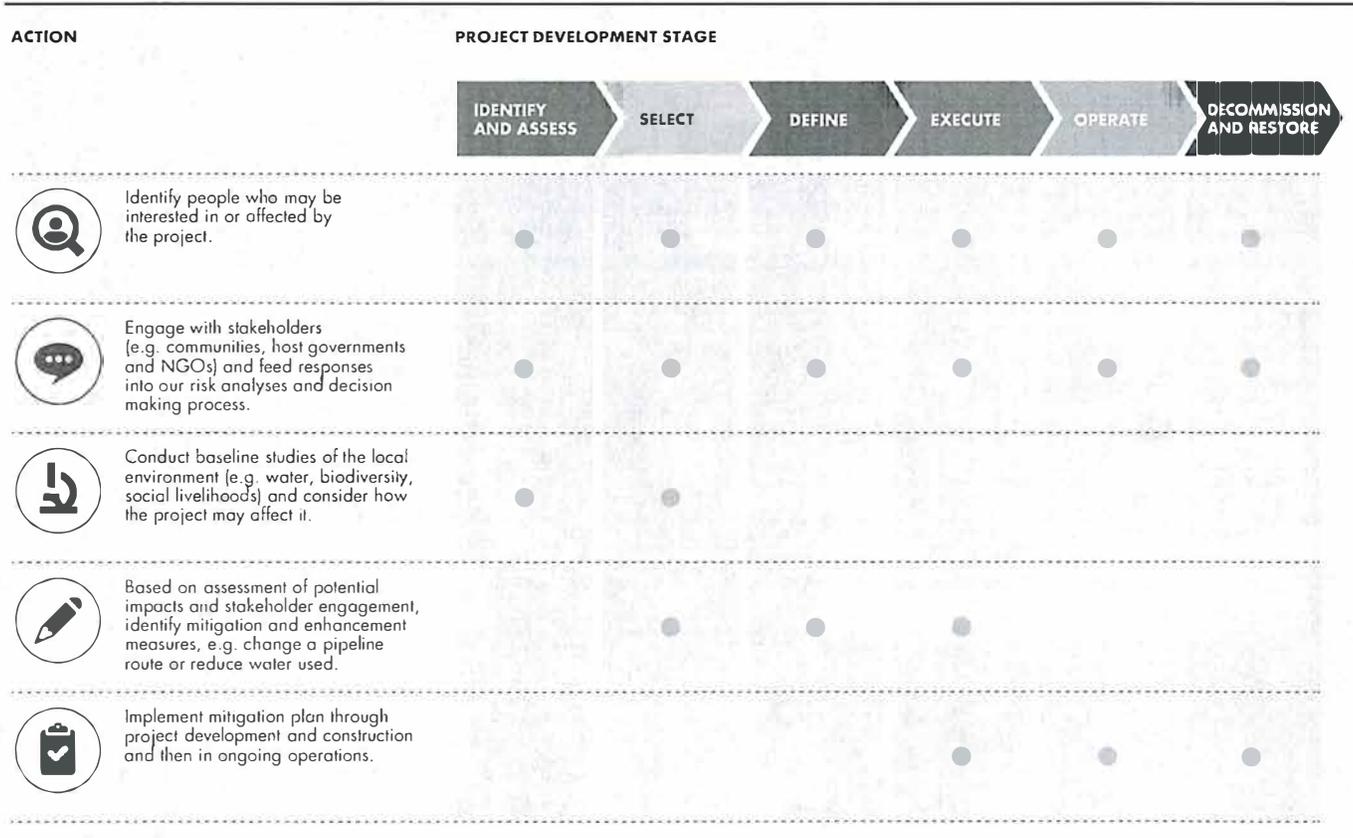
The specialists work with the project team to help manage potential impacts on communities or the environment during project design, construction and operation.

### OUR PROCESS

At each review stage in the project development process, we decide if and how we are going to move forward with the project. This includes balancing short- and long-term interests, and integrating economic, environmental and social considerations into our decision-making.

The results of all assessments are documented in a project-management plan which is approved by the manager accountable for the project. The plan is updated and its implementation is monitored and reviewed throughout the lifespan of the project.

## PROJECT PROCESSES IN PRACTICE



# THE ENERGY TRANSITION

An energy transition is under way to a global low-carbon energy system. Managing this transition is complex: energy is needed to meet the needs of a growing global population, yet the energy produced needs to be less carbon-intensive.

There are things societies can do to speed up their own energy transitions. For example, expand the use of renewable energy, use cleaner-burning natural gas to replace coal, and increase the uptake of carbon capture and storage.

This section outlines Shell's approach to the energy transition.

**49%**

Share of our production that was natural gas



**72** MILLION TONNES

Direct greenhouse gas emissions from facilities we operate



**315** KILOTONNES

Reduction of CO<sub>2</sub> at Quest CCS facility in 2015



Quest carbon capture and storage started up at our oil sands operations in 2015. It can capture more than one million tonnes of CO<sub>2</sub> emissions each year from the Scotford Upgrader and store it safely underground, Alberta, Canada.



# THE ENERGY FUTURE

Energy is essential to our daily lives. But the way the world produces and consumes energy continues to change.

For many, energy is a defining feature of modern life. Lives and livelihoods, economies and communities depend on convenient, reliable and affordable energy – for power, heating, industry and transport – to prosper and grow. As more people strive to attain energy-dependent products and services, more energy will be needed.

Energy has enhanced our lives: we have never been more connected and, today, more people have better opportunities, better health and better living conditions. This progress has been dependent on reliable, accessible energy. As the global population increases and incomes rise, demand for energy will grow: by 2050, the world's population will be approaching 10 billion, up from 7 billion today, while more than two in three people could be living in cities. Shell's New Lens Scenarios show that, within 50 years, global energy demand could be 60% higher than in 2015.

### MORE ENERGY, LESS CO<sub>2</sub>

The world must find ways to meet this rising energy demand while reducing global greenhouse gas

emissions to limit the effects of climate change. The historic Paris Agreement adopted by 195 countries in late 2015, and expected to be ratified over the coming year, established a goal to limit the global temperature rise this century to well below 2 °C.

This reinforces the need to shift our existing energy system to one based on energy sources that are lower-carbon. It requires a huge undertaking – a global energy transition involves producing and consuming energy in a different way. We need to design our economies, communities and lives to thrive on these energy systems.

It will be necessary to achieve close to net-zero carbon dioxide (CO<sub>2</sub>) emissions as early as possible this century if we are to maintain a world below 2 °C. In a net-zero emissions world, CO<sub>2</sub> emissions would be safely absorbed by the earth's natural infrastructure – such as forests and oceans – with any remaining emissions safely stored underground by carbon capture and storage (CCS). Shell's New Lens Scenarios show that, while difficult, it could be possible for society to approach

net-zero emissions by the end of this century. However, these scenarios assume an average global temperature increase of 2–3 °C by 2100.

A huge part of the challenge is to cut the carbon from the existing fossil fuels that currently make up around 80% of the energy mix. Our New Lens Scenarios show that energy needs towards the end of this century will be predominantly met by renewable energy sources such as solar, wind and biomass, with fossil fuels around 25% of the energy mix.

### GLOBAL ENERGY CONSUMPTION

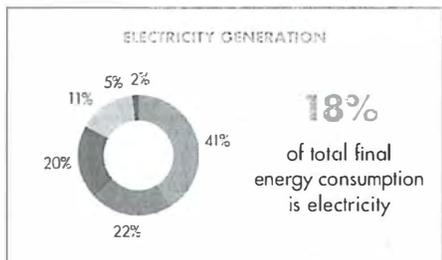
While renewable energy sources are growing fast, there are technological challenges to achieving a completely renewable energy system. The world needs to shift four main areas of global energy consumption to low-carbon alternatives: electricity, transport, industry and domestic use (see diagram). Each of these sectors will transition at a different pace.

Today, 18% of total global energy use is provided by electricity. Around 40% of this electricity is still generated by coal, while just over 20% comes from renewable energy sources. By 2050, more than 40% of the world's electricity could be powered

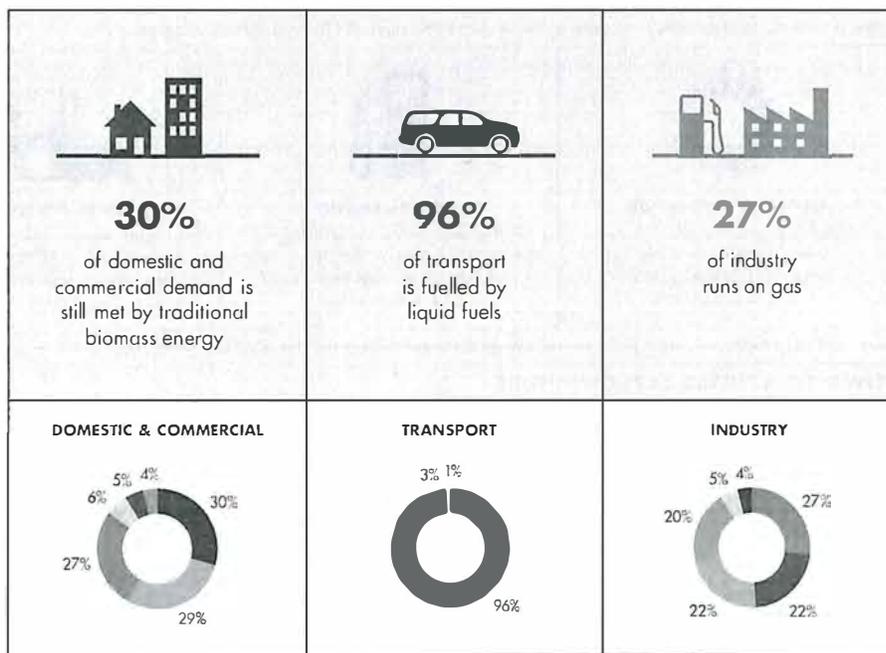
### TODAY'S ENERGY NEEDS

The world today currently consumes most of its energy from coal, oil and gas sources, with around a fifth of total energy supply used to generate electricity. Energy sources differ across the sectors of industry, transport and domestic use which all need to transition to low-carbon energy options.

### CURRENT GLOBAL ENERGY DEMAND



### ENERGY CONSUMPTION BY SECTOR AND CONSUMER TRENDS



Oil Coal Gas Biomass Nuclear Renewables (including hydro) Electricity Heat Liquid fuels (including biofuels)

Source: International Energy Agency, Key world energy statistics 2015 and World energy outlook 2015.

## THE ENERGY FUTURE CONTINUED

by renewable energy sources, according to the International Energy Agency. At the same time, only around 3% of transport is powered by renewable energy sources. In 2040, this could reach 8%. Many forms of transport will, likely, still rely on oil-based products (blended with biofuels).

There are some industrial users, such as steel and aluminium producers, whose processes require temperatures that are currently difficult to achieve without hydrocarbons. Across other industries and in our homes, the existing infrastructure needs to change to shift from fossil fuels to electricity. The scale of the required investment is another reason why the energy transition will take time.

One possible solution to meet energy demand is to have a hybrid system of both renewable energy sources and lower-carbon oil and gas. This combination would give people access to a full suite of energy products until the technological challenges to achieving a lower-carbon energy system are solved.

### MEETING THE ENERGY CHALLENGE

A successful energy transition requires sustained and substantial investment in all energy sources, including oil and gas production, to meet the global demand needed to fuel economic development. If the world is to achieve an energy transition

and approach net-zero emissions, our New Lens Scenarios suggest that society should grow its share of renewable energy to up to 70% by 2100.

Even if global demand for hydrocarbons is flat, there still needs to be investment in oil and gas supply simply to meet this demand. Without this ongoing investment, the production from existing fields drops an average 4–6% each year.

### MANAGING THE TRANSITION

The Paris Agreement has set the global direction for the energy transition. Government and business need to deliver policies and products in support of this. The energy transition will require a mixture of vision and realism, urgency and long-term planning.

There are many things that can be done now to reduce global emissions. Some will have a more immediate impact – such as substituting coal for natural gas or advancing renewable energy; while other solutions and technologies could play a larger role later in the transition – such as introducing new forms of transport fuels or carbon capture and storage (CCS). In a similar vein, it will be easier for some sectors of the economy or particular countries to reduce their carbon emissions faster than others in the coming decades.

Within Shell, we can best help to decarbonise the existing hydrocarbon energy system by promoting the use of cleaner-burning natural gas and by advancing CCS technology. We also support the implementation of widespread government-led carbon-pricing mechanisms (see page 13) and are investing in efficient fuels and lubricants, and transport alternatives that include biofuels and hydrogen fuel. (See page 20 and 21).

Yet, there needs to be a broader response with cross-sector collaboration on an unprecedented scale. Government, business and civil society need to work together, particularly in the design and implementation of local energy policies, city planning and infrastructure. For example, the transport and mobility sector needs greater collaboration among manufacturers, energy companies and governments if innovation is to reach the scale required. In 2015, Shell was a founding member of the Energy Transitions Commission. This is a cross-sector collaboration of leading individuals from the public, private and social sectors to make recommendations that will contribute to the energy transition.

We believe that our capacity to innovate and to take a long-term view on investment, along with our experience, can help us to make an important contribution to the energy transition.

### FUTURE ENERGY NEEDS

A successful energy transition requires substantial investment across all energy sources, including oil and gas production, to meet a growing demand for energy.

### THE ENERGY CHALLENGE

There is more demand for energy globally as the world's population and living standards increase.

|   |  |  |   |
|---|--|--|---|
|  <p><b>GROWING POPULATION</b><br/>Global population will increase from around 7 billion today to nearly 10 billion by 2050, with 67% living in cities.</p> |  <p><b>RISING DEMAND</b><br/>Global energy demand will likely be almost 60% higher in 2060 than today, with 2 billion vehicles on the road (800 million today).</p> |  <p><b>ONGOING SUPPLY</b><br/>Renewable energy could triple by 2050, but we will still need large amounts of oil and gas to provide the full range of energy products we need.</p> |  <p><b>MITIGATING CLIMATE CHANGE</b><br/>Net-zero emissions is a potentially achievable societal ambition.</p> |
|---|--|--|---|

Source: UN World Population Prospects (2015 revision); World Urbanization Prospects (2014 revision); International Energy Agency, Energy Technology Perspectives 2015; Shell New Lens Scenarios.

### TOWARDS A LOWER-CARBON FUTURE

Shell is working to meet the energy challenge in many different ways:

|   |  |   |
|---|--|---|
|  <p><b>Bringing lower-carbon natural gas to a wider market</b></p>               |  <p><b>Industry leader in carbon capture and storage</b></p>              |  <p><b>A biofuels business</b></p>                                 |
|  <p><b>Investment in lower-carbon technologies such as hydrogen and wind</b></p> |  <p><b>Continued investment in oil and gas to meet growing demand</b></p> |  <p><b>Advocating government-led carbon-pricing mechanisms</b></p> |

## ADDRESSING CLIMATE CHANGE

At Shell, we believe there are clear, practical steps the world can take to tackle climate change while continuing to provide energy to meet present and future needs.

The Paris Agreement provides a way forward for governments and society to find effective policy and cultural changes that can drive low-carbon business and consumer choices. Shell supports long-term climate goals that address environmental pressures and provide development opportunities for communities. We all need to work together to achieve the ambitions set in the Paris Agreement. Targets for countries are a good place to start and set the direction for the significant global undertaking ahead.

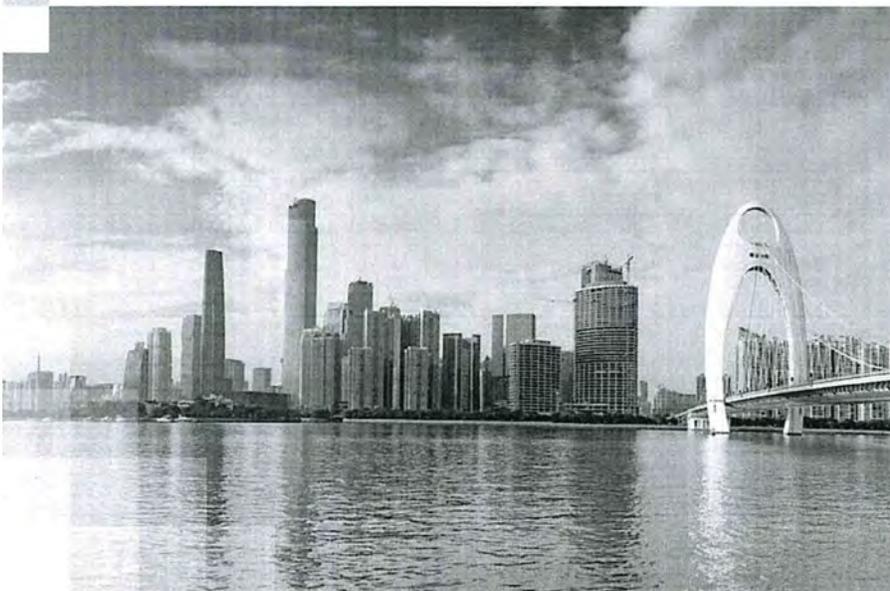
### REDUCING EMISSIONS

It will be necessary for the world to reach net-zero carbon dioxide (CO<sub>2</sub>) emissions if there is to be a successful shift to a low-carbon energy system and to keep global temperatures well below 2 °C. This will require a combination of the best of renewables, gas and oil to meet all types of energy needs and create low-carbon economies and communities. It also requires the large-scale implementation of technologies, such as carbon capture and storage. A number of measures can be applied to reach net-zero emissions, including:

- regulatory measures such as government implemented carbon-pricing mechanisms to motivate investment in emissions reduction and energy efficiency;
- energy efficiency to encourage smarter practices and stricter regulations for compact urban development, infrastructure and energy-efficient buildings, as well as investment in low-emission transport;
- ways to reduce or offset CO<sub>2</sub> emissions, such as reforestation and carbon capture and storage (CCS);
- removal of consumption subsidies for fossil fuels to create a level playing field for all energy providers, and
- financial incentives that encourage the development, demonstration and deployment of new low-carbon technologies.

We are currently working with a number of governments around the world to develop an appropriate energy mix that can help these countries to move towards a low-carbon energy system. (See box).

Natural gas can play a role in helping countries diversify their energy mix. Shell has been working with China's Development Research Centre on China's long-term energy development strategy. Guangzhou Zhujiang, China.



### CHINA'S FUTURE ENERGY MIX

Since 2011, Shell has worked closely with the Chinese government's Development Research Centre (DRC) of the State Council on China's medium- to long-term energy development strategy. The ongoing collaboration has identified the key energy challenges facing the country and suggested detailed, practical solutions.

The recently concluded second phase of the collaboration examined the important role natural gas can play in helping China diversify its energy mix, boost economic development, improve air quality, and help meet China's Intended Nationally Determined Contribution for reducing carbon emissions. Displacement of coal use was specifically identified as one of the key areas for natural gas development.

The research draws on international experience from other countries and regions that have increased the share of gas in their energy mix and offers insights into how China could replicate this. The Shell-DRC joint report "Research on China's Gas Development Strategy" recommended the liberalisation of China's natural gas value chain as a way to support and enable greater natural gas consumption.

This would require opening up China's gas market to new entrants and increasing domestic natural gas supplies; enhancing the construction of pipeline networks and gas storage facilities, accelerating the reform of regulatory systems and institutions, and the development of market-based pricing mechanisms. The report recommendations have informed the development of China's 13th Five Year Plan for 2016–2020.

## ADDRESSING CLIMATE CHANGE CONTINUED

### MITIGATING CLIMATE CHANGE

Shell is meeting the energy challenge in many different ways. Over the past decade we have invested in cleanerburning natural gas and sugar-cane ethanol, a low-carbon biofuel. We are also working on new fuels for transport. Our approach to mitigating climate change is to take action in the following ways:

#### Natural gas as an alternative to coal

Natural gas produces half the amount of CO<sub>2</sub> as coal when burnt to generate electric power. Greater use of natural gas as a fuel for power plants, instead of coal, could significantly reduce emissions from the power sector. This can also be the most affordable route for countries that are seeking to reduce their CO<sub>2</sub> emissions while maintaining reliable power generation.

#### Government carbon-pricing mechanisms

Shell has long called for governments to create carbon-pricing mechanisms that deliver a meaningful cost on CO<sub>2</sub> emissions. These mechanisms offer an effective way to stimulate the development of low-carbon technologies, generate revenue for governments and, ultimately, give consumers new energy choices. It could encourage the deployment of renewable energy, carbon capture and storage (CCS) and nuclear power plants.

#### Carbon capture and storage

The International Energy Agency estimates that without CCS the cost of achieving a 2 °C scenario could be around 138% higher. Over time, CCS could capture enough CO<sub>2</sub> to deliver a 13% reduction in overall emissions needed by 2050 to limit the rise in global temperature to 2 °C. CCS is currently the only technology that can capture industrial CO<sub>2</sub> emissions.

If CCS is to have an impact on global CO<sub>2</sub> emissions it needs to be both supported by governments and taken up widely by industry, including power generation companies. In 2015, Shell started operating Quest, our CCS project in Canada. (See page 19).

#### Low-carbon energy: renewable energy and biofuels

Shell's New Lens Scenarios show how renewable energy could eventually become the largest component of the global energy system. We currently produce biofuels in Brazil through our Raizen joint venture. We have longer-term investments with partners in developing alternative transport fuels, such as hydrogen, and advanced biofuels. (See page 20).

#### Combining renewable energy with hydrocarbons

Reliable energy solutions can be designed by combining fastgrowing renewable energy with hydrocarbons. In practice, some countries may choose to develop smaller scale power grids that use a mix of energy sources. For example, Shell is working on the design of a combined natural gas and solar power project with Marikina City, Metropolitan Manila, the Philippines.

### COLLABORATION AND PUBLIC POLICY

Governments play a key role in their energy transitions: their policy choices can drive innovation in low-carbon technologies, and encourage investment in low-carbon energy and infrastructure. Policies and frameworks need to be developed to support businesses and consumers to make choices that reduce emissions. This could bring about fundamental change. Innovation can be driven by a global carbon emissions market – an approach that is suggested in the Paris Agreement.

Shell has a long history of collaborating to build international policy and market frameworks. For example, we were a founding member of the International Emissions Trading Association (IETA), which today is a leading business association focused on carbon pricing and the development of emissions markets. We continue to work with IETA and a number of other organisations on climate change issues. (See page 45).

### SHAREHOLDER RESOLUTION IN 2015

In 2015, a shareholder resolution was filed for Shell's Annual General Meeting (AGM) requesting additional information from Shell regarding business risks associated with climate change. We have been asked to disclose this information from 2016 onwards.

The resolution was prepared by a coalition of UK asset owners and mutual fund managers. It was intended to emphasise the need to balance the short- and long-term interests of Shell's shareholders in relation to Shell's actions to mitigate climate change.

We supported the resolution at the 2015 AGM. We provided additional reporting in 2015 and we maintain our commitment to engage with our shareholders. In 2016, we continue to report on the five areas specified in the resolution. These five areas are Shell's ongoing operational emissions management, asset portfolio resilience to post-2035 scenarios, low-carbon research and development and investment strategies, as well as Shell's public policy interventions. Information that addresses the resolution can be found on the following pages of this report:

- reducing emissions, page 13;
- portfolio resilience, page 15;
- low-carbon energy investment, page 18;
- Shell's scorecard structure, page 48; and
- collaboration and public policy, page 14.

The full resolution can be viewed at [www.shell.com/ghg](http://www.shell.com/ghg). We will continue to publish additional information on this website as it becomes available. This will include, for example, our greenhouse gas emissions, additional information on our resilience to post-2035 scenarios and our submission to the Carbon Disclosure Project.

## PORTFOLIO RESILIENCE

Shell has long taken into account the potential risks and threats to the viability and profitability of major projects to ensure the robustness of our portfolio. Our investment horizons can be decades ahead.

At Shell, we assess the greenhouse gas (GHG) risks on all our planned ventures. We generally apply a GHG project screening value (PSV) for all new projects, and have done so since 2000. Since 2008, our GHG PSV has been \$40 per tonne. This means that new projects are assessed for the financial impact if a government imposed price or levy of \$40 per tonne for GHG emissions is implemented. For projects with a high exposure to government imposed carbon pricing or legislation, we consider the impact of higher GHG prices.

The screening value can affect our project design in a number of ways. Some projects may be stopped at an early stage if the GHG footprint is too high or a design may be altered to reduce GHG emissions at start-up. For example, we have stopped some projects at an early stage, due to high levels of CO<sub>2</sub> in the hydrocarbon reservoir. Alternatively, a project may be designed to enable CO<sub>2</sub> reduction at a later date if there is an increase in the local government imposed carbon price – for example, by adding CCS.

Special equipment enables us to measure changes in environmental conditions, which are factored into our project design criteria and support safe and more efficient operations. Gulf of Mexico, USA.



We strengthen the resilience of our portfolio with internal targets on energy efficiency and emission reductions at our assets. We use targets that are based on the local context and which cannot meaningfully be converted into company-wide goals. Our Carbon Disclosure Project submission provides more information about how we apply our targets.

## ADAPTATION

The effects of climate change will require governments, businesses and local communities to adapt their infrastructure to the changing environment. Across Shell, we take steps at our facilities around the world to ensure that they are resilient to climate change. This reduces the vulnerability of our assets and infrastructure to potential extreme variability in weather conditions linked to climate change.

We take different approaches to adaptation for existing operating assets and new projects. We progressively adjust our design standards for new projects while, for existing assets, we identify those that are most vulnerable to climate change and take appropriately timed action – for example, by upgrading refinery drainage systems.

## ENERGY EFFICIENCY

Across all our Upstream and Downstream operations, we strive for improved energy efficiency to help reduce Shell's overall GHG emissions. Better energy efficiency can be achieved by improving the reliability of our equipment, by smart scheduling of maintenance activities or by installing more energy-efficient equipment. The main metric that we use to measure our energy efficiency is energy intensity – that is, the amount of energy consumed for every unit of output.

Each of our 13 Shell-operated refineries has to identify measures to improve energy efficiency every year. For example, in 2015 we installed a cogeneration unit at our Bukom refinery in Singapore. This unit improves energy efficiency by recovering waste heat from the gas turbine's exhaust to generate steam.

Between 2009 and 2015, the energy intensity of our refineries decreased by about 6%, due to a combination of improved equipment reliability and better operating processes and energy-efficiency projects. Energy savings in downstream, combined with changes in the refining energy mix to lower-carbon alternatives, reduced the refining CO<sub>2</sub> emission footprint by about 1.5 million tonnes each year. These energy savings helped us to reduce costs: the total annual energy cost of our 13 refineries is around \$2.5 billion. We were able to reduce costs between 2009 and 2015 by about \$100 million each year.

We also continue to improve the scheduling of our shipping operations which helps to reduce fuel consumption, loading and discharging times.

For information on our energy-efficiency performance, see page 36.

## NATURAL GAS

The world needs to find lower-carbon ways to produce and consume energy. At Shell, we believe natural gas has an important role to play in meeting that challenge.



Natural gas is abundant, versatile and cleanerburning than coal. It makes up about half of Shell's total production and is one of the few energy sources that can meet many energy needs: to generate electricity, heat homes, power industry, and fuel ships and trucks. According to the International

Energy Agency, there are enough recoverable natural gas resources to last more than 200 years at current levels of consumption.

Natural gas can make an important contribution to the energy transition. It produces around half the CO<sub>2</sub> emissions of coal when burnt to generate electricity. The production and use of both coal and natural gas for power generation emits methane, which contributes to global warming. The use of gas for power will have less global warming impact than coal over a 100-year time frame as long as the total methane emissions of the gas supply chain do not exceed 3%. Most independent studies demonstrate that the emissions from the gas value chain are well below this level. (See page 27).

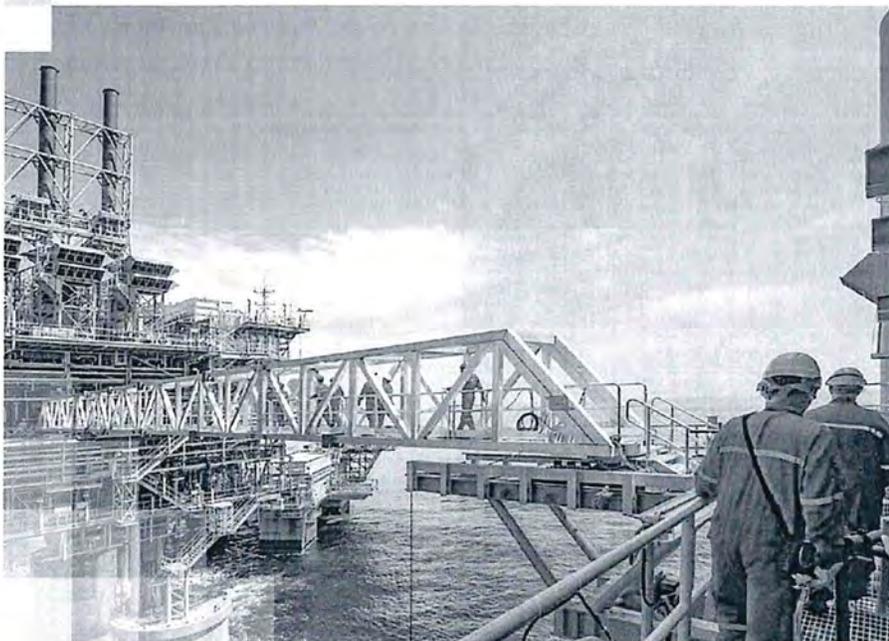
There is also potential to significantly reduce local air pollution by replacing coal with natural gas in power generation. This is already happening in Beijing, for example, where steps are being taken

to switch coal-fired power plants to natural gas. Modern natural gas plants emit less than one-tenth of sulphur oxides, nitrogen oxides, particulates, and heavy metals compared with coal. We work with a number of governments to support the creation of infrastructure needed to use gas as an energy source – such as liquefied natural gas import terminals.

Renewable energy will play a key role in the transition to a lower-carbon future. Yet, some renewable energy sources, such as solar and wind power, are intermittent due to the current absence of large-scale energy storage. They need a partner, such as natural gas, to maintain a reliable flow of electricity. A natural gas-fired power plant takes much less time to start and stop than a coal-fired plant.

Natural gas can also be used in combination with carbon capture and storage (CCS) to reduce CO<sub>2</sub> emissions. CCS could remove up to 90% of CO<sub>2</sub> emissions from power generation and play a key role in supporting the shift to a lower-carbon future. (See page 19).

Phase 3 of the Malampaya deep-water gas-to-power project was completed in 2015, providing up to 30% of the country's energy requirements. The Philippines.



## LIQUEFIED NATURAL GAS

Liquefied natural gas (LNG) is helping to bring the benefits of cleaner-burning natural gas to markets all over the world. Shell is one of the world's leading suppliers of LNG.



The LNG process enables natural gas to be easily transported from areas where it is abundant to places where it is needed. To create LNG, natural gas is cooled to  $-162^{\circ}\text{C}$ , turning it into liquid form and shrinking its volume by 600 times. At its destination, the LNG is converted back into gas for conventional use.

Shell was a pioneer of the LNG industry more than 50 years ago and is one of the world's largest LNG suppliers. Today, new global LNG supply is mainly coming from Australia, North America and East Africa. At the same time, we expect LNG demand to rise by 5% each year over the next two decades. Shell is currently involved in several LNG projects around the world.

For example, the LNG plant at Sakhalin-2 (Shell interest 27.5%), located off the east coast of Russia, provides around 9% of Japan's and 8% of South Korea's LNG supplies. LNG Canada (Shell interest 50%), is a proposed joint venture to develop an LNG export project in British Columbia, connecting the gas supply from north-west Canada to markets in Asia.

### FLOATING LNG

Floating liquefied natural gas (FLNG) facilities enable LNG to be produced, liquefied, stored and offloaded at sea. This makes it possible to reach offshore gas fields previously considered too expensive or too difficult to develop. FLNG is designed to reduce the local environmental footprint of LNG infrastructure and decrease the disturbance to land and marine life.

We are constructing our first FLNG facility, Prelude FLNG (Shell interest 67.5%), which will be located 475 km off the coast of Western Australia. It is under construction in various locations around the world – the main construction site is the Samsung Heavy Industries Yard in Geoje, South Korea. Once completed, Prelude FLNG will be the largest floating offshore facility in the world.

A module is lifted on to Prelude Floating LNG which is being assembled in Geoje, South Korea. Prelude will be located off the coast of Western Australia.



### LNG FOR TRANSPORT

Cleaner vehicles and fuels are needed to meet increasing demand for transport with less greenhouse gas emissions. Cleaner-burning LNG is a fuel for heavy-duty road transport, shipping and industry that is virtually free of sulphur emissions and has lower levels of nitrogen dioxide and particulates. It can be used as an alternative transport fuel to diesel and heavy fuel oil.

In shipping, LNG is already used as a fuel for vessels on inland and coastal waterways. In Norway, Gasnor, a Shell company, is a leading supplier of LNG to industrial and marine operators. Since 2015, Shell is able to import and use storage capacity at the Gas Access to Europe (Gate) LNG terminal in the Netherlands, which enables us to supply LNG to marine and road transport customers in north-west Europe. Shell is also using the terminal to supply LNG fuel to its growing truck-refuelling network in the Netherlands. In the same year, Shell also signed an agreement with Plouvier Transport NV and Intertrans Tankschiffahrt in Europe to charter 15 new inland dual-fuel barges. They will run predominantly on LNG and are expected to use the new Gate terminal.

Since 2015, Shell has been operating two offshore supply vessels for our deep-water activities in the Gulf of Mexico. The vessels run mainly on LNG, with one more LNG-fuelled vessel on order. We have also started construction of an LNG refuelling vessel to supply LNG-powered vessels and ships across north-west Europe.

In the USA, Shell continues to work with the truck-stop chain, Travel Centers of America, to develop a network of LNG refuelling stations for trucks. The first station was opened in California in 2014 and five more LNG stations are now operational in California, Texas and Louisiana. Shell also has two LNG refuelling stations in Canada.

# RESEARCH AND DEVELOPMENT

Innovation and advanced technologies play a crucial role in the energy transition. Our research and development (R&D) activities aim to address the need for more energy while reducing the environmental impact.

We have programmes, partners and funding methods to help us develop new technologies. Shell has research partnerships with leading universities and research institutes including Massachusetts Institute of Technology in the USA, Imperial College in the UK and Tsinghua University in China.

Our three main programmes that support future energy technology development are Shell GameChanger, Shell Technology Ventures (STV) and Shell TechWorks. Shell GameChanger nurtures radical, unproven ideas that have the potential to influence the energy future. STV, our corporate ventures arm, invests in companies and technologies that are likely to accelerate the development and deployment of innovations in the energy sector. Shell TechWorks is an open innovation programme that connects entrepreneurs and technology startups from other sectors to apply different technologies to the energy sector.

## LOW-CARBON ENERGY INVESTMENT

Over the past six years, we have invested about \$1.1 billion in low-carbon R&D. We support the development and implementation of new energy technologies by investing in companies and technologies that are complementary to Shell's existing business.

Through STV, we invest across the full scope of alternative energy: in production, we invested in GlassPoint solar technology (see page 21); in energy distribution, we invested in Next Step Living, a company that helps homeowners improve energy efficiency and use more renewable energy; in energy storage, we invested in Aquion Energy, a company that produces saltwater ion batteries that can store solar power for use at night for industrial purposes.

Other areas of low-carbon investment include supporting the global Carbon XPRIZE in the area of carbon capture and use. In Canada, Shell and

nine members of Canada's Oil Sands Innovation Alliance are funding an XPRIZE to foster ideas to find alternative uses for captured carbon dioxide.

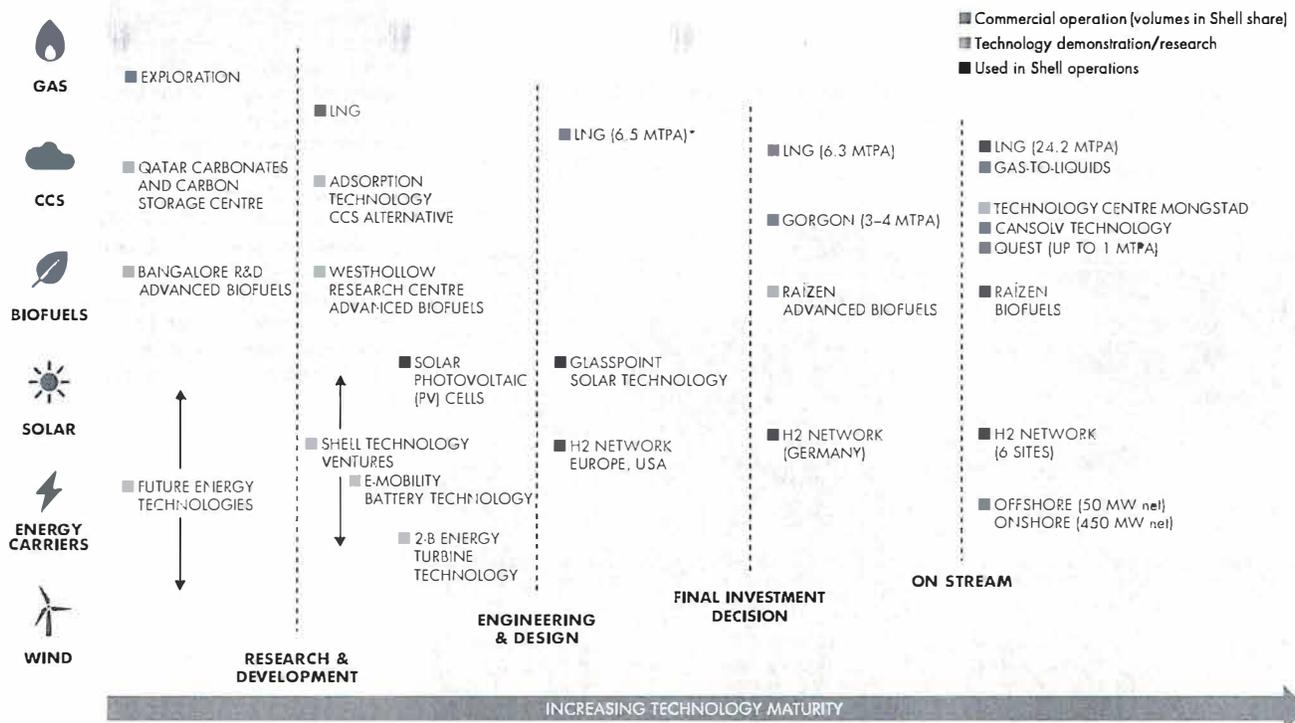
As part of our low-carbon investment portfolio, we are also researching new transport solutions including hydrogen technologies, energy storage for electric vehicles (see page 21) and advanced biofuels (see page 20).

## Stages of low-carbon investment

Our investment in low-carbon R&D can be categorised into six areas. (See diagram). We try and test many new technologies, often working in partnership with others. If the technology development shows commercial viability at the R&D stage, we will continue to invest in it.

For example, over a number of years, we have conducted seven advanced biofuel trials to test new biofuels made from plant and crop waste. Today, we have three demonstration plants where we evaluate cellulosic ethanol and manufacturing processes in which advanced biofuels are added to existing fuels.

## LOW-CARBON RESEARCH & DEVELOPMENT INVESTMENT



## CARBON CAPTURE AND STORAGE

Carbon capture and storage – or CCS – is the name given to a combination of technologies that captures and stores carbon dioxide (CO<sub>2</sub>) deep underground, preventing its release into the atmosphere.

At Shell, we believe the world will need CCS to achieve the ambition of net-zero emissions. CCS is already being used around the world to capture CO<sub>2</sub> from power generation and industrial processes with around 25 million tonnes of CO<sub>2</sub> captured and stored globally each year. Many companies have further CCS projects in development. There is considerable potential for the future deployment of CCS in a variety of industrial sectors including power, iron and steel.

### QUEST, CANADA

In Alberta, Canada, Shell operates a joint venture (Shell interest 60%) to develop the first commercial-scale CCS for reserves extracted from our oil sands operations. The facility is designed to capture up to 35% of the current CO<sub>2</sub> emissions from the Scotford Upgrader – the site where bitumen is processed into synthetic crude oil. The captured CO<sub>2</sub> is stored in a porous rock layer about 60 km away and more than 2 km below ground.

Quest started operating in 2015. At full capacity it can capture and store more than 1 million tonnes of CO<sub>2</sub> each year – equivalent to the emissions from about 250,000 cars. Since its start-up, Quest has reduced CO<sub>2</sub> emissions by 315 kilotonnes. The provincial government of Alberta and federal government of Canada have provided C\$865 million to support the development of Quest.

Shell and our joint-venture partners are freely sharing any data or intellectual property generated by the Quest project to help others advance CCS projects and demonstrate its value on an industrial scale.

### Monitoring Quest

Quest is designed to meet all the requirements for the safe and permanent storage of CO<sub>2</sub>. We have developed a rigorous monitoring programme to ensure that the CO<sub>2</sub> remains safely and securely underground. This includes continuous pipeline monitoring and early-warning systems, groundwater sampling and 3D seismic surveying. Throughout the development of Quest, we conducted an extensive

consultation programme with nearby communities. We share our baseline results from our monitoring programme with the local community.

### SHELL CANSOLV

CCS technology developed by Shell Cansolv is used at the Boundary Dam power station in Saskatchewan, Canada. It is Saskpower's largest coal-fired power station and a significant source of power for the region. Both sulphur dioxide and CO<sub>2</sub> are captured from the power station.

### PETERHEAD, UK

At the Peterhead power station in Scotland, which is operated by the British energy company SSE, we were, until recently, designing a full-scale gas CCS project for a natural gas-fired power plant. The CCS technology was being designed to capture and move CO<sub>2</sub> from the power station offshore through pipelines for storage deep under the seabed of the North Sea. Unfortunately, the UK government withdrew potential funding in late 2015, and the project did not proceed. We learnt much about how to reduce the costs of future CCS projects. The technical data and reports from our work is made publicly available.

## CARBON CAPTURE AND STORAGE OVERVIEW

### 1 CAPTURE

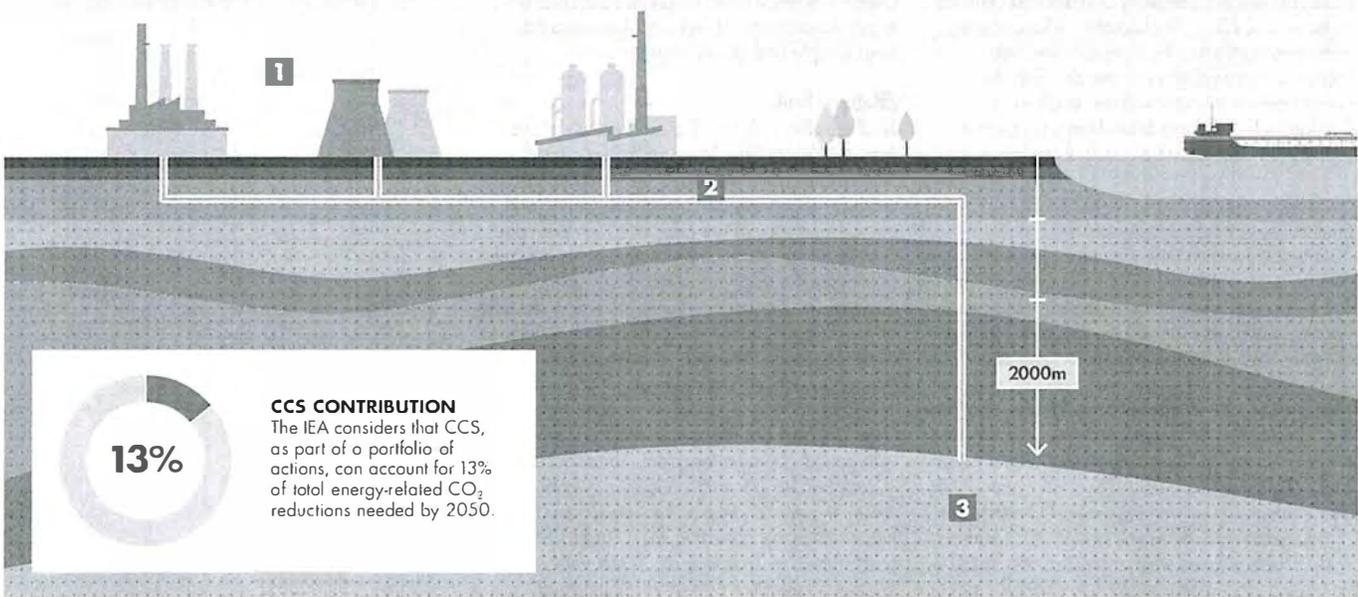
CO<sub>2</sub> capture separates CO<sub>2</sub> from gas, before it is emitted, using a chemical solvent. The captured CO<sub>2</sub> is separated from the solvent and compressed into a liquid form for transport.

### 2 TRANSPORT

CO<sub>2</sub> is generally pumped along a pipeline, taking the CO<sub>2</sub> from the industrial site where it has been produced, to its storage site which may be onshore or offshore.

### 3 STORAGE

CO<sub>2</sub> is injected deep underground into the microscopic spaces in porous rocks. A layer of impermeable rock, called a cap rock, lies directly above the porous rocks ensuring that the CO<sub>2</sub> remains there permanently.



13%

**CCS CONTRIBUTION**  
The IEA considers that CCS, as part of a portfolio of actions, can account for 13% of total energy-related CO<sub>2</sub> reductions needed by 2050.

2000m

## LOWER-CARBON ALTERNATIVES

Shell invests in a range of lower-carbon technologies and fuels, sometimes working with partners. Many of these technologies have the potential to bring about changes in the energy system.



### BIOFUELS

In the coming decades, biofuels produced from sugar cane and other crops are expected to play a valuable part in the changing energy mix. They are a cost-effective way to reduce CO<sub>2</sub> emissions in the transport sector, as long as their production is managed in a responsible way.

Our joint venture, Raízen (Shell interest 50%), in Brazil is the world's largest producer of sugar-cane ethanol. We also buy and blend biofuels into conventional fuels. We invest in advanced biofuels made from plant and crop waste. These are expected to further improve the sustainability of biofuels and increase production from the same amount of land.

#### Producing biofuels with Raízen

The use of sugar-cane ethanol produces 70% less CO<sub>2</sub> emissions than conventional petrol. In 2015, Raízen produced more than 2 billion litres of low-carbon ethanol from Brazilian sugar cane.

The company's production process is designed to minimise its environmental footprint. By-products are recycled as natural fertilisers. Waste sugar-cane fibres are used as fuel to generate electricity for the mills or exported to the grid. The sugar cane is grown using only natural rainfall, water recycled from the production process and irrigation on a small area. Raízen's harvesting process is already 98% mechanised which improves worker conditions and operational efficiency.

Raízen was the first company to certify a sugar-cane mill using the Bonsucro sustainability standard in 2011. Bonsucro's robust social and environmental standards are independently audited and certified. At the end of 2015, 13 of Raízen's 24 sugar-cane mills were certified to the Bonsucro standard. Raízen is also working in partnership with the non-governmental organisations, Imaflores and Solidaridad, to support its third-party sugarcane suppliers to become more sustainable producers.

#### SUSTAINABILITY STANDARDS

Shell currently buys biofuels from more than 100 suppliers around the world for blending with conventional fuels. In 2015, we used around 9.5 billion litres of biofuels in the petrol and diesel we sold worldwide – making us one of the largest blenders and distributors of biofuels globally.

Nearly all of the contracts with our suppliers of biofuels that we purchase for blending contain environmental and social clauses. These requirements aim to protect human rights and the biodiversity of ecosystems. We also continue to work on increasing the proportion of independently certified volumes. In 2015, around 40% of these volumes were certified as sustainable by an independent auditor, working to standards set out in the European Union's Renewable Energy Directive.

We support the adoption of international standards including the Round Table on Responsible Soy, the Roundtable on Sustainable Biomaterials, the Roundtable on Sustainable Palm Oil (RSPO) and Bonsucro for sugar cane. Every year, 100% of the palm oil that Shell blends is either independently certified by RSPO or the International Sustainability and Carbon Certification, or covered by offsets from GreenPalm.

In 2015, Shell completed a project with Patum Vegetable Oil in Thailand that helped farmers to meet RSPO standards. Around 800 farmers were successfully audited and received RSPO certification, which increased the availability of certified material by around 15,000 tonnes. We are also working to increase the purchase of independently certified sustainable sugar-cane ethanol and soy biodiesel.

#### DEVELOPING ADVANCED BIOFUELS

We continue to invest in new ways to produce biofuels from sustainable feedstocks such as waste and cellulosic biomass. Shell has three pilot plants at different stages of construction in the USA and India. The pilot plants will convert cellulosic biomass, which is non-food plants and waste, into a range of products, including petrol, diesel, aviation fuel and ethanol.

In addition, in 2015 Raízen opened its cellulosic ethanol plant at its Costa Pinto mill in Brazil. It is expected to produce 40 million litres a year of advanced biofuels from sugarcane residues.

#### ENERGY-EFFICIENT TRANSPORT

Energy efficiency is an important consideration in our development of fuels and lubricants that keep people and goods on the move.

#### Efficient fuels

Shell supplies fuels to millions of drivers around the world every day. For more than a century, our scientists have worked to develop high-quality products to improve the driving experience and energy efficiency of our customers. For example, Shell FuelSave Diesel contains ingredients designed to improve the combustion process in vehicle engines. This, in turn, can boost efficiency and help drivers save fuel. Shell FuelSave Diesel has helped reduce the carbon footprint of business customers in the bus, coach, construction and trucking sectors.

Shell GTL Fuel uses a gas-to-liquids (GTL) process, with natural gas as a feedstock, to produce a cleanerburning alternative fuel to conventional diesel. It is virtually sulphurfree, odourless and helps to improve local air quality. Shell GTL Fuel can be used as a drop-in diesel fuel without engine modification or new infrastructure or vehicle investment.

### HYDROGEN

Hydrogen has the potential to be an important low-carbon transport fuel. Hydrogen electric vehicles are quick to refuel and can drive a similar range as conventional cars. Hydrogen electric vehicles could also help improve local air quality as they produce water rather than emissions from the tailpipe. When electricity from renewable sources is used to produce the hydrogen, in future, they could generate close to no carbon emissions.

Shell is taking part in several initiatives to encourage the adoption of hydrogen electric energy as a transport fuel. Hydrogen electric transport can succeed if vehicle manufacturers and fuel suppliers, with the support of governments, work together to enable wide uptake of the technology. There needs to be a sufficient refuelling infrastructure to attract customers, as well as incentives for businesses to build this infrastructure.

In Germany, for example, the government is supporting the deployment of a national network of hydrogen electric fuelling stations across the country by 2023. We are working on this project with our joint-venture partners in H2 Mobility Germany – Air Liquide, Daimler, Linde, OMV and Total. We currently operate three hydrogen filling stations in Germany and have two hydrogen filling stations in Los Angeles, California. We are assessing the potential for similar projects in the USA, UK, Switzerland, Austria, France, Belgium, Luxembourg and the Netherlands.

### Advanced lubricants

The lubricants we produce for motorists and commercial vehicles are designed to increase engine efficiency and reduce fuel consumption. Shell is one of the largest investors in research and development (R&D) among international oil and gas companies and employs more than 200 scientists and engineers in lubricants R&D. Our technology centre in Shanghai, China, researches motor oils for passenger cars, heavy-duty engine oils and transmission fluids for the Asian markets, while our marine power innovation centre in Hamburg, Germany, develops lubricants for ships.

Our Shell Rimula range of heavy-duty engine oils was developed with leading engine makers including Mercedes Benz. The oils help heavy-duty commercial vehicle operators improve the fuel economy of their fleets, while providing extra protection against wear in the vehicle engine.

We also produce high-quality engine lubricants which can improve the fuel efficiency of passenger cars and motorcycles. These include products manufactured using Shell PurePlus Technology that applies the GTL process to produce a clear base oil. This has much lower levels of impurities than other base oils and can help improve performance.

### Fuel efficiency

Each year, Shell runs a series of competitions, called Shell Eco-marathon, in which we challenge student teams from around the world to design and build ultra energy-efficient vehicles. The events – which take place in the Americas, Africa, Asia and Europe – inspire young engineers to push the boundaries of innovation. The winning teams are those which can travel the furthest on the least amount of energy. Competitors regularly enter vehicles capable of travelling more than 1,000 km on a single litre of fuel. In 2015, one of the leading vehicles was capable of travelling more than 2,500 km on 1 litre of fuel.

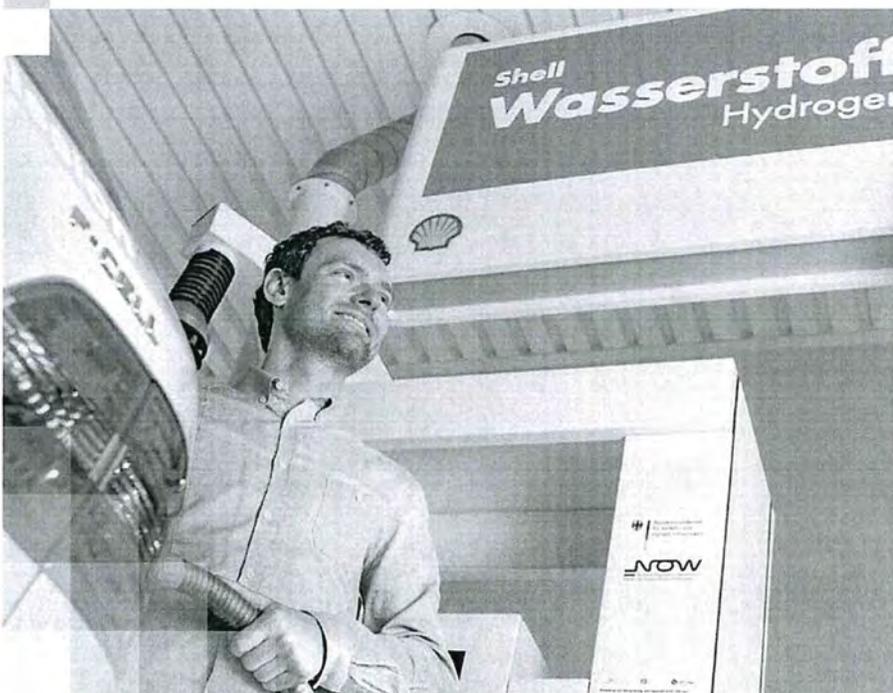
### Project M

Shell lubricants experts are working closely with leading car designer, Professor Gordon Murray, and engine specialists, Geo Technology, to co-engineer a compact, ultra-efficient concept car for urban driving. Due for launch in April 2016, it could help to advance efficient energy use in transport if it is produced by a car manufacturer.

### Electric mobility

We have taken part in electric mobility trials since 2013 with commercial partners in Germany, the UK and the USA. In 2015, we took part in a trial in California, USA, with San Diego Gas & Electric. The trial integrated electric vehicles into California's wholesale energy market by aggregating the storage capacity of electric vehicle fleets across five locations.

A customer fills his car with hydrogen at one of Shell's hydrogen fuelling stations in Hamburg, Germany.



## SOLAR AND WIND TECHNOLOGIES



Solar and wind power are playing a growing part in meeting global energy demand. At Shell, we expect an emerging low-carbon

energy system to include traditional fuels such as oil and natural gas alongside renewable energy and carbon capture and storage.

Shell has been involved in wind power for more than a decade. We have interests in eight operational wind power projects in North America and one in Europe. Our share of the energy capacity from these projects is about 500 megawatts. When designing the European wind farm, we used our experience with oil and gas platforms to ensure it could withstand the harsh North Sea conditions. STV has invested in 2-B Energy, a renewable energy company, to support its two-blade turbine wind technology and reduce the cost of offshore wind power. (See page 18).

We are also exploring the possibilities offered by solar power. Petroleum Development Oman (PDO, Shell interest 34%) uses technology developed by GlassPoint Solar – a company in which Shell has invested – to reduce energy consumption within its operations. GlassPoint uses solar power to generate steam which is, in turn, injected into wells to enhance the recovery of oil.

PDO and GlassPoint are constructing a solar thermal steam plant in Oman, called Project Mirraah. Once completed in 2020, Mirraah will be the world's largest solar thermal steam plant, providing about a third of the Amal oilfield's steam requirements. It will potentially be capable of producing up to 1 gigawatt of power. This solar technology will replace gas-fired steam generation and free the gas for other uses, to reduce the CO<sub>2</sub> intensity of the oil production. We are looking at further opportunities to deploy both steam and power using photovoltaic systems on an industrial scale at oilfields in the Middle East and California.

We also use renewable energy in our own operations. This can result in significant cost and CO<sub>2</sub> savings. For example, in Pakistan we installed a 100 kilowatt solar photovoltaic system at our fuel depot in Karachi, generating around 170 megawatt-hours of power each year. This helps reduce diesel consumption for back-up power generation.

## MANAGING OPERATIONS

The nature of the energy industry means that we often operate in challenging environments. We work to reduce our environmental impact and manage our operations safely and responsibly, wherever they may be.

This section describes those operations identified by stakeholders as of high interest in 2015. It explains how we are striving to improve our performance in areas such as safety and reduce our impact on the environment and communities.

**1.2** MILLION

Tonnes decrease of GHG emissions from flaring compared with 2014



**58%**

Approximate reduction of number of operational spills in Nigeria compared with 2014



**85%**

Water recycling rate in oil sands



We monitor our tight-gas operations in line with our onshore operating principles. An employee checks a pressure gauge at Groundbirch, Canada.



## OUR ACTIVITIES IN ALASKA

In September 2015, we ended our offshore exploration drilling operations in Alaska for the foreseeable future.



We drilled in Alaska's outer continental shelf during the summer months of 2015. We successfully met the regulatory safety and environmental standards expected

of us. After safely drilling an exploration well in the Burger prospect in the Chukchi Sea, we found that there was insufficient oil for commercial development. This, in part, led us to stop drilling operations in Alaska for the foreseeable future.

This decision reflects the outcome of the Burger J well, and the high costs associated with the project. We support regulation that enforces high safety and environmental standards. However, the unpredictable federal regulatory environment for the Alaska outer continental shelf also made it difficult to operate efficiently. In the summer months of 2016, we will remove the remaining equipment from the drilling sites in Alaska.

Currently, 6% of the world's oil and gas comes from the Arctic region, including Alaska, according to Wood Mackenzie. We believe this region will be an important source of energy in the future. However, our drilling in Alaska was an issue that divided public opinion: throughout our operations there was a high level of litigation and environmental activism in opposition to our drilling in the region. While we maintained our focus on safe and successful exploration in 2015, we recognised

the concerns of many international non-governmental organisations who do not believe continued fossil fuel extraction from the Arctic is necessary.

### WORKING WITH COMMUNITIES

Our relationship with local communities, including the indigenous peoples of Alaska's North Slope, the Iñupiat, played a key role in our operations in Alaska. The Arctic Iñupiat Offshore (AIO) – a company that includes some of Alaska's North Slope village corporations and the Arctic Slope Village Corporation – took part in discussions with Shell about potential impacts on their lifestyles and livelihoods. Its president, Rex Rock, Sr., was pivotal in the signing of an agreement between AIO and Shell for its members to have an option to share in future oil and gas production from Shell's Chukchi Sea leases.

An important part of our work with the Iñupiat communities was to create opportunities for jobs and to develop skills that were both sustainable and transferable to other sectors that operate in the region. Shell trained people from the community in skills that included communications, observing marine mammals, working on drill ships and oil-spill response.

### ARCTIC SCIENCE

Our work in remote areas, such as the Arctic, requires an in-depth understanding of the region's ecosystem, including its wildlife, marine mammals and wetlands. Shell's chief environmental scientist for the Arctic, Michael Macrander, has been leading our research efforts over two decades to improve our understanding of the Arctic and, in particular, Alaska.

In Alaska, Shell set up and has funded since 2006, a science programme with the local governments of the North Slope. As part of the agreement, the Iñupiat communities were able to choose subjects for scientific research which included topics of research relating to their traditional way of life.

The scientific research led to a deeper understanding of the birds and mammals in the Arctic region. The work provided insight into migration patterns, the sensitivity of aquatic species to man-made sounds and important patterns of biodiversity.

For example, our science teams investigated whether Shell's work affected the migration route of the bowhead whale. We found that the bowhead whales tended to avoid areas of seismic activity while on their established migration path. Another scientific discovery – one that the Iñupiat peoples had always supported but western science had disputed – was that the bowhead whale has a sense of smell. These discoveries helped guide our operations to have minimal impact on the Iñupiat peoples' subsistence activities.

This body of scientific research has established an understanding of Arctic systems and the effect of oil and gas operations on them. The findings help to inform our operations in other sensitive environments and minimise our impacts on local biodiversity. We share our science research with the industry and regulators, and have published our findings in academic journals.

The drilling ship Polar Pioneer anchored in Dutch Harbor for the 2015 exploration season, Alaska, USA.



## OUR ACTIVITIES IN NIGERIA

Incidents in 2015, including the continued theft of crude oil, reinforced the need to maintain the highest standards of safety and security in Nigeria.



In 2015, the Shell Petroleum Development Company of Nigeria Ltd (SPDC), which is the operator of the SPDC joint venture (SPDC, Shell interest 30%), divested its interest in three onshore leases and a major pipeline. Our performance metrics for Nigeria this year reflect, in part, these divestments.

Shell Companies in Nigeria (SCiN) recorded a total of seven fatalities in 2015, in four separate incidents. In one incident, four people lost their lives while working to remove an illegal tap point from a pipeline in the Niger Delta. The incident is being investigated, in line with our procedures, and we are taking steps to learn from what happened. "This loss of life is a deeply troubling turn for SCiN after no fatalities in 2014," says Osagie Okunbor, the Managing Director of SPDC and Country Chair of SCiN. "Crude oil theft is a major issue, with attacks not only on pipelines but increasingly on flowlines and well heads."

In the same year, the gas flared from SPDC JV operations declined by 28% and flaring intensity decreased by 15% from 2014, partly due to divestments and also to their focus on gas flare reduction. However, a lack of adequate joint-venture funding from our government partner has delayed planned start-up dates for two other major gas gathering projects. (See page 28 for more on flaring).

### SPILL PREVENTION AND RESPONSE

In 2015, the new Nigerian president stated that he would prioritise the recommendations of the United Nations Environment Programme (UNEP) report on Ogoniland. The report called on the Nigerian government, oil and gas companies and communities to put an end to all forms of oil contamination and to begin a comprehensive clean-up of the region.

The government brought together a number of parties including representatives of the Ogoni Community who will work to move forward with implementing the report's recommendations. An 18-month roadmap has been agreed by the government, UNEP and SPDC which includes a governance framework. SPDC fully supports the UNEP report and remains committed to playing its part in implementing the UNEP recommendations. SPDC also announced a £55 million settlement in 2015 with members of the Bodo community in Nigeria regarding two operational spills in 2008. Ongoing discussions are taking place with the Bodo community to allow international contractors to proceed with oil removal and clean-up. This is in accordance with the Memorandum of Understanding between the SPDC JV and the Bodo community.

SPDC is working on a number of initiatives to prevent and minimise the impact of theft and sabotage in Ogoniland, including community-based pipeline surveillance, education and alternative livelihood programmes. In 2015, SPDC introduced new ways for the community to directly log complaints or issues. This is intended to improve the company's communication with host communities.

### SPILLS AND RESPONSE DATA

SPDC continues work to clean up areas near our facilities affected by spills irrespective of the cause of the spills. The number of operational spills fell from 37 in 2014 to 15 in 2015. The volume of oil spilled in operational incidents also fell, from 0.3 thousand tonnes of spills volume to 0.2 thousand tonnes.

Theft of SPDC JV crude oil on the pipeline network amounted to around 25 thousand barrels of oil a day in 2015. This reduction from around 37 thousand barrels of oil a day in the previous year is partly due to continued surveillance efforts and implementing anti-theft protection mechanisms on key equipment. Since 2012, SPDC has removed more than 850 illegal theft points.

The number of sabotage-related spills in 2015 declined to 93 compared with 139 in 2014. This decrease was due to divestments in the Niger Delta and increased surveillance and security by the Government of Nigeria. However, theft and sabotage are still the cause of around 85% of spills from SPDC JV operations.

In total, 133 new sites requiring remediation were identified in 2015, of which 23 were in Ogoniland. Of the total of 305 sites identified for remediation and certification at the start of 2015, 184 have been remediated and certified. 55 of these sites were in Ogoniland (representing a net reduction of 29% in remediation sites in that area during 2015).

SCiN hold interests in a number of offshore licences including the Shell-operated Bonga field, Gulf of Guinea, Nigeria.



**WORKING WITH COMMUNITIES**

SCiN work with government, communities and civil society to implement programmes that can positively impact people's lives in the Niger Delta and in other parts of Nigeria. The programmes focus on community and enterprise development, education and health.

In 2015, SPDC JV and Shell Nigeria Exploration & Production Co Ltd (SNEPCo) invested around \$10 million (Shell share around \$3 million) in scholarships and education programmes. Grants were awarded to 930 secondary school students and 638 university undergraduates during 2015. Ten postgraduate scholarships were also awarded to students from Rivers, Bayelsa and Delta states to study engineering and geosciences at international universities.

The cradle to career programme enrolled 60 new students in 2015. The programme was launched in 2010 to pay for children from rural communities in the Niger Delta to attend some of the country's leading secondary schools. Over five years, 410 places have been awarded.

SPDC JV has supported community health in the Niger Delta since the 1980s: the Obio Cottage Hospital in Port Harcourt, set up by SPDC JV, has become one of the most visited health facilities in the region. This is due to a community health-insurance scheme which was the first of

its kind for the Niger Delta. More than 45,000 people had been enrolled in the SPDC JV community health-insurance scheme at Obio Cottage Hospital by the end of 2015. In total, more than 550,000 host communities have benefited from outreach programmes between 2007 and 2015. The SPDC JV supports 18 health centres in the Niger Delta and SNEPCo supports two centres outside the Niger Delta.

SNEPCo will also be collaborating with Project Gaia Prospects, an international non-governmental organisation to conduct a year-long pilot study to promote the use of clean cookstoves in Lagos households. SNEPCo will provide 2,500 clean cookstoves in 2016.

LiveWIRE, Shell's youth entrepreneurship programme, has now been extended beyond the Niger Delta to include Lagos, with 255 trainees, and 126 business grants awarded in 2015. In total, 6,290 people have been trained under the programme between 2003 and 2015 and 3,183 grants awarded.

SPDC JV also provides funds for communities as part of its global memorandum of understanding (GMoU), where projects are nominated by community groups. To date, 35 GMoUs are in place covering 359 host communities, with the Ogulagha cluster of communities joining in 2015.



**External opinion**

"SPDC and its joint-venture partners provide funds to support projects that are nominated by community groups under the GMoU agreement. SPDC was prepared to fund a marine services business for the Andoni Cluster, which is made up of 22 Niger Delta communities. This would enable the community-led enterprises to provide marine services to SPDC.

We invested the GMoU funds in a ship. Today, we have a vessel that is contracted to Shell and operating in the Santa Barbara field. This initiative has been a huge support to the communities in the Andoni Cluster and has employed seven young people. However, it would be simpler if payments were made direct to the community enterprise rather than through the marine services contractor."

**Chief (Hon) Gad Harry Ekipiriko (JP)**  
 Chairman, Andoni Cluster GMoU Foundation  
 Andoni Local Government Area, Rivers State Nigeria

**SHELL'S ECONOMIC CONTRIBUTION**

In addition to SPDC and SNEPCo, Shell also holds interests in a number of offshore licences including the Shell-operated Bonga field (Shell interest 55%). Shell also has a 25.6% interest in Nigeria Liquefied Natural Gas (NLNG), which exports LNG around the world.

- \$42 billion:** economic contribution from SPDC JV partners to the Nigerian government 2011–2015.
- \$1.1 billion:** Shell share of royalties and corporate taxes paid to the Nigerian government in 2015 (SPDC \$0.6 billion; SNEPCo \$0.5 billion).
- 93%:** SCiN contracts awarded to Nigerian companies.
- \$0.9 billion:** SCiN spend on local contracting and procurement.
- 94%:** employees of SCiN are Nigerian (data as of October 2015).
- \$145.1 million:** SPDC JV and SNEPCo contribution to Niger Delta Development Commission in 2015 (Shell share \$62.3 million).
- \$50.4 million:** SPDC JV and SNEPCo direct spending on social investment projects in 2015 (Shell share \$15.4 million).

## TIGHT GAS AND OIL

Tight gas and oil continue to play an important role in meeting global energy demand. We use advanced, proven technologies, including hydraulic fracturing, and follow our global operating principles to unlock these resources safely and responsibly.



Tight gas and oil resources are trapped in microscopic pores of very dense shale or sandstone rock, normally thousands of metres underground. Hydraulic fracturing

has been used for many years in the oil and gas industry to extract tight gas and oil. The process fractures the rock and releases the gas and oil into the well.

The US Energy Information Agency states that tight gas and oil in the USA has boosted the production of natural gas by around 35% since 2005. This has reduced the need for gas imports. The increased use of these resources instead of coal in North America has helped to reduce carbon dioxide emissions.

### ONSHORE OPERATING PRINCIPLES

Some communities and environmental groups have raised concerns about the use of hydraulic fracturing. These groups question the high volumes of water used, the risk of chemical release into water sources and the potential release of methane gas or other chemicals into the air.

In 2011, we developed and publicly shared a set of five global principles that govern the onshore tight or shale gas and oil activities where we operate and where hydraulic fracturing is used. The principles cover safety, air quality, water protection and use, land use and engagement with local communities. We encourage regulations that set comparable standards. The principles are reviewed and updated as new technologies, challenges and regulatory requirements emerge. We share our global onshore operating principles publicly.

Each of our projects takes into account the local context – including the geology of the area and impacts such as noise and traffic – and we then design our activities to suit the local conditions. We have implemented technologies that reduce the environmental impact of tight gas and oil activities, including capturing methane emissions and improving the detection and repair of leaks. (See page 27).

### COLLABORATION

We strive to be transparent in our activities and work in partnership with communities and others in the industry to bring about improvements in the sector.

For example, in the USA, we collaborate with the Center for Sustainable Shale Development (CSSD) and its members. These include environmental organisations, foundations and oil and gas companies. CSSD has developed 15 voluntary performance standards covering air quality, water resources and climate. Our tight-gas operations in the Appalachia region received CSSD certification in 2015.

We also work with the Environmental Protection Agency in the USA to contribute to discussions on effective regulations and programmes to reduce emissions. Significant reductions are being achieved by a combination of existing regulation and voluntary efforts by the industry.

Throughout 2015, Shell worked closely with industry, regulators and academics in Western Canada to address concerns about emerging risks of induced seismicity associated with hydraulic fracturing. Shell is working with industry partners, through the Canadian Association of Petroleum Producers, to develop best practice that includes monitoring, mitigation and response procedures to avoid or minimise seismicity potentially associated with hydraulic fracturing.

### LISTENING AND RESPONDING

There remain some concerns about the development of tight gas and oil resources due to the use of hydraulic fracturing. (See table).

## LISTENING AND RESPONDING TO COMMUNITY CONCERNS

| Concerns raised by communities  | Shell operating principles  | Examples in practice  |
|---|---|---|
| Chemicals could be released into local water sources.   | We always have at least two physical barriers in the section of the well that passes through the potable groundwater aquifer, to prevent the production stream from mixing with potable groundwater.  | In Appalachia, USA, we test the quality of water wells around our sites both before and after drilling to ensure we can detect any changes.   |
| High volumes of water are used in hydraulic fracturing which can compete with other local water needs.          | We design our operations to reduce the use of potable water and to use non-potable water as far as reasonably practical.  | Our Fox Creek operations in Canada have an agreement with the town to use their treated waste water in our operations. In 2015, we used around 60% alternative or waste water sources in our Fox Creek operations. Shell also funded a design study to upgrade the town's natural water facilities.   |
| Methane gas and other chemicals could be released into the air from hydraulic fracturing sites.                 | At many locations, we monitor production facilities and pipelines for fugitive emissions. This may be done by pressure testing, visual observation, infrared testing or other emerging technologies.  | In Appalachia, USA, we introduced a number of voluntary measures at our sites to reduce methane emissions. These exceeded local, state and federal air quality regulations. Around 90% of our surface facilities have low-emission devices to reduce fugitive emissions.  |
| Noise and traffic could affect local communities.   | We work to understand and reduce the impact of our operations on communities, wildlife and livestock. This includes limiting our activities during specific times.  | At our sites in Permian, USA, we invested in pipelines and water recycling facilities. This has significantly reduced the number of trucks coming to our site.  |
| Effects of operational land use on local communities.   | We assess the impacts of our operations on the social and economic aspects of the community and find ways to reduce the effects and identify the opportunities.   | Shell proactively engages with First Nations in Canada to understand traditional land use and help reduce impacts on culturally-sensitive areas or areas used for traditional purposes such as fishing and hunting.   |
| Hydraulic fracturing activity could cause seismic events that damage infrastructure and threaten public safety. | Shell analyses publicly available seismic, geological and geophysical data to determine historical seismicity in areas where we plan to operate. If seismic activity beyond historic levels is detected, we will investigate and review our operations. | We support appropriate local regulations based on local geology and surface conditions, to manage the risk of induced seismicity in areas where we operate. To date, we have not experienced any induced seismic events from our Shell-operated water injection or hydraulic fracturing activities in North America. We have also introduced guidelines to help avoid or minimise induced seismicity. |

## MANAGING METHANE EMISSIONS

An important part of the effort to tackle climate change is to cut methane emissions. Shell is using specialist equipment to find methane emission sources quickly and cost effectively.

The Intergovernmental Panel on Climate Change (IPCC) has estimated that around 370 million tonnes of methane are released into the atmosphere each year from man-made sources which, on a carbon dioxide (CO<sub>2</sub>) equivalent basis, makes up about 20% of total global greenhouse gas (GHG) emissions.

Methane is more potent than CO<sub>2</sub>; it has 34 times the global warming potential of CO<sub>2</sub> over a 100-year time frame, according to the IPCC AR5 report. Reductions in methane emissions today will help to slow the rate of global temperature rise, as methane remains in the atmosphere for a much shorter time than CO<sub>2</sub>.

The regulation of methane emissions varies among countries. Shell and the industry are working with governments to highlight the challenges and help find the most cost-effective and efficient solutions for methane management. Any solutions should be informed by robust data and peer-reviewed science.

### METHANE IN OIL AND GAS PRODUCTION

Methane emissions associated with oil and natural gas production tend to occur in four main areas: combustion (emissions of unburnt methane from fuel combustion); flaring (where the flaring itself fails to burn all the methane); venting (including from equipment); and unintended emissions (for example, small leaks sometimes called fugitive emissions).

Reports by the Environmental Defense Fund (EDF) and the International Energy Agency have shown that gas used in power generation will continue to have lower total GHG emissions than coal, as long as methane leakage throughout the natural gas supply chain is less than 3% or 8% respectively. (The variation is due to assumptions made about how long methane emissions endure in the atmosphere.) The Environmental Protection Agency (EPA) in the USA estimates that total methane emissions in the natural gas supply chain – as a percentage of the global total volume of natural gas produced – are around 1.3%. This takes into account methane leaks during gas processing and transmission through pipelines for power generation.

### Collaborating to reduce emissions

Shell has collaborated on academic studies to better understand methane life-cycle emissions. In 2014, we participated in a University of Texas and EDF assessment of methane emissions from tight-gas production in the USA. Recommendations from the study have been used as input for our programme to improve or replace equipment to reduce our methane emissions.

Shell has been a partner with the EPA Natural Gas STAR programme since 1995. The programme encourages oil and gas companies to adopt cost-effective technologies and practices that improve operational efficiency to reduce

methane emissions. It also encourages the introduction of internal voluntary measures such as Shell's onshore operating principles. (See page 26).

### OUR PERFORMANCE

In 2015, methane emissions contributed less than 5% of Shell's GHG emissions on a CO<sub>2</sub> equivalent basis. We recognise that it is important to reduce methane emissions from our operations. Methane from flaring and venting in our Upstream operations represented more than 45% of our reported methane in 2015. (For our flare reduction work, see page 28).

There are also concerns that tight-gas production could cause fugitive emissions. Our reported methane emissions from the production of tight gas in 2015 were less than 0.5% of the gas produced from these assets. We have leak detection and repair programmes across our sites to identify unintended emissions or equipment that has high emissions so they can be replaced or repaired. Following successful pilots in the USA, Shell is now deploying advanced leak detection and repair technology using infrared cameras to scan for methane emissions.

Shell continues to work to identify all potential methane sources to help reduce our emissions. We report our methane emissions from these sources according to regulations and industry standards. We also monitor work in the industry for more accurate reporting methods.

Shell is using infrared cameras to scan for methane emissions so that leaks can be repaired. Appalachia, Pennsylvania.



## FLARING

The flaring of natural gas produced with oil wastes valuable resources and contributes to climate change. At Shell, we are working hard to minimise flaring associated with oil and gas production.

When oil is extracted from a reservoir, gas is produced as the oil is brought to the surface. Operational flaring is sometimes carried out for safety reasons. However, continuous flaring occurs when there are no facilities to capture the gas – this wastes valuable energy resources and releases carbon dioxide into the atmosphere.

Shell's policy is to reduce any continuous flaring or venting at our operations to a level as low as technically and financially feasible. We also aim to minimise operational flaring required for safety reasons such as during the start-up of a new facility. Our flaring policy is set out in our health, safety, security, environment and social performance (HSSE & SP) Control Framework, including the requirement that new facilities are designed so as not to continuously flare or vent.

Shell has been an active member of the World Bank sponsored Global Gas Flaring Reduction (GGFR) partnership since 2002. This public-private partnership promotes and facilitates progress in reducing flaring by working collaboratively to find alternative uses for gas that would otherwise be flared. As part of the GGFR partnership, the World Bank has developed a Zero Routine Flaring by 2030 initiative to encourage governments, companies and development organisations to work closely together to end continuous flaring. Shell joined the initiative in April 2015 before it was launched. The initiative aims to identify ways to use associated gas from projects at the design stage – for example, to generate electricity for local communities.

### OUR PERFORMANCE

In 2015, we reduced flaring from facilities we operate from the level reported in 2014 despite an increase in flaring levels in Malaysia in line with increased oil production in 2015. More than 90% of our flaring occurs in Iraq, Nigeria, Malaysia and Qatar.

In Iraq, flaring decreased slightly in 2015 as Shell Iraq Petroleum Development (Shell interest 45%)

safely delivered the first phase of a gas-capturing system at our Majnoon facilities. When the second phase is complete, the project will capture about 65% of the gas that would otherwise be flared. The start-up of this project marks a significant milestone in our efforts to reduce gas flaring at Majnoon and deliver natural gas for power generation for the people of Iraq.

The flaring volume from Shell Petroleum Development Company's (SPDC) joint-venture facilities in Nigeria was reduced by 85% between 2002 and 2015. The flaring intensity (the amount of gas flared for every tonne of oil and gas produced) was reduced by around 70% over the same period. Flaring from SPDC facilities decreased in 2015, due to divestments and improved operations at our assets. Progress was also made on several gas-gathering projects, which are now at advanced stages of completion. For example, we have installed a gas-gathering plant at the Oloma Station that is ready for final commissioning. However, the planned start-up dates for two other major gas gathering projects have been delayed due to a lack of adequate joint-venture funding from our government partner.

Flaring increased in Malaysia, due to increased oil production at Gumusut Kakap (Shell interest 33%) which started production in 2014. The associated gas was flared until reinjection equipment was ready for use in October 2015. The gas is now injected back into the hydrocarbon reservoir from which it came.

At our Pearl gas-to-liquids (GTL) plant in Qatar, flaring takes place for operational reasons. In 2015, our flaring decreased due to lower activity while maintenance and enhancements to the plant took place. This helped lower operational flaring by using more waste gas for electricity generation.

We expect our overall flaring levels to continue to decline in 2016 as the gas-gathering facilities in Iraq and Malaysia become operational.

### WIDER FLARE REDUCTION EFFORTS

Basrah Gas Company (BGC, Shell interest 44%) is a joint venture with South Gas Company and Mitsubishi. It captures associated gas that would otherwise be flared from three non-operated oil fields in southern Iraq (Rumaila, West Qurna 1 and Zubair) for use in the domestic market. BGC recently achieved a record production of 515 million standard cubic feet of gas each day. If used for power generation, this would be enough to power more than 3.5 million homes. In 2015, BGC in Iraq and SPDC in Nigeria received awards from the World Bank Group for their flare reduction work. (See external opinion).



### External opinion

"Gas flaring at oil production sites around the globe has been steadily declining for several years. However, progress has been too slow, particularly when the world is demanding strong climate action and when many oil producing countries have severe energy shortages. If the amount of gas flared globally was instead used for power generation, it could produce more electricity than the whole of Africa currently consumes

In 2015, the World Bank introduced a new initiative – Zero Routine Flaring by 2030 – to accelerate efforts to reduce global gas flaring. Shell demonstrated leadership by endorsing the initiative before its official launch in Washington, D.C. Its endorsement was an impetus for other oil companies to join. We expect Shell to continue its progressive, proactive role to turn the initiative into action.

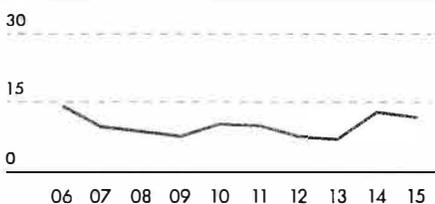
The Zero Routine Flaring by 2030 initiative means new oil fields will be developed with solutions that avoid flaring or venting. Existing legacy flaring must end as soon as possible and no later than 2030. In late 2015, Shell received a Global Gas Flaring Reduction Partnership Excellence Award for its achievements in Iraq and Nigeria. We look forward to continuing our partnership towards a more sustainable energy future."

### Bjørn Håmsø

Programme Manager, Global Gas Flaring Reduction Partnership, World Bank, Washington D.C., USA

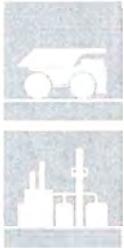
### FLARING - UPSTREAM

million tonnes CO<sub>2</sub> equivalent



## OIL SANDS

Canada's oil sands in Alberta and Saskatchewan are among the largest oil reserves in the world. In 2015, we opened the Quest carbon capture and storage (CCS) facility in Alberta to reduce our carbon dioxide emissions.



Oil sands are a mixture of sand, water, clay and heavy oil called bitumen. Shell has a 60% interest in the Athabasca Oil Sands Project (AOSP) which includes Shell Albion Sands (Muskeg River and Jackpine mines) and the Scotford Upgrader, which processes bitumen into synthetic crude oil. During 2015, we improved efficiency in water and energy use. This was part of our ambition to become more economically and environmentally resilient and competitive.

In 2015, we took the decision to stop construction of our Carmon Creek oil sands project in Alberta.

### MANAGING GHG EMISSIONS

Oil sands emit 4–23% more greenhouse gas (GHG) emissions – from production through to use as a transport fuel – than the average crude oil used in the USA, according to research in 2013 by Cambridge Energy Research Associates. Since the start-up of the Quest CCS in 2015, the GHG intensity of Shell's oil sands operation has decreased. These emissions are now closer to the average GHG emissions of North American oil. (See page 19).

Overall, we have reduced our energy intensity by 8%. Two programmes are currently in place at Albion: one uses waste heat from tailings to reduce the demand for steam; and the other programme has installed a pressure-reducing turbine that converts steam to electricity. We also explore advanced energy-efficiency techniques with other oil sands producers through our membership of Canada's Oil Sands Innovation Alliance (COSIA) – an organisation that aims to accelerate the development of environmental technologies by sharing information among oil sands operators.

In 2015, the government of Alberta announced a new climate plan, which affects the oil and natural gas industry, and includes a carbon-pricing regime and an emissions limit for the oil sands. This is a policy that aligns with our own advocacy to support carbon pricing. (See page 14).

### WATER USE AND RECYCLING

Oil sands mining operations require water to separate bitumen from the sand. Shell is committed to exploring ways to minimise water use in our oil sands operations. We use water efficiently and recycle as much as possible: in 2015, we increased water recycling in our mines by 3%.

Reductions in our water use are due to a number of efforts. This includes increased tailings monitoring and increased reclamation capacity by transferring processed water between the mines.

### TAILINGS

The separation of bitumen from sand creates tailings – a mixture of water, sand, clay and residual hydrocarbons, as well as naturally occurring traces of heavy metals and other chemicals. Tailings are stored in ponds to allow the sand to settle at the bottom, so that the water can be recycled and the solids can be used for reclamation. We carefully manage our tailings to prevent contamination of local surface-water courses and groundwater.

Tailings ponds at the Muskeg River and Jackpine mines covered 42.9 km<sup>2</sup> at the end of 2015. This is in line with the planned development of the mines, as the size of the ponds has increased to support ongoing production and facilitate reclamation of older ponds.

The Alberta government has introduced a new Tailings Management Framework to minimise the growth of tailings ponds and accelerate reclamation. Shell supports these regulations. We have invested approximately C\$465 million during the past decade to develop technologies that speed up the drying process for fluid fine tailings, and have processed around 3.4 million cubic metres of fluid fine tailings during that period. In 2015, we processed around 5.1 million cubic metres of fluid fine tailings at our Athabasca site.

We carefully manage our tailings to prevent contamination of local surface water and groundwater. Albion Sands, Alberta, Canada.



### INDIGENOUS COMMUNITIES

Shell has been working closely with indigenous communities in Canada for many years to reduce the impact of oil sands development on traditional land use and culture, as well as bring benefits to these communities. Since 2005, Shell has spent more than C\$1.8 billion with local indigenous contracting companies (See page 46).

### RECLAMATION

We aim to reclaim the land used in our oil sands mines by refilling the mined-out areas with dried tailings and restoring the contours of disturbed land. We will then place topsoil and plant suitable vegetation on the sites in question. Reclamation is an integral part of our mine development.

We work with local and indigenous communities on our reclamation work. To date, Shell has salvaged and stockpiled nearly 47 million cubic metres of soil for future reclamation. A total of 185 hectares of land has been permanently reclaimed at our Albion mines.

## OUR PERFORMANCE

Each year, we measure our performance: we assess the safety of our operations and our impact on the environment, including our greenhouse gas emissions and energy intensity. This helps us to improve our operations and strive towards our Goal Zero ambition of no harm and no leaks.

We also work closely with communities near our operations to address concerns and we contribute in areas such as local employment.

This section provides information on our safety, economic, environmental and social performance in 2015.

**186** MILLION CUBIC METRES

Fresh water used in our operations



**0.94**

Total recordable case frequency of injuries



**\$122** MILLION

Spent on voluntary social investment



Pearl GTL is the world's largest source of gas-to-liquids products. It produces up to 140,000 barrels of GTL products each day. Ras Laffan, Qatar.



## SAFETY

We work to deliver energy responsibly and safely, while looking after our employees, contractors, local communities and the environment. We strive to improve safety performance throughout the energy industry.

Our ambition of Goal Zero is to achieve no harm and no leaks across all of our projects and operations. To accomplish this goal, we focus on the three areas of safety which have the highest risks for our type of activities: personal, process and transport safety.

We have consistent, high safety standards and requirements across Shell that all our employees and contractors must meet, no matter where they work. These standards apply to any joint ventures that we operate. We work relentlessly to strengthen our safety culture and leadership, with the focus on caring for people. We learn from incidents within Shell and other companies. Our approach is to reduce safety risks as far as technically and financially feasible, and to minimise the potential impacts of an incident.

### PERSONAL SAFETY

Everyone who works for us, or with us, has an important part to play in making Shell a safer place to work. We have been working to create an environment in which our employees and contractors take personal responsibility for achieving Goal Zero. This is more than a culture of compliance, but one in which people feel looked after. Our aim is to have a more motivated, productive, healthier and safer workforce.

All employees and contractors must follow Shell's 12 Life-Saving Rules, which cover the most critical safety hazards that have caused loss of life in our activities. We introduced the rules in 2009 and have since achieved a notable reduction in fatalities and injuries. Personal responsibility also extends to intervening to prevent unsafe conditions, and respecting fellow workers and the communities in which we work.

The safety of our contractors is an important area of focus, as we have a large contractor workforce which often performs activities with higher safety risks. (See page 46). We work with our contractor partners to ensure they understand our safety requirements and expectations, and we help them to build skills and expertise where needed.

For example, Shell is the world's largest contractor of vessels, with around 1,300 on the water on any given day. We introduced a safety programme to encourage contractor partners and the industry to share their knowledge and experiences. This has led to better leadership and safety behaviour. The number of serious or potential incidents has been reduced by more than half within Shell since 2011. In 2015, the programme won a Shell CEO's HSSE & SP award which recognises outstanding performance in safety.

### PROCESS SAFETY

Process safety starts at the early phase of designing and building facilities and continues throughout their life cycle, making sure they are operated safely, well maintained and inspected regularly. Our global technical and operational safety standards are in place to ensure that hazardous materials are safely contained. If an incident happens, we learn from it to help prevent any similar incidents from occurring again.

We also make sure that we have the necessary resources to deal with spills, leaks, fires and explosions. Our emergency-response plans are routinely tested and improved after simulation exercises.

### TRANSPORT SAFETY

Aviation, rail, maritime and road transport activities to move people, product and equipment are an area of risk within our industry. Risks vary across different types of transport. We develop best practice standards within Shell, and work with specialist contractors and industry bodies, where needed. For example, we are focusing on reducing the risks involved when we load and unload product. (For more on road transport see page 32).



### External opinion

"Effective safety management requires more than engineering skills: it needs to be complemented with an understanding of human factors and organisational behaviour. Shell appreciates that a broad scientific perspective is essential for risk control and regularly sponsors psychological research on safety.

Our projects at the University of Aberdeen – based on platforms, rigs and tankers – have provided insights into what makes a good safety leader. This led to the development of an appraisal tool for the energy industry that Shell made publicly available.

Recently, we studied how Shell managers remain vigilant and respectful of operational risks, even when everything is apparently running smoothly. This kind of behavioural research shows the willingness of a company to be self-critical. It is a powerful component for sustaining operational and process safety.

### Rhona Flin

Emeritus Professor of Applied Psychology, University of Aberdeen, Aberdeen, UK

## SAFETY CONTINUED

### SAFETY IN DEEP WATER

Shell has a long history of working safely in deep water – that is, offshore oil or gas production at depths greater than 300 metres. Today, technological advances enable us to work in water up to 10 times that depth.

At Shell, as we operate in deeper and more challenging environments, we continually review our procedures, improve our equipment and develop the skills of our employees. For example, Phase 3 of our Malampaya gas project off the coast of the Philippines, which started up in 2015, is supported by a specialist health, safety and environment (HSE) training centre. More than 6,000 Filipinos have been trained to the highest HSE standards at the centre since 2013.

At our training centre in Louisiana, USA, we have equipment and simulators that replicate normal and emergency conditions on an offshore deep-water platform. This allows us to provide new operators with the necessary skills to work safely offshore and to reduce their training time from around three years to eight months.

### OIL-SPILL RESPONSE

We regularly test our oil-spill emergency response procedures and capability to ensure employees and contractors can respond rapidly to an incident. We continue to work with the oil and gas industry to further develop effective oil-spill emergency response capabilities.

Shell is a founding member of the Marine Well Containment Company (MWCC), which is designed to respond to a deep-water well control incident in the Gulf of Mexico, USA. The MWCC can cap or contain wells at depths of more than 3,000 metres. MWCC continues to make upgrades and enhancements to its cap and containment systems, including developing equipment that has higher temperature and pressure capabilities.

Shell is also a founding member of the Subsea Well Response Project, backed by nine major companies. The project has deep-water well-capping and spill-response equipment in Brazil, Norway, Singapore and South Africa. In early 2015, new well containment equipment – designed to capture oil from a leaking well if other systems fail – was made available to member companies around the world.

### RAISING INDUSTRY STANDARDS

We want to help improve safety performance throughout the energy industry. Shell works in partnership with industry associations and other professional groups to share our safety experience and standards with other operators and contractors. These include the International Association of Oil & Gas Producers, the American Petroleum Institute (API) and the Society of Petroleum Engineers. We also work with other third parties, such as the Energy Institute in the UK, to promote industry-leading research into safety culture in organisations, safety leadership and how best to learn from incidents.

The Center for Offshore Safety (COS), sponsored by the API and of which Shell is a member, is an example of collaboration between the industry and regulators to continuously improve safety and environmental performance in the Gulf of Mexico. Safety and environmental management systems of COS members are audited and certified by third parties. Member companies also co-operate to learn from their best practices and experiences. For example, Shell has been participating in an analysis of safety incidents involving lifting and hoisting.

### ROAD SAFETY

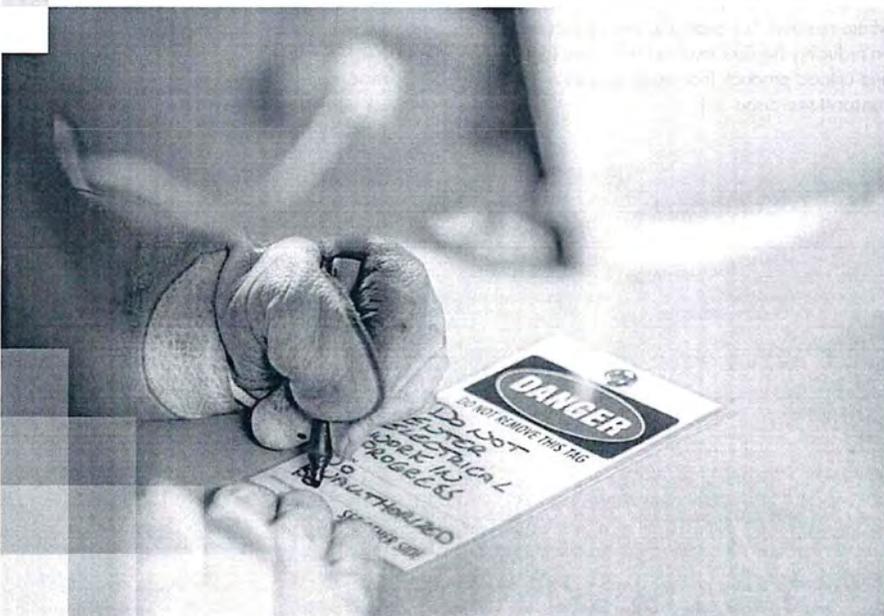
Road safety is a global concern. The World Health Organisation states that there are around 1.25 million deaths each year from road traffic incidents. Shell is always working to improve road safety among our drivers in the 70 countries where we operate, with a greater focus on countries that have a higher risk.

Our road safety approach focuses on the skills and behaviour of the driver, the condition of the vehicle, the local environment and road conditions. These are supported by activities such as our global mandatory road safety training programme for drivers as well as by routine audits of our contractor road safety capabilities. Since introducing our first global driver safety programmes in 2008, there has been a significant decline in fatal road incidents across Shell. We recorded no road fatalities across our own operations in 2015.

Our employees and drivers are required to follow Shell's Life-Saving Rules at all times. These include following a prescribed route for road journeys, wearing a seat belt, not using mobile phones or any other devices while driving and adhering to speed limits. Monitoring systems are in place in many of our vehicles to give drivers feedback and coaching on their driving performance. We also try to reduce road transport risks by reducing the number of journeys – using buses to transport employees, and marine vessels and trains to transport equipment.

We think it is important to share our experience of effective road safety with governments and non-governmental organisations, and to learn from others. We are board members of the Network of Employers for Traffic Safety and the Global Road Safety Partnership. (See page 39). We also learn from and share our knowledge with companies outside of the oil and gas industry.

Everyone working at Shell must take responsibility for achieving Goal Zero.  
Caroline, Alberta, Canada.



**SAFETY PERFORMANCE**

Our safety performance in 2015 was mixed, as described below.

**Personal safety**

In 2015, following steady and significant improvements in our safety performance over the past decade, we achieved our lowest ever number of injuries per million working hours – the total recordable case frequency (TRCF). We also achieved our lowest ever level of injuries that led to time off work in 2015, measured as lost time injury frequency (LTIF).

Sadly, seven people lost their lives while working for Shell in 2015; four of them during one single operational incident. Our fatal accident rate (FAR) – the number of fatalities per 100 million hours worked – increased in 2015 after many years of significant improvement. We investigate and learn from these incidents – along with any significant near misses – to reduce the risk of harm.

**Process safety**

A process safety incident is any leak or spill of hazardous material. In line with industry standards, we measure and report according to the significance of the incidents, with Tier 1 as the most significant. In 2015, we achieved our lowest ever total for both Tier 1 and 2 operational process safety events: 51 Tier 1 occurrences in 2015 (57 in 2014) and 169 Tier 2 in 2015 (194 in 2014).

Process safety events that are related to sabotage and theft in Nigeria are recorded separately. There was an improvement during 2015 with fewer incidents: 28 Tier 1 and 17 Tier 2 events (91 Tier 1 and 48 Tier 2 in 2014).

In 2015, the six most significant operational incidents were:

- four fatalities during a pipeline repair (Nigeria);
- a gas release from the Curlew offshore production facility (UK);
- a crude oil spill from an onshore well (Nigeria);

- a fire at a furnace at the Rhineland refinery (Germany);
- a fire at the Bukom refinery (Singapore); and
- a gas release from a subsea reinjection pipeline (UK).

**Safety in the community**

The Groningen gas field in the Netherlands is operated by Nederlandse Aardolie Maatschappij B.V. (NAM, Shell interest 50%) and is one of the largest onshore gas fields in Europe. Earthquakes occur in the province of Groningen as a result of gas production. Following the Huizinge earthquake in August 2012, new insights emerged about the potential intensity of future earthquakes. NAM is in discussions with the local communities about their concerns regarding safety and the uncertainties about the future.

An extensive study is in progress to better understand seismic risk in the area. Several international universities and researchers are involved, with the final report expected in 2016. Interim results from November 2015 include a seismic risk assessment which demonstrates that all production levels analysed meet the acceptable risk boundaries set by the Netherlands Ministry of Economic Affairs.

Since 2012, the ministry has set gas production reduction measures, including a production limit. A range of actions has been taken to improve safety, liveability and economic prospects in the region. NAM is working hard, together with all relevant parties, to fulfil commitments to the residents of the area. A long-term programme has been developed by the National Coordinator for Groningen to work with regional authorities and residents on issues such as improving the handling of claims and resolution of disputes. NAM is publicly sharing information on its progress and publishes earthquake measurements.

**SECURITY**

We carefully assess the security threats and risks to our operations. We work with governments and partners to safeguard our assets and provide a secure working environment for our employees and contractors.

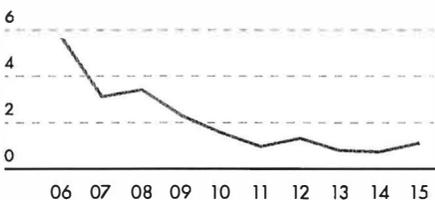
Shell only uses armed security in countries where the threats are greatest, or if it is a requirement under local laws. The use of armed security reflects greater threats, mostly due to increased geopolitical volatility in certain parts of the world.

We implement the Voluntary Principles on Security and Human Rights (VPSHR) in our operations – and with companies with whom we co-operate – to reduce the risk to employees, contractors and communities of human rights violations by the security forces. Our security plans are validated by independent audits and assurance checks.

Our security risk management plans are part of our efforts to minimise negative impacts on communities and the environment. We work alongside governments, companies and non-governmental organisations who are involved in the VPSHR initiative to increase adoption of the principles.

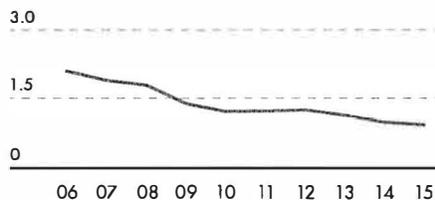
**FATAL ACCIDENT RATE (FAR)**

fatalities per 100 million working hours



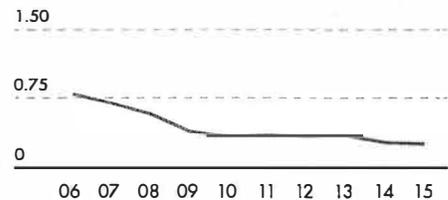
**TOTAL RECORDABLE CASE FREQUENCY (TRCF)**

injuries per million working hours



**LOST TIME INJURY FREQUENCY (LTIF)**

injuries per million working hours



## ENVIRONMENT

We carefully consider the potential environmental impact of our activities and how local communities might be affected throughout the lifetime of a facility.

Our approach is to comply with all environmental regulations, to improve our performance continually in line with best practice, and to prepare to respond to future challenges and opportunities. We use external standards and guidelines, such as those developed by the World Bank and International Finance Corporation, to inform our approach.

We have global environmental standards that include a focus on managing our emissions, minimising our use of fresh water and conserving biodiversity. Within our operations, we also focus on reducing our energy use, flaring less gas and preventing spills and leaks.

### OUR STANDARDS

Our environmental standards are detailed in our health, safety, security, environment and social performance (HSSE & SP) Control Framework. Shell standards are applied to joint ventures of which we are the operator. We also encourage our joint-venture partners to apply materially equivalent standards at ventures we do not operate. Our projects and operated facilities comply with local environmental regulations and our own standards.

Whenever we plan new projects, we carry out detailed assessments of the potential environmental, social and health impacts. These assessments help us to manage and reduce impacts on the environment and communities during construction, operation and, when relevant, decommissioning. We make the results of these assessments available to the public when we are legally and contractually permitted to do so.

For example, LNG Canada (Shell interest 50%) has conducted a number of studies since 2012 on the potential impacts of its proposed project to build a liquefied natural gas (LNG) export facility in Kitimat, western Canada. The studies reviewed the potential impact of the project on the environment and local community, including its economy, health and cultural heritage. It involved meetings with people affected by the potential project, including aboriginal groups, local communities and government regulators. The full assessment has been approved by the regulatory authorities with letters of support from the community, and First Nations whose traditional territory would be affected by the project. Its recommendations will be implemented if the proposed LNG plant is built and operated.

### SENSITIVE AREAS

We work to avoid impacts on biodiversity when developing new projects. In some cases, our projects can affect local biodiversity and the communities who rely on its biodiversity for their livelihoods. We develop comprehensive biodiversity action plans to assess and mitigate the extent to which local biodiversity and communities may be affected by operations in critical habitats. For example, at our Corrib facility in Ireland, we constructed a pipeline tunnel under an estuary to minimise the impact on land and water habitats.

We partner with major conservation organisations, such as the International Union for Conservation of Nature, The Nature Conservancy, Wetlands International and Earthwatch. We seek their guidance on how best to protect natural habitats. (See page 47).

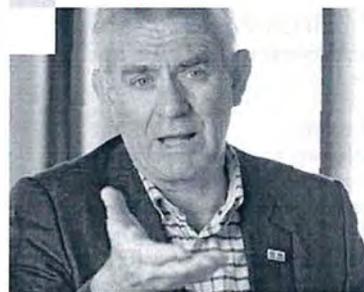
### PROTECTING OCEANS

The biodiversity of the world's oceans is at risk from a range of different challenges, including overfishing, climate change and pollution from plastics. We combine science and knowledge from local communities to enhance our understanding of the marine environments in which we operate. We also train people in communities to help protect marine mammals off the coast in countries where we are active, for example, in New Zealand and Colombia.

In the Gulf of Mexico, USA, we are encouraging scientists to use Shell's expertise and technology – such as remotely-operated vehicles – to explore the depths of the ocean. This collaboration between academics and the deep-water oil and gas industry has led to sightings of rarely seen sea creatures and the discovery of what is thought to be a new species of octopus.

### CREATING GREEN INFRASTRUCTURE

Green infrastructure is the term used to describe the use of natural systems to complement man-made infrastructure, an approach which typically makes the overall system more resilient. We are looking for ways to integrate natural systems into the design of our projects. In some cases, natural systems could be used as part of climate change adaptation strategies by governments, businesses or communities.



#### External opinion

"Shell has contributed to UNEP-WCMC's Proteus Partnership for more than 13 years, supporting the development and accessibility of valuable biodiversity information. Shell has made good progress integrating biodiversity data into operational decisions by screening for critical habitats and implementing biodiversity management plans. But there is always room for improvement.

Our research shows there are overlaps between hydrocarbon resources and areas that the conservation community considers important for biodiversity. This will make securing social licence to operate increasingly challenging. The energy industry needs to place a greater emphasis on the value of nature, economic or otherwise, in its decision-making. This would enable a more nuanced approach to developing resources in areas which require sensitive management of the social and environmental impacts and risks."

#### Dr Jon Hutton

Former director, UNEP-World Conservation Monitoring Centre (WCMC), Cambridge, UK

In Louisiana, USA, a Shell-funded programme, operated by the Coalition to Restore Coastal Louisiana, organised the collection of hundreds of tonnes of oyster shells from local restaurants to help rebuild oyster reefs and restore the state's coastline. Louisiana is home to 40% of the USA's wetlands, and a natural habitat for oysters. The oysters clump together to form reefs, which trap sediment and help create shallow marshes and estuaries. These are the nurseries for one of the country's largest commercial fisheries and refuge for more than 5 million migratory birds. The reefs also help shield homes, businesses and ports from storms on Louisiana's coast.

### MANAGING WATER

The availability of fresh water is a growing challenge in some regions of the world. At Shell, we know that it is important to preserve this valuable resource and manage our water use responsibly. Water constraints tend to affect people at the local or regional level, so we tailor our use of fresh water to local conditions.

In water scarce areas, we develop water management plans. These plans describe the long-term risks to water availability and define measures to minimise our use of fresh water or prescribe alternatives to fresh water, such as recycled water, processed sewage water and desalinated water. Waste water from our operations is treated before discharge into the environment. Where appropriate, we look for ways to treat waste water using natural solutions such as constructed wetlands. This helps us to reduce the energy use associated with water management.

Our technology centre in Bangalore, India, is home to our water research laboratories. It is also a hub that connects Shell's water experts around the world

In Louisiana, USA, a Shell-funded programme organised the collection of oyster shells to help restore parts of the state's eroded coastline.



so that they can share their experience. The centre works in collaboration with leading universities, non-governmental organisations and global technology firms such as Wetsus, one of the top water research organisations in the Netherlands. A focus of this work is on the development of advanced technologies to increase recycling and reuse rates.

Shell is also involved in a number of working groups with different organisations, such as the World Business Council for Sustainable Development and IPIECA, the global oil and gas industry association for environmental and social issues. In these groups we share experiences and encourage the adoption of common practices across the industry. In 2012, we published an accounting methodology for water used in oil and gas operations, in co-operation with the University of Utrecht.

### SPILLS

Shell has clear requirements and procedures in place to prevent operational spills. We have routine programmes to maintain our facilities and pipelines, and improve their reliability, in order to reduce operational spills. However, spills still occur for reasons such as operational failure, accidents or unusual corrosion. (See page 36).

### AIR EMISSIONS

We track emissions released into the atmosphere from our upstream and downstream facilities and work to reduce air pollution from our operations. This includes making investments to lower our emissions of nitrogen oxides, sulphur oxides and volatile organic compounds that are released during oil and gas production and processing. These pollutants can affect air quality in the areas where we operate.

## DECOMMISSIONING AND RESTORATION

Decommissioning is an intrinsic part of the life cycle of any asset and must be done safely and responsibly when the asset reaches the end of its life. When we decommission a well pad, for example, we safely seal the well, remove the production equipment and reinstate the land. We use expertise from the decommissioning industry to help us with this work. However, as with much of the oil and gas industry, some of our more complex decommissioning projects take place offshore.

Our largest decommissioning activity, to date, is for the Brent oil and gas field which lies in the North Sea between Scotland and Norway. The preparation for the decommissioning of the four Brent field platforms started more than eight years ago. It has involved consultation with more than 180 interested parties and an independent review group to validate Shell's decision-making process. In 2014, Shell submitted a recommendation to the UK regulator to decommission the topside of one Brent platform in a single lift – the largest ever attempted offshore – and transport it onshore for recycling. These plans have been approved.

In 2015, we took a further step to sharpen our focus on decommissioning by forming a team within Shell to improve safety, increase efficiency, reduce cost and meet environmental and stakeholder requirements for these projects. The team will work with the industry to identify best practice and enhance technologies for decommissioning our wells and facilities responsibly and efficiently.

## ENVIRONMENT CONTINUED

### ENVIRONMENTAL PERFORMANCE

We improved or maintained our environmental performance across most areas during 2015. This was due to operational improvements as well as reduced activity and divestments. Details about our environmental performance are provided below and on pages 27 and 28 for methane and flaring.

#### Spills

The number of operational oil spills in 2015 was 108, down from 153 in 2014. The volume of operational spills of oil and oil products increased to 0.8 thousand tonnes, from 0.7 thousand tonnes in 2014.

The number of spills caused by sabotage and theft fell to 94 from 139 in 2014. The volume of these spills decreased to 2.2 thousand tonnes in 2015 from 2.7 thousand tonnes in 2014. In 2015, sabotage and oil theft remained a significant cause of spills in the Niger Delta, Nigeria. See pages 24 and 25 for more information on spills in Nigeria.

The reduction in spills was in part due to divestments. We investigate and learn from all spills to improve our performance and we clean up the areas near our operations that are affected by spills, irrespective of the cause. As of the end of March 2016, there were two spills under investigation in Nigeria that may result in adjustments.

#### Water use

Our facilities are designed and run to help minimise their use of fresh water, particularly in areas of water scarcity. In 2015, the amount of fresh water we used decreased to 186 million cubic metres from 199 million cubic metres in 2014. More than three-quarters of our fresh water use was for manufacturing oil products and chemicals. Our Upstream operations accounted for almost a quarter of our total fresh water use.

#### Energy efficiency

One of the ways we can manage our direct GHG emissions is to work on improving the energy efficiency of the facilities we operate. The main metric that we use to measure our energy efficiency is energy intensity (the amount of energy consumed for every unit of output).

In 2015, the overall energy intensity for the production of oil and gas in our Upstream business (excluding oil sands and gas-to-liquids) improved slightly compared with 2014. This was partly due to divestments of unconventional assets in the USA and Canada.

All our major upstream facilities have energy management plans in place to make the best use of those facilities, including the use of improved field management techniques.

We expect it will be more difficult in future to maintain the energy-efficiency levels of recent years, as existing fields age and new production comes from more energy-intensive sources. This may increase our upstream energy intensity over time.

In our oil sands operations, energy intensity improved from 6.3 gigajoules for every tonne of production in 2014 to 5.8 gigajoules in 2015. The overall energy intensity for the manufacture of oil products at our refineries worsened, from 94.9 refinery energy index in 2014 to 95.4 in 2015. This was mainly due to more unplanned production shutdowns at several refineries.

The methodology for calculating the energy intensity of our chemical plants was updated in 2015; therefore data for preceding years is not directly comparable and have not been recalculated. Based on the new methodology, the comparable result for 2014 was 90.7, compared with 90.4 which was originally calculated. The increase to 91.6 in 2015 was mainly due to unplanned equipment shutdowns at our chemical plant in Moerdijk. (To read more about our energy efficiency, see page 15).

## GREENHOUSE GAS EMISSIONS

The direct GHG emissions from facilities that we operate were 72 million tonnes on a CO<sub>2</sub>-equivalent basis in 2015, down from 76 million tonnes of CO<sub>2</sub> equivalent in 2014.

We have changed our reporting methodology to align with the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. This has involved updating the way we calculate the global warming potential (GWP) of the greenhouse gases we emit. GWP compares the impact of emissions from greenhouse gases with the impact of emissions from the equivalent amount of CO<sub>2</sub>. This update has increased our reported GHG emissions (on a CO<sub>2</sub>-equivalent basis) by around 0.5 million tonnes.

The reasons for our overall decrease in GHG emissions were as follows:

- divestments, including unconventional assets in North America, some operations in Nigeria and the Geelong refinery in Australia;
- operational improvements across many assets;
- overall reduction in flaring (see page 28);

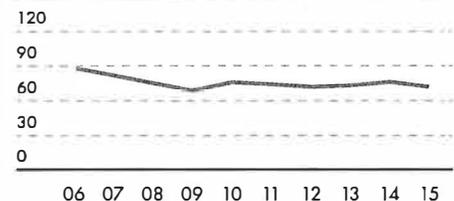
- startup of Quest CCS in Canada's oil sands (see page 19); and
- shutdown of multiple units at our Moerdijk chemical plant in the Netherlands.

Around 45% of our GHG emissions came from the refineries and chemical plants in our Downstream business. The production of oil, gas and gas-to-liquids products in our Upstream business accounted for around 50% of our GHG emissions, and our shipping activities for less than 3%. We continue to work on improving operational performance and energy efficiency to reduce GHG emissions.

The indirect GHG emissions from the energy that we purchased (electricity, heat and steam) decreased to 9 million tonnes on a CO<sub>2</sub>-equivalent basis in 2015, from 10 million tonnes in 2014. These emissions were calculated using a market-based approach, as defined by the World Resources Institute GHG Protocol. We estimate that the CO<sub>2</sub> emissions from the use of our refinery and natural gas products were around 560 million tonnes in 2015.

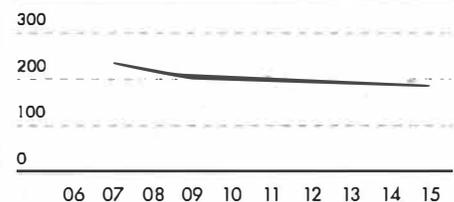
### DIRECT GREENHOUSE GAS EMISSIONS

million tonnes CO<sub>2</sub> equivalent



### FRESH WATER WITHDRAWN

million cubic metres



**Air emissions**

We track emissions released into the atmosphere from all our operations. Our sulphur oxides emissions decreased from 97 thousand tonnes in 2014 to 88 thousand tonnes in 2015. This decrease was partly due to using fuel with lower sulphur content in our shipping activities but was partly offset by the higher sulphur content of the crude oil processed by our refineries.

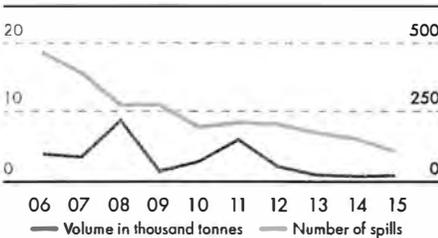
Our nitrogen oxides emissions decreased from 146 thousand tonnes in 2014 to 104 thousand tonnes in 2015. The realignment of reporting boundaries in 2015 to follow guidance from IPIECA/API/IOGP, in part affected these numbers.

Our emissions of volatile organic compounds (VOCs) decreased to 125 thousand tonnes in 2015 compared with 151 thousand tonnes in 2014. This was mostly due to a reduction of venting in Majnoon, Iraq. We expect our VOC emissions to further decrease in the coming years as a result of our efforts to reduce flaring and venting.

**Waste**

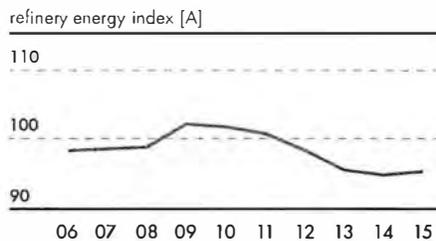
We aim to reduce the amount of waste we generate and to reuse or recycle materials, wherever possible. For example, in 2015, five of our Downstream manufacturing sites sent more than 75% of their waste generated during the year off-site for recycling or reuse. We track the amount of waste sent off-site for disposal or recycling.

**SPILLS – OPERATIONAL [A]**



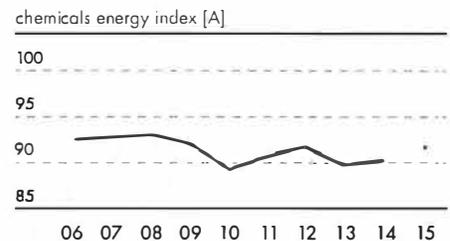
[A] Over 100 kilograms.

**ENERGY INTENSITY – REFINERIES**



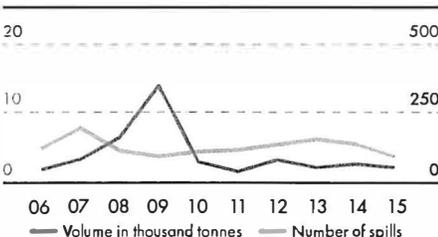
[A] Indexed to 2002; based on 2006 Solomon EII™ methodology.

**ENERGY INTENSITY – CHEMICAL PLANTS**



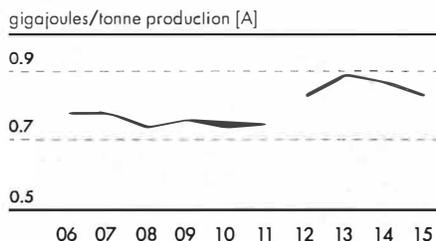
[A] CEI calculation methodology changed in 2015; therefore, data for prior years are not directly comparable.

**SPILLS – SABOTAGE [A]**



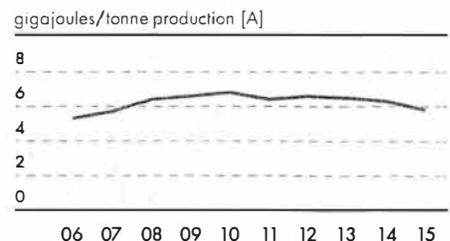
[A] Sabotage and theft-related spills over 100 kilograms.

**ENERGY INTENSITY – UPSTREAM (EXCLUDING OIL SANDS AND GTL)**



[A] 2012-2015 data are reported in accordance with IPIECA/API/IOGP guidance 2010.

**ENERGY INTENSITY – OIL SANDS**



[A] Includes mining and upgrading operations.

## WORKING WITH COMMUNITIES

Many of our operations are located close to communities. We work with communities to understand their priorities and concerns. This is essential to our being a responsible company.

We engage with communities to identify how we can avoid, minimise or mitigate any negative impacts. This engagement also determines how and where we can add sustainable benefits in the form of employment, contract opportunities and social investment programmes.

Our work with communities follows our health, safety, security, environment and social performance (HSSE & SP) Control Framework. Our social performance teams, working closely with our environmental teams, use the framework to guide their work. It governs how we plan projects and run operations. The framework recognises international standards as a benchmark – such as the environment and social performance standards set by the International Finance Corporation.

Each major project and asset at Shell has a social performance plan. This includes a summary of our impacts on communities and the environment – which are identified during the impact assessment process – and the actions we take to address them. (See page 9). We use indicators to monitor the progress of our work in communities. The indicators used are relevant to each local community and may include monitoring spending on local goods and services or measuring and categorising community feedback.

A hydropower generator has been installed as part of a pilot project to bring electricity to the indigenous Batak people. Palawan, the Philippines.



### LISTENING AND RESPONDING

We know that effective communication with communities can help to both avoid and, if necessary, remedy grievances. We ensure that people in neighbouring communities are able to express their views in a variety of ways, including community meetings, surveys, community advisory panels and employee hotlines.

Community liaison officers are employed to keep people informed about the ways our operations may affect them. They listen to the concerns of people in the community so that those concerns can be incorporated into our plans, whenever appropriate. This approach was successfully applied during our recent operations in Alaska where we had an agreement with the Iñupiat communities near the Chukchi Sea to inform them daily of our activities to avoid disturbing their hunting and fishing activities.

Shell has implemented community feedback mechanisms at all major operations and projects to receive, track and respond to questions and complaints from community members. This enables us to capture and resolve concerns quickly and in a transparent and balanced manner.



### External opinion

“Shell is one of about ten new operators who have recently entered into offshore exploration in Myanmar. Our Centre has been working with most of them during an impact assessment we conducted on oil and gas. This has involved a number of multi-stakeholder discussions on issues like environmental impact assessment, community engagement, community investment and the Voluntary Principles on Security and Human Rights.

It's been important to have Shell in those discussions to hear how international standards can be applied in Myanmar. They have, for example, shared with us their field experience in community consultations in Myanmar. Shell and other multinationals are breaking new ground by discussing the potential impacts of their operations directly with communities. Shell's transparency about successes and challenges with civil society and others, can help to overcome years of distrust of business and build a better oil and gas industry in Myanmar.”

### Vicky Bowman

Director, Myanmar Centre for Responsible Business, Yangon, Myanmar

**WORKING IN SPECIALIST AREAS**

Some projects require specialist social performance expertise on topics such as indigenous peoples, cultural heritage or resettlement. (See page 43). In these cases, our relevant specialists will support the project teams to interpret and apply local and international standards that protect community rights.

In Iraq's Basra province, we were assessing potential sites for the proposed Nebras petrochemical complex. When our team visited an initially proposed site, we discovered a children's cemetery that had not been documented. The proposed site was also used to access fishing grounds. These factors held significant weight in the final assessment of site options. As a result, an alternative site was identified as the preferred option for the project.

In some cases, our operations require temporary or permanent access to areas of land or sea where people are living or working. We first try to avoid the need to resettle people. In circumstances where this cannot be avoided, we work closely with local communities and governments to help people relocate and to restore their livelihoods. In some situations, even where physical relocation is not

necessary, our operations may affect people's livelihoods – for example, by limiting access to their land. In these cases, we will support people to restore or establish alternative livelihoods.

In Sichuan province, China, for example, we partnered with the non-governmental organisation, Mercy Corps, to assist 150 smallholder farmers who were affected by our operations. We worked with the farmers to help them improve their agricultural practices, manage their businesses better, and identify markets for selling their produce. In the early stages of the project, 83% of the farmers reported increased knowledge of farming techniques, while 40% had improved their agricultural practices or adopted new farming technologies.

**INVESTING IN COMMUNITIES**

Investing in communities where we operate – what we call social investment – is an important part of being a good neighbour. Most of our social investment is at country and community level. Our businesses tailor their social investment strategy to the communities' needs, while working to a common global vision and framework.

Shell has three core themes of social investment in areas that are closely connected to our business: enabling access to energy, improving road safety, and enabling employment within communities. Local Shell teams determine which social investment themes are relevant to the community and design programmes accordingly, working within a common framework for measuring social and business outcomes. (See box). Social investment teams also have the freedom to implement locally-tailored programmes for community development, education, biodiversity and conservation in response to local needs. We also partner whenever possible with other businesses, development agencies and non-governmental organisations to implement our programmes.

Our global framework enables us to measure the impact of our social investment programmes in terms of positive outcomes for the community as well as achievement of our business goals. Our social performance teams also work closely with our contracting and procurement organisation to encourage local procurement of goods and services, contributing to local or regional economic development. (See page 40).

**ACCESS TO ENERGY**

Energy is crucial to economic and social development, and improves the livelihoods of people across the world. Globally, more than 1.1 billion people are without access to electricity – and a billion more only have access to unreliable and unsafe power networks. Nearly 3 billion people rely on solid fuels for cooking. For many in the world, better access to energy could help people out of poverty: it affects their health, education and their ability to earn a living.

At Shell, we apply our core business skills and technical resources to help enable access to energy for communities in regions where the need is great and we have a presence. In countries such as Iraq and Nigeria, we supply natural gas that was previously flared for domestic power generation. As part of our social investment programme, Shell Philippines, through the Pilipinas Shell Foundation, funded a micro-grid that uses hydropower and solar energy to power an indigenous village in Palawan, the Philippines. It provides the local Batak tribe with a constant supply of electricity.

The smoke emitted from traditional or inefficient cookstoves poses severe health risks. Shell is the largest private-sector partner of the Global Alliance for Clean Cookstoves, which works to encourage a global market for clean and efficient household cookstoves and fuels in developing countries. Shell offers both financial and in-kind support to the Alliance and its grant facility, the Spark Fund.

**ENCOURAGING LOCAL ENTERPRISE**

The need to develop local enterprise, skills and jobs is one of the most common topics raised by local communities. Shell has many programmes in place to support and encourage the building of new businesses and generate local employment. Our LiveWIRE programme helps entrepreneurs turn their ideas into long-term sources of income. The programme was extended to Malaysia in 2015 and is active in 15 countries where we operate. In 2015, more than 8,000 people took part in LiveWIRE and small business development programmes and more than 90 businesses were established.

We further support communities by offering training for jobs in the oil and gas industry. For example, in Argentina, we are working with the mayor of San Patricio del Chañar on two local training initiatives. One programme trains adults to work in the welding and electrical trades; the other prepares students for specific jobs in the energy industry, such as working on a drilling rig or inspecting equipment.

**ROAD SAFETY**

The promotion of road safety awareness among people in local communities is another focus area of our social investment projects. In southern Iraq, for example, near our Majnoon operations, we work with the AMAR International Charitable Foundation to train local health staff and women safety volunteers to raise awareness among parents and children about road safety. We are also working with authorities in education, government and the police to set up road safety zones around primary schools and build speed bumps, new footpaths and warning signs.

We are a board member of the Global Road Safety Partnership (GRSP), a global alliance that brings together governments, civil society and businesses to improve road safety. Shell chairs the Global Road Safety Initiative, a private sector collaboration with GRSP that works to improve road safety in cities and communities. It operates in eight countries and its "Safe to School – Safe to Home" programme focuses on helping children to travel safely to and from school. (See more on our road safety work on page 32).

## WORKING WITH COMMUNITIES CONTINUED

### SOCIAL PERFORMANCE

We have indicators in place that gauge our relationship with communities near our operations. We also measure our contribution to communities through our social investment programmes and the procurement of local goods and services within our supply chain.

#### Community feedback

Shell uses data from our community feedback mechanisms as a performance indicator at both the local community and global levels. Community complaints are registered in different categories to identify common issues across Shell and share knowledge on how they were resolved. In 2015, the largest number of complaints received related to social and environmental issues. These included concerns about Shell's allocation of its social investment funds, the creation of local jobs and the impact of our operations on people's land, property or livelihoods. Most environmental complaints related to nuisances, such as noise, odours or dust.

### Social investment

We invest in projects that aim to benefit local communities over the long term. In 2015, we completed our first assessment of the long-term impact of our social investment projects globally. In 2015, we spent around \$122 million on voluntary social investments worldwide (compared with \$160 million in 2014). Our social investment is closely connected to the locations where we operate and so portfolio changes can affect the amount that we spend. This is the main reason for the decrease in social investment in 2015. These figures do not include investments that were part of contractual agreements or legal requirements with host governments, which was around \$97 million.

Of the \$122 million, we spent around \$29 million on our three global strategic themes of enterprise development, road safety and energy access. Around \$93 million was spent on local programmes for community development, disaster relief, education, health and biodiversity. We estimate that almost \$43 million of our spend in 2015 was in countries that are part of the UNDP Human Development Index 2015, that is, those defined as having a gross domestic product of less than \$15,000 a year per person. Significant support is also provided in the form of voluntary work by Shell employees and donations of equipment.

### Local procurement

We prioritise buying goods and services from local suppliers that meet the standards we require. In some cases, we support local businesses and skills development to meet these standards. In 2015, we spent more than \$56.3 billion on goods and services worldwide. Around 65% of this was spent in Canada, the Netherlands, Nigeria, the UK and the USA. We estimate around \$5.9 billion was spent in countries that have a gross domestic product of less than \$15,000 a year per person. In these countries, Shell companies spent more than 75% (\$4.4 billion) on goods and services from local companies.

We also check that our suppliers comply with key sustainability criteria, including good working conditions. In 2015, we conducted 10 assessments of suppliers in Africa and the Middle East, 126 in the Americas, 129 in the Asia-Pacific region, and 119 in Europe to check their compliance with our Shell Supplier Principles. These principles cover areas such as human rights, labour practices (including those relating to child and forced labour) and business integrity. (See page 46).

### VOLUNTARY SOCIAL INVESTMENT IN 2015

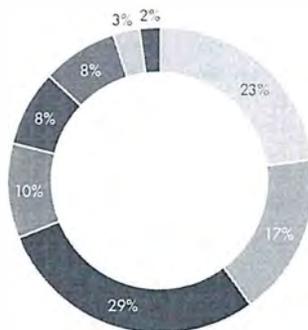
proportion of spend



Enterprise development  
Energy access  
Road safety  
Community development  
Education  
Biodiversity  
Other

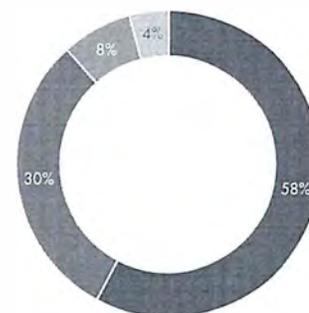
### VOLUNTARY SOCIAL INVESTMENT IN 2015

split by region



MENA  
Africa  
Americas  
Global (various regions incl. Shell Foundation)  
Europe  
Asia Pacific  
Russia and CIS

### COMMUNITY COMPLAINTS IN 2015



Local content, social investment and benefit sharing  
Land, livelihood and property  
Stakeholder engagement  
Physical impacts

**Shell Foundation**

Shell Foundation (SF) is an independent charity that applies a business approach to global development challenges that constrain job creation, access to energy and urban mobility.

Since 2000, SF has worked with social enterprise partners to create new business solutions to deliver social and environmental improvement internationally. SF provides a mix of business support, grant funding and market links to help entrepreneurs prove their business models, achieve financial independence and expand into new markets.

Once a social enterprise partner is able to serve low-income consumers on a commercial scale, SF creates intermediary businesses and industry associations. These support the growth of new markets around the partner. For example, helping to create the model for the Global Off-Grid Lighting Association – an industry association that is building market infrastructure for off-grid lighting to reach low-income consumers.

To date, SF has deployed \$207 million of grant funding into social enterprises and new market builders operating in Africa, Asia and Latin America.

In 2015, SF published an analysis of the successes and failures of its work over the past 15 years in a report entitled "Enterprise Solutions to 2030". The report collates the Foundation's learnings from more than 200 partnerships with public and private social investors. It outlines a road map for co-ordinated action to accelerate progress towards sustainable development in emerging markets.

**2015 social enterprise partner highlights**

- **d.light:** a leading provider of low-cost, high-quality solar energy products. Its expanded product range includes the world's most affordable and reliable solar-powered lantern that is sold for just \$5;

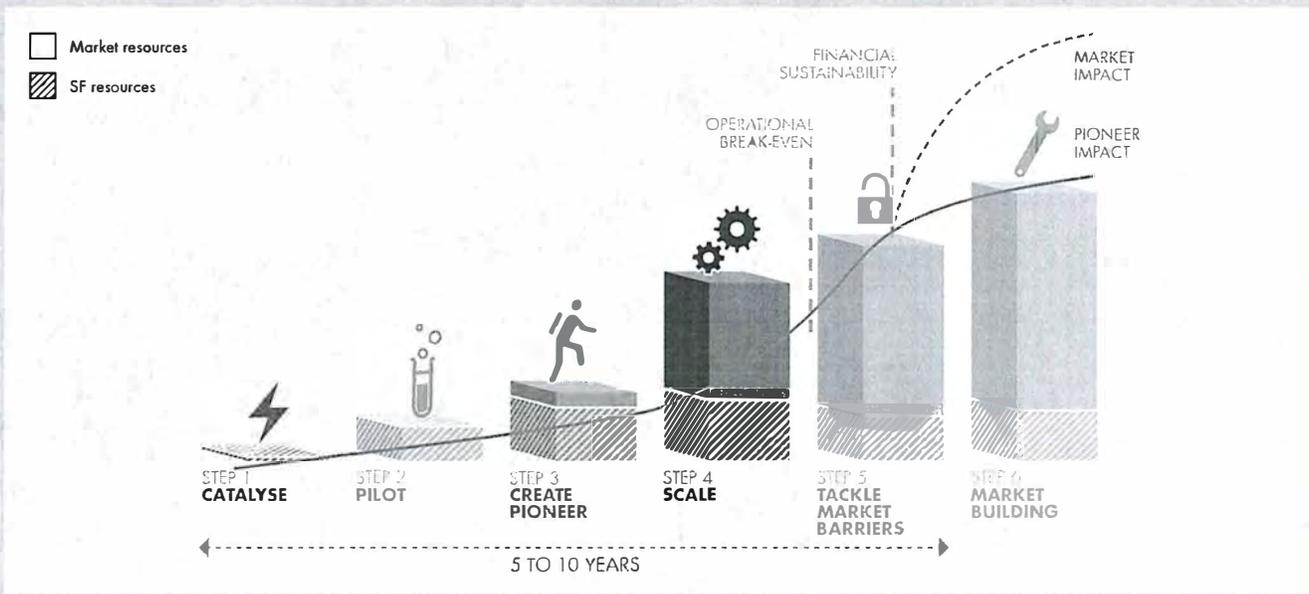
- **Envirofit:** pioneer of high-quality, efficient and affordable clean-cooking solutions. More than 1 million clean cookstoves have been sold so far, improving the lives of 5 million people in 45 countries;

- **Husk Power Systems (HPS):** a rural utility that generates low-cost electricity from waste and solar power. In 2015, HPS launched the world's first combined solar and biomass hybrid power plant to bring continuous electricity to communities in rural India; and

- **GroFin:** provider of finance and business support to small- and medium-sized enterprises to spur job creation in emerging markets. Last year, the company launched a \$100 million fund backed by individual and business investors to generate 47,000 jobs in Africa by 2025.

For more information visit:  
[www.shellfoundation.org/2030](http://www.shellfoundation.org/2030)

**SHELL FOUNDATION'S SIX-STEP THEORY OF CHANGE**



**SHELL FOUNDATION'S IMPACT TO DATE**

|                                       |   |   |   |
|---------------------------------------|---|---|---|
| <p><b>55,165</b><br/>jobs created</p> | <p><b>10.3 million</b><br/>tonnes of carbon reduction</p> | <p><b>\$5.3 billion</b><br/>funding leveraged</p> | <p><b>47.8 million</b><br/>livelihoods improved</p> |
|---------------------------------------|---|---|---|

## WORKING TOGETHER

All of the work we do around the world requires working collaboratively: with contractors, suppliers, non-governmental organisations and other businesses, among many others. We work together towards a number of goals: to achieve operational excellence, best practice on sustainability issues and to improve standards within the energy sector.

Collaboration will be critical to achieving a low-carbon society. Government, business and civil society need to work together to design and support practical solutions.

This section details our work with many of our partners.

19%



Women in senior leadership positions

600,000



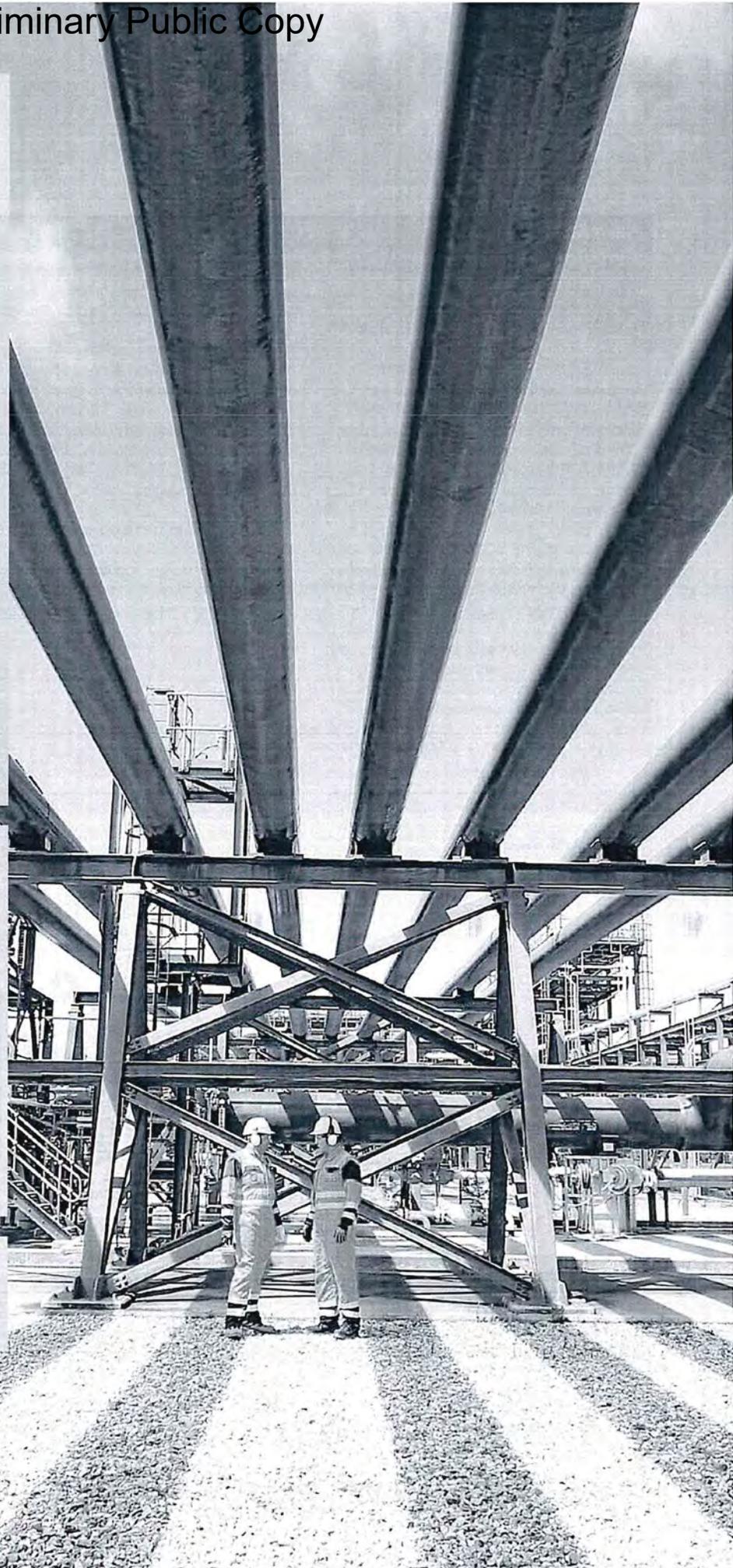
Training days for employees and JV partners

216,000



Contractors working for Shell

Shell employees at the Bellanaboy Bridge gas terminal at the Corrib natural gas plant that started up in 2015. County Mayo, Ireland.



## LIVING BY OUR PRINCIPLES

The core values of honesty, integrity and respect for people are reflected in our business principles, which strictly govern the way we work.

### OUR BUSINESS PRINCIPLES

The Shell General Business Principles detail our responsibilities to shareholders, customers, employees, business partners and society. They set the standards for the way we conduct business, with honesty, integrity and respect for people, the environment and communities. We aim to do business fairly, ethically and in accordance with laws that promote and safeguard fair competition between businesses. We do not tolerate the direct or indirect offer, payment, solicitation or acceptance of bribes in any form, including facilitation payments.

All Shell companies and joint ventures that we operate must conduct their activities in line with our business principles. We also encourage joint ventures we do not operate to apply materially equivalent business principles.

### Our Code of Conduct

All Shell employees, contractors and anyone acting on behalf of Shell must follow the Code of Conduct, which describes the behaviour Shell expects of individuals. The Code of Conduct was refreshed in 2015, making it easier for individuals to identify potential risks associated with their roles. All employees and contractors are required to complete Code of Conduct training.

We encourage employees and contractors to seek advice and report concerns of any potential breaches, anonymously if they wish. Concerns or allegations are investigated by specialists within Shell and if a violation is confirmed, we take appropriate action. This may involve serious consequences, up to and including dismissal or contract termination. We maintain a stringent no retaliation policy to protect any person making a good faith allegation.

### Business integrity in our supply chain

The Shell Supplier Principles, along with specific contractual clauses, set out our expectations for suppliers and contractors to behave with business integrity. (See page 46). Our risk-based due diligence processes assess prospective suppliers to determine whether they can meet our expectations. We regularly engage with suppliers to reinforce these principles, offer support to help them strengthen their own practices, if needed, and to hold them accountable for their performance.

### HUMAN RIGHTS

We respect human rights and our approach applies to all of our employees and contractors. It is informed by the Universal Declaration of Human Rights, the core conventions of the International Labour Organization (ILO), and the UN Guiding Principles on Business and Human Rights. Respect for human rights and provision of remedy are ways in which we uphold our business principles.

We consult with international organisations, companies, civil society and other relevant bodies to understand and respond to current and emerging human rights topics. (See page 45). We collaborate closely with the Danish Institute of Human Rights to assess and improve our approach to human rights. We participate in IPIECA working groups (the global oil and gas industry association for environmental and social issues) to develop guidance and implementation tools to improve respect for human rights across the industry.

Our human rights approach focuses on four key areas:

#### Communities

We assess and manage the potential environmental, health and community impacts of our projects in line with international standards, such as the International Finance Corporation's performance standards on environmental and social sustainability. Our community engagement mechanisms allow our neighbours to raise any concerns about the impacts of our activities and enable us to respond to those concerns through credible and effective non-judicial processes. These mechanisms are informed by, and are important components of, the UN Guiding Principles on Business and Human Rights.

#### Security

We aim to keep employees, contractors and facilities safe, while respecting the human rights and security of local communities. The Voluntary Principles on Security and Human Rights (VPSHR) are implemented across Shell and are included in our private security contracts and our engagements with public security forces. We conduct annual risk assessments in our relevant operations and provide training to employees and contractors.

### Labour rights

We respect the principles of freedom of association, the right to collective bargaining, non-discrimination and equal opportunity, adequate conditions of work, adequate remuneration and the elimination of forced labour and child labour. We respect the rights of our employees, contractors and suppliers by working in alignment with ILO conventions and the UN Global Compact.

### Supply chain

We seek to work with contractors and suppliers who are committed to acting in an environmentally and socially responsible way. In line with our business principles, the Shell Supplier Principles include specific expectations for contractors and suppliers concerning labour and human rights. (See page 46).

### INDIGENOUS PEOPLES

Our activities have the potential to affect indigenous peoples who hold specific rights for the protection of their cultures and traditional ways of life. We consult and engage with indigenous communities to understand how our activities may impact their rights. (See page 38). Our approach is to work with indigenous communities to find ways to mitigate negative impacts and to help neighbouring communities benefit from our activities. We train our employees to understand how to work and engage with indigenous peoples. And we continue to work with IPIECA to develop a consistent approach and best practice across the oil and gas sector for free, prior and informed consent.

## ENVIRONMENTAL AND SOCIAL PARTNERS

Shell has a long track record of working in partnership with environmental and development organisations. These partnerships bring important insights to our work.

The aims of these partnerships vary from helping to reduce our environmental impact, to improving the quality of land around our operations and implementing social investment programmes. For example, we partner with organisations that advise us on specific issues such as biodiversity or human rights.

### ENVIRONMENTAL PARTNERSHIPS

Shell has environmental partnerships with Wetlands International, the International Union for Conservation of Nature (IUCN), The Nature Conservancy (TNC) and Earthwatch. Our environmental partners can bring specific expertise to our projects in areas such as biodiversity, while they can advance their own scientific or conservation knowledge by working on our projects.

#### Protecting the Arctic's critical habitats with Wetlands International

Wetlands International is working with Shell to identify and assess critical habitats in the Arctic regions. Wetlands International has developed a tool that predicts the distribution of Arctic species. The tool maps critical wetland habitats for species in the Arctic, including migratory waterbirds and endangered species. The information it generates follows the International Finance Corporation's performance standards and will become part of Shell's standard biodiversity screening tools. It has been used by our project teams to screen for sensitive areas and to help manage and prevent potentially adverse impacts on Arctic biodiversity. We have been working with Wetlands International since 2001 on projects that range from managing biodiversity and water issues at our operations in Iraq, Brunei and Canada to strengthening sustainability practices with communities in Nigeria.

#### Protecting whales with IUCN

Shell and IUCN have been working together since 2004 to minimise the impacts on western gray whales at Shell's jointventure operations at Sakhalin, Russia. Under the guidance of the Western Gray Whale Advisory Panel – a panel of 13 prominent scientists convened by IUCN – we have worked to reduce the impacts that phases of our operations may have on the whales and their habitat. In 2005, we rerouted pipelines away from the whales' feeding grounds. In 2015, Sakhalin Energy was the only energy company operating at Sakhalin that had an IUCN independent observer on their team implementing a seismic survey monitoring and mitigation programme. The panel will continue to examine the impact of oil and gas development on the whales following a positive review of its role in 2015.

#### Mapping biodiversity and rehabilitating coastlines with TNC

Shell and TNC have completed a pilot project to map critical biodiversity in three watersheds of the central Magdalena River Basin in Colombia – a place of important environmental and cultural significance. The results will be made publicly available and will provide the energy industry and the Colombian government with an understanding of local biodiversity.

We have also been working with TNC to develop a nature-based approach to reduce the cost and rate of erosion along the pipelines in the Louisiana coastal zone. This is done by creating living shorelines with planted vegetation, or creating oyster reefs to restore wetlands and improve the resilience of the coastline. Over time, the living shorelines will also enhance the local flora and fauna.

#### Employees participate in Earthwatch activities

Our employee volunteer partnership, Project Better World, has been running for 18 years. As part of this, Shell sponsors employees to work with scientists and communities on environmental research and conservation projects. This deepens our employees' understanding of sustainability in areas such as climate change and habitat loss. In another programme, Shell employees provide mentoring to managers in organisations working to preserve protected areas. To date, over 800 Shell employees have taken part in the Earthwatch programmes.

### COMMUNITY PARTNERS

We work with both international and community-based organisations to address social issues close to our operations. The benefits of these collaborations can help meet a specific need within a community – such as unemployment – and they can help Shell to improve its own operational practices. For example, the Danish Institute for Human Rights provides guidance on the integration of human rights into labour practices, procurement, security and community issues.

Partnerships in specific countries help to build trust and draw on local knowledge. For example, Shell is working with the United Nations Development Programme to expand and refurbish Al Jawadian School in Al Dayr, near Basra in southern Iraq. The partnership has also constructed four local playgrounds so that children can play in safe areas away from traffic. Another project in Iraq has supported 13 local businesses – including women entrepreneurs – with business training, coaching and capital investment.

We also have a global partnership with Mercy Corps, an international organisation that helps people to recover from crises, build better lives and transform their communities. In its first three years, the partnership has focused on transforming how companies and non-governmental organisations can work together for mutual benefit. In Sichuan province, China, for example, we are helping smallholder farmers to improve their agricultural practices and the way they manage their businesses. (See Communities, page 38).

Project Better World is a partnership with Earthwatch. Shell sponsors employees to work on environmental research and conservation projects. Manitoba, Canada.



## COLLABORATIONS

Shell collaborates and works with different organisations around the world. These relationships help us to build trust among a diverse range of stakeholders, including non-governmental organisations.

We define collaboration to mean all forms of working with organisations outside of Shell. Collaborating with these different organisations helps us to gain insight into our business and industry, while the sharing of knowledge and experience with others contributes to the continuous improvement of practices. We participate in relevant sector discussions, ranging from improving industry-wide technical standards to reviewing ways to tackle human rights abuses within the supply chain.

Some of the views of the organisations with which we work may differ from our own. For example, we may not always agree with their opinions on topics, such as climate change. In these cases, we make our views known within the organisation and seek to influence their policy position.

However, we believe it is important to remain involved with these organisations to do this, particularly where we benefit from working together in areas such as safety, the environment and human rights. In our Carbon Disclosure Project submission, we provide more information on organisations with which we work but whose position on climate change is not entirely consistent with our own.

We review this work to ensure the objectives of these collaborations are being met and that the relationships remain mutually beneficial. The table shows some of the organisations that we collaborate with globally on sustainability and technology. Shell also works with many local organisations in countries around the world.

### COLLABORATIONS OVERVIEW

|   | Environmental sustainability and climate change | Human rights and social responsibility | Safety and technical standards | Technology and innovation | Transparency and governance |
|---|---|--|--------------------------------|---------------------------|-----------------------------|
| American Petroleum Institute (API)                                | ■   |  | ■                              | ■                         | ■                           |
| Bonsucro  | ■   | ■                                      |                                |                           |                             |
| Canada's Oil Sands Innovation Alliance (COSIA)                    | ■   |  |                                | ■                         |                             |
| Center for Sustainable Shale Development (CSSD)                   | ■   | ■                                      |                                |                           |                             |
| Danish Institute for Human Rights (DIHR)                          |   | ■                                      |                                |                           |                             |
| Energy Institute (EI)   |   |  | ■                              | ■                         |                             |
| Energy Transitions Commission (ETC)                               | ■   |  |                                |                           |                             |
| Extractive Industries Transparency Initiative (EITI)              |   |  |                                |                           | ■                           |
| Global Alliance for Clean Cookstoves                              | ■   | ■                                      |                                |                           |                             |
| Global Business Initiative on Human Rights (GBI)                  |   | ■                                      |                                |                           |                             |
| Global Gas Flaring Reduction Partnership (GGFR)                   | ■   |  |                                |                           | ■                           |
| Global Road Safety Partnership (GRSP)                             |   |  | ■                              |                           |                             |
| International Association of Oil and Gas Producers (IOGP)         | ■   | ■                                      | ■                              | ■                         | ■                           |
| International Audit Protocol Consortium (IAPC)                    | ■   |  | ■                              |                           |                             |
| International Emissions Trading Association (IETA)                | ■   |  |                                |                           |                             |
| IPIECA (industry association for environmental and social issues) | ■   | ■                                      | ■                              |                           | ■                           |
| Network of Employers for Traffic Safety (NETS)                    |   |  | ■                              |                           |                             |
| Roundtable for Responsible Soy (RTRS)                             | ■   | ■                                      |                                |                           |                             |
| Roundtable on Sustainable Palm Oil (RSPO)                         | ■   | ■                                      |                                |                           |                             |
| UN Global Compact   | ■   | ■                                      |                                |                           | ■                           |
| Oil and Gas Climate Initiative (OGCI)                             | ■   |  |                                |                           |                             |
| World Business Council for Sustainable Development (WBCSD)        | ■   | ■                                      | ■                              |                           | ■                           |

## CONTRACTORS AND SUPPLIERS

In 2015, Shell spent \$56.3 billion on goods and services from 52,000 suppliers globally. Around 216,000 contractors worked to deliver Shell projects and help run our operations.

We seek to work with contractors and suppliers that behave in an economically, environmentally and socially responsible way, as stated in our Shell General Business Principles. We have a set of principles for our suppliers that provides a consistent framework detailing what we expect. The Shell Supplier Principles cover what is required from our suppliers regarding business integrity, health and safety, social performance, and labour and human rights. These apply regardless of the business environment in the oil and gas industry.

It is important that our suppliers have the appropriate policies, principles and standards in place within their own company. Building strong relationships with our suppliers is essential to delivering our projects, running our operations and ensuring suppliers place the same importance on health, safety, the environment and community impact as we do. In close collaboration with suppliers and contractors, we work towards our safety goal of no harm and no leaks at our sites.

Certain areas of our supply chain may pose a higher labour rights risk, due to their location and the nature of the goods and services we procure. Of all assessments carried out for compliance with our supplier principles in 2015, 384 suppliers were subsequently awarded contracts. The number of assessments follows our risk-based approach and is dependent on the level of project activity and the number of new contracts awarded throughout the year. If gaps are identified, we sometimes work with our suppliers and contractors to help them understand how to close these gaps. We also work closely with specific suppliers – such as those in developing countries – to help them develop the right skills, policies and management systems.

We work in close collaboration with our suppliers and contractors to meet our safety and environmental standards.



A successful example of this is the VIP Car Rental company in Iraq (see external opinion).

### LOOKING AFTER OUR WORKFORCE

During 2015, as part of our global worker welfare programme, we implemented our Accommodation and Welfare Guide, which was published in 2014. This provides tools and management guidance for providing safe, secure and comfortable accommodation for workers who are away from home and sometimes in remote areas – whether their needs are physical, mental, cultural or social. This guidance is applied at a number of new Shell ventures.

Shell contributes to economic development in the countries where we operate – either by employing people directly or through our partners, such as government or business partners. At the outset of a project, we consider how we can employ local suppliers and individuals. If needed, we help them build capabilities that meet our safety and quality standards. We also support the growth of local businesses in many countries where we work (we refer to these efforts as local content). (See page 40).

In many countries, a local content plan forms part of the bid criteria against which potential suppliers are assessed. For example, a global supplier to Shell partnered with an independent First Nations company to form The Bouchier Carillion Group, in line with the plan included in the bid. They provide facilities management services to Shell in Alberta, Canada. This partnership enables The Bouchier Carillion Group to use its global experience and support regional initiatives, particularly those focused on aboriginal youth and women in business.



### External opinion

"The VIP Car Rental company provides passenger transport services for Shell Iraq Petroleum Development (SIPD) in the Majnoon area of southern Iraq. We are proud to be a supplier to a global company like Shell.

By working closely with the SIPD logistics team, we are able to quickly solve issues so that we can provide the services needed by SIPD in a safe and timely manner.

We are a fully-owned Iraqi company, managing one of the highest risk activities in Iraq. Local driving habits are tolerable at best, but with the support of SIPD, we have successfully driven 2 million km and achieved two years of operations without injury. We have also scored 100% in Shell's road safety and driver assessment programme.

In future, we recommend that Shell works closely with the local police to improve road security between Basra and Majnoon."

**Sabah Alkhazrahej**  
General Manager,  
VIP Car Rental  
Basra, Iraq

## JOINT VENTURES

We often work in joint ventures with national and international energy companies. All of our business partners bring important skills and experiences to a joint venture.

When we operate a joint venture (JV), Shell's health, safety, security, environment and social performance (HSSE & SP) Control Framework is applied, as well as the Shell General Business Principles and the Shell Code of Conduct. (See page 43).

### NON-OPERATED VENTURES

More than half of Shell's JVs are non-operated ventures. For these ventures, our Shell JV representatives and the Shell-appointed JV board directors encourage our partners to apply similar standards and principles as our own.

When these JVs implement our Control Framework, or a similar approach, we offer to support them by assuring the JV's compliance. We also offer to review the effectiveness of the framework's implementation, overseen by the JV's Board of Directors.

If there is no such assessment, we periodically evaluate the health, safety, environment and community risks of the JV. If the JV is falling below expectations, plans will be put in place, in agreement with the other partners, to improve performance.

### LEARNING FROM EACH OTHER

Another advantage of working with our business partners – who are often located in different parts of the world – is that they offer an opportunity to share knowledge and insights and learn from each other's experience. As a result we can work together to create better solutions that tackle specific social, environmental, safety or technical challenges.

For example, in Russia, our JV, Salym Petroleum Development (Shell interest 50%), has developed competence in social performance. It conducts structured and regular community engagements and applies a social impact assessment process.

Its key priority areas with communities where it operates are education, healthcare and the development of small businesses.

The Brunei Shell Petroleum JV (Shell interest 50%) used our HSSE & SP Control Framework to carry out an assessment of the effects on the local ecosystem from using 3D seismic surveying. The assessment surveyed offshore and onshore areas in Brunei. Measures were put in place to reduce the impact of seismic surveying, including a biodiversity action plan that was created with Wellands International to protect and conserve critical habitats, such as Brunei's peat swamp forests.

In Brazil, our biofuels JV, Raízen, adopted Shell's Goal Zero approach to implement safe practices across all its businesses, with the aim of achieving no incidents. In one crop year, Raízen recorded a 37% reduction from the previous year in the frequency of incidents that could have prevented employees from working. (See page 31).

## OUR PEOPLE

The quality of our people is essential to the success of our company. In 2015, we employed an average of 93,000 employees in more than 70 countries.

We work to maintain a productive and healthy organisation, resource talented people across the business, accelerate development of our people, grow and strengthen our leadership capabilities, and enhance employee performance through strong engagement.

### OUR WORKFORCE

Around 40% of our workforce is in countries outside of Europe and North America. In 2015, we recruited around 1,000 graduates and 1,500 experienced professionals. Close to 40% of our graduate recruits came from universities outside of Europe and the Americas.

Shell manages the effects of business changes on people as consistently as possible. Affected employees are supported in their search for alternative employment as appropriate by country law and policy.

### COMMUNICATION AND ENGAGEMENT

We strive to maintain healthy relations with our employees. Dialogue between management and employees is integral to our work practices and takes place directly and, where appropriate, through employee representative bodies. Management briefs employees on operational and financial results regularly through a variety of channels. The annual Shell People Survey is one

of the principal tools used to measure employees' views on a range of topics. For example, the average employee engagement score in 2015 was 80% favourable and 5% unfavourable (both the same as 2014). The survey also measures employees' views on the inclusiveness of their workplace. In 2015, 71% felt positive about this, while 11% felt negative about inclusion in the workplace, the same figures as 2014.

We promote the safe expression and reporting of views about our processes and practices. We offer multiple channels for employees to report, confidentially and anonymously, breaches of the Shell General Business Principles or our Code of Conduct, or other concerns.

### DIVERSITY AND INCLUSION

Embedding the principles of diversity and inclusion in the way we do business gives us a better understanding of the needs of our stakeholders. We provide equal opportunity in recruitment, career development, promotion, training and reward for all employees regardless of gender, ethnicity, sexual orientation or physical ability. We actively monitor diversity: at a global level, we measure representation of women and local nationals in senior leadership positions. We have a talent development process to bring about more diverse representation.

At the end of 2015, the proportion of women in senior leadership positions was 19% compared with 18% in 2014. The representation of senior local nationals is monitored in 20 principal countries. We measure the percentage of senior nationals employed in Shell compared with the number of senior positions in their home country. The reporting shows two categories: local national coverage greater than 80% (12 countries in 2015) and less than 80% (eight countries in 2015).

### TRAINING AND DEVELOPMENT

In 2015, we invested about \$335 million in training and development, providing more than 600,000 training days for our employees and joint-venture partners. We focused on growing our leadership capability, improving skills in technical, safety and commercial areas, and our expertise in specialist areas such as cultural heritage and indigenous peoples.

### CODE OF CONDUCT VIOLATIONS

Shell employees and contractors must abide by our Code of Conduct. Violations can be reported through a variety of local channels, which are adapted to local regulations and customs, and one global channel, which is a dedicated helpline operated by an independent provider. In 2015, from the incidents reported through the global helpline, 217 were confirmed as Code of Conduct violations after investigation (267 in 2014). As a result, we dismissed or terminated the contracts of 89 employees and contractors (118 in 2014).

## ECONOMIC PERFORMANCE

During 2015, significantly lower oil and gas prices challenged our industry, with an average Brent price of \$52 a barrel. Our integrated business and improved operational performance helped reduce the impact of lower energy prices.

We are managing our business through the current oil price downturn which underpins our intention to continue to pay attractive dividends to shareholders while investing for the future. In 2015, we reduced our operating costs and capital spending; restructured our upstream business, tight and shale gas, and oil products; sold assets worth \$20 billion in 2014–15; and delivered new projects with substantial cash flow potential.

Our income in 2015 was \$1.9 billion, impacted by significantly lower oil and gas prices during the year. In 2015, the average Brent price was \$52, down 47% from 2014. We distributed dividends of some \$12 billion to our shareholders of which \$2.6 billion was taken in shares through our scrip dividend programme.

We reduced our total capital investment to \$29 billion to reflect the falling oil price and focused on progressing only the most competitive projects, which will help to build and sustain our business for the future. We completed divestments of \$5 billion from our non-core portfolio, including proceeds from the USA's midstream master limited partnership. We also spent \$1,093 million on our research and development programme.

Shell generated \$29.8 billion of cash flow from its operating activities in 2015.

In 2015, we started up our Corrib facility in Ireland (Shell interest 45%) and Bonga Phase 3 (Shell interest 55%), off the coast of Nigeria. Only the most competitive projects are going ahead: in the same year, we took just four major final investment decisions, three of which were in Downstream. We also announced the cancellation of the Alaska exploration project and Carmon Creek heavy oil project and in early 2016, we postponed the final investment decisions on LNG Canada and Bonga South West.

Shell's oil and gas production in 2015 was 3 million boe a day, down 4% from 2014. Our sales of liquefied natural gas decreased to around 22.6 million tonnes.

Following the announcement of a recommended offer in April 2015, Shell completed the acquisition of BG Group plc in February 2016. This acquisition will mark the start of a new chapter in Shell. It rejuvenates Shell's Upstream business by adding more deep-water and integrated gas to our portfolio. These are areas where Shell has significant capabilities and technologies.

Shell is becoming a company that is more focused on its core strengths, and more resilient and competitive throughout the oil price cycle.



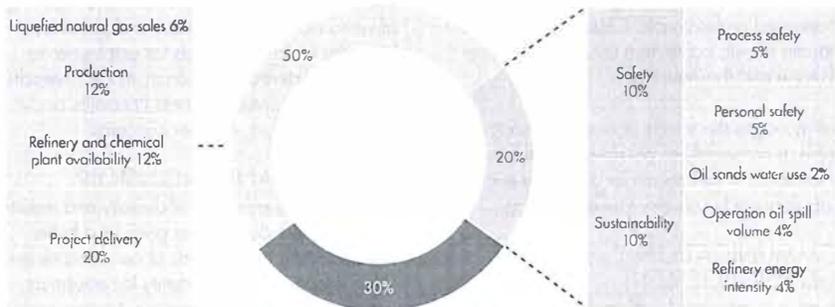
### EXECUTIVE SCORECARD

In 2015, sustainable development continued to account for 20% of the company scorecard, which helps determine the annual bonus levels for all our employees, including members of the Shell Executive Committee (EC).

In 2015, the EC's sustainable development measures were split evenly between Shell's safety and environmental performance. Our environmental measures cover operational spill volume, energy efficiency and use of fresh water. From 2015, process safety Tier 1 events were introduced as a new measure for safety, with an equal weighting for personal safety. These measures reflect Shell's Goal Zero ambition of no harm and no leaks.

Targets are set each year by the Board's Remuneration Committee, taking into account performance over the past three years in order to incentivise continuous and sustained improvement. In 2015, our performance was better than the target for all sustainable development measures and was our strongest result to date.

### SCORECARD STRUCTURE



Operational excellence  
Cash flow from operating activities  
Sustainable development

## TAX AND TRANSPARENCY

Tax binds governments, communities and businesses together. Revenue transparency provides citizens with important information to hold their government representatives accountable and to advance good governance. Shell is committed to transparency.

Our operations generate revenue through taxes and royalties for governments around the world. In 2015, Shell paid more than \$60.8 billion to governments. We paid \$7.7 billion in income taxes around the world, and \$2.7 billion in royalties. We collected \$50.4 billion in excise duties, sales taxes and similar levies on our fuel and other products on behalf of governments.

### OUR APPROACH

For Shell, paying taxes in the countries where we operate is about more than complying with the law. It is about showing that extraction of natural resources provides governments with an opportunity to generate revenues, support economic growth and enhance social development.

We comply with the tax laws wherever we operate. We are transparent about our tax payments to governments and we strive for an open dialogue with governments. This approach helps us to comply with both the letter and the spirit of the laws.

### Principles

In line with the Shell General Business Principles we support a number of external voluntary codes, which include the Organisation for Economic

Co-operation and Development (OECD) Guidelines for Multinational Enterprises and the Business and Industry Advisory Committee to the OECD Statement of Tax Principles for International Business.

### Transparency

In 2012, we were one of the first companies to voluntarily publish revenues that our operations generate through income taxes, royalties and indirect taxes for governments around the world. From 2016 onwards, Shell will make mandatory disclosures under the Reports on Payments to Governments Regulations 2014, and will file its Payments to Governments Report with the UK's Companies House. This report will be published on our website [www.shell.com/payments](http://www.shell.com/payments).

### Tax strategy

It is the right of governments to determine what a fair share of tax is and to draft tax laws accordingly. They do so against strong competition for capital and investment, which is internationally mobile. It is not the role of business to farm views on what level of taxation is fair. We use legitimate tax incentives and exemptions designed by governments to promote investment, employment and economic growth.

When considering the viability of investments, tax is one of the factors we examine. Income tax is just one part of the overall tax regime considered. We expect to pay tax on our income in the country where activities take place, and believe double taxation of the same activity by different jurisdictions should be avoided. Shell supports efficient, predictable and stable tax regimes that incentivise long-term investment. We expect the laws to be applied consistently, creating a level playing field for all.

### Governance of tax

Shell's Board of Directors is responsible for maintaining a sound system of risk management and internal control, and for regularly reviewing its effectiveness. This system also covers taxation, which forms an integral part of the Shell control framework. Annually, the Board conducts a review of the effectiveness of Shell's system of risk management and internal control, including financial, taxation, operational and compliance controls.

### COLLABORATING WITH OTHERS

Shell supports co-operative compliance relationships with tax authorities on the basis of the framework proposed by the OECD Forum on Tax Administration. We have a co-operative compliance relationship in place in the UK, the Netherlands and Singapore, and pilot relationships in Austria and Italy.



We provide the authorities with timely and comprehensive information on potential tax issues. In return, we receive treatment that is open, impartial, proportionate, responsive and grounded in an understanding of our commercial environment. This approach improves the transparency of our tax affairs and allows Shell to better manage its tax-related risks throughout the life cycle of each project.

Transparency is only really effective if all parties in a country follow the same disclosure standards. Shell is a founder and board member of the Extractive Industries Transparency Initiative (EITI). Consistent with the EITI requirements, we continue to advocate mandatory country-by-country global reporting, as most tax payments are made at the corporate level to national governments. We support unified revenue reporting rules and standards applicable to all multinationals, irrespective of their ownership or place of business.

Shell is actively involved in the revenue transparency discussion and we are working with stakeholders to develop an approach that takes into account the views of the relevant stakeholders involved, i.e. industry, governments and civil society.

Ben van Beurden, CEO, speaking at the Shell Annual General Meeting in May 2015. The Hague, The Netherlands.



## DATA AND REPORTING

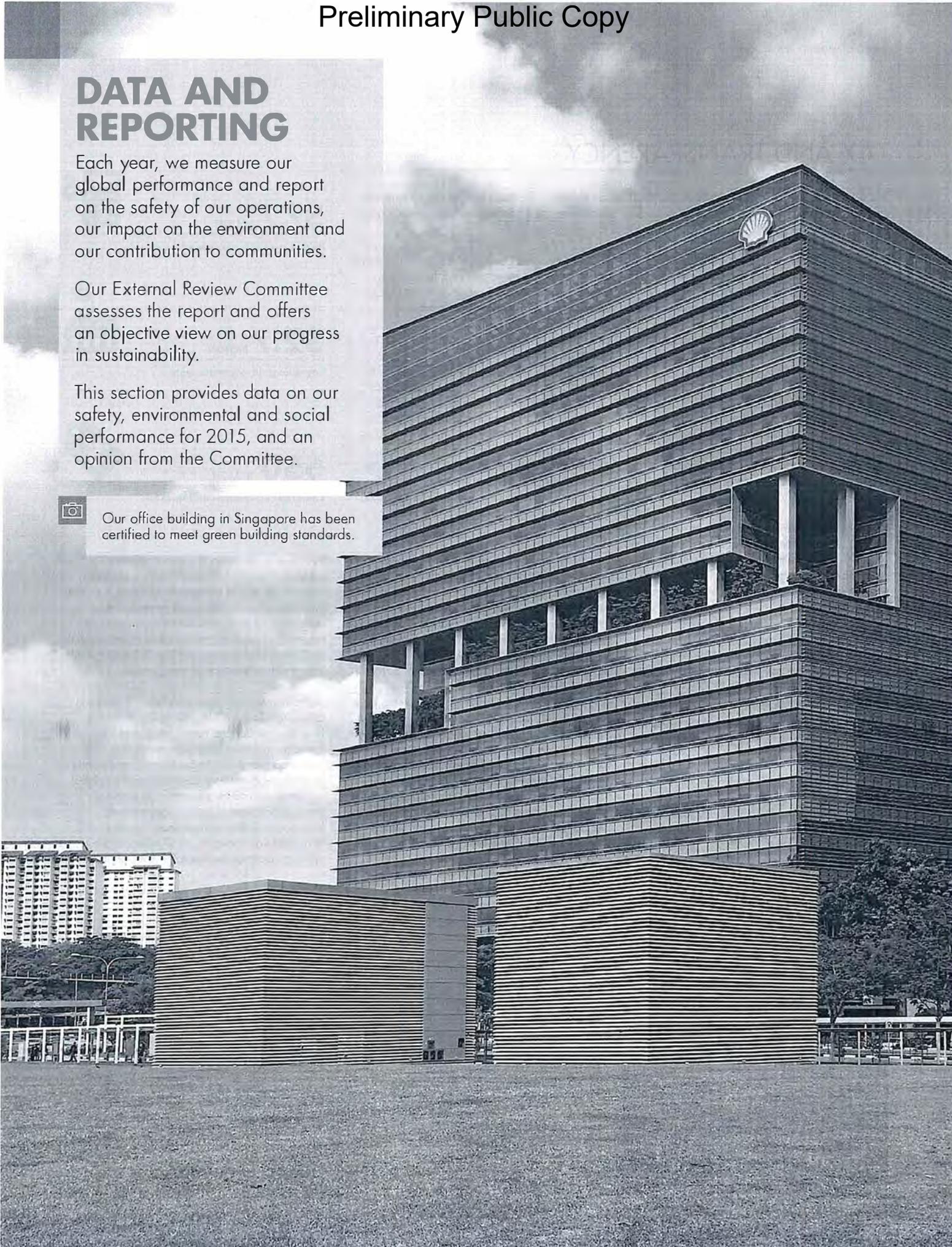
Each year, we measure our global performance and report on the safety of our operations, our impact on the environment and our contribution to communities.

Our External Review Committee assesses the report and offers an objective view on our progress in sustainability.

This section provides data on our safety, environmental and social performance for 2015, and an opinion from the Committee.



Our office building in Singapore has been certified to meet green building standards.



## ABOUT OUR REPORTING

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We began reporting voluntarily on our environmental and social performance with the first Shell Report in 1997. We support transparency and share information and data in this report and on our company website.

We also provide regular information to the Carbon Disclosure Project, Dow Jones Sustainability Index, FTSE4Good Index and other organisations that assess the economic, environmental and social performance of companies.

### ABOUT OUR DATA

There are inherent limitations to the accuracy of environmental and social data. We recognise that our data will be affected by these limitations and continue to improve data integrity by strengthening our internal controls.

All non-financial data in this report are reported on a 100% basis for companies and joint ventures where we are the operator. Environmental data pertain to our direct emissions unless otherwise stated. We report in this way, in line with industry practice, because these are the data we can directly manage and affect through operational improvements. We refer to the number of people employed or contracted on a "full-time equivalent" basis.

Operations acquired or divested during the year are included only for the period of our ownership. Our 2015 reporting does not include data from BG Group. Other data are collected from external sources, staff surveys and other internal sources as indicated.

We only include data in this report that were confirmed by the end of March 2016. If incidents are reclassified or confirmed, or if significant data changes occur after preparation of this report, they will be updated in the following year's publication. Data marked in the social data table come from an internal survey completed by the senior Shell representative in each country. The accuracy of environmental and social data may be lower than that of data obtained through our financial systems.

### ASSURANCE

We have clear standards and reporting requirements for our health, safety, security, environment and social performance data. This is supported by internal controls such as audit trails and statistical checks to help ensure the accuracy of the Shell Sustainability Report.

The External Review Committee of independent experts helps to make sure our reporting is balanced, relevant and responsive to stakeholders' interests.

Lloyd's Register Quality Assurance Ltd has provided limited assurance of our direct and indirect greenhouse gas emissions data for 2015. Limited assurance means nothing has come to the auditor's attention that would indicate that the data are not correct.

Conversions into US and Canadian dollars are based on the average exchange rates for 2015.

## ENVIRONMENTAL DATA

| ENVIRONMENTAL DATA   | 2015  | 2014  | 2013  | 2012  | 2011  | 2010  | 2009  | 2008  | 2007  | 2006  |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Greenhouse gas emissions (GHGs)</b>                                     |       |       |       |       |       |       |       |       |       |       |
| Direct total GHGs (million tonnes CO <sub>2</sub> equivalent) [A]          | 72    | 76    | 73    | 72    | 74    | 76    | 69    | 75    | 82    | 88    |
| Carbon dioxide (CO <sub>2</sub> ) (million tonnes)                         | 68    | 73    | 71    | 69    | 71    | 72    | 66    | 72    | 79    | 85    |
| Methane (CH <sub>4</sub> ) (thousand tonnes)                               | 119   | 126   | 120   | 93    | 133   | 128   | 127   | 126   | 119   | 124   |
| Nitrous oxide (N <sub>2</sub> O) (thousand tonnes)                         | 1     | 1     | 1     | 1     | 1     | 2     | 2     | 2     | 2     | 2     |
| Hydrofluorocarbons (HFCs) (tonnes)   | 18    | 16    | 17    | 23    | 22    | 23    | 25    | 23    | 28    | 24    |
| Energy indirect total GHGs (million tonnes CO <sub>2</sub> equivalent) [B] | 9     | 10    | 10    | 9     | 10    | 9     | 9     | n/c   | n/c   | n/c   |
| <b>Flaring</b>   |       |       |       |       |       |       |       |       |       |       |
| Flaring (Upstream) (million tonnes CO <sub>2</sub> equivalent)             | 11.8  | 13.0  | 7.4   | 7.7   | 10.0  | 10.4  | 7.8   | 8.8   | 9.7   | 14.3  |
| Flaring (Upstream) (million tonnes hydrocarbon flared)                     | 3.5   | 3.8   | 2.1   | 2.3   | 3.4   | 3.6   | 2.6   | 2.8   | 3.4   | 4.8   |
| Nigeria [C]  | 0.9   | 1.3   | 1.1   | 1.5   | 2.0   | 2.4   | 1.9   | 2.3   | 2.5   | 3.7   |
| Rest of world [D]  | 2.6   | 2.5   | 1.0   | 0.8   | 1.4   | 1.2   | 0.7   | 0.5   | 0.9   | 1.1   |
| <b>Energy intensity</b>  |       |       |       |       |       |       |       |       |       |       |
| Upstream excl. oil sands and GTL (gigajoules per tonne production) [E]     | 0.83  | 0.87  | 0.89  | 0.83  | 0.75  | 0.74  | 0.76  | 0.74  | 0.78  | 0.78  |
| Oil sands (gigajoules per tonne production) [F]                            | 5.8   | 6.3   | 6.5   | 6.6   | 6.4   | 6.8   | 6.6   | 6.4   | 5.7   | 5.3   |
| Refineries: Refinery Energy Index [G]                                      | 95.4  | 94.9  | 95.6  | 98.4  | 100.8 | 101.8 | 102.2 | 98.9  | 98.6  | 98.4  |
| Chemical plants: Chemicals Energy Index                                    | 91.6  | 90.3  | 89.8  | 91.7  | 90.8  | 89.3  | 92.0  | 93.0  | 92.6  | 92.5  |
| <b>Acid gases and VOCs</b>   |       |       |       |       |       |       |       |       |       |       |
| Sulphur oxides (SO <sub>x</sub> ) (thousand tonnes SO <sub>2</sub> )       | 88    | 97    | 99    | 113   | 136   | 139   | 141   | 175   | 212   | 233   |
| Nitrogen oxides (NO <sub>x</sub> ) (thousand tonnes NO <sub>2</sub> ) [H]  | 104   | 146   | 156   | 147   | 146   | 159   | 142   | 150   | 145   | 154   |
| Volatile organic compounds (VOCs) (thousand tonnes)                        | 125   | 151   | 89    | 89    | 129   | 147   | 126   | 130   | 148   | 185   |
| <b>Ozone-depleting emissions</b>   |       |       |       |       |       |       |       |       |       |       |
| CFCs/halons/trichloroethane (tonnes)                                       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.4   | 1.4   | 0.6   | 0.3   |
| Hydrochlorofluorocarbons (HCFCs) (tonnes)                                  | 8     | 6     | 8     | 8     | 12    | 21    | 24    | 26    | 27    | 35    |
| <b>Spills and discharges [I] [J]</b>                                       |       |       |       |       |       |       |       |       |       |       |
| Sabotage spills – volume (thousand tonnes) [K]                             | 2.2   | 2.7   | 2.2   | 3.3   | 1.6   | 3.0   | 14.0  | 6.5   | 3.4   | 1.9   |
| Sabotage spills – number [K]   | 94    | 139   | 157   | 137   | 118   | 112   | 95    | 115   | 197   | 123   |
| Operational spills – volume (thousand tonnes)                              | 0.8   | 0.7   | 0.9   | 2.1   | 6.0   | 2.9   | 1.4   | 8.8   | 3.5   | 3.9   |
| Nigeria [L]  | 0.2   | 0.3   | 0.4   | 0.2   | 5.3   | 0.7   | 0.3   | 7.1   | 1.6   | 1.4   |
| Rest of world  | 0.7   | 0.4   | 0.5   | 1.9   | 0.7   | 2.2   | 1.1   | 1.7   | 1.9   | 2.5   |
| Operational spills – number  | 108   | 153   | 174   | 207   | 211   | 195   | 275   | 275   | 392   | 465   |
| Nigeria [M]  | 16    | 38    | 31    | 37    | 64    | 32    | 37    | 42    | 52    | 41    |
| Rest of world  | 92    | 115   | 143   | 170   | 147   | 163   | 238   | 233   | 340   | 424   |
| Hurricane spills – volume (thousand tonnes)                                | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Oil in effluents to surface environment (thousand tonnes)                  | 1.0   | 0.9   | 1.0   | 1.0   | 1.3   | 1.6   | 1.5   | 1.7   | 1.6   | 1.8   |
| <b>Water</b>   |       |       |       |       |       |       |       |       |       |       |
| Fresh water withdrawn (million cubic metres)                               | 186   | 199   | 198   | 203   | 209   | 202   | 198   | 224   | 235   | n/c   |
| <b>Waste disposal</b>  |       |       |       |       |       |       |       |       |       |       |
| Hazardous (thousand tonnes)  | 455   | 529   | 770   | 820   | 740   | 1,048 | 962   | 688   | 907   | 716   |
| Non-hazardous (thousand tonnes)  | 1,680 | 1,674 | 2,065 | 2,295 | 1,850 | 1,079 | 1,139 | 996   | 1,899 | 1,154 |
| Total waste (thousand tonnes) [N]  | 2,135 | 2,203 | 2,835 | 3,115 | 2,590 | 2,127 | 2,101 | 1,684 | 2,806 | 1,870 |

[A] Greenhouse gas emissions comprise carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. The data are calculated using locally regulated methods where they exist. Where there is no locally regulated method, the data are calculated using the 2009 API Compendium, which is the recognised industry standard under the GHG Protocol Corporate Accounting and Reporting Standard. There are inherent limitations to the accuracy of such data. Oil and gas industry guidelines (IPIECA/API/IOGP) indicate that a number of sources of uncertainty can contribute to the overall uncertainty of a corporate emissions inventory. 2015 emissions are calculated using Global Warming Potential factors from the IPCC's Fourth Assessment Report. Data for prior years were calculated using Global Warming Potential factors from the IPCC's Second Assessment Report.

[B] These emissions were calculated using a market-based approach in line with the GHG Protocol Corporate Accounting and Reporting Standard.

[C] Nigeria includes SPDC onshore operations (0.8 million tonnes flared in 2015) and SNEPCo offshore operations (0.1 million tonnes flared in 2015).

[D] Flaring from the Majnoon field in Iraq and from Malaysia amounted to 1.4 and 0.6 million tonnes of hydrocarbons respectively in 2015.

[E] Since 2012 data are prepared in accordance with IPIECA/API/IOGP guidance 2010. Data for prior years are not directly comparable.

[F] The data include mining and upgrading operations. The data do not include in-situ production.

[G] Data are indexed to 2002, based on Solomon Associates Energy Intensity Index 2006 methodology.

[H] Decrease in NO<sub>x</sub> emissions in 2015 was partially driven by the realignment of reporting boundaries with the IPIECA/API/IOGP guidance.

[I] All spill volumes and numbers are for spills over 100 kilograms. Due to the rounding of numbers, spill volumes for Nigeria and rest of world might not add up to the exact total volume of spills.

[J] As of the end of March 2016, there were two spills under investigation in Nigeria that may result in adjustments.

[K] All sabotage- and theft-related spills have occurred in Nigeria except in 2015 (0.005 thousand tonnes outside Nigeria), 2007 (0.7 thousand tonnes outside Nigeria) and 2006 (0.6 thousand tonnes outside Nigeria).

[L] Nigeria includes SPDC onshore operations and SNEPCo offshore operations. A single spill at the Bonga field offshore Nigeria amounted to 4.8 thousand tonnes in 2011.

[M] Nigeria includes SPDC onshore operations (15 operational spills in 2015) and SNEPCo offshore operations (one operational spill in 2015).

[N] In 2015, we sent waste offsite for recycling or reuse, or sold close to 500 thousand tonnes of material that would otherwise have been disposed of as waste.

n/c = not calculated.

## SOCIAL AND SAFETY DATA

| SOCIAL AND SAFETY DATA  |      |      |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|------|------|
|   | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 |
| <b>Fatalities</b>   |      |      |      |      |      |      |      |      |      |      |
| Total number  | 7    | 5    | 5    | 8    | 6    | 12   | 20   | 26   | 21   | 37   |
| Employees   | 1    | 3    | 0    | 3    | 1    | 0    | 1    | 2    | 1    | 2    |
| Contractors   | 6    | 2    | 5    | 5    | 5    | 12   | 19   | 24   | 20   | 35   |
| Fatal accident rate (FAR)   | 1.11 | 0.74 | 0.79 | 1.32 | 0.96 | 1.56 | 2.3  | 3.4  | 3.1  | 5.6  |
| Fatalities per 100 million working hours (employees and contractors)                        |      |      |      |      |      |      |      |      |      |      |
| <b>Injuries and process safety incidents</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable case frequency (TRCF)  | 0.94 | 0.99 | 1.15 | 1.26 | 1.24 | 1.23 | 1.4  | 1.8  | 1.9  | 2.1  |
| Injuries per million working hours (employees and contractors)                              |      |      |      |      |      |      |      |      |      |      |
| Lost time injury frequency (LTIF)   | 0.26 | 0.28 | 0.36 | 0.34 | 0.36 | 0.35 | 0.4  | 0.6  | 0.7  | 0.8  |
| Lost time injuries per million working hours (employees and contractors)                    |      |      |      |      |      |      |      |      |      |      |
| Operational Process Safety Events   |      |      |      |      |      |      |      |      |      |      |
| Tier 1 [O]  | 51   | 57   | 65   | 91   | n/c  | n/c  | n/c  | n/c  | n/c  | n/c  |
| Tier 2 [O]  | 169  | 194  | 246  | 308  | n/c  | n/c  | n/c  | n/c  | n/c  | n/c  |
| <b>Illnesses</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable occupational illness frequency (TROIF)                                     | 0.60 | 0.96 | 0.77 | 0.51 | 0.66 | 0.76 | 0.6  | 1.2  | 1.5  | 1.8  |
| Illnesses per million working hours (employees only)  |      |      |      |      |      |      |      |      |      |      |
| <b>Security</b>   |      |      |      |      |      |      |      |      |      |      |
| Using armed security (% of countries)   | 19   | 24   | 19   | 17   | 14   | 9    | 17   | 17   | 16   | 15   |
| Using armed company security (% of countries)   | 1    | 1    | 3    | 0    | 1    | 1    | 1    | 1    | 2    | 2    |
| Using armed contractor security (% of countries)  | 8    | 10   | 8    | 10   | 9    | 6    | 10   | 9    | 12   | 9    |
| <b>Gender diversity [P]</b>   |      |      |      |      |      |      |      |      |      |      |
| In supervisory/professional positions (% women)   | 28.0 | 29.0 | 28.8 | 28.1 | 27.3 | 26.3 | 26.4 | 24.7 | 24.6 | 23.2 |
| In management positions (% women)   | 20.0 | 21.0 | 18.8 | 18.2 | 17.6 | 17.0 | 16.1 | 15.3 | 17.7 | 16.2 |
| In senior leadership positions (% women)  | 19.0 | 18.2 | 17.2 | 16.2 | 16.6 | 15.3 | 14.0 | 13.6 | 12.9 | 11.6 |
| <b>Staff forums and grievance procedures</b>  |      |      |      |      |      |      |      |      |      |      |
| % countries with staff access to staff forum, grievance procedure or other support system   | 100  | 100  | 100  | 100  | 99   | 100  | 99   | 100  | 100  | 99   |
| <b>Child labour (% countries with procedures in place)</b>                                  |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | 100  | 99   | 95   |
| Contractors   |      |      |      |      |      |      |      |      | 98   | 89   |
| Suppliers   | 100  | 100  | 100  | 100  | 97   | 96   | 97   | 99   | 96   | 82   |
| <b>Forced labour (% countries with procedures in place)</b>                                 |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | n/c  | n/c  | n/c  |
| Contractors and suppliers   | 100  | 100  | 100  | 100  | 97   | 95   | 89   | n/c  | n/c  | n/c  |
| <b>Integrity</b>  |      |      |      |      |      |      |      |      |      |      |
| Code of Conduct violations [Q]  | 217  | 267  | 181  | 209  | 226  | 205  | 165  | 204  | 361  | n/c  |
| <b>Contracting and procurement</b>  |      |      |      |      |      |      |      |      |      |      |
| Estimated expenditure on goods and services in lower-income countries (\$ billion) [R] [S]  | 6    | 14   | 12   | 14   | 12   | 13   | 12   | 12   | 13   | 10   |
| <b>Social investment [T]</b>  |      |      |      |      |      |      |      |      |      |      |
| Estimated voluntary social investment (equity share) (\$ million)                           | 122  | 160  | 159  | 149  | 125  | 121  | 132  | 148  | 170  | 140  |
| Estimated social investment spend (equity share) in lower-income countries (\$ million) [U] | 43   | 73   | 74   | 67   | 45   | 61   | 54   | 61   | 65   | n/c  |

[O] Process safety events are classified based on guidance from the IOGP and API. In 2015, there were 28 Tier 1 and 17 Tier 2 sabotage related events.

[P] Diversity data obtained from our human resources system.

[Q] Code of Conduct violations represent the number of reported incidents in the Shell Global Helpline (excluding queries or customer service queries), which have been investigated and closed during the relevant period and where allegation was found to be (at least partially) true.

[R] Estimated expenditure in countries where gross domestic product amounts to less than \$15,000 a year per person (source: UNDP Human Development Index 2015). In 2015, the UNDP index update no longer includes some of the countries in which Shell invests, which impacts on our reported spend amount.

[S] From 2013 onwards, this figure only includes the amount spent on goods and services by Shell group companies.

[T] Social investment spending varies from year to year depending on business climate, locations and type of activities under way. This is voluntary social investment and does not include social investments made through contractual agreements with host governments, voluntary work by Shell employees and donations of equipment.

[U] Estimated voluntary social investment spending in countries where gross domestic product amounts to less than \$15,000 a year per person (source: UNDP Human Development Index 2015). As the countries included in the UNDP index change, this affects our spend numbers. In 2015, the UNDP index update no longer includes some of the countries in which Shell invests, which impacts on our reported spend amount.

[V] Social investment and contracting and procurement data collected via our financial system since 2007.

[W] Data obtained from an internal survey completed by the senior Shell representative in each country.

n/c = not calculated.

## EXTERNAL REVIEW COMMITTEE



External Review Committee:  
(clockwise from centre front)

1. Seema Arora (Chair), Executive Director, Confederation of Indian Industry, India
2. John Gardner, Vice President and Chief Sustainability Officer, Novelis Inc, UK
3. Reidar Kvam, Global Lead, Social sustainability and standards, World Bank, Norway
4. Lavinia Hollanda, Head of Research, FGV Energia, Brazil
5. Mark Brownstein, Vice President, Climate and Energy Program, Environmental Defense Fund, USA
6. Ed Whittingham, Executive Director, Pembina Institute, Canada
7. Bernice Lee, Head of Climate Change and Resource Security Initiatives, World Economic Forum, Hong Kong

In 2005, Shell established an External Review Committee (ERC) to help evaluate the quality and credibility of the annual sustainability report and to recommend improvements to our sustainability performance.

Members of the ERC come from a range of professional backgrounds, but they share the following expertise and experience:

- globally respected, independent, pragmatic in their approach;
- familiar with, and able to convey, the perspectives of Shell stakeholder groups or are experts in the main sustainability challenges that Shell faces;
- broadly representative of regions of strategic importance to Shell;
- reasonably familiar with the oil and gas industry, Shell, and related sustainability issues; and
- capable of adding fresh perspectives to Shell's thinking and reporting on sustainability.

Committee members are asked to serve for three years, with two or three new members appointed each year. This is long enough to develop the necessary understanding of the issues and process, without diminishing the independence or external perception of independence critical to the ERC's effectiveness. The intention is that the Committee should bring a balance of experience and perspectives.

### ERC RECOMMENDATIONS IN 2014

Each year, the ERC is asked to present its independent opinion on the Shell sustainability report. Below is an example of some of the recommendations included in the ERC's letter in the Shell Sustainability Report 2014 and Shell's response. The ERC recommendations have been fundamental in shaping this current report. (See table).

### ERC RECOMMENDATIONS AND OUR RESPONSES

| ERC recommendation in 2014   | How Shell responded in the 2015 report   | Pages     |
|--|--|-----------|
| The ERC would like to see Shell disclose how the energy transition will further impact the company's business strategy, influence its targets and determine its future actions.  | A dedicated section describing Shell's view and actions in relation to the energy transition has been introduced.  | 10 to 21  |
| The ERC believes the report should more clearly describe how Shell's methane emissions compare to the studies performed, and the plans Shell has in place to reduce its methane emissions.   | We have included more detail on our efforts to reduce our methane emissions and on our progress in reducing flaring.   | 27 and 28 |
| In Nigeria, Shell's efforts to reduce theft and sabotage are clearly described in the report and demonstrate the company's commitment to improve operational standards, even in a challenging context. The ERC encourages Shell to further disclose its progress in this area. | A summary of our progress is included on the different aspects of spill remediation. It also highlights the safety and security challenges that our employees face, which slows the pace of this work. | 24 and 25 |

### REVIEW PROCESS

The Committee meets in person three times annually (in The Hague, the Netherlands), and on other occasions by teleconference. It holds meetings with Shell senior management, including Shell's Executive Committee, to discuss Shell's approach to sustainability and our reporting. When reviewing the sustainability report, the ERC focuses on three main questions:

- Has Shell selected the most important topics for the report?
- How well has the report dealt with these topics and responded to stakeholder interests?
- Has Shell provided sufficient information and access for the ERC to do its job effectively?

This review does not include the verification of performance data in the sustainability report, or the information on which the case studies in the report are based. Separately, the ERC provides Shell with its observations on the company's strategy and sustainability performance.

To acknowledge the ERC's time and expertise an honorarium is offered, payable either to the individual members, their organisation or their charity of choice. They are also offered reimbursement for their expenses.

## ERC OPINION

The External Review Committee (ERC or the Committee) is pleased to share its independent opinion on Shell's 2015 Sustainability Report (the report).

The ERC recognises that the report has improved considerably compared with previous years in both tone and content, with significant improvements in its structure, flow, design and readability. The ERC believes the report covers the issues most relevant to Shell and its stakeholders. It is helpful that the 2015 report includes a section summarising action taken on some of the issues identified in the 2014 ERC letter.

The ERC's engagement with Shell's senior leadership during the 2015 report cycle was well structured; this has enabled the ERC to better understand Shell's current thinking on its business strategy and sustainability. The report more clearly reflects the social and environmental challenges and opportunities facing the energy industry than in previous years, although the ERC feels there is further room for improvement.

### ENERGY TRANSITION AND CLIMATE CHANGE

The report outlines Shell's approach to the energy transition and how it is preparing for the transition to a lower-carbon world. In our view, the report does not adequately convey the urgency of this transition in light of the 2015 Paris Agreement to keep the global temperature rise well below 2 °C above preindustrial levels and to pursue efforts to limit it to 1.5 °C. The ERC encourages Shell to disclose more precisely how its strategy aligns with this global ambition and to provide more disclosure on Shell's thinking on the role of natural gas (and other fossil fuels) beyond 2050.

In terms of technological choices, for example, the report outlines Shell investments in carbon capture and storage (CCS), transportation alternatives based on hydrogen and biofuels, and even renewables. Yet it is not clear whether these efforts are being pursued with the urgency and scale required to meaningfully shift Shell's operations in the timeframe implied by the Paris Agreement.

The ERC encourages Shell to more clearly articulate short- and medium-term (up to five years) and longer-term (five to 20 years) goals detailing a robust and comprehensive low-carbon transition strategy.

### NATURAL GAS AND METHANE

The ERC welcomes the inclusion of a separate section on methane and the description of Shell's actions to control these emissions. As cited in the report, the IPCC estimates that methane makes up about 20% of man-made greenhouse gas emissions

on a CO<sub>2</sub>-equivalent basis. The ERC also notes that the oil and gas supply chain from production, transmission and distribution is the largest industrial source of these emissions. In light of Shell's declared strategy to increase its focus on natural gas, the ERC believes that the report understates the magnitude of the climate problem posed by methane and the risk this represents to Shell. The report would benefit from greater clarity on how managing methane emissions and the related risks within its operations are reflected in Shell's business strategy.

In future reports, the ERC encourages Shell to include more detail on improvements undertaken in measuring and assessing emissions; the steps required to reduce these emissions including specific targets, and the role Shell is playing in advancing legal and regulatory policies that support methane reductions.

### ALASKA

In recent years, the ERC has raised various questions about Shell's exploration work in Alaska, for example, urging Shell to communicate how different risk factors are considered in a balanced manner. The 2015 report explains that the ultimate decision to cease Alaska exploration was based on the failure to find hydrocarbons. The report also acknowledges the many challenges Shell experienced in respect of Alaska operations over the last few years, including the high operating costs, increased opposition from environmental groups and others, as well as the unpredictable regulatory environment. The ERC thinks it would help stakeholders to hear more about how the different financial and non-financial risk factors were considered over time and how the company will apply learning from Alaska to ongoing investments in the Arctic and other sensitive regions.

### OIL SANDS

The ERC believes halting construction of the Carmon Creek oil sands project warranted additional explanation. Future reports might include further discussions on the evaluation and balance of technical and non-technical risks for controversial activities such as oil sands development. This could also include discussions on how Alberta's new oil sands emissions limits – which Shell publicly supported – may impact Shell's future operations.

### NIGERIA

In 2015, Shell recorded seven fatalities in four separate incidents in their Nigeria operations. Once investigations are completed, the ERC urges Shell to disclose the measures undertaken to reduce the risk of future events.

The ERC appreciates the complexity of oil leak clean-ups in Nigeria, but encourages Shell to be more transparent in the timing of the remediation programme committed to by the Shell Petroleum Development Company of Nigeria joint venture to implement the United Nations Environment Programme report recommendations.

### TARGETS AND GOALS

For several years, the ERC has encouraged Shell to include sustainability targets and goals in its reporting to demonstrate its long-term ambition and corresponding management focus. The ERC welcomes the inclusion of the new section on reporting against aspirations in the 2015 report which lists goals, performance and plans for 2016 and beyond. The ERC suggests that the report also provides information on the process and the criteria for selecting the reported aspirations, including their standing in Shell's materiality assessment. The ERC suggests that future Shell reporting includes a more comprehensive list of targets and goals, analysis of performance trends and action taken where performance is below target.

### SOCIAL PERFORMANCE

The ERC acknowledges strong improvement in the clarity of reporting on Shell's social performance in the 2015 report. For example, the report makes a much clearer distinction between a rights-based approach to risk management and providing opportunities to local communities and other groups than in the past. Also, the detail provided on Shell community social investment efforts combines well with descriptions of the work of the Shell Foundation, providing a broader understanding of impact. The ERC hopes to see continuing emphasis in the report on this area, which can be strengthened further with more robust indicators and data related to social performance.

### CONCLUSION

The Committee recognises the progress in the 2015 report, particularly the response to the ERC's recommendations from previous years. In future reports, the ERC would like to see a more strategic conversation on the role of fossil fuels as the world pursues efforts to limit global warming to 1.5 °C, and the challenges posed by volatility in the market price of oil. In the 2016 Sustainability Report, we anticipate commentary on the acquisition of BG Group and how this will impact Shell's sustainability strategy.

## LINKS

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Following is a list of links to find more information about topics included in the sustainability report.

### INTRODUCTION

|           |  |  |
|-----------|--|--|
| <b>02</b> | Topic selection for 2015               | An overview of our work in sustainability:<br><a href="http://www.shell.com/sustainability">www.shell.com/sustainability</a>           |
| <b>04</b> | About Shell                            | An overview of Shell's business:<br><a href="http://www.shell.com/about">www.shell.com/about</a>                                       |
| <b>09</b> | Embedding sustainability into projects | Information about our impact assessment process:<br><a href="http://www.shell.com/impactassessment">www.shell.com/impactassessment</a> |

### THE ENERGY TRANSITION

|           |                                  |   |
|-----------|----------------------------------|---|
| <b>11</b> | The energy future                | Our work in cleaner energy, future transport, cities and the Shell Scenarios:<br><a href="http://www.shell.com/energyfuture">www.shell.com/energyfuture</a> |
| <b>14</b> | Addressing climate change        | Shareholder resolution in 2015:<br><a href="http://www.shell.com/ghg">www.shell.com/ghg</a>   |
| <b>16</b> | Natural gas                      | Our natural gas story:<br><a href="http://www.shell.com/naturalgas">www.shell.com/naturalgas</a>  |
| <b>18</b> | Research and development         | Areas of innovation:<br><a href="http://www.shell.com/innovatingtogether">www.shell.com/innovatingtogether</a>  |
| <b>19</b> | Carbon capture and storage (CCS) | Our CCS projects:<br><a href="http://www.shell.com/ccs">www.shell.com/ccs</a>   |
| <b>20</b> | Lower-carbon alternatives        | Innovations in lower-carbon transport:<br><a href="http://www.shell.com/futuretransport">www.shell.com/futuretransport</a>                                  |

### MANAGING OPERATIONS

|           |                           |  |
|-----------|---------------------------|--|
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## REPORT SPECIFICATIONS

The paper used for this report is Satimat Green, a Forest Stewardship Council® (FSC®) certified paper, produced from 60% FSC-certified recycled fibre and 40% FSC-certified virgin fibre. All virgin fibres are Elemental Chlorine Free bleached, without using chlorine gas. The inks used are vegetable oil-based. The laminate used for the cover is eco-friendly and allows the report to be fully recycled.



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- Comprehensive financial information on our activities throughout 2015
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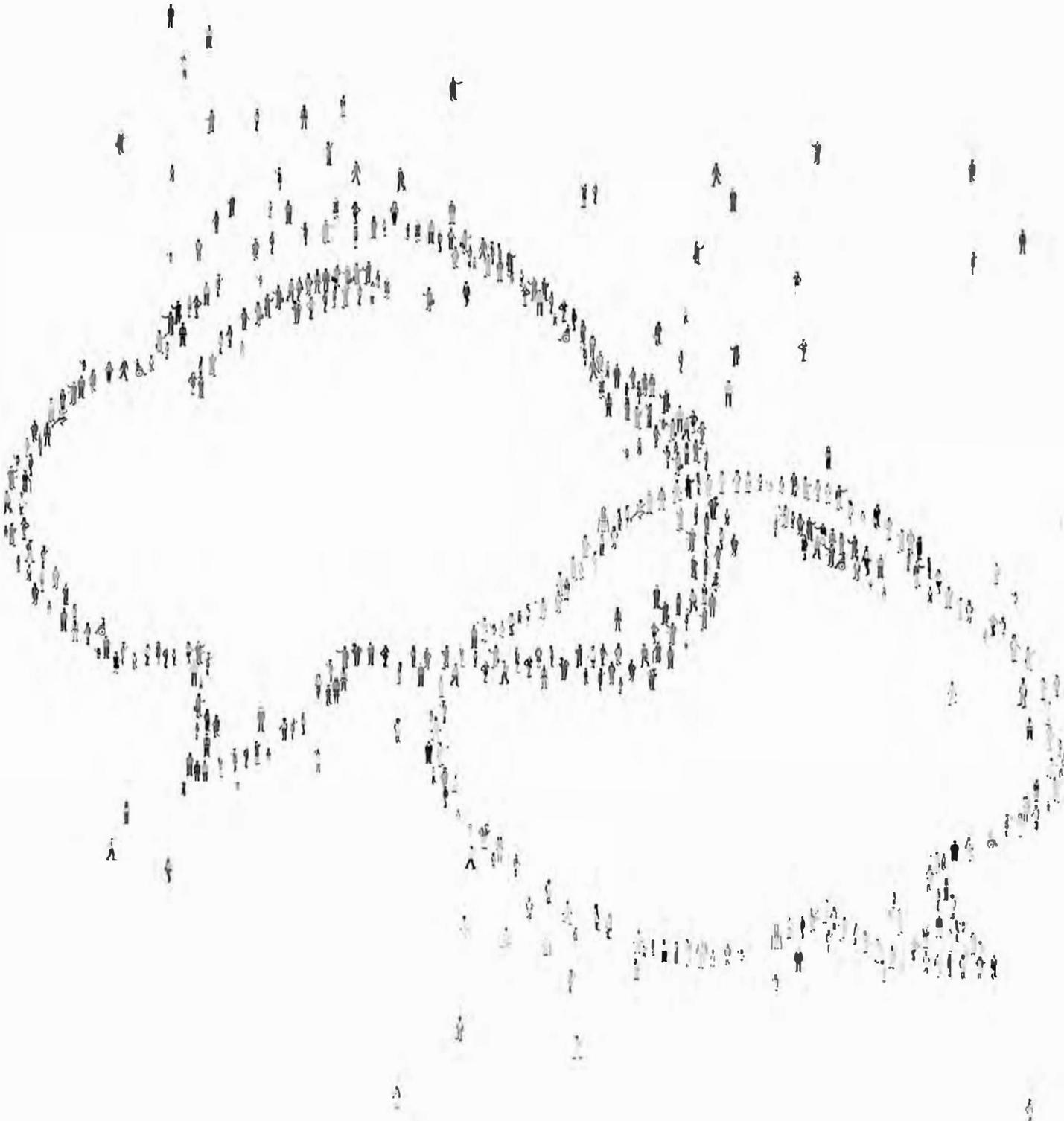
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# ATTACHMENT 81



# SUSTAINABILITY REPORT

Royal Dutch Shell plc  
Sustainability Report 2016



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### CAUTIONARY NOTE

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this report, "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. "Subsidiaries", "Shell subsidiaries" and "Shell companies" as used in this publication refer to companies over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations" respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect (for example, through our 23% shareholding in Woodside Petroleum Ltd.) ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.

This report contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "anticipate", "believe", "could", "estimate", "expect", "goals", "intend", "may", "objectives", "outlook", "plan", "probably", "project", "risks", "schedule", "seek", "should", "target", "will" and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause these results to differ materially from those expressed in the forward-looking statements included in this report, including (without limitation):

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### COVER IMAGE

The cover shows how collaborations and discussions with communities, customers and partners worldwide help Shell provide more and cleaner energy solutions.

### DIGITAL

The Sustainability Report has moved to an online digital report reports.shell.com. The digital version includes further information such as an interactive GRI index to enhance usability for and the experience of the readers of the report. In the event of any conflict, discrepancy or inconsistency between the digital report and this hardcopy report of the Sustainability Report then the information contained in the digital report will prevail. This hardcopy report is provided for the readers convenience only.

### NEW LENS SCENARIOS

This publication contains data from Shell's New Lens Scenarios. The New Lens Scenarios are a part of an ongoing process used in Shell for 40 years to challenge executives' perspectives on the future business environment. We base them on plausible assumptions and quantifications, and they are designed to stretch management to also consider events that may only be remotely possible. Scenarios, therefore, are not intended to be predictions of likely future events or outcomes and investors should not rely on them when making an investment decision with regard to Royal Dutch Shell plc securities.

It is important to note that Shell's existing portfolio has been decades in development. While we believe our portfolio is resilient under a wide range of outlooks, including the IEA's 450 scenario, it includes assets across a spectrum of energy intensities including some with above-average intensity. While we seek to enhance our operations' average energy intensity through both the development of new projects and divestments, we have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10-20 years.

(a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell's 2017 for the year ended December 31, 2016 (available at [www.shell.com/investor](http://www.shell.com/investor) and [www.sec.gov](http://www.sec.gov)). These risk factors also expressly qualify all forward-looking statements contained in this report and should be considered by the reader. Each forward-looking statement speaks only as of the date of this report, 12 April 2017. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this report.

This report contains references to Shell's website. These references are for the readers convenience only. Shell is not incorporating by reference any information posted on [www.shell.com](http://www.shell.com).

We may have used certain terms, such as resources, in this report that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. US investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website [www.sec.gov](http://www.sec.gov).

## INTRODUCTION

Welcome to the 2016 Shell Sustainability Report, which covers our performance in 2016 and significant changes and events during the year. The report includes an introduction from Shell's Chief Executive Officer Ben van Beurden and an opinion from the External Review Committee.



**70+**

Countries Shell operates in



**92,000**

Average number of people employed by Shell in 2016



**2%**

Our approximate share of world oil production



**3%**

Our approximate share of world gas production



**1%**

Our share of the global supply of energy



## INTRODUCTION FROM THE CEO



**“We need to fulfil the growing demand for energy, with more natural gas and cleaner energy products.”**

In 2016, the world took significant steps towards building a low-carbon energy future. The United Nations (UN) Paris Agreement and the UN's sustainable development goals came into force, setting new targets for tackling climate change, promoting sustainable economic growth and providing access to modern energy.

It was also a significant year for Shell. Against a backdrop of low oil prices, we acquired BG, which added to our operations and opportunities in natural gas, the cleanest-burning hydrocarbon, and in deep water.

As part of a refreshed business strategy, we set long-term environmental and social ambitions: to reduce our carbon intensity and to deliver shared value for society. This includes creating jobs and investing in communities. But it also means providing more and cleaner energy solutions.

### ENVIRONMENT AND SAFETY

In 2016, we reduced greenhouse gas (GHG) emissions from the facilities we operate, even with the addition of BG projects to our portfolio.

We achieved this partly by reducing flaring in our operations and through our Quest project in Canada, where we safely captured and stored deep underground more than 1 million tonnes of carbon dioxide (CO<sub>2</sub>) from our oil sands operations. The sale of some of our businesses also contributed to the reduction.

Our goal is to work without causing harm to people and the environment. However, we had three fatalities in 2016, which is unacceptable. Our company must continue its efforts to ensure safety wherever we work. We must encourage staff and contractors to be alert to their own safety, to care about the safety of their colleagues, and to look out for any potential safety risks in all our operations, however small.

Overall, we continued to reduce the number of process safety incidents in our operations, such as leaks or spills of hazardous materials.

### SHAPING SHELL

Our business strategy includes creating a world-class investment case for shareholders and strengthening our leadership in the oil and gas industry, while positioning the company for growth as the world transitions to a low-carbon energy system.

From 2017, employee bonuses, including those of Shell's Executive Committee, will also reflect our progress in managing GHG intensity, in particular CO<sub>2</sub> and methane. Here, we will focus on three operational areas: refining, chemical plants and flaring in upstream projects.

The choices we make to shape our portfolio should take into account the shift to a world of lower GHG emissions. We will specifically consider the carbon intensity of projects when taking decisions about which assets we decide to invest in.

In 2016, we created a New Energies business to continue to explore investment opportunities in areas including biofuels, hydrogen and renewable energy. This business will also look for opportunities in energy solutions that combine wind and solar power with gas, for example, and new ways to connect customers to energy.

### ENABLING THE ENERGY TRANSITION

The Paris Agreement has set targets for tackling climate change. I want Shell to promote and play a role in the energy transition to a low-carbon future when there is clear commercial value. A world of net-zero emissions of GHGs is both technically and economically feasible towards the end of the century, according to our Scenarios team, which considers possible futures.

Government policy will be critical to creating the conditions for making the transition to cleaner energy across all sectors of the economy commercially possible. Shell continues to call for effective government-led carbon-pricing mechanisms, which would support the commercial development of technologies that can reduce emissions, such as carbon capture and storage.

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We are currently working with some countries to help them shape their energy future. For example, we are helping policy makers in the Netherlands in their efforts to explore the energy mix the country would need to reduce its GHG emissions.

It is also important that we work with coalitions, both within industry and more broadly, to help meet the challenge of climate change. In late 2016, for example, we were one of 10 oil and gas companies that jointly pledged to invest \$1 billion in technologies with the potential to reduce GHG emissions. We are a founding member of the Energy Transitions Commission that brings together energy companies, investors, public and academic institutions, and foundations.

## SHARED VALUE

What is shared value? Our work at Shell helps to create jobs. We pay taxes, invest in communities close to our operations, develop local supply chains and train local people.

But that is not enough. We need to build on this to fulfil the growing demand for energy, with more natural gas and cleaner energy products. There are still more than 1 billion people without access to electricity; those who use basic materials, such as firewood, for heating their homes or cooking meals.

Shell has a part to play in improving access to energy. We can offer new supply models for communities that are underserved, where sufficient commercial value is available. For example, we can provide cleaner energy

solutions, by offering energy powered by a combination of natural gas and renewable energy. That is why we have made creating shared value a strategic aspiration for Shell.

## THE 2016 SUSTAINABILITY REPORT

This Sustainability Report details our social, safety and environmental performance during 2016. Once again, we appreciate the input of the External Review Committee, which consists of leading sustainability experts, as we develop our thinking in this area. They also play an important role in developing our reporting.

Shell is a founding member of the UN Global Compact that aims to promote environmental protection, human rights, better labour practices and anti-corruption standards through good corporate governance.

Today, we continue to build on that work as we reshape our company and work with others to help deliver the energy that the world needs.



Ben van Beurden  
Chief Executive Officer

## TOPIC SELECTION FOR 2016

The Shell Sustainability Report 2016 focuses on the key sustainability challenges the company faces and explores the many ways that we are responding. The topic selection identifies the sustainability subjects that were relevant or prominent in 2016.

Each year, we use a structured process to select the report's content and confirm its validity. We engage with various groups and individuals to understand specific concerns about our business and its impacts around the world, particularly in relation to the environment and society.

This includes speaking with community representatives, business partners, customers, non-governmental organisations, investors, the media, academics, contractors and suppliers, ratings agencies and members of the public. We also talk to teams within Shell. We gather opinions and advice in various ways including formal and informal meetings, workshops and online surveys. We also considered the acquisition of BG in our topic selection. Given the extent of the similarities between the two companies, particularly our working practices, safety standards and controls, and global portfolio in deep water and liquefied natural gas, the review did not lead to any new topics being added to the report.

We have listed the selected topics in alphabetical order rather than prioritising them. The topics consistently ranked as of high importance in 2016 were energy transition and climate change; we have sections dedicated to these topics.

### THE MAIN STEPS INVOLVED IN SELECTING THE TOPICS ARE:

Step 1: identifying and understanding topics that are important to our stakeholders;

Step 2: identifying topics that are important to Shell's business strategy;

Step 3: collating all the topics identified as of high importance by our stakeholders – these topics determine the report's content;

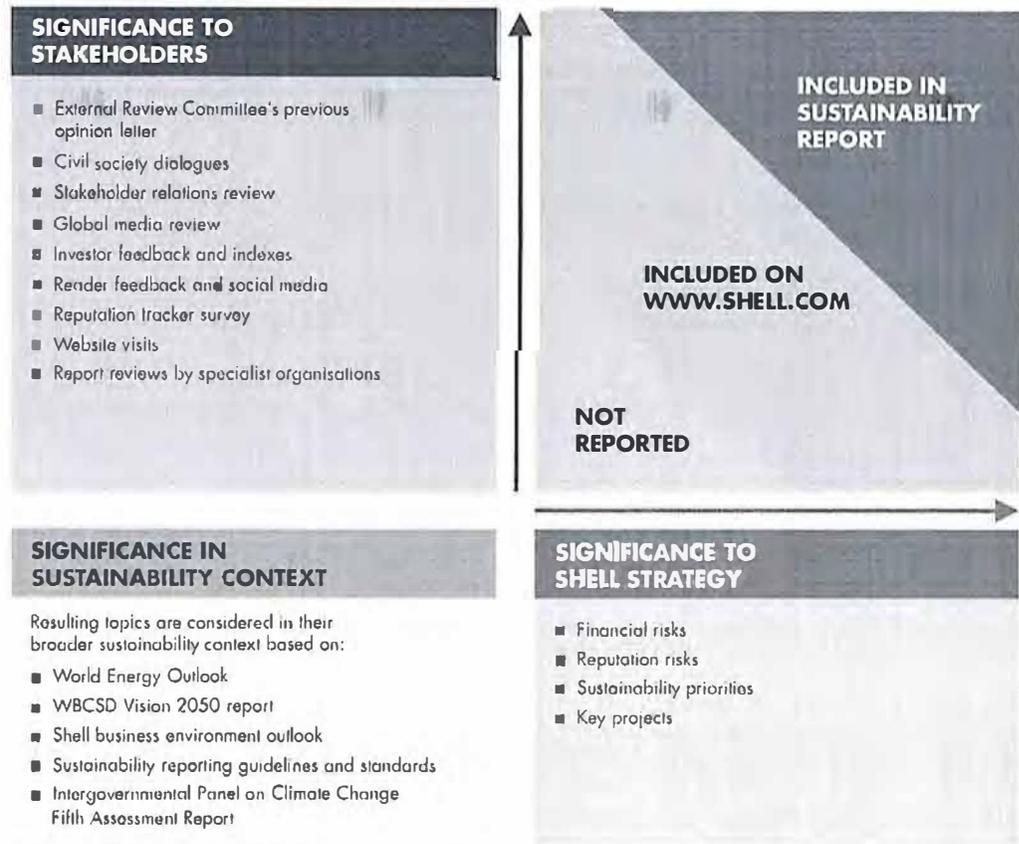
Step 4: identifying the topics for 2016 that will be covered elsewhere on [www.shell.com](http://www.shell.com);

Step 5: submitting details of the topic selection process for review and approval by the External Review Committee to ensure that coverage is balanced, relevant and complete; and

Step 6: informing Shell's Executive Committee of the chosen topics, for their endorsement.

We report in accordance with the Global Reporting Initiative (GRI) version G4 and in line with the oil and gas industry guidelines developed by IPIECA – the global oil and gas industry association for environmental and social issues. We also use the guidance on voluntary reporting from the American Petroleum Institute and the International Association of Oil and Gas Producers.

### Topic selection diagram



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The GRI content index is available under GRI Index. Shell supports the United Nations Global Compact and its 10 principles covering human rights, labour, the environment and anti-corruption. Sections of this sustainability report cover Shell's performance in 2016 across these areas. We continue to follow the progress of the United Nations' sustainable development goals through our membership of IPIECA, and have provided an overview of our activities in relation to some of these goals in this report.

More detailed information about Shell's approach to sustainability, our processes and work around the world is available on [www.shell.com](http://www.shell.com). Links to specific topics discussed in the report are published at the end of the web page under "More on other Shell websites".

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## ABOUT SHELL

Royal Dutch Shell plc is an international energy company with expertise in the production, refining and marketing of oil and natural gas.

Shell is one of the world's largest independent energy companies in terms of market capitalisation, operating cash flow and production. The company explores for oil and gas worldwide, both from conventional fields and from sources such as shales and deep water. We work to develop new oil and gas supplies, and have a global network of refineries and chemical plants. Shell transports and trades oil, gas and other energy-related products, such as carbon-emission rights, and continues to invest in new business models in renewable energy enabled by digital technology. We serve around 30 million customers every day through our global network of 43,000 Shell-branded retail stations.

### OUR BUSINESS STRATEGY

Our strategy seeks to create a world-class investment case for shareholders. This strategy is underpinned by Shell's outlook for the energy sector and the need to adapt to substantial changes in the world around us. Rising global population and standards of living should continue to drive demand growth for oil and gas for decades to come. At the same time, there is a transition under way to: a lower-carbon energy system, a world with increased customer choice, and continued energy price volatility. Safety and environmental and social responsibility are at the heart of our activities and continue to be a driver for our strategic ambitions.

In February 2016, Shell completed the acquisition of BG, adding significantly to our activities in liquefied natural gas (LNG) worldwide and deep-water oil and gas production in Brazil.

At the end of 2016, the underlying operating cost of the combined group was below \$40 billion, lower than that used to run Shell previously, and 2017 is expected to be lower again. After the acquisition, three-quarters of BG employees have moved to a role in Shell.

### BG AND RESHAPING SHELL

Delivering the BG deal required swift and effective integration in 2016, while learning from their best working practices.

A team made up of employees from both companies identified more than 100 different practices, for example, engineering standards and contractor requirements, that were incorporated into Shell's operating model.

Staff at all former BG facilities, which are now operated by Shell, have reviewed their health, safety, security, environment and social performance (HSSE&SP) plans against Shell's HSSE&SP Control Framework, and now comply with the Shell framework or have plans to close any gaps.

### BRAZIL GROWTH

Brazil has been key to Shell for over a century and, since the BG-Shell combination, is now a bigger part of our portfolio.

### IN 2016, SHELL

- produced **3,668 thousand** barrels of oil equivalent per day in 2016
- sold **57.1 million tonnes** of LNG
- used around **9.5 billion** litres of biofuels in petrol and diesel we sold in 2016
- produced **1,232 gigawatt-hours** of energy from its wind business; mainly in the USA and the Netherlands
- invested **\$26.9 billion** in capital projects around the world

Shell has four strategic ambitions:

- create a world-class investment case, by reshaping Shell to grow free cash flow per share and increase our returns, all underpinned by a conservative financial framework;
- reduce our carbon intensity as part of the energy transition by shaping our portfolio and business strategy to ensure Shell's resilience for the future, looking at cost-effective ways to manage greenhouse gas emissions (GHG) and the commercial opportunities these solutions bring; and linking remuneration for all employees to the management of GHG emissions;
- maintain a position of leadership and influence in our industry and have the largest value share among our competitors; and
- create shared value by working with communities, countries and global organisations. We invest in communities living close to our operations, develop local supply chains, create jobs and train local people.

Shell has a diverse operated and non-operated portfolio in Upstream in Brazil - including exploration and production equity in several deep-water fields. Our Downstream footprint includes Shell's largest investments in biofuels globally through its Raízen joint venture; a lubricants blending plant and a 17% stake in Comgás, one of Latin America's largest natural gas distributors.

After the acquisition our average daily production in Brazil grew tenfold in 2016, from 30,000 to more than 300,000 barrels of oil equivalent (boe). Today, Shell is Brazil's second largest oil and gas producer, with production expected to grow over the next decade. Shell's current position in Brazilian deep-water includes Petrabras-operated facilities and Shell-operated facilities.

In 2016, we continued to fund social investment projects coming from both Shell and BG in Brazil and launched the first Shell Eco-marathon Brazil. Shell LiveWIRE has helped develop more than 600 new businesses in Brazil over the past 15 years.

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## OUR BUSINESS

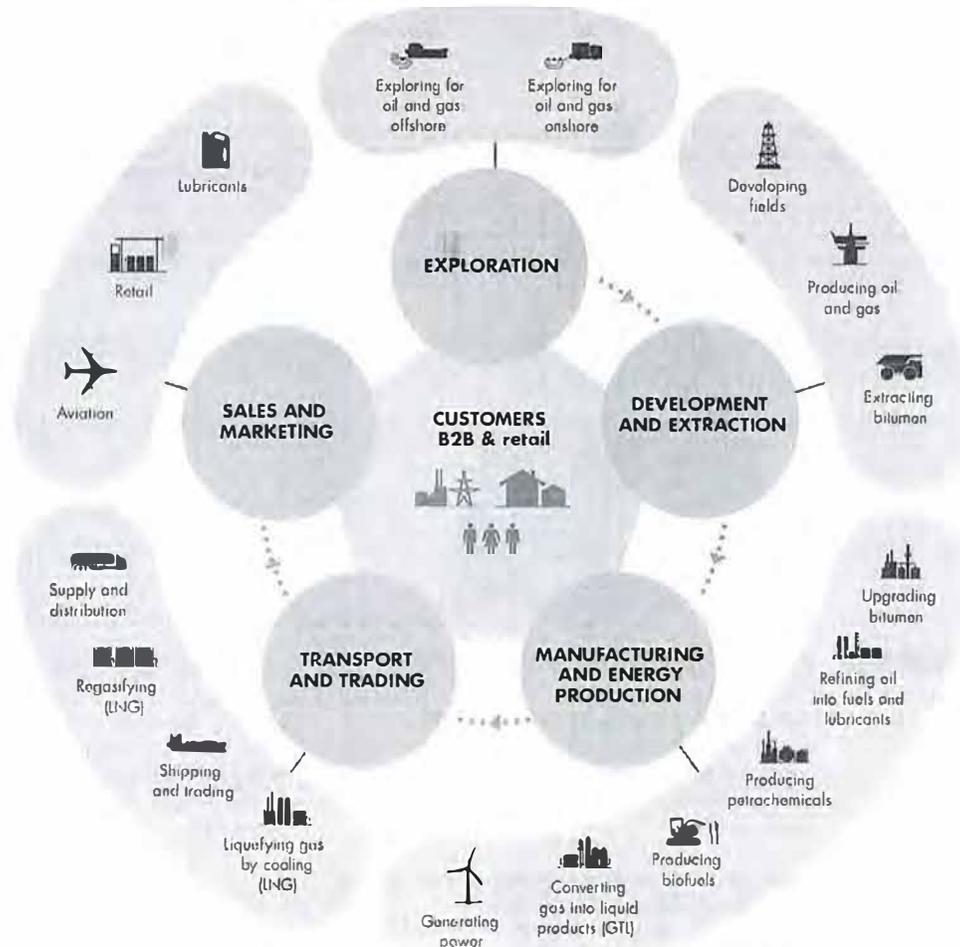
Shell's business is divided into three areas: Upstream, Integrated Gas and Downstream:

- **Upstream** is responsible for Shell's conventional oil and gas businesses around the world, including deep water as well as shale oil and gas. It explores for and recovers crude oil and natural gas, and develops major new projects.
- **Integrated Gas** manages Shell's manufacturing and distribution of liquefied natural gas (LNG) and gas-to-liquids products. It includes natural gas exploration and extraction and the operation of the upstream and midstream infrastructure necessary to deliver gas to market. It also includes the New Energies business, created in 2016, which invests in low-carbon energy solutions such as biofuels, hydrogen, wind and solar power.
- **Downstream** manages Shell's refining and marketing activities for oil products which are sold around the world for domestic, industrial and transport use. It also produces and sells chemicals for industrial customers. Shell's oil sands mining activities in Canada are also part of the Downstream business.

## STRATEGIC THEMES

As part of its refreshed strategy, Shell manages its portfolio around three time horizons: cash engines for today, growth priorities for the medium term and future opportunities for the longer term:

- **Cash engines:** conventional oil and gas, integrated gas and oil products are the activities that we expect to provide strong returns and free cash flow. They will fund distributions to shareholders and reduce debt, as well as investments in our growth priorities and future opportunities. In March 2017, Shell announced our agreement to sell the majority of our interests in oil sands in Canada. As a result, oil sands mining no longer features as a strategic theme.
- **Growth priorities:** deep-water oil and gas and chemicals are Shell's growth priorities. They are our future cash engines, with expected improved returns and cash flow from around 2020. We are developing deep-water fields in Brazil and the Gulf of Mexico, and chemicals projects in the USA and China; and
- **Future opportunities:** We see shale oil and gas and our New Energies business as future opportunities. Our current shale portfolio is centred on the USA, Canada and Argentina. In the New Energies business, we are building our portfolio around our existing activities in low-carbon biofuels and hydrogen, and exploring investments in solar and wind energy. Future opportunities should provide us with material growth in free cash flow in the next decade or beyond.



## HOW SUSTAINABILITY WORKS AT SHELL

Sustainability at Shell means providing energy in a responsible manner, respecting people, their safety and the environment.

Our approach to sustainability starts with our goal to run a safe, efficient, responsible and profitable business. We work to share wider benefits where we operate. Shell's core values of honesty, integrity and respect for people – first laid out in the Shell General Business Principles 40 years ago – underpin everything we do. A commitment to contribute to sustainable development was added in 1997. These principles apply to the way we do business and to our conduct with the communities where we operate.

### INTEGRATING SUSTAINABILITY

When we invest in energy projects, we seek to balance the short- and long-term interests of our business. For investment decisions, we consider the economic, social and environmental risks and opportunities as well as the political and technical risks. Our commitment to safety, the environment and communities plays a crucial role in how we plan, design and operate projects and facilities.

Our approach to sustainability is integrated across our business activities on three levels.

### RUNNING A SAFE, EFFICIENT, RESPONSIBLE AND PROFITABLE BUSINESS

Safeguarding and respecting people – our employees, contractors and neighbours – is fundamental to how we do business. This includes having global standards, processes and tools in place to manage safety, the environment and

how we engage with communities. We aim to continuously improve the way we operate to prevent incidents and to identify, avoid where possible and minimise adverse environmental and social impacts.

### SHARING WIDER BENEFITS WHERE WE OPERATE

We plan our business for the long term, which means we can be part of a community for decades. We help to develop local economies by creating jobs, sourcing from local suppliers, and paying taxes and royalties. We support community projects that are based on the needs of the local communities.

### HELPING TO SHAPE A MORE SUSTAINABLE ENERGY FUTURE

In the coming decades, more and cleaner energy will be needed for economic development in the face of growing environmental pressures. We are investing in low-carbon energy solutions and advanced technologies, such as those that increase energy efficiency and reduce emissions. We continue to contribute to the public dialogue on energy and climate policy. Yet the scale of the global challenges that the world faces are too great for one company, or one sector, to resolve. We advocate that businesses, governments and civil society work together to shape a more sustainable energy future.



## REPORTING AGAINST ASPIRATIONS

This table represents a selection of global metrics that we track within Shell. These metrics have been selected because they reflect the direct impact of our operations on people and the environment. We used them to set our goals and measure progress in 2016 and to define priorities for 2017.

We review the metrics we use regularly to ensure that we capture the information needed to improve our performance. For example, Shell introduced Goal Zero for

personal safety in 2007. Since then, we have broadened the goal to aim for no harm to people and the environment. More information on our performance, definitions of the indicators and the referenced goals are provided in the Environmental data and Social and safety data sections.

## Goals and performance for 2016 and priorities in 2017

|                         | 2016 Goal   | Progress in 2016  | Priorities in 2017  |      |      |      |      |      |           |      |      |      |      |      |   |
|-------------------------|---|---|---|------|------|------|------|------|-----------|------|------|------|------|------|---|
| <b>PERSONAL SAFETY</b>  | <p>Achieve total recordable case frequency (TRCF) – the number of injuries per million working hours – below 0.96 for employees and contractors.</p> <p>Goal Zero has been our ambition for personal safety since 2007</p> <p>In 2016, TRCF slightly increased compared to 2015. [See Safety performance].</p>  | <p>Total recordable case frequency (TRCF)</p> <table border="1"> <tr><th>Year</th><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><th>TRCF</th><td>1.26</td><td>1.15</td><td>0.99</td><td>0.94</td><td>1.00</td></tr> </table>   | Year  | 2012 | 2013 | 2014 | 2015 | 2016 | TRCF      | 1.26 | 1.15 | 0.99 | 0.94 | 1.00 | <ul style="list-style-type: none"> <li>For road safety, continue to replicate proven practices from existing programmes across all lines of business.</li> <li>Support application of common industry safety standards.</li> <li>Continue to leverage insights from assurance and investigations of incidents with potential to cause harm.</li> </ul>      |
| Year                    | 2012  | 2013  | 2014  | 2015 | 2016 |      |      |      |           |      |      |      |      |      |   |
| TRCF                    | 1.26  | 1.15  | 0.99  | 0.94 | 1.00 |      |      |      |           |      |      |      |      |      |   |
| <b>PROCESS SAFETY</b>   | <p>Achieve a number of operational leaks below 54 (classified as “operational Tier 1 process safety events”).</p> <p>Since 2011, we have extended our ambition of Goal Zero to process safety.</p> <p>In 2016, the number of process safety events has decreased again for both categories – Tier 1 and Tier 2 – to our lowest reported total. (See Safety).</p>  | <p>Number of operational process safety Tier 1 events</p> <table border="1"> <tr><th>Year</th><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><th>Events</th><td>91</td><td>65</td><td>57</td><td>51</td><td>39</td></tr> </table>   | Year  | 2012 | 2013 | 2014 | 2015 | 2016 | Events    | 91   | 65   | 57   | 51   | 39   | <ul style="list-style-type: none"> <li>Keep a strong focus on asset integrity and operational task execution.</li> <li>Improve learning from process safety events with high potential impact.</li> </ul>   |
| Year                    | 2012  | 2013  | 2014  | 2015 | 2016 |      |      |      |           |      |      |      |      |      |   |
| Events                  | 91  | 65  | 57  | 51   | 39   |      |      |      |           |      |      |      |      |      |   |
| <b>ENVIRONMENT</b>      | <p>Achieve operational spills below a volume of 0.7 ('000 tonnes) (classified as “hydrocarbons reaching soil or water”).</p> <p>Goal Zero also extends to the environment with our goal of no operational spills.</p> <p>The volume of operational spills decreased slightly. We continued to reduce the number of operational spills significantly in 2016 (72) compared to 2015 (108). (See Operational Spills).</p>  | <p>Volume of operational spills in '000 tonnes</p> <table border="1"> <tr><th>Year</th><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><th>Spills</th><td>2.1</td><td>0.9</td><td>0.7</td><td>0.8</td><td>0.7</td></tr> </table>   | Year  | 2012 | 2013 | 2014 | 2015 | 2016 | Spills    | 2.1  | 0.9  | 0.7  | 0.8  | 0.7  | <ul style="list-style-type: none"> <li>Keep focus on improving the reliability of our facilities to reduce the number and volume of operational spills.</li> <li>Continue to work with the oil and gas industry to further develop effective oil-spill emergency response capabilities.</li> </ul>  |
| Year                    | 2012  | 2013  | 2014  | 2015 | 2016 |      |      |      |           |      |      |      |      |      |   |
| Spills                  | 2.1   | 0.9   | 0.7   | 0.8  | 0.7  |      |      |      |           |      |      |      |      |      |   |
| <b>GHG &amp; ENERGY</b> | <p>Reduce flaring in our upstream business (million tonnes CO<sub>2</sub> equivalent).</p> <p>Our policy is to reduce any continuous flaring or venting to as low a level as reasonably practical.</p> <p>We are a signatory of the World Bank’s “Zero Routine Flaring 2030” initiative.</p> <p>With measures implemented in 2016, we reduced routine flaring at our facilities significantly, even though we increased production and number of facilities. (See Flaring).</p> | <p>Flaring in million tonnes CO<sub>2</sub> equivalent</p> <table border="1"> <tr><th>Year</th><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><th>Flaring</th><td>7.7</td><td>7.4</td><td>13.0</td><td>11.8</td><td>7.6</td></tr> </table>  | Year  | 2012 | 2013 | 2014 | 2015 | 2016 | Flaring   | 7.7  | 7.4  | 13.0 | 11.8 | 7.6  | <ul style="list-style-type: none"> <li>Link all Shell staff performance bonuses to the management of greenhouse gas emissions, including the reduction of flaring.</li> <li>Work with the World Bank and focus on finding solutions to host-government funding for flaring projects.</li> </ul>   |
| Year                    | 2012  | 2013  | 2014  | 2015 | 2016 |      |      |      |           |      |      |      |      |      |   |
| Flaring                 | 7.7   | 7.4   | 13.0  | 11.8 | 7.6  |      |      |      |           |      |      |      |      |      |   |
| <b>GHG &amp; ENERGY</b> | <p>Achieve a refinery energy intensity below 92.2 (based on the Refineries Energy Index).</p> <p>We aim to achieve top level energy efficiency performance in our refineries.</p> <p>Improve energy efficiency to reduce our greenhouse gas emissions.</p> <p>The energy intensity of our refineries remained at similar levels to 2015. This was due to operational issues and improvement initiatives not fully delivering against plans. (See Energy efficiency).</p>        | <p>Refinery energy intensity as Refineries Energy Index</p> <table border="1"> <tr><th>Year</th><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><th>Intensity</th><td>98.4</td><td>95.6</td><td>94.9</td><td>95.4</td><td>95.4</td></tr> </table>  | Year  | 2012 | 2013 | 2014 | 2015 | 2016 | Intensity | 98.4 | 95.6 | 94.9 | 95.4 | 95.4 | <ul style="list-style-type: none"> <li>Link all Shell staff performance bonuses to the management of greenhouse gas emissions, including the reduction of refining GHG intensity.</li> <li>Continue to focus on maintenance measures that enhance the reliability of our equipment.</li> <li>Ensure sharing of tools and practices across Shell.</li> </ul> |
| Year                    | 2012  | 2013  | 2014  | 2015 | 2016 |      |      |      |           |      |      |      |      |      |   |
| Intensity               | 98.4  | 95.6  | 94.9  | 95.4 | 95.4 |      |      |      |           |      |      |      |      |      |   |
| <b>SOCIAL</b>           | <p><b>Effective community feedback</b></p> <p>Our community feedback mechanism (CFM) has been used to address community concerns since 2012. We continue to progress the implementation of our standard online community feedback tool which helps to strengthen tracking and reporting of concerns.</p>  | <p>We implemented our online community feedback tool across almost all our upstream operations.</p> <p>At the refineries in our Downstream business, we introduced the full range of community feedback categories. As a result, we are now able to evaluate data in the categories beyond environmental complaints, including, for example, stakeholder engagement, property issues and local benefit sharing. (See Social performance).</p> | <ul style="list-style-type: none"> <li>Implementation of our online community feedback tool across all major operational sites and projects under development in different lines of business: Upstream, Downstream and Integrated Gas and New Energies.</li> <li>Perform a pilot project to assess the effectiveness of our CFM against the UN Guiding Principles on Business and Human Rights effectiveness criteria.</li> </ul> |      |      |      |      |      |           |      |      |      |      |      |   |

## OUR EXECUTIVE SCORECARD

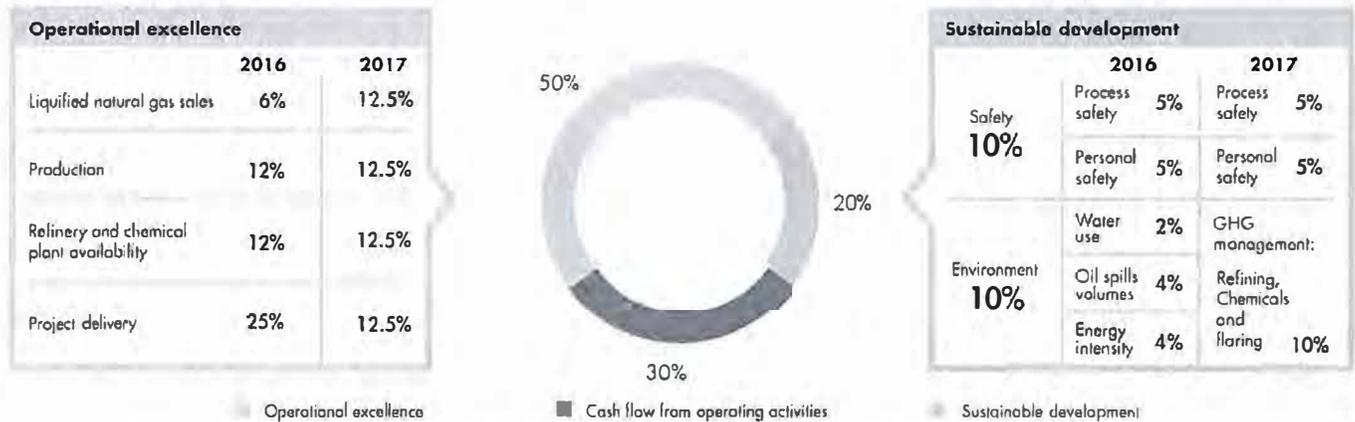
In 2016, sustainable development continued to account for 20% of the company scorecard, which helps determine the annual bonus levels for all our employees, including members of the Shell Executive Committee.

The Executive Committee's sustainable development measures were split evenly between Shell's safety and environmental performance in 2016. Our environmental measures covered operational spill volume, energy efficiency and use of fresh water. The safety measures cover, with an equal weighting, process safety events, such as leaks or spills of hazardous material, and personal safety. These measures reflect Shell's Goal Zero ambition of no harm and no leaks.

Targets covering all employees are set each year by the Board's Remuneration Committee to incentivise continuous and sustained improvement.

Sustainable development will continue to account for 20% of the 2017 annual bonus scorecard. The safety component will still cover process safety events and personal safety, but based on recommendations from the Corporate and Social Responsibility Committee, the Remuneration Committee has focused the environmental component on greenhouse gas (GHG) emissions in three specific business areas: refining, chemical plants and flaring in upstream assets. This goes beyond carbon dioxide to include other GHGs such as methane.

### Scorecard Structure



## THE SUSTAINABLE DEVELOPMENT GOALS

In 2016, the United Nations adopted 17 sustainable development goals. These goals build on the preceding Millennium Development Goals and seek to tackle the world's economic, social and environmental issues by 2030.

Achieving the sustainable development goals (SDGs) will require action by governments, non-governmental organisations and the private sector. Companies can contribute to the achievement of the SDGs by reducing the negative impact of their operations and seeking to contribute positively to the environments and communities in which they work.

### SHELL AND THE SDGS

The goals highlighted below are most closely related to the topics that were identified as most relevant or prominent for Shell in 2016, which are covered in this report. See how we selected the topics for the Sustainability Report 2016.

#### GOAL 6: CLEAN WATER AND SANITATION

We work to protect and preserve water and manage its use in a responsible and sustainable way. We invest in new technologies to use this valuable resource more efficiently. Fresh water is an important part of our environmental standards. (See Natural gas, Oil sands, Environment).

**GOAL 7: ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY**  
Shell's purpose is to provide more and cleaner energy solutions. We do this by investing in the production and distribution of oil and natural gas, as well as in lower-carbon technology and sources of energy. We also invest in local projects to help communities gain access to energy. In the Philippines, for example, we are using hydro and solar power to provide energy to an off-grid community. (See Towards a low-carbon future, Social performance).

#### GOAL 8: DECENT WORK AND ECONOMIC GROWTH

Our activities create jobs, use local suppliers and support local businesses. We contribute to economic growth by paying taxes and royalties to local governments. Our projects create demand for a range of goods and services, such as construction. We assess those we work with to ensure they adhere to principles supporting the eradication of forced labour and modern slavery and the protection of labour rights. We have social investment projects to help create opportunities for individuals. Shell LiveWIRE, for example, helps young people start their own businesses. These local programmes operate in 15 countries including Oman, Brazil, Nigeria, Indonesia, Saudi Arabia and Pakistan. (See Living by our principles, Contractors and suppliers).

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## GOAL 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE

We work with governments, academics and industry specialists, and partner with companies and organisations to help meet the world's growing energy needs. We share ideas and expertise with partners inside and beyond the energy sector to help encourage innovation. We have programmes in various countries to support small- and medium-sized businesses. (See Our business partners).

## GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES

The Shell Scenarios team has partnered with local authorities in three emerging Asian cities to help them explore new approaches to urban development and to help make these cities more resilient.

## GOAL 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

We have codes, policies and assurance processes to help define how we can protect the environment, respect our neighbours and cause no harm to people. We have voluntarily reported on our environmental and social performance since 1997. Energy efficiency is carefully considered in the life cycle of our fuels and lubricants, from managing energy consumption in their production to providing customer advice on optimum fuel efficiency. (See Environment)

## GOAL 13: CLIMATE ACTION

We continue to work to manage greenhouse gas emissions from our operations and have signed up to the World Bank's "Zero Routine Flaring by 2030" initiative. Our major projects have energy management plans and we monitor and manage our emissions using, for example, methane emissions detection technology. We work with governments, other companies and international organisations to help advance the transition to a low-carbon future. In 2016, in its first operating year, our Quest carbon capture and storage project in Alberta, Canada, captured and safely stored more than 1 million tonnes of carbon dioxide. (See Our greenhouse gas emissions, Managing methane emissions, Carbon capture and storage).

## GOAL 14: LIFE BELOW WATER

Shell is working with governments, nongovernmental organisations and other experts to find ways to protect marine biodiversity. We aim to avoid impacts on biodiversity when developing new projects. We carry out impact assessments to minimise the extent to which local biodiversity and communities might be affected by operations. Shell is also involved in research programmes to help increase understanding of marine mammals. One example is our collaboration with the International Union for Conservation of Nature off the east coast of Russia. (See Environment, Environmental partners).

## GOAL 15: LIFE ON LAND

We aim to minimise the impact our operations may have on natural environments and on people near our projects. This includes any impacts on local communities' health, safety and access to fresh water, food or income. Our standards help reduce any impact our operations may have in areas that are rich in biodiversity or under environmental protection. We work with conservation organisations to restore natural habitats and ecosystems close to our operations. We also support rigorous sustainability standards to help ensure that our biofuels come from sustainable sources.

## GOAL 16: PEACE, JUSTICE AND STRONG INSTITUTIONS

Our core values of honesty, integrity and respect for people underpin how we work. We promote inclusion, fairness and sustainability through our corporate governance structure, which is designed to support the responsibilities and commitments set out in the Shell General Business Principles. Through Shell's own activities, including support for employee networks, and by collaborating with communities, we work to strengthen mechanisms that uphold human rights, the rule of law, accountability and transparency.

## GOAL 17: PARTNERSHIPS FOR THE GOALS

We collaborate and work in partnership in many areas, for example, to deliver more and cleaner energy and to help us reduce our environmental impact. We share our knowledge, experience and understanding of the energy system with policymakers. (See Environmental partners, Social partners).

### The sustainable development goals



## SUSTAINABILITY GOVERNANCE

Shell has strong governance structures, supported by standards, policies and controls. These are the foundations of our decisions and actions at every level of the company.

We have put clear and effective governance structures in place throughout Shell, along with many performance standards and other controls. These influence the decisions we make and the actions we take, at every level of our company.

Our governance procedures involve the Board of Royal Dutch Shell plc, four Board Committees, our Executive Committee (EC), and the teams and individuals who work in our operations. We take rigorous care to ensure decisions are cascaded within the business.

The overall accountability for sustainability within Shell lies with the Chief Executive Officer and the EC. They are assisted by the health, safety, security, environment and social performance (HSSE&SP) executive team. Our standards are set out in our HSSE&SP Control Framework and apply to every Shell company. The process safety and HSSE&SP assurance team, with a mandate from the Corporate and Social Responsibility Committee (CSRC), provides independent assurance on compliance with the Control Framework.

### CORPORATE AND SOCIAL RESPONSIBILITY COMMITTEE

One of the four Board Committees is our CSRC. It reviews and advises on our sustainability policies and practices to ensure that these are discussed, understood, owned and promoted at Board level. This can include advising on areas as broad as climate change and human rights through to process safety management.

The CSRC also visits different Shell operations each year to speak with Shell employees, contractors and suppliers, as well as with community members and external stakeholders. After each visit, the CSRC shares its

observations with the Board and with the management responsible for that project. The Committee's work strengthens sustainability within our operations around the world.

### THE CSRC TODAY

The CSRC's role is to review and advise Shell about our policies and performance against the Shell General Business Principles, our Code of Conduct and our mandatory HSSE&SP standards.

The CSRC meets regularly throughout the year. It reviews and discusses a wide range of sustainability-related topics and assesses our sustainability performance, audit results and the sustainable development metrics that apply to the Executive Committee. It also monitors major issues of public concern that may be relevant to Shell.

### CSRC MEMBERS

The CSRC had three members in 2016. Each was a non-executive director:

- in 2016, the Chairman of the CSRC was Hans Wijers, former Chief Executive and Chairman of Akzo Nobel (Chairman of the Committee with effect from May 20, 2015);
- Sir Nigel Sheinwald, a former British diplomat; and
- Patricia A. Woertz, a business leader with extensive oil industry experience.

In 2016, the CSRC visited the Karachaganak facilities in Kazakhstan, jointly operated by Shell (Shell interest 29.25%). During the visit, the CSRC engaged with local stakeholders including employees and government representatives. The CSRC also dedicated a session in 2016 to Nigeria and individual CSRC members visited the Moerdijk chemical plant and one of the Nederlandse Aardolie Maatschappij (NAM) gas fields in the Netherlands.



In 2016, the Corporate and Social Responsibility Committee visited the Karachaganak facilities in Kazakhstan.

# ENERGY TRANSITION

A transition is underway to a global lower-carbon energy system. Managing this transition is complex: all types of energy will be required to meet the needs of a growing population with rising living standards, yet that energy needs to be less carbon-intensive.



**50%**

Share of our production that was natural gas in 2016



**70 MILLION TONNES**

Direct GHG emissions from facilities we operate on a CO<sub>2</sub> equivalent basis in 2016



**1 MILLION TONNES**

Amount of CO<sub>2</sub> captured by Quest

## TOWARDS A LOW-CARBON FUTURE

The energy transition will require providing much more energy to meet rising global demand, while at the same time significantly reducing carbon dioxide emissions.

Energy is essential to the global economy. From fuels to fertilisers, and manufacturing to transportation, energy enables the lifestyles that many enjoy today. Access to reliable energy can transform lives and enables economic growth.

However, around 20% of the global population lives in OECD countries but uses 40% of the world's energy. Billions of people still lack access to energy that many take for granted: modern, affordable energy for heating, lighting, cooking, refrigeration and sanitation.

The world's primary energy demand, driven by a growing population and rising living standards, is expected to rise by 30% between 2015 and 2040, according to the main scenario in the International Energy Agency's World Energy Outlook 2016. At the same time, there is a critical need to address environmental stresses, from local air pollution to climate change.

Today, oil and gas make up around half the world's primary energy mix, and coal provides around 30%. The rest comes from sources such as hydropower, biofuels, solar, wind and nuclear. More energy from this current energy mix means more greenhouse gas emissions, which in turn leads to climate change.

The transition to a low-carbon future will unfold at different paces in different places, and across all sectors of economic activity – creating new risks and opportunities. New technologies, business models and partnerships, supported by policy and regulatory frameworks, will be needed.

Shell will play its role in a way that is commercially competitive as well as environmentally and socially responsible, in oil and gas, as well as in low-carbon and renewable energy sources. Our success depends on our ability to anticipate the types of energy that people will need.



Most of the world's energy consumption comes from coal, oil and gas sources, but only around a fifth of energy consumption is electricity.

### TRANSFORMING THE GLOBAL ECONOMY

The Shell Scenarios publication, *A Better Life with a Healthy Planet. Pathways to Net-Zero Emissions*, sets out a plausible route for the world to achieve, during this century, economic development for most people coupled with net-zero greenhouse gas emissions from energy. In a net-zero world, emissions in some sectors are offset by efforts to remove carbon dioxide (CO<sub>2</sub>) from the atmosphere, including reforestation and large-scale industrial facilities built to capture and store CO<sub>2</sub>.

Making this transition will take significant efforts to boost energy efficiency. A transformation of the global economy is also required, especially in the power, transport, buildings and industry sectors, where a significant proportion of energy-related emissions of CO<sub>2</sub> occurs.

The power sector, for example, must evolve into a combination of more renewable sources of energy, nuclear, and natural gas – the cleanest-burning hydrocarbon – with carbon capture and storage (CCS) technology. In the transport sector, passenger road travel increasingly needs to be electrified or to rely on hydrogen. For the foreseeable future, longer-distance freight shipping and aviation will continue to rely on energy-dense liquid fuels, including oil, biofuels and liquefied natural gas.

### Towards a low-carbon future

Shell is working to meet the energy challenge in many different ways:



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## LOOKING BEYOND ELECTRICITY

Increasing use of renewable sources of energy is essential for a transition to a low-carbon future. However, renewables are mainly used to produce electricity, which today only meets 18% of global energy demand. For renewables to have a bigger impact, electricity has to play a large part in other key sectors of the economy.

The switch to using electricity powered by low-carbon or renewable sources will be easier for some sectors, such as the manufacture of clothes and food, which require relatively low temperatures.

Other sectors, such as industries that produce iron, steel, cement, plastics and chemicals, rely on hydrocarbons to provide extremely high temperatures, chemical reactions or dense energy storage. Many of these cannot be electrified at all, or only at a high cost. In the transport sector, oil currently supports more than 90% of demand. In the coming decades, passenger road travel will increasingly need to be electrified, powered by batteries or hydrogen.

Petrochemicals, the building blocks of products people use every day, such as solvents, detergents and plastics, will also continue to play a vital role in meeting the demands

of a growing population and in some cases can improve energy efficiency. Replacing metal car parts with lighter plastics, for example, helps lower fuel consumption and therefore reduces emissions.

## SECURING A SMOOTH TRANSITION

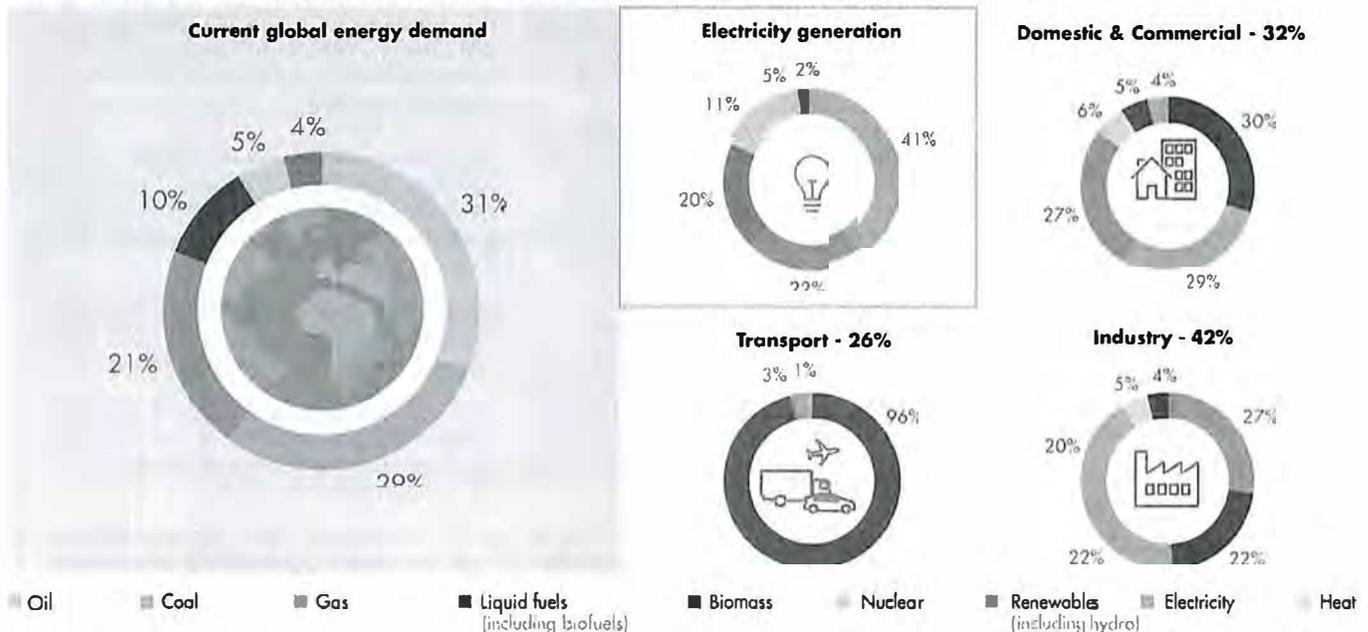
The transformation to a low-carbon energy system requires urgent action. It will take realism, investment, innovation and collaboration between policymakers, business executives, non-governmental organisations and energy consumers.

Government-led carbon pricing mechanisms are one essential policy tool that can drive efficiencies and provide an incentive for lower-carbon choices by businesses and consumers.

Other policies should focus on city and transport planning to improve energy efficiency; accelerating the switch from coal to gas to reduce power-sector emissions; sustaining the rapid growth of renewables; and establishing the widespread use of CCS, which can significantly reduce emissions from industrial sectors by safely storing CO<sub>2</sub> deep underground.

## Today's energy needs

The world today currently consumes most of its energy from coal, oil and gas sources. Around a fifth of total energy consumption is electricity. Energy sources differ across the sectors of industry, transport, and domestic use which all need to transition to low-carbon energy options.



Source: International Energy Agency, Key world energy statistics 2015 and World energy outlook 2015

## Energy challenge

There is more demand for energy globally as the world's population and living standards increase.



A successful energy transition requires substantial investment across all energy sources, including oil and gas production, to meet growing demand for energy.



### Growing population

Global population will increase from around 7.4 billion today to nearly 10 billion by 2050, with 67% living in cities.



### Rising demand

Global energy demand will likely be almost 60% higher in 2060 than today, with 2 billion vehicles on the road (800 million today).



### Ongoing supply

Renewable energy could triple by 2050, but we will still need large amounts of oil and gas to provide the full range of energy products we need.



### Mitigating climate change

Net-zero emissions is a potentially achievable societal ambition.

Source: UN Population Fund, UN World Population Prospect (2015 revision), World Urbanization Prospects (2014 revision), International Energy Agency, Energy Technology Perspectives 2015, Shell New Lent Seminar

## OUR WORK TO ADDRESS CLIMATE CHANGE

There are clear, practical steps that could help tackle climate change while continuing to provide energy to meet the world's present and future needs.

We welcomed the United Nations Paris Agreement on climate change and its entering into force on November 4, 2016. The agreement seeks to limit global warming to well below 2 °C by managing climate and environmental pressures while ensuring economic development.

It highlights the urgent need for policies that can help build a low-carbon future. In particular, Article 6 of the Paris Agreement introduces the necessary foundation to support the development of a global carbon emissions market. However, as noted by the International Energy Agency (IEA), implementing the current Nationally Determined Contributions (NDCs) will not limit global warming to well below 2 °C.

Shell is looking at cost-effective ways to manage greenhouse gas (GHG) emissions and the commercial opportunities these solutions will bring. Our four main contributions to reducing global GHG emissions are: supplying more natural gas to replace coal for power generation; progressing carbon capture and storage (CCS) technologies; developing alternative energies; and implementing energy-efficiency measures in our operations. To support this, we continue to advocate the introduction of effective government-led carbon pricing mechanisms.

We work with governments and industry representatives to help society transition to a low-carbon energy future. We have invested in cleaner-burning natural gas and low-carbon biofuels and are also working on new fuels for transport. Shell shapes its portfolio and strategy to take into account the shift to lower-carbon energy, ensuring our company's resilience for the future.

### A GREATER ROLE FOR NATURAL GAS

Natural gas, the cleanest-burning hydrocarbon, produces around half the carbon dioxide (CO<sub>2</sub>) and just one-tenth of the air pollutants compared to coal when used for power generation. We convert natural gas into products, such as liquid fuels, hydraulic fluids and lubricants, and are always working to make them as efficient and reliable as possible. Natural gas can also act as a partner for intermittent renewable energy, such as solar and wind, to maintain a steady supply of electricity, because gas-fired plants can start and stop relatively quickly. The IEA estimates that global demand for gas will grow by 1.5% every year in the period to 2040.

Shell is one of the world's leading suppliers of natural gas and liquefied natural gas (LNG), through our operated and non-operated joint ventures, and is safely tapping into resources of natural gas known as shale gas.

### GOVERNMENT-LED CARBON PRICING MECHANISMS

Shell has long called for governments to create carbon-pricing mechanisms that place a meaningful cost on CO<sub>2</sub> emissions.

These mechanisms offer an effective way to stimulate the development of low-carbon technologies, generate revenue for governments and, ultimately, give consumers new energy choices. They could encourage the deployment of renewable energy and CCS.

### CARBON CAPTURE AND STORAGE

According to the IEA, CCS remains the only technology capable of delivering significant reductions in emissions from the use of hydrocarbons.

CCS will be essential for meeting the goal of limiting global warming to well below 2°C. According to the IEA, reaching this goal will require 6,000 million tonnes of CO<sub>2</sub> to be stored by 2050, equivalent to about 100 times the global CCS capacity expected by the end of 2017. The IEA also estimates that without CCS, the transformation to a low-carbon power sector will cost at least \$3.5 trillion more.

Shell is playing a leading role in the demonstration of CCS technology at the Quest CCS project in Canada. We are working on CCS research programmes with partners around the world, and sharing knowledge with working groups and coalitions.

### LOW-CARBON ENERGY AND BIOFUELS

Low-carbon biofuels are one of the most viable ways to reduce CO<sub>2</sub> from transport fuels in the coming years.

Our Raízen joint venture (Shell interest 50%) in Brazil produces low-carbon biofuel from sugar cane. We are also investing in research to help develop and commercialise advanced biofuels.

In 2016, we created a New Energies business to continue to explore investment opportunities in areas including biofuels, hydrogen and renewable energy. This business will also look for opportunities in energy solutions that combine wind and solar power with gas, for example, and new ways to connect customers to energy.

## PORTFOLIO RESILIENCE

We continually assess Shell's portfolio and strategy against a wide range of outlooks, taking into account the long timescales in our industry and the potential for shifts in the economic landscape. This is how we identify new business opportunities and possible divestments, and ensure the resilience of the company in the future. Our refreshed company strategy reflects our recognition that we are in an era of transition and volatility for the energy industry. The Energy Transitions and Portfolio Resilience report explains how Shell is investing in low-carbon energy, and creating a strategy to succeed through changing times. Shell Energy Transitions and Portfolio Resilience (PDF, 2.7 MB)

Shell has a rigorous approach to understanding, managing and mitigating climate risks in our facilities. We reflect future regulatory costs by typically applying a common \$40 per tonne project screening value (PSV) to the CO<sub>2</sub> emissions associated with investments. This means that new projects are assessed for the financial impact if a government imposed price or levy of \$40 per tonne for GHG emissions is implemented. For projects with a high exposure to government imposed carbon pricing or legislation, we apply several other forms of GHG management including GHG design standards and stress testing.

The screening value can affect our project design in several ways. Some projects may be stopped at an early stage if the GHG footprint is too high or a design may be altered to reduce GHG emissions at start-up. We also maintain energy management plans for all assets and projects to identify opportunities to reduce GHG emissions and consider the potential for CCS in the design of our new projects.

We also evaluate options to integrate readiness for CCS into the design of our new projects.



Singapore featured in Shell's New Lenses on Future Cities supplement, which looked at choices that may be needed to build sustainable cities in the future.

The 2017 Executive scorecard focuses on GHG emissions in three specific business areas: refining, chemical plants and flaring in upstream assets. This goes beyond carbon dioxide and specifically includes methane, which is also a GHG.

## ADAPTATION

The effects of climate change mean that governments, businesses and local communities are adopting their infrastructure to the changing environment. At Shell, we are taking steps at our facilities around the world to ensure that they are resilient to climate change. This reduces the vulnerability of our facilities and infrastructure to potential extreme variability in weather conditions.

We take different approaches to adaptation for existing facilities and new projects. We progressively adjust our design standards for new projects while, for existing assets, we identify those that are most vulnerable to climate change and take appropriate action.

## WORKING WITH COUNTRIES TO HELP SHAPE ENERGY TRANSITIONS

Shell is working with some countries as they shape their energy future. Each country has its own opportunities and challenges depending on factors such as wealth, population density, and level of industrialisation. Our discussions with governments include ways to improve energy efficiency, as well as ways to increase the use of natural gas and low-carbon fuels such as biofuels, wind, solar and hydrogen. We discuss how to develop compact city designs and public transit systems, and policy options including carbon pricing to help bring through technologies such as CCS.

In the Netherlands, for example, we are working with policymakers and industry representatives to help determine the shape and speed of the transition to a low-carbon energy future. The Netherlands has large wind resources, but also a large petrochemical and industrial sector, and has set itself a target of reducing GHG emissions by between 80% and 95% by 2050. Such ambitious targets will require significant shifts in

the way energy is produced and consumed across the economy.

In 2016, Dutch energy company Eneco, the Port of Rotterdam, German engineering group Siemens, Dutch contracting company Van Oord and Shell initiated a coalition to accelerate the energy transition in the Netherlands. At the National Climate Summit in Rotterdam in October 2016, the coalition called on the Dutch government to prioritise the international climate goals set during the climate summit in Paris and decide on a long-term policy framework to support them. By the end of the year, the coalition had more than 50 member companies.

The coalition believes accelerating the energy transition in the Netherlands will require the active involvement of individuals and companies, as well as long-term government policies on climate, energy and the economy.

## OUR GREENHOUSE GAS EMISSIONS

Shell tracks emissions released by our upstream and downstream facilities and works to reduce air pollution from our operations.

We report our greenhouse gas (GHG) emissions in line with the recommendations of the Intergovernmental Panel on Climate Change. Shell's Health, Safety, Security, Environment and Social Performance (HSSE&SP) Control Framework defines standards and accountabilities at each level of the organisation, and sets out the procedures people are required to follow. For example, our environmental standards include the requirement to set up GHG and energy management plans.

### OUR PERFORMANCE

The direct GHG emissions from facilities that we operate were 70 million tonnes on a CO<sub>2</sub>-equivalent basis in 2016, down from 72 million tonnes of CO<sub>2</sub> equivalent in 2015.

Our 2015 base year GHG emissions were recalculated from 72 million to 76 million tonnes CO<sub>2</sub> equivalent to reflect the impact of the former BG facilities and other structural changes. Therefore, on a like-to-like basis, the direct GHG emissions have decreased from 76 million tonnes in 2015 to 70 million in 2016.

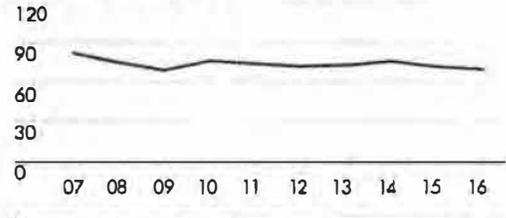
Our overall GHG emissions decreased for the following reasons:

- overall reduction in flaring;
- Quest carbon capture and storage project in Canada's oil sands safely injecting more than 1 million tonnes of CO<sub>2</sub> per year;
- divestments, for example in Nigeria and the UK; and
- operational improvements across many facilities;

These decreases were partially offset by the inclusion of emissions from former BG facilities in our inventory as of February 1, 2016.

In 2016, around 45% of our GHG emissions came from the refineries and chemical plants in our Downstream business. The production of oil, gas and gas-to-liquids products accounted for slightly more than 50% of our GHG emissions, and our shipping activities for less than 2%. We continue to work on improving operational performance and energy efficiency to manage GHG emissions.

### Direct greenhouse gas emissions million tonnes CO<sub>2</sub> equivalent

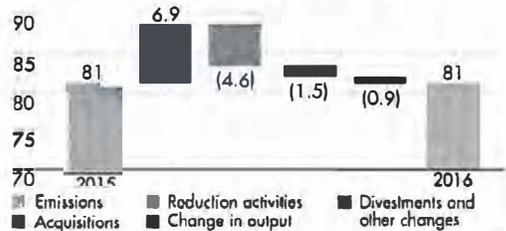


The indirect GHG emissions from the energy that we purchased (electricity, heat and steam) increased to 11 million tonnes on a CO<sub>2</sub>-equivalent basis in 2016, from 9 million tonnes in 2015, mainly due to the inclusion of former BG facilities in our portfolio. These emissions were calculated using a market-based approach, as defined by the World Resources Institute GHG Protocol.

We estimate that the CO<sub>2</sub> emissions from the use of our refinery and natural gas products by others were around 600 million tonnes in 2016, which represents less than 2% of the world's emissions.

(See more on [www.shell.com/ghg](http://www.shell.com/ghg))

### GHG movements from 2015 to 2016 [A] million tonnes CO<sub>2</sub> equivalent



[A] Direct and energy indirect greenhouse gas emissions. Numbers have been rounded so some totals may not agree exactly.

## FLARING

The flaring of natural gas wastes valuable resources and contributes to climate change. We are working hard to reduce flaring associated with oil and gas production.

When oil is extracted from a reservoir, gas is also produced as the oil is brought to the surface. This is known as associated gas. This gas can be captured and used alongside the oil. When there are no facilities to gather the gas, or they have insufficient capacity, it is sometimes flared, or burned. Flaring is also carried out for safety reasons to relieve pressure in the production system. Flaring wastes valuable energy resources and releases greenhouse gas into the atmosphere.

Shell's policy is to reduce any routine flaring or venting of associated gas at our operations to a level as low as technically and financially feasible. We also aim to minimise operational flaring required for safety reasons such as during the start-up of a new facility. Our flaring policy is set out in our Health, Safety, Security, Environment and Social Performance (HSSE&SP) Control Framework. It includes the requirement for all facilities to be designed to export, use or reinject associated gas that is produced, and all facilities have to meet strict performance criteria.

Shell has been an active member of the World Bank-sponsored "Global Gas Flaring Reduction" (GGFR) partnership since 2002. This public-private partnership helps reduce flaring by working collaboratively to find alternative uses for gas that would otherwise be flared. As part of the partnership, the World Bank has developed the "Zero Routine Flaring by 2030" initiative, which Shell signed up to in 2015. This encourages governments, companies and development organisations to work together to end the disposal of gas by flaring. The initiative aims to identify ways to use gas from oil production – for example, to generate electricity for local communities.

## OUR PERFORMANCE

More than 70% of flaring from Shell-operated fields in 2016 occurred in Iraq, Nigeria, Malaysia and Qatar. New facilities brought online in Malaysia and Iraq have helped reduce our flaring from 11.8 million tonnes of carbon (CO<sub>2</sub>) equivalent in 2015 to 7.6 million tonnes in 2016, including the additional fields added to our portfolio from the acquisition of BG in 2016. Work continues to bring additional gas gathering facilities online in Iraq and Nigeria to reach our goal of no routine flaring by 2030, while continuous improvement efforts will reduce operational flaring.

In Iraq, Shell Iraq Petroleum Development (Shell interest 45%) safely delivered the second phase of a gas-capturing system at our Majnoon facilities. The system captured about 65% of the gas that would otherwise be flared in 2016, which was around 90 million standard cubic feet per day. The delivery of this phase marks a significant milestone in our efforts to reduce gas flaring at Majnoon and deliver natural gas for power generation in Iraq.

Basrah Gas Company (BGC, Shell interest 44%) is a joint venture with Iraq's South Gas Company and Japan's Mitsubishi. It captures gas that would otherwise be flared from three non-Shell-operated oil fields in southern Iraq (Rumaila, West Qurna 1 and Zubair) for use in the domestic market. In 2016, BGC processed an average of 574 million standard cubic feet of gas each day from these fields. This is equivalent to the amount of energy needed to power more than 4.5 million homes.

These projects are helping to improve the electrical infrastructure of the country and deliver much-needed energy to the population. They required collaboration with the Iraqi government, joint-venture partners, domestic companies and non-governmental organisations.

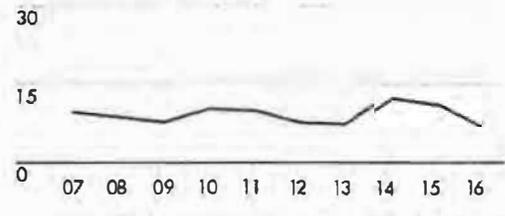
In Nigeria, flaring from Shell Petroleum Development Company's (SPDC) joint-venture facilities fell by more than 90% between 2002 and 2016. Flaring from SPDC facilities decreased further in 2016, mainly due to production outages as well as to operational improvements. Progress was also made on several gas-gathering projects. However, the planned start-up dates for two major gas-gathering projects continue to be delayed by security issues and a lack of adequate joint-venture funding from our government partner.

In Malaysia, the associated gas flaring reported in 2015 at the Gumusut (Shell interest 29%) and Kikeh fields has been eliminated by the introduction of a fully operational system in 2016 that injects gas back into the hydrocarbon reservoir. This will maximise production from the oil field.

In Qatar, at our Pearl gas-to-liquids plant (Shell interest 100%), flaring takes place for operational reasons. In 2016, further enhancements to the plant took place, to reuse more waste gas. (See Natural gas).

At Shell, we continue to develop solutions that eliminate flaring while, where possible, bringing gas to markets for domestic and international use.

**Flaring - Upstream**  
million tonnes CO<sub>2</sub> equivalent



## MANAGING METHANE EMISSIONS

We are working to detect and lower our methane emissions to reduce our impact on the environment.

Shell has a range of initiatives in place to reduce our methane emissions. These include programmes to detect and repair methane leaks in our operations. We also implement energy-efficiency measures, as well as flaring and venting reduction programmes.

Efforts to further reduce our emissions will continue to be a focus over the coming years.

### METHANE FROM OIL AND GAS PRODUCTION

Methane is a more potent greenhouse gas (GHG) than carbon dioxide (CO<sub>2</sub>); it has 34 times the global warming potential of CO<sub>2</sub> over a 100-year time frame, according to the Intergovernmental Panel on Climate Change AR5

report. Reductions in methane emissions today will help to slow the short-term rate of global temperature rise, as methane remains in the atmosphere for a much shorter time than CO<sub>2</sub>.

Methane emissions associated with oil and natural gas production tend to occur in four main areas: combustion (emissions of unburnt methane from fuel combustion); flaring (where the flaring itself fails to burn all the methane); venting (for example, from tanks and equipment); and unintended emissions (for example, small leaks sometimes called fugitive emissions).

## Managing Methane Emissions Continued

Natural gas emits less CO<sub>2</sub>-equivalent than coal when burnt at a power plant, but methane leakage in the natural gas system could reduce this benefit. The US Environmental Protection Agency (EPA) estimates that total methane emissions in the natural gas supply chain – as a percentage of the global total volume of natural gas produced – were around 1.3% in 2014. This takes into account methane leaks during gas processing and transmission through pipelines for power generation.

At this leak rate, the average life cycle GHG emissions from US natural gas power plants is around half of those from US coal power plants. Shell continues to work to manage and reduce our methane emissions so that the emissions from gas remain lower than coal. Liquefied natural gas emits around 40% less GHG emissions than coal when burnt to generate electricity.

### COLLABORATING ON EMISSIONS REDUCTION

Shell works with others to manage methane emissions. We have participated in several initiatives, such as the EPA Natural Gas STAR programme, for many years. This programme encourages oil and gas companies to adopt technologies and practices that reduce methane emissions. In early 2017, we joined the Climate and Clean Air Coalition Oil & Gas Methane Partnership, which brings together industry, governments and non-governmental organisations to improve our understanding of methane emissions and work to reduce them.

We are also collaborating on research to better understand methane emissions. This includes studies by Euragas, the association representing the European gas industry, and the Natural and bio Gas Vehicle Association, on methane emissions in the gas supply chain in Europe.

As a member of the Oil and Gas Climate Initiative (OGCI), we are working with experts to improve methane data collection and our understanding of the natural gas life cycle.

Shell is working with governments, the oil and gas sector and regulators, to help find a way to effectively manage methane emissions. We advocate government policies that will support the reduction of methane emissions across all sectors of the economy.

In our onshore unconventional operations, we regularly use leak detection and repair (LDAR) programmes, which have infrared cameras to identify and repair fugitive leaks. We use LDAR in countries including the USA, Canada, the Netherlands and Tunisia. We continue to extend the implementation of LDAR across our operations.

We are actively testing new technologies for the detection and measurement of methane emissions, such as optical gas imaging through our membership of OGCI Climate Investments. This partnership, that launched in 2016, will invest \$1 billion over 10 years in low-carbon technologies.

### OUR PERFORMANCE

In 2016, methane emissions contributed less than 5% of Shell's GHG emissions on a CO<sub>2</sub>-equivalent basis. More than 60% of our reported methane emissions in 2016 came from flaring and venting in our upstream operations.

We report our methane emissions from these sources according to regulations and industry standards. We also engage in industry-wide work on more accurate reporting methods, such as through IPIECA, the global oil and gas industry association for environmental and social issues.

## CARBON CAPTURE AND STORAGE

Carbon capture and storage is the name given to a combination of technologies that captures and stores carbon dioxide deep underground, preventing its release into the atmosphere.

The world will need carbon capture and storage (CCS) to achieve the ambition of net-zero greenhouse gas emissions. CCS technology can be used to capture carbon dioxide (CO<sub>2</sub>) from a range of industries including steel, chemicals and power.

There are 21 large-scale CCS projects in operation or under construction globally, with a combined capacity to capture around 40 million tonnes of CO<sub>2</sub> each year. All projects presently in construction (five as of January 2017) are expected to be operational by the end of 2017.

Shell is sharing the knowledge and experience gained in CCS through various working groups. The Oil and Gas Climate Initiative's (OGCI) Climate Investments partnership

– comprising 10 major oil and gas companies, including Shell – has made CCS one of its priority areas. It plans to invest in finding ways to make CCS commercially viable by reducing the cost of the technology and exploring ways to deploy CCS in a wide range of industrial sectors including power, iron and steel.

We work with the Zero Emissions Platform, which brings together energy companies, academics and non-governmental organisations to support the development of CCS. In 2016, we launched an app to share information about CCS and to explain how it works.

Shell is also investing in the future Gorgon CO<sub>2</sub> injection project in Australia, the CCS Test Centre in Mongstad, Norway, and the Qatar Carbonates and Carbon Storage Research Centre in the UK.

## QUEST, CANADA

In Alberta, Canada, Shell operates a joint venture (Shell interest 60% in 2016) that has developed the first commercial-scale CCS facility for CO<sub>2</sub> extracted from our oil sands operations. The Quest facility is designed to capture up to 35% of the current CO<sub>2</sub> emissions from the Scotford Upgrader – a plant where bitumen is processed into synthetic crude oil. The captured CO<sub>2</sub> is stored in a porous rock layer about 60 kilometres away and more than 2 kilometres under ground. The provincial government of Alberta and the federal government of Canada have provided C\$865 million to support the development of Quest.

In 2016, in its first full year of operation, Quest safely captured and stored more than 1 million tonnes of CO<sub>2</sub> ahead of schedule. This is equivalent to the emissions from about 250,000 cars. Shell and our joint-venture partners are freely sharing any data or intellectual property generated by the Quest project to help others advance CCS projects and demonstrate the technology's value on an industrial scale.

In March 2017, Shell agreed to sell to Canadian Natural Resources Limited (Canadian Natural) its 60% interest in the Athabasca Oil Sands Project (AOSP), its 100% interest in the Peace River Complex in-situ assets including Carmon Creek, and a number of undeveloped oil sands leases, all in Alberta, Canada. In a related transaction, Shell and Canadian Natural have agreed to jointly acquire Marathon Oil Canada Corporation, which has a 20% interest in the AOSP. Following these transactions, Shell will continue as operator of the Scotford Upgrader and Quest.

## MONITORING QUEST

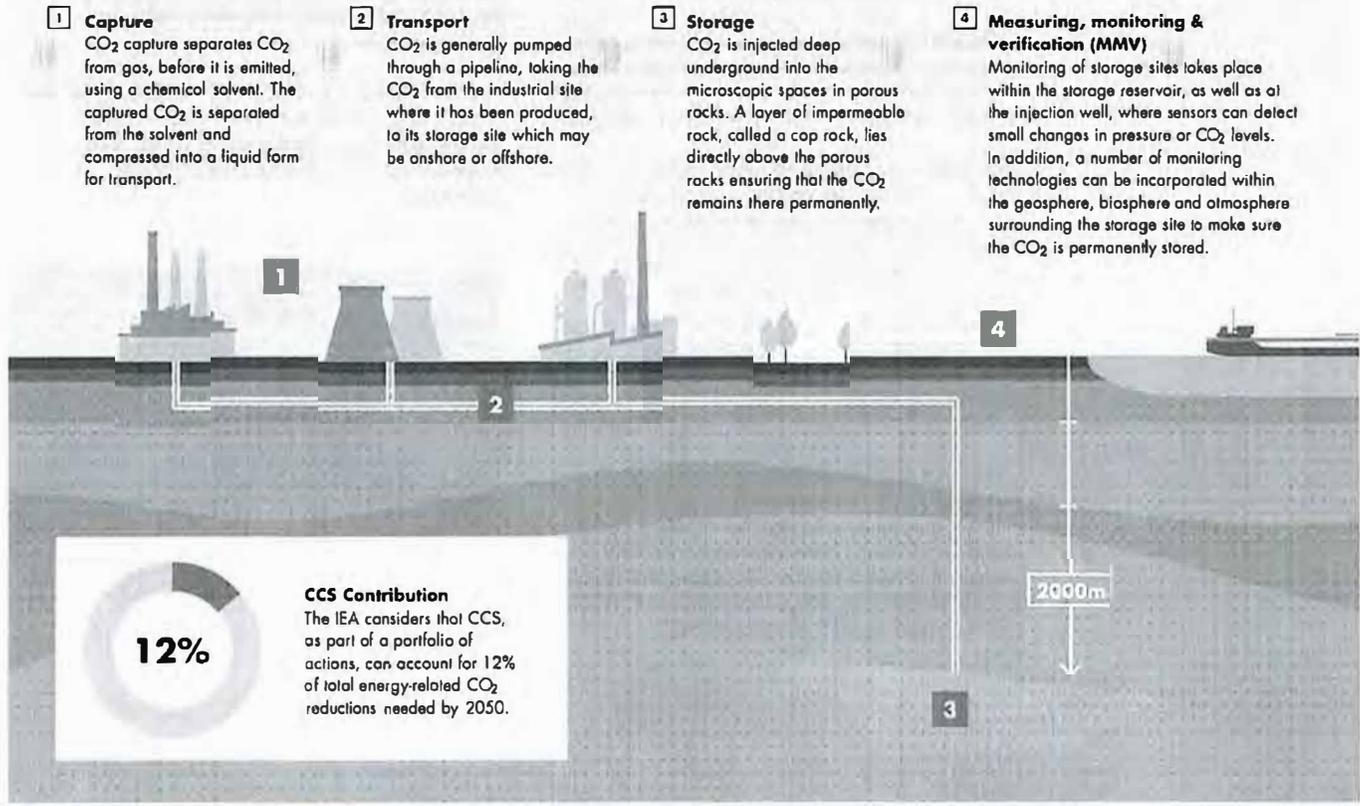
Quest is designed to meet all the requirements for the safe and permanent storage of CO<sub>2</sub>. We have developed a rigorous monitoring programme, agreed by the government and verified by a third party, to ensure that the CO<sub>2</sub> remains safely and securely underground. This includes continuous pipeline monitoring and early-warning systems, groundwater sampling and 3D seismic surveying. Throughout the development of Quest, we conducted an extensive consultation programme with nearby communities. We share results from our monitoring programme with them.

## SHELL CANSOLV

CCS technology developed by Shell Cansolv, a subsidiary of Shell, is used at the power station Boundary Dam in Saskatchewan, Canada. It is SaskPower's largest coal-fired power station and a significant source of power for the region. Both sulphur dioxide and CO<sub>2</sub> are captured from the power station. We continue to support SaskPower to improve the application of the technology.

## How carbon capture and storage works

See what's involved in the process of capturing and storing carbon dioxide deep underground



## NATURAL GAS

Natural gas – the cleanest-burning hydrocarbon – comprises about half of Shell's total production.

Natural gas provides a readily available solution to meeting rising global demand for energy with fewer emissions if used instead of coal for power generation. There are enough recoverable natural gas resources to last more than 220 years at current levels of consumption, according to the International Energy Agency. Natural gas can be transported by pipeline or in liquid form to countries in need of energy. It is also one of the few energy sources that can be used economically across most energy applications – from electricity to heating to transport fuels – and its uses are diversifying, as an alternative to diesel in trucks, heavy fuel oil in transport and oil for lubricants. As such, Shell expects it to play an increasingly prominent role in the future energy mix, both in its own right and as a partner for renewables.

### LOWER EMISSIONS

Natural gas produces around half the greenhouse gas (GHG) emissions of coal when burnt to generate electricity. This includes methane emissions.

Using natural gas instead of coal in power generation will also significantly improve air quality. Compared to coal-fired plants, modern natural gas plants emit less than one-tenth of sulphur oxides, nitrogen oxides, particulates and heavy metals that impact hundreds of millions of people all over the world, especially in Asia.

Natural gas can also be used in combination with carbon capture and storage (CCS) to further reduce GHG emissions. CCS can remove up to 90% of CO<sub>2</sub> emissions from power plants, according to the UN Intergovernmental Panel on Climate Change.

### PEARL GAS-TO-LIQUIDS PROJECT

The Pearl gas-to-liquids (GTL) project – 80 kilometres north of Doha, Qatar – is the world's largest plant to turn natural gas into fuels and lubricants (Shell interest 100%).

The plant relies on a heavy paraffin synthesis (HPS) catalyst. It accelerates the reaction that converts synthesis gas, a mixture of hydrogen and carbon monoxide, into hydrocarbons that can be broken down into shorter chain molecules and then turned into finished GTL products. These include paraffin for detergents and kerosene for blending into aviation fuel.

In 2016, Shell reduced heavy paraffin synthesis off-gas operational flaring at the plant to zero by using the gas as a fuel to power the plant. As a result, less energy is used to make the same products, which results in reduced CO<sub>2</sub> intensity.

In addition, the flared gas was used to generate electricity, which was exported to Doha-based Kahramaa, Qatar's national Electricity and Water Company.

### A PARTNER FOR RENEWABLES

Natural gas is flexible and offers significant advantages as a partner with renewables, which will be essential in a transition to a low-carbon future.

Using gas as a partner ensures steady power supplies when the sun does not shine or the wind does not blow. Modern gas-fired power plants also take less than a third of the time a coal plant needs to ramp up to full operation.

Increasing use of renewables will be vital in the energy transition. However, renewables are mostly used to produce electricity which due to the high temperature needed in the manufacture of materials such as iron, steel and cement, will struggle to replace oil and gas on a practical scale. This means gas will complement renewables by continuing to play a core role in industry and construction. Our New Energies business is looking at how new technologies could work more effectively together, for example, combining wind and solar power with gas.

### CHINA'S FUTURE ENERGY MIX

Since 2011, Shell has worked closely with the Chinese government's Development Research Centre (DRC) of the State Council on the country's medium- to long-term energy development strategy. The ongoing collaboration has identified the key energy challenges facing the country and suggested detailed, practical solutions.

The second phase of the collaboration examined the important role natural gas can play in helping China diversify its energy mix, boost economic development, improve air quality, and help meet China's Intended Nationally Determined Contribution for reducing carbon emissions.

In 2016, Shell and the DRC presented the outcomes from Phase 2 at the China Development Forum. Phase 3 focuses on the future development of China's energy system to help the country transition to a lower-carbon economy.



Kroonborg is the first offshore vessel in the world to sail on GTL fuel, a liquid fuel made of natural gas with less emissions than conventional fuels for vessels.

## LIQUEFIED NATURAL GAS

Shell is involved in every stage of the LNG value chain: from finding the fields and extracting the gas to liquefying it, shipping, turning the LNG back into gas and distributing it to customers. In February 2016, Shell's acquisition of BG added significantly to our activities in LNG.

The LNG process enables natural gas to be easily transported from areas where it is abundant to places where it is needed. To create LNG, natural gas is cooled to  $-162^{\circ}\text{C}$ , turning it into liquid form and shrinking its volume by 600 times. At its destination, the LNG is converted back into gas for conventional use. Even after liquefying, transporting and turning it back into a gas, LNG emits around 40% less greenhouse gas emissions than coal when burnt to generate electricity. Innovations, for example, floating import terminals that convert LNG back into natural gas, mean LNG can reach new

customers in developing markets, such as India, Pakistan, Egypt, Jordan and Ghana. In the next few years, countries including the Philippines, Vietnam, Myanmar and Bangladesh are expected to become LNG importers.

The World Health Organisation estimates that exposure to smoke emissions from household solid fuels, such as coal, dung and wood, causes more than 4 million deaths a year. Replacing these solid fuels with cleaner-burning gas will improve the quality of the air people breathe. Gujarat, for example, where Shell and French oil and gas company Total operate the Hazira LNG terminal (Shell interest 74%), is the first state in India to connect some of its villages to piped gas. This has helped reduce indoor air pollution in these rural homes and saved people in some cases up to five hours of their day collecting firewood.

### QGC PROJECT

As a result of the BG acquisition, we have a majority interest in the QGC Project in Queensland, Australia. The Shell-operated project consists of onshore production areas piping natural gas to a two-train LNG facility. Shell holds a 50% interest in train one and a 97.5% interest in train two, and a 100% interest in the common facilities on the LNG plant.

In 2014, the QGC Project started producing LNG from natural gas sources from coal seams, which can produce up to 8.5 million tonnes of LNG a year. It supplies natural gas to both the domestic market and LNG to international customers. In December 2016, the 200th cargo of LNG was delivered to customers.



At the QGC Project, Australia, the central water treatment plant recycles salty underground water extracted during gas production.

We are managing our environmental impact, including our water use. There are two treatment plants, which recycle salty underground water extracted during gas production. This treated water is then used by irrigators, industries and communities in the Surat region. The plants have a combined capacity to treat the equivalent of about 25 Olympic-sized swimming pools during peak production.

### FLOATING LIQUEFIED NATURAL GAS

Floating liquefied natural gas (FLNG) facilities enable LNG to be produced, liquefied, stored and transferred at sea. This makes it possible to reach offshore gas fields previously considered too expensive or too difficult to develop. FLNG also reduces the local impact of LNG infrastructure and decreases the disturbance to land and marine life.

Shell is constructing the Prelude FLNG (Shell interest 67.5%), which will be located 475 kilometres off the coast of Western Australia. Once completed, Prelude

FLNG will be the largest floating offshore facility in the world.

In 2016, the project began the transition from construction to commissioning and start-up activities at the shipyard in Geoje, South Korea. The undersea infrastructure has also been completed in preparation for the arrival of Prelude.

The project continues to work toward the finalisation of the required regulatory approvals, with the Prelude environment plan accepted by the regulator at the end of 2016.

## LNG FOR TRANSPORT

Cleaner vehicles and fuels are needed to meet increasing demand for transport with less greenhouse gas emissions.

Cleaner-burning LNG is a fuel for heavy-duty road transport, shipping and rail. It is virtually free of sulphur emissions and has lower levels of nitrogen oxides and particulates. It can be used as an alternative transport fuel to diesel and heavy fuel oil.

Shell has created a network of five LNG truck refuelling stations in the Netherlands. One of the stations, located on the premises of one of the largest Dutch supermarket chains, is used by 150 LNG delivery trucks a day.

In shipping, LNG is already used as a fuel with around 100 vessels in use today. Using LNG as a fuel for shipping on a wide scale would lead to significant reductions in marine emissions.

In 2016, Shell signed an agreement with one of the world's biggest cruise operators, Carnival, to supply LNG to fuel two of the world's largest passenger cruise ships. These will be the world's first LNG-powered



Shell has created a network of five LNG truck refuelling stations in the Netherlands. One is located on the premises of one of the largest Dutch supermarket chains.

cruise ships, due to start sailing in north-west Europe and the Mediterranean in 2019.

In 2016, Shell and Keppel Offshore & Marine Ltd won a bid for Singapore's first licence to fuel ships with LNG.

Read more about LNG for transport on [www.shell.com](http://www.shell.com).

## RESEARCH AND DEVELOPMENT

Innovation will be critical for Shell to provide more energy with less environmental impact as the world transitions to a lower-carbon energy system.

Shell continues to invest in research and development (R&D) to improve the efficiency of our products, processes and operations, and to develop new technology solutions for the energy transition. In 2016, we invested \$1,014 million in R&D.

We operate a global network of technology centres, with major hubs in Houston, USA, Amsterdam, the Netherlands, and Bangalore, India. These hubs carry out a range of

activities, from building on existing technologies to designing breakthrough innovations.

### COLLABORATING FOR INNOVATION

We have programmes, partners and funding methods to help us develop new technologies.

Our R&D activities are complemented by research and technology collaborations with leading universities including the Massachusetts Institute of Technology in the USA, Imperial College in the UK, and the Shanghai Advanced Research Institute of the Chinese Academy of Sciences.



In 2016, Shell Technology Ventures invested in Kite Power Systems, a UK company developing high-altitude wind power generation technology.

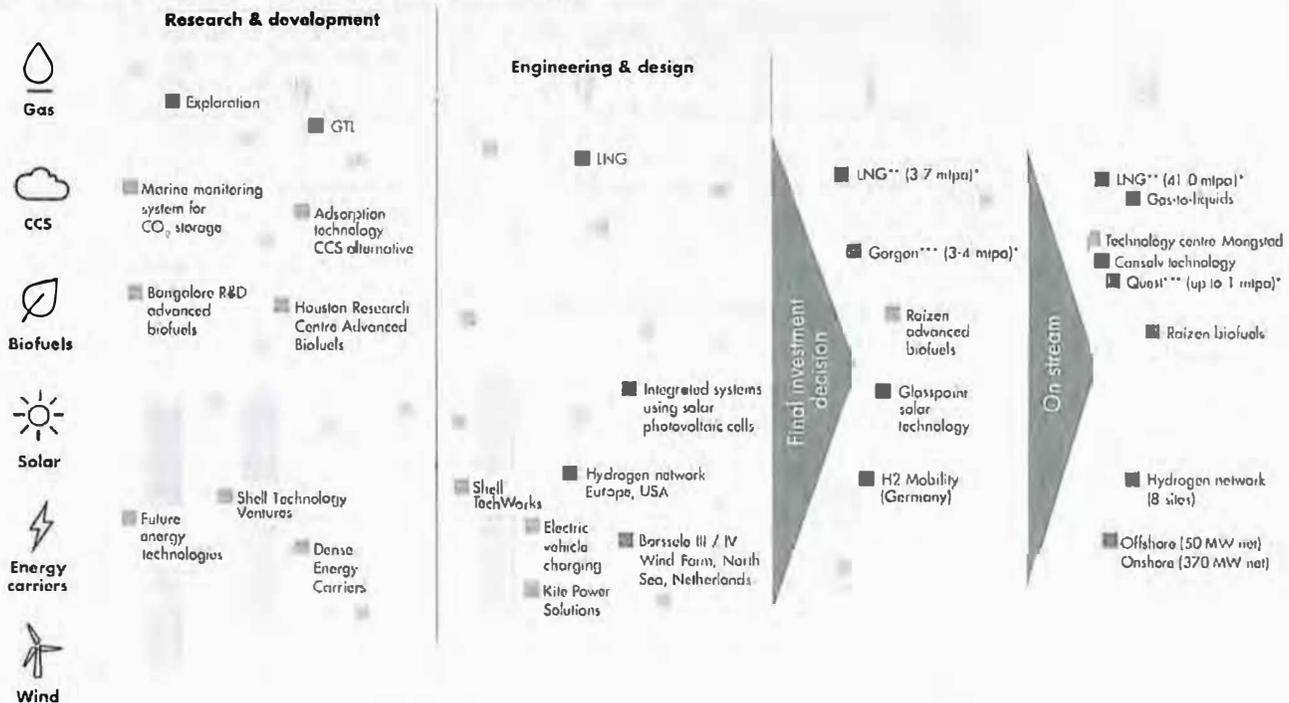
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We have three main collaborative programmes that support the development of future energy technology:

■ **Shell GameChanger:** this programme provides financial and technical support to prove the commercial and technical viability of ideas within the oil and gas sector including new energies. Since 1996, GameChanger has interacted with more than 5,000 Innovators and helped turn more than 150 ideas into reality. Many ideas currently in operation or under development in Shell were initiated through GameChanger. For example, the programme evaluated the feasibility of building a floating liquefied natural gas (FLNG) facility to produce and liquefy natural gas at sea. Shell is now constructing Prelude FLNG, which will be located off the coast of Western Australia. GameChanger connects with early-stage start-ups, incubators and accelerators (schools for start-ups) globally. One of these is Cyclotron Road, a California-based energy entrepreneurship programme which recruits people to work at Lawrence Berkeley National Laboratory, to research potential new energy technologies. Opus 12, a start-up at Cyclotron Road, won the 2016 Shell GameChanger Innovation Challenge. Opus 12 is researching recycling carbon dioxide into chemicals and fuels using an electrochemical process.

- **Shell Technology Ventures (STV):** is our corporate venturing arm that is both an investor and a partner in companies that are developing promising technologies which complement Shell's business. STV invests mainly in oil and gas, new energy technologies and information technology. STV's investments in 2016 included California-based Growing Energy Labs which provides software to design, connect and operate energy storage and micro-grid projects. Another investment was Sense Labs, a Cambridge, Massachusetts-based company which has developed a device enabling households to monitor the energy use of any home appliance from mobile devices. In 2016, STV also invested in the UK company Kite Power Systems (KPS). Following Shell's early-stage support to KPS through GameChanger, this latest investment will support the technical and commercial development of KPS's high-altitude wind power generation technology. This is cheaper to manufacture and needs less construction and installation materials than conventional wind turbines.
- **Shell TechWorks (STW):** based in Cambridge, Massachusetts, STW aims to accelerate the introduction and adoption of proven technologies from other industries and apply these to our sector. Since its founding in 2013, STW has collaborated with companies, universities, research institutes and start-ups to help develop and deploy technology quickly and cost-effectively. For example, STW collaborated with other companies to develop a system for robot submarines to detect hydrocarbons that seep naturally from the seabed. This gives it the potential to identify new reservoirs of hydrocarbon exploration, but also detect leaks at existing operations.

## Low-carbon research & development investment



### Increasing technology maturity

\* Million tonnes per annum. \*\* Volumes in Shell share. \*\*\* Capacity based on 100% shares

■ Commercial operation ■ Technology demonstration/research ■ Used in Shell operations

## LOWER-CARBON ALTERNATIVES

Shell invests in a portfolio of lower-carbon energy opportunities, including technologies and fuels.

In our fuels and lubricants business, we continue to look for ways to improve energy efficiency for our customers.

We created a New Energies business in 2016 to further explore opportunities in alternative transport fuels, such as biofuels and hydrogen, along with new ways to connect energy producers and consumers, including through increased use of digital technology.

### BIOFUELS

Shell is one of the largest blenders and distributors of biofuels worldwide. In 2016, we used around 9.5 billion litres of biofuels in the petrol and diesel we sold worldwide.

In the coming decades, we expect biofuels to play a valuable part in the changing energy mix. They can be a cost-effective way to reduce carbon dioxide (CO<sub>2</sub>) emissions in the transport sector, as long as their production is managed in a responsible way. In addition to closely understanding their emissions, we want to ensure other environmental impacts from their production are well managed (such as impacts on soil, air and water) and that social impacts are beneficial for local communities.

#### SUSTAINABILITY STANDARDS

Shell purchases biofuels to blend into our fuels in line with country specific regulations. We continue to support the adoption of international sustainability standards including the Round Table on Responsible Soy, the Roundtable for Sustainable Palm Oil (RSPO) and Bonsucro, a non-profit organisation, for sugar cane. We also support the Roundtable for Sustainable Biomaterials and the International Sustainability and Carbon Certification (ISCC) scheme both of which can be used for any feedstocks.

The majority (75%) of the biofuels we purchase are from feedstocks that come from North America or Europe. In addition to good agricultural practices, both regions have sustainability rules that include land-use restrictions and set controls for greenhouse gas emissions.

We have specific purchasing policies for biofuels made from palm oil, soy from South America or sugar cane, to increase our use of independently certified sustainable biofuels. Every year, 100% of the palm oil that Shell blends is either independently certified by RSPO or the ISCC, or covered by offsets from the RSPO certificate.

trading system. In Argentina, we have assessed several of our cone suppliers against the Bonsucro standard and are encouraging their full certification. We are also setting up several projects in the country, aiming to increase the amount of sustainable soy and cane.

At the end of 2016, 30% of the sugar-cane ethanol and South American soy biodiesel used in biofuels that Shell blended was either independently certified as sustainable, audited against robust standards, or offset by purchasing soy or cane sustainability credits.

#### PRODUCING BIOFUELS WITH RAÍZEN

In 2016, our joint venture Raízen (Shell interest 50%) produced more than 2 billion litres of low-carbon ethanol from Brazilian sugar cane. Around 40% of Raízen's production was certified as sustainable to the standards set by Bonsucro.

Raízen's production process is designed to minimise its environmental impact. The company's harvesting process is already 98% mechanised which improves worker conditions and operational efficiency. By the end of 2016, 16 of Raízen's 24 sugar-cane mills were certified to the Bonsucro standard.

Raízen purchases around half of the sugar cane it uses as a raw material from independent suppliers. The company is working in partnership with two non-governmental organisations, Malilora and Solidaridad, to support these suppliers to become more sustainable producers. The suppliers complete a confidential self-assessment against a list of sustainability criteria which enables Solidaridad to prepare individual improvement guides. Since the programme started in 2014, more than 1,300 suppliers have completed the assessments and are working on improvements.

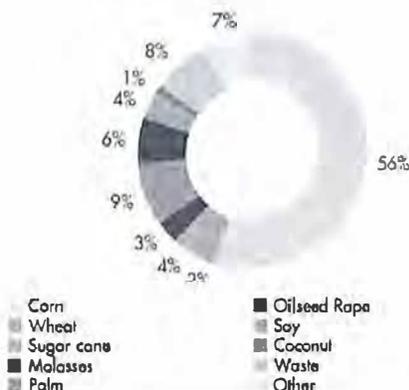
In 2015, Raízen opened its first cellulosic ethanol plant at its Costa Pinto mill in Brazil. Production in 2016 was almost 6.9 million litres, and over time the mill is expected to produce around 40 million litres a year of advanced biofuels from sugar-cane residues.

#### DEVELOPING ADVANCED BIOFUELS

We continue to invest in new ways to produce biofuels from sustainable feedstocks such as waste and cellulosic biomass from non-food plants. Shell has two pilot plants in the USA, which convert cellulosic biomass into a range of products, including petrol, diesel, aviation fuel and ethanol.

Another pilot plant is being installed in Bangalore, India, that will demonstrate a technology called IH<sup>2</sup> that turns waste into fuel using a two-stage catalytic reaction. The technology was developed by a USA-based research centre, the Gas Technology Institute.

#### Global bio-component purchase [A] by feedstock



[A] Does not include purchases by Raízen or Malilora.

## ENERGY-EFFICIENT TRANSPORT

Shell invests in a range of lower-carbon technologies and fuels, sometimes working with partners.

Energy efficiency is an important consideration in the development of our fuels and lubricants. Shell is taking part in several initiatives to encourage the adoption of hydrogen electric transport, and is developing a service that supports the charging of electric vehicles.

### EFFICIENT FUELS

Shell supplies fuels to millions of drivers around the world every day. For more than a century, our scientists have worked to develop products to improve the driving experience and energy efficiency of our customers. For example, Shell FuelSave Diesel contains ingredients designed to improve fuel-efficiency for our customers.

Shell GTL Fuel uses a gas-to-liquids (GTL) technology that converts cleaner-burning natural gas into alternative diesel fuels. Shell GTL Fuels are virtually sulphur-free, odourless and help to improve local air quality. They can be used as a diesel fuel without requiring changes to the engine or investment in new heavy-duty road transport infrastructure, and as a fuel for shipping.

In 2016, the European Committee for Standardisation approved a new European standard for paraffinic diesel fuel, helping develop the market for these fuels. Paraffinic fuels are synthetic liquid fuels such as Shell's GTL Fuel that are made from natural gas, biomass or vegetable oil. This new generation of cleaner transport fuels are colourless and odourless and contain almost none of the impurities – sulphur, aromatics and nitrogen – that are found in crude oil. Shell GTL Fuel is commercially available to customers in the Netherlands, Germany, the UK, Denmark and France.

### ADVANCED LUBRICANTS

Lubricants are designed to increase the efficiency of equipment – including engines – and reduce fuel consumption. Shell is one of the largest investors among international energy companies in the research and development of lubricants for motorists, commercial vehicles and industrial sectors. We employ more than 200 scientists and engineers in lubricant research and development.

In 2016, Shell introduced a new range of heavy-duty engine oils in the USA, under the Shell Rotella brand. These were developed to meet the requirements of new American Petroleum Institute specifications for lubricants, which include reducing engine emissions.

We also produce motor oils that can improve the fuel efficiency of passenger cars and motorcycles. These include products manufactured using Shell PurePlus Technology, which applies the GTL process to produce a clear base oil. This has much lower levels of impurities than other base oils, and lubricants produced with this technology can help improve engine performance.



In Germany, the government is supporting the development of a national network of hydrogen electric fuelling stations.

### ENERGY CHALLENGE

Our annual Shell Eco-marathon competition challenges students worldwide to design and build energy-efficient vehicles. Held in the Americas, Africa, Asia and Europe, the events inspire young engineers to develop vehicles that can travel the furthest on the least amount of energy. The 2016 competition showcased a vehicle capable of travelling more than 2,600 kilometres on the equivalent of one litre of fuel.

### SHELL CONCEPT CAR

In 2016, Shell unveiled an energy-efficient city car called the Shell Concept Car. This is a collaboration between three companies: Shell, engine specialists Geo Technology and automotive engineers Gordon Murray Design.

In tests, the Shell Concept Car demonstrated a 34% reduction in primary energy use over its entire life cycle compared to a typical city car available in the UK.

In test results, the car runs at 38 kilometres (km) per litre at 70km/h. In formal testing (using the European Union's New European Driving Cycle laboratory test), the Shell Concept Car produced lower CO<sub>2</sub> emissions than a petrol-powered city car (28%).

### HYDROGEN

Hydrogen has the potential to be an important low-carbon transport fuel and Shell is part of several initiatives to encourage the adoption of hydrogen electric energy.

Hydrogen fuel-cell electric cars do not emit greenhouse gases from their tailpipe – the only emission is water vapour. If the hydrogen comes from renewable sources of energy, and if it is produced at retail sites, then the fuel-cell vehicles have almost no emissions.

Hydrogen electric vehicles are quick to refuel and can drive a similar range to conventional cars. Energy is stored in compressed hydrogen fuel, rather than a battery, which means that hydrogen-powered cars can potentially drive up to 700 kilometres without refuelling. The cars take only three minutes to refuel – similar to current refuelling times for petrol and diesel cars.

Hydrogen electric transport can succeed if vehicle manufacturers and fuel suppliers, with the support of governments, work together. There needs to be sufficient refuelling infrastructure to attract customers, as well as incentives for businesses to build this infrastructure.

## Lower-carbon Alternatives Continued

In Germany, for example, the government is supporting the development of a national network of hydrogen electric fuel stations across the country by 2023. We are working on this project with our joint-venture partners in H2 Mobility Germany – French gas supplier Air Liquide, German car manufacturer Daimler, Austrian oil and gas company OMV, German engineering firm Linde and French oil and gas company Total. The hydrogen will be delivered by truck as a gas to retail sites. Under the terms of the partnership, at least 50% of the hydrogen sold must be produced without emitting greenhouse gases. In 2016, the first two stations in the H2 Mobility network opened in Germany.

Outside this network, we also have three hydrogen filling stations in Germany and two in Los Angeles, California. In the UK, we are partnering with ITM Power, a company specialising in hydrogen fuel-cell products, to make hydrogen fuel available at three Shell retail sites in the southeast of the country. The first of the UK stations opened in February 2017. Shell is assessing the potential for similar projects in the USA, Canada, Switzerland, Austria, France, Belgium, Luxembourg and the Netherlands. For example, in California, USA, we are working with Toyota and the state government to build hydrogen refuelling stations, which Shell will own and operate when completed.

In January 2017, Shell and 12 other companies launched the Hydrogen Council, an initiative to raise the profile of hydrogen and its role in the energy transition. A report (PDF, 5.3MB) entitled *How hydrogen empowers the energy transition* further details hydrogen's potential.

### ELECTRIC MOBILITY

Shell is looking into how we can serve the increasing number of people driving electric vehicles and the potential to introduce electric vehicle charging points at our retail sites in several countries.

We have also been developing technology that can support the integration of electric vehicles with the power grid. This technology explores how to charge electric vehicles at times when the cost of using power is low, and therefore cheaper for customers.

Since 2013, Shell has worked with partners in the power sector and commercial customers who have electric vehicles in their fleet to test this technology. We are now looking at introducing it in places such as California, USA, to help local governments push forward their goals for vehicles with zero emissions.

### External opinion

"Hydrogen plays a crucial role in sustainable mobility, providing a convenient fuel for transport, as well as flexibility and storage for the power and heat sectors.

### "Refuelling with hydrogen is safe, fast and customer-friendly"

Public-private activities such as the Clean Energy Partnership (CEP) in Germany have successfully demonstrated that refuelling with hydrogen is safe, fast and customer-friendly. This, along with the long range and the silent and powerful performance of fuel-cell cars and buses from various manufacturers, will encourage widespread acceptance by customers. That's why companies have started selling fuel-cell electric vehicles and hydrogen fuel in key global markets.

Shell continues to help provide the transport sector with this sustainable fuel as a partner in the CEP and as a driving force behind the creation of H2 Mobility Germany – a joint venture that includes car manufacturers and oil and gas companies – and which is developing a network of hydrogen refuelling stations."

### Klaus Bonhoff

Managing Director, National Organization Hydrogen and Fuel Cell Technologies, Berlin, Germany



## SOLAR AND WIND TECHNOLOGIES

Solar and wind power are playing a growing part in meeting global energy demand.

We expect an emerging low-carbon energy system to include traditional fuels such as oil and natural gas alongside renewable energy and carbon capture and storage.

### SOLAR POWER

Shell is exploring the possibilities offered by solar power and continues to install the technology at facilities to lower carbon intensity while also reducing operating cost.

In Canada and Gabon, for example, we have used solar photovoltaic (PV), wind turbines and batteries in remote, off-grid well sites to power monitoring and control systems, so avoiding the need for diesel generators.

At some offshore platforms in the North Sea, we use solar PV and batteries to provide 100% renewable power generation, cutting costs, and reducing refuelling trips to the platforms.

We use small-scale solar power systems in some retail stations. In Thailand, for example, we fitted two Shell retail stations and the Shell office in Bangkok with solar panels. In pilot projects in Pakistan, solar power is also helping oil product storage facilities continue to operate despite outages in the local power grid.

Petroleum Development Oman (PDO, Shell interest 34%) is constructing a solar thermal steam plant called Project Miraah. Once completed in 2020, Miraah will be the world's largest solar thermal steam plant, providing about a third of the Amal oil field's steam requirements. It will potentially be capable of producing up to 1 gigawatt of thermal energy. This solar technology, developed by GlassPoint with investment from Shell Technology Ventures (STV), will replace gas-fired steam generation and free the gas for other uses, to reduce the CO<sub>2</sub> intensity of the oil production.

### WIND POWER

In 2001, Shell entered the onshore wind business in the USA. We have interests in six operational wind power projects in North America and one in Europe. At the end of 2016, our share of the energy capacity from these projects was about 420 megawatts (MW).

In late 2016, a consortium of Shell, Dutch energy company Eneco, Dutch contracting company Van Oord and Mitsubishi's power-producing subsidiary Diamond Generating Europe, won a tender to construct and operate two wind farms in the Borssele Wind Farm Zone off the coast of the Netherlands. These are designed to have a capacity of 680MW, enough to power 825,000 Dutch homes.

Our Shell Energy Europe marketing and trading organisation is planning to buy half the power generated from this windfarm. Shell also committed to buy 100% of the power generated from the offshore wind farm Egmond aan Zee (OVVEZ), the Netherlands' first large-scale offshore wind farm. From 2017, Shell will take the power generated from the wind farm and offer it to customers in Europe. In 2016, Shell Energy North America managed more than 9,500MW of power, with over one third of that power produced by renewable methods.

STV is also investing in wind-related technologies, including the UK company Kite Power Systems (KPS). Through our GameChanger programme, Shell and KPS have worked to develop KPS's high-altitude wind power generation technology, which uses two kites tethered to a spool and flying in figure eights to generate electricity.



Solar panels are installed on the rooftop of a Shell service station in Thailand.

## MANAGING OPERATIONS

The nature of the energy industry means that we often operate in challenging environments. We work to reduce our environmental impact and manage our operations safely and responsibly, wherever they may be.



**50%**

Improvement in our process safety events in our shales operations from 2015



**53%**

Reduction in operational spills in Nigeria from 2015



**8%**

Increase in water recycling in oil sands mining from 2015



## OUR ACTIVITIES IN NIGERIA

Safety and security remain top priorities in Nigeria, where acts of sabotage and vandalism caused a reduction in onshore oil and gas production in 2016.

Shell has interests in several companies in Nigeria and they are major contributors to the economy. They produce oil and natural gas, distribute gas to industries in the country, produce liquefied natural gas (LNG) for export, generate revenues for the government and provide social investment. The Shell companies are also working with federal and state government agencies, communities and civil society to try to create a safe operating environment.

Shell Companies in Nigeria continue to operate both onshore and offshore oil activities in the country, while investing in oil and gas production. Shell Companies in Nigeria are also working with the government and other partners to increasingly focus on developing gas production onshore and delivering gas to power plants and other industrial customers in order to drive economic growth.

### SECURITY IN THE NIGER DELTA

The Shell Petroleum and Development Company of Nigeria Ltd (SPDC), the operator of the SPDC Joint Venture (SPDC interest 30%), had a challenging 2016 due to further acts of sabotage and vandalism on oil and gas facilities in parts of the Niger Delta. As a result, oil and gas production from domestic and international operators declined sharply in the year.

Export operations at the SPDC-operated Forcados oil terminal were disrupted after three sabotage incidents in 2016. This resulted in loss of revenue, particularly for domestic producers who rely on the terminal for export. Reduced oil and gas production in the Niger Delta also led to lower revenues for state and federal government and major disruptions to gas supply needed to power electricity for industry, businesses and public sector services.

### SAFETY OF STAFF AND CONTRACTORS

The safety of staff and contractors in Nigeria remains the top priority. The Shell Companies in Nigeria aim to mitigate security risks that may impact people, the environment and facilities. We only carry out operations where it is safe to do so. We also continue to engage with the government and nongovernmental organisations (NGOs), as well as local communities, to help promote human rights and a peaceful and safe operating environment.

Despite a challenging security environment, the safety performance of Shell Companies in Nigeria improved in 2016. There were no recorded fatalities in the year, compared to seven in 2015. We shared findings from investigations into the 2015 incidents in sessions with employees and contractors and produced a safety video with senior Shell leaders to encourage discussions on lessons learned. Although there were no recorded fatalities in 2016, we recorded a significant number of high-potential incidents, indicating the situation remains fragile and requires sustained intervention at all levels.

### HELPING SUPPLIERS DEVELOP

Access to financing has been a challenge for suppliers to Shell Companies in Nigeria. In collaboration with leading banks in the country, the SPDC Joint Venture (SPDC JV) and the Shell Nigeria Exploration and Production Company Limited (SNEPCo) have created a funding mechanism that offers local contractors faster access to loans and at cheaper interest rates. The Organisation for Economic Co-operation and Development has recognised the programme as best practice for shared value creation and

### External opinion

"The collaboration between the Federal Road Safety Corps (FRSC) and SPDC is the key to achieving the goals of the United Nations Decade of Action for Road Safety in Nigeria. The National Community Post Crash Care Initiative (NCPCCI), has 27 centres in 13 states with 540 volunteers. These initiatives and the crash care efforts recorded have led to its adoption by the West African Road Safety Organisation to be replicated in other West African countries.

### "SPDC has supported the use of speed radar devices and breathalysers for road safety"

SPDC has also helped the FRSC by supporting the use of speed radar devices, breathalysers and extricating equipment. The annual National Road Safety Quiz for senior secondary school students, the marathon race and support for crash victim remembrance day have also helped promote awareness of road safety. The FRSC appreciates the expansion of the NCPCCI to cover all the critical road corridors in Nigeria, in addition to sponsoring campaigns for safe tyres and the installation of speed-limiting devices."

### Ojeme Ewhrudjakpor fdc

Deputy Corps Marshal (Operations), Federal Road Safety Commission, Abuja, Nigeria



local content. Since the scheme started in 2011, 220 small- and medium-sized Nigerian enterprises have received loans worth a total of around \$1 billion with no recorded defaults on the loans.

### ENTREPRENEURSHIP, EDUCATION, HEALTH AND ROAD SAFETY

Shell companies in Nigeria work with government, communities and civil society to implement programmes that could positively impact people's lives. The Niger Delta Development Commission (NDDC) Act requires all oil companies operating in Nigeria to contribute 3% of their annual budgets to NDDC. The commission is a federal government agency tasked with the sustainable development of the Niger Delta region. In 2016, the SPDC JV and SNEPCo contributed \$106.8 million (Shell share \$48.5 million) to the NDDC. Over the last five years Shell Companies in Nigeria's contribution to the NDDC totalled more than \$800 million (Shell share around \$340 million).

Since 2003, the SPDC JV has invested in training more than 6,550 young people in the Niger Delta in enterprise development and provided business start-up grants to more than 3,300 people.

## Our Activities in Nigeria Continued

Shell Companies in Nigeria have long supported education in the country. Since launching in the 1950s, the Shell scholarship scheme has supported thousands of students in their careers in Nigeria. In 2016, Shell Companies in Nigeria awarded grants to 911 secondary school students and 530 university undergraduates.

The SPDC JV and SNEPCo continue to invest in the Cradle-to-Career scholarship programme, which pays for less privileged children from rural communities to attend some of the country's top secondary schools. Since 2010, 420 students have received Cradle-to-Career scholarships from the SPDC JV and 164 from SNEPCo. The SPDC JV also funds a Centre of Excellence in Geosciences and Petroleum Engineering at the University of Benin.

Shell Companies in Nigeria have supported community health projects and programmes since the 1980s. Today, SNEPCo and the SPDC JV support 20 health centres including the SOS Village near Lagos and Obio Cottage Hospital in Port Harcourt.

Road safety is another area of social investment. Shell Companies in Nigeria have launched several road safety programmes in 2016, focusing on defensive driving, road rules, safe tyres, seat belt use and pedestrian safety. The Shell-sponsored National Community Post Crash Care Initiative, which trains and equips volunteers in accident victim rescue, has been replicated in other East and West African countries.

### SPILL PREVENTION AND RESPONSE

Regrettably, 90% of the number of oil spills of more than 100 kilograms in 2016 from SPDC JV facilities in the Niger Delta were caused by theft and sabotage. SPDC works with government agencies, NGOs and communities to prevent and minimise spills from illegal activity. These include air and ground surveillance, awareness campaigns and alternative livelihood programmes.

In 2015, SPDC, on behalf of the SPDC JV, and the Bodo community signed a memorandum of understanding (MOU) granting SPDC access to begin the clean-up of areas affected by two operational spills in 2008. The MOU also provided for the selection of two contractors to conduct the clean-up and to be overseen by an independent project director.



An engineer carries out regular checks on board the Bongo production storage and offloading facility in deep water Nigeria.

Contractors for the first phase of the clean-up were sent to the location in September 2015, and they trained 400 Bodo youths in clean-up techniques. Unfortunately, the contractors were subsequently denied access by the community in late September 2015. In 2016, discussions continued with the Bodo community under the Bodo Mediation Initiative to allow contractors to proceed with the clean-up but no resolution had been achieved by the end of December 2016. SPDC remains committed to the clean-up of identified areas of Bodo when access is granted.

### CLEAN-UP PROGRAMME IN Ogoniland

In August 2016, Nigeria's President Buhari accelerated the implementation of the 2011 United Nations Environmental Programme (UNEP) Report on Ogoniland with the inauguration of two governance bodies to oversee the clean-up process. The SPDC JV is represented on both bodies and will continue to actively support the process within the framework established by the federal government.

Since 2011, SPDC has taken action on all recommendations in the UNEP report that were specifically addressed to it as operator of the SPDC JV, and has completed the majority of these recommendations. SPDC has re-assessed the 15 SPDC JV sites mentioned by UNEP. When further remediation was required because of acts of vandalism and oil theft, those sites have been remediated and certified by government regulators. SPDC has completed a review of its oil spill response and remediation techniques, and made several improvements in line with industry practices.

### SHELL'S ECONOMIC CONTRIBUTION

SPDC and SNEPCo hold interests in several offshore licences (\*) including the Shell-operated Bongo field (Shell interest 55%). Shell Nigeria Gas Limited (SNG) is a wholly-owned subsidiary of Shell.

\$29 billion: economic contribution from the SPDC JV partners to the Nigerian government from 2012–2016.

\$1.4 billion: Shell share of royalties and corporate taxes paid to the Nigerian government in 2016 (SPDC \$1 billion; SNEPCo \$0.4 billion).

94%: Shell Companies in Nigeria contracts awarded to Nigerian companies.

\$0.74 billion: Shell Companies in Nigeria spend on contracts awarded to Nigerian companies.

96%: employees of Shell Companies in Nigeria are Nigerian.

\$106.8 million: SPDC JV and SNEPCo contribution to Niger Delta Development Commission in 2016 (Shell share \$48.5 million).

\$29.8 million SPDC JV, SNEPCo and Shell Nigeria Gas direct spending on social investment projects in 2016 (Shell share \$10 million).

(\*) Authorities in various countries are investigating our investment in Nigerian oil block OPL 245 and the 2011 settlement of litigation pertaining to that block. On February 14, 2017, we received notice of the request of indictment from the Italian prosecution office in Milan with respect to this matter.

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SPDC has worked with the International Union for Conservation of Nature since 2012 to improve remediation techniques and protect biodiversity at sites affected by oil spills in the Niger Delta.

The UNEP Report also recommended coordinated action by all parties to achieve a sustainable clean-up and to prevent further pollution from crude oil theft and illegal

refining. SPDC is working on alternative livelihood programmes, including training in Ogoniland as part of Shell's youth entrepreneurship programme, Shell LiveWIRE.

SPDC remains fully committed to supporting the Nigerian government in the clean-up of Ogoniland.

## SPILLS AND RESPONSE DATA

Oil spills due to crude oil theft and sabotage of facilities, as well as illegal refining, cause most of the environmental damage from oil and gas operations in the Niger Delta. Irrespective of cause, the SPDC JV cleans and remediates areas affected by spills originating from its facilities.

Theft of the SPDC JV's crude oil from the pipeline network amounted to around 5.6 thousand barrels of oil per day (bpd) in 2016. This reduction from 25 thousand bpd in the previous year is partly due to continued air and ground surveillance and anti-theft mechanisms on equipment. Since 2012, SPDC has removed more than 880 illegal theft points.

The number of operational spills from Shell companies in Nigeria fell from 16 in 2015 to seven in 2016. The volume of oil spilled in operational incidents remained at 0.2 thousand tonnes. This includes one spill of 0.15

thousand tonnes caused by unintentional third-party damage to a SPDC JV pipeline.

The number of sabotage-related spills in 2016 decreased to 45 from 93 in 2015. This was despite a resurgence in attacks on oil and gas facilities in parts of the Niger Delta. Theft and sabotage caused 90% of spills of more than 100 kilograms from SPDC JV pipelines.

At the start of 2016, there were 270 sites identified for remediation and certification, of which 92 have been remediated and certified, with 31 in Ogoniland (representing a net reduction of 22% in remediation sites in that area during 2016). During 2016, 73 new sites requiring remediation were identified, of which nine were in Ogoniland. In total, there are 251 oil spill sites that require remediation.

## OIL SANDS

Canada's oil sands in Alberta and Saskatchewan are among the largest oil reserves in the world.

Oil sands are a mixture of sand, water, clay and heavy oil called bitumen. In 2016, Shell was the operator and majority shareholder of the Athabasca Oil Sands Project (AOSP), a joint venture between Shell Canada (60%), Chevron Canada Limited (20%) and Marathon Oil Canada Corporation (20%). The AOSP consists of the Albion Mines (Muskeg River and Jackpine mines), the Scaford Upgrader, which processes bitumen into synthetic crude oil and Quest Carbon Capture and Storage.

### MANAGING EMISSIONS

Crude oils produced from oil sands emit more greenhouse gas (GHG) emissions than the average crude oil used in the USA, according to data and analytics company IHS Markit. However, the GHG intensity of Shell's oil sands operations has been on an improving trend due to performance enhancements and the launch of our Quest carbon capture and storage (CCS) project.

In 2016, its first full year of operation, Quest exceeded its annual target of capturing 1 million tonnes of CO<sub>2</sub> and storing it safely underground.

Compared to 2015, we reduced our energy intensity by around 5% in 2016. A pilot programme at Shell Albion Sands has led to improvements in energy efficiency and emissions reduction by removing lower quality materials, such as clay, from the oil production process. This allows for lower temperatures to be used to release the oil from the ore, reducing energy consumption. As members of Canada's Oil Sands Innovation Alliance we are exploring advanced energy efficiency techniques with other oil sands producers.



A heavy hauler driver safely navigates around the Shell Albion Sands' Athabasca Oil and Sands Project, Canada.

We have also supported the Government of Alberta's climate leadership plan, which includes a carbon pricing regime, a cap on oil sands emissions, and a reduction in methane emissions.

### WATER USE AND RECYCLING

Oil sands mining operations use water to separate bitumen from the sand and generate steam for utilities. We explore ways to use less water. For example, we work to eliminate steam leaks and to reuse water and steam condensate from the production process. We manage our tailings and the storage systems, such as ponds, to increase the volume of water we recycle and capture and to prevent impacts to local watercourses and groundwater.

In 2016, these various approaches helped us increase water recycling in our mines by almost 8%. Our total fresh water intake for 2016 increased slightly. This was because we needed more water to dilute the higher calcium concentrations in our recycled water, the result of lower-than-average precipitation and snow melting in the region.

## Oil Sands Continued

### TAILINGS TECHNOLOGY

The separation of bitumen from oil sands creates tailings - a mixture of water, sand, clay, residual hydrocarbons, trace heavy metals and other chemicals. These tailings are stored in ponds that allow the solids to settle so the water can be recycled.

The total area used for storing tailings at the Muskeg River and Jackpine mines was around 46 square kilometres at the end of 2016. This is in line with government-approved mine development plans as the tailings areas increase to support ongoing production and to help fill mined areas with solid tailings for future reclamation.

Shell supports the Alberta government Tailings Management Framework, which aims to minimise fluid fine tailings and accelerate the process of reclaiming the land. Over the past decade, we have invested around C\$474 million to develop technologies that speed up the treatment process for fluid tailings. In 2016, we processed around 3.7 million cubic metres of fluid fine tailings at our Albion site.

### INDIGENOUS COMMUNITIES

Shell continues to work closely with indigenous communities in Canada to reduce the impact of oil sands development on traditional land use and culture, while bringing benefits to these communities.

The Canadian Council of Aboriginal Business has certified Shell for its work in aboriginal relations across four areas: employment, business development, community investment, and community engagement. The certification was decided by an independent jury made up of representatives from aboriginal businesses.

One example of our aboriginal engagement in 2016 involved the Fort McKay community advisory group. As part of this collaboration, elders joined us to plant trees at a Muskeg River Mine reclamation site.

Since 2005, Shell has spent nearly C\$1.9 billion with local indigenous contracting companies.

### RECLAMATION

Reclamation is an important part of the development of our oil sands mines. Before mining, the surface soils are removed and stockpiled for future reclamation. We reclaim the land by refilling the mined-out areas with tailings and restoring the contours of the disturbed land. We then replace surface soil and plant native vegetation on the sites.

By the end of 2016, Shell had permanently reclaimed a total of 221 hectares of land and planted almost 1 million trees and shrubs at the Albion mine sites.

In March 2017, Shell agreed to sell to Canadian Resources Limited (Canadian Natural) its 60% interest in the AOSP, accounted for as a joint operation, its 100% interest in the Peace River Complex in-situ assets including Carmon Creek, and a number of undeveloped oil sands leases, all in Alberta, Canada. The consideration is approximately \$8.5 billion, comprising \$5.4 billion in cash and around 98 million Canadian Natural shares currently valued at \$3.1 billion. The transaction is estimated to result in a post-tax impairment loss of \$1.3 billion to \$1.5 billion, subject to adjustments. In a related transaction, Shell and Canadian Natural have agreed to jointly (50:50) acquire Marathon Oil Canada Corporation (MOCC), which has a 20% interest in the AOSP, for \$1.25 billion each. Following these transactions, Shell will continue as operator of the Scaford upgrader and the Quest CCS project. Subject to regulatory approvals, the transactions are expected to close in mid 2017. Subject to closing of these transactions and additional further conditions, Shell may swap its purchased interest in MOCC for a 20% interest in the Scaford Upgrader and Quest. If the swap were to occur, Shell would fully exit AOSP mining operations and have a 20% interest in the Scaford Upgrader and Quest.

### WILDFIRE EMERGENCY RESPONSE

In May 2016, a wildfire spread across around 590,000 hectares in northern Alberta, Canada, triggering a state of emergency and destroying portions of the Regional Municipality of Wood Buffalo, including parts of Fort McMurray near our oil sands operations.

We temporarily suspended the Shell Albion Sands mining operations to focus our resources on the safety of our people and the wider community. This included

feeding and sheltering thousands of people and their pets at our Albion Village work camp, and the safe evacuation of 9,920 displaced employees, contractors and community members took place from Shell's Albion Aerodrome. At about 80 kilometres north of the city, our mining site remained safe and secure from the wildfire. Shell emergency response teams in Fort McMurray provided support to local and provincial fire crews and Shell donated fuel to first responders in the region.

## SHALES

Shales - also known as tight gas and oil - continue to play an important role in meeting global energy demand. We use advanced, proven technologies, including hydraulic fracturing, and follow our operating principles to unlock these resources safely and responsibly.

Tight gas and oil resources are trapped in microscopic pores of dense shale or sandstone rock, normally thousands of metres underground. Hydraulic fracturing has been used for decades in the oil and gas industry to extract tight gas and oil. The process fractures the rock and releases the gas and oil into the well.



The Shell Groundbirch asset, located in Northeast British Columbia, Canada, uses hydraulic fracturing to unlock tight gas trapped in rock underground.

The shales portfolio within Shell's Upstream business is currently focused on the Americas. We see shales as a future opportunity, one that we expect to become a significant growth priority for Shell beyond 2020. In 2016, we reduced spending by 20% but grew our portfolio value by 13%. From 2015 to 2016, our personal safety performance measured as total recordable case frequency, improved by 40% and our process safety events reduced in number by 50%. The number of spills has also reduced by 50%.

## PROTECTING THE ENVIRONMENT WHILE SAVING ON COST

In 2016, we converted the hydraulic fracturing fleet in our Appalachia operations in Pennsylvania, USA, to electric power. In collaboration with oil and gas services company US Well Services, Shell deployed a technology for fracturing that required no diesel fuel. This significantly cut our air emissions and saw a reduction in noise and water use – all while saving costs and improving efficiency and reliability.

## RAISING THE BAR WITH DIFFERENTIATING PRINCIPLES

Shell upholds a set of five global principles, the Onshore Operating Principles, that govern the onshore tight or shale gas and oil activities where we operate and where hydraulic fracturing is used. The principles cover safety, air quality, water protection and use, land use and engagement with local communities. We support regulations that set comparable standards. We review and

update our Onshore Operating Principles as new technologies, challenges and regulatory requirements emerge. In 2016, we updated the Principles to include how we manage any potential induced seismic events from our water injection or hydraulic fracturing activities. There have been no seismic events felt on the surface that were attributed to Shell's onshore operations in the Americas.

## COLLABORATION, INNOVATION AND CONTINUOUS IMPROVEMENT

In our own operations, we continue to take actions to address air quality and control fugitive emissions, reducing the potential for our impact on the environment. We strive to be transparent in our activities and work in partnership with communities and others in the industry to bring about improvements in the sector.

Shell remains an active member and certified operator under the Center for Responsible Shale Development. Through our commitments, we replaced or upgraded valves linked to methane leaks – known as high-bleed pneumatic controllers – that resulted in reduced methane intensity at our Appalachia operations.

Shell continues to participate in the Environmental Defense Fund's "Methane Detectors Challenge", a technology collaboration which focuses on improving the techniques and tools to detect methane leaks. In 2016, we screened several methane detection technologies and have chosen a Canadian facility for a technology pilot.

## DECOMMISSIONING AND RESTORATION

Decommissioning is part of the normal life cycle of every oil and gas structure and must be done safely and responsibly when a facility reaches the end of its life.

When we decommission a well pad, for example, we safely seal the well, remove the production equipment and reinstate the land. We use expertise from the decommissioning industry to help us.

Some of our more complex decommissioning projects take place offshore. For example, our largest decommissioning project to date is the Brent oil and gas field, which lies in the North Sea between Scotland and Norway. Preparation for decommissioning the four Brent platforms, called Alpha, Bravo, Charlie and Delta, started more than a decade ago. During this period, around 300 scientific and technical studies explored the options for decommissioning the Brent field. This included consultation with more than 180 interested parties and an independent review group to help validate the science and engineering. Shell's recommendations for the decommissioning programme include closing down and making safe the four platforms, the wells and the undersea infrastructure. We launched a 60-day public consultation in February 2017 to allow anyone with an interest to access our full recommendations.



There are four platforms in the Brent field - Alpha, Bravo, Charlie and Delta.

In 2015, the UK regulator approved the Brent Delta decommissioning programme to remove the topside of the platform in a single lift. This will be the largest ever lift of its kind offshore, and is planned to take place in the summer of 2017. The topside will be transported onshore where we estimate around 97% will be recycled.

Restoring project sites is also an important element of the decommissioning process. In early 2016, Shell decided to exit the Jinqiu tight gas exploration project in Sichuan province, China. After consultation with the land owners and local authorities, Shell restored the site and established a decommissioning fund, which was used to provide seeds and soil fertiliser. The restoration also included recycling materials to pave a local road and build eight irrigation systems for the community.

## MEASURING THE IMPACT OF EARTHQUAKES IN GRONINGEN

The NAM joint venture operates the Groningen gas field in the Netherlands. Since a significant earthquake in 2012, the NAM has studied the impact of earthquakes associated with the gas production on the residents. The studies have helped the NAM to implement and improve measures that address the impact on the residents.

Since 1963, the NAM joint venture (Shell interest 50%, Exxon-Mobil interest 50%) in partnership with the Dutch government, has operated the Groningen gas field in the Netherlands, one of the largest onshore gas fields in the world.

Regrettably, gas production caused a large number of earthquakes in the area, which have damaged homes and buildings, and caused anxiety for people locally. Various measures are in place for this impact, such as improvements to damage claim handling and a value loss compensation scheme. As a result of the earthquakes, the Netherlands Ministry of Economic Affairs has significantly limited gas production in Groningen since 2014. The measures included production limits in areas where the earthquakes caused the greatest damage and highest social impacts. Earthquakes in Groningen are becoming less frequent. In September 2016, the ministry approved the production of 24 billion cubic metres of gas per year in Groningen until October 1, 2021, and will review these production levels each year.

### IMPROVING QUALITY OF LIFE

Shell supports NAM and the government as they take the necessary steps to improve the situation. This includes ensuring production levels are safe; repairing damage and where necessary strengthening houses; and supporting regional programmes to improve quality of life and economic development. As part of this, NAM is also working closely with local residents and other relevant parties including the National Coordinator for Groningen (NCG), Centrum Veilig Wonen, the Ministry of Economic Affairs and experts on these subjects. The various roles continue to evolve. As an example of this is that on 30 March 2017 NCG announced to introduce a new damage claim system as per 1 July and that NAM will no longer be involved in this process.

During a Dutch Parliament hearing in 2016, the President of Shell Netherlands, Marjan van Laan, apologised to the residents of Groningen. She recognised that Groningen was having to deal with most of the problems caused by the earthquakes, while the whole country had benefited from the gas production with an increase in prosperity.

### SOCIAL IMPACT ASSESSMENT

In order to get an overview of the social impacts of the earthquakes, NAM commissioned Dutch consultants Rayol HaskoningDHV to carry out a social impact assessment in 2015. The report was updated in 2016 and has been published in 2017. The impact assessment provides an



Frits and Ada Indri, who live near the Groningen gas field in the Netherlands, had their house rebuilt to be earthquake-proof after it was severely damaged due to an earthquake.

### External opinion

"In Loppersum, we see the impacts on our inhabitants of the earthquakes caused by gas production every day. There are feelings of powerlessness and anxiety, feelings of being unsafe, struggles with handling the repairs and concerns about the value of private property. Many people feel as if they've lost control of their lives.

The study on the social impact of earthquakes in northeast Groningen has mapped the consequences of living in an earthquake zone. It has become a transparent review of the effectiveness of measures that have already been taken. That's a good start. The challenge now is to improve and complete the measures so that they will help restore trust, which is badly needed. In order to achieve that, we need to move from thinking to acting."

### Drs. Jacolien Masselink

Programme Manager Gas extraction and Earthquakes, Municipality of Loppersum, the Netherlands



understanding of the effectiveness of the steps that have been taken and what should be improved or changed.

The social impact assessment analyses eight themes. These include the damage caused by earthquakes and the way it is acknowledged and restored, and the safety of the residents in northeast Groningen, impact on value of houses and broader economic consequences. From August 2012 until December 2016, 76,694 damage claims were submitted.

Among its observations, the report said there could be financial consequences such as a decrease in the value of properties. There could also be positive consequences such as the creation of new jobs in the construction industry as a result of the repairs and the strengthening of buildings. It also found that there is still room for improvement regarding communications with residents.

The recommendations made in the report have been used to improve measures currently in place such as compensation for damage and temporary resettlement and to develop new research. The University of Groningen and the Delft University of Technology, for example, have researched the health of people living in Groningen and the liveability of the region, building on the findings of the report.

In addition, the report provides a useful overview of the situation at a time when roles and responsibilities are still evolving. NAM's aim with these assessments is to improve the quality of life in the area, by monitoring the effects of the earthquakes in a transparent and structured way.

## OUR PERFORMANCE

Each year, we assess the safety of our operations and our impact on the environment, including our greenhouse gas emissions. We also work closely with communities near our operations to address concerns and we contribute in areas such as local employment and education.



**1.00**

Our total recordable case frequency of injuries and safety incidents per million working hours in 2016



**71**

Our number of operational spills in 2016



**\$102 MILLION**

Spent on voluntary social investment in 2016



## SAFETY

We work to deliver energy responsibly and safely, while looking after our employees, contractors, local communities and the environment. We strive to help improve safety performance throughout the energy industry.

Shell's Goal Zero ambition is to achieve no harm and no leaks across our operations. To accomplish this, we focus on the three areas of safety with the highest risks in our activities: personal, process and transport.

We work relentlessly to strengthen our safety culture and leadership: this means caring for people, and includes a focus on learning from incidents within Shell and other companies.

### 2016 HIGHLIGHTS

- A process safety incident is any leak or spill of hazardous material. In 2016, we achieved our lowest ever total for both Tier 1 and 2 operational process safety events. (See also Safety performance).
- In 2016, we continued to work with contractors to improve our safety performance and learn from incidents. (See also Contractors and suppliers).

## SAFETY LEADERSHIP AND CULTURE

### OUR STANDARDS

Employees and contractors, wherever they work, must meet our safety standards and requirements. We strive to reduce risks as far as is technically and financially feasible, and to minimise the potential impact of any incident. These standards also apply to any joint ventures that we operate.

Shell employees and contractors must follow our 12 Life-Saving Rules, which cover the most critical safety hazards that have caused loss of life in our activities. Since their introduction in 2009, the rules have helped achieve a notable reduction in fatalities and injuries.

### EMBEDDING A SAFETY CULTURE

Shell has made great progress in improving our safety performance and Goal Zero is firmly embedded in all our work. However, incidents and near misses still occur.

We work relentlessly to strengthen our safety culture, focusing on caring for people and leadership commitment. A strong safety culture is complemented by a skilled workforce. We ensure that people responsible for tasks involving a significant safety hazard have the necessary training and skills. Our safety experts work in networks to share and implement best practices around the world.

### LEARNING FROM INCIDENTS

We investigate all incidents and endeavour to learn from them. Since 2014, more than 80,000 employees and contractors have participated in learning sessions that focus on an incident which presented potential risks to safety. Participants discussed how incidents could have been prevented and ways to apply lessons in their line of work.

We also learn from what we call high-potential incidents - incidents with no consequences but which, under slightly different circumstances, could have led to people or facilities being harmed. For example, an analysis of high-

potential incidents in our wells organisation has led to a focus on preventing dropped objects. This has helped to achieve a 40% reduction in high-potential incidents involving dropped objects in 2016.

### CONTRACTOR SAFETY

We employ a large number of contractors who often perform activities with high safety risks. We work with our contractors to ensure they understand our safety requirements and we help them build skills and expertise to improve their safety performance where needed.

Since 2014, executives from Shell have partnered with the chief executive officers of 14 major contracting companies to identify practical steps for safety improvements and strategies for achieving our Goal Zero ambition. The executive pairs have sponsored new safer ways of working in project delivery and facilities maintenance. Senior leaders at engineering company Amec Foster Wheeler and Shell, for example, worked together to simplify safety processes on North Sea platforms.



Crew members consult at the Shelburne Basin deep-water exploration project, Canada

### CARING FOR SAFETY IN NIGERIA

Leaders in Shell recognise that safe assets are often those where people care about one another. This encourages people to intervene in potentially dangerous situations because they want colleagues to be safe.

In Nigeria, for example, we are doing this by dividing our production operations into what we call 50 families - groups of people who work closely together

regardless of role or rank - covering around 8,500 staff and contractors. We are working with around 25 people who have the most influence in each of these families, through discussions and workshops, to help them understand their work culture, reflect on their leadership, and suggest areas of improvement. By the end of 2016, more than half the families had taken part in these workshops, with the rest to follow in 2017.

# Preliminary Public Copy

With our shipping and maritime partners, we have taken steps to improve safety since 2012, including the quality and consistency of their safety management tools. Between 2011 and the end of 2016, the number of serious or potential incidents across Shell Shipping & Maritime's contracted companies was reduced by more than half.

## RAISING INDUSTRY STANDARDS

Shell strives to help improve safety performance throughout the energy industry. We share our safety experience and standards with other operators, contractors and professional groups. These include the International Association of Oil & Gas Producers (IOGP), the American Petroleum Institute and the Energy Institute.

For example, Shell is leading a task force within the IOGP to develop a set of standardised safety requirements in construction projects in the oil and gas sector.

## SAFETY IN DEEP WATER

Shell has a long history of working safely in deep water - that is, offshore oil and gas production at depths greater than 300 metres. Today, technological advances enable us to work in water up to 10 times that depth.

At Shell, we continually review our procedures to keep our deep-water operations safe and reliable. These include the onshore surveillance of wells using advanced sensors that measure ocean conditions, and high standards of training.

For example, our training centre in Louisiana, USA, has equipment that replicates conditions on an offshore deep-water platform. Operators are trained in global and US health, safety and environment procedures. In Nigeria, our focus on deep-water training has helped launch the first generation of Nigerian energy engineers.

## OIL-SPILL RESPONSE

We regularly test our oil-spill emergency response procedures and capability to ensure employees and contractors can respond rapidly to an incident. We continue to work with the oil and gas industry to further develop effective oil-spill emergency response capabilities.

During drilling operations, we gather and analyse information about deep-water wells to better understand the geology of the area. Realtime pressure and temperature sensors track conditions so that we can immediately detect any changes. Shell-operated drilling activities are monitored from a global network of onshore operating centres which allows oversight and timely technical support.

## External opinion

"Simply sharing incident information with people is not enough for effective learning. We need to understand more about exactly how adults learn from incidents. With this in mind, Shell and the UK industry body Energy Institute sponsored us to observe Shell employees at refinery sites in the UK and Canada.

## "We pinpointed a critical learning stage that's often missed"

We pinpointed a critical learning stage that is often missed: considering how incidents specifically relate to your line of work and how you can adapt your practices to prevent future incidents.

We developed a toolkit that encourages reflection and allows sites to improve the measurement of incidents. The Open University is now working with Shell to investigate the impact on learning of informal communication networks, such as talking with colleagues on site, and other ways to improve the flow of incident information for safer working."

### Allison Littlejohn

Professor of Learning Technology and Academic Director of Digital Innovation, The Open University, UK



## SAFETY PERFORMANCE

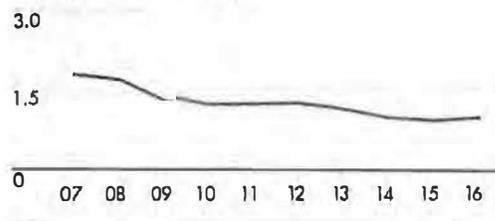
### PERSONAL SAFETY

Everyone who works for us, or with us, has an important part to play in making Shell a safer place to work. We are aiming for more than a culture of compliance, one in which people feel listened to and cared for. Our aim is to have a more motivated, productive, healthier and safer workforce.

For example, at the Pernis refinery in the Netherlands, we have worked on creating a positive work culture, where ideas from workers are welcomed, rewarded and implemented when feasible.

### Total recordable case frequency (TRCF)

injuries per million working hours



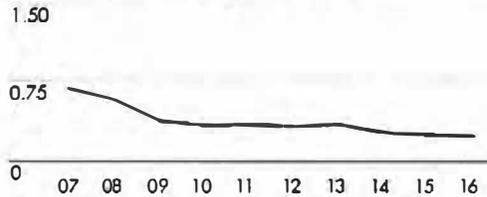
## Safety Continued

We run an annual safety day that gives our employees and contractors the opportunity to learn how they can manage the safety hazards in their work and share ideas with each other.

Overall, in 2016, following steady and significant improvements in our safety performance over the past decade, the number of injuries per million working hours – the total recordable case frequency – has increased slightly compared to 2015. We achieved our lowest ever

### Lost time injury frequency (LTIF)

injuries per million working hours



### PROCESS SAFETY

A process safety incident is any leak or spill of hazardous material. Process safety management is about keeping our hazardous substances in the pipes, tanks and vessels so they do not cause any harm to people or the environment. It starts with designing and building projects and is implemented throughout the life cycle of these facilities to ensure they are operated safely, well-maintained and regularly inspected. With our technical and operational safety standards, we aim to avoid the release of hazardous material, and minimise the consequences if any releases do occur. If an incident occurs, we investigate and learn from it.

We make sure that we have the necessary resources to deal with spills, leaks, fires and explosions. Our emergency-response plans are routinely tested and improved after simulation exercises.

In line with industry standards, we measure and report according to the significance of the incidents, with Tier 1 as the most significant. In 2016, we achieved our lowest ever total for both Tier 1 and 2 operational process safety events. There were 39 Tier 1 events in 2016, compared to 51 in 2015 and 107 Tier 2 events in 2016.

### ROAD SAFETY

Traffic accidents claim around 1.25 million lives every year, according to the World Health Organisation. Shell is working to ensure our employees and professional drivers have the best safety skills possible and behave responsibly on the road. Our approach to road safety applies to all the countries where we operate.

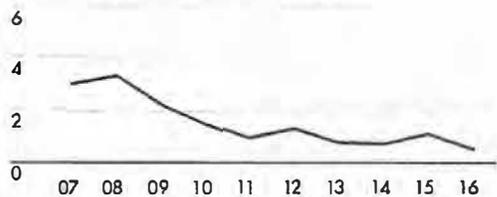
Since the introduction of our first global driver safety programmes in 2008, there has been a significant decline in fatal road incidents across Shell. We sadly

level of injuries that led to time off work in 2016, measured as last time injury frequency.

Our fatal accident rate – the number of fatalities per 100 million working hours – decreased in 2016 to the lowest ever level, but we still need to do more in this area. Sadly, three people lost their lives while working for Shell in 2016.

### Fatal accident rate (FAR)

fatalities per 100 million working hours



compared to 169 in 2015. This is a reduction of more than 30% compared to last year.

Process safety events related to sabotage and theft in Nigeria are recorded separately. There was an improvement during 2016 with fewer incidents: 17 Tier 1 and 0 Tier 2 events, compared to 28 Tier 1 and 17 Tier 2 in 2015.

In 2016, the four most significant operational incidents were:

- a fatality at our Fox Creek operations in Canada;
- a gas release at the Moerdijk chemical plant in the Netherlands;
- a gas release from the offshore wellhead pipeline in India; and
- a crude oil spill from a subsea flow line in the USA.

### TRANSPORT SAFETY

Moving large numbers of people, products and equipment by road, rail, sea and air brings safety risks with it. We work closely with specialist contractors and industry bodies to find ways of reducing these risks.

recorded one road fatality in 2016, when one of our contractors was involved in a vehicle rollover at our GGC venture operation in Australia.

Outside our own operations, we also work to improve road safety through social investment in communities. Shell Malaysia, for example, has worked to improve road safety culture for nearly 60 years and its current campaign, the Shell Road Safety Movement, targets school children, college students and local communities.

## SECURITY

The management of security risks is part of our efforts to protect our staff and contractors, communities and the environment.

In line with our goal of no harm to people, we carefully assess the security threats and risks to our operations. We work with governments and partners to safeguard our assets and provide a secure working environment for our employees and contractors.

Shell only uses armed security in countries where the threats are most severe, or if it is a requirement under local laws. Greater threats are mostly due to increased geopolitical volatility in certain parts of the world.

### HUMAN RIGHTS AND SECURITY

We create security risk management plans as part of our aim to prevent harm to communities and the environment. We work alongside governments, companies and non-governmental organisations, which are involved in the Voluntary Principles on Security and Human Rights (VPSHR) initiative, to increase adoption of the principles.



An employee enters security gates at the Shell offices in Doha, Qatar.

Our security plans are validated by independent audits and assurance checks.

For more details on how we implement these principles see our VPSHR report.

## ENVIRONMENT

We carefully consider the potential environmental impact of our activities and how local communities might be affected during the lifetime of a project.

### HIGHLIGHTS IN 2016

- In 2016, we reduced the direct greenhouse gas emissions from facilities that we operate to 70 million tonnes on a CO<sub>2</sub>-equivalent basis. We also reduced our flaring from 11.8 million tonnes CO<sub>2</sub>-equivalent in 2015 to 7.6 million tonnes in 2016. (See also Our greenhouse gas emissions, Flaring).
- We had 71 operational spills in 2016, down from 108 in 2015, continuing year-on-year improvements in this area since 2006.
- The International Union for Conservation of Nature (IUCN) Niger Delta Panel - focused on enhanced remediation techniques and protection of biodiversity at sites affected by oil spills in Shell Petroleum Development Company's (SPDC) areas of operation in the Niger Delta - completed its work in 2016. (See also Environmental partners, Our activities in Nigeria).
- We joined the Climate and Clean Air Coalition Oil & Gas Methane Partnership in early 2017 to continue making progress on methane management. (See also Managing methane emissions).

### OUR STANDARDS

We aim to comply with all environmental regulations, continually improve our performance, and prepare for future challenges and opportunities. We use external standards and guidelines, such as those developed by the World Bank and the International Finance Corporation, to inform our approach.

Our global environmental standards include a focus on managing our emissions, minimising our use of fresh water and conserving biodiversity. Within our operations, we also focus on reducing our energy use, flaring less gas and preventing spills and leaks.

When planning new projects, we carry out detailed assessments of the potential environmental, social and health impacts. These assessments help us manage and reduce impacts on the environment and communities during construction, operation and, when relevant, decommissioning.

We require major installations including refineries, chemical plants, gas plants and permanently stored oil and gas production facilities to certify their environmental management system to an internationally recognised standard, such as ISO 14001, which sets out the criteria for environmental management systems.

### MANAGING ENVIRONMENTAL IMPACTS IN IRAQ

Shell is the operator of Majnoon, one of the world's largest oil fields (Shell interest, 45%). In 2016, Majnoon was certified to ISO 14001, making Shell the first international oil company to achieve this certification in the country.

The UNESCO World Heritage Committee has recognised the area of the Mesopotamian marshes

north of Majnoon as a World Heritage Site. Shell works with conservation organisations such as Wetlands International and IUCN, as well as local stakeholders and international consultants, to ensure projects are developed in a way that avoids negative impacts.

### SENSITIVE AREAS AND OCEANS

We seek to understand and respond to any potential impacts our activities may have on biodiversity or ecosystem services. This covers the benefits, such as food and clean water, which people or businesses derive from ecosystems.

We develop biodiversity action plans when operating in areas that are rich in biodiversity, areas also known as critical habitats. These assess and mitigate the impact of our plans on local biodiversity and dependent communities. We partner with major conservation organisations to understand how to protect these critical habitats and the benefits that people derive from them.

#### PROTECTING OCEANS

Increased industrial activity in seas and oceans around the world is leading to environmental concerns. Marine spatial planning - a process which identifies natural resources and habitats in an area and plans how best to use them - is increasingly being used to improve decision-making where competing human activities occur. This includes managing the effects on the marine environment of fisheries, shipping and oil and gas exploration.

For example, Shell is supporting an initiative in Gabon where the government and the Wildlife Conservation Society are working to create Gabon Bleu. This will create protected marine areas, zones for traditional fishing methods, and sites where oil and gas activity and conservation coexist. Shell is providing data, information and expertise.

We are also working with scientists to explore the depths of the ocean. Our Stones deep-water project in the Gulf of Mexico, USA, for example, will share the data we collect from sensors with marine scientists. Shell is also a member of the International Association of Oil and Gas Producers (IOGP) Joint Industry Programme on Sound and Marine

Life. This supports research to help understand and mitigate the effects of sounds on marine life generated by oil and gas exploration and production activity. The research helps the industry reduce its impact on the environment by, for instance, developing software to detect marine mammals near seismic operations.

#### NATURAL CAPITAL

Natural capital is the value of nature to people, society, businesses, and the economy. The concept of natural capital - and measuring, valuing and accounting for it - is evolving and a topic of interest to many, including governments, non-governmental organisations, financial institutions and businesses.

Shell is involved in several initiatives to learn more about natural capital, including its measurement and valuation, and to better understand its potential applications. Natural capital assessments can provide extra insights into Shell's impact and dependency on the environment to help us manage this in a sustainable way and inform our business decisions.

In June 2015, we joined the Natural Capital Coalition, that brings together a broad range of global stakeholders, including organisations from business and finance, government, academia and civil society. As a member of the technical group developing the Natural Capital Protocol, a framework designed to help companies include natural capital in their decision-making, we have offered insights into how the Protocol could help businesses. Shell, with the support of our environmental partner IUCN, is one of the companies piloting the Natural Capital Protocol. We are part of a working group within IPIECA, the global oil and gas industry association for environmental and social issues, looking at water valuation, and exploring its application for the oil and gas sector.

#### CONSERVATION IN CANADA

Where our operations have affected biodiversity, we take measures to restore habitats or ecosystems. For example, at our oil sands mining operations in Canada, we are reclaiming the land as it becomes available. This means returning the land to conditions similar to those before mining, providing habitat for wildlife and plants, and supporting traditional activities such as hunting and berry picking. In 2016, Shell Alberta Sands reclaimed 34.8 hectares of land. Our work in this area has been recognised by the Wildlife Habitat Council, an international non-profit

organisation that promotes and certifies habitat conservation and management on lands owned by companies.

Elsewhere in Canada, Shell has donated its exploration rights to an area of more than 860,000 hectares in the waters of Baffin Bay to the Nature Conservancy of Canada. This supports government and Inuit aspirations to expand a proposed conservation area off the coast of Nunavut, a territory in northern Canada.

## ENVIRONMENTAL PERFORMANCE

We improved or maintained our environmental performance across many business areas during 2016. This was due to operational improvements as well as reduced activity and divestments. Details about our environmental performance are provided below and under the greenhouse gas emissions, managing methane emissions and flaring sections.

### MANAGING WATER USE

The availability of fresh water is a growing challenge in some regions of the world. We manage our water use responsibly, and because water constraints tend to affect people at the local or regional level, we tailor our use of fresh water to local conditions.

In water-scarce areas, we develop water management plans. These plans describe the long-term risks to water availability and define measures to minimise our use of fresh water or recommend alternatives to fresh water, such as recycled water, processed sewage water and desalinated water. Waste water from our operations is treated before it is released into the environment. Where appropriate, we look for ways to treat waste water using natural solutions such as constructed wetlands. This also helps us to reduce the energy use associated with water management.

In Doha, Qatar, for example, our research and technology centre is working on a pilot programme to test whether constructed wetlands can remove chemicals from water generated as a by-product of oil and gas production. At our joint venture operations in the Omani desert, we use reed beds to naturally clean the water that is extracted alongside oil production.

We are also involved in a number of working groups with different organisations, such as the World Business Council for Sustainable Development and IPIECA.

In 2016, our intake of freshwater increased to 195 million cubic metres of fresh water, compared to 186 million cubic metres in 2015, mainly due to higher water demand in our oil sands mining operations. Around 65% of our fresh water consumption was for manufacturing oil products and chemicals and a further 22% was used by oil sands mining operations.

### Internal opinion

"Our global centre of excellence for water at the Shell Technology Centre in Bangalore allows us to share ideas, innovations and technologies across Shell to improve our water efficiency. For example, we develop technologies that enable the reuse and recycling of fresh water to manage our water footprint in a responsible way while meeting environmental standards. Shell participates in a joint industry project with partners including the Dutch government and universities to find new ways of using saline water to minimise freshwater intake.

### "We map where fresh water is scarce"

We also map where fresh water is scarce to understand the tension between freshwater demand and supply. This helps us improve our knowledge of the subsurface to manage our use of fresh water in our facilities.

Having a better understanding of the ways water and hydrocarbons separate helps us design projects more efficiently and improve our environmental footprint.

Shell continues to explore ways to reduce the potential cost of water risks to our facilities. With advanced chemistry and engineering, we can improve our current performance in line with best practice and prepare for future legislation."

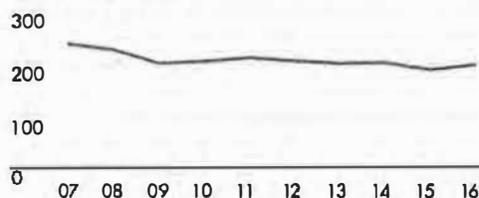
**Albert Janssen**

Manager Water Technology, Shell, Bangalore, India



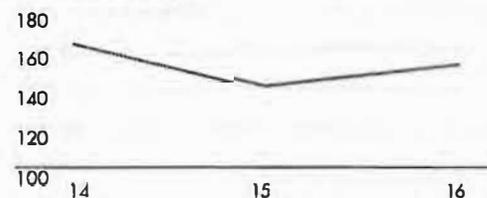
### Fresh water withdrawn

million cubic metres



### Fresh water consumed

million cubic metres



## Environment Continued

### SPILLS

Shell has clear requirements and procedures in place to prevent operational spills. We have routine programmes to maintain our facilities and pipelines, and improve their reliability, in order to reduce operational spills. However, spills still occur for reasons such as operational failure, accidents or unusual corrosion.

There were 71 operational oil spills in 2016, down from 108 in 2015. The volume of operational spills of oil and oil products in 2016 was 0.7 thousand tonnes, 11% less than in 2015.

The number of spills caused by sabotage and theft fell to 46 from 94 in 2015. The volume of these spills decreased to 1.4 thousand tonnes in 2016 from 2.2 thousand tonnes in 2015. In 2016, sabotage and oil theft remained a significant cause of spills in the Niger Delta, Nigeria.

We investigate and learn from all spills to improve our performance and we clean up the areas near our operations that are affected by spills, irrespective of the cause. As of the end of March 2017, there were five spills under investigation in Nigeria that may result in adjustments to our figures.

### ENERGY EFFICIENCY

One of the ways we manage our greenhouse gas (GHG) emissions is to work on improving the energy efficiency of the facilities we operate. The main metric that we use to measure our energy efficiency is energy intensity – that is, the amount of energy consumed for every unit of output.

Shell produces GHG and energy management plans with annual updates for Shell-operated facilities that account for more than 50,000 tonnes of GHG emissions per year, and for each proposed project that will account for more than 500,000 tonnes of GHG emissions per year.

These plans must include the sources of GHG emissions, as well as a forecast of expected emissions at the site for at least 10 years, and it must outline options for improving energy efficiency or reducing emissions.

Some of the ways Shell improved energy efficiency include making our equipment more reliable through maintenance, by smart scheduling of maintenance activities or by installing more energy-efficient equipment.

The overall energy intensity index of our chemical plants and refineries in 2016 was similar to the year before. For our chemicals plants, it improved slightly to 91.0 in 2016, compared to 91.6 in 2015. For our refineries, it was unchanged at 95.4.

### External opinion

"In 2006, the Rotterdam district of Hoogvliet started exploring the idea of using waste heat from the nearby Shell refinery in Pernis for its district heating network. Eventually there was a plan that was technically feasible, but not economical because of the raise of the foreseen investments.

### "Sending heat from the refinery to the city"

The breakthrough came when we visited the MiRO refinery, which supplies heat to the city of Karlsruhe, Germany. As supplier of waste heat heating company, there were two important insights for us. You should not recover waste heat from the primary production process of a refinery. And, as partners, you should start with the solutions that are relatively easy to realise, technically and for your organisation. Because of the security of supply of the current heat transport network from Pernis, Warmtebedrijf Rotterdam is looking for a second heat supplier. In 2016, we signed a contract with Shell and expect to start taking heat from the Pernis refinery at the end of 2018."

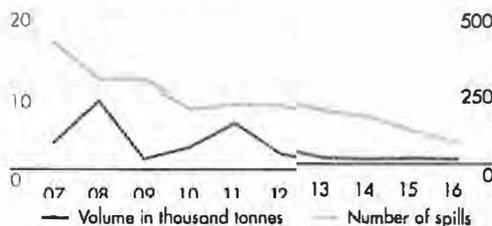
### Co Hamers

Director, Warmtebedrijf Rotterdam, Rotterdam, Netherlands



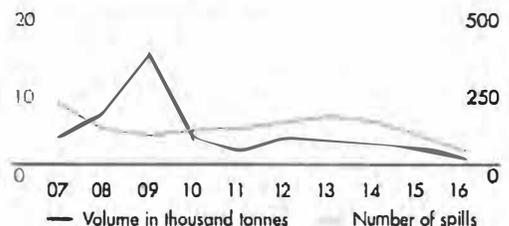
In 2016, chemical plants and refineries continued to focus on operational improvements, including how to reduce unplanned shut downs, which require significant amounts of extra energy to start up again. Together, these measures had a cumulative effect on the amount of energy we use to produce energy and chemical products, and ultimately our energy intensity. For example, the combined heat and power plant at our Bukom refinery and chemical plant in

Spills - Operational [A]



[A] Over 100 kilograms.

Spills - Sabotage [A]



[A] Sabotage and theft-related spills over 100 kilograms.

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Singapore had its first full year of operation in 2016. It is expected to reduce total energy consumption at Bukom by between 4% and 5%, saving more than 200,000 tonnes of CO<sub>2</sub> a year. Other sites have strengthened the integration and monitoring of energy efficiency in their daily operational routine, ensuring that energy use is optimised.

In our oil sands operations, energy intensity improved to 5.5 gigajoules in 2016, from 5.8 gigajoules for every tonne of production in 2015, due to improvements in operational efficiency. This was our best result in nearly a decade. Combined with Quest carbon capture storage, we reduced the GHG emissions intensity from oil sands activities by more than 15%.

In 2016, the overall energy intensity for the production of oil and gas in our Upstream and Integrated Gas businesses (excluding liquefied natural gas and gas-to-liquids) worsened compared with 2015, mainly due to inclusion of former BG assets in our portfolio. We expect it will be difficult to maintain the energy-efficiency levels of recent years, as existing fields age and new production comes from more energy-intensive sources. This may increase our upstream energy intensity over time.

Our Downstream and Upstream operations are learning from each other to improve performance. For example, our energy-efficiency surveillance tool enhances real-time data availability enabling corrective actions to become part of a daily routine. The tool was developed by Downstream, and was deployed at our offshore oil and gas field Bonga, Nigeria (Shell interest 55%), in 2015. In 2016, it was implemented at other sites in Nigeria, Norway and the UK, and plans are in place for Malaysia.

## AIR EMISSIONS

We track emissions released into the atmosphere from our upstream and downstream facilities and work to reduce air pollution from our operations. This includes making investments to lower our emissions of nitrogen oxides, sulphur oxides and volatile organic compounds that are released during oil and gas production and processing. These pollutants can affect air quality in the areas where we operate. We evaluate and take action to mitigate potential adverse impacts of our emissions.

Our sulphur oxides emissions in 2016 continued to fall compared to the previous year.

Our nitrogen oxides emissions increased from 104 thousand tonnes in 2015 to 122 thousand tonnes in 2016. The increase was primarily driven by the inclusion of former BG facilities in our portfolio.

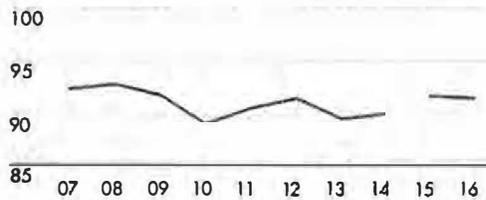
Our emissions of volatile organic compounds (VOCs) increased to 146 thousand tonnes in 2016 compared with 125 thousand tonnes in 2015. This was mostly due to an increase of venting at our facilities in Majnoon, Iraq. We expect our VOC emissions to decrease in the coming years as a result of our efforts to reduce flaring and venting.

## WASTE

We aim to reduce the amount of waste we generate and to reuse or recycle materials, wherever possible. For example, in 2016, nine of our downstream manufacturing sites sent more than 50% of their waste generated during the year for recycling or reuse. Of these nine, five sites sent for recycling and reuse over 80% of their waste.

### Energy intensity - Chemical plants

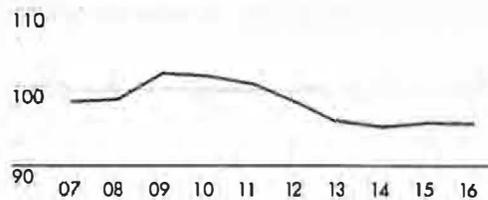
chemicals energy index [A]



[A] CEI calculation methodology changed in 2015; therefore, data for prior years are not directly comparable.

### Energy intensity - Refineries

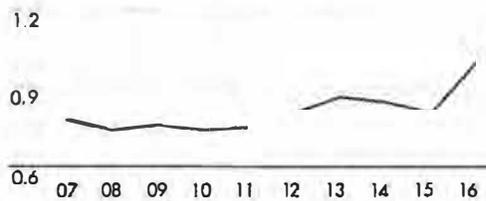
refinery energy index [A]



[A] Indexed to 2002; based on 2006 Solomon EITM methodology.

### Energy intensity - Upstream

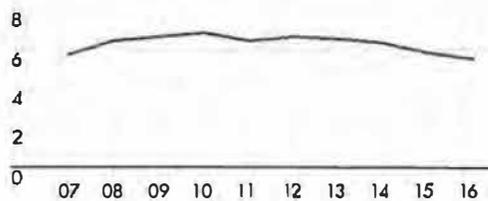
(excluding Oil Sands and GTI)  
gigajoules/tonne production [A]



[A] 2012-2016 data are reported in accordance with IPECA/API/OGP guidance 2010.

### Energy intensity - Oil Sands

gigajoules/tonne production [A]



[A] Includes mining and upgrading operations.

## SOCIAL PERFORMANCE

Many of our operations are located close to communities. We work with them to understand their priorities and concerns. Managing our impact on people is essential to being a responsible company.

### HIGHLIGHTS IN 2016

- Shell co-funded pilot projects in China with the Global Alliance for Clean Cookstoves to give 250,000 households access to clean cooking fuels. (See also Investing in communities)
- Entrepreneurs behind a Shell LiveWIRE-funded UK start-up, which gives communities in Africa access to safe drinking water using profits from the sale of bottles, pitched their idea to the US President. (See also Investing in communities)
- Shell successfully completed the resettlement of around 1,850 people close to operations in Kazakhstan after consulting with local communities. (See also Investing in communities)

Our projects and operations can impact our neighbours. Our social performance team, working with environmental specialists, assesses and manages the impact of Shell's business to ensure that work is carried out in a responsible way. The team also contributes to building skills in the communities where we operate by supporting education and training programmes, and by encouraging the development of local businesses.

We apply both local laws and the principles of international law in our work. Shell's Control Framework uses international standards as a benchmark, such as those set out by the International Finance Corporation.

### ASSESSING OUR IMPACT

Shell conducts an environmental, social and health impact assessment for all major projects to understand the positive and negative effects that the project is likely to have on the surrounding environment and the local communities. Shell's internal specialists as well as consultants and scientific advisors help project teams understand the impact on land, livelihood and culture, to respect human rights, and to interpret and apply local and international standards.

## LISTENING AND RESPONDING

Respectful engagement with local communities is critical to the success of projects and long-term operations. We need to understand the priorities and address the concerns or grievances people may have.

We have implemented community feedback mechanisms at all of our operations and projects to receive, track and respond to questions and complaints from community members. This enables us to capture and resolve concerns quickly in a transparent way, and to track our performance.

In South Korea, for example, the local community was concerned about noise levels from the construction of the Prelude floating LNG plant. Shell responded by installing industrial silencers to reduce disturbance from the shipyard.

The large Rhineland refinery in Germany is situated close to urban areas. Before the construction of a railloading facility, the refinery consulted with communities living next to the railway track. Initially, more than 400 people raised concerns mainly about noise from the additional transport.

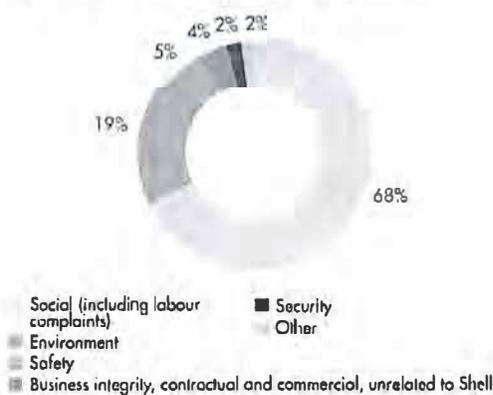
As a result of the engagement, Shell decided to use a fleet of low-noise freight wagons with silent brakes. The solution was accepted by the community and supported by the municipality. In September 2016, construction was completed without further complaints from the community.

### COMMUNITY FEEDBACK IN 2016

Shell uses data from our community feedback mechanisms as a performance indicator at both the local community and global levels. Community complaints are registered in different categories to identify common issues across Shell and share knowledge on how they were resolved.

Complaints are recorded and consolidated on a quarterly basis to track performance of complaint management in a timely manner. In 2016, the profile of complaints was consistent with the previous three years, in which the largest number of complaints received related to social and environmental issues. Concerns about local job opportunities, allocation of benefits from social investment and the impact of our operations on people's land, property or livelihoods comprise most of the social issues. Most environmental complaints are related to nuisances, such as noise, odours or dust.

### Total complaints received in 2016



### RESETTLEMENT

Our operations sometimes require temporary or permanent access to areas of land or sea where people are living or working. Where resettlement is unavoidable, we work with local communities to help them relocate and maintain, or improve, their standard of living. If necessary, we support them as they establish alternative livelihoods.

As a result of the acquisition of BG, Shell became joint operator of Karachaganak Petroleum Operating BV (KPO, Shell interest 29.25%) in north-west Kazakhstan. In 2015, the government approved an expansion of the safety perimeter around the Karachaganak field, which required two villages to relocate. Led by the regional government and funded by KPO, around 1,850 people from these villages were resettled in line with international best practice.

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In late 2015, the first 82 households were successfully resettled to new housing and compensated for moving costs and loss of assets. In the second phase of resettlement, we are working with the government to ensure that the remaining 373 households from the village of Berezovka have comparable or better housing and that their livelihoods are restored. Shell has funded the construction of a new school and kindergarten where half the places are available to local residents. We continue to consult with affected people, local leaders and representatives to ensure they thrive in their new location.

## INDIGENOUS PEOPLES

Our activities in certain parts of the world affect indigenous peoples who hold specific rights for the protection of their culture, traditional way of life and special connections to lands and waters.

In line with Shell's General Business Principles, and in support of the UN Declaration on the Rights of Indigenous Peoples, our approach is to continue seeking the support and agreement of indigenous peoples potentially affected by our projects. We do this through mutually agreed, transparent and culturally appropriate consultation and impact management processes. It requires open dialogue, good faith negotiations, and, where appropriate, the development of agreements that address the needs of indigenous peoples.

We recognise the principle of free, prior and informed consent, as interpreted by the International Finance Corporation Performance Standards, as a safeguard for indigenous peoples' rights. We believe our approach is consistent with the application of this principle, while respecting the laws of the jurisdictions in which we operate.

For example, in Russia's Far East Sakhalin Island, Sakhalin Energy (Shell interest, 27.5% minus one share) signed its third Sakhalin Indigenous Minorities Development Plan (SIMDP) for 2016–2020. Under the plan, decision-making about the selection of projects to support economic and social development involves elected indigenous representatives. The plan is implemented in partnership with the Sakhalin regional government and the Regional Council of Indigenous Peoples. Over the past decade, more than 500 projects have been developed and approved for implementation under the plan, such as wood carving workshops and fishing schools.

## Internal opinion

"The cultural heritage resources of Majnoon in Iraq and the surrounding marshes provide an interesting chapter in the human story. It was here in southern Mesopotamia that humanity witnessed a marked rise in social complexity that led to the development of cities, social classes, writing and craft specialisation. Our archaeological work at Majnoon aims to uphold Shell's commitment to social performance by integrating the protection of cultural heritage into the development of one of the world's largest oil fields. We were hired to bring global expertise in cultural heritage management. We work to follow international best practice under the International Financial Corporation's Performance Standards for cultural heritage because the protection of cultural heritage is the responsible and right thing to do."

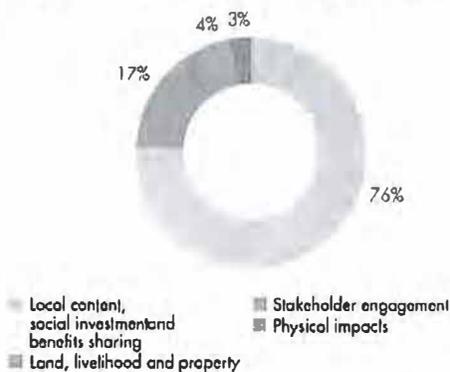
**"Protecting cultural heritage is the right thing to do"**

Matthew Whincop  
Whincop Archaeology PTY Ltd., Director, Australia

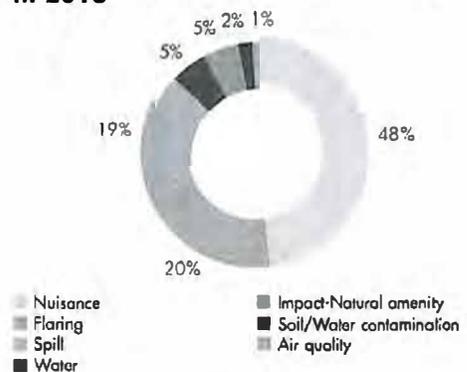


In 2014, Bolivia changed compensation for new hydrocarbon projects on collective indigenous land and farmland. This meant that a fixed percentage of the cost of the activity should be invested in social programmes. Previously, regulations required companies to compensate through cash payments. The following year, the then BG campaign to explore for oil and gas in the Huacareta oreo was the first project to apply this new regulation. Initially, local communities had opposed the move away

## Social complaints received in 2016



## Environmental complaints received in 2016



## Social Performance Continued

from cash compensation. Over the past two years, the local Shell team has worked to establish a relationship with these communities and identify and implement social projects that meet community needs and objectives. These programmes focused on technical assistance for agriculture and livestock improvement. Shell is in the process of obtaining the environmental licence to launch the new phase of exploration in Bolivia, which is expected to begin in 2017.

### CULTURAL HERITAGE

Cultural heritage can be represented in tangible form, such as treasured artefacts, or as intangible attributes, such as language and traditions. It may have great value for past, present and future generations. Our specialists work to preserve cultural heritage near our operations.

Shell is the operator of the Majnoon oil and gas field in Iraq. The field is the site of rich cultural heritage due to its proximity to an area considered the cradle of civilisation. In 2016, Shell – in consultation with the Ministry of Antiquities – identified two additional archaeological sites to the 10 previously identified. All sites are recorded in Shell's geographic information system. In 2017, they will be formally registered with the Ministry of Antiquities and artefacts will be handed over to the Basra Museum.

## INVESTING IN COMMUNITIES

Investing in the communities where we operate enables local people to participate in the benefits that industrial development can bring, and is central to the way we do business. We develop social investment projects that are closely aligned with our business.

In 2016, following the integration of BG, we reflected on our social investment strategy and made science, technology, engineering and mathematics (STEM) education one of our three core themes, with the aim of making a more positive impact on future generations through education. The key global social investment themes are:

- access to energy;
- boosting local skills and enterprise; and
- STEM education.

Shell teams can also implement local programmes on other community topics, such as conservation, road safety and health, that are connected to our business.

### ACCESS TO ENERGY

More than 1.1 billion people in the world have no electricity – and a billion more only have access to unreliable and unsafe power networks. Nearly 3 billion people rely on solid fuels for cooking. The ability to obtain reliable and safe energy enables economic and social development, and improves the health, education and livelihoods of people around the world. At Shell, we apply our core business skills and technical resources to bring energy to communities that need it and where we have a presence.

In the Philippines, through the Pilipinas Shell Foundation, we funded a micro-grid that uses hydropower and solar energy to power an indigenous village in Palawan. It provides the local Botak tribe with a continuous electricity supply. In 2016, we launched another micro-grid programme for a fishing community, mainly using wind, backed up by solar and diesel.



Shell teams held an open house with community members in Huacoreta as part of a social project in Bolivia.

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In Nigeria, we created an independent, not-for-profit company to help establish the market for off-grid renewable energy in the country. Together with its partners, the company will provide investments and technical support to address energy poverty in unserved and underserved communities.

## BOOSTING LOCAL SKILLS AND ENTERPRISE

Shell supports the building of new businesses to generate local employment and our LiveWIRE programme helps entrepreneurs turn their ideas into reality. The programme is active in 15 countries where we operate. In 2016, 7,889 people took part in LiveWIRE and small business development programmes, and 351 businesses were established.

Shell LiveWIRE Nigeria awarded around \$124,000 in business start-up funding to 50 budding young entrepreneurs from Ogoniland who successfully completed its enterprise development programme. The entrepreneurs will use their funding to start a wide range of businesses in areas such as palm oil processing, poultry farming, solar energy and waste paper recycling.

LiveWIRE entrepreneurs continue to have an economic and social impact. In 2016, five years after Shell funded their British start-up, entrepreneurs behind the GiveMeTop bottle venture pitched their idea to US President Barack Obama. GiveMeTop gives communities across Africa access to clean, safe drinking water, through pumps installed using profits from the global sales of drinking bottles. President Obama then personally selected the company as part of a Google initiative to promote entrepreneurs.

In Saudi Arabia, where LiveWIRE is called Intilaqah, Shell trained 823 participants in 2016 - 57% of whom were women - and supported the start-up of 69 businesses.

## External opinion

"We are a consumers' club supporting local agriculture by purchasing organic products from producers. The LiveWIRE programme was essential to establishing my company's roots and preparing it for business and the market."

## "LiveWIRE helped prepare my idea for market"

There is a strong network among the entrepreneurs offering knowledge and connections, facilitated by the programme staff. The *Shell Iniciativa Jovem LiveWIRE Brazil* programme also helped me control my anxiety about my professional life. Ultimately, it allowed me to take an idea, put it into perspective and turn it into a successful and structured project."

### Victor Piranda

Entrepreneur - Winner of LiveWIRE Brazil award, Clube Orgânico, Rio de Janeiro, Brazil



## CLEAN COOKSTOVES

Shell is one of the founding partners of the Global Alliance for Clean Cookstoves, a public-private partnership that helps to create a thriving global market for clean and efficient household cooking solutions.

Since 2010, we have pledged \$12 million to the alliance and provided in-kind support on leadership, business and technical skills. We have also contributed half of the alliance's Spark Fund, a grant facility that supports the development of clean cooking enterprises globally.

Shell's support to the alliance builds on the work of Shell Foundation, an independent charity that helped to set up the Alliance, together with the UN Foundation and US State Department.

In 2016, Shell co-funded seven pilot projects in China to explore a more market-driven approach to promoting clean cookstoves and fuels. This helped 75 new fuel distributors start up and gave 250,000 households access to clean cooking fuels. In India, we



The alliance's goal is for 100 million households to gain access to clean and efficient cookstoves and fuels by 2020.

sponsored a workshop for 14 cookstove and fuel businesses to help them grow in a sustainable way and support their applications for future funding.

By the end of 2016, the alliance and its partners had distributed around 53 million clean stoves. The target is to reach 100 million households by 2020.

## Social Performance Continued

### LOCAL GOODS AND JOBS

Shell also invests in communities through local employment, buying goods and services from local sources and by supporting the economic development of the community.

We prioritise buying goods and services from local suppliers that meet the standards we require. In some cases, we support local businesses and skills development to meet these standards. In 2016, we spent more than \$45 billion on goods and services worldwide, of which around 64% was in Canada, Nigeria, the Netherlands, the UK and the USA. In 2016, Shell spent \$4.4 billion on goods and services from local companies in countries with a gross domestic product of less than \$15,000 a year per person.

In the UK, for example, Shell's Upstream business spent around 47% of its contracting budget with UK companies. Around 26% of this was spent with companies based in Scotland and 21% with companies based in England and Wales.

The Nyhamna Expansion in Norway was one of Shell's biggest brownfield projects in 2016. Here, we worked with the main contractor on the project to enable local and regional small- and medium-sized companies to compete, by developing capabilities and a supplier network. Our analysis shows that more than 80% of our spending was on Norwegian content in the project and more than \$58 million of total investment in businesses in central Norway. Overall, this involved more than 150 Norwegian companies.

### STEM EDUCATION

Engaging children in STEM is a vital step to inspiring them to become future engineers or scientists. Shell has STEM programmes in 16 countries, including the USA, UK, Brazil, and the Netherlands.

In Brazil, we introduced a STEM education programme for less privileged children in 14 public-sector middle schools in the Rio de Janeiro and Rio Grande do Sul states. The project started in 2012 and provides teacher training, teaching aids and resources. Around 6,000 students

(6–14 year-olds) and 130 teachers have taken part every year.

In the UK, Shell has invested more than £1 million since 2014 in a programme called Tomorrow's Engineers, which aims to give 11–14 year olds engineering experience with employers. With Shell's investment, Tomorrow's Engineers has launched a new school programme – Energy Quest – to help students explore the science and maths curriculum in a fun and engaging way. At the end of 2016 more than 35,000 students had participated. The Shell-sponsored Girls in Energy programme is also helping to remove barriers to female participation in STEM careers and now reaches 100 young women (14–16 year olds) a year.

In the Netherlands, Shell launched the Generation Discover Festival to inspire children, parents and teachers in the world of science. In 2016, more than 31,000 visitors, including 10,000 schoolchildren, attended the five-day festival.

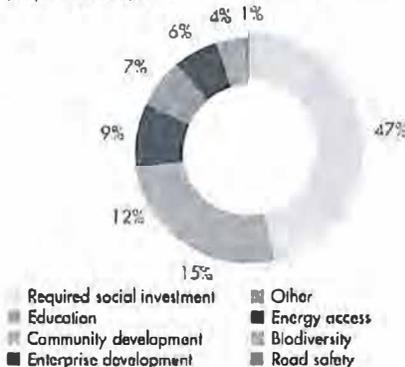
### SOCIAL INVESTMENT IN 2016

We voluntarily invest in projects that aim to benefit local communities over the long term, as well as invest in social programmes as part of contractual agreements or legal requirements with host governments. In 2016, we spent around \$193 million on social investments worldwide, compared with \$219 million in 2015.

In 2016, we spent \$102 million on voluntary social investment, of which around \$58 million was in line with our global themes - energy access, boosting local skills and enterprise, and STEM education. We spent around \$44 million on local programmes for community development, disaster relief, education, health and biodiversity. We estimate that almost \$96 million of our total spend in 2016 was in countries that are part of the United Nations Development Programme Human Development Index 2015, that is, those defined as having a gross domestic product of less than \$15,000 a year per person. Significant support is also provided in the form of voluntary work by Shell employees and donations of equipment.

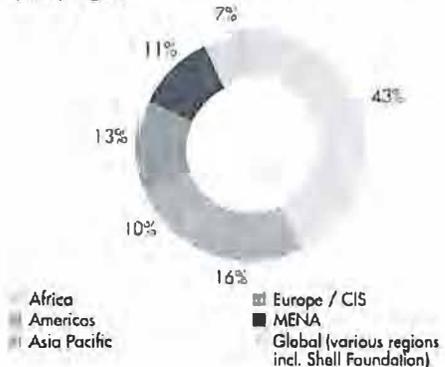
### Social investment in 2016

proportion of spend



### Social investment in 2016

split by region



## EMBEDDING SUSTAINABILITY INTO PROJECTS

Shell conducts an environmental, social and health impact assessment for every major project. This helps us to understand and manage the effects our projects could have on the surrounding environment and local communities.

### ASSESSING OUR PROJECTS

When we plan or develop new facilities, or make changes to existing ones, we apply a staged project development process (see diagram) and aim for a consistent approach around the world. We embed sustainability across our projects by:

- conducting integrated assessments of the potential environmental, social and health impacts. These may include specialist studies on topics such as water use, cultural heritage or security; and
- engaging with communities to understand concerns they may have and discussing possible ways to address these concerns.

These assessments help us manage and reduce potential impacts of all stages of projects. We also draw on international standards, such as those of the World Bank and the International Finance Corporation, to guide our engagement with communities.

### OUR PEOPLE

We train our teams to understand how to embed sustainability into our projects. They are supported by specialists in areas such as environmental management and health and social performance including, but not limited to:

- biodiversity, waste, energy and water management; and
- indigenous peoples' rights, cultural heritage and resettlement.

The specialists work with project teams to help manage potential impacts on communities or the environment during project design, construction and operation.

### OUR PROCESS

At each review stage in the project development process, we decide if and how we are going to move forward with a project. This includes balancing short- and long-term interests, and integrating economic, environmental and social considerations into our decision-making.

The results of all assessments are documented in a mitigation plan which is approved by the manager accountable for the project. The plan is updated and its implementation is monitored and reviewed throughout the lifespan of the project.

### External opinion

"Early collaboration with non-governmental organisations (NGOs) can help the energy sector more effectively manage its environmental impact, reduce project risk, and improve conservation planning. Shell's coastal and offshore operations have direct and indirect impacts on coastal areas and fisheries. Addressing these impacts early in the project cycle must be a priority.

### "Shell data helped protect tuna stocks"

Investing in fisheries management, including support for monitoring and enforcement, can mitigate impacts especially if the investment is in line with the severity of the impacts and delivers desired conservation outcomes. In Gabon, Shell provided the WCS and the government of Gabon's marine conservation programme, Gabon Bleu, with data to improve planning and management of Shell's seismic surveys and the awarding of local fishing licences. All this helped to protect tuna stocks in the area.

By continuing to work closely with conservation NGOs Shell can ensure it has the expertise and exchange of scientific information to better manage the impact of its activities and contribute to biodiversity conservation and to the local economy."

### Ray Victorine

Director Business and Conservation, Wildlife Conservation Society, Seattle, USA



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## Sustainability in the project life cycle - interactive guide



**Identify people** who may be interested in or affected by the project.



**Engage with stakeholders** (e.g. communities, host governments and NGOs) and feed responses into our risk analyses and decision-making process.



**Conduct baseline studies** of the local environment (e.g. water, biodiversity, social livelihoods) and consider how the project may affect it.



Based on assessment of potential impacts and stakeholder engagement, **identify mitigation and enhancement measures**.



**Implement mitigation plan** through project development and construction and then in ongoing operations.



**1. Myanmar:** Shell took steps to avoid impacts on the environment and people following a seismic impact assessment study. For example, we adjusted seismic lines after some fishermen raised concerns they would interfere with fishing areas. Shell also planned seismic activities to ensure they would not coincide with fishing times, to avoid collisions. **2. Gibraltar:** Shell selected an onshore development for a liquefied natural gas terminal in Gibraltar after impact studies identified it as the safest and most environmentally responsible option. The terminal uses waste heat from a power station to turn LNG back into gas. This mitigates environmental impact by minimising energy and water use. **3. Philippines:** Shell helped develop and implement a resettlement action plan for 88 informal settler families living near the Philippine Ports Authority's operations and reclamation project and Shell's North Mindanao Import Facility's (NMIF) fire pumps in Cagayan de Oro City. There was a potential health and safety risk to these families. Shell and NMIF partnered with local authorities and the community to plan and coordinate resettlement. **4. China:** In early 2016, Shell decided to exit the Jinjiu tight gas project in China. We restored the land after full consultation with the land owners and local authorities to provide benefits to the community.

## WORKING TOGETHER

All the work we do around the world requires working collaboratively with contractors, suppliers, non-governmental organisations and other businesses, among many others. We work together to achieve goals in operational excellence, best practice on sustainability issues and to improve standards within the energy sector. Collaboration will be critical to achieving a low-carbon society. Government, business and civil society need to work together to design and support practical solutions.



**20%**

Of women in senior leadership positions in 2016



**548,000**

Training days employees and joint-venture partners in 2016



**43,000**

Suppliers that worked for Shell in 2016



## LIVING BY OUR PRINCIPLES

The core values of honesty, integrity and respect for people are reflected in our business principles and code of conduct, which strictly govern the way we work.

### OUR BUSINESS PRINCIPLES AND CODE OF CONDUCT

The Shell General Business Principles detail our responsibilities to shareholders, customers, employees, business partners and society. They set the standards for the way we conduct business with honesty, integrity and respect for people, the environment and communities. We aim to do business fairly, ethically and in accordance with laws that promote and safeguard fair competition. We do not tolerate the direct or indirect offer, payment, solicitation or acceptance of bribes in any form, including facilitation payments.

All Shell companies and joint ventures that we operate must conduct their activities in line with our business principles. We also encourage joint ventures that we do not operate to apply materially equivalent business principles.

All Shell employees and contract staff must follow our Code of Conduct which describes the behaviour Shell expects of individuals. They are also required to complete Code of Conduct training and to confirm they understand their personal responsibilities under the code. We also require individuals working on Shell's behalf, for example independent contractors or consultants, to act consistently with our Code as it applies to their work for Shell.

Employees, contract staff and contractor employees can report concerns about any potential breaches of the Code of Conduct confidentially and anonymously. This can be done through a variety of local channels, which are adapted to local regulations and customs, and one global channel, the Global Helpline, operated by an independent provider. This helpline is also available to third parties such as customers, suppliers or agents, in the event they observe misconduct by Shell staff.

Concerns or allegations are investigated by specialists within Shell. If a violation is confirmed, we take appropriate action. This may involve serious consequences, up to and including dismissal or contract termination. We maintain a

stringent no retaliation policy to protect any person making a good faith allegation.

In 2016, internal investigations confirmed that 341 allegations reported through the Global Helpline were Code of Conduct violations (217 in 2015). As a result, we dismissed or terminated the contracts of 114 employees, contract staff or contractor employees (89 in 2015).

Additional information about how our ethics and compliance programme equips and supports staff to understand and follow our business principles and code of conduct is available on Shell.com.

### BUSINESS INTEGRITY IN OUR SUPPLY CHAIN

The Shell Supplier Principles, along with specific contractual clauses, set out our expectations for suppliers and contractors to act with integrity. Our risk-based due diligence processes assess prospective suppliers to determine whether they can meet our expectations. We engage regularly with suppliers to reinforce these principles, offer support to help them strengthen their own practices, if needed, and hold them accountable for their performance.

### HUMAN RIGHTS

We respect human rights; our approach applies to all our employees and contract staff. It is informed by the Universal Declaration of Human Rights, the core conventions of the International Labour Organization (ILO), and the United Nations (UN) Guiding Principles on Business and Human Rights. Respect for human rights and provision of remedy are ways in which we uphold our business principles.

We consult with international organisations, companies, civil society and other relevant bodies to understand and respond to current and emerging human rights issues that are relevant to our business. We collaborate closely with the Danish Institute of Human Rights to assess and improve our approach to human rights. We participate in IPIECA - the global oil and gas industry association for environmental and social issues - and through its working groups develop guidance and implementation tools to improve respect for human rights across the industry.



All Shell employees and contract staff must follow our Code of Conduct.

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Our human rights approach focuses on four key areas:

## COMMUNITIES

We assess and manage the potential environmental, health and community impacts of our projects in line with international standards, such as the International Finance Corporation's performance standards on environmental and social sustainability. Impact assessments are embedded in our project process from the identification and assessment phases through to operation, decommissioning and restoration.

Our community engagement mechanisms allow our neighbours to raise any concerns about the impacts of our activities and enable us to respond to those concerns through credible and effective non-judicial processes, informed by the UN Guiding Principles on Business and Human Rights. When our operations are near indigenous peoples, we seek advice from our experts to identify any additional activities or measures that may be required to accommodate these communities.

## SECURITY

We aim to keep employees, contract staff and facilities safe, while respecting the human rights and security of local communities. The Voluntary Principles on Security and

Human Rights (VPSHR) are implemented across Shell operations where there is an identified threat and are included in our private security contracts and our engagements with public security forces. We conduct annual risk assessments in our relevant operations and provide training to employees and contract staff.

## LABOUR RIGHTS

We respect the principles of freedom of association, the right to collective bargaining, non-discrimination and equal opportunity, along with adequate work conditions, adequate remuneration and the elimination of forced or child labour. We respect the rights of our employees, contract staff and suppliers by working in alignment with ILO conventions and the UN Global Compact, an initiative that aims to encourage businesses to adopt sustainable and socially responsible policies.

## SUPPLY CHAIN

We seek to work with contractors and suppliers who are committed to acting in an environmentally and socially responsible way. In line with our business principles, the Shell Supplier Principles include specific expectations for contractors and suppliers concerning labour and human rights.

## ENVIRONMENTAL AND SOCIAL PARTNERS

Shell works in partnership with environmental and developmental organisations. These collaborations bring important insights to our work.

We work in partnerships to help reduce our environmental and societal impact, to improve the quality of land and water around our operations and to enhance benefits to local communities by implementing social investment programmes.

The map below shows an overview of how we work with our partners around the world. You can read about this work in detail over the next two pages.

### Worldmap to our partnerships



■ International Union for Conservation of Nature   ■ Wetlands International   ■ The Nature Conservancy   ■ Earthwatch   ■ Social partners

## Environmental and Social Partners Continued

### ENVIRONMENTAL PARTNERS

Shell has environmental partnerships with the International Union for Conservation of Nature (IUCN), Wetlands International, The Nature Conservancy and Earthwatch. Our environmental partners can bring specific expertise to our projects in areas such as biodiversity, while at the same time advancing their own scientific or conservation knowledge by working on our projects.

#### MANAGING ENVIRONMENTAL IMPACT

We have worked with IUCN since 1999. As part of our collaboration, IUCN has set up two independent scientific panels to help us mitigate environmental impacts.

At the end of 2016, the Niger Delta Panel concluded its work with Shell Petroleum and Development Company Limited of Nigeria (SPDC), the operator of the SPDC Joint Venture. The work focused on restoring biodiversity at sites affected by oil spills and on enhanced remediation techniques within the SPDC JV areas of operation in the Niger Delta. IUCN and SPDC will continue to work together to improve the recovery of biodiversity at sites within SPDC JV's areas of operation.

In Russia, the Western Gray Whale Advisory Panel has been advising Sakhalin Energy (Shell interest 27.5% minus one share) since 2004. A report issued at the 2016 IUCN World Conservation Congress stated that over the last 12 years Sakhalin Energy has made important efforts to limit the impact of its operations on whales and their fragile environment. During this period, the western gray whale population has grown between 3% and 4% annually, from an estimated 115 animals in 2004 to 174 in 2015.

#### SUPPORTING BIODIVERSITY AND LIVELIHOODS

Shell has worked with Wetlands International for nine years. Since 2010, we have sponsored a Wetlands International project to help three communities in the Niger Delta - the Abobiri, Obio-yagha and Opume - change the way they manage their wetland environment. To stop the unsustainable use of wetlands, such as mangrove cutting, community members were given access to micro-credits, to adopt more sustainable livelihoods, like fish and snail farming. One of the conditions for getting access to the micro-credits was participation in wetland restoration activities, such as planting wetland trees and clearing overgrown waterways.

In the Majnoon oil field in southern Iraq, Shell is working with Wetlands International, IUCN and others to ensure that oil and gas development does not cause harm to the Mesopotamian Marshes and to contribute to their restoration. Parts of the marshes that lie outside of the Majnoon field were designated a UNESCO World Heritage Site in 2016.

In 2016, Shell Development Oman supported a Wetlands International's survey of birds at Bar Al Hikman wetlands, a globally significant wetland for water birds.



Earthwatch team preparing for field work, Churchill, Manitoba, Canada.

#### BIODIVERSITY AND REHABILITATING COASTLINES

Shell and The Nature Conservancy are working together to help protect the environment and to build knowledge about conservation in industry and government.

A previous joint project in the Louisiana coastal zone, USA, focused on developing a nature-based approach to control pipeline erosion. In 2016, Shell constructed a pilot living shoreline in the area by bringing in soil and rock and planting native vegetation. Within nine months, the constructed shoreline appeared more stable, and vegetation is reclaiming the area, helping to protect the pipeline and coastal area. We will continue to monitor the site to assess its long-term performance.

#### ENGAGING EMPLOYEES

Shell employees from 49 countries have contributed nearly 44,000 hours to environmental research and conservation projects since the start of our employee volunteer partnership with Earthwatch, Project Better World, 19 years ago.

Earthwatch expeditions enable Shell employees to deepen their understanding of environmental issues and make a contribution to scientific research. The Enhanced Learning Programme allows Shell participants to hone their sustainability leadership skills and create sustainability action plans to implement at work or at home. In 2016, Shell employees from 21 countries took part in these programmes.

On the Earth Skills Network programme, employees share their knowledge and expertise by mentoring managers of protected areas. This gives participants the opportunity to sharpen their professional skills and further their understanding of how business decisions can impact the environment. Shell has supported 45 protected areas since 2009, including six in 2016.

Also in partnership with Earthwatch, FreshWater Watch is a global research project that aims to safeguard the quality and supply of fresh water for the future.

## SOCIAL PARTNERS

In 2016, Shell's shipping business supported a programme in Somalia aimed at steering young people away from piracy and developing the local economy by funding infrastructure projects. Shell worked alongside the United Nations Development Programme, UK oil and gas company BP, Danish shipping group Maersk, Swedish shipping business Stena, Japanese shipping companies NYK, "K"-line and MCL. We contributed \$500,000 to the total \$2.5 million the partnership spent on projects for roads, healthcare facilities and training centres.

In Iraq, we have worked in partnership with the AMAR International Charitable Foundation to build a girls' school in Al Nashwa, close to our Majnoon operations near Basrah in southern Iraq. Together with AMAR, we have also established health projects including four mobile clinics that currently serve more than 30 remote villages. In addition, we have supported a primary health-care centre in Al Dayr that trains 40 women volunteers to deliver health awareness sessions in their local communities.

We have a global partnership with Mercy Corps, an international organisation that helps people to recover from crises, build better lives and transform their communities. In 2016, the partnership focused on creating jobs and promoting entrepreneurship to strengthen local economies. In Myanmar, for example, we worked with Mercy Corps

to increase incomes and the resilience of households in Rakhine State, one of the nation's poorest areas. We trained 1,782 vegetable farmers from households in 32 villages to improve their agricultural practices. We also provided access to advice and new technologies to an additional 1,399 commercial farmers.

In quarter four 2016 we commenced discussions about providing funds to support internally displaced persons affected by the conflict in North-Eastern Nigeria. This resulted in a donation in February 2017 of \$2.2 million to Mercy Corps to support their humanitarian relief in the region.

Since 2011, Shell has funded a programme run by Shell Foundation and finance company Grafir that invests in small- and medium-sized enterprises (SMEs) in the Middle East and North Africa. The Nomou programme's approach includes linking these businesses to the supply chains of large companies. Over the last five years it has made 103 investments worth \$53 million and created more than 4,000 jobs.

We also continue to work with the Danish Institute of Human Rights to understand and respond to current and emerging human rights issues relevant to our business.



Through our partnership with Mercy Corps, Shell helps people in China recover from crises or build better lives and transform their communities.

## COLLABORATIONS

Shell's work with organisations around the world gives us insight into our business, while the sharing of knowledge and experience with others contributes to better practices.

We define collaboration as all forms of working with organisations outside Shell. These collaborations range from working with another organisation on a project to sponsoring a particular group.

As a member of IPIECA, the global oil and gas industry association for environmental and social issues, we take part in discussions on topics including biodiversity, climate change and resettlement. By working with others, we are able to assess issues, such as climate change, from different perspectives within the industry.

Shell works with various associations in the chemical industry to address life-cycle management issues both for raw materials and finished products derived from them. We also work closely with customers and suppliers, monitor any changes in the science behind our products and support research if it helps us to reduce risks even further.

Some of the views of the organisations with which we participate may differ from our own. For example, we may not always agree with their opinions on topics such as climate change. In these cases, we make our views known within the organisation and seek to influence its position on certain policies.

### Collaborations Overview

The table shows some of the organisations that we collaborate with globally on topics such as environmental sustainability, climate change and technology. Shell also works with many community-based organisations.

|   | Environmental Sustainability | Human rights and social responsibility | Safety and technical standards | Technology and innovation | Transparency and governance |
|---|------------------------------|--|--------------------------------|---------------------------|-----------------------------|
| American Petroleum Institute (API)                                | ■                            |  | ■                              | ■                         | ■                           |
| Bonsucro  | ■                            |  |                                |                           |                             |
| Canada's Oil Sands Innovation Alliance (COSIA)                    | ■                            |  |                                | ■                         |                             |
| Center for Sustainable Shale Development (CSSD)                   | ■                            |  |                                |                           |                             |
| Danish Institute for Human Rights (DIHR)                          |                              |  |                                |                           |                             |
| Energy Institute (EI)   |                              |  | ■                              | ■                         |                             |
| Energy Transitions Commission (ETC)                               | ■                            |  |                                |                           |                             |
| Extractive Industries Transparency Initiative (EITI)              |                              |  |                                |                           | ■                           |
| Global Alliance for Clean Cookstoves                              | ■                            |  |                                |                           |                             |
| Global Business Initiative on Human Rights (GBI)                  |                              |  |                                |                           |                             |
| Global Gas Flaring Reduction Partnership (GGFR)                   | ■                            |  |                                |                           | ■                           |
| Global Road Safety Partnership (GRSP)                             |                              |  | ■                              |                           |                             |
| International Association of Oil and Gas Producers (IOGP)         | ■                            |  | ■                              | ■                         | ■                           |
| International Audit Protocol Consortium (IAPC)                    | ■                            |  | ■                              |                           |                             |
| International Emissions Trading Association (IETA)                | ■                            |  |                                |                           |                             |
| IPIECA (industry association for environmental and social issues) | ■                            |  | ■                              |                           | ■                           |
| Network of Employers for Traffic Safety (NETS)                    |                              |  | ■                              |                           |                             |
| Roundtable for Responsible Soy (RTRS)                             | ■                            |  |                                |                           |                             |
| Roundtable on Sustainable Palm Oil (RSPO)                         | ■                            |  |                                |                           |                             |
| UN Global Compact   | ■                            |  |                                |                           | ■                           |
| Oil and Gas Climate Initiative (OGCI)                             | ■                            |  |                                |                           |                             |
| World Business Council for Sustainable Development (WBCSD)        | ■                            |  | ■                              |                           | ■                           |

## SHELL FOUNDATION

Shell Foundation is an independent charity that applies a business approach to global development challenges that constrain job creation, access to energy and urban mobility.

Shell Foundation (SF) provides a mix of business support, grant funding and market links to help entrepreneurs prove their business models, achieve financial independence and expand into new markets. The Foundation applies business thinking to major social and environmental issues linked to the energy sector.

Since 2000, SF has deployed \$263 million of grant funding to social enterprises and new market builders operating in Africa, Asia and Latin America.

### 2016 SOCIAL ENTERPRISE PARTNER HIGHLIGHTS

SafeBodo operates a network of trained motorcycle taxi drivers in Uganda. Safety is a major issue in the capital Kampala where 40% of trauma cases are estimated to be caused by motorcycle taxi accidents. SafeBodo customers can access transport on-demand using their mobile phone to book and pay for a driver. The start-up has rapidly grown its network in the city from 100 to more than 1,100 drivers. In 2016, its customers made over 4.5 million trips.

Dharma Life provides people in rural India with access to social-impact products such as cleaner cookstoves and solar lights. The business works with village entrepreneurs, offering skills training, logistics support and awareness

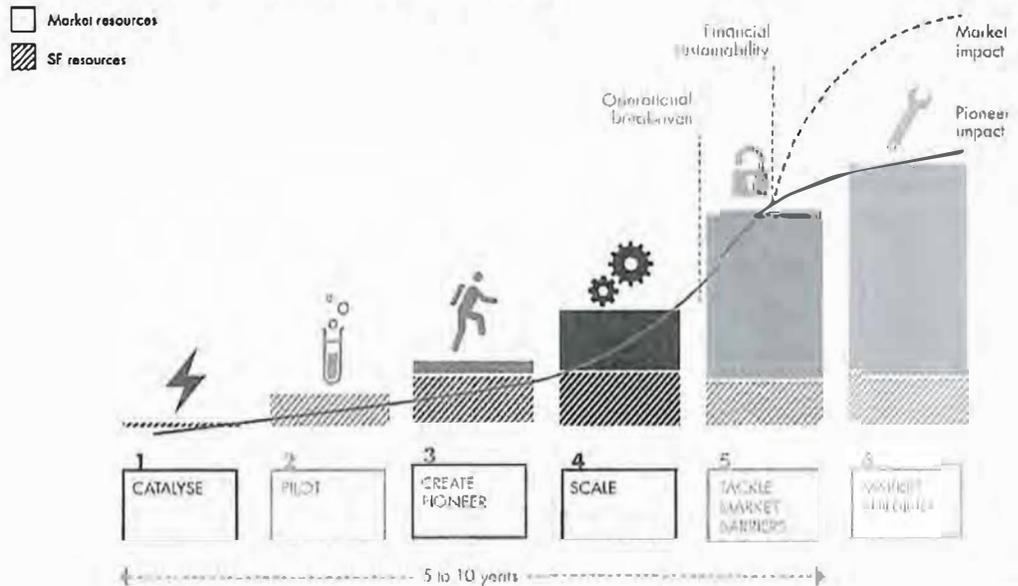


Shell Foundation has partnered with solar company d.light to help people without access to reliable electricity.

campaigns to build demand. In 2016, its entrepreneur network in villages grew by 150% to 10,758 entrepreneurs across 12 states in India. To date, more than 4 million people have gained access to the products.

GroFin provides finance and business support to small- and medium-sized enterprises (SMEs) to spur job creation in emerging markets. The company has provided \$286 million of growth finance to small and growing businesses in Africa and the Middle East. In 2015, a GroFin report stated an estimated \$469 million of economic value is generated each year from its support of more than 500 SMEs.

### Shell Foundation's six-step theory of change



### Shell Foundation's impact to date

**66,267** jobs created

**14.24 million** tonnes of carbon reduction

**\$5.75 billion** funding leveraged

**70.02 million** livelihoods improved

## CONTRACTORS AND SUPPLIERS

In 2016, Shell spent \$45 billion on goods and services from 43,000 suppliers globally.

Shell aims to work with contractors and suppliers that behave in an economically, environmentally and socially responsible way, as stated in our Shell General Business Principles. The Shell Supplier Principles cover what is required from our suppliers regarding business integrity, health and safety, social performance, and labour and human rights.

### ASSESSING OUR SUPPLIERS

Certain areas of our supply chain may pose a higher risk to labour rights due to their location and the nature of the goods and services we procure. In these cases, we use a defined set of criteria to identify potential supply chain risks and, where we see risk, we ask suppliers to undertake due diligence studies before considering awarding a contract. A successful example of this is the retailer Abenson Ventures in the Philippines (see external opinion). In 2016, 1,436 suppliers who worked to deliver Shell projects and help run our operations, were required to register with our Supplier Qualification System (SQS). Of these suppliers, several hundred were flagged for second stage qualification for one of our risk filters, 70 of which were flagged for labour risks analysis (see the infographic below for further detailed analysis).

The results of our supplier assessments are summarised in a green/amber/red rating depending on the number and significance of any gaps between our requirements and the supplier's policies or performance.

We work with each of these suppliers to ensure they have a plan to correct serious gaps. These are the most common gaps found during our supplier assessments, which typically relate to policy rather than performance gaps.

- freely chosen employment;
- child labour avoidance;
- working hours, wages and benefits;
- dormitory, housing and working conditions;
- equal opportunities and freedom of association; and
- supply chain and performance management.

### CONTRACTOR SAFETY LEADERSHIP

Senior leaders from Shell and 14 contractors developed the Contractor Safety Leadership Initiative Declared Future. This outlines a joint vision for safety leadership with the ambition of no harm and no leaks achieved through collaboration.

### Applying risk filters

When we assess our suppliers, we use a combination of the type of work they do and the country in which the work will be delivered to identify suppliers we consider "high-risk" for potential labour rights violations.



Applying our labour rights risk criteria during our sourcing process in 2016, we identified and assessed 70 high-risk suppliers. Of those, 23 were awarded contracts.

### Labour rights risk analysis 2016



Performance can be improved by aligning the health, safety, security and environment (HSSE) frameworks of a contractor and Shell, by empowering the contractor to deliver using their own HSSE controls and by visiting sites together to listen to the workforce. Teams are encouraged to jointly attend talks, conduct risk assessments and oversee the completion of projects.

## LOCAL SUPPLIER DEVELOPMENT

Shell aims to contribute to the economic development of countries where we operate through employment and by helping local companies develop, either by employing people directly or through our government and business partners. At the start of a project, as well as throughout the project life cycle, we consider how we can employ local suppliers and use community knowledge. If needed, we help them build capabilities that meet our safety and quality standards. We also support the growth of local businesses in many countries where we work. In many countries, a plan to support the growth of local businesses forms part of the selection criteria against which potential suppliers are assessed.

For example, Qatar Shell spends more than 50% of its annual procurement budget with local companies. Fourteen contracts have been awarded to small and medium-sized local companies since 2013 (with six awarded in 2016) worth around \$19 million.

## External opinion

"As a retailer, we supply corporate merchandise to companies like Shell. Their Supplier Qualification System (SQS) helps us align our policies to the international standards Shell expects. It is important we provide stakeholders with clear policies that improve our way of doing business. We take pride in providing our customers with the best products and services, which would not be possible without a sophisticated platform designed for suppliers, like SQS.

## "We expect to reduce cost and time"

We have several business units in the Philippines and SQS enables us to standardise and streamline the way we engage with Shell companies in different locations. We expect this will reduce costs, time and avoid duplication of effort. We are delighted that improving our policies merits a green banding."

### CJ Barrion

Abenson, Philippines

## OUR PEOPLE

The quality of our people is essential to the success of our company. During 2016, we employed an average of 92,000 staff in more than 70 countries.

We work to maintain an effective and healthy organisation, resource talented people across the business, accelerate development of our people, grow and strengthen our leadership capabilities, and enhance employee performance through strong engagement. We recruit, train and recompense people to ensure our continued business success.

## OUR WORKFORCE

Around 40% of our workforce is in countries outside of Europe and North America. In 2016, we recruited around 800 graduates, 800 experienced professionals and 2,800 people in our Shell Business Operations. Close to 40% of graduate recruits come from universities outside of Europe and the Americas.

Shell aims to manage the impacts of business changes on people respectfully and as consistently as possible. Affected employees are supported in their search for alternative employment as appropriate by country law and policy.

Following the acquisition of BG, we successfully transferred three quarters of BG employees to a role in Shell.



Employees review computer-generated designs at Shell's offices in Doha, Qatar.

## COMMUNICATION AND ENGAGEMENT

We strive to maintain strong relations with our employees. Dialogue between management and employees is integral to our work practices; it takes place directly and, where appropriate, through employee representative bodies. Management briefs employees on operational and financial results regularly through a variety of channels. The annual Shell People Survey is one of the main tools used to measure employees' views on a range of topics. For example, the average employee engagement score in 2016 was 79% favourable and 6% unfavourable (80% favorable and 5% unfavorable in 2015). The survey also measures employees' views on the inclusiveness of their workplace. In 2016, 71% felt positive about this, while 12% felt negative about inclusion in the workplace, the same figures as in 2015.

We promote the safe expression and reporting of views about our processes and practices. We offer multiple channels for employees to report, confidentially and anonymously, breaches of the Shell General Business Principles or our Code of Conduct, or other concerns.

## Our People Continued

### DIVERSITY AND INCLUSION

Embedding the principles of diversity and inclusion in the way we do business gives us a better understanding of the needs of our staff and our stakeholders.

A diverse workforce and an inclusive environment that respects and nurtures different people is a way to improve our business performance. We provide equal opportunity in recruitment, career development, promotion, training and reward for all employees, regardless of gender, ethnicity, sexual orientation or physical ability. We actively monitor diversity on a global level, and we measure representation of women and local nationals in senior leadership positions. Diverse teams led by inclusive leaders are more engaged, and thus deliver better business performance.

At the end of 2016, the proportion of women in senior leadership positions was 20% compared to 19% in 2015.

The representation of senior local nationals is monitored in 20 principal countries. We measure the percentage of senior nationals employed in Shell compared with the number of senior positions in their home country. The reporting shows two categories: local national coverage greater than 80% (10 countries in 2016) and less than 80% (10 countries in 2016).

### TRAINING AND DEVELOPMENT

In 2016, we provided 548,000 training days for our employees and joint-venture partners. We focused on growing our leadership capability, improving skills in technical, safety and commercial areas, and increasing our expertise in specialist areas such as cultural heritage and indigenous peoples.

## OUR BUSINESS PARTNERS

We often work in joint ventures with national and other international energy companies. Our business partners bring important skills and experiences to a joint venture.

### NON-OPERATED VENTURES

More than half of Shell's joint ventures (JVs) are not operated by Shell. For these ventures, our Shell JV representatives and the Shell-appointed JV board require our partners to adopt the Shell commitment and policy on Health, Safety, Security and Environment and Social Performance (HSSE&SP) or one materially equivalent to our own. They are also required to put in place standards to adequately address HSSE&SP risks.

When these JVs implement our control framework, or a similar approach, Shell teams carry out independent audits or participate in the JVs own auditing programmes. This provides assurance on the JV's compliance. We also offer to review the effectiveness of the framework's implementation, overseen by the JV's board of directors.

We periodically evaluate the health, safety, environment and community risks of the JV. If the JV is falling below expectations, plans will be put in place, in agreement with the other partners, to improve performance.

### SHARING KNOWLEDGE

Another advantage of working with our business partners – who are often located in different parts of the world – is that they offer an opportunity to share knowledge and insights and learn from each other's experience. As a result, we can work together to tackle specific social, environmental, safety or technical challenges.



An employee working at the Solyim Petroleum JV in Russia.

We encourage and support our JV partners in implementing similar standards to our own for the management of greenhouse gas (GHG) emissions. In 2016, we engaged with several partners in workshops to share practices and explore opportunities for reducing GHG emissions from our joint operations.

Since 2014, we have helped Petroleum Development Oman (PDO, Shell interest 34%) reduce its GHG emissions by sharing our work to reduce flaring, as well as our approach to energy and methane management. We also raised awareness about voluntary GHG reduction initiatives, such as the World Bank's "Zero Routine Flaring by 2030" Initiative. PDO endorsed the initiative in January 2017.

## TAX AND TRANSPARENCY

Tax binds governments, communities and businesses together. Revenue transparency provides citizens with important information to hold their government representatives accountable and to advance good governance. Shell is committed to transparency.

Our operations generate revenue through taxes and royalties for governments around the world. In 2016, Shell paid more than \$55.6 billion to governments. We paid \$4.4 billion in income taxes and \$2.3 billion in government royalties, and collected \$48.9 billion in excise duties, sales taxes and similar levies on our fuel and other products on behalf of governments.

### OUR APPROACH

For Shell, paying taxes in the countries where we operate is about more than complying with the law. It is about showing that extraction of natural resources provides governments with an opportunity to generate revenues, support economic growth and enhance social development.

We comply with applicable tax laws wherever we operate. We are transparent about our tax payments to governments and we strive for an open dialogue with them. This approach helps us to comply with both the letter and the spirit of the laws.

### PRINCIPLES

In line with the Shell General Business Principles, we support several external voluntary codes, which include the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises and the Business and Industry Advisory Committee to the OECD Statement of Tax Principles for International Business.

### TRANSPARENCY

In 2012, we were one of the first energy companies to voluntarily publish revenues that our operations generate through income taxes, royalties and indirect taxes for governments around the world. As of 2016 onwards, Shell makes mandatory disclosures under the Reports on Payments to Governments Regulations 2014, and files its Payments to Governments Report with the UK's Companies House instead. The report covering calendar year 2016, which will integrate BG figures, will be published on [www.shell.com/payments](http://www.shell.com/payments) by the end of June 2017.

### TAX STRATEGY

It is the right of governments to determine tax policies and tax rates and to draft tax laws accordingly. They do so against strong competition for capital and investment, which is internationally mobile. It is not the role of business to form views on what level of taxation is adequate or required. We use legitimate tax incentives and exemptions designed by governments to promote investment, employment and economic growth.

When considering the viability of investments, tax is one of the factors we examine. Income tax is just one part of the overall tax regime considered. We expect to pay tax on our income in the country where activities take place, and believe double taxation of the same activity by different jurisdictions should be avoided. Shell supports efficient, predictable and stable tax regimes that incentivise long-



Chairman Chad Holliday delivers his keynote speech at Shell's 2016 Annual General Meeting.

term investment. We expect the laws to be applied consistently, creating a level playing field for all.

### GOVERNANCE OF TAX

Shell's Board of Directors is responsible for maintaining a sound system of risk management and internal control, and for regularly reviewing its effectiveness. This system also covers taxation, which forms an integral part of the Shell control framework. Annually, the Board conducts a review of the effectiveness of Shell's system of risk management and internal control, including financial, taxation, operational and compliance controls.

### COLLABORATING WITH OTHERS

Shell supports cooperative compliance relationships with tax authorities on the basis of the framework proposed by the OECD Forum on Tax Administration. We have a cooperative compliance relationship in the UK, the Netherlands and Singapore. In Italy, we have filed an application for a cooperative compliance relationship; in Austria, we have a pilot relationship, and we continue to explore establishing similar relationships with other countries.

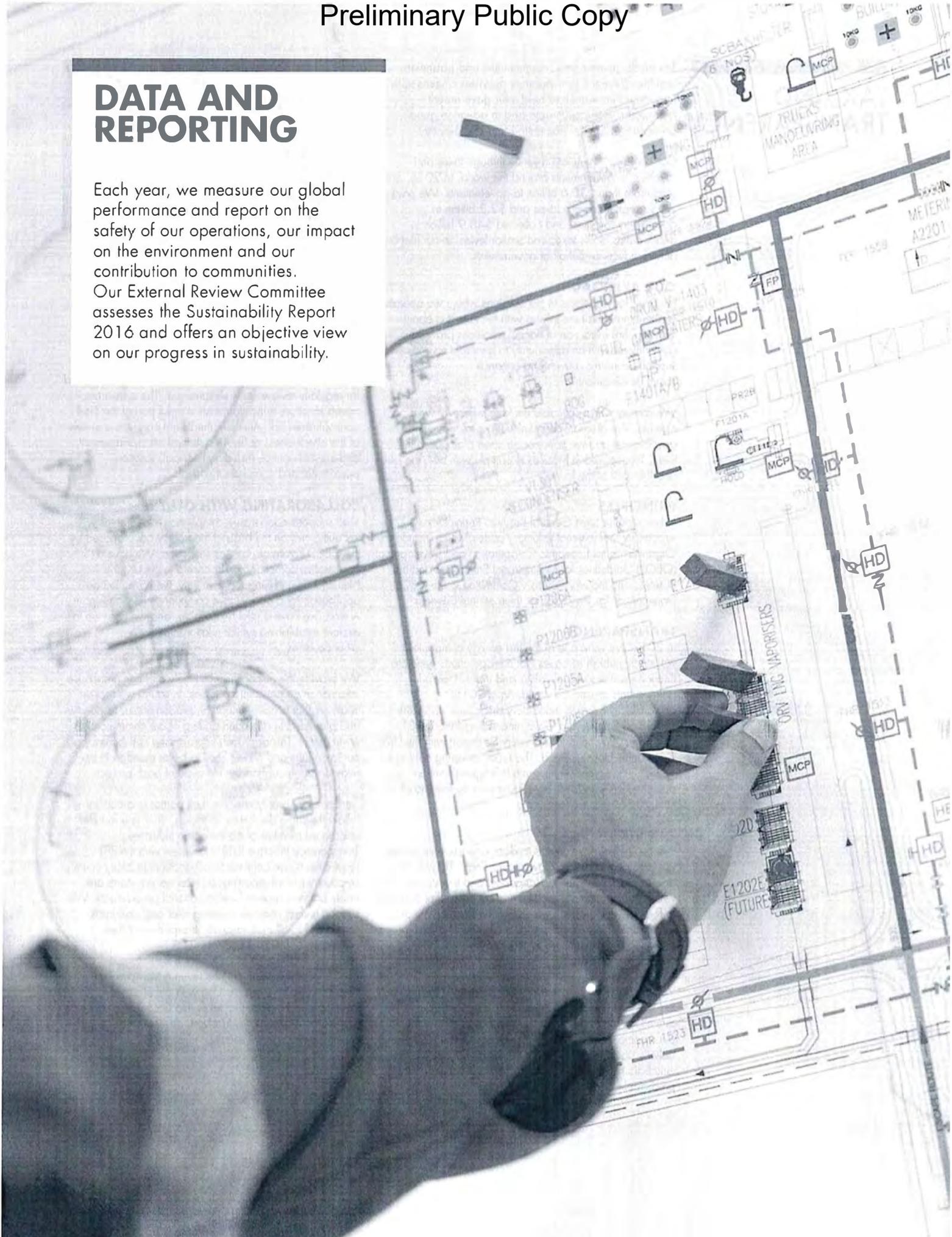
We provide the authorities with timely and comprehensive information on potential tax issues. In return, we receive treatment that is open, impartial, proportionate, responsive and grounded in an understanding of our commercial environment. This approach improves the transparency of our tax affairs and allows Shell to better manage its tax-related risks throughout the life cycle of each project.

Transparency is only effective if all parties in a country follow the same disclosure standards. Shell is a founder and board member of the Extractive Industries Transparency Initiative (EITI). Consistent with the EITI requirements, we continue to advocate mandatory country-by-country global reporting, as most tax payments are made at the corporate level to national governments. We support unified revenue reporting rules and standards applicable to all multinationals, irrespective of their ownership or place of business.

Shell is actively involved in the revenue transparency discussion and we are working with stakeholders to develop an approach that takes into account the views of the relevant stakeholders involved, i.e. industry, governments and civil society.

## DATA AND REPORTING

Each year, we measure our global performance and report on the safety of our operations, our impact on the environment and our contribution to communities. Our External Review Committee assesses the Sustainability Report 2016 and offers an objective view on our progress in sustainability.



## ABOUT OUR REPORTING

We began reporting voluntarily on our environmental and social performance with the first Shell Report in 1997. We support transparency and share information and data in this report and on our company website.

We also provide regular information to the Carbon Disclosure Project, Dow Jones Sustainability Index, FTSE4Good Index and other organisations that assess the economic, environmental and social performance of companies.

### ABOUT OUR DATA

There are inherent limitations to the accuracy of environmental and social data. We recognise that our data will be affected by these limitations and continue to improve data integrity by strengthening our internal controls.

All non-financial data in this report are reported on a 100% basis for companies and joint ventures where we are the operator. Environmental data pertain to our direct emissions unless otherwise stated. We report in this way, in line with industry practice, because these are the data we can directly manage and affect through operational improvements. We refer to the number of people employed or contracted on a "full-time equivalent" basis.

Operations acquired or divested during 2016 are included only for the period of our ownership. Our reporting includes equivalent data from BG from February 1, 2016, following a review to ensure all data are aligned with Shell's health, safety, security, environment & social performance (HSSE&SP) Control Framework.

Other data are collected from external sources, staff surveys and other internal sources as indicated.

We only include data in this report that were confirmed by the end of March 2017. If incidents are reclassified or confirmed, or if significant data changes occur after preparation of this report, they will be updated in the following year's publication. Data marked in the social data table come from an internal survey completed by the senior Shell representative in each country. The accuracy of environmental and social data may be lower than that of data obtained through our financial systems.

### ASSURANCE

We have clear standards and reporting requirements for our HSSE&SP data. This is supported by internal controls such as audit trails and statistical checks to help ensure the accuracy of the Shell Sustainability Report.

The External Review Committee of independent experts helps to make sure our reporting is balanced, relevant and responsive to stakeholders' interests.

Lloyd's Register Quality Assurance Ltd has provided limited assurance of our direct and indirect greenhouse gas emissions data for 2016. Limited assurance means nothing has come to the auditor's attention that would indicate that the data are not correct.

Conversions into US and Canadian dollars are based on the average exchange rates for 2016.



Employees at the Qatar Shell Research and Technology Center, part of Shell's wider research and development community which includes technology centres in Amsterdam and Houston.

# ENVIRONMENTAL DATA

## Environmental data

|  | 2016  | 2015  | 2014  | 2013  | 2012  | 2011  | 2010  | 2009  | 2008  | 2007  |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Greenhouse gas emissions (GHGs)</b>   |       |       |       |       |       |       |       |       |       |       |
| Direct total GHGs (million tonnes CO <sub>2</sub> equivalent) [A]                | 70    | 72    | 76    | 73    | 72    | 71    | 76    | 69    | 75    | 82    |
| Carbon dioxide (CO <sub>2</sub> ) (million tonnes)                               | 67    | 68    | 73    | 71    | 69    | 71    | 72    | 66    | 72    | 79    |
| Methane (CH <sub>4</sub> ) (thousand tonnes)                                     | 123   | 119   | 126   | 120   | 93    | 133   | 128   | 127   | 126   | 119   |
| Nitrous oxide (N <sub>2</sub> O) (thousand tonnes)                               | 1     | 1     | 1     | 1     | 1     | 1     | 2     | 2     | 2     | 2     |
| Hydrofluorocarbons (HFCs) (tonnes)   | 21    | 18    | 16    | 17    | 23    | 22    | 23    | 25    | 23    | 28    |
| Energy indirect total GHGs (million tonnes CO <sub>2</sub> equivalent) [B]       | 11    | 9     | 10    | 10    | 9     | 10    | 9     | 9     | n/c   | n/c   |
| <b>Flaring</b>   |       |       |       |       |       |       |       |       |       |       |
| Flaring (Upstream) (million tonnes CO <sub>2</sub> equivalent) [C]               | 7.6   | 11.8  | 13.0  | 7.4   | 7.7   | 10.0  | 10.4  | 7.8   | 8.8   | 9.7   |
| Flaring (Upstream) (million tonnes hydrocarbon flared) [C]                       | 2.3   | 3.5   | 3.8   | 2.1   | 2.3   | 3.4   | 3.6   | 2.6   | 2.8   | 3.4   |
| Nigeria [D]  | 0.5   | 0.9   | 1.3   | 1.1   | 1.5   | 2.0   | 2.4   | 1.9   | 2.3   | 2.5   |
| Rest of the world [E]  | 1.8   | 2.6   | 2.5   | 1.0   | 0.8   | 1.4   | 1.2   | 0.7   | 0.5   | 0.9   |
| <b>Energy intensity</b>  |       |       |       |       |       |       |       |       |       |       |
| Upstream excl. oil sands, LNG and GTL (gigajoules per tonne production) [C], [F] | 1.02  | 0.83  | 0.87  | 0.89  | 0.83  | 0.75  | 0.74  | 0.76  | 0.74  | 0.78  |
| Oil sands (gigajoules per tonne production) [G]                                  | 5.5   | 5.8   | 6.3   | 6.5   | 6.6   | 6.1   | 6.8   | 6.6   | 6.4   | 5.7   |
| Refineries: Refinery Energy Index [H]  | 95.4  | 95.4  | 94.9  | 95.6  | 98.4  | 100.8 | 101.8 | 102.2 | 98.9  | 98.6  |
| Chemical plants: Chemicals Energy Index  | 91.0  | 91.6  | 90.3  | 89.8  | 91.7  | 90.8  | 89.3  | 92.0  | 93.0  | 92.6  |
| <b>Acid gases and VOCs</b>   |       |       |       |       |       |       |       |       |       |       |
| Sulphur oxides (SO <sub>x</sub> ) (thousand tonnes SO <sub>2</sub> )             | 83    | 88    | 97    | 99    | 113   | 136   | 139   | 141   | 175   | 212   |
| Nitrogen oxides (NO <sub>x</sub> ) (thousand tonnes NO <sub>2</sub> ) [I]        | 122   | 104   | 146   | 156   | 147   | 146   | 159   | 142   | 150   | 145   |
| Volatile organic compounds (VOCs) (thousand tonnes)                              | 146   | 125   | 151   | 89    | 89    | 129   | 147   | 126   | 130   | 148   |
| <b>Ozone-depleting emissions</b>   |       |       |       |       |       |       |       |       |       |       |
| CFCs/halons/trichloroethane (tonnes)   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.4   | 1.4   | 0.6   |
| Hydrochlorofluorocarbons (HCFCs) (tonnes)  | 8     | 8     | 6     | 8     | 8     | 12    | 21    | 24    | 26    | 27    |
| <b>Spills and discharges [J] [K]</b>   |       |       |       |       |       |       |       |       |       |       |
| Sabotage spills – volume (thousand tonnes) [L]                                   | 0.6   | 2.2   | 2.7   | 2.2   | 3.3   | 1.6   | 3.0   | 14.0  | 6.5   | 3.4   |
| Sabotage spills – number [L]   | 46    | 94    | 139   | 157   | 137   | 118   | 112   | 95    | 115   | 197   |
| Operational spills – volume (thousand tonnes)                                    | 0.7   | 0.8   | 0.7   | 0.9   | 2.1   | 6.0   | 2.9   | 1.4   | 8.8   | 3.5   |
| Nigeria [M]  | 0.2   | 0.2   | 0.3   | 0.4   | 0.2   | 5.3   | 0.7   | 0.3   | 7.1   | 1.6   |
| Rest of the world  | 0.5   | 0.7   | 0.4   | 0.5   | 1.9   | 0.7   | 2.2   | 1.1   | 1.7   | 1.9   |
| Operational spills – number  | 71    | 108   | 153   | 174   | 207   | 211   | 195   | 275   | 275   | 392   |
| Nigeria [N]  | 7     | 16    | 38    | 31    | 37    | 64    | 32    | 37    | 42    | 52    |
| Rest of the world  | 64    | 92    | 115   | 143   | 170   | 147   | 163   | 238   | 233   | 340   |
| Hurricane spills – volume (thousand tonnes)                                      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Oil in effluents to surface environment (thousand tonnes)                        | 0.9   | 1.0   | 0.9   | 1.0   | 1.0   | 1.3   | 1.6   | 1.5   | 1.7   | 1.6   |
| <b>Water</b>   |       |       |       |       |       |       |       |       |       |       |
| Fresh water withdrawn (million cubic metres)                                     | 195   | 186   | 199   | 198   | 203   | 209   | 202   | 198   | 224   | 235   |
| Fresh water consumed (million cubic metres)                                      | 152   | 141   | 155   | n/c   |
| <b>Waste disposal</b>  |       |       |       |       |       |       |       |       |       |       |
| Hazardous (thousand tonnes)  | 658   | 455   | 529   | 770   | 820   | 740   | 1,048 | 962   | 688   | 907   |
| Non-hazardous (thousand tonnes)  | 1,491 | 1,680 | 1,674 | 2,065 | 2,295 | 1,850 | 1,079 | 1,139 | 996   | 1,899 |
| Total waste (thousand tonnes) [O]  | 2,148 | 2,135 | 2,203 | 2,835 | 3,115 | 2,590 | 2,127 | 2,101 | 1,684 | 2,806 |

[A] Greenhouse gas emissions comprises carbon dioxide, methane, nitrous oxide, hydrofluorocarbon, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. The data are calculated using locally regulated methods where they exist. Where there is no locally regulated method, the data are calculated using the 2009 API Compendium, which is the recognised industry standard under the ISO 14064 Protocol Corporate Accounting and Reporting Standard. There are inherent limitations to the accuracy of such data. CO<sub>2</sub> and gas industry guidelines (IECA/API/IOGP) indicate that a number of sources of uncertainty can contribute to the overall uncertainty of a corporate emissions inventory. 2015 and 2016 emissions are calculated using Global Warming Potential factors from the IPCC's Fourth Assessment Report. Data for prior years were calculated using Global Warming Potential factors from the IPCC's Second Assessment Report.

[B] These emissions were calculated using the market-based approach in line with the GHG Protocol Corporate Accounting and Reporting Standard.

[C] The term upstream in this context includes assets and activities from our Upstream, Integrated Gas and Oil Divisions.

[D] Nigeria includes SPDC onshore operations (0.4 million tonnes flared in 2016) and SNEPCO offshore operations (0.1 million tonnes flared in 2016).

[E] Flaring from the Marjan field in Iraq and from Malaysia amounted to 0.9 and 1.1 million tonnes of hydrocarbons respectively in 2016.

[F] Since 2012, data are prepared in accordance with IHEC/API/IOGP guidance 2012. Data for prior years are not directly comparable.

[G] The data include mining and upgrading operations. The data do not include metal production.

[H] Data are indexed to 2002, based on S&P Global Associates Energy Intensity Index 2006 methodology.

[I] Increase in NO<sub>x</sub> emissions in 2016 was primarily driven by inclusion of certain BG assets in our portfolio as of February 1st, 2016.

[J] All spill volumes and numbers are for spills over 120 kilograms. Due to the rounding of numbers, spill volumes for Nigeria and the rest of the world might not add up to the overall total volume of spills.

[K] As of the end of March 2017, there were five spills under investigation in Nigeria that may result in adjustment.

[L] All sabotage and theft-related spills have occurred in Nigeria (except in 2016 (0.001 thousand tonnes), 2015 (0.005 thousand tonnes), and 2007 (0.7 thousand tonnes)).

[M] Nigeria includes SPDC onshore operations and SNEPCO offshore operations. A single spill at the Bonga field offshore Nigeria amounted to 4.8 thousand tonnes in 2011.

[N] Nigeria includes SPDC onshore operations (15 operational spills in 2016) and SNEPCO offshore operations (2 operational spills in 2016).

[O] In 2016, we had waste alternative recycling in place of 0.01 million BSO tonnes and tonnes of material that would otherwise have been disposed of as waste. n/c = not calculated.

# SOCIAL AND SAFETY DATA

## Social and safety data

|   | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|------|------|------|------|------|------|------|------|------|------|
| <b>Fatalities</b>   |      |      |      |      |      |      |      |      |      |      |
| Total number  | 3    | 7    | 5    | 5    | 8    | 6    | 12   | 20   | 26   | 21   |
| Employees   | 0    | 1    | 3    | 0    | 3    | 1    | 0    | 1    | 2    | 1    |
| Contractors   | 3    | 6    | 2    | 5    | 5    | 5    | 12   | 19   | 24   | 20   |
| Total accident rate (FAR)   | 0.53 | 1.11 | 0.74 | 0.79 | 1.32 | 0.96 | 1.56 | 2.3  | 3.4  | 3.1  |
| Fatalities per 100 million working hours (employees and contractors)                            |      |      |      |      |      |      |      |      |      |      |
| <b>Injuries and process safety incidents</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable case frequency (TRCF)  | 1.00 | 0.94 | 0.99 | 1.15 | 1.26 | 1.24 | 1.23 | 1.4  | 1.8  | 1.9  |
| Injuries per million working hours (employees and contractors)                                  |      |      |      |      |      |      |      |      |      |      |
| Last time injury frequency (LTIF)   | 0.25 | 0.26 | 0.28 | 0.36 | 0.34 | 0.36 | 0.35 | 0.4  | 0.6  | 0.7  |
| Last time injuries per million working hours (employees and contractors)                        |      |      |      |      |      |      |      |      |      |      |
| <b>Operational process safety events</b>  |      |      |      |      |      |      |      |      |      |      |
| Tier 1 [A]  | 39   | 51   | 57   | 65   | 91   | n/c  | n/c  | n/c  | n/c  | n/c  |
| Tier 2 [A]  | 107  | 169  | 194  | 246  | 308  | n/c  | n/c  | n/c  | n/c  | n/c  |
| <b>Illnesses</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable occupational illness frequency (TROIF)   | 0.40 | 0.60 | 0.96 | 0.77 | 0.51 | 0.66 | 0.76 | 0.6  | 1.2  | 1.5  |
| Illnesses per million working hours (employees only)  |      |      |      |      |      |      |      |      |      |      |
| <b>[S] Security</b>   |      |      |      |      |      |      |      |      |      |      |
| Using armed security (% of countries)   | 17   | 19   | 24   | 19   | 17   | 14   | 9    | 17   | 17   | 16   |
| Using armed company security (% of countries)   | 1    | 1    | 1    | 3    | 0    | 1    | 1    | 1    | 1    | 2    |
| Using armed contractor security (% of countries)  | 7    | 8    | 10   | 8    | 10   | 9    | 6    | 10   | 9    | 12   |
| <b>[B] Gender diversity [B]</b>   |      |      |      |      |      |      |      |      |      |      |
| In supervisory/professional positions (% women)   | 28.0 | 28.0 | 29.0 | 29.8 | 28.1 | 27.3 | 26.3 | 26.4 | 24.7 | 24.6 |
| In management positions (% women)   | 21.0 | 20.0 | 21.0 | 18.8 | 18.2 | 17.6 | 17.0 | 16.1 | 15.3 | 17.7 |
| In senior leadership positions (% women)  | 20.0 | 19.0 | 18.2 | 17.2 | 16.2 | 16.4 | 15.3 | 14.0 | 13.6 | 12.9 |
| <b>[S] Staff forums and grievance procedures</b>  |      |      |      |      |      |      |      |      |      |      |
| % countries with staff access to staff forum, grievance procedure or other support system       | 100  | 100  | 100  | 100  | 100  | 99   | 100  | 99   | 100  | 100  |
| <b>[S] Child labour (% countries with procedures in place)</b>                                  |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | 100  | 99   |
| Contractors   | 100  | 100  | 100  | 100  | 100  | 97   | 96   | 97   | 99   | 98   |
| Suppliers   |      |      |      |      |      |      |      |      |      | 96   |
| <b>[S] Forced labour (% countries with procedures in place)</b>                                 |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | n/c  | n/c  |
| Contractors and suppliers   | 100  | 100  | 100  | 100  | 100  | 97   | 95   | 89   | n/c  | n/c  |
| <b>Integrity</b>  |      |      |      |      |      |      |      |      |      |      |
| Code of Conduct violations [C]  | 341  | 217  | 267  | 181  | 209  | 226  | 205  | 165  | 204  | 361  |
| <b>[S] Contracting and procurement</b>  |      |      |      |      |      |      |      |      |      |      |
| Estimated expenditure on goods and services in lower-income countries (\$ billion) [D] [E]      | 4.4  | 6    | 14   | 12   | 14   | 12   | 13   | 12   | 12   | 13   |
| <b>Social investment [F]</b>  |      |      |      |      |      |      |      |      |      |      |
| [S] Estimated voluntary social investment (equity share) (\$ million)                           | 102  | 122  | 160  | 159  | 149  | 125  | 121  | 132  | 148  | 170  |
| [S] Estimated social investment spend (equity share) in lower-income countries (\$ million) [G] | 96   | 43   | 73   | 74   | 67   | 45   | 61   | 54   | 61   | 65   |

[A] Process safety events are classified based on guidance from the ICGP and API. In 2016, there were 16 Tier 1 and 10 Tier 2 substantiated events.

[B] Diversity data obtained from our human resources system.

[C] Code of Conduct violations represent the number of reported incidents in the Shell Global discipline (excluding queries or customer services queries), which have been investigated and closed during the relevant period and where the allegation was found to be (at least partially) true.

[D] Estimated expenditure in countries where gross domestic product amounts to less than \$15,000 per year per person (source: UNDP Human Development Index 2015). In 2015, the UNDP index update no longer includes some of the countries in which Shell invests, which impacts on our reported spend amount.

[E] From 2013 onwards, this figure only includes the amount spent on goods and services by Shell group companies.

[F] Social investment spending varies from year to year depending on business climate, locations and types of activities under way. This is voluntary social investment and does not include social investments made through contractual agreements with host governments, voluntary work by Shell employees and donations of equipment.

[G] Estimated voluntary social investment spending in countries where gross domestic product amounts to less than \$15,000 a year per person (source: UNDP Human Development Index 2015). As the countries included in the UNDP index change, this affects our spend numbers. In 2015, the UNDP index update no longer includes some of the countries in which Shell invests, which impacts on our reported spend amount.

[S] Social investment and contracting and procurement data collected via our financial system since 2007.

[S] Data obtained from an internal survey completed by the senior Shell representative in each country.

## EXTERNAL REVIEW COMMITTEE

In 2005, Shell established an External Review Committee to help evaluate the quality and credibility of the annual Shell Sustainability Report and to recommend improvements to our sustainability performance.

Members of the External Review Committee (ERC) come from a range of professional backgrounds, but they share the following expertise and experience:

- globally respected, independent and pragmatic in their approach;
- familiar with, and able to convey, the perspectives of Shell stakeholder groups or are experts in the main sustainability challenges that Shell faces;
- broadly representative of regions of strategic importance to Shell;
- reasonably familiar with the oil and gas industry, Shell, and related sustainability issues; and
- capable of adding fresh perspectives to Shell's thinking and reporting on sustainability.

Committee members are asked to serve for three years, with two or three new members appointed each year. This is long enough to develop the necessary understanding of the issues and process, without diminishing the independence or external perception of independence critical to the ERC's effectiveness. The intention is that the Committee should bring a balance of experience and perspectives.

### ERC RECOMMENDATIONS IN 2015

Each year, the ERC is asked to present its independent opinion on the Shell Sustainability Report. An example is provided below of some of the recommendations included in the ERC's letter in the Shell Sustainability Report 2015 and Shell's response. The ERC recommendations have been fundamental in shaping this current report. (See table).

### REVIEW PROCESS

The Committee meets in person three times annually (in The Hague, the Netherlands), and on other occasions by teleconference. It holds meetings with Shell senior management, including Shell's Executive Committee, to discuss Shell's approach to sustainability and our reporting. When reviewing the sustainability report, the ERC focuses on three main questions:

- Has Shell selected the most important topics for the report?
- How well has the report dealt with these topics and responded to stakeholder interests?
- Has Shell provided sufficient information and access for the ERC to do its job effectively?

This review does not include the verification of performance data in the sustainability report, or the information on which the case studies in the report are based. Separately, the ERC provides Shell with its observations on the company's strategy and sustainability performance.

To acknowledge the ERC's time and expertise an honorarium is offered, payable either to the individual members, their organisation or their charity of choice. They are also offered reimbursement for their expenses.

## ERC recommendations and our responses

### ERC recommendation in 2015

#### Future reporting

The ERC would like to see a more strategic conversation on the role of fossil fuels, and the challenges posed by volatility of the oil price. The ERC is also anticipating a commentary on the acquisition of BG Group.

#### Energy transition and climate change

The ERC encourages Shell to disclose more precisely how its strategy aligns with this global ambition as stated at the COP21 in Paris and to provide more disclosures on Shell's thinking about the role of natural gas (and other fossil fuels) beyond 2050.

#### Natural gas and methane

The ERC believes that the report understates the magnitude of the climate problem posed by methane and the risk this represents to Shell. The report would benefit from greater clarity on how managing methane emissions and the related risks within its operations are reflected in Shell's business strategy.

#### Nigeria

In light of the fatalities in 2015, the ERC urges Shell to disclose more details on measures taken to avoid future incidents. They also ask Shell to be more transparent around the measures taken to implement the UNEP report recommendations.

### How Shell responded in the 2016 report

In *About Shell and Energy transition*, we outline the role of fossil fuels in the energy transition and how our refreshed strategy will make Shell a more resilient company.

Details on the BG integration can be found in *About Shell and How sustainability works at Shell*.

In 2016, Shell published the *Shell: Energy Transitions and Portfolio Resilience report* and the *Scenarios supplement A Better Life with a Healthy Planet: Pathways to Net-Zero Emissions*.

Shell's refreshed strategy is detailed in *About Shell, Natural gas and lower-carbon alternatives*.

The *Natural gas and Managing methane emissions* sections of this report set out our efforts in detecting and managing our methane emissions.

In *Our activities in Nigeria and Safety*, we explain our safety approach and focus.

This report includes an update on our activities in relation to spill prevention and clean up in Nigeria and the Ogoniland region.

## ERC OPINION

The External Review Committee (the ERC or the Committee) is pleased to share its independent opinion on Shell's Sustainability Report 2016 (the report).

As in past years, the ERC benefited from structured engagement with Shell's senior leadership and from participation in the report topic selection process. In our opinion, the report appropriately covers the main issues relevant to Shell and its stakeholders with the exception of one emerging issue which we note below.

The ERC commends Shell for updating the report format this year by embracing a web-first, interactive design approach for the narrative as well as for the presentation of performance data.

### SHARED VALUE AND SOCIAL PERFORMANCE

The ERC has long advocated for Shell to improve its reporting on social performance. We see improvements in the 2016 report, such as increased disclosure on indigenous people and resettlement. Social performance reporting could be further strengthened by discussing the challenge of applying social performance standards uniformly worldwide.

We welcome the addition of shared value as one of company's four strategic ambitions. However, the report provides little information on how Shell plans to create and deliver shared value. Given it is one of Shell's four strategic ambitions, a clear and consistent definition and a framework for measuring progress on shared value needs articulating. For stakeholders to understand shared value and see its impact, future reporting needs to describe how it is embedded throughout Shell's business and overall sustainable development agenda.

### ENERGY TRANSITION AND CLIMATE CHANGE

The 2016 report describes more clearly the company's intended contribution to the transition to a low-carbon future. However, the ERC finds the report ambiguous on the necessary pace of change, plus how Shell discusses the evolution of its business sometimes seems at odds with the report's own commentary on the urgency implied by the science of climate change as well as trends in many other sectors. There is a lack of discussion about how exploration and production will change over time or how in these two areas Shell will prioritise investments and activities. The report would also benefit from more detail on the key nations where Shell is partnering with governments to plan and execute pathways through the energy transition.

The report describes the activities planned under the New Energies portfolio but is silent on how Shell plans to win investor support for progressively increasing and accelerating investment in low-carbon alternatives, which today often offer different or lower returns than traditional oil and gas investments.

We are encouraged to see that the Quest carbon capture and storage (CCS) project exceeded its annual target to safely capture and store 1 million tonnes of CO<sub>2</sub> in its first full year. Looking forward, we recommend more disclosure on how Shell will develop more CCS projects, especially as part of gas and downstream operations, as well as more detail on how Shell will share Quest-related learning. More importantly, future reporting should discuss the implications for Shell's strategy if broad deployment of CCS on the scale envisioned in Shell's scenarios were significantly delayed.



External Review Committee: (from left to right)  
Ed Whittingham, Executive Director, Pembina Institute, Canada  
Bernice Lee, Head of Climate Change and Resource Security Initiatives, World Economic Forum, Hong Kong  
John Gardner, Vice President and Chief Sustainability Officer, Novellis Inc, UK  
Seema Arora (Chair), Executive Director, Confederation of Indian Industry, India  
Mark Brownstein, Vice President, Climate and Energy Program, Environmental Defense Fund, USA  
Lavinia Hollanda, Senior Energy Consultant and Advisor, Brazil

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As in previous years, the report does not share with readers any targets to indicate the intended pace of Shell's transition to a lower carbon portfolio. The ERC recommends the report include such goals in future.

## **NATURAL GAS AND METHANE**

The ERC is encouraged by the steps Shell is taking to eliminate venting and flaring of natural gas, especially now gas plays an even bigger part in Shell's portfolio following the BG acquisition. The report makes clear Shell's commitment to natural gas, and how Shell sees it as an important fuel in the journey towards an energy transition. However, natural gas cannot play a constructive role in a low-carbon transition without minimisation of methane emissions.

The ERC is pleased that Shell has now joined the Climate and Clean Air Coalition's "Oil and Gas Methane" partnership, but suggests further action and disclosure are needed. Given Shell's advocacy and emphasis on natural gas, it is important for Shell to articulate a comprehensive plan for methane reduction. This should address the operating practices and regulatory requirements that are needed for the oil and gas industry to deal effectively with the problem of methane leakage from the production, transportation and use of natural gas.

## **PRODUCT STEWARDSHIP AND CIRCULAR ECONOMY**

The report lacks comprehensive information on Shell's approach to product stewardship, particularly end of life responsibility and circular economy initiatives. The ERC recommends that the company share more in the report about the policies and plans that will guide development of Shell thinking on product stewardship including end of life as well as the ways that the circular economy may affect Shell's businesses.

## **ADVOCACY, PARTNERSHIPS AND COLLABORATIONS**

The report describes various partnerships and collaborations through which Shell advocates its position on sustainability issues, including on climate change. There is growing global concern that oil and gas companies have advocated against stronger climate regulations through their trade associations and in private discussions with governments. The ERC suggests that future reports clarify when and how Shell's public positions on material issues differ from those of its trade associations.

## **DIVESTMENTS**

In 2016, Shell announced a \$30 billion divestment programme, which will raise capital and has the potential to shift the carbon intensity of the company's portfolio. The ERC believes the report should explain to stakeholders how Shell addresses the environmental and social liabilities associated with divested assets.

## **NIGERIA**

The ERC recognises the security challenges and complexity of operating in Nigeria and notes Shell's safety record there improved in 2016. The ERC suggests future reporting should explain in more detail the steps Shell is taking to minimise harm to communities from spills and the timeline for major remediation commitments.

## **CONCLUSION**

The Committee recognises Shell's commitment to transparency and reporting best practice and to stakeholder engagement, including with the ERC. There is progress in the 2016 report, particularly the prominent disclosure of changes to the sustainability elements of the executive scorecard and compensation, as well as the inclusion of more strategic topics. In the 2017 report, the ERC hopes to see clearer description of quantifiable and time-bound sustainability goals and ambitions, which will enhance the reader's ability to judge progress.



**SHARE YOUR OPINION**

If you have any views on issues described  
in this report, or on the report itself, please  
email us at: [sustainabilityreport@shell.com](mailto:sustainabilityreport@shell.com)

All our reports are available at  
<http://reports.shell.com>



- Comprehensive financial information on our activities throughout 2016
- Detailed operational information including maps
- Report on our progress in contributing to sustainable development

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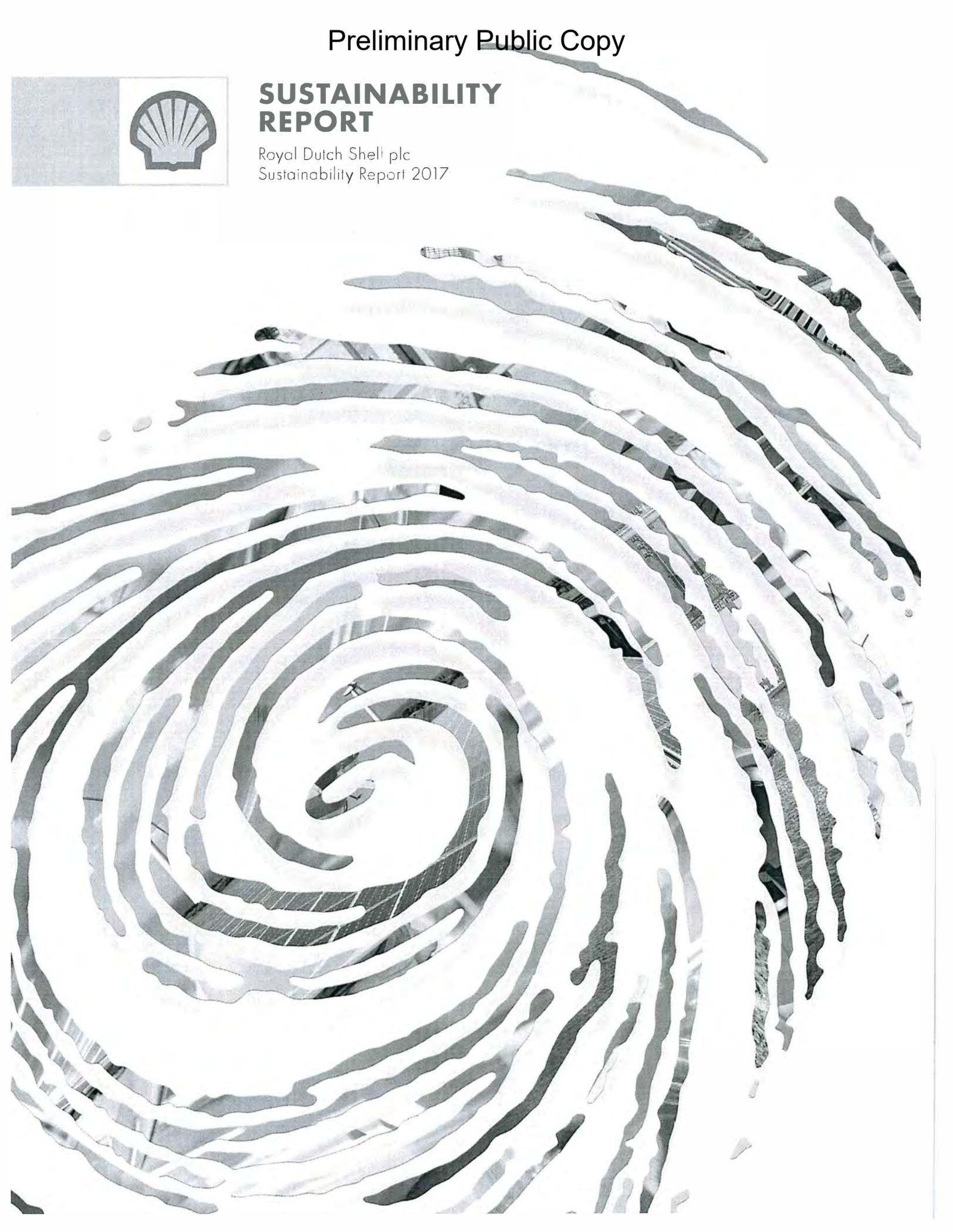
# ATTACHMENT 82

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# SUSTAINABILITY REPORT

Royal Dutch Shell plc  
Sustainability Report 2017



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#### Cover image

The fingerprint reflects how people are central to powering progress with more and cleaner energy, from our retail sites to our offshore operations.

#### Digital

The Sustainability Report is published in an online version at [reports.shell.com](https://reports.shell.com). The online version includes additional information, such as an interactive GRI index to enhance usability for the reader. In the event of any discrepancy between the online and hardcopy versions, the information contained in the online report prevails. This hardcopy version is provided for the reader's convenience only.

#### Scenarios

This report contains data from Shell's new Sky Scenario. Unlike Shell's previously published Mountains and Oceans exploratory scenarios, the Sky Scenario is targeted through the assumption that society reaches the Paris Agreement's goal of holding global average temperatures to well below 2°C. Unlike Shell's Mountains and Oceans scenarios which unfolded in an open-ended way based upon plausible assumptions and quantifications, the Sky Scenario was specifically designed to reach the Paris Agreement's goal in a technically possible manner. These scenarios are a part of an ongoing process used in Shell for over 40 years to challenge executives' perspectives on the future business environment. They are designed to stretch management to consider even events that may only be remotely possible. Scenarios, therefore, are not

intended to be predictions of likely future events or outcomes and investors should not rely on them when making an investment decision with regard to Royal Dutch Shell plc securities.

Additionally, it is important to note that Shell's existing portfolio has been decades in development. While we believe our portfolio is resilient under a wide range of outlooks, including the IEA's 450 scenario (World Energy Outlook 2016), it includes assets across a spectrum of energy intensities including some with above-average intensity. While we seek to enhance our operations' average energy intensity through both the development of new projects and divestments, we have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10-20 years.

# Introduction

Welcome to the Shell Sustainability Report, which covers our social, safety and environmental performance in 2017 and significant events for Shell during the year. The report includes an introduction from Shell Chief Executive Officer Ben van Beurden and an opinion from the independent experts on the Report Review Panel.

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## Introduction from the CEO

In 2017, the world continued its efforts to meet the dual challenge of rising energy demand and tackling climate change. The landmark UN Paris Agreement has set the planet a clear direction of travel towards a low-carbon future.

Getting there will mean providing much more energy with much less carbon dioxide (CO<sub>2</sub>). It will need collaboration between business and civil society. Beyond widespread support for the Paris Agreement, there will need to be strong government policies to drive behaviour towards its targets.

The challenge is clear. Large parts of the world's growing population still live without access to safe, reliable and affordable energy. As living standards rise, energy demand could double over the course of the century. The world is going to have to make meeting this demand part of the approach to cutting emissions. All this change offers huge opportunities to break new ground in low-carbon energy solutions and technologies.

We, at Shell, think long and hard about our role in the transition to a cleaner energy future and the steps needed to create a sustainable world economy. We continue to put respect for people, their safety, communities and the environment at the heart of our approach.

### THRIVING THROUGH THE ENERGY TRANSITION

In 2017, we announced our ambition to cut the net carbon footprint of the energy products we provide by around half by 2050 in step with society's drive to align with the goals of the Paris Agreement. This is an industry-leading aspiration that may need periodic recalibration in line with the pace of change in broader society and the wider energy system.

As an interim step, by 2035, we aim for a reduction of 20% based on our expectation of society's movement toward meeting the goal of the Paris Agreement. This includes emissions from Shell's operations; emissions of third parties who supply energy for that production; and our customers' emissions from their use of the products we sell. This means we aim to help our customers reduce their own emissions through the solutions we offer.

To meet this ambition, we will step up many of our existing activities. That means bringing more biofuels, hydrogen and electric vehicle charging into the mix; more renewable power; and helping to advance technology to capture CO<sub>2</sub> emissions and store them safely underground. We will also use natural solutions, including forests and wetlands, to help naturally absorb emissions from uses where alternatives do not yet exist or will take time to reach commercial scale. We will produce more natural gas, the cleanest-burning hydrocarbon, and make it a priority to reduce leakage of the potent greenhouse gas methane from our gas operations.

Our continued financial resilience is vital if we are to play a successful role in the energy transition. We are working with the Task Force on Climate-related Financial Disclosures (TCFD), which in 2017 published recommendations calling



"We, at Shell, think long and hard about our role in the transition to a cleaner energy future and the steps needed to create a sustainable world economy."

on companies to give more information about how they assess and manage climate-related risks. The 2017 Annual Report and other publications aim to complement our 2017 Sustainability Report in responding to the TCFD recommendations, including discussing the energy transition and our portfolio resilience.

#### OUR CONTRIBUTION TO SOCIETY

The 2017 Sustainability Report sets out in detail our contribution to society. This includes how we play our part in achieving the UN's sustainable development goals, which seek to address the world's biggest challenges, from ending poverty to improving health and education to making cities more sustainable.

We work to do the right thing. Firstly, we continue our relentless focus on working with communities and managing our impact on the environment. This means in Nigeria, for example, addressing environmental challenges related to oil spills in areas with significant oil theft and illegal refining. We saw progress in 2017 with vital clean-up work starting in Bodo, an area affected by oil spills from various sources. In the Netherlands, we are working hard with our partners to find solutions to the problems caused by earthquakes as a result of gas production in Groningen. We support the people of Groningen and will meet our responsibility.

Secondly, we help provide the energy products that light, heat and cool homes and businesses, as well as providing the energy that transports and connects people, goods and services. We deliver products that contribute to people's quality of life and, where viable, provide energy to those who lack enough access to it.

Finally, we continue to play a positive role in communities and wider society. This includes providing employment, education and paying taxes. It is about being a good neighbour. In 2017, for example, I was heartened by the courage and determination of Shell employees who helped those caught in the devastation left by Hurricane Harvey.

#### OPERATING SAFELY

Our goal is to work without causing any harm to people and the environment. However, we had two fatalities in 2017: a contractor died in a road accident in Alberta, Canada and there was a fatality due to a security incident

in Port Harcourt, Nigeria. This is unacceptable. Safety in our operations is our top priority and we work to ensure staff and contractors are alert to their own safety, care about the safety of their colleagues and look out for any potential safety risks in our operations, however small. We need to continue to assure our plants and projects operate safely, particularly by improving our safety behaviour and enabling employees to quickly report incidents or potential incidents when they occur.

I was deeply saddened by a road-tanker incident in Pakistan in 2017. In this tragedy, which was outside the scope of Shell's safety reporting, a vehicle operated by a contractor overturned, spilling fuel that subsequently ignited and caused more than 200 fatalities and injured a number of other people. Events such as these underscore the importance of the continued focus on health and safety standards by all contractors, suppliers and employees.

#### THE 2017 SUSTAINABILITY REPORT

Once again, we appreciate the involvement of leading independent sustainability experts, which this year comes from the Report Review Panel. They have provided feedback that has helped our reporting become more balanced, relevant and responsive to the interests of our customers, partners and investors and made recommendations for Shell's future reporting.

We are a founding member of the UN Global Compact and continue to support its corporate governance principles on human rights, anti-corruption, environmental protection and better labour practices.

Sustainability is essential to the way we do business. Our Sustainability Report is an account of our progress in this area as we continue to deliver energy products society needs in the transition to a low-carbon world.

A handwritten signature in black ink, appearing to read 'Ben van Beurden'. The signature is stylized and written in a cursive-like font.

Ben van Beurden  
Chief Executive Officer

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## About this report

The 2017 Sustainability Report, published on April 9, 2018, is our 21<sup>st</sup> report. Sustainability at Shell means providing energy in a responsible manner, respecting people, their safety and the environment.

This report focuses on the key sustainability challenges we face and the many ways we are responding. It details our social, safety and environmental performance in 2017.

### TOPIC SELECTION FOR 2017

The topic selection process identifies the sustainability subjects that were most relevant to Shell and our stakeholders or prominent globally in 2017.

Each year, we use a structured process to select the report's content and confirm its validity. We engage with various groups and individuals to understand specific concerns about our business and its impact around the world, particularly in relation to the environment and society.

These include community representatives, business partners, customers, non-governmental organisations, investors, the media, academics, contractors, suppliers, ratings agencies and members of the public. We also talk to teams within Shell across all parts of our business. We gather opinions and advice in various ways including formal and informal meetings, workshops and online surveys.

This report lists the topics that were a priority to our company in 2017. The topics that consistently ranked of higher importance were energy transition and climate change, as well as business ethics and corporate governance. A full list of priority topics is provided in the table below.

### THE MAIN STEPS INVOLVED IN SELECTING THE TOPICS ARE:

**Step 1:** identify and understand topics that are important to our stakeholders;

**Step 2:** identify topics that are important to Shell's business strategy;

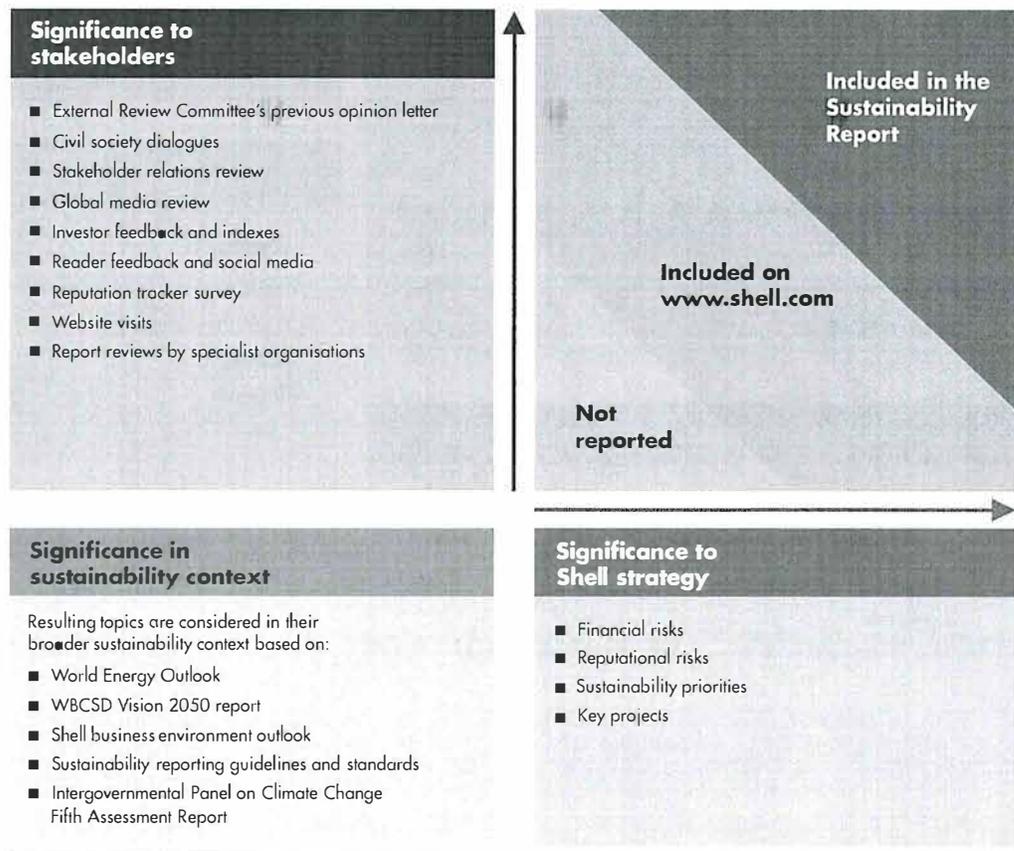
**Step 3:** collate all the topics identified as of high importance by our stakeholders in the previous steps – these topics determine the report's content;

**Step 4:** identify the topics that will be covered elsewhere on [www.shell.com](http://www.shell.com);

**Step 5:** consider input from our Report Review Panel to ensure that coverage is balanced, relevant and complete; and

**Step 6:** inform Shell's Executive Committee of the chosen topics, for their endorsement.

### Topic selection diagram



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## REPORTING GUIDELINES

We report in line with guidelines developed by IPIECA, the global oil and gas industry association for environmental and social issues, and in accordance with the Global Reporting Initiative (GRI) version 4 (See GRI index for full details).

In 2018, we are using the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) to guide our reporting in our 2017 Annual Report and 2017 Sustainability Report, complemented by our Sky Scenario and the Shell Energy Transition Report. The TCFD was set up by the Financial Stability Board, an international body, and the recommendations call on companies to provide greater transparency about how they identify, assess and manage climate-related risks and opportunities.

In 2017, we were one of the earliest supporters of the TCFD and we continue to work with the task force to help develop more specific guidance on meaningful disclosures linked to climate change. To that end, we have joined the Oil & Gas Preparer Forum, initiated by the TCFD and convened by the World Business Council for Sustainable Development, an advocacy association.

More detailed information about how we report is available on [www.shell.com](http://www.shell.com).

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## Report Review Panel

We have used external review panels to strengthen our sustainability reporting since 2005. They help us evaluate and improve the quality and credibility of our Sustainability Report.

The 2017 Report Review Panel, previously called the External Review Committee, comprises six sustainability and corporate reporting experts. Panel members are offered an honorarium for their time and expertise. This year's panel comprised:

- Faris Natour, Germany/USA. Director, Human Rights & Business Initiative, UC Berkeley Haas School of Business, (Chair of the Report Review Panel)
- Andrew Logan, USA. Director, Oil and Gas, Ceres
- Changhua Wu, China. Chair, China Redesign Hub and Asia Region liaison, Office of Jeremy Rifkin
- Marie Morice, USA. Senior advisor, Natural Capital Finance Alliance
- Mandy Kirby, UK. Director, Principles for Responsible Investment
- Merene Botsio Tamakloe, Ghana/UK. New Partnerships Manager, CARE International

You can read more about the panel members on [www.shell.com](http://www.shell.com)

The panel provided input as part of our content selection process and reviewed the report in depth before preparing their statement focusing on the quality of the report. The panel met to discuss Shell's reporting, question Shell experts and prepare their statement.

The 2017 panel's mandate focused on the quality – including the credibility, completeness and responsiveness – of Shell's reporting.

Read below some of the feedback given in the 2016 report by the expert reviewers, and our response (see table).

| <b>2016 RECOMMENDATIONS AND OUR RESPONSES</b>  |  |
|--|--|
| <b>2016 recommendation</b>   | <b>How Shell responded in 2017</b>   |
| <p><b>Shared value and social performance:</b> For stakeholders to understand shared value and see its impact, future reporting needs to describe how it is embedded throughout Shell's business and overall sustainable development agenda.</p>   | <p>In the 2017 report, you can read more about how Shell is contributing to society and how this is connected to the UN's sustainable development goals.</p>                     |
| <p><b>Energy transition and climate change:</b> There is a lack of discussion about how exploration and production will change over time or how in these two areas Shell will prioritise investments and activities.</p> <p>The report does not share with readers any targets to indicate the intended pace of Shell's transition to a lower-carbon portfolio and it is recommended that the report include such goals in future.</p> | <p>Shell's climate change thinking is detailed in the introduction from our CEO and Energy Transition section. You can also read more in the Shell Energy Transition Report.</p> |
| <p><b>Product stewardship and circular economy:</b> It is recommended that the company shares more in the report about the policies and plans that will guide development of Shell thinking on product stewardship including end of life as well as the ways that the circular economy may affect Shell's businesses.</p>  | <p>Read about our Product Stewardship policies.</p>  |
| <p><b>Divestments:</b> The report should explain to stakeholders how Shell addresses the environmental and social liabilities associated with divested assets.</p>   | <p>In our Divestment section, you can read about our approach and how we have managed some recent cases.</p>   |

### REPORT REVIEW PANEL - INDEPENDENT STATEMENT

The Report Review Panel provides this independent statement on Shell's 2017 Sustainability Report. We have had the opportunity to review two drafts of the 2017 Sustainability Report and provide feedback to Shell through conference calls and in writing. Shell has responded to our questions and suggestions. We have developed this statement independently following our review. We commend Shell on its commitment to transparency, stakeholder engagement, and continuous improvement in its approach to sustainability reporting.

We appreciate the opportunity to provide feedback and recommendations for further improving Shell's sustainability reporting. In line with the scope of our review, our feedback focuses on the quality of Shell's sustainability reporting rather than its sustainability performance.

The 2017 Sustainability Report focuses largely on the sustainability issues the company has identified as most material through a materiality analysis. It does so in a thorough, rigorous, and comprehensive way and provides important information in a clear, accessible and concise format. In future reporting, we recommend that Shell provides more comprehensive disclosure on social issues and water, greater balance between successes and areas for improvement, as well as greater emphasis on the ways in which the company's sustainability efforts strengthen its core business.

The disclosure on Shell's approach to the energy transition and its emissions disclosure are particularly comprehensive, although more emphasis on the interconnectedness between energy, water, ecosystems and watershed management could further improve Shell's reporting. The inclusion of independent statements as well as case studies provide important context to the description of Shell's strategic priorities and management approach in sustainability. However, we encourage the company to seek out greater balance by highlighting external opinions and case studies that offer constructive criticism of its performance.

**Recommendations:** We see opportunities to further improve Shell's sustainability reporting in the following ways:

- **Social issues:** While the report provides a thorough review of Shell's material issues, we would like to see more detailed disclosure of social issues, including Shell's holistic approach to contributing to the UN's sustainable development goals (SDGs), human rights due diligence, and operating in sensitive areas. We are aware that Shell provides some information on these topics on [www.shell.com](http://www.shell.com) but we would urge the company to ensure that sufficient depth is provided in the report on these important topics. We welcome that Shell has identified the SDGs it views as most relevant to the business. Moving forward, we expect Shell to integrate the SDGs more in its reporting and provide additional information about how Shell is advancing

the SDGs as a company and in partnership with others. In addition, Shell has an opportunity to more clearly emphasize the interconnectedness between environmental and social issues. We also view gender diversity and inclusion as a material issue for all companies, and Shell could provide more detail in its sustainability reporting on its approach to advancing diversity and inclusion at Shell and in the energy sector.

- **Water:** We see water as an increasingly important topic and would welcome more information on how Shell manages impacts on water beyond the facilities level. This should include information on how Shell is mitigating broader watershed impacts as well as steps it has taken to reduce risk exposure including through the setting of targets. We would also welcome data on Shell's water performance that is specific to particular assets and geographies, as water is largely a local issue and global data reveals little to a reader.
- **Balance:** While the report highlights both successes and areas for improvement, overall there is an emphasis on success in the report. We see an opportunity for Shell to improve the report's overall balance and drive continuous improvement in the energy sector by including more discussion of challenging experiences, lessons learned and areas for improvement. In addition, while we commend Shell for including independent statements from civil society organisations throughout the report, we encourage it to seek more diverse voices of constructive criticism in future.
- **Metrics:** We would like to see Shell provide more context for the performance data included in the report. It is not apparent for all metrics what factors contributed to a specific outcome and what impact any management steps taken by Shell have had. Including more of this kind of information will help readers understand how Shell achieved or did not achieve the targets the company has set for itself.
- **Strategic focus and ease of navigation:** We appreciate Shell's effort to strive for completeness. Future reports could be simplified further by putting greater emphasis on the ways in which the company's sustainability efforts strengthen its core business. Shell could highlight fewer case studies while going into more detail and linking each more closely to the broader operating context for the sustainability priorities they seek to illustrate. Similarly, we would welcome more sign-posting to highlight the various connections across the report to Shell's strategic priorities.

Robust sustainability disclosure is essential for Shell to meet the ambitious goals it has set for itself and for Shell's stakeholders to assess progress and hold the company to account. We appreciate the opportunity to share our feedback and recommendations. While we saw improvements during the drafting stage, there remain opportunities to further improve Shell's reporting, and we look forward to reviewing Shell's progress in these areas in future reports.

## About Shell

### OUR STRATEGY

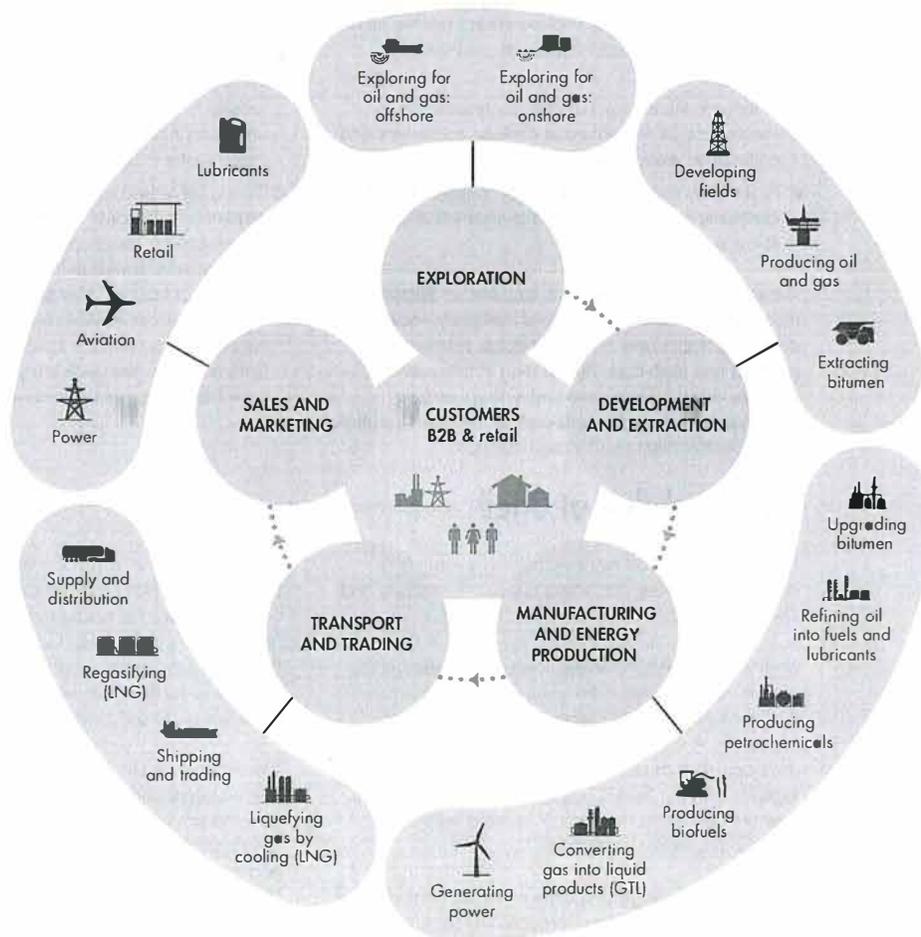
Shell is an international energy company with expertise in the exploration, development, production, refining and marketing of oil and natural gas, as well as in the manufacturing and marketing of chemicals. Our New Energies business pursues two main areas of opportunities: new fuels for transport, such as advanced biofuels, hydrogen, and charging for battery-electric vehicles; and power, including low-carbon sources such as wind and solar as well as natural gas.

We are one of the world's largest independent energy companies in terms of market capitalisation, cash flow from operating activities, and production levels. We explore for and produce oil and gas worldwide, both

from conventional fields and from sources such as shales and deep water. We work to develop new oil and gas supplies, and have a global network of refineries and chemical plants. Shell transports and trades oil, gas and other energy-related products, such as electricity and carbon-emission rights. Our New Energies business, which we created in 2016, invests in commercial opportunities linked to the energy transition. This business focuses on new fuels, such as biofuels, hydrogen and charging for battery-electric vehicles; and power, including from low-carbon sources such as wind and solar as well as natural gas. We also invest in new business models and digital technology that improve our core business. Around 30 million customers every day are served through Shell's global network of 44,000 Shell-branded retail stations.

### IN 2017, SHELL:

- Produced 3,664 thousand barrels of oil equivalent on average per day.
- Traded more than 8 million barrels of physical crude oil on average every day.
- Sold 66 million tonnes of liquefied natural gas.
- Served 30 million customers on average every day at our retail sites.
- Made capital investments of \$24 billion.



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## OUR PURPOSE AND BUSINESS STRATEGY

Shell's purpose is to power progress together with more and cleaner energy solutions. Our strategy is to strengthen our position as a leading energy company by providing oil and gas and lowcarbon energy as the world's energy system changes. Safety and social responsibility are fundamental to our business approach. Shell will only succeed by working with customers, governments, business partners, investors and other stakeholders.

Our strategy is founded on our outlook for the energy sector and the chance to grasp the opportunities arising from the substantial changes in the world around us. The rising standard of living of a growing global population is likely to continue to drive demand for energy, including oil and gas, for years to come. At the same time, technology changes and the need to tackle climate change means there is a transition under way to a lower-carbon, multi-source energy system with increasing customer choice. We recognise that the pace and specific path forward is uncertain and so requires agile decision making.

## STRATEGIC AMBITIONS

Against this backdrop, Shell has the following strategic ambitions:

- to provide a world-class investment case. This involves growing free cash flow and increasing returns, all built upon a strong financial framework and resilient portfolio;
- to thrive in the energy transition by responding to society's desire for more and cleaner, convenient and competitive energy; and
- to sustain a strong societal licence to operate and contribute to society through a shared value approach to our activities.

The execution of our strategy is founded on becoming a more customer-centric and simpler company, focused on delivering higher and more predictable returns and growing free cash flow. By investing in competitive projects, driving down costs and selling non-core businesses, Shell continues to seek to reshape its portfolio into a more resilient and focused company.

## Sustainability at Shell

Sustainability at Shell means providing energy in a responsible manner, respecting people, their safety and the environment.

Shell's core values of honesty, integrity and respect for people – first laid out in the Shell General Business Principles more than 40 years ago – underpin our approach. A commitment to contribute to sustainable development was added in 1997. These principles, together with our Shell Code of Conduct, apply to the way we do business and to our conduct with the communities where we operate.

We share knowledge and experience with a number of organisations to improve approaches to areas such as environmental sustainability, climate change and

Our ability to achieve our strategic ambitions depends on how we respond to competitive forces. We continuously assess the external environment – the markets as well as the underlying economic, political, social and environmental drivers that shape them – to evaluate changes in competitive forces and business models. We undertake regular reviews of the markets we operate in and analyse our traditional and non-traditional competitors' strengths and weaknesses to understand our competitive position. We maintain business strategies and plans that focus on actions and capabilities to create and sustain competitive advantage. We maintain a risk management framework that regularly assesses our response to, and risk appetite for, identified risk factors.

## STRATEGIC THEMES

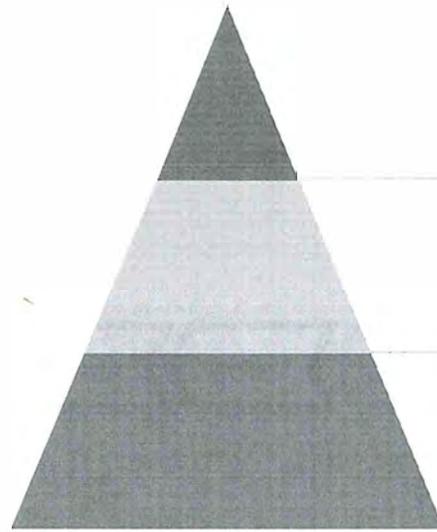
As part of our strategy, we divide our portfolio into strategic themes, each with distinctive capabilities, growth strategies, risk management, capital allocation and expected returns:

- Cash engines are strategic themes that are expected to provide strong and resilient returns and free cash flow, funding shareholder returns and strengthening the balance sheet. Shell continues to invest in selective growth opportunities for cash engines. Our cash engines are conventional oil and gas in Upstream, Integrated Gas, and oil products in Downstream.
- Growth priorities are the cash engines of the future. Shell seeks to invest in affordable growth in advantaged positions with a pathway to free cash flow and returns in the near future. Our growth priorities currently are deep water in Upstream and chemicals in Downstream.
- Emerging opportunities are strategic themes that are expected to become growth priorities after further development. These opportunities should provide us with material growth in free cash flow in the next decade or beyond. We seek to manage our exposure to these businesses while establishing scale. Our emerging opportunities currently are shales in Upstream and new energies, which is part of the Integrated Gas and New Energies organisation.

technology. We also support the UN Universal Declaration of Human Rights and several external voluntary codes promoting responsible business practices, including, the UN Global Compact, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises and the Voluntary Principles on Security and Human Rights.

We support the UN Paris Agreement on climate change. We welcome and will play our part in helping governments and society to achieve the UN's sustainable development goals, which seek to tackle the world's economic, social and environmental challenges by 2030. We also regularly provide information to various indices, and engage with customers and suppliers through their sustainability questionnaires.

## Integrating sustainability



Helping to shape a more sustainable energy future

Sharing wider benefits where we operate

Running a safe, efficient, responsible and profitable business

Our approach to sustainability is integrated across our business activities on three levels:

### **Running a safe, efficient, responsible and profitable business**

Safeguarding and respecting people – our employees, contractors and neighbours – is fundamental to how we do business. This includes having global standards, processes and tools in place to manage safety, the environment and how we engage with communities. We aim to continuously improve the way we operate to prevent incidents and to identify, avoid where possible and minimise adverse environmental and social impacts. For more details on our 2017 performance in these areas see [Our performance and data](#).

### **Sharing wider benefits where we operate**

We plan our business for the long term to help ensure we play a positive role in communities where we operate and in wider society. We contribute to the development of local economies by creating jobs, boosting skills, sourcing from local suppliers and helping to improve industry standards, as well as paying taxes and royalties.

We support community projects that are based on the needs of the local communities.

### **Helping to shape a more sustainable energy future**

Achieving a more sustainable energy future requires an energy transition that allows society to reduce its emissions, tackle climate change, while also extending the economic and social benefits of energy to everyone. This ambition requires a change in the way energy is produced, used and made accessible to more people while drastically cutting emissions. It is feasible but requires urgent action and long-term vision. Shell is a willing and able player in this transition. We will play our role where it makes commercial sense, in oil and gas, as well as in low-carbon technologies and renewable energy sources. But there is the need for society as a whole to address the climate challenge. We advocate that businesses, governments and civil society work together to shape a more sustainable energy future.

For Shell's view of the energy transition and our strategic response to it, see [Our strategy](#) and the [Energy transition](#) sections.

## Embedding sustainability in projects

Our commitment to safety, the environment and communities plays an important role in how we plan, design and operate projects and facilities. We will continue our relentless focus on managing impacts, especially in the challenging environments where we operate.

When we invest in projects, we aim to balance the short- and long-term interests of our business. For investment decisions, we consider the economic, social and environmental risks and opportunities as well as the political and technical risks.

Shell conducts an environmental, social and health impact assessment for every major project. As part of the impact

assessment process, we engage with communities and other stakeholders, for example non-governmental organisations, to discuss possible ways to address their concerns. This helps us understand and better manage the effects our projects could have on the surrounding environment and local communities and to comply with relevant social and environmental regulations.

Our Health, Safety, Security, Environment and Social Performance (HSS&SP) Control Framework has mandatory requirements to ensure the performance of these impact assessments. We also draw on international standards from bodies such as the World Bank and its International Finance Corporation, to guide our engagement with communities.

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## OUR PEOPLE

We train our project teams to understand how to use impact assessments to embed sustainability into project decisions. They are supported by specialists in areas such as environmental management, health and social performance including, but not limited to:

- biodiversity, waste, air, energy and water management; and
- indigenous peoples' rights, cultural heritage and resettlement.

The specialists support project teams on impact assessments and help manage potential impacts on communities or the environment during project design, construction and operation.

For more details, read what sustainability means at Shell on [www.shell.com](http://www.shell.com).

## A guide to sustainability across the life of a project



**Identify people** who may be interested in or affected by the project



**Engage with stakeholders** (e.g. communities, host governments and NGOs) and feed responses into our risk analyses and decision-making process.



**Conduct baseline studies** of the local environment (e.g. water, biodiversity, social livelihoods) and consider how the project may affect it.



Based on an assessment of potential impacts and stakeholder engagement, **identify mitigation and enhancement measures.**



**Implement a mitigation plan** for project development, construction and operation.



1. **Colombia baseline work:** In Colombia, where we have several exploration blocks offshore, conducting extensive environmental baseline studies is a legal requirement, including sampling of aquatic animals. We collaborated with local fishermen to get better quality data. During 2016 and 2017, the fishermen were trained and given equipment, including a GPS to mark locations. They were also given cameras, to label and document the fish they caught. This resulted in a representative list of the main species caught in each fishing area and mapped variations throughout the year, providing a firm basis for the evaluation of the marine biodiversity, frequency and abundance of species. The fishermen benefited from this knowledge and received training to improve their safety. The project received positive recognition from local authorities.
2. **Pennsylvania:** In Pennsylvania, USA, our project to build a petrochemical facility will involve redeveloping an existing industrial site used for zinc smelting for around 100 years.
3. **Groundbirch reclamation work:** We comply with the terms of our permits, agreements and local laws and regulations concerning restoration of the land used by our operations. In Canada, for example, at the Shell Groundbirch project, where we use hydraulic fracturing to unlock gas trapped in rock, we are working with a First Nations indigenous community plant nursery to preserve their cultural heritage and the natural habitat. Seeds from local indigenous plants are collected and planted above pipelines and other infrastructure in the area. Matching plants with their natural habitats increases the chance of survival and results in a landscape that is more diverse and natural. First Nation community members participate in the restoration efforts, carrying our work that builds on their knowledge of plants and the ecosystem.

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## NEW LIFE FOR AN OLD INDUSTRIAL SITE

In Pennsylvania, USA, we are building a petrochemicals facility on an existing industrial site used for zinc smelting for around 100 years.

Minimising the impact on people and the local environment is at the heart of our plans.

After the zinc smelter had been safely decommissioned, we recycled the old equipment and waste products. We covered the site with special industrial liners and caps to protect groundwater and surface water and people building the new facility. Where areas of water on the site could not be protected, we created wetlands elsewhere. These have now grown into healthy habitats for fish and vegetation.

We used an emissions offsetting programme to help reduce the impact that building work will have on local air quality. After consulting with local residents and community leaders, we also planted native trees along the nearby river to improve the look of the construction site.

Working closely with the state environmental regulator, we are investing \$80 million in mitigating the environmental impacts of converting the industrial site. Once up and running, the plant will produce polyethylene which is used in many everyday products, from food packaging and containers to automotive components.

## Sustainability governance

Governance is about making sure we live up to the high standards we set as a company – on health and safety, on the environment and biodiversity, and in our relationships with local communities.

We have put clear and effective governance structures in place throughout Shell, along with performance standards and other controls. These influence decisions and actions across the Shell businesses.

Our governance procedures involves the Board of Royal Dutch Shell plc, four Board Committees, our Executive Committee, and the teams and individuals who manage our operations. We take rigorous care to ensure that standards are communicated and maintained across the business.

The Corporate and Social Responsibility committee (CSRC) is one of our Board Committees. For further details on the CSRC and how sustainability is managed at Shell see [www.shell.com](http://www.shell.com) and our Annual Report.

### THE CSRC IN 2017

The CSRC's role is to review and advise Shell on our strategy, policies and performance against the Shell General Business Principles, our Code of Conduct and our Health, Safety, Security, Environment and Social Performance (HSSE&SP) standards.

The CSRC meets regularly to review and discuss a wide range of sustainability-related topics and to assess our sustainability performance, audit results and the sustainable development metrics that apply to the Executive Committee scorecard. It also monitors major issues of public concern that may be relevant to Shell.

Members of the CSRC during 2017 were:

- Hans Wijers, appointed Chair of the Committee with effect from May 2015;
- Sir Nigel Sheinwald, appointed a member of the Committee with effect from July 2012;
- Catherine Hughes, appointed a member of the Committee with effect from November 2017;
- Guy Elliott, appointed a member of the Committee with effect from March 2017 and stood down as a Non-executive Director of the company in October 2017; and
- Patricia A. Woertz, appointed a member of the Committee with effect from June 2014 and stood down as a Non-executive Director of the company in May 2017.

### CSRC ENGAGEMENT

In 2017, the CSRC discussed topics including Shell's operations in the Niger Delta, Nigeria and Groningen, the Netherlands, human rights, natural capital, the energy transition, greenhouse gas emission targets and CO<sub>2</sub> and methane-related developments. The committee also conducted several site visits. Sir Nigel Sheinwald and Guy Elliott visited the Bacton gas plant on the UK's North Sea coast and met with community members to discuss, among other topics, how to redistribute sand and sediment to protect the coastline. Hans Wijers visited the Pernis refinery in the Netherlands and discussed the challenges and opportunities for the facility with the leadership team. The committee, along with the CEO, also visited Shell's project in Pennsylvania, USA, to learn about the transformation of the site from a zinc smelter to a chemical plant and to meet with local stakeholders and contractors to discuss a range of HSSE topics.

## Reporting against aspirations

This table represents a selection of global metrics that we track within Shell. These metrics have been selected because they reflect the direct impact of our operations on people and the environment. We used them to set our goals and measure progress in 2017 and to define priorities for 2018.

We review our metrics regularly to ensure we capture the information needed to improve our performance. For example, we introduced Goal Zero for personal safety at

Shell in 2007. Since then, we have broadened the goal to aim for no harm to people and the environment. The metrics used to measure our greenhouse gas performance of refineries and chemical plants changed in 2017, and further changes to upstream and integrated gas emissions are planned for 2018. More information on our performance, definitions of the indicators and the referenced goals are provided in the environmental, social and safety data sections.

### Goals, performance and plans for 2017 and beyond

|                        | Goal 2017  | Progress in 2017   | Priorities in 2018 |                         |      |     |      |     |      |     |      |     |      |     |  |
|------------------------|--|--|--------------------|-------------------------|------|-----|------|-----|------|-----|------|-----|------|-----|--|
| <b>PERSONAL SAFETY</b> | <p>TRCF &lt; 0.9</p> <p><b>Achieve total recordable case frequency (TRCF) – the number of injuries per million working hours – below 0.9 for employees and contractors.</b></p> <p>Goal Zero has been our ambition for personal safety since 2007.</p>   | <p>Total recordable case frequency (TRCF)</p> <table border="1"> <caption>TRCF Data</caption> <thead> <tr> <th>Year</th> <th>TRCF</th> </tr> </thead> <tbody> <tr> <td>2013</td> <td>1.2</td> </tr> <tr> <td>2014</td> <td>1.0</td> </tr> <tr> <td>2015</td> <td>0.9</td> </tr> <tr> <td>2016</td> <td>1.0</td> </tr> <tr> <td>2017</td> <td>0.8</td> </tr> </tbody> </table> <p>In 2017, we achieved our lowest ever number of injuries. (See Safety performance).</p>  | Year               | TRCF                    | 2013 | 1.2 | 2014 | 1.0 | 2015 | 0.9 | 2016 | 1.0 | 2017 | 0.8 | <ul style="list-style-type: none"> <li>■ In road safety, continue to focus on effective implementation of proven practices across all lines of business.</li> <li>■ Support the development and implementation of common industry safety standards.</li> <li>■ Improve our capabilities to capture insights from audit findings and investigations into incidents with the potential to cause harm.</li> </ul> |
| Year                   | TRCF   |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2013                   | 1.2  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2014                   | 1.0  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2015                   | 0.9  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2016                   | 1.0  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2017                   | 0.8  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| <b>PROCESS SAFETY</b>  | <p>Leaks &lt; 130</p> <p><b>Achieve a number of operational leaks below 130 (classified as “operational Tier 1 &amp; 2 process safety events”).</b></p> <p>Since 2011, we have extended our ambition of Goal Zero to process safety.</p> <p>From 2017, we combined operational Tier 1 &amp; 2 safety events when setting the target. Previously, we only used Tier 1 events.</p> | <p>Number of operational process safety Tier 1 and 2 events</p> <table border="1"> <caption>Operational process safety events Data</caption> <thead> <tr> <th>Year</th> <th>Number of events</th> </tr> </thead> <tbody> <tr> <td>2013</td> <td>311</td> </tr> <tr> <td>2014</td> <td>251</td> </tr> <tr> <td>2015</td> <td>220</td> </tr> <tr> <td>2016</td> <td>146</td> </tr> <tr> <td>2017</td> <td>166</td> </tr> </tbody> </table> <p>We saw an increase in leaks in 2017 compared to 2016. (See Safety performance).</p>            | Year               | Number of events        | 2013 | 311 | 2014 | 251 | 2015 | 220 | 2016 | 146 | 2017 | 166 | <ul style="list-style-type: none"> <li>■ Strong focus on asset integrity and quality of operational execution, including through the group-wide roll out of our Process Safety Fundamentals.</li> <li>■ Continue to improve learning from process safety events with high potential impact.</li> </ul>   |
| Year                   | Number of events   |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2013                   | 311  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2014                   | 251  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2015                   | 220  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2016                   | 146  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2017                   | 166  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| <b>ENVIRONMENT</b>     | <p>Goal Zero extends to the environment with our goal of no operational spills.</p>  | <p>Volume of operational spills in '000 tonnes</p> <table border="1"> <caption>Operational spills Data</caption> <thead> <tr> <th>Year</th> <th>Volume (in '000 tonnes)</th> </tr> </thead> <tbody> <tr> <td>2013</td> <td>0.9</td> </tr> <tr> <td>2014</td> <td>0.7</td> </tr> <tr> <td>2015</td> <td>0.8</td> </tr> <tr> <td>2016</td> <td>0.8</td> </tr> <tr> <td>2017</td> <td>0.3</td> </tr> </tbody> </table> <p>In 2017, we had the lowest volume of operational spills we have ever recorded. (See Environmental performance).</p> | Year               | Volume (in '000 tonnes) | 2013 | 0.9 | 2014 | 0.7 | 2015 | 0.8 | 2016 | 0.8 | 2017 | 0.3 | <ul style="list-style-type: none"> <li>■ Continue to learn from incidents with spills to improve the reliability of our facilities and further reduce the number and volume of operational spills.</li> <li>■ Continue to work with the oil and gas industry to further develop effective oil-spill response capacities.</li> </ul>  |
| Year                   | Volume (in '000 tonnes)  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2013                   | 0.9  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2014                   | 0.7  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2015                   | 0.8  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2016                   | 0.8  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |
| 2017                   | 0.3  |  |                    |                         |      |     |      |     |      |     |      |     |      |     |  |

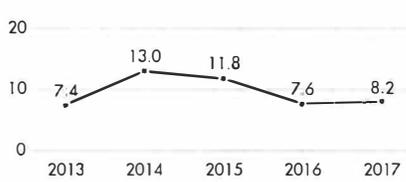
## Flaring emissions < 8.1

### Reduce flaring in our upstream business (million tonnes CO<sub>2</sub> equivalent)

Our policy is to reduce any continuous flaring or venting to as low as level as reasonably practical.

We are a signatory of the World Bank's "Zero routine flaring by 2030" initiative.

Flaring in million tonnes CO<sub>2</sub> equivalent [A]



[A] We have updated our 2017 upstream flaring from 8.0 million tonnes of CO<sub>2</sub> equivalent as published in our 2017 Annual Report and Form 20-F to 8.2 million tonnes following finalisation of 2017 data. The scorecard outcome for 2017 was not affected by this update.

(See Flaring).

- Continue to link staff bonuses to the management of greenhouse gas emissions.
- In November 2017, Shell and seven other energy companies signed guiding principles for reducing methane emissions across the natural gas value chain.

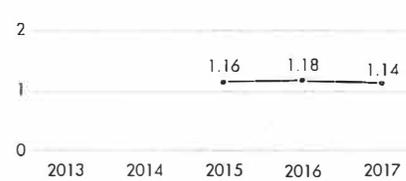
## Refinery GHG intensity < 1.15

For our refineries, achieve a GHG intensity below an intensity of 1.15 tonnes of CO<sub>2</sub> equivalent per Solomon's Utilised Equivalent Distillation Capacity [UEDC™]

### Chemicals GHG intensity < 0.45

For our chemical plants, achieve a GHG intensity below an intensity of 0.45 tonnes of CO<sub>2</sub> equivalent per tonne of petrochemicals produced (See Energy efficiency).

Refineries: tonnes CO<sub>2</sub>e per Solomon's Utilised Equivalent Distillation Capacity [UEDC™]



Chemicals: tonnes CO<sub>2</sub>e per tonne of petrochemicals produced



In 2017, we have changed our metric for reporting from energy intensity to GHG intensity, and can currently provide data for three years of performance.

- Continue to link staff bonuses to the management of greenhouse gas emissions.
- Continue to focus on maintenance measures to enhance the reliability of our equipment and reduce emissions through leaks.

## Effective community feedback

Our community feedback mechanism (CFM) has been used to address community concerns since 2012. We continue to progress the implementation of our standard online community feedback tool which helps to strengthen tracking and reporting of concerns.

We conducted a full evaluation of our online community feedback tool to understand how it has been used across our projects and facilities. Following the evaluation, we identified a number of areas for improvement, which are now being considered to enhance the tool.

We developed the CFM self-check to assess the effectiveness of the mechanism based on UN Guiding Principles and Human Rights criteria for implementation in all major facilities and projects. (See Social performance).

- Aim to enhance the online community feedback tool, based on the improvement areas we identified in 2017, for example, the user friendliness to ensure short response times. The improvements help to ensure we are able to effectively track and record feedback, and support projects and facilities in responding quickly to concerns.
- Identify further improvement opportunities for the CFM implementation from the self-check exercise, to meet the UN Guiding Principles and Human Rights effectiveness criteria.

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## Executive scorecard

In 2017, sustainable development continued to account for 20% of the Executive Directors' annual bonus scorecard, which helps determine the annual bonus for the Executive Directors.

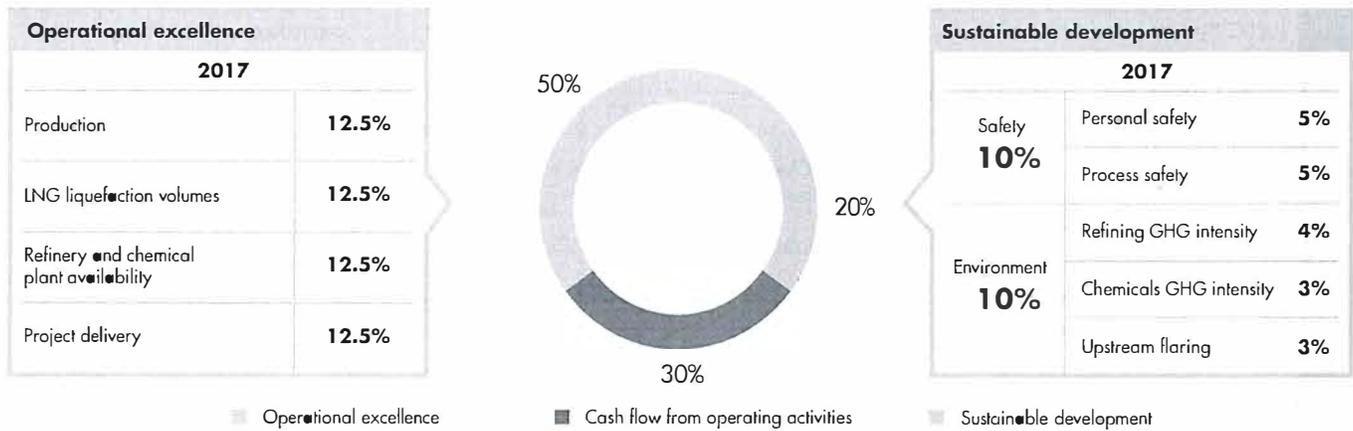
Targets are set each year by the Board's Remuneration Committee and the outcomes against these targets are reported retrospectively in the Annual Report. The same annual bonus scorecard approach applies to senior management and other employees.

The metrics on sustainable development in 2017 had equal weighting between our safety (10%) and environmental (10%) performance. The safety

component covers personal and process safety and the environmental component includes greenhouse gas (GHG) emissions for the first time in three specific business areas: refining, chemical plants and flaring in upstream assets.

In 2017, GHG metrics covered around 60% of direct and energy indirect emissions from our operated portfolio. The GHG metrics in the 2018 scorecard have evolved and coverage has increased to around 90% of operated emissions. The refining and chemicals metrics will be retained and emissions coverage in upstream and midstream will be measured on an intensity basis and expanded beyond flaring.

### Scorecard structure



# Energy transition

Society faces a dual challenge: how to make a transition to a low-carbon energy future to manage the risks of climate change, while also extending the economic and social benefits of energy to everyone on the planet.

## IN THIS CHAPTER

- 17 Energy transition and climate change
- 20 Natural gas
- 21 Carbon capture and storage
- 23 Lower-carbon alternatives
- 26 Energy-efficient products
- 27 Research and development

## Energy transition and climate change

In 2015, governments came together in Paris and achieved a landmark agreement to tackle climate change. We fully support the Paris Agreement's goal to keep the rise in global average temperature this century to well below two degrees Celsius (2°C) above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 °C. In pursuit of this goal, we also support the vision of a transition towards a net zero emissions energy system.

The Intergovernmental Panel on Climate Change indicated through energy scenario based climate modelling in their 5th Assessment Report (2013, 2014) that limiting the rise in global average surface temperature to 2°C would require greenhouse gas emissions to reach net zero by around 2070. This needs to be achieved while recognising that the rising living standards of a growing population means that energy demand could double over the course of the century.

### REDUCING THE NET CARBON FOOTPRINT OF THE ENERGY PRODUCTS WE SELL

In November 2017, we outlined Shell's ambition to reduce the net carbon footprint of our energy products by around half by 2050 in step with society's drive to align with the Paris climate agreement. This is an industry-leading position that will need periodic recalibration in line with the pace of change in the wider energy system.

For the Paris Agreement to be achieved, significant change in the energy system is required. Shell knows we can only remain a leading company if we evolve in line with societal expectations. Shell will adapt and play its part.

The world needs more energy and falling GHG emissions at the same time. This means that, on average, each unit of energy consumed has to come with a lower amount of GHG emission in its production, distribution and use, or in other words, a lower carbon footprint.

### GREATER DISCLOSURE ON CLIMATE CHANGE RISKS AND OPPORTUNITIES

We welcome and support efforts, such as those led by the Task Force on Climate-related Financial Disclosures (TCFD), to increase transparency and to promote investors' understanding of companies' strategies to respond to the risks and opportunities presented by climate change. We believe that companies should be clear about how they plan to be resilient in the energy transition. Therefore, we are working with the TCFD to develop guidance on effective disclosures which, where commercially possible, will be most relevant and useful to investors. The 2017 Annual Report and other publications aim to complement our Sustainability Report in responding to the TCFD recommendations, including discussing the energy transition and Shell's portfolio resilience.

Find out more in the Shell Energy Transition Report.

## **NATURE-BASED SOLUTIONS TO COMPENSATE EMISSIONS**

Nature has the potential to play an important role in the energy transition. In pursuit of a long-term low-carbon future, nature-based solutions present an immediate opportunity and can help to bridge the time that is required to scale the current generation of mature renewable energy technologies, or to develop the next generation of technologies. Also, they represent just one of several tools that Shell will focus on to meet our net-carbon footprint ambition.

We work with nature-based projects to prevent deforestation and restore natural ecosystems, creating carbon sinks. These projects, which also support local communities and conserve biodiversity, generate carbon credits that are then passed to energy consumers around the world. In the Netherlands, for example, we offer our business customers the opportunity to offset their CO<sub>2</sub> emissions from driving their vehicles. One project we work with is the Kasigau Corridor in Kenya, developed by Wildlife Works, which protects 500,000 acres of highly threatened forest.

The projects we work with are certified by Verified Carbon Standard, currently the largest source of nature-based projects globally, and the Climate Community & Biodiversity Standard, which verifies that projects not only address climate change, but also support local communities and conserve biodiversity.

## **External voice: "We work with Shell on natural climate solutions"**

Most climate efforts have rightly so far focused on reducing fossil fuel use. But we also know that nature plays a large role in storing and reducing carbon emissions that cannot be eliminated immediately. Natural climate solutions have the potential in the short term to deliver more than a third of greenhouse gas emissions reductions needed to prevent dangerous levels of global warming.

We are working with Shell to invest in nature offsets and deliver on the company's aspiration to reduce its net carbon footprint. Natural climate solutions are cost-effective, scalable and available nearly everywhere. We are unlikely to see a better carbon capture and storage opportunity than that which nature provides.

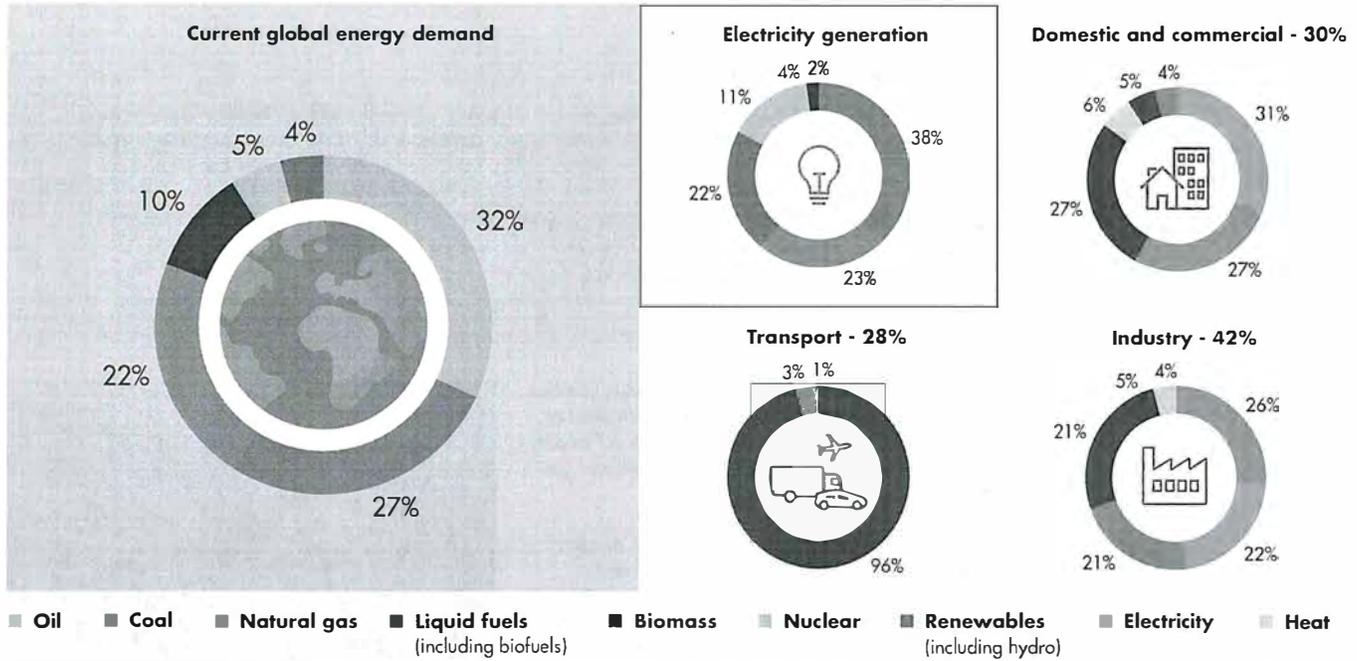


**Mark Tercek**  
CEO, The Nature Conservancy

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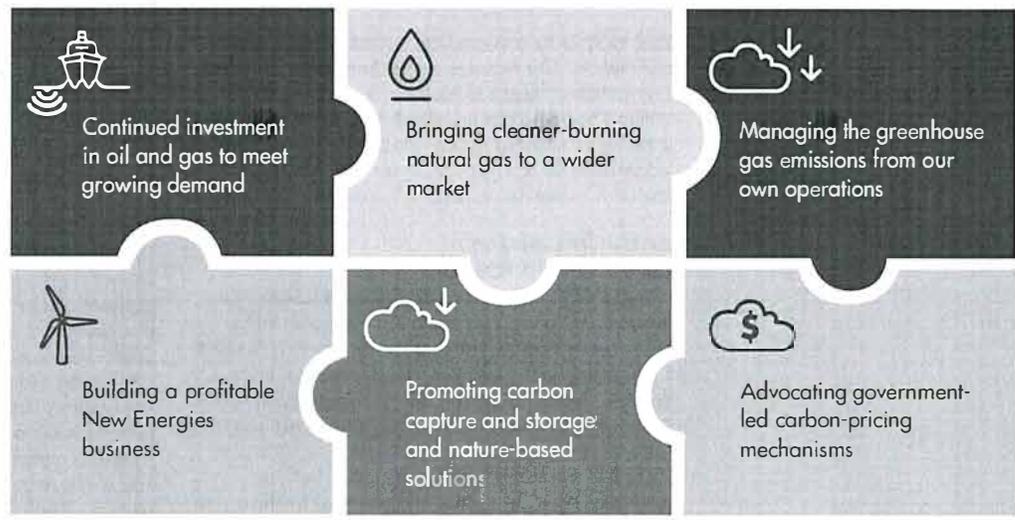
## Today's energy needs

The world gets most of its energy from coal, oil and gas, with around a fifth of all energy used to generate electricity. Energy sources differ across industry, transport and domestic use, which all need to transition to low-carbon options.



Source: International Energy Agency, Key world energy statistics 2017 and World Energy Balances 2017

Over the next few decades, we plan to show leadership in the oil and gas industry, while responding in many different ways to society's need for more and cleaner energy



## Natural gas

Natural gas – the cleanest-burning hydrocarbon – comprises about half of Shell's total production and is at the centre of our strategy to provide more and cleaner energy.

### HIGHLIGHTS IN 2017

- The Shell Petroleum Development Company of Nigeria Ltd joint venture (Shell interest 30%) started production at Gbaran-Ubie Phase 2 in the Niger Delta region.
- In Australia, the Shell-operated QGC venture started up the Charlie project, which comprises around 340 wells, a field compression station and pipelines and facilities.
- The Prelude floating facility that will produce and process liquefied natural gas at sea was safely anchored in Australia after a journey from a shipyard in South Korea.

Natural gas is a critical component of the world's transition to a lower-carbon energy system. When used instead of higher carbon fuels such as coal and diesel, it will help to meet increasing demand while lowering greenhouse gas (GHG) emissions and air pollution.

Gas is one of the few energy sources that can be used across all sectors of the global economy. It is used to generate electricity, provide heat for essential industrial processes and homes, as well as fuel for heavy-duty road transport, shipping and rail. Gas emits between 45% and 55% lower GHG emissions than coal when used to generate electricity, according to International Energy Agency data.

Gas can also act as a partner for intermittent renewable energy, such as solar and wind, to maintain a steady supply of electricity, because gas-fired plants can start and stop relatively quickly.

Shell explores for and produces natural gas both onshore and offshore. Our expertise ranges from finding the fields and extracting the gas to liquefying it, shipping it, turning it back into gas and distributing to customers. Shell is the largest liquefied natural gas (LNG) marketer of all independent oil and gas companies. We sell LNG to around 70 customers in about 25 countries.

### ACTIVITIES IN 2017 TRINIDAD AND TOBAGO

In August 2017, Shell acquired Chevron's subsidiary in Trinidad and Tobago, including its 50% interest in the Shell-operated East Coast Marine Area Blocks 6, 5a and E. This strengthens Shell's position to supply gas to the domestic market, as well as internationally through Atlantic LNG, which produces LNG using gas extracted from fields in and around the country. Atlantic LNG is one of the largest facilities of its kind in the world, with a production capacity of 14.8 metric tonnes of LNG a year.

### NIGERIA

In August 2017, the Shell Petroleum Development Company of Nigeria Ltd joint venture started production at Gbaran-Ubie Phase 2 (Shell interest 30%) in the Niger Delta region. Gas from this project will help to improve supply to the domestic economy and export market.



The Charlie project started up in 2017 and will ensure QGC can continue to supply natural gas and provide jobs in Queensland, Australia.

### AUSTRALIA

As a result of the BG acquisition in 2016, we have a majority interest in the QGC project in Queensland, Australia, which produces natural gas from coal seams and liquefies it as LNG through two processing units, called LNG trains. The Shell-operated project supplies natural gas to the domestic market and LNG to international customers and can produce up to 8.5 million tonnes of LNG a year. We hold a 50% interest in train one, a 97.5% interest in train two and a 100% interest in the common facilities on the LNG plant.

In August 2017, QGC started up the Charlie project. This involved drilling around 340 wells, a 240Tj/day capacity field compression station and associated pipelines and facilities which feed into existing gas processing and water infrastructure at Woleebee Creek, South West Queensland. Construction created about 1,600 jobs and continues to support around 100 jobs. The Charlie project has a footprint of less than 2,000 hectares within a development area of around 1,230 square kilometres. It ensures QGC can continue to supply natural gas and provide jobs in Queensland. QGC supplies around 40% of the gas needs of Queensland and around 14% of Australia's east coast demand.

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## PRELUDE FLOATING LIQUEFIED NATURAL GAS

In July 2017, the Prelude floating liquefied natural gas (FLNG) facility (Shell interest 67.5%) arrived safely in Australia – after leaving a shipyard in South Korea in June – ready for the commissioning phase of the project. Once operating, Prelude will extract and process gas at sea.

FLNG removes the need for pipelines to shore, dredging and onshore works, significantly limiting the disturbance to the surrounding environment and in the right conditions, reducing development costs.

FLNG is a competitive solution for fields like Prelude, which are very remote and hard to access.



Prelude made its journey to Australia pulled by a team of tugboats.

## LNG AS A FUEL FOR TRANSPORT

Cleaner vehicles and fuels are needed to meet increasing demand for transport with less greenhouse gas emissions and air pollution. LNG, which burns more cleanly than diesel, is a fuel for heavy-duty road transport, shipping and rail. In shipping alone, there are around 200 sea-going vessels powered by LNG. The International Maritime Organization has made progress in agreeing to limit sulphur oxide and nitrogen oxide emissions from all ships. LNG fuel can help ship operators meet these requirements.

We signed an agreement in April 2017 with Sovcomflot, a Russian shipping company, to supply LNG to four of its crude oil tankers. The tankers, which operate in the Baltic Sea and Northern Europe, will be the first in the world powered by LNG.

In August 2017, we finalised a long-term agreement to charter an LNG bunker barge with the capacity to carry 3,000 cubic metres of LNG fuel. We also took delivery of the Cardissa, an LNG bunker vessel with a capacity to hold around 6,500 cubic metres of LNG fuel. Both will deliver fuel from the Gate terminal in Rotterdam to locations in Europe.



The Cardissa LNG bunker vessel will deliver fuel from the Gate terminal in Rotterdam to locations in Europe.

In December 2017, RedStar, a joint venture between Shell and Shaanxi Yanchang Group Company, opened an LNG retail site in Shaan'xi, north-west China. China is the largest market for LNG as a fuel, with more than 200,000 heavy-duty trucks and buses using it.

## Carbon capture and storage

Shell invests in carbon capture and storage projects, which use a combination of technologies to capture and store carbon dioxide deep underground, preventing its release into the atmosphere.

### HIGHLIGHTS IN 2017

- The Quest CCS project in Canada captured and safely stored more than 1 million tonnes of carbon dioxide in 2017.
- We entered a partnership to continue to develop carbon dioxide storage on Norway's continental shelf.
- The OGCI's investment arm, OGCI Climate Investments, made its first investments in carbon capture utilisation and storage technology.

Carbon capture and storage (CCS) is expected to play a significant role in the global climate response, according to the International Energy Agency (IEA). CCS technology

offers the opportunity to capture carbon dioxide (CO<sub>2</sub>) from large industrial facilities, such as steel, chemical and power plants.

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Globally, there are 21 large-scale CCS projects in operation or under construction, with a combined capacity to capture around 40 million tonnes of CO<sub>2</sub> each year. CCS will be essential for meeting the goal of limiting global warming to well below 2°C. According to the IEA, reaching this goal will require 6,000 million tonnes of CO<sub>2</sub> to be stored by 2050, equivalent to about 100 times the global CCS capacity in place by the end of 2017.

## SHELL AND CCS

We are operating the Quest CCS project (Shell interest 10%) in Alberta, Canada to capture and store CO<sub>2</sub> from the Scotford Upgrader, a plant where bitumen is turned into synthetic crude oil. In less than two years and ahead of schedule, Quest has captured and safely stored more than 2 million tonnes of CO<sub>2</sub>. This represents around a third of the upgrader's direct GHG emissions. We developed a rigorous monitoring programme for Quest, agreed by the government and verified by a third party, to ensure the CO<sub>2</sub> remains safely underground. This includes continuous pipeline monitoring and early-warning systems, groundwater sampling and 3D seismic surveying.

Carbon capture technology developed by Shell Cansolv, a subsidiary of Shell, is also used at the Boundary Dam power station in Saskatchewan, Canada. It is SaskPower's largest coal-fired power station and a significant source of power for the region. Both sulphur dioxide and CO<sub>2</sub> are captured from the power station. We continue to support SaskPower to improve the application of the technology.

Around 2 million tonnes of CO<sub>2</sub> have been captured and stored since the CCS facility started operating in 2014.

At Technology Centre Mongstad, Shell, together with the Norwegian government and energy companies Statoil and Total, will carry out further research and development to reduce the cost of CCS technology. In 2017, we reaffirmed our commitment to participate in continued testing at the centre until 2020.

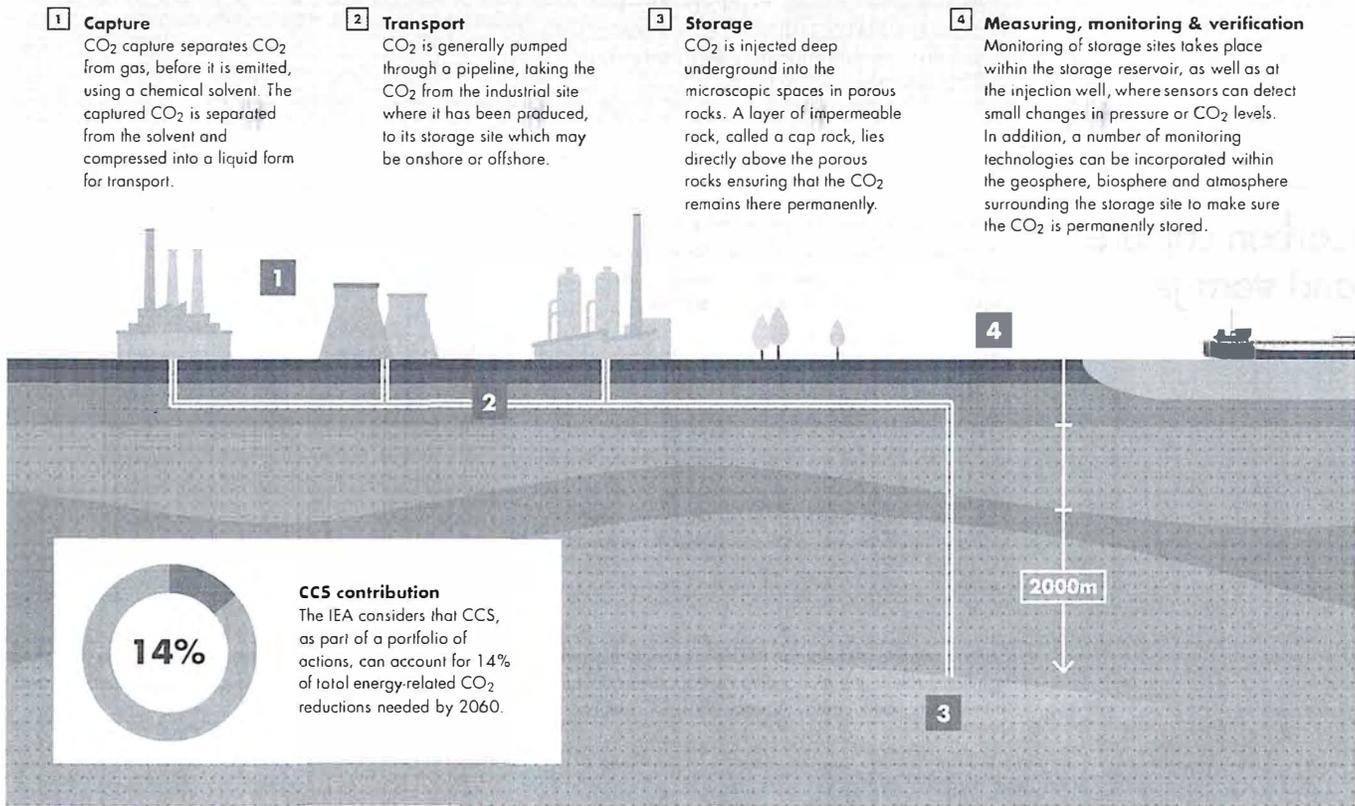
In October 2017, Shell entered a partnership to continue to develop CO<sub>2</sub> storage on the Norwegian continental shelf. The project is part of the Norwegian government's efforts to develop full-scale CCS in the country.

Shell is also investing in the Gorgon CO<sub>2</sub> injection project in Australia, which is operated by Chevron and will be the world's largest CCS operation when completed. Gorgon CCS will separate and reinject between 3 to 4 million tonnes of CO<sub>2</sub> each year. Over the life of the project, it is expected that around 100 million tonnes of CO<sub>2</sub> will be captured and stored.

The Oil and Gas Climate Initiative (OGCI), comprised of 10 major oil and gas companies, including Shell, has made carbon capture, utilisation and storage technology one of its priorities. In 2017, OGCI's investment arm Climate Investments made its first investments in technology to capture CO<sub>2</sub> emissions and store them safely in the ground. This includes ways to reinject the CO<sub>2</sub> captured from industrial processes, such as cement production.

## How carbon capture and storage works

See what's involved in the process of capturing and storing carbon dioxide deep underground



## Lower-carbon alternatives

Shell invests in a range of lower-carbon energies, including hydrogen for transport, charging for battery electric vehicles and biofuels. We aim to become an integrated power player, which includes delivering more electricity generated by natural gas – a cleaner-burning alternative to coal – and renewable energy.

Our New Energies business, set up in 2016, strengthens our approach with its focus on new fuels and power.

### HIGHLIGHTS IN 2017

- We acquired vehicle charging firm NewMotion and signed an agreement with charging network operator IONITY to offer charging points in 10 European countries.
- We began working with carmakers Honda and Toyota to install new hydrogen refuelling stations in northern California.
- We blended around 9 billion litres of biofuels in the petrol and diesel we sold.
- We worked with AFA, a large association of small soy farms in Argentina, to help them gain a certification from the global body Round Table on Responsible Soy.
- We acquired Texas electricity group MP2 Energy.

With more than 2 billion vehicles expected on the road by 2050, compared to around 900 million today, according to International Energy Agency, we need to find cleaner, more energy-efficient transport solutions. Our approach includes providing cleaner-burning liquefied natural gas (LNG) for heavy-duty road vehicles and the marine industry.

We are one of the world's largest blenders and distributors of biofuels. Our activities range from developing advanced biofuels to opening hydrogen stations. We are also starting to provide electric vehicle charging points at retail stations, homes and workplaces.

In power, we focus on meeting commercial, industrial and residential customer needs, supported by our activities in electricity generation, trading and supply. As well as developments on the supply side, there are also advances in the way demand is managed: smart meters in homes, offices and factories allow users to time energy use outside peak times.

We already have an established wind business and are developing new projects. In solar, we are looking into potential business models while increasingly using solar energy at our own sites and operations.

We recognise the importance of storing renewable energy and are investing in innovative ways to deliver this. We are also developing models to help customers better manage their energy use. At the same time, we are looking at commercial opportunities to bring electricity to remote communities.

### NEW FUELS

Shell invests in a range of low-carbon technologies and fuels, including hydrogen and charging for battery electric vehicles including at some of our retail sites. As new technologies evolve to coexist with traditional transport fuels over the coming decades, Shell will expand its fuels to offer customers greater choice.

### EXPANDING CHARGING STATIONS

In 2017, Shell acquired NewMotion, a Netherlands-based company with one of Europe's biggest networks of electric vehicle charging points. It operates around 30,000 private electric charge points in the Netherlands, France, Germany and the UK. It also provides around 100,000 registered NewMotion charge card users access to more than 50,000 public charging points in 25 European countries.

Shell also signed an agreement with high-powered charging network operator IONITY to offer charging points in 10 European countries starting with 80 of its biggest highway stations, allowing drivers to travel long distances. IONITY is a joint venture between BMW Group, Daimler AG, Ford Motor Company and the Volkswagen Group, which was formed to create a network of 350 kilowatt chargers next to major highways in Europe.

### HYDROGEN

In Germany, the government is supporting the development of a national network of hydrogen electric fuel stations across the country by 2023. We are working on this project with our joint venture partners in H<sub>2</sub> Mobility Germany. The partnership comprises French gas supplier Air Liquide, German car manufacturer Daimler, Austrian oil and gas company OMV, German engineering firm Linde and French oil and gas company Total. The hydrogen will be delivered by truck as a gas to retail sites. Under the terms of the partnership, at least 50% of the hydrogen sold must be produced without emitting greenhouse gases. At the end of 2017, Shell already had nine hydrogen filling stations at its retail sites in Germany.

In 2017, we started work with Honda and Toyota, supported by the California state government, to build seven hydrogen refuelling stations across Northern California. Shell already has two hydrogen stations in Los Angeles, California.

In the UK, we are collaborating with ITM Power, a company specialising in hydrogen fuel-cell products, to make hydrogen fuel available at three Shell retail sites in the south-east of the country. The first of the UK stations opened in February 2017. We are assessing the potential for similar projects in Austria, Belgium, Canada, France, Luxembourg, the Netherlands, Switzerland and the rest of the USA.

In January 2017, we helped launch the Hydrogen Council, a global coalition of chief executives working to raise the profile of hydrogen's role in the transition to a low-carbon energy system.

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Shell is building a reliable network of premium fast chargers for electric vehicles along the main roads of the Netherlands.

## DIGITAL TECHNOLOGIES

Digital technologies support our activities. For example, we have developed an app in the UK called FarePilot that helps taxi drivers quickly identify high-demand areas to find their next fare and potentially save them fuel. In the USA, our Fitcar app will transform a regular car into a connected car that can provide maintenance alerts and information on the engine. Through our innovation arm, Shell Technology Ventures, we have invested in "tiramizoo", a German start-up whose online technology connects retailers with customers.

## BIOFUELS

Biofuels are expected to play a valuable role in the changing energy mix. They can be a cost-effective way to reduce carbon dioxide emissions in the transport sector, as long as their production is managed in a responsible way.

Shell is one of the largest blenders and distributors of biofuels worldwide. We purchase biofuels to blend into our fuels in line with country-specific regulations. In addition to understanding blended biofuel emissions, we want to ensure that other environmental impacts from their production are well managed – such as the effect on soil, air and water – and there is a positive impact on the livelihoods of local communities.

The start of the Raízen joint venture (Shell interest 50%) in Brazil in 2011 marked our first move into the large-scale production of biofuels. We also continue to look for opportunities to invest in the development of advanced biofuels.

For more details on our approach to biofuels refer to [www.shell.com/biofuels](http://www.shell.com/biofuels).

## KEY DEVELOPMENTS IN BIOFUELS

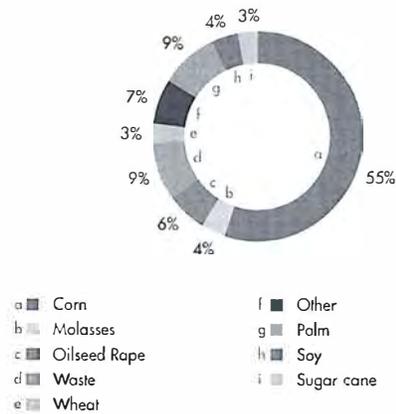
We continue to support the adoption of international sustainability standards including the Round Table on Responsible Soy (RTRS), the Roundtable for Sustainable Palm Oil (RSPO) and Bonsucro, an organisation for the certification of sugar cane. We also support the Roundtable for Sustainable Biomaterials and the International Sustainability and Carbon Certification (ISCC) for feedstocks.

Three-quarters of the biofuels we purchase are from North American or European feedstock producers. Both regions have good agricultural practices and sustainability rules relating to areas such as land-use restrictions and limits for greenhouse gas emissions.

By 2020, we aim to have 100% of the sugar-cane ethanol and South American soy biodiesel used in Shell blended biofuels certified as sustainable.

100% of the palm oil that we blend is already certified by RSPO or the ISCC, or covered by offsets from the RSPO certificate trading system.

## Global bio-component purchase [A] by feedstock



[A] Does not include purchases by Raízen or Motiva.

In 2017, we concluded a support project with the Federation of Argentine Farmers (AFA), to help them become RTRS certified. The federation is comprised of 17,000 small- and medium-sized soy farms in Argentina and represents around 20% of the country's soy growers. We worked on the project with Cefetra, a large European animal feed trading company, which has taken a leading role in sourcing sustainable soy meal for its European customers.

## PRODUCING BIOFUELS WITH RAÍZEN

In 2017, our joint venture Raízen (Shell interest 50%) produced around 2 billion litres of low-carbon ethanol from Brazilian sugar cane. Around 44% of Raízen's ethanol and 38% of its sugar production was certified as sustainable to the standards set by Bonsucro.

Raízen's production process is designed to minimise its environmental impact. By the end of 2017, 20 of Raízen's 24 sugar-cane mills were certified to the Bonsucro standard.

Raízen purchases around half of the sugar cane it uses as a raw material from independent suppliers. Since 2014, the company has worked with two non-governmental organisations, Imaflo and Solidaridad, on a programme to help its suppliers become more sustainable producers. The suppliers complete a confidential assessment against a list of sustainability criteria which enables Solidaridad to prepare individual improvement guides. The programme currently covers 99% of third-party sugar cane, meaning that 2,130 suppliers have completed the assessments and are working on improvements. In 2017, Raízen issued a good practices manual to help suppliers move through the programme.

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In 2015, Raízen launched the ReduSa programme aimed at reducing water consumption and waste generation when growing sugar cane. This was achieved by decreasing overall water use per tonne of ground cane and reducing water consumption in the industrial processes by recycling the water used. In two years, water usage was reduced by 8 billion litres, equivalent to the annual consumption of a city of 135,000 people in Brazil.

For more details on Raízen, see the company's sustainability report.



Raízen, our joint venture in Brazil, uses the latest technology to produce ethanol from sugar cane, with an annual production capacity of more than 2 billion litres.

## DEVELOPING ADVANCED BIOFUELS

We continue to invest in the research and development of new ways to produce biofuels from sustainable feedstocks such as waste and cellulosic biomass from non-food plants.

Raízen started operating its first cellulosic ethanol plant in 2015 at its Costa Pinto mill in Brazil. Production in 2017 was 10 million litres. Over time, the mill is expected to produce around 40 million litres a year of advanced biofuels from sugar-cane residues.

In 2017, we completed construction of a plant at Shell Technology Centre Bangalore, India, which demonstrates a technology called IH2 that turns waste into transport fuel. The plant can process around five tonnes a day of non-food biomass, such as wood, algae, municipal waste and aquatic plants. The plant is the final stage of the R&D process before possible scaling up and commercialisation.

We continue to look for opportunities to invest in third-party technologies and to collaborate in developing them for commercialisation.

## POWER

Power is the fastest-growing segment of the energy system.

Today, electricity provides around 20% of global final energy consumption and we expect that figure could grow to as much as 50% by 2060.

To help meet this demand, Shell aims to become an integrated power player and grow, over time, a material new business. To achieve this, we will continue to expand our power generation and trading capability and expand our marketing efforts to even more customers.

We are also working to deliver more electricity generated by natural gas and renewable energy, from developing wind and solar projects, to selling electricity generated by renewable sources.

## SELLING AND TRADING POWER

We are expanding our business in marketing and selling electricity, including power from renewable sources, in the Americas and Europe. In 2017, our North American gas and power marketing and trading business managed more than 10,500 megawatts (MW) of power generation, with over one-third of that electricity produced by renewables.

In 2017, we acquired Texas electricity group MP2 Energy, which supplies commercial and industrial customers with energy, including wind and solar power. The acquisition gives us direct access to the large commercial and industrial electricity markets in Texas and the eastern USA.

We have started to buy more power from renewable producers. In 2017, we signed agreements to buy more than 200 MW of capacity from wind farms and solar parks in Italy, the Netherlands, the UK and Spain.

We made our first move into supplying electricity directly to homes in February 2018, with the acquisition of First Utility, which provides energy to around 825,000 homes in the UK.

We are exploring potential business models for solar power, including developing power plants.

We are supporting the development of voluntary procurement of power from solar energy. This includes our investment in the Singapore-based Sunseap Group, which has around 160 MW capacity of distributed solar contracts, an electricity retailer licence in Singapore and large-scale solar projects.

## WIND AND SOLAR POWER GENERATION

Shell has more than 15 years' experience in wind power and continues to explore the possibilities of wind-related technologies, including the combination of wind and gas to manage intermittency.

In the USA, Shell WindEnergy has joint ventures (Shell interest 50%) with a Shell share capacity of about 370 MW from 553 wind turbines, as well as one venture in the Netherlands (Shell interest 50%) with a Shell share capacity of 50 MW from 36 wind turbines.

In the Netherlands, we have an interest in the consortium that was awarded the concession by the Dutch government in December 2016 to develop the Borssele III and IV offshore wind farm projects, which are to be located 20 kilometres off the Dutch coast. These two wind farms are designed to have a total maximum capacity of 680 MW, enough to power around 825,000 households. In January 2018, Partners Group signed an agreement to join the projects, diluting our interest in the consortium from 40% to 20%. The final investment decision is yet to be taken on this project.

In 2018, we signed an agreement to acquire a minority interest (43.83%) in Silicon Ranch Corporation, a US developer, owner and operator of around 900 MW capacity of operational or contracted solar projects.

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Our share of capacity from wind power projects is more than 400 megawatts.

## ENERGY ACCESS

We also plan to grow the part of our business that provides energy to those who have insufficient access to it today. This will typically involve renewable power combined with storage and other sources of energy.

In this area, Shell has invested in the following companies:

- SolarNow, a Dutch company that provides rooftop solar energy modules to off-grid households and entrepreneurs in East Africa. SolarNow has 47 branches in Uganda and five in Kenya.
- SteamaCo, a UK-based company that sells off-grid smart metering technology to companies developing mini-grids in Africa, Asia and Latin America.

## Energy-efficient products

Gains in energy efficiency are some of the quickest and least costly ways of addressing environmental challenges across a range of sectors.

Energy efficiency can deliver up to 38% of what is needed to keep global warming below two degrees Celsius (2°C) by 2050, according to the International Energy Agency.

Engines and machines consume huge amounts of energy to overcome friction. In a typical car, friction alone accounts for around 20% of the fuel burned.

Shell's advanced technology and customer knowledge has helped us develop a range of lubricants and other products to help customers save energy and reduce emissions (see [www.shell.com](http://www.shell.com)).

### FUEL-SAVING LUBRICANTS

Working with the Netherlands-based haulage firm Van der Lee, we have helped to increase the fuel efficiency of its vehicles over the last three years.

Tests on part of the company's fleet found that using one of our longer-lasting advanced heavy-duty lubricants, Shell Rimula, they could lower fuel consumption by an average of 2.1%. For a typical Van der Lee Volvo truck with a 13-litre engine travelling around 100,000 kilometres each year, this translates into around 600 fewer litres of fuel burned.

Across the company's 160 Volvo trucks, this could mean a reduction in CO<sub>2</sub> emissions of around 250 metric tonnes. Van der Lee has now upgraded all its Volvo fleet to use Shell Rimula.

### KEEPING CHINA'S GAS BUSES ON THE ROAD

Shell Rimula helped improve the efficiency of a large fleet of public buses in Qingdao City, in eastern China, by

extending the interval between maintenance stops. In a bid to tackle emissions, the city fuelled around 40% of its buses with cleanerburning liquefied natural gas. The buses covered up to 1,000 kilometres per week and required an oil change every 14,000 kilometres, or around every three months.

By switching to Shell's engine oil, the company running public transport in the city more than doubled the amount of time its fleet could stay on the road between oil changes and made significant savings from the reduced amount of oil used.

### LOWER ENERGY SOLUTION FOR PACKAGING FIRM

The German packaging company AGI Freden reduced the energy consumption of its injection moulding machine by 4% by switching to our specialised lubricant hydraulic fluid, Shell Tellus. This lubricant, designed to last longer, will also help the company save on hydraulic fluid consumption and maintenance costs.



Shell helped the Netherlands-based haulage firm Van der Lee to further increase the fuel efficiency of its vehicles.

## Research and development

Shell continues to invest in research and development to improve the efficiency of our products, processes and operations, and to commercialise new technologies for the transition to a low-carbon energy future.

### HIGHLIGHTS IN 2017

- We invested \$922 million in research and development.
- In the USA, we agreed to support the Energy Biosciences Institute's research into using biochemical processes to store or deliver energy.
- We signed an agreement with Brazil's industry association SENAI to collaborate on technology innovations in the oil and gas sector.
- We extended our support for the largest clean-tech incubator in the USA, Greentown Labs, where start-ups build their prototypes.

We develop and deploy technology to increase the value or reduce the cost of our projects or otherwise enhance the performance and profitability of our own and our customers' businesses.

We operate a global network of technology centres, with major hubs in Houston, USA; Amsterdam, the Netherlands; and Bangalore, India. Thousands of employees across the network work on research and development (R&D) projects including turning natural gas into more efficient and cleaner fuels, unlocking oil from rock layers thousands of metres below the sea surface, and reducing Shell's net carbon footprint.

R&D projects often involve collaborations with public or private entities, including universities, government laboratories, technology start-ups and incubators.

We invested \$922 million in R&D in 2017 compared with \$1,014 million in 2016.



In 2017, we completed construction of our Shell Technology Centre Bangalore, India.

The majority of our research focuses on the near term, to help our existing businesses to reduce capital and operating costs, and to enhance customer products and services. This research also focuses on ways to lower energy consumption. For the long term, we aim to quickly acquire deeper insights into the science and engineering that underpins new energy technologies that can help create a lower-carbon future.

### SHELL GAMECHANGER

Shell GameChanger works with start-ups and businesses on unproven early-stage ideas with the potential to impact the future of energy. We provide companies with support, expertise and seed funding, while they maintain independence to make their own decisions.

### SHELL TECHNOLOGY VENTURES

This is our corporate venturing arm. It invests in companies that are developing promising technologies that complement Shell's businesses – mainly in oil and gas, new energies and information technology.

### SHELL TECHWORKS

Based in Massachusetts, USA, Shell TechWorks accelerates the adoption of proven technologies from other industries and applies them to the oil and gas sector. Founded in 2013, the programme has collaborated with companies, universities, research institutes and start-ups to help develop and deploy technology quickly and cost-effectively.

For more details on how we innovate through R&D, see [www.shell.com](http://www.shell.com)

# Managing operations

We work to reduce our environmental impact and manage our operations safely and responsibly. Safeguarding and respecting people – our employees, contractors and neighbours – is fundamental to how we do business.

## Our activities in Nigeria

Shell companies in Nigeria have continued to contribute to economic development in Nigeria with safety and security as our top priorities.

Shell has interests in several companies in Nigeria which are major contributors to the economy. They produce oil and natural gas, distribute gas to industries in the country, produce liquefied natural gas (LNG) for export, generate revenues for the government and provide social investment. Shell companies in Nigeria are also working with federal and state government agencies, communities and civil society groups, such as non-governmental organisations, to try to create a safe operating environment.

In 2017, an agreement between The Shell Petroleum Development Company of Nigeria Ltd (SPDC), the operator of the SPDC Joint Venture (SPDC interest 30%), and its government partner, the Nigerian National Petroleum Corporation, came into effect. This agreement provides an improved structure to finance future oil and gas projects and commercialise the country's large gas resources. Improved funding will enable the SPDC Joint Venture to explore more opportunities particularly in shallow water offshore and to increase onshore gas supply to the domestic market.

### SAFETY OF STAFF AND CONTRACTORS

The safety of staff and contractors in Nigeria remains our top priority. We continue to strengthen our safety culture around Shell companies in Nigeria with our Goal Zero ambition of no harm and no leaks including partly through a programme to connect senior leaders with contractor CEOs to promote best safety working practices. We also continued to run campaigns for employees and contractors in our production operations to help them better understand Shell companies in Nigeria's work culture, reflect on their leadership and suggest improvements to maintain a safe workplace.

### SECURITY IN THE NIGER DELTA

We continued to address safety and environmental challenges related to both operational spills and illegal activities, such as oil theft in parts of the Niger Delta. Although there has been no damage to key oil and gas infrastructure caused by militant activity since November 2016, the security situation remains volatile in this region of the country.

Shell companies in Nigeria continue to work closely with federal and state government agencies, communities and civil society to ensure that operations are carried out in a safe environment.

### LOCAL CONTENT INITIATIVES

To enable Nigerian ownership of key equipment such as rigs, helicopters and marine vessels, Shell companies in Nigeria continue to support the development of local people and companies. For example, over the past seven years, Shell Nigeria Exploration and Production Company Limited (SNEPCo) has provided support to improve training and safety standards at Caverion Helicopters, one of the biggest aviation logistics providers in sub-Saharan Africa.

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SNEPCo has provided support to improve training and safety standards at Caveron Helicopters.



Dikiburi Diri founded an education training academy in Nigeria after receiving a scholarship to the USA under an SPDC joint venture GMoU initiative.

Current and former Shell employees transfer their technical and project management skills to all sectors of the Nigeria oil and gas industry. Several of the growing indigenous oil and gas producing companies are run by former staff of Shell companies in Nigeria. In September 2017, the annual Global Nigerian Forum in Aberdeen, the UK, sponsored for the fourth year by SNEPCo, provided a platform for Nigerian professionals in the UK to connect with Nigerian companies about participating in offshore exploration activities in their home country.

### SOCIAL INVESTMENT PROGRAMMES

Shell companies in Nigeria work with all tiers of government, communities and civil society to fund and implement social investment programmes. Some of these investments are mandated by federal legislation, such as requiring all oil companies in Nigeria to contribute funds from their annual budgets to the Niger Delta Development Commission.

At state government and local community levels, Shell companies in Nigeria focus their social investment activities on areas such as enterprise development, education, health and access to energy. Since launching in the 1950s, the Shell companies in Nigeria scholarship scheme has supported thousands of students to study both in Nigeria and abroad. Several leading figures in Nigeria today were part of the scheme in the 1960s and 1970s.

In 2017, SPDC Joint Venture (JV) and SNEPCo continued to invest in the Cradle-to-Career scholarship programme, which pays for less privileged children from rural communities to attend some of the country's top secondary schools. Since 2010, 480 students have received Cradle-to-Career scholarships from the SPDC JV and 268 from SNEPCo. Read about one student in Rivers State who received the SPDC JV scholarship.

The SPDC JV also supports community-driven development programmes in the Niger Delta. Since 2006, the programmes have been delivered through the global memorandum of understanding (GMoU). This agreement brings together communities, government representatives, SPDC and non-governmental organisations and provides secure five-year funding for community projects of their choice. For more details on how one GMoU scholarship benefited students and communities, see [www.shell.com.ng](http://www.shell.com.ng).

We work with our partners to explore opportunities to increase access to affordable, reliable and sustainable energy sources for off-grid low-income households, small- to medium-sized businesses and communities in Nigeria, particularly in the Niger Delta.

We have funded All On, an independent Nigerian investment company, which in 2017 approved investments that included solar home system provider Lumos and the country's leading electricity mini-grid company Green Village Electricity. All On provided a grant to Co Creation Hub, Nigeria's leading tech innovation hub, to seed and incubate up to 10 new companies working to improve access to energy. It also signed a three-year partnership with the US Africa Development Foundation to match their grant funding with debt financing for up to 30 Nigerian off-grid energy providers.

### External voice: "Our work helped contain a cholera outbreak"

In 2017, our partnership with SNEPCo provided around 50,000 internally displaced people in the Dikwa area of north-east Nigeria with humanitarian aid in the form of health, water, sanitation, hygiene and nutrition services. The integrated nature of services provided was one of the contributing factors to containing the cholera outbreak in Dikwa.



**Satish Raj Pandey**

Acting Country Director, Family Health International (FHI 360), Abuja, Nigeria

## SOCIAL AND ECONOMIC CONTRIBUTION

- \$23 billion: economic contribution from the SPDC JV partners to the Nigerian government from 2013–2017.
- \$1.1 billion: Shell share of royalties and corporate taxes paid to the Nigerian government in 2017 (SPDC \$0.4 billion; SNEPCo \$0.7 billion).
- 94%: Shell companies in Nigeria contracts awarded to Nigerian companies in 2017.
- \$0.76 billion: Shell companies in Nigeria spend on contracts awarded to Nigerian companies in 2017.
- 95%: employees of Shell companies in Nigeria are Nigerian citizens in 2017.
- \$109.9 million: SPDC JV and SNEPCo contribution to Niger Delta Development Commission in 2017 (Shell share \$40.2 million).
- \$60.2 million SPDC JV, SNEPCo and Shell Nigeria Gas direct spending on social investment projects in 2017 (Shell share \$19.2 million).
- \$228 million disbursed by the SPDC JV to GMoU clusters for financing of development projects and programmes since 2007.
- 6,780 Niger Delta youth trained in enterprise development and management and 3,493 provided with business start-up grants since 2003.
- 8,192 (secondary) and 5,034 (university) SPDC JV and SNEPCo educational grants awarded since 2011.

## NIGERIAN LITIGATION

The authorities in various countries are investigating allegations of bribery and corruption over Shell's investment in Nigerian oil block OPL 245 and the associated 2011 settlement of litigation. In Italy, Shell and four former Shell employees were remanded to trial commencing in May 2018. We are disappointed by this decision but we believe the trial judges will conclude that there is no case against Shell or its former employees.

Shell attaches the greatest importance to business integrity. It is one of our core values and is a central tenet of the Business Principles that govern the way we do business. Shell has clear rules on anti-bribery and corruption and these are included in our Code of Conduct for all staff. There is no place for bribery or corruption in our company.

## SPILL RESPONSE AND PREVENTION

When a leak is identified on SPDC JV or SNEPCo assets, production is suspended and efforts are made to contain any spilled oil as part of our emergency spill response. We carry out this response in compliance with government regulations and in line with other standards at Shell-operated ventures globally. A joint investigation visit team comprising representatives of SPDC, regulators, government security agencies, state government and communities, is dispatched to spill sites to establish the cause, volume of oil spilled and what further action is required.

The vast majority of oil spills in the Niger Delta continue to be caused by crude oil theft or sabotage of pipelines, as well as illegal oil refining. In 2017, close to 90% of the number of oil spills from SPDC JV facilities was due to illegal activities. Regrettably, spills also occur due to operational reasons.

Regardless of the cause, SPDC cleans up and remediates areas impacted by spills that come from its facilities. In the case of operational spills, SPDC also pays compensation to people and communities impacted by the spill. Once the clean-up and remediation are completed, the work is inspected, and, if satisfactory, approved and certified by Nigerian government regulators.

SPDC works with government agencies, non-governmental organisations and communities to prevent and minimise spills from illegal activity. In 2017, we continued air and ground surveillance as well as installing antitheft mechanisms on equipment and pipelines to mitigate

third-party interference and ensure that spills are detected and responded to as quickly as possible. There were daily flights over the pipeline network to identify any new spill incidents or illegal activities.

Since 2012, SPDC has worked with the International Union for Conservation of Nature to enhance remediation techniques and protect biodiversity at sites affected by oil spills in SPDC's areas of operation in the Niger Delta. In 2017, SPDC launched new initiatives, such as a Niger Delta biodiversity strategy and a toolkit which provides guidance on restoring mangroves that will help to strengthen its remediation and rehabilitation efforts.

## CLEAN-UP EFFORTS IN OGO NILAND

SPDC is working with the relevant stakeholders to implement the 2011 UN Environmental Programme (UNEP) report on Ogoniland. Over the last six years, SPDC has taken action on all the UNEP recommendations addressed specifically to it as operator of the joint venture and has completed the majority of these recommendations.

The UNEP report recommended the creation of an Ogoni Restoration Fund with \$1 billion capital, to be co-funded by the Nigerian government, the SPDC JV and other operators in the area. SPDC is supporting and contributing its share to the fund and on behalf of the SPDC JV made \$10 million available in 2017 to help set up the Hydrocarbon Pollution and Remediation Project (HYPREP), a government-led body to clean up contaminated sites. The body agreed to \$33 million in funding for areas such as emergency water supply, scoping of contaminated sites and alternative livelihood programmes.

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Throughout 2017, SPDC representatives continued to actively support the clean-up process within the governance framework established in August 2016 by the Nigerian government. Some stakeholders have expressed concern about the pace of reaching decisions and taking action on the clean-up process. The Nigerian government and HYPREP strongly advocate setting up a transparent governance structure before starting actual clean-up.

## CLEAN-UP AND REMEDIATION OF BODO

In 2015, SPDC - on behalf of the SPDC JV - and the Bodo community signed a memorandum of understanding granting SPDC access to begin the clean-up of areas affected by two operational spills in 2008. As part of this, two contractors were selected to conduct the clean-up and be overseen by an independent project director. The clean-up project suffered a delay in 2016 and most of 2017 due to difficulties accessing the sites.

After significant engagement with the communities and other stakeholders, managed by the Bodo Mediation Initiative, the clean-up and remediation activities at Bodo started in September 2017. The clean-up will consist of four phases: clean-up of free-phase surface oil; remediation of soil; restoration of mangroves; and monitoring. Should activities continue uninterrupted, the process is expected to take around three years. However, for it to be successful, the repeated re-contamination of remediated sites due to crude oil theft and illegal refining must end.

## SPILLS AND RESPONSE DATA

Crude oil theft from SPDC JV's pipeline network amounted to around 9,000 barrels of oil a day (b/d) in 2017, an increase from around 6,000 b/d in the previous year. The increase in 2017 can in part be explained by the militant-induced shutdown of the Forcados export terminal in 2016, which reduced opportunities for third-party interference. This demonstrates that continued air and ground surveillance as well as the action by the government security forces remain necessary to prevent crude oil theft. Since 2012, SPDC has removed more than 950 illegal theft points.

The number of operational spills from Shell companies in Nigeria increased from eight in 2016 to nine in 2017. However, the volume of oil spilled in operational incidents decreased to 0.1 thousand tonnes compared to 0.3 thousand tonnes in 2016.

The number of sabotage-related spills in 2017 increased to 62 from 48 in 2016. Theft and sabotage caused close to 90% of the number of spills of more than 100 kilograms from SPDC JV pipelines, with the balance being operational spills.

In 2017, 92 sites were remediated and certified (out of 251 identified for this work), with 32 in Ogoniland. During 2017, 84 new sites requiring remediation were identified, of which eight are in Ogoniland. In total, there are 243 oil spill sites that require remediation.

## External voice: "We simply cannot blame one party for all the woes in the Niger Delta"

In the past four and half years, initially as co-chairman, and now as chairman, I can confirm that it's been an intense, prolonged and sometimes quite complex and frustrating process. I'm glad to say that despite all the challenges, we've been able to collectively start the clean-up of the polluted sites in Bodo community. We couldn't have done this without the sustained commitment and tenacity displayed by both SPDC and the Bodo community.

The Bodo mediation process is a delicate process based on trust and confidentiality. As an activist and a constructive critic of some of the practices by the international oil companies in the Niger Delta, I've come to realise that responsibilities are shared and we simply cannot blame one party for all the woes in the Niger Delta. Therefore, it would take the collective efforts of the federal, state and local governments, IOCs, civil society and the communities to resolve some of these intricate challenges. What we have achieved so far in the Bodo clean-up exercise is proof that it is possible to do so.

The main priority of the Bodo Mediation Initiative is to ensure that as we move smoothly from phase one to phase two of the clean-up, all parties, in particular the Bodo community and SPDC remain committed to the Initiative's process and clean-up of the Bodo community.



**Inemo Samiama**

Chairman of the Bodo Mediation Initiative, Bodo, Nigeria

## Divestments

Shell made significant progress towards the completion of our three-year \$30 billion divestment programme, which is an important part of our strategy to reshape into a world-class investment and to strengthen our financial framework.

### HIGHLIGHTS IN 2017

- We completed divestments worth around \$22.3 billion over the period 2016-2017.
- We sold our stake in Australian energy company Woodside Petroleum.
- We sold the majority of our oil sands interests in Canada.
- We completed the sale of a number of UK North Sea assets and our onshore upstream operations in Gabon, and announced the divestment of our upstream business in Ireland.

We made good progress on our 2016-2018 \$30 billion divestment programme by the end of 2017, with deals worth \$22.3 billion completed.

We sold non-operated shareholdings in assets as well as entire businesses. In each transaction, Shell carried out extensive due diligence to ensure that the buyer had the capabilities to uphold, or even improve, delivery with respect to safety, security, the environment and responsibilities to neighbouring communities.

### DIVESTING CANADIAN OIL SANDS

In March 2017, we announced the sale of the majority of our oil sands assets to Canadian Natural Resources Limited (Canadian Natural) and reduced its share in the Athabasca Oil Sands Project (AOSP) from 60% to 10%. Canadian Natural became the operator of the AOSP upstream mining assets from June 1, 2017.

We continue to operate the Scotford complex, which includes a bitumen upgrader and the Quest carbon capture and storage project (Shell interest 10%) located next to the refinery and chemical plants.

To ensure a successful transition, we developed an employee engagement plan in line with our Code of Conduct and antitrust requirements to address questions from the 3,000 staff moving to Canadian Natural. We worked with local community and business leaders, including indigenous communities, to respond to questions and concerns. We assumed the financial obligation for agreed communities and encouraged submissions for social investments up to the divestment date. We formalised the handover and assignment of any established future obligations. Once all regulatory approvals were in place and full operational readiness and conditions were met for a safe transition, we transferred assets and operatorship to Canadian Natural.

Throughout the divestment process, we ensured our customers and suppliers were updated on the transaction to manage expectations and ensure there were no service disruptions.

### SELLING GABON ONSHORE INTERESTS

In March 2017, we announced that after 50 years of activities we would divest all our onshore oil and gas operations and related infrastructure in Gabon. We sold our onshore operated and non-operated interests in the country to Assala Energy Holdings, a new energy company funded by US investment firm The Carlyle Group.

From early in the sales process, we communicated the sensitivity of the ecologically diverse habitat to all potential buyers. During the due diligence process, we contracted an independent social and environmental consultancy to provide insight into the impact of operations in and around the onshore facilities. The Carlyle Group also hired a separate independent consultancy to provide insights and to verify the findings of the original due diligence work.

We engaged a cross section of community, government and non-governmental organisations to explain the divestment and introduce the new owners to the communities likely to be affected. The sale to Assala Energy was agreed with the intention that operations would continue.

We expect Assala Energy to make managing the impact of its operations on biodiversity and communities as high a priority as we did. To date, Assala Energy has confirmed it will continue the Gabon biodiversity programme which we had worked on previously with our research partner the Smithsonian Conservation Biology Institute.

## Decommissioning

Safe and responsible decommissioning is a priority for Shell. This includes restoring the surroundings of platforms and facilities in line with relevant legislation, while taking our own environmental standards into account.

### HIGHLIGHTS IN 2017

- In the UK, the single lift of the Brent Delta platform marked the world's heaviest offshore lift, by the world's largest construction vessel.
- We submitted decommissioning plans for the Tapti field to Indian authorities.
- We decommissioned the Cougar platform in the USA and donated parts of the structure to an artificial reef programme.

Decommissioning is part of the normal life cycle of every oil and gas structure when a facility reaches the end of its life. A growing number of oil and gas platforms and facilities are ageing so decommissioning will increase over the next few decades. Every decommissioning is different and needs to be tailored to the facility design, the local context and the local legislative requirements. Some of our more complex decommissioning projects take place offshore.

In 2017, we started preparing to decommission the Tapti field, a former BG project in India. We jointly operate the project (Shell interest 30%) with the Indian National Oil Company, Oil and Natural Gas Corporation and Reliance Industries Limited. Production stopped in March 2016 and work is under way to plug 38 wells and close down five platforms and four pipelines. In India more broadly, we contribute to government-led work on the development of regulations and guidelines for decommissioning projects.

In the Gulf of Mexico, we decommissioned the Cougar platform, which has produced more than 31 million barrels of oil over the last two decades. In 2017, we used a specially-designed vessel to lift the top part of the

platform and deck, then place it on a barge to be transported to shore for cleaning and recycling or disposal. The same vessel was used to move the platform's 105 metre-tall and 3,000-tonne support structure across about 80 kilometres of open water to its resting place as an artificial reef. We donated the structure to the Louisiana artificial reef programme and made a \$619,000 contribution to help maintain and monitor the reef. It will provide a habitat for a variety of marine life, including red snapper and amberjack fish.



The Brent Delta platform was transported to the Able UK Seaton Port yard in Hartlepool, UK, where at least 97% of the material will be recycled.

### BRENT DELTA PLATFORM TOPSIDE SINGLE LIFT

Our largest decommissioning project to date is the Brent oil and gas field, which lies in the North Sea between the UK and Norway. Preparation for decommissioning the four Brent platforms - Alpha, Bravo, Charlie and Delta - started more than a decade ago.

We based our decommissioning recommendation on options from about 300 scientific and technical studies. This work included consultation with around 180 interested parties and an independent review to validate the science and engineering.

In 2015, the UK regulator approved the Brent Delta decommissioning programme to remove the topside of the platform in a single lift. The removal was carried out in April 2017 by Pioneering Spirit, the world's



The Brent Delta platform weighs the same as 2,000 London buses and is as high as the London Eye.

largest single lift construction vessel, making it the heaviest lift of its kind offshore. The 24,200 tonne lift marked the culmination of about five years of study and engineering work.

## Working for solutions in Groningen

The Nederlandse Aardolie Maatschappij B.V. joint venture operates the Groningen gas field in the Netherlands. Regrettably, production from the Groningen field has caused earthquakes. Some of these earthquakes have damaged homes and buildings, and caused worry for the people of Groningen.

Since 1963, the Nederlandse Aardolie Maatschappij B.V. (NAM) joint venture (Shell interest 50%) in partnership with the Dutch government, has operated the Groningen gas field, one of the world's largest onshore gas fields.

The Dutch Ministry of Economic Affairs has limited gas production in Groningen significantly since 2014 in response to earthquakes caused by extraction. Various other measures have been taken to reduce the social impacts, including improving the way damage claims are handled as part of the programme to repair and strengthen houses and local primary schools and launching socio-economic development programmes. Production limits are set in areas where earthquakes cause the greatest damage and highest social impacts.

### DIFFERENT ROLE FOR NAM

In 2017, NAM's role in handling damage claims and the building strengthening programme was handed over to the National Coordinator Groningen. This was an important step to improve credibility and restore trust in the region. NAM remains liable for any damage or loss directly caused by these induced earthquakes. NAM continues to work to rebuild relationships with the people of Groningen, for instance through open and honest face-to-face conversations.

### IMPROVING PERSPECTIVE

Since 2014, NAM has taken steps to help improve the situation in Groningen, including investing in the NAM Livability and Sustainability programme and on a personal level through conversations with members of the community. With this programme, NAM supports local initiatives, often co-financed by other parties and the local communities, in order to build relationships in areas where NAM has had a long-term presence. This is important as scientific research shows that social cohesion positively contributes to the community's resilience and its ability to deal with the impact of earthquakes.

The programme has provided financial support for around 200 local initiatives to strengthen structures affected by earthquakes. This includes providing support for houses and improving the running costs of sports facilities by installing solar panels.

## Shales

Shales – also known as tight gas and oil – continue to play an important role in meeting global energy demand. Shell uses advanced, proven technologies, including hydraulic fracturing, and follow our operating principles to unlock these resources safely and responsibly.

### HIGHLIGHTS IN 2017

- In Canada, around a third of our water demand in the Fox Creek facility was met by reusing produced water and waste water.
- We recycled produced water at a development in the Permian asset in the USA to significantly reduce groundwater consumption in hydraulic fracturing.
- Our new Waterton radio tower construction project contributed to local conservation efforts in Canada.

Shell expects shales to become a significant growth priority for the company beyond 2020. We are involved in seven shale projects in North America. In Canada, we are active in the Duvernay and Wet Montney oil plays in Alberta along with the Montney gas play in British Columbia. In the US, we are active in the Marcellus and Utica gas plays in Appalachia, the Delaware Basin portion of the Permian play and a non-operated position in the Haynesville gas play. Outside of North America, we are also active in the Vaca Muerta shale play in Argentina.

Shell upholds five global principles, the Onshore Operating Principles, which govern the onshore shale activities where we operate and where hydraulic fracturing is used. The principles cover safety, air quality, water protection and usage, footprint and engagement with local communities. We review the principles annually and update them as new technologies, challenges and regulatory requirements emerge. We actively engage with communities, industry participants and other groups to bring about improvements in the sector.

In our operations, we continue to take action to address air quality and control fugitive emissions, reducing the potential for our impact on the environment. We implement voluntary methane leak detection and repair programmes across all our shale sites, by primarily using optical gas imaging cameras. We are also looking at next generation detection technologies.

### IMPROVING WATER USE IN CANADA

We have worked for several years to improve water management at our facilities in Canada, first in Groundbirch, British Columbia, and then in Fox Creek, Alberta. In August 2017, the Canadian Association of Petroleum Producers recognised Shell's efforts as an example of industry best practice for water management.

We have taken steps to reduce our overall fresh water footprint and minimise the impact to other water users from our oil and natural gas operations. We have also been looking at ways to reduce overall water demand through completion design and reusing water. Previously, we agreed with the municipality to use Fox Creek's treated waste water for hydraulic fracturing and in return we

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helped upgrade the town's reclaimed water facilities. In 2017, around a third of Shell's water demand in the Fox Creek asset was met by produced water and waste water.

We have been pursuing similar initiatives in Groundbirch where we worked with the nearby city of Dawson Creek to build a reclaimed water facility to treat and recycle the city's waste water for local industries and the community.

Read more about water recycling at our Permian project in Texas.

## ADDRESSING ENVIRONMENTAL SENSITIVITIES

When implementing projects, we try to find solutions which minimise impacts on the environment. In 2017, our Waterton Complex in Alberta, Canada, needed to replace a support cable for its communications system. However, the mountainous terrain meant installing a new radio system was the only feasible option. As a result, we had to build two radio towers, including one on a ridge near Waterton Lakes National Park, which involved addressing several environmental sensitivities.

To minimise the environmental impact, we placed the radio tower on the ridge during frozen ground conditions,

using track equipment and solar panels. We also installed a watering system for livestock, which protects the habitat in nearby Yarrow Creek, and a new water well with an above ground pipe drilled. We consulted with the local community and landowners throughout the project to ensure it was executed in a way that preserves the local environment and contributes to local conservation efforts.

The communications system works well and was built in collaboration with local landowners and communities.



In Canada, we installed two radio towers at our Waterton shales project, which involved addressing several environmental sensitivities.

# Our contribution to society

Our contribution to society includes providing people with access to energy products. The company also contributes through paying taxes, procuring local goods and services, hiring locally and supporting social investment programmes. All this is underpinned by our core values of honesty, integrity and respect for human rights.

## Key contributions data



**22%**  
of senior leaders are women and around half of graduate recruits are also female



**\$ 15.6 billion**  
dividends distributed



**424,580**  
**training days**  
for employees and JV partners



**\$ 59.1 billion**  
payments to governments



**1,697**  
jobs created through LiveWire



**\$ 42.2 billion**  
spent on goods and services worldwide



**86,000 people**  
employed by Shell



**\$ 111 million**  
spent on social investment



**\$ 922 million**  
spent on research and development in 2017



**30 million**  
customers served every day at our retail sites

## Sustainable development goals

In 2015, the UN adopted 17 sustainable development goals (SDGs), which seek to address the world's biggest challenges, including ending poverty, improving health and education, making cities sustainable and tackling climate change.

Governments are responsible for prioritising and implementing approaches that meet the SDGs. But achieving these tasks will require collaboration between civil society, governments, the private sector, non-governmental organisations and the public.

We welcome the SDGs and we continue to develop our approach to how we can help achieve them. All the SDGs are relevant to Shell's operations to varying degrees and we are already contributing to many of these goals. In 2017, we prioritised six of the goals that have particular significance for Shell across our global business. Through IPIECA, the global oil and gas industry association for environmental and social issues, we have collaborated

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with the UN Development Programme and the World Bank's International Finance Corporation to develop a shared understanding of how our industry can most effectively support the goals. Together, we launched the report Mapping the Oil and Gas Industry to the Sustainable Development Goals: An Atlas.

The priority SDGs for Shell are highlighted in the graphic below.



## 7 AFFORDABLE AND RELIABLE, SUSTAINABLE AND MODERN ENERGY

Access to reliable and safe energy enables economic and social development and improves health, education and livelihoods. We aim to enable energy access by helping develop local energy markets and supporting entrepreneurs and partners in the development and distribution of energy solutions. (See Access to Energy and Local content and skills development.)

Read more on Shell.com:

- Access to energy
- Local employment and enterprise
- Shell LiveWire

## 8 DECENT WORK AND ECONOMIC GROWTH

Employment is a critical route out of poverty and towards prosperity. We provide jobs and aim to follow labour, health and safety standards. We encourage local businesses to be part of our supply chain, and encourage our suppliers to meet Shell standards. We work with governments and others to offer training to build local skills and expertise. We support entrepreneurs through various programmes, including the Shell LiveWIRE programme, which helps young people start their own businesses. We also contribute to economic growth by paying taxes and royalties to local governments. (See Living by our principles, Local content and skills development, Contractors and suppliers and Tax and transparency.)

Read more on Shell.com:

- Revenues for governments
- Human rights
- Supporting enterprise development and entrepreneurs

## 9 BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALISATION AND FOSTER INNOVATION

Shell often upgrades or builds infrastructure required for our projects, including roads and ports, and aims to minimise our impact on the local area. We support off-grid energy projects that can provide reliable, affordable energy in rural areas with little or no energy infrastructure.

Innovation is critical for sustainable growth. We spend around \$1 billion each year on research and development to turn ideas into commercially viable technologies. Our innovations include fuels and lubricants that help customers use less energy, and technologies that improve the energy and water efficiency of our own operations.

Read more on Shell.com:

- Innovation through R&D
- Fresh water
- Shell engine oils and lubricants

## 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

We aim to protect the environment and respect our neighbours. We work hard to avoid harm to people and set ourselves high environmental standards. This includes a focus on managing our greenhouse gas emissions, minimising our use of fresh water, conserving biodiversity and preventing spills and leaks. We meet and often exceed regulatory requirements.

We invest in a range of lower-carbon technologies and fuels and continue to work on improving the energy efficiency of our fuels and lubricants. Shell is taking part in several initiatives to encourage the adoption of hydrogen electric transport, and is developing a service that supports the charging of electric vehicles. We are one of the largest blenders and distributors of biofuels worldwide and are developing advanced biofuels that convert non-food plants into cellulosic ethanol.

Read more on Shell.com:

- Biofuels
- Shell engine oils and lubricants
- Our approach - environment
- Product stewardship

## 13 CLIMATE ACTION

We are seeking cost-effective ways to manage greenhouse gas (GHG) emissions and see potential business opportunities in developing such solutions. We seek to contribute to reducing global GHG emissions in a number of ways: supplying more natural gas to replace coal for power generation; progressing CCS technologies; implementing energy-efficiency measures in our operations where reasonably practical; developing new fuels for transport such as advanced biofuels and hydrogen; and participating throughout the power value chain with a focus on natural gas and renewable electricity. To support this, we continue to advocate the introduction of effective government-led carbon pricing mechanisms.

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We fully support the Paris Agreement, and its goal of keeping the rise in global temperatures to below two degrees Celsius. After having carefully listened to our critics, supporters and shareholders, we have set a long-term ambition to reduce the net carbon footprint of our energy products in step with society's drive to reduce GHG emissions.

Read more on Shell.com:

- Shell scenarios
- Climate change and energy transitions



## 17 PARTNERSHIPS FOR THE GOALS

We work with governments, academics and industry specialists, and partner with companies and organisations to help meet the world's growing energy needs. We share ideas and expertise to help encourage innovation.

We work with others to help reduce our impact on the environment and on people, to improve the quality of nature around our operations and to enhance benefits to local communities by implementing social investment programmes. Partnerships are also essential to help enhance safety and environmental standards and practices within our industry.

Read more on Shell.com:

- Innovating together
- Environmental and community partners
- Working with others

## Tax and transparency

Tax binds governments, communities and businesses together. Revenue transparency provides citizens with important information to hold their government representatives accountable and to advance good governance.

### HIGHLIGHTS IN 2017

- We paid more than \$59.1 billion in taxes and royalties to governments around the world.
- We paid \$6.3 billion in income taxes. Our government royalties were \$3.7 billion.
- We collected \$49.1 billion in excise duties, sales taxes and similar levies on our fuel and other products on behalf of governments.

### OUR APPROACH

We comply with applicable tax laws wherever we operate. We are transparent about our tax payments to governments and strive for an open dialogue with them. This approach helps us to comply with both the letter and the spirit of the laws. For Shell, being transparent is also about showing how developing energy resources provides governments with an opportunity to generate revenues, support economic growth and enhance social development.

### PRINCIPLES

In line with the Shell General Business Principles, we support several external voluntary codes, including the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises and the Business and Industry Advisory Committee to the OECD Statement of Tax Principles for International Business. We endorse the responsible tax principles set out by the B Team, a non-profit initiative formed by a group of global business leaders, and we work towards full implementation of these principles.

### TRANSPARENCY

In 2012, we were one of the first energy companies to voluntarily publish revenues that our operations generate through income taxes, royalties and indirect taxes for governments around the world. As of 2016, we make mandatory disclosures under the Reports on Payments to Governments Regulations 2014, and we file our Payments to Governments Report with the UK's Companies House.

The report covering calendar year 2017 has been published on [www.shell.com/payments](http://www.shell.com/payments).

### TAX STRATEGY

It is the right of governments to determine tax policies and tax rates and to draft tax laws accordingly. They do so under strong competition for capital and investment, which is internationally mobile. It is not the role of business to form views on what level of taxation is adequate or required. We use legitimate tax incentives and exemptions designed by governments to promote investment, employment and economic growth.

When considering the viability of investments, tax is one of the factors we examine. Income tax is just one part of the overall tax regime considered. We expect to pay tax on our income in the country where activities take place, and believe double taxation of the same activity by different jurisdictions should be avoided. Shell supports efficient, predictable and stable tax regimes that incentivise long-term investment. We expect the laws to be applied consistently, creating a level playing field for all.

### GOVERNANCE OF TAX

Shell's Board of Directors is responsible for maintaining a sound system of risk management and internal control, and for regularly reviewing its effectiveness. This system also covers taxation, which forms an integral part of the Shell control framework. Annually, the Board conducts a review of the effectiveness of Shell's system of risk management and internal control, including financial, taxation, operational and compliance controls.

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## COLLABORATING WITH OTHERS

Shell supports cooperative compliance relationships with tax authorities on the basis of the framework proposed by the OECD Forum on Tax Administration. We have these relationships in the UK, the Netherlands, Singapore and Italy, and a pilot relationship in Austria. Shell is also part of the OECD pilot International Compliance Assurance Program, which aims to facilitate open and cooperative engagements between multinational companies and tax administrations.

We provide the authorities with timely and comprehensive information on potential tax issues. In return, we receive treatment that is open, impartial, proportionate, responsive and grounded in an understanding of our commercial environment. This approach improves the transparency of our tax affairs and allows Shell to better manage its tax-related risks throughout the life cycle of each project.

Transparency is only effective if all parties in a country follow the same disclosure standards. Shell is a founder and board member of the Extractive Industries Transparency Initiative. Consistent with the Initiative's requirements, we continue to advocate mandatory country-by-country global reporting, as most tax payments are made at the corporate level to national governments. We support unified revenue reporting rules and standards applicable to all multinationals, irrespective of their ownership or place of business.

Shell is actively involved in revenue transparency discussions and we are working to develop an approach that takes into account the views of the relevant parties involved, including industry, governments and civil society.

## Our people

The quality of our people is essential to the success of the company. We work to maintain a productive and healthy organisation, employ and develop talented people, strengthen our leadership, and enhance employee performance through strong engagement.

### HIGHLIGHTS IN 2017

- We employed an average of 86,000 people in more than 70 countries.
- We recruited around 400 graduates, 1,400 experienced professionals and 3,700 people for Shell Business Operations.
- Around 45% of graduate recruits came from universities outside of Europe and the Americas.
- Around half of our graduate recruits are female.
- We provided 424,580 training days for employees and joint-venture partners.

In 2017, we employed an average of 86,000 people in more than 70 countries, with more than 40% of our workforce operating in countries outside Europe and North America. We strive to maintain strong relations with our employees. Dialogue between management and employees takes place directly and through employee representative bodies. We offer multiple channels for employees to report, confidentially and anonymously, breaches of the Shell General Business Principles or our Code of Conduct, or other concerns.

We provide equal opportunity in recruitment, career development, promotion, training and reward for all employees, regardless of gender, ethnicity, sexual orientation or physical ability. We actively monitor diversity on a global level and measure the representation of women and local nationals in senior leadership positions. Shell believes that diverse teams led by inclusive leaders can improve business performance.

Shell aims to manage the impacts of business changes on people respectfully and as consistently as possible. Affected employees are supported in their search for alternative employment as appropriate by country law and policy.

### EMPLOYEE ENGAGEMENT

The annual Shell People Survey is one of the main tools we use to measure employee views on a range of topics. In 2017, we started using a new methodology for this assessment. In addition to providing team leaders with improved reports, the rating scale changed from percentage favourable to an average index and the scores reflect the new methodology. Based on this new rating scale, the average employee engagement score remained stable

in 2017 with 76 points, similar to 2016 (previously reported as 79%).

The survey also measures employee views on the inclusiveness of their workplace. In 2017, we achieved 81 index points for our diversity and inclusiveness index.

### WORKFORCE DIVERSITY

Embedding the principles of diversity and inclusion in the way we do business gives us a better understanding of the needs of our staff, partners, suppliers and customers. A diverse workforce and an inclusive environment that respects and nurtures different people is a way to improve our safety and business performance.

Our diversity and inclusion approach focuses on hiring, developing and retaining the best.

We provide equal opportunity in recruitment, career development, promotion, training and rewards for all employees, including those with disabilities. In 2017, we introduced a workplace accessibility service at our major locations to ensure that all employees have access to reasonable adjustments to that they can perform their work effectively.

Shell also became the first major integrated oil and gas company to announce a global minimum standard of 16 weeks paid maternity leave, effective from 2018. More information on this can be found on our website. In 2017, we were ranked highly in the Workplace Pride global LGBTI (Lesbian Gay Bisexual, Transgender Intersexed) inclusive workplace benchmark and earned a 100% score in the Human Rights Campaign Corporate

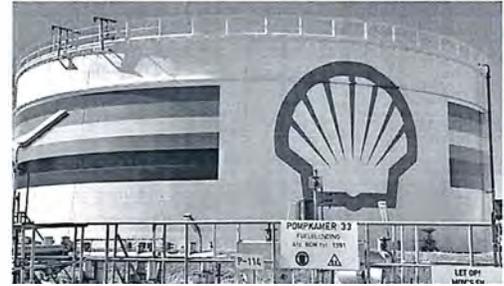
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Equality Index. Shell was also among The Times (UK) Top 50 Employers for Women in 2017.

We actively monitor diversity on a global level, measuring representation of women and local nationals in senior leadership positions, and have processes in place to identify and mitigate any biases. At the end of 2017, the percentage of women in senior leadership positions was 22% compared with 20% at the end of 2016. We continue to measure and work to improve our gender balance by making female leaders more visible and accessible as role models, by providing leadership programmes for women and by embedding diversity and inclusiveness in our policies and processes.

The representation of senior local nationals is monitored in 20 principal countries. We measure the percentage of senior nationals employed in Shell compared with the number of senior positions in their home country. The

reporting shows two categories: local national coverage greater than 80% (10 countries in 2017) and less than 80% (10 countries in 2017). There was no change from the 2016 numbers.



In 2017, Shell ranked high up on the Workplace Pride global LGBTI inclusive workplace benchmark. The picture shows the pride flag on a product tank at our Pernis refinery in the Netherlands.

## Local content and skills development

Shell buys goods and services from local suppliers as part of our approach to share the benefits of oil and gas development with the wider economy.

We contribute to employment creation directly and indirectly: directly through the employment of company staff and the purchase of goods and services; indirectly through the employment, subcontracting and procurement activities of our contractor and suppliers, and through wider economic effects.

We buy goods and services from local suppliers that meet our standards as part of our approach to share the benefits of oil and gas development to the wider economy. In some cases, we support businesses in developing the skills required to meet these standards.

Our supplier principles integrate social considerations in the contracting and procurement processes. In 2017, we spent \$42.2 billion on goods and services worldwide, of which around 58% was in the USA, Canada, the UK, the Netherlands and Nigeria. In 2017, we spent around \$4.9 billion in countries that, according to the UNDP Human Development Index 2016, have a gross domestic product of less than \$15,000 a year per person. In these countries, Shell companies spent 80% with local companies.

In 2017, we worked with the Australian government on a development programme to support local suppliers to the Queensland Gas Company (QGC) (Shell-operated, majority interest) coal seam gas project. We provided 12 local suppliers with a dedicated business advisor to help them develop a customised improvement plan to grow and diversify their business. The Australian government matched our funding with AUD\$20,000.

At the Prelude floating liquefied natural gas facility, we awarded contracts to Australian waste management company Rusca Environmental Solutions for onshore waste and cleaning services. This is a new business area for the company, which is 100% indigenously owned, and is expected to create further opportunities for indigenous sub-contractors.

In Nigeria, we use locally manufactured goods and service companies which create jobs in the communities in

which we operate. In 2017, Shell companies in Nigeria spent around \$0.76 billion on contracts for Nigerian companies. Access to financing has been a challenge for suppliers to Shell companies in Nigeria. In collaboration with leading banks in the country, the SPDC Joint Venture (SPDC JV) and the Shell Nigeria Exploration and Production Company Limited continue to fund a mechanism that offers local contractors faster access to loans at cheaper interest rates.

### COMMUNITY SKILLS AND ENTERPRISE DEVELOPMENT

Through our social investment programmes, we support economically viable enterprise development and skills programmes that create valuable opportunities for local people and communities, while adding value to our supply chain.

We support the building of new businesses to generate local employment and our Shell LiveWIRE programme, helps young entrepreneurs turn their ideas into reality.

Shell LiveWIRE marked its 35<sup>th</sup> anniversary in 2017 and now operates in 15 countries in eight languages. In 2017, through the programme, 4,159 people were trained, 450 businesses were established, 465 existing businesses were supported, 1,697 jobs were created and 10 businesses entered the Shell supply chain.

Shell LiveWIRE entrepreneurs increasingly focus on energy solutions such as affordable and clean energy for low-income communities. For example, *Innovate Energy*, is a company that offers an external phone battery rental service powered by renewable energy.

Nigeria has one of our most successful Shell LiveWIRE programmes, with a total of \$66,200 awarded to 60 young entrepreneurs from Ogoniland, all of whom completed its enterprise development programme. In the Middle East and North Africa, where Shell LiveWIRE is called Intilaaqah, we trained 1,920 participants in 2017 – 52% of whom were women – and helped start up 186 businesses. In Saudi Arabia, Ghazael Aldossary, one of many female Intilaaqah entrepreneurs, has set up two businesses in the chemical and shipping industries with 45 employees.

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In the Philippines, we have a community-based enterprise development and biodiversity programme called Turismo at Negosyo Dulot ng Ingat Kalikasan (Tourism and Business Through Protecting Nature). The programme supports sustainable tourism by mobilising community involvement and creating alternative income opportunities, all while protecting and conserving Palawan's biodiversity. In 2017, the programme provided 67 local jobs and generated more than \$90,000 in revenues from supported enterprises.

In Tanzania and Kenya, we are supporting a programme called E4D/Employment and Skills for Eastern Africa with the German, British and Norwegian governments. This programme aims to improve access to jobs and economic opportunities for local people in natural resource-based industries and related sectors. By the end of 2017, the partnership, had raised more than 35 training programmes to industry standards and provided training for around 13,000 people. So far, 73% of the graduates have found employment.



Our enterprise development programmes are helping young Tanzanians grow their businesses.

## THE ENERGY OF COFFEE

We are working with a start-up called bio-bean, which turns coffee waste into fuel. The company won Shell LiveWIRE's Innovation Award in 2013 and has since gone on to produce bio-mass pellets and briquettes called Coffee Logs. These are now sold at Shell retail sites across the UK.

In 2017, bio-bean helped power some of London's buses using biofuel made partly from its waste coffee grounds. The company collects and processes 50,000 tonnes of waste grounds a year. Every tonne of waste coffee grounds recycled using bio-bean's technology saves 6.8 tonnes of CO<sub>2</sub> emissions.

The collaboration forms part of our #makethefuture campaign, which demonstrates how we are providing access to cleaner energy to improve lives.

## External voice: "Shell's support was crucial to my start-up's success"

Ciclo Orgânico is an organic waste collection and composting business that makes money through customer subscriptions. I founded the company as part of Shell's LiveWIRE programme in Brazil in 2015.

The programme helped me build the company from the initial concept to planning and final execution so was crucial to our success. One of the biggest benefits was the support I received in developing my business plan. This guides me to this day whenever I am faced with hard decisions.

Shell also connected me to a network of entrepreneurs, specialists and mentors. It was a wonderful experience and I am grateful for all the support I received from Shell.



**Lucas Chiabi**

Entrepreneur, Ciclo Orgânico, Brazil

## Access to energy

Globally, around 1.1 billion people have no electricity and 1 billion more only have access to unreliable and unsafe power networks. Nearly 3 billion people rely on solid fuels for cooking.

Reliable and safe energy enables economic and social development, and improves the health, education and livelihoods of people around the world. Energy access plays an important role in achieving the UN's sustainable development goals, in particular goal 7 "Ensure access to affordable, reliable, sustainable and modern energy".

Our New Energies business is pursuing commercial opportunities to provide energy to those who have insufficient access to it. Access to energy is also one of our three global social investment themes through which we aim to provide access to reliable, affordable and cleaner energy, to spur socio-economic progress in local communities.

In Myanmar, we worked with PACT, a non-profit organisation, to provide access to sustainable energy for around 20,000 people in 2017. We have improved the livelihoods of around 35,000 people since the start of the programme in 2015.

Renewable energy committees were set up in 76 villages to train people to install and maintain solar power systems in their homes, and to manage renewable energy funds that provide initial capital to purchase the solar power systems.

In 2017, we piloted a fund to encourage our teams to work with local partners to design and implement small local energy access projects using a sustainable community business model. The fund has so far supported four projects and will monitor their success during 2018.

We continued to support our partner The Global Alliance for Clean Cookstoves with its activities in India, China and Nigeria. In China, we sponsored activities to help cookstove manufacturers expand into international markets and share best practices with partners abroad. We also supported the Alliance in Nigeria, where we sponsored a workshop in Lagos in 2017, to help clean cooking enterprises improve their business plans and attract more funding. Thirty-four participants from 11 states in Nigeria attended the workshop. We continued to support the Alliance's Spark Fund, which provides growth capital and capacity development to help cookstove enterprises reach commercial viability. By the end of 2017, the Alliance and its partners had distributed an estimated 80.9 million clean or efficient stoves and fuels, and are on track to exceed their goal of reaching 100 million households by 2020.

In addition, we support access to energy through the All On programme and initiatives of Shell Foundation globally.

## STEM education

Shell is working with schools and academia to excite young people about the wealth of career opportunities available to them in science, technology, engineering and mathematics (STEM).

We support STEM education programmes in 16 countries where we operate. We are helping to deliver a growing, diverse and talented population of future innovators and leaders who can find solutions to help meet greater energy demand while reducing carbon emissions. NXplorers is our global STEM programme which seeks to enthuse and empower young people and equip them with the tools and skills to solve some of the world's biggest challenges. In 2017, we launched NXplorers in Brazil, Nigeria and Egypt, with plans to launch in other countries including India, Australia, the United Arab Emirates and Oman in 2018. Our goal is that more than 1 million young people participate in the programme worldwide by 2020.

Our STEM programmes also focus on teachers. In Brazil, where a lack of qualified science and technical professionals is hampering the country's overall development, we launched a project in 2012 that continues to provide teacher training, teaching aids and resources. This includes an award for teachers that recognises the role they play in influencing others and changing their students' perspective on life. The winning teachers travelled to London on an education trip in 2017.

We held festivals in the Netherlands, Singapore, the UK and the USA in 2017 to support our efforts to promote STEM careers. Around 30,000 visitors, including 10,000 schoolchildren, attended the five-day Generation Discovery festival in the Netherlands.

In 2017, Shell made a second investment of more than £1 million in Tomorrow's Engineers, a UK STEM programme. Through our investment, we aim to give hands-on engineering experience and career information to more than 160,000 children by 2020.



Our social investment programmes are exciting young people about careers in science, technology, engineering and maths.

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## Shell Foundation

Shell Foundation is an independent charity that applies a business approach to the global development challenges of access to energy and sustainable mobility.

Shell Foundation (SF) provides business support, grants and market connections to help pioneering social entrepreneurs prove new business models in low-income communities.

SF selects partners with the potential to benefit 10 million people within a 10-year timeframe, achieve financial independence and spur international replication.

Since 2000, SF has deployed \$279 million in grants to early-stage businesses and new market builders operating in Africa, Asia and Latin America.

### 2017 SOCIAL ENTERPRISE PARTNER HIGHLIGHTS

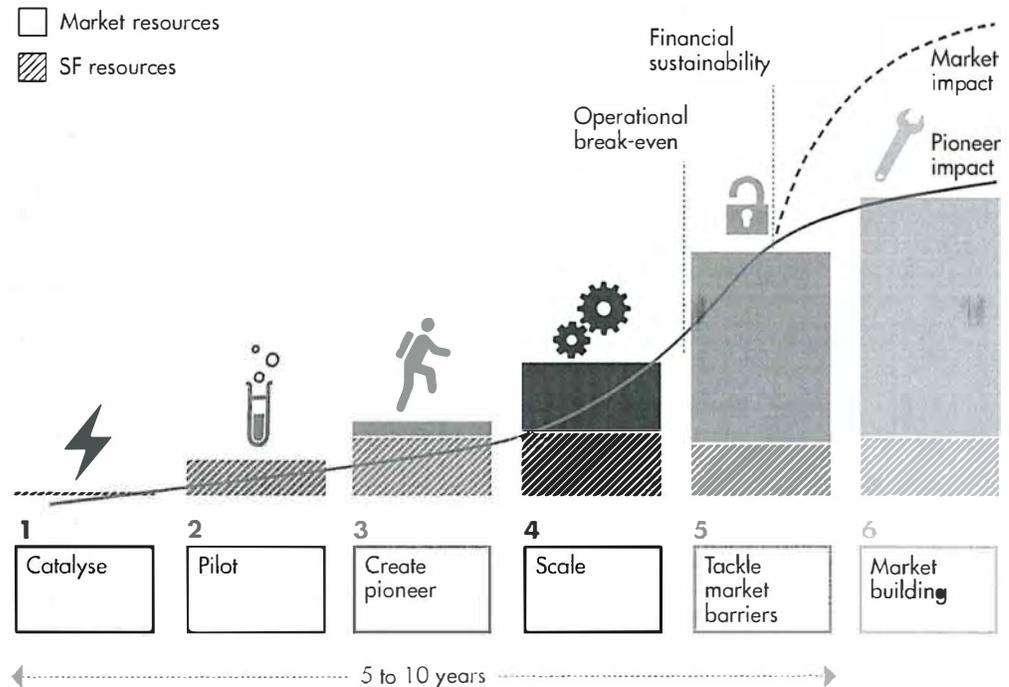
Sistema.bio makes biodigester equipment that converts farm waste into renewable energy. This can be used for cooking, heating or electricity. The process also reduces greenhouse gas emissions from livestock farming. So far, more than 4,100 units have been installed across Mexico and Latin America, improving the lives of 24,600 people.

In 2017, SF supported Sistema.bio to expand their operations into Kenya and India, where 800 units have been sold to date.

M-KOPA provides low-income consumers in East Africa with financing to purchase solar energy products on a pay-as-you-go basis. M-KOPA acquired over 600,000 products to date, benefiting more than 3 million people. In 2017, it raised a new working capital facility of \$55 million with a consortium of commercial lenders that will help the company to reach 1 million more homes by 2020.

Tugende offers affordable finance to motorcycle taxi drivers in Uganda, most of whom have limited access to banking products and services. Tugende enables these drivers to buy vehicles and increase their earnings. The company also offers road safety training, safety equipment and insurance. In 2017, Tugende doubled its loan portfolio and revenue and has served more than 10,000 customers in seven locations. In total, Tugende has transferred \$2.6 million in funds to customers and improved their credit. Around a third of customers used their improved financial status to start new ventures or invest in existing businesses.

### Shell Foundation's six-step theory of change



### Shell Foundation's impact to date



# Working together

We collaborate with partners, contractors, suppliers, non-governmental organisations and other businesses around the world. Together, we are achieving goals in operational excellence, best practice on sustainability challenges and improving standards within the energy sector.

## Living by our principles

Our core values of honesty, integrity and respect for people underpin our work with contractors, suppliers, non-governmental organisations and others.

### HIGHLIGHTS IN 2017

- We screened around 10 million potential trading partners against a range of watch lists to meet our requirements for anti-bribery and corruption, anti-money laundering and trade compliance.
- Internal investigations confirmed 261 substantiated Code of Conduct allegations. As a result, we dismissed or terminated the contracts of 73 employees, contract staff or contractor employees.
- Most of the Code of Conduct violations related to protection of assets, data privacy, conflicts of interest and harassment.

The Shell General Business Principles detail our responsibilities and set the standards for the way we conduct business. We aim to do business fairly, ethically and in accordance with all applicable laws.

All Shell employees and contract staff must follow our Code of Conduct, which guides employees on how to apply the Shell General Business Principles in line with our core values. Employees and contract staff are also required to complete Code of Conduct training and to confirm they understand their personal responsibilities under the Code of Conduct. Contractors and consultants are also required to act consistently with the Code of Conduct when acting on our behalf.

Shell employees, contract staff and any third party can report any potential breaches of the Code of Conduct confidentially and anonymously through a variety of channels, including the Global Helpline, which is operated by an independent provider.

### INVESTIGATING CODE BREACHES

Shell has specialists who investigate concerns or allegations about a breach of our Code of Conduct. If a violation is confirmed, we take appropriate action up to and including contract termination or dismissal. We maintain a stringent no retaliation policy to protect any person making a good faith allegation.

Internal investigations confirmed 261 substantiated Code of Conduct violations in 2017 compared with 341 in 2016. We dismissed or terminated the contracts of 73 employees, contract staff or contractor employees, compared with 114 in 2016.

### IN THIS CHAPTER

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## Shell global helpline statistics in 2017



**1007**

**ALLEGATIONS REPORTED**  
to the Shell Global Helpline



**202**

**DISCIPLINARY ACTIONS TAKEN**  
(including 73 contract terminations or dismissals)

### SCREENING FOR INTEGRITY AND COMPLIANCE

Various national and international laws prohibit business involvement with certain individuals, entities and organisations. Our anti-bribery and corruption and anti-money laundering and trade compliance programmes set out the requirements for screening business partners.

These checks provide an overview of the key risks and allow us to manage these risks appropriately. Using a risk-based approach, we screen potential business partners before and during the contractual relationship. In 2017, we carried out 7,243 enhanced pre-screenings for higher risk contracts. Additionally, Group counterparties (around 10 million) are screened on a continuous basis against a range of trade compliance, anti-bribery and corruption and anti-money laundering watch-lists.

### MANAGING ETHICAL RISK

In 2017, we launched a training programme for our 500 most senior leaders covering a range of ethical risks faced by the energy industry. The programme simulates realistic situations and requires leaders to make real-time decisions on which they receive instant feedback. Leaders are faced with risks covering bribery and corruption, money laundering, antitrust, data privacy and trade compliance.

## Human rights

We recognise our responsibility to respect human rights and our approach applies to all of our employees and contractors. It is informed by the Universal Declaration of Human Rights, the core conventions of the International Labour Organization, and the United Nations Guiding Principles on Business and Human Rights.

We have embedded human rights into our policies, business systems and processes. We believe this integrated approach allows us to efficiently and effectively manage human rights within our existing ways of working.

We focus on four areas where respect for human rights is particularly critical to the way we operate: labour rights, communities, supply chains and security. Our Community Feedback Mechanism and Global Helpline enable us to meet our commitment to provide access to remedy.

We consult with international organisations, companies and civil society to understand and respond to current and emerging human rights issues relevant to our business. For example, we collaborate with The Danish Institute for Human Rights to assess and improve our approach. We are members of the Business for Social Responsibility human rights working group which enables us to engage with companies across industries. We participate in IPIECA, the global oil and gas industry association for environmental and social issues, to share social performance good practice and guidance tools that can be used more widely. We actively adhere to the Voluntary Principles on Security and Human Rights and participate in FPIC Solutions Dialogue, hosted by the non-profit organisation Resolve, to promote the practical implementation of Free Prior and Informed Consent.

### Approach to human rights



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## Contractors and suppliers

Shell aims to work with contractors and suppliers that behave in an economically, environmentally and socially responsible way, as set out in our Shell General Business Principles. The Shell Supplier Principles cover our requirements for suppliers in business integrity, health and safety, social performance and labour and human rights.

In 2017, Shell spent \$42.2 billion on goods and services from 33,505 suppliers globally.

Suppliers who work to deliver Shell projects and help run our operations are invited to register with our supplier qualification system (SQS). Certain areas of our supply chain may pose a higher risk to labour rights due to their location and the nature of the goods and services we procure. In these cases, we use a defined set of criteria to identify potential supply chain risks and, where we see

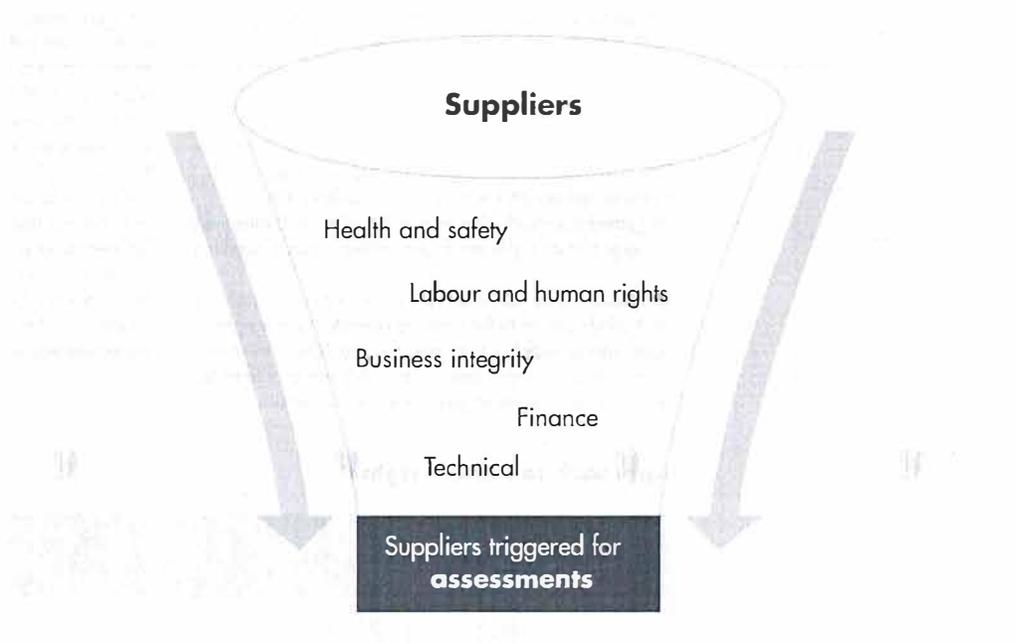
risk, we ask suppliers to undertake due diligence assessments prior to the award of a contract. We require our suppliers to declare whether they have a process in place to assess and manage social risks with their own suppliers.

If gaps are identified, we may work with suppliers and contractors to help them understand how to close these gaps, implement corrective action – which may include on-site audits from Shell – or we may consider terminating the contract.

This risk-based approach is shared in several external regulatory declarations that describe how we manage human rights risks in our supply chains, most recently in our statement under Section 54 of the UK Modern Slavery Act 2015.

### Applying risk filters

When we assess our suppliers, we use a combination of the type of work they do and the country in which the work will be delivered to identify suppliers we consider high risk for potential labour rights violations.



### Labour rights risk analysis 2017



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## RESULTS AND WORKING WITH SUPPLIERS TO CLOSE GAPS

The results of our supplier assessments are summarised in a green/amber/red rating depending on the number and significance of any gaps between our requirements and the supplier's policies or performance.

We engage with each supplier that has serious gaps to ensure they have a correction plan. The most common gaps found during our supplier assessments, which typically relate to policy rather than performance gaps, are:

- freely chosen employment;
- child labour avoidance;
- working hours, wages and benefits;
- dormitory, housing and working conditions;
- humane treatment, equal opportunities and freedom of association; and
- supply chain and performance management.

## CONTRACTOR SAFETY LEADERSHIP

We share our safety experience and standards with other operators, contractors and professional organisations, including the International Association of Oil & Gas Producers (IOGP). For more details on how we helped raise industry standards in 2017, see the Safety section.

## SHELL ARIBA PROCUREMENT: SHARP

We have adopted a new contracting and procurement platform to make it as easy and smooth as possible to do business with Shell. SAP Ariba, a market standard solution, has replaced some of our IT systems and will be known as Shell Ariba Procurement, or SHARP. It enables us to process procurement data more efficiently, reduce costs and track purchase orders and invoices in real time. For more details on ways Shell Ariba Procurement is improving our supply chain see [www.shell.com](http://www.shell.com)

SHARP also helps suppliers easily take part in online sourcing or tenders and provide their web catalogues for Shell employees wishing to place orders. This video gives a supplier's perspective on what it has meant to them to join SAP Ariba.

## CARE FOR PEOPLE

Good working and living conditions help to bring about a safer and more productive working environment. Our approach to worker welfare means supporting the needs of the individual worker, their relationship with their family and connections with colleagues. We aim to provide a home away from home for people by delivering a standard of accommodation and facilities that improves their quality of life and well-being, and as a result promotes safe and productive work.

In Shell contracts, suppliers agree to provide and maintain safe and healthy working conditions for all supplier personnel. In 2017, we ran a series of engagements with Shell procurement teams in high-risk locations to raise awareness and improve understanding of contractor worker welfare. For some services in these locations, we also require contractors to develop a worker welfare plan that includes ethical recruitment practices and no use of forced labour. In our Singapore operations, for example, an opportunity was identified for our contractors to improve on-site and off-site welfare of workers, as well as clarify worker recruitment practices. An element of this included building awareness of worker welfare and the correlation to increased performance in safety, productivity, quality and retention with government and local industry bodies. Several changes have been made, including in on-site and off-site infrastructure, fatigue management, and transport, all done with a strong voice from the workers themselves.



We engage with each of our suppliers that have serious gaps in their policies or performance to ensure they have a correction plan.

## Our business partners

Shell often work in joint ventures with national and other international energy companies. Our business partners bring important skills and experience to a joint venture.

### NON-OPERATED VENTURES

More than half of Shell's joint ventures (JVs) are not operated by Shell. For these ventures, our Shell JV representatives and the Shell-appointed member(s) of the JV board require our partners to adopt the Shell commitment and policy on health, safety, security, environment and social performance (HSSE&SP) or one materially equivalent to our own. They are also required to put in place standards to adequately address HSSE&SP risks.

When these JVs implement our control framework, or a similar approach, Shell teams carry out independent audits or participate in the JV's own auditing programmes. This provides assurance on the JV's compliance. We also offer to review the effectiveness of the framework's implementation, overseen by the JV's board of directors.

We periodically evaluate the health, safety, environment and community risks of the JV. If the JV is falling below expectations, plans will be put in place, in agreement with the other partners, to improve performance.

In 2017, we connected 159 community liaison officers and experts in social performance in operated and non-operated ventures with contractors via a virtual platform. This network aims to share knowledge and discuss

challenges and holds regular teaching sessions focused on respectful engagement with communities close to our operations. This also enabled our business leaders to share their priorities and ensure contractors comply with standards of behaving in a socially responsible way.

We also continued to work with our partners on how to adopt the Shell greenhouse gas (GHG) and energy management process. For example, we supported Brunei Shell Petroleum (BSP, Shell interest 50%) to assess its GHG emissions to a reasonable level of assurance. We ran GHG and energy management workshops with other ventures such as Petroleum Development Oman (PDO, Shell interest 34%), Badr Petroleum Company in Egypt (Bapetco, Shell interest 50%) and Karachaganak Petroleum Operating B.V. (KPO, Shell interest 29%). These workshops helped to identify opportunities to improve their GHG emissions management.

An important part of our efforts to keep JV staff, contractors and communities safe is our focus on a culture of road safety. In 2017, PDO worked with the police and the Oman Road Safety Association to raise awareness about safe road behaviour. The initiative was launched in 2013 and has so far reached about 8,000 customers. In the city of Salalah, for example, the campaign focused on promoting safe driving habits, including respecting speed limits, not using mobile phones while driving and wearing seat belts at all times. The campaign featured in Shell service stations and at a police road safety exhibition with various interactive and educational activities.

## Environmental and social partners

Shell collaborates with environmental and developmental organisations to bring important insights to our work to protect the environment and contribute to the well-being of communities where we operate.

Our environmental partners can bring specific expertise to our projects in areas such as biodiversity and livelihoods, while at the same time advancing their own scientific or conservation knowledge by working on our projects.

Our social partners help us tackle a range of community or human rights topics. They help us address specific priorities such as boosting local employment and improving road safety.

### ENVIRONMENTAL PARTNERS OPERATING IN SENSITIVE LOCATIONS

We partner with major conservation organisations to understand how to protect areas that are rich in biodiversity known as critical habitats.

#### Majnoon

The Majnoon marshlands form one of the world's largest inland delta systems. In 2016, the Mesopotamian marshes north of the Majnoon field were recognised as a UNESCO World Heritage Site. In 2017, we worked with environmental organisations Flora & Fauna International, Nature Iraq and Wetlands International to bring together experts in the field to develop a biodiversity monitoring plan for Majnoon. They considered the latest techniques and technologies that could be deployed to better monitor the risks to biodiversity in the region, including using satellite imagery, radar and DNA analysis. We also worked with the International Union for Conservation of Nature (IUCN) and 30 government officials in Basrah, southern Iraq, to share best practices in protected area management.

#### Niger Delta

Based on recommendations from the IUCN Niger Delta panel, in 2017 Shell Petroleum Development Company of Nigeria Limited published a study on bioremediation of oil spills in Niger Delta soils. Bioremediation is a process that involves stimulating growth of microorganisms that help to degrade the pollutants. The study helped confirm the best remediation techniques to treat contaminated soil for the area in which we operate in Nigeria.

Working with the IUCN Niger Delta panel and regulators, we also developed a new framework for remediation of soil and groundwater. The framework is based on the latest science and best practice, taking into account the climate, land-use and how people live and work in the area. This framework will be tested in 2018. The collaboration has also led to a Niger Delta biodiversity strategy and a toolkit which provides guidance on restoring mangroves.

#### Oman

In 2017, Shell Development Oman continued to support Wetlands International's bird survey at Barr Al Hikman wetlands, a globally significant wetland for more than 550,000 waterbirds. This initiative is helping to build scientific knowledge and understanding of the area. It supports Oman's plans for the initiative to be recognised under the Ramsar Convention, an international treaty for the conservation and sustainable use of wetlands.

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## USA

In 2017, we worked with The Nature Conservancy to launch an online tool to monitor migratory species in the Gulf of Mexico and the Caribbean Sea, both areas where Shell has operations. The portal includes details on fish, sea turtles, mammals and birds to provide information on migration patterns and possible threats to the species. For more information, see the Migratory Species Conservation Programme site.

## NATURE-BASED SOLUTIONS

We work with The Nature Conservancy to better understand how investing in natural climate solutions can help address the global climate challenge. This includes exploring how nature-based projects, such as large-scale reforestation, can reduce CO<sub>2</sub> levels in the atmosphere while improving the livelihoods of local communities and preserving biodiversity and wildlife. These projects can generate carbon credits which are used to compensate for emissions elsewhere as part of a 'biological bridge' to a lower carbon future.

## ENGAGING EMPLOYEES

We partner with Earthwatch through Project Better World, an employee volunteer scheme that enables Shell staff to make a meaningful contribution to global science and conservation. The programme also gives staff a more strategic and informed understanding of Shell's sustainability strategy and goals.

In 2017, 50 Shell employees from 12 countries took part in Earthwatch Expeditions to South Africa, the UK and the USA, which included a learning programme to hone their sustainability leadership skills. A further 50 staff took part in other Earthwatch Expeditions to Canada and India. Over the past 19 years, the programmes have contributed around 49,000 work hours to environmental research and we welcomed the 1,000<sup>th</sup> Shell participant in 2017.

Through the Earth Skills Network programme, Earthwatch continues to help Shell build staff leadership skills by supporting them to adopt a mentoring role for IUCN or UNESCO protected areas. We have supported 51 protected areas since 2009, including six in 2017.

## PARTNERING FOR CONSERVATION

Over the past 20 years, we have funded around 270 projects with our conservation partners in the USA, including the National Fish and Wildlife Foundation, to support the protection, restoration and management of habitats in the Gulf of Mexico. This approach includes using wetlands, reefs, marshes and outer island barriers to reduce coastal erosion.

In 2017, we widened our focus. We joined the Killer Whale Research and Conservation Program, a public-private partnership to help the killer whale population recover in the Pacific Northwest. The programme awards grants to projects for improving food supply and the quality and management of habitats.

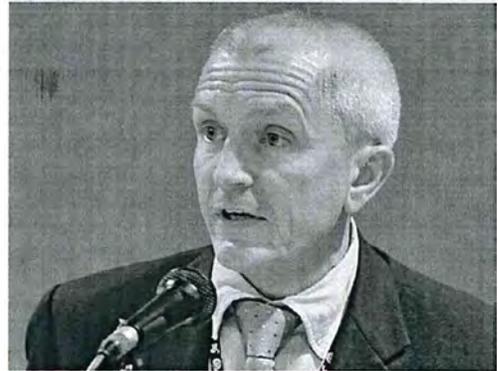
Read more about Shell's environmental and community partners.

### External voice: "We are helping companies build natural capital into their decision-making"

Improving how businesses value, manage and account for their impacts on nature forged the first International Union for Conservation of Nature (IUCN)-Shell collaboration back in 1999. We have worked to improve Shell's biodiversity management and environmental performance and, in return, Shell has shared valuable insights with us on IUCN's business engagement tools.

Our collaboration is built on applying scientific evidence to improve conservation in the world of business. Together in 2017, we launched a pilot framework to help companies include natural capital in their decision-making.

IUCN and Shell don't always see eye-to-eye and we accept that sometimes our positions may differ. But with mutual trust and respect, these differences become a strength in working through challenges. Shell's support for IUCN-led independent, scientific and technical advisory panels, for example, has helped address contentious environmental issues in places such as the Niger Delta and the Russian Far East.



**Stewart Maginnis**

Global Director, Nature-based Solutions Group,  
International Union for Conservation of Nature

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## SOCIAL PARTNERS

### RESPECT FOR HUMAN RIGHTS

We consult with international organisations, companies and civil society to understand and respond to current and emerging human rights issues relevant to our business. We have collaborated closely with The Danish Institute of Human Rights since 1999 to assess and improve our approach. In 2017, the institute developed an analysis to help us improve our transparency, advised us on industry benchmarking, and supported us to strengthen the application of internal metrics in some of our key areas.

### DISASTER RELIEF

We partner with Mercy Corps to meet urgent needs, help people to recover from crises and build stronger futures. For example, in 2017, we donated \$100,000 to Mercy Corps in response to the drought in the Lower Shabelle region of Somalia helping reach 1,950 households.

Mercy Corps' response, with Shell's support focused on three areas:

1. **Food:** distributing about two months of food rations to recently displaced people in the emergency camp in Baidoa and the worst affected villages of Lower Shabelle;
2. **Water:** providing 10,000 litres of safe, drinkable water twice a week for two months for displaced families and 10,000 litres of water for both human and livestock use to households in four villages in the Lower Shabelle region; and
3. **Hygiene:** promoting hygiene awareness for displaced people to reduce the risk of acute watery diarrhoea or cholera outbreaks.

In north-east Nigeria, with Shell's support, Mercy Corps provided emergency humanitarian relief to 1,000 vulnerable families in Dikwa, Borno State. This response included distributing kits containing essential household items and providing people with the skills, tools and seeds needed for basic agriculture and cultivation, to help them rebuild and become more resilient to future shocks and stresses.

### DIALOGUE WITH INDIGENOUS COMMUNITIES

In 2016, as part of our acquisition of BG, we entered into a partnership with RESOLVE, a non-profit organisation that founded the Free Prior Informed Consent (FPIC) Solutions Dialogue in 2012, and we are an active member of the FPIC Solutions Dialogue steering committee. This enables us to improve our approach to developing projects through better engagement with indigenous communities.

### DEVELOPING SKILLS AND ENTERPRISES

From 2012 to 2017, we provided funding for GroFin, a finance company and long-standing partner of Shell Foundation that invests in small- and medium-sized enterprises in the Middle East and North Africa, to launch

the Nomou job creation programme. Now active in Oman, Jordan, Iraq and Egypt, Nomou has invested around \$46 million, helping to sustain more than 12,000 jobs, 17% of which are held by women. This programme has created around \$120 million of additional economic value to date. 2017 was the last year Shell provided funding for GroFin.

In Tanzania and Kenya, we are supporting a programme called E4D/Employment and Skills for Eastern Africa with the German, British and Norwegian governments. The programme aims to improve access to jobs and economic opportunities for local people in natural resource-based industries and related sectors. By the end of 2017, the partnership raised more than 35 training programmes to industry standards and provided training for around 13,000 people. So far, 73% of the graduates have found a job.

### External voice: "Helping Shell conduct business responsibly"

The Danish Institute for Human Rights was one of the first human rights organisations to work in partnership with business. Our work with Shell goes way back. They contributed to the development of our human rights compliance assessment tool, which continues to be one of the most comprehensive tools for businesses to understand how their policies, procedures and performance align with over 80 international human rights instruments.

In recent years, we worked with Shell on research that is helping further strengthen human rights implementation in the company, explore new concepts, developments and opportunities for Shell to help it conduct its business in a responsible way. This includes respecting the rights of communities.



**Catherine Bloch Veiberg**  
Danish Institute of Human Rights, Corporate Engagement Programme Manager, Denmark

## Collaborations

Shell's work with organisations around the world gives us insight into our business, while the sharing of knowledge and experience with others contributes to better practices.

We define collaboration as all forms of working with organisations outside Shell. These collaborations range from working with organisations on a project to sponsoring a particular group. We collaborate with a variety of companies, academics, think tanks and individuals. We also play an active role in many trade organisations across the world on a wide range of topics.

As a member of IPIECA, the global oil and gas industry association for environmental and social issues, we discuss and share industry best practice on topics including biodiversity, climate change and resettlement.

Some of the views of the organisations with which we participate may differ from our own. For example, we may not always agree with their opinions on topics such as climate change. In these cases, we make our views known within the organisation and seek to influence its position on certain policies.

In June 2017, we joined the Global Industry Alliance, a public-private partnership of the International Maritime Organisation, which brings together maritime industry leaders to support the development of more energy-efficient and lower-carbon shipping.

We aim to reduce our methane emissions and are working with seven other energy companies to further reduce methane emissions from natural gas facilities around the world.

We have been engaging with the Task Force on Climate-related Financial Disclosures (TCFD) before and after its launch of financial disclosure recommendations in June 2017, which help investors to see which companies are resilient through the energy transition. As a member of the TCFD's Oil & Gas Preparer Forum, we are working with three other oil and gas companies to develop more specific guidance on meaningful disclosures building on existing good practices.

### Collaborations overview

The table shows some of the organisations we collaborate with globally on topics such as environmental sustainability, climate change and technology. Shell also works with many community-based organisations.

|   | Environmental sustainability | Human rights and social responsibility | Safety and technical standards | Technology and innovation | Transparency and governance |
|---|------------------------------|--|--------------------------------|---------------------------|-----------------------------|
| American Petroleum Institute (API)                                | ■                            |  | ■                              | ■                         | ■                           |
| Bonsucro  | ■                            | ■                                      |                                |                           |                             |
| Center for Sustainable Shale Development (CSSD)                   | ■                            | ■                                      |                                |                           |                             |
| Danish Institute for Human Rights (DIHR)                          |                              | ■                                      |                                |                           |                             |
| Energy Institute (EI)   |                              |  | ■                              | ■                         |                             |
| Energy Transitions Commission (ETC)                               | ■                            |  |                                |                           |                             |
| Extractive Industries Transparency Initiative (EITI)              |                              |  |                                |                           | ■                           |
| Global Alliance for Clean Cookstoves                              | ■                            | ■                                      |                                |                           |                             |
| Global Gas Flaring Reduction Partnership (GGFR)                   | ■                            |  |                                |                           | ■                           |
| Global Road Safety Partnership (GRSP)                             |                              |  | ■                              |                           |                             |
| International Association of Oil and Gas Producers (IOGP)         | ■                            | ■                                      | ■                              | ■                         | ■                           |
| International Audit Protocol Consortium (IAPC)                    | ■                            |  | ■                              |                           |                             |
| International Emissions Trading Association (IETA)                | ■                            |  |                                |                           |                             |
| IPIECA (industry association for environmental and social issues) | ■                            | ■                                      | ■                              |                           | ■                           |
| Network of Employers for Traffic Safety (NETS)                    |                              |  | ■                              |                           |                             |
| Roundtable for Responsible Soy (RTRS)                             | ■                            | ■                                      |                                |                           |                             |
| Roundtable on Sustainable Palm Oil (RSPO)                         | ■                            | ■                                      |                                |                           |                             |
| UN Global Compact   | ■                            | ■                                      |                                |                           | ■                           |
| Oil and Gas Climate Initiative (OGCI)                             | ■                            |  |                                |                           |                             |
| World Business Council for Sustainable Development (WBCSD)        | ■                            | ■                                      | ■                              |                           | ■                           |

# Our performance and data

Each year, we measure our global performance and report on the safety of our operations, our impact on the environment and our contribution to communities.

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## Environment

We carefully consider the potential environmental impact of our activities and how local communities might be affected during the lifetime of a project.

### HIGHLIGHTS IN 2017

- We started working with nature-based projects to compensate for greenhouse gas emissions while improving the livelihoods of local communities and preserving biodiversity.
- We recorded our lowest volume of operational spills.
- The Australian government approved a biodiversity offsetting plan from the Shell-operated QGC gas project.

We aim to comply with all applicable environmental regulations, continually improve our performance and prepare for future challenges and opportunities. We use external standards and guidelines, such as those developed by the World Bank and its International Finance Corporation, to inform our approach.

Our global environmental standards include requirements for managing our emissions, minimising our use of fresh water and conserving biodiversity. Within our operations, we also focus on reducing our energy use, flaring less gas and preventing spills and leaks.

When planning new projects, we carry out detailed assessments of the potential environmental, social and health impacts. These assessments help us manage and reduce impacts on the environment and communities during construction, operation and, when relevant, decommissioning.

As a member of the Natural Capital Coalition, we also continue to follow and contribute to work on the evolving concept of natural capital – the value of nature to people, society, businesses, and the economy. This helps us to better understand its potential applications.

Read more about Shell and the environment.

### BIODIVERSITY

We seek to understand and respond to any potential impacts our activities may have on biodiversity or ecosystem services. This covers the benefits that people or businesses derive from ecosystems, such as food and clean water.

In our projects and operations, our primary aim is to avoid impacts on biodiversity and ecosystem services. Where avoidance is not possible we aim to minimise our impact. Where our operations have affected biodiversity and the communities who rely on biodiversity for their livelihoods, we take measures to help restore habitats or ecosystems. We look for opportunities to make a positive contribution to biodiversity conservation in the communities where we operate.

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To help us improve our environmental performance, including protecting biodiversity, we work with scientific and conservation organisations around the world. For example, at our Stones deep-water project in the Gulf of Mexico, we share deep-water data with marine scientists.

We develop biodiversity action plans when operating in areas that are rich in biodiversity, known as critical habitats, to assess and mitigate our impact on local biodiversity and dependent communities.

## BIODIVERSITY IN AUSTRALIA

In 2017, the Australian government approved a biodiversity offsetting plan from the Shell-operated QGC gas project which included protecting an area with a rich ecosystem.

QGC had acquired the Valkyrie property in 2015 as a biodiversity offset to compensate for clearing vegetation and habitat for the development of gas resources. It is located next to the Dipperu National Park and contains large areas of eucalyptus woodlands, endangered brigalow woodlands, semi-evergreen vine thickets, riparian vegetation and wetlands.



The Valkyrie property provides a refuge for fauna. It will help to regenerate endangered ecosystems and can be used for nature-based carbon storage and ecological research.

## WATER

The availability of fresh water is a growing challenge in some parts of the world. Increasing demand for water resources, growing community expectations, and water-related legislation might affect our ability to secure access to fresh water and to discharge water from our operations.

We design and operate our facilities to help reduce their fresh water use. We manage our water use carefully, and we tailor our use of fresh water to local conditions because water constraints affect people at the local or regional level.

In water-scarce areas, we develop water management plans for our facilities. These plans describe the long-term risks to water availability and define measures to minimise our use of fresh water or recommend alternatives to fresh water, such as recycled water, processed sewage water and desalinated water.

We work together with organisations, such as the World Business Council for Sustainable Development (WBCSD) and IPIECA, the global oil and gas industry association for environmental and social performance. For example, we contributed to WBCSD's publication and case studies on circular water management, published in 2017.



We manage our water use carefully, and we tailor our use of fresh water to local conditions because water constraints affect people at the local or regional level.

## WATER RECYCLING IN TEXAS

Shell has taken steps to improve water recycling in one area of the Permian shale asset in west Texas, USA. Previously, we transported groundwater used for hydraulic fracturing through a 21 kilometre pipeline due to limited local water supply in this area. Since late 2016, we have replaced about 40% (or around 0.37 million m<sup>3</sup>) of this water by recycling produced water near a new development area. Permian now reuses produced water sourced from three saltwater disposal facilities.

## WATER MANAGEMENT

We develop technologies to treat, reuse and recycle water from our operations so that we can manage our water footprint in a responsible way while meeting environmental standards.

Where appropriate, we look for ways to treat water from our operations using natural solutions such as constructed wetlands. At our research and technology centre in Doha, Qatar, we run a pilot programme to evaluate the effectiveness of constructed wetlands in removing various chemical components found in the gas field waste water. Tests over the past two years have shown the technology is feasible and we are now testing other waste-water streams for treatment.

At the Petroleum Development Oman (PDO, Shell interest 34%) joint venture operations in the Omani desert, the Nimr reed beds are used to naturally clean the water that is extracted alongside oil production. PDO is also investigating the potential of using some of the water to irrigate crops that are tolerant to high levels of dissolved salt.

Read about our fresh water use in 2017 in the Environmental performance section.

Read more about Shell and water.

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## MANAGING WASTE

We aim to reduce the amount of waste we generate and to reuse or recycle materials, wherever possible. For example, in 2017, seven of our downstream manufacturing sites sent more than 50% of their waste generated during the year for recycling or reuse. Of these seven, four sites sent more than 80% of their waste for recycling and reuse.

We determine if waste is hazardous to ensure it is managed properly. In Tunisia, we addressed a

long-standing challenge to responsibly dispose of a significant volume of solid sulphur waste that we had stored on site due to the lack of disposal facilities for this waste in North Africa that met international standards. After studying potential disposal options, we transferred the solid sulphur to an international standard disposal facility in Norway for final disposal.

Read more about Shell and managing waste

## RECYCLING MANUFACTURING WASTE IN THE USA

In Michigan, USA, where we make catalysts for refineries and chemical plants, we now recycle waste from the manufacturing site by sending it to a local company for use in the production of cement. We previously sent the waste to a landfill but it now forms

a component to make clinker, an ingredient in the process of making Portland cement. The initiative has significantly reduced our volume of waste and reduced costs.

## SOIL AND GROUNDWATER

We assess and carefully manage the risks of potential soil and groundwater contamination. We also conduct scientific research on the risks of contamination from petroleum activities and share our findings with government agencies to support the development of environmental guidelines.

In China, for example, local and national environmental regulations are emerging in response to rapid urbanisation and the government's aim to return significant portions of contaminated land to productive use. In 2017, we shared our expertise in managing land contaminated by oil and gas activity to help Chinese regulators and research institutes develop comprehensive sustainable, risk-based approaches.

## PRODUCT STEWARDSHIP

Product stewardship at Shell means protecting employees, customers, communities and the environment from potential hazards caused by our products when they are manufactured and used.

We work to understand and communicate the potential health, safety and environmental impacts of the products Shell makes to ensure they are managed responsibly throughout their life cycle, from production to final disposal or reuse.

We ensure this by:

- checking the safety of all our products and assessing their potential harmful effects;
- assessing how suitable the products are for each market;
- communicating the hazards and risks of our products; and
- complying with applicable regulations.

Before we decide to sell a product in a new market, we assess the risks of using it in a new way, and the applicable regulatory requirements. This enables us to manage the risks posed by a product, and even to selectively choose whether to participate in certain market end-uses based on those risks.

We communicate the potential hazards associated with products through product labelling and safety data sheets. These documents explain how to safely manage the products.

We also monitor changing regulations in countries where we manufacture, sell or import products.

Here you can access our safety data sheets.

You can also read more about our product stewardship, as well as understand our commitment to animal welfare in relation to product safety testing in our annual reports.

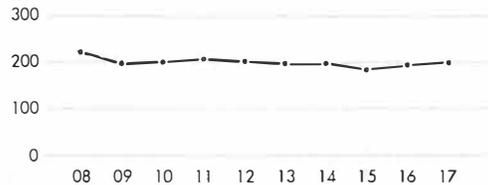
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## ENVIRONMENTAL PERFORMANCE

We improved or maintained our environmental performance across many business areas during 2017. This was due to operational improvements as well as reduced activities at some of our facilities and divestments. Details about our environmental performance are provided below and in the Greenhouse gas emissions, Managing methane emissions and Flaring sections.

### Fresh water withdrawn

million cubic metres

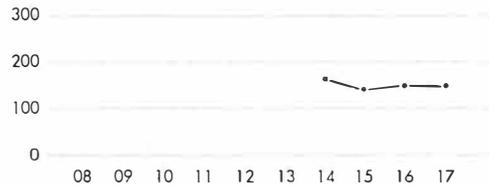


## MANAGING WATER USE

In 2017, our intake of fresh water was 201 million cubic metres, about the same as 2016. Around 80% of our fresh water consumption was used for manufacturing oil products and chemicals, with the balance mainly consumed in oil and gas production. Around 40% of fresh-water intake was from public utilities such as municipal water supplies.

### Fresh water consumed

million cubic metres



## SPILLS

Shell has clear requirements and procedures in place to prevent operational spills. We have routine programmes to maintain our facilities and pipelines, and improve their reliability, in order to reduce operational spills. However, spills still occur for reasons such as operational failure, accidents or unusual corrosion.

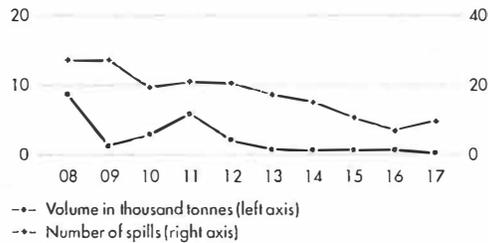
The volume of operational spills of oil and oil products in 2017 was 0.3 thousand tonnes, a decrease of around 60% from 2016. The number of operational spills increased to 99 from 72 in 2016. We have programmes in place to improve the long-term trend for the number of operational spills (See 10-year data table).

The number of spills caused by sabotage and theft increased to 62 from 49 in 2016. The volume of these spills decreased to 1.4 thousand tonnes in 2017 from 3.9 thousand tonnes in 2016. Sabotage and oil theft remained a significant cause of spills in the Niger Delta, Nigeria.

In 2017, we also recorded four spills of 0.3 thousand tonnes in total caused by the hurricane Harvey in the USA.

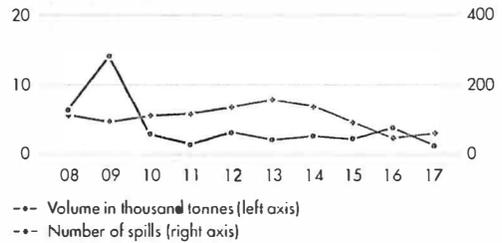
We investigate and learn from all spills to improve our performance and we clean up the areas around our operations that are affected by spills, irrespective of the cause. As of the end of March 2018, there were 3 spills under investigation in Nigeria that may result in adjustments to our figures.

### Spills – operational [A]



[A] Over 100 kilograms.

### Spills – sabotage [A]



[A] Sabotage and theft-related spills over 100 kilograms.

## ENERGY EFFICIENCY

Improving the energy efficiency of the facilities we operate is one of the ways we manage our greenhouse gas (GHG) emissions. The main metric is energy intensity, the amount of energy consumed for every unit of output.

Shell-operated facilities and proposed projects that generate more than 50,000 tonnes of GHG emissions a year are required to produce a GHG and energy management plan with annual updates.

These plans must include the sources of GHG emissions, as well as a forecast of expected emissions at the site for

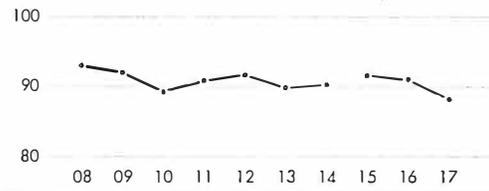
at least 10 years, and must identify options for improving energy efficiency or reducing emissions.

Some of the ways Shell improved energy efficiency include making our equipment more reliable through regular maintenance, by smart scheduling of maintenance activities or by installing more energy-efficient equipment.

The overall energy intensity index of our chemical plants and refineries in 2017 was similar to the year before: our chemical plants improved to 88.2 in 2017, from 91.0 in 2016 and our refineries improved to 94.8 in 2017 from 95.4 in 2016.

## Energy intensity – chemical plants

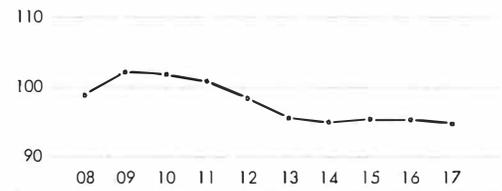
chemicals energy index [A]



[A] CEI calculation methodology changed in 2015; therefore, data for prior years are not directly comparable.

## Energy intensity – refineries

refinery energy index [A]



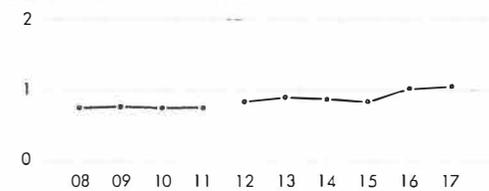
[A] Indexed to 2002; based on 2006 Solomon EITM methodology.

We aim to achieve superior energy-efficiency performance at our 17 operated refineries and chemicals plants and each site has a CO<sub>2</sub> and energy-management plan. We invest in combined heat and power units and implement heat integration and waste gas recovery systems. We exchange steam turbine drives with electrical motors and replace end-of-life equipment with higher-efficiency types. We have incorporated top-quartile energy-efficiency technology into the design of our new-build chemicals plant in Pennsylvania, USA.

In 2017, the overall energy intensity for the production of oil and gas in our Upstream and Integrated Gas businesses (excluding liquefied natural gas and gas-to-liquids) increased slightly compared with 2016, mainly due to lower production from the NAM joint venture (Shell interest 50%) in the Netherlands. We expect it will be difficult to maintain the energy intensity levels of recent years, as existing fields age and new production comes from more energy-intensive sources. This may increase our upstream energy intensity over time.

## Energy intensity – upstream

(excluding Oil Sands, GTL and LNG)  
gigajoules/tonne production [A]



[A] 2012-2015 data are reported in accordance with IPECA/API/OGP guidance 2010.

## OTHER AIR EMISSIONS

We track emissions released into the atmosphere from our upstream and downstream facilities and work to reduce air pollution from our operations. This includes making investments to lower our emissions of nitrogen oxides, sulphur oxides and volatile organic compounds that are released during oil and gas production and processing. These pollutants can affect air quality in the areas where we operate. We evaluate and take action to mitigate potential adverse impacts of our emissions.

Our sulphur oxides emissions in 2017 remained relatively flat at 81 thousand tonnes compared with the previous year (83 thousand). A decrease in emissions due to divestment of Port Dickson refinery in Malaysia in 2016 was offset by higher emissions from the Bukom site in Singapore.

Our nitrogen oxides emissions decreased from 122 thousand tonnes in 2016 to 107 thousand tonnes in 2017. The decrease was mainly due to the change in oil sands mining reporting boundary and changes in calculation methodologies at some of our facilities (for example in Australia to align with regulatory methodologies).

Our emissions of volatile organic compounds (VOCs) decreased to 95 thousand tonnes in 2017 compared with 146 thousand tonnes in 2016. This was mostly due to a decrease of venting at our facilities in Majnoon, Iraq. We expect our VOC emissions to further decrease in the coming years as a result of our efforts to reduce flaring and venting.

## Emissions and flaring

We track emissions released by our facilities and work to reduce air pollution from our operations. We have technologies and work practices in place to help find and address unintended emissions in our operations and we also implement reduction programmes.

### GREENHOUSE GAS EMISSIONS

Shell tracks emissions released by our upstream and downstream facilities and works to reduce air pollution from our operations.

We report our greenhouse gas (GHG) emissions in line with the recommendations of the Intergovernmental Panel on Climate Change. Shell's Health, Safety, Security, Environment and Social Performance (HSSE&SP) Control Framework defines standards and accountabilities at each

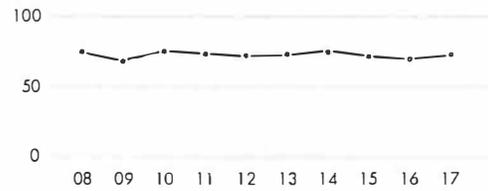
level of the organisation, and sets out the procedures people are required to follow. For example, our environmental standards include the requirement that all Shell-operated facilities that generate more than 50,000 tonnes of GHG emissions have GHG and energy management plans.

### OUR PERFORMANCE

Our direct GHG emissions increased from 70 million tonnes carbon dioxide (CO<sub>2</sub>-equivalent) in 2016 to 73 million tonnes CO<sub>2</sub>-equivalent in 2017. Our 2016 base year GHG emissions did not change by more than 5% in 2017 and therefore the base year has not been recalculated.

## Direct greenhouse gas emissions

million tonnes CO<sub>2</sub> equivalent



The main reasons for the overall increase in our GHG emissions were the inclusion in our data from May 2017 of the facility previously operated by the Motiva joint venture in the USA and the return to production of previously shut-down units at the Bukom site in Singapore. These increases were partly offset by divestments (for example in Canada, Gabon, Malaysia and the UK) and reduced production at our Pearl gas-to-liquids (GTL) plant in Qatar.

In 2017, around 50% of our direct GHG emissions came from our refineries and chemical plants. The production of oil, gas and GTL products accounted for around 45% of our GHG emissions, and our shipping activities accounted for around 2%. We continue to work on improving operational performance and energy efficiency to manage GHG emissions.

The indirect GHG emissions associated with the generation of the energy we purchased (from electricity, heat and steam) were 12 million tonnes on a CO<sub>2</sub> equivalent basis in 2017 compared with 11 million tonnes CO<sub>2</sub> equivalent in 2016. The increase is mainly due to the inclusion of former Motiva refineries and a rise in production at our QGC facilities in Australia. These emissions were calculated using a market-based approach, as defined by the World Resources Institute GHG Protocol.

We estimate that the CO<sub>2</sub> emissions from the use of our refinery and natural gas products by others were around 579 million tonnes in 2017, which represents less than 2% of the world's emissions.

(See more on [www.shell.com/ghg](http://www.shell.com/ghg))

## GHG movements from 2016 to 2017 [A]

million tonnes CO<sub>2</sub> equivalent



[A] Direct and energy indirect greenhouse gas emissions. Numbers have been rounded so some totals may not agree exactly.

[B] Does not include 1 million tonnes of CO<sub>2</sub> captured and sequestered by our Quest CCS project in Canada in 2017.

## MANAGING METHANE EMISSIONS

Methane is a more potent GHG than CO<sub>2</sub>. It has 34 times the global warming potential of CO<sub>2</sub> over a 100-year time frame, according to the UN Intergovernmental Panel on Climate Change Fifth Assessment Report.

We have a range of technologies and work practices in place to help find and address unintended – or fugitive – methane emissions in our operations. We also implement energy-efficiency measures, as well as flaring and venting reduction programmes. Our Methane Fact Sheet provides a comprehensive account of our voluntary initiatives to reduce methane emissions. Actions to further reduce our emissions will continue to be a focus in coming years.

### HIGHLIGHTS IN 2017

- We joined the Oil and Gas Methane Partnership, a global voluntary methane emissions reduction programme under the Climate and Clean Air Coalition.
- We launched our latest methane detector pilot at our oil and gas exploration asset in Alberta, Canada.
- Shell and seven energy companies agreed to guiding principles to further reduce methane emissions from their natural gas assets.

In our onshore unconventional operations, we regularly use leak detection and repair (LDAR) programmes, which have infrared cameras to help identify fugitive leaks. We use LDAR in Australia, Canada, the Netherlands, Trinidad and Tobago, Tunisia and the USA, among others, and will continue to extend this approach across our operations.

## COLLABORATING ON EMISSIONS REDUCTION

In January 2017, we joined the Climate and Clean Air Coalition Oil & Gas Methane Partnership, which brings together industry, governments and non-governmental organisations to improve understanding of methane emissions and work to reduce them. Later in the year, we submitted a detailed plan of our operations that will initially participate in the partnership.

As a member of the Oil and Gas Climate Initiative (OGCI), we are working with experts to improve methane data collection and our understanding of the natural gas life cycle. Shell is working with governments, the oil and gas sector and regulators, to manage methane emissions effectively. We advocate government policies that will support the reduction of methane emissions across all sectors of the economy.

In October 2017, OGCI members committed to a range of measures including establishing a methodology to improve the collection, verification and reporting of methane emission data in 2018. We actively test new technologies in this area through our membership of OGCI Climate Investments. This collaboration, launched in 2016, will invest \$1 billion over 10 years in low-carbon technologies.

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Shell is working with industry, as well as international institutions, non-governmental organisations and academia, to make progress on improving methane management. In November 2017, Shell and seven energy companies signed guiding principles for reducing methane emissions across the natural gas value chain, from production to the final consumer.

In December 2017, Shell joined the Environmental Partnership in the USA, which requires companies to apply voluntary methane reduction measures in areas such as leak detection and the repair, replacement or upgrade of equipment. The partnership was developed by American Petroleum Institute (API) and includes 25 of its members — companies that account for around a quarter of gas production in the USA. Non-API members can also sign up to the partnership.

We have participated in the EPA Natural Gas STAR programme for many years. This programme encourages oil and gas companies to adopt technologies and practices that reduce methane emissions.

We also collaborate on research with Eurogas, the association representing the European gas industry, and the Natural and bio Gas Vehicle Association, on methane emissions in the gas supply chain in Europe.

## Rocky Mountain House pilot

In June 2017, Shell launched a methane detector pilot at our Rocky Mountain House project in Canada. The pilot is part of the Methane Detectors Challenge, which is a collaboration between the Environmental Defense Fund, oil and gas companies, US-based technology developers and other experts.

## OUR PERFORMANCE

In 2017, our total methane emissions were 123 thousand tonnes. Methane emissions contributed less than 5% of Shell's GHG emissions on a CO<sub>2</sub>-equivalent basis. More than 60% of our reported methane emissions in 2017 came from flaring and venting in our upstream and midstream operations.

We report our methane emissions in accordance with applicable regulations and industry standards. We also engage in industrywide work on developing more accurate reporting methods, such as through IPIECA, the global oil and gas industry association for environmental and social issues.



We have installed methane detection technology at our unconventional gas project near Rocky Mountain House, Canada.

## FLARING

The flaring of natural gas wastes valuable resources and contributes to climate change. We are working hard to reduce flaring associated with oil and gas production.

When oil is extracted from a reservoir, gas is also produced as the oil is brought to the surface. This is known as associated gas. This gas can be captured and used alongside the oil. When there are no facilities to gather the gas, or they have insufficient capacity, it is sometimes flared, or burned off. Flaring is also carried out for safety reasons to relieve pressure in the production system.

Shell's policy is to reduce any routine flaring or venting of associated gas at our operations to a level as low as technically and economically feasible. We also aim to minimise operational flaring required for safety reasons such as during the start-up of a new facility. Our flaring policy is set out in our Health, Safety, Security, Environment and Social Performance (HSE&SP) Control Framework. It includes the requirement that all facilities must be designed to export, use or reinject associated gas and that all facilities have to meet strict performance criteria.

Shell has been an active member of the World Bank-sponsored Global Gas Flaring Reduction partnership since 2002. This public-private partnership helps reduce flaring by working collaboratively to find alternative uses for gas that would otherwise be flared. As part of the partnership, the World Bank has developed the Zero Routine Flaring by 2030 initiative, which Shell signed in 2015. This encourages governments, companies and development organisations to work together to end flaring. The initiative aims to identify ways to use gas from oil production — for example, to generate electricity for local communities.

## OUR PERFORMANCE

Flaring of gas in our Upstream and Integrated Gas businesses contributed around 11% of our overall direct GHG emissions in 2017. Almost half of this flaring took place at facilities where there was no infrastructure to capture the associated gas.

Close to 80% of flaring from Shell-operated assets in 2017 occurred in Iraq, Nigeria, Malaysia and Qatar. Our flaring increased by slightly less than 10% from 7.6 million tonnes in 2016 to 8.2 million tonnes in 2017. This was primarily a result of increased production in Nigeria following the return to production of fields previously closed due to security issues. Work continues to bring additional gas gathering facilities online in Nigeria to reach our goal of no routine flaring by 2030.

In Iraq, the Majnoon facilities (Shell interest 45%) captured about 44% of associated gas that otherwise would have been flared in 2017. The gas was exported to a local power plant for electricity generation.

Basrah Gas Company (BGC, Shell interest 44%) is a non-operated joint venture with Iraq's South Gas Company and Japan's Mitsubishi. It captures gas that would otherwise be flared from three non-Shell-operated oil fields in southern Iraq (Rumaila, West Qurna 1 and Zubair) for use in the domestic market. In 2017, BGC processed an average of 676 million standard cubic feet of gas each day from these fields to produce electricity.

These projects are helping to improve the power infrastructure of the country and deliver much-needed energy to the population. They involve collaboration with the Iraqi government, joint-venture partners, domestic companies and non-governmental organisations.

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## Nigeria

In Nigeria, flaring from Shell Petroleum Development Company's (SPDC) joint-venture (Shell interest 30%) facilities fell by close to 90% between the start of the programme in 2002 and 2017. This reduction was mainly due to investing in associated gas gathering and processing facilities that capture the associated gas and commercialise it for either the domestic or export market. Divestments also resulted in a further reduction. However, flaring intensity levels from SPDC JV facilities increased in 2017, mainly due to the restart of facilities that were off-line in 2016.

SPDC supports the elimination of routine flaring as quickly as practical. However, to do so requires significant investment in gas-gathering and processing facilities or the stoppage of associated oil production which generates revenue for the Nigerian economy. Several new gas-gathering projects came on stream at the end of 2017 however, the planned start-up dates for two gas-gathering projects have historically been delayed due to a lack of adequate joint-venture funding. Nevertheless, with funding now restored the projects are planned for completion in 2018-19.

## Malaysia

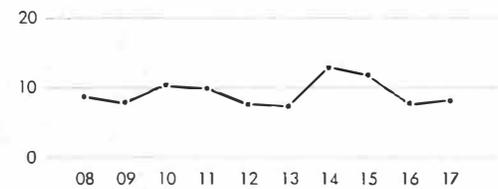
In Malaysia, associated gas flaring at the Gumusut (Shell interest 29%) and Kikeh fields was eliminated by introducing a system in 2016 that injects gas back into the hydrocarbon reservoir. In 2017, the system worked as expected and production from the oil field was maximised.

## Qatar

In Qatar, at our Pearl gas-to-liquids plant (Shell interest 100%), flaring takes place for operational reasons. In 2017, further enhancements to the plant were made to reuse more waste gas. (See Natural gas).

## Flaring - upstream

million tonnes CO<sub>2</sub> equivalent [A]



[A] includes Upstream and Integrated Gas

## Safety

We work to deliver energy responsibly and safely, while looking after our employees, contractors, local communities and the environment. We strive to help improve safety performance throughout the energy industry.

### HIGHLIGHTS IN 2017

- Following work by a Shell led task force, the International Association of Oil & Gas Producers published recommended practices for addressing safety risks at fabrication sites, which have now been adopted for all Shell projects.
- We recorded the lowest-ever injuries per million working hours – the total recordable case frequency.
- We also achieved the lowest-ever level of injuries that led to time off work, measured as lost time injury frequency.

We work to build a strong safety culture and leadership within Shell. Our Goal Zero ambition is to achieve no harm and no leaks across our operations. To accomplish this, we focus on the three highest-risk areas of safety in our activities: personal, process and transport.

Employees and contractors, wherever they work, must meet our safety standards and requirements, including following our 12 Life-Saving Rules. We strive to reduce risks as far as is technically and financially feasible, and to minimise the potential impact of any incident. These standards also apply to any joint ventures we operate. We work with our contractors to ensure they understand our safety requirements and we help them build skills and expertise to improve their safety performance where needed.

We investigate all incidents and aim to learn from them. Since 2014, around 100,000 employees and contractors have taken part in learning sessions. The sessions focus on how an incident with a potential safety risk could have been prevented and teach participants how to apply the lessons learned in their line of work.

Read more about Shell and safety

### PERSONAL SAFETY

Everyone who works for us, or with us, has an important part to play in making Shell a safer place. We aim for a safety culture that goes beyond compliance to one where people feel listened to and cared for and comfortable raising concerns.

We run an annual safety day that gives our employees and contractors the opportunity to learn how they can manage the safety hazards in their work and share ideas with each other. Conversations in 2017 focused on the three themes of care, dilemmas and avoiding becoming complacent about everyday risks.

### PROCESS SAFETY

Process safety management is about keeping our hazardous substances in pipes, tanks and vessels so they do not cause harm to people or the environment. It starts with designing and building projects and is implemented throughout the life cycle of these facilities to ensure they are operated safely, well-maintained and regularly inspected.

Read about our process safety performance in 2017.

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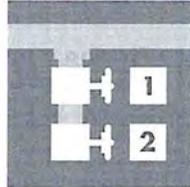
## PROCESS SAFETY FUNDAMENTALS

In 2017, we launched a set of fundamental rules for process safety tasks to enable employees to prevent the release of hazardous materials. These rules help us carry out tasks that are critical for operating safely.

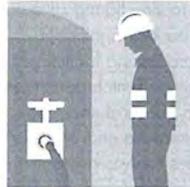
They are based on the process safety operating practices rolled out across our manufacturing business in 2016. By the end of 2017, the number of process safety events related to operational integrity in this business fell by around 30%.

### 10 process safety fundamentals

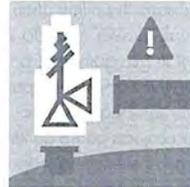
Always use two barriers for hydrocarbon and chemical drains and vents



Do not leave an open drain or critical transfer unattended



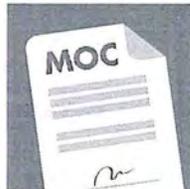
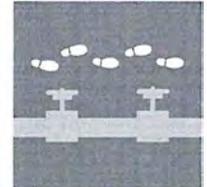
Take interim mitigating measures in case of failure of Safety Critical Equipment



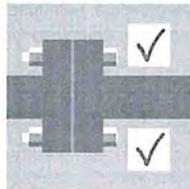
For all defined high-risk activities, follow the procedures and sign off after each step



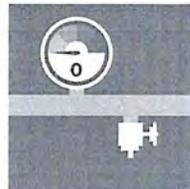
Walk the Line – Verify and validate any line up change



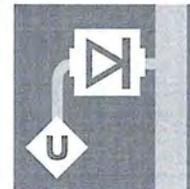
Do not make a change without a proper Management of Change



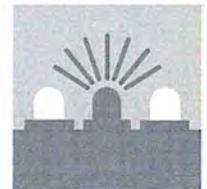
Verify for complete tightness after maintenance work



Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work



Perform Management of Change and install backflow protection when connecting utilities to process



Respond to critical alarms

## TRANSPORT SAFETY

Moving large numbers of people, products and equipment by road, rail, sea and air brings safety risks with it. We work closely with specialist contractors and industry bodies to reduce risks.

We have taken proactive steps to improve safety in shipping, for example, working with our global shipping and maritime partners on a programme to improve the quality and consistency of their safety management and on tools to help learn from incidents. In 2017, we carried out around 400 vessel visits to engage mariners on safety and to understand how to implement the programme better in future.

Road traffic accidents claim around 1.25 million lives every year, according to the World Health Organization. Shell employees and contractors drive a combined distance of around 650 million km each year in more than 70 countries. We run road safety programmes, such as our mandatory defensive driving course, which teaches safe techniques and behaviour.

We require everyone driving more than 7,500 km a year on company business and those who drive in high-risk countries to take the in-vehicle defensive driving course. In 2017, 2,900 people completed the course.

Outside our operations, we also work to improve road safety in several communities and countries where we operate.

Our performance indicators report on personal and process safety in line with industry standards. Outside our reporting scope and therefore not reflected in these indicators is a devastating road-tanker incident that occurred in Pakistan in June 2017. A tanker, operated by a contractor, was transporting fuel from the Shell Pakistan Limited oil terminal in Karachi to Vehari when it overturned in the central Punjab province resulting in a fuel spill. Following the accident, people from a nearby village approached the site to collect the fuel spilling from the tanker. Tragically, the fuel ignited and more than 200 people died and more were injured. Shell Pakistan Limited is implementing a long-term relief plan for those impacted.

[Read about our transport safety performance.](#)

## ROAD SAFETY IN MYANMAR

In Myanmar, Shell helped launch a road safety campaign in 2017 to educate drivers and the communities along the Yangon-Naypyidaw highway, a road known for its high accident rate. We ran this in partnership with the Myanmar Red Cross Society and the Global Road Safety Partnership.

The programme also teaches children and adults about safe road use, as many drive motorbikes or are pedestrians along the high-speed expressway. More than 6,000 people participated in the workshops in 11 villages. We also launched a nationwide online awareness campaign.

## ROAD SAFETY IN THE PERMIAN BASIN

We have taken proactive steps to improve road safety around the Permian Basin, in Texas, USA, where we have significant shale acreage. Rising oil and gas production activity in recent years has led to increased traffic and more serious accidents and fatalities. In 2015, around 200 people were killed in road accidents in 15 counties, accounting for around 33% of all fatalities reported in Texas.

In June 2015, Shell led the formation of the multi-stakeholder Permian Road Safety Coalition. The coalition has worked to improve road infrastructure and best practice on road safety for oil and gas companies operating in the area. It has also called for funding from local and state governments and rolled out an annual public education and awareness campaign. In 2016, 118 people were killed in road traffic accidents across the 15 counties.

## EMERGENCY PREPAREDNESS AND RESPONSE

We make sure that we have the necessary resources to deal with spills, leaks, fires and explosions. We regularly test our oil-spill and emergency response procedures and capability to ensure employees and contractors can respond rapidly to an incident.

In 2017, we trained around 2,000 employees in six large-scale exercises to test different response scenarios to potential oil spills at refineries, offshore wells and vessels. All the exercises involve our emergency response contractors and the local authorities. One simulation exercise in The Hague, the Netherlands, for example, focused on a large marine oil spill. Part of the emergency response for the 200 trainees involved mobilising deep-water equipment to cap the leaking well and then collect the oil in a vessel.

During drilling operations, we gather and analyse information about wells to better understand the geology of the area. Pressure and temperature sensors track conditions in real time so that we can immediately detect any changes. Shell-operated drilling activities are monitored from a global network of onshore operating centres which allows oversight and timely technical support.

## Internal voice: "We pooled the industry's best technology and ideas to improve well safety"

The Subsea Well Response Project is a unique group of nine oil and gas companies that came together following the BP Macondo incident in 2010 to prevent any occurrence of this kind happening again. It has pooled the best technologies, ideas and plans from all the companies involved. In 2017, we saw the culmination of these efforts with the delivery of a new set of containment hardware called Offset Installation Equipment.

One of the challenges we faced was that as a group of nine companies, we were not all aligned on how much effort would be required. We broke the process down into smaller steps, first agreeing to invest in capping stacks, which created time and space to work on the feasibility for a containment solution that could be supported by all the companies. As containment reached its investment decision, we continued working in parallel to mature a solution to cap shallow water wells: the Offset Installation Equipment.

I am very proud of what the project achieved, but there is still a significant responsibility on everyone involved to use this equipment properly to prevent future incidents.



**Arne Kalle**  
Subsea Well Response Finance Manager, Stavanger, Norway

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## HURRICANE HARVEY EMERGENCY RESPONSE

In August 2017, Hurricane Harvey forced Shell to safely shut down the Shell Deer Park manufacturing complex, shut in deep water Gulf of Mexico facilities and temporarily close the Houston Lubricants plant. Many pipelines were down or had reduced feeds and several facilities in the region suffered supply issues. It was critical to get Shell facilities safely back online and to supply our customers.

We sent response teams to remote locations to provide much-needed support to staff and residents in the region. Among several other contributions made by Shell and staff, we donated \$1 million to the Hurricane Harvey disaster relief fund of the American Red Cross and provided office space for people involved in the response.

## RAISING INDUSTRY STANDARDS

We share our safety experience and standards with other operators, contractors and professional organisations, including the International Association of Oil & Gas Producers (IOGP).

In 2017, IOGP published recommended practices for addressing safety risks at fabrication sites. Shell led the task force within the IOGP which developed these recommended practices and is now working on a set of enabling activities and a resource library to support their implementation. From June 2017, we adopted recommended practices at all Shell projects.

In 2017, together with several South Korean shipyards, we developed a set of common safety practices that are being implemented at all fabrication yards in the country.

Shell's Prelude floating liquefied natural gas facility and the Appomattox hull, our deep-water development in the Gulf of Mexico, were both built in South Korea.

## APPOMATTOX

The Appomattox development is a cornerstone of our global deep-water strategy. The hull was completed and arrived in Texas, USA in 2017. Construction of the host platform and fabrication of undersea infrastructure is now under way and Appomattox is on track for first oil by the end of the decade.

Appomattox is one of Shell's first major projects to implement construction site safety standards, a predecessor to the IOGP's recommended safety practices for fabrication site construction. These standards are being applied by all of Appomattox's major fabrication and installation contractors. They address key construction safety hazards such as dropped objects, working at height, lifting and hoisting, and confined space entry. They also provide a framework of activities for health, safety, security and environment leadership, care for the workforce, training, and upfront planning.



The Appomattox project hull is prepared for its journey from Geogje, South Korea to Ingleside, Texas, USA, to complete the semi-submersible host platform's construction.

Shell will also deploy an advanced well-capping stack for Appomattox, allowing us to quickly shut-down operations in the unlikely event of a spill.

## WORKING WITH OUR CONTRACTORS

We work with our contractors to ensure they understand our safety requirements and together we build skills and expertise to improve safety performance.

Since 2014, executives from Shell have partnered with chief executive officers of major contractor partners to identify strategies and practical steps to improve the safety culture and achieve our Goal Zero ambition of no harm and no leaks, including driving standardisation together. The initiative now includes 18 contracting companies.

## SHARING OUR RESILIENCE PROGRAMME

Resilience is about working through difficult experiences and having the ability to bounce back quickly.

Our contractor partners Subsea 7 and Heerema Marine Contractors, together with four other engineering and construction firms, have developed a series of training videos on resilience for offshore crews based on Shell's resilience programme. The

International Marine Contractors Association is now adopting the approach and making it available to all contractor members from 2018.

Our programme improves not only employee resilience, but employee engagement as well. Shell data show a correlation between engagement and safety performance: a 1% increase in engagement can result in a 4% improvement in safety performance.

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## SECURITY

Managing security risks is part of our effort to protect our staff, contractors, nearby communities and the environment.

In line with our goal of no harm to people, we carefully assess the security threats and risks to our operations. We work with governments and partners to safeguard our facilities and projects and provide a secure working environment for our employees and contractors. Shell only uses armed security in countries where the threats are most severe, or if it is a requirement under local laws.

## SECURITY AND HUMAN RIGHTS

We continuously work to maintain the safety, security and human rights of our employees, contract staff, and local communities. The Voluntary Principles on Security and Human Rights (VPSHR) are implemented across Shell operations where there are identified threats of infraction. Shell continues to play an active role in the Voluntary Principles Initiative (VPI), and in 2017 was the chair of the Corporate Pillar, and a member of the steering committee, working with other partners on the initiative to advance security and human rights implementation.

As part of our internal implementation efforts, we include VPSHR clauses in our private security contracts and raise the principles in our engagements with public security forces. We carry out annual risk assessments and develop plans to manage the identified risks. In Tunisia, for example, we trained private security providers on VPSHR and human rights. In Nigeria, we continued to work with a third-party human rights institute to deliver human rights training to our operational teams. For more details on our implementation, please see our VPSHR report.

## SAFETY PERFORMANCE

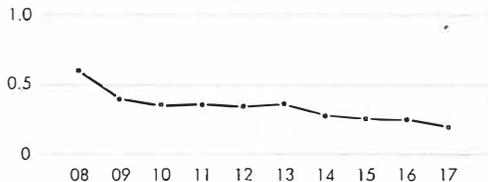
### PERSONAL SAFETY

In 2017, following steady and significant improvements in our safety performance over the past decade, the number of injuries per million working hours – the total recordable case frequency – further improved compared with 2016 and was the lowest ever. We also achieved our lowest ever level of injuries that led to time off work in 2017, measured as last time injury frequency.

Our fatal accident rate – the number of fatalities per 100 million working hours – decreased in 2017 to the lowest ever level, but we still need to do more in this area. Regrettably, two people lost their lives while working for Shell in 2017.

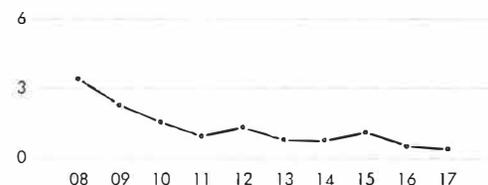
### Lost time injury frequency (LTIF)

injuries per million working hours



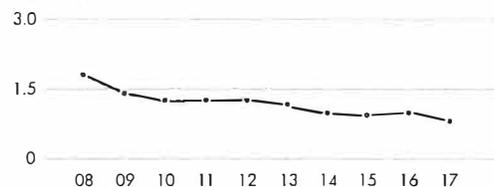
### Fatal accident rate (FAR)

fatalities per 100 million working hours



### Total recordable case frequency (TRCF)

injuries per million working hours



### Process safety

In line with industry standards, we measure and report according to the significance of the incidents, with Tier 1 as the most significant. In 2017, our process safety performance deteriorated. The number of Tier 1 and 2 operational process safety events increased from 146 to 166, of which 49 were Tier 1 and 117 were Tier 2.

In 2017, the most significant operational incidents were fires at our Enchilada offshore platform in the USA and Pulau Bukom manufacturing site in Singapore. All businesses are working hard to return to the positive trend of previous years.

Process safety events related to sabotage and theft in Nigeria are recorded separately. There was an improvement during 2017 with fewer incidents: 9 Tier 1 and 0 Tier 2 events, compared to 20 Tier 1 and 0 Tier 2 in 2016.

### Transport and road safety

We sadly recorded one road fatality in 2017, when one of our contractors was fatally injured in an accident while driving between sites in the Gold Creek area in Canada.

Social Performance plays a key role in delivering Shell's business strategy at the community level. Building strong relationships with people, understanding their priorities and concerns and managing our impact on them are essential to being a responsible company.

### HIGHLIGHTS IN 2017

- We made significant progress towards completing the resettlement of families in the village of Berezovka in Kazakhstan.
- We registered archaeological finds with the Iraqi government in our role as the operator of the Majnoon oil and gas field, a site of rich cultural heritage.

Our projects and operations can impact our neighbours. Our social performance team, working with environmental specialists, assesses and manages the impact of Shell's business to ensure that work is carried out in a responsible way. The team also contributes to building skills in the communities where we operate by supporting education and training programmes, and by encouraging the development of local businesses.

We apply local laws and the principles of international law in our work. Shell's Control Framework uses international standards as benchmark, such as those set out by the International Finance Corporation.

We assess and manage the potential social impact of our projects as part of integrated environmental, social and health impact assessments. Our engagement is essential to identifying how we might impact people and to helping us design and apply impact monitoring and mitigation measures.

In Alberta, Canada, at the Shell Scotford complex, we consult local people who may be affected by our activities and find ways to address their specific issues. For example, in 2017 the Scotford team discussed with a local farmer how to minimise unwanted snow melt and rainwater that were running off a Shell well pad at our carbon capture facility. These discussions led to a project that will divert the water and ensure the landowner's crops do not get waterlogged.

At the end of a project's life cycle, we take great care with decommissioning. In 2017, after we decided to exit the Jinqiu tight gas exploration project in Sichuan province, China, we worked closely with local farmers to ensure that drill sites were restored to productive arable use, and we used recycled project materials to pave a local road and build irrigation systems for eight communities.

### COMMUNITY FEEDBACK IN 2017

Shell's network of around 100 community liaison officers act as a bridge between the local community and the project or asset. We have implemented community feedback mechanisms at all of our operations and projects to receive, track and respond to questions and complaints from community members. This enables us to capture and resolve concerns quickly in a transparent way, and to track our performance.

### Types of complaints received in 2017 Split by category



- a Social
- b Environment
- c Health
- d Safety
- e Security
- f Business integrity, contractual and commercial, unrelated to Shell
- g Other

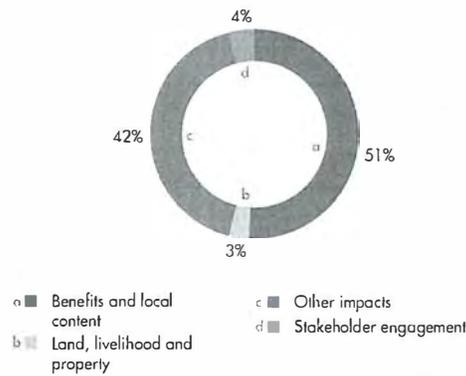
Several of our exploration locations off the coast of Colombia include Afrodescendants and Wayuu and Arahucos indigenous groups whose main livelihood is fishing using traditional methods. We identified them as vulnerable communities and recognised that we could impact their way of life or that they could impact our operations.

We have worked to better understand the cultural norms and socio-economic needs of the region, with three Shell employees staying with communities over the last five years.

The fishermen and women reported that they often lost colleagues at sea or were frequently injured in fishing trips. Together, we evaluated the causes and frequency of the accidents and identified ways to improve safety and prevent the most serious incidents. We also provided the communities with equipment, including GPS navigation, boats and motors. Overall, 800 people were involved in the programme. You can read more about our work with these communities on [www.shell.com](http://www.shell.com).

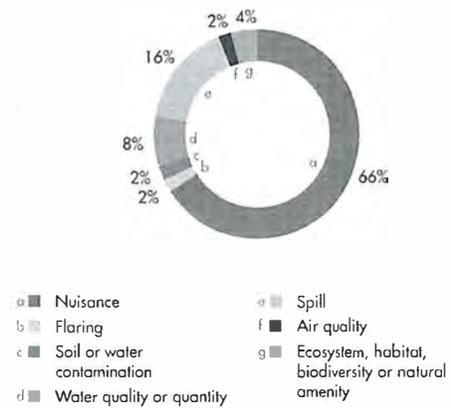
## Social complaints received in 2017

Split by category



## Environmental complaints received in 2017

Split by category



### RESETTLEMENT

Our operations sometimes require temporary or permanent access to areas of land or sea where people are living or working. Where resettlement is unavoidable, we work with local communities to help them relocate and maintain, or improve, their standard of living. If necessary, we help support them as they establish alternative livelihoods.

As a result of the BG acquisition, Shell became joint operator of Karachaganak Petroleum Operating BV (KPO, Shell interest 29.25%) in Kazakhstan. In 2015, the government approved an expansion of the safety perimeter around the Karachaganak field, which required two villages to relocate. Led by the regional government and funded by KPO, around 464 families from these villages were resettled in line with international best practice.

In late 2015, the first 82 families were successfully resettled. The second phase of resettlement was nearly completed by the end of 2017 and we are working with the government to ensure that the remaining 382 families in the village of Berezovka have comparable or better housing and that their livelihoods are restored. Read more about the resettlement and the positive impact it has had on local residents' lives.



We are working to ensure that resettled families in the village of Berezovka, Kazakhstan, have comparable or better housing and that their livelihoods are restored.

### INDIGENOUS PEOPLES

Our activities in certain parts of the world affect indigenous peoples who hold specific rights for the protection of their cultures, traditional ways of life and special connections to land and water.

Our approach is to continue seeking the support and agreement of indigenous peoples potentially affected by our projects. We do this through mutually agreed, transparent and culturally appropriate consultation and impact management processes. In 2016, Shell developed a public position statement on Free Prior Informed Consent (FPIC), which is based on a pre-requisite to engage in dialogue with local indigenous communities and come to a joint agreement on the way forward in project development. In 2017, we shared outcomes from our involvement with FPIC with the industry through IPIECA, the global oil and gas industry association for environmental and social issues, which enables us to refine how we apply FPIC in our operations.

In Bolivia, the government requires that a percentage of capital investment in the hydrocarbon sector be applied for the social benefit of indigenous and farming communities holding collective land rights. To fulfil this requirement, Shell implemented three social investment programmes after engaging with more than 50 local communities during a 2016 seismic campaign. These programmes involved bee keeping; improving fruit and vegetable production; and building a marketing platform for the communities' agricultural products. In 2017, the Bolivian national oil and gas company recognised Shell's programme as best practice.

We entered the second phase of exploration in the country, drilling the Jaguar exploration well in 2017. Building on the same methodology, together Shell and the local Weenhayek communities decided that the required social investment funds would be used to sustainably increase local agricultural production in communal lands surrounding the well for the duration of the project.

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## CULTURAL HERITAGE

Cultural heritage can be tangible, such as treasured artefacts, or intangible, such as language and traditions. Our specialists work to preserve cultural heritage near our operations.

In 2017, Shell was the operator of the Majnoon oil and gas field in Iraq, a site of rich cultural heritage due to its proximity to the area widely held to be the cradle of civilisation. Shell formally registered archaeological finds with the Ministry of Antiquities and handed over the artefacts to the Basrah Museum in 2017, leaving a positive legacy of valuable archaeological data and management practices. You can read more about our work to protect Majnoon's heritage on [www.shell.com](http://www.shell.com).

## SOCIAL INVESTMENT

We invest in community projects to help people to benefit from social and economic development. This investment is sometimes voluntary and sometimes required by governments, or as part of a contractual agreement. The intent of our social investment programmes is to benefit both Shell as well as society or the environment. Areas on which social investment programmes are focused are determined by local community needs and priorities.

We aim to deliver business growth and have a positive impact on people. To help us achieve this we have three global social investment themes:

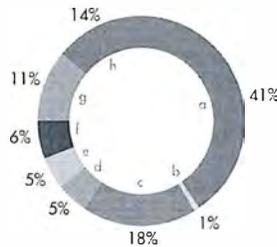
- access to energy;
- science technology engineering and mathematics (STEM) education; and
- community skills and enterprise development.

In 2017, we spent \$189 million on social investment of which 41% was required by government regulations or contractual agreements. We spent \$111 million on voluntary social investment, of which around \$57 million was in line with our global themes. The remaining \$54 million was spent on local programmes for community development, disaster relief, education, road safety, health and biodiversity.

Almost \$107 million of our total social investment spend in 2017 was in countries that are part of the United Nations Development Programme's Human Development Index 2016. These countries have a gross domestic product of less than \$15,000 a year per person. Significant support is also provided in the form of voluntary work by Shell employees and equipment donations.

### Social investment in 2017

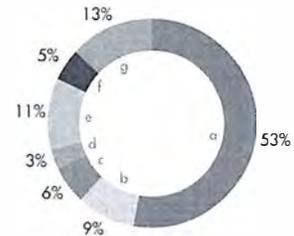
proportion of spend



- |  |   |
|--|---|
| ■ Required SI                                  | ■ Biodiversity and ecosystem services         |
| ■ Road safety                                  | ■ Community skills and enterprise development |
| ■ Community development                        | ■ Energy access                               |
| ■ Other (including health and disaster relief) | ■ Education                                   |

### Social investment in 2017

split by region



- |                 |                    |
|-----------------|--------------------|
| ■ Africa        | ■ MENA             |
| ■ APAC          | ■ Multiple regions |
| ■ Europe/CIS    | ■ USA & Canada     |
| ■ Latin America |                    |

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## About our data

We began reporting voluntarily on our environmental, safety and social performance with the first Shell Report in 1997. We support transparency and share information and data in this report and on our company website.

There are inherent limitations to the accuracy of environmental and social data. We recognise that our data will be affected by these limitations, so we continue to improve data integrity by strengthening our internal controls.

We provide all non-financial data in this report on a 100% basis for companies and joint ventures where we are the operator. Environmental data pertain to our direct operations unless otherwise stated. We report in this way, in line with industry practice, because these are the data we can directly manage and affect through operational improvements. We refer to the number of people employed or contracted on a "full-time equivalent" basis.

Operations acquired or divested during 2017 are included only for the period in which we operated these assets. Other data are collected from external sources, staff surveys and other internal sources as indicated.

We only include data in this report that were confirmed by the end of March 2018. If incidents are reclassified or confirmed, or if significant data changes occur after preparation of this report, they will be updated in the following year's publication. Data marked in the social data table come from an internal survey completed by the senior Shell representative in each country. The accuracy of environmental and social data may be lower than that of data obtained through our financial systems.

### ASSURANCE

We have clear standards and reporting requirements for our health, safety, security, environment and social performance (HSSE&SP) data.

Shell facilities are required to comply with these standards, which define management roles and responsibilities, the scope of data at facilities and how data are calculated and collected. These standards are part of our HSSE&SP Control Framework.

To ensure we provide accurate information, our data assurance process of HSSE&SP data is also a key element of the HSSE&SP Control Framework. The process flows from the facility all the way up to central group level. Some examples of what is controlled through this process are:

- self-assessments at the facility level;
- internal audits at all levels of the company;
- quarterly reviews and assessments of the data at all levels;
- an annual series of meetings between leaders at the group level and senior business managers to discuss outcomes and reporting parameters; and
- a formal sign-off by Shell's senior country leaders

The Report Review Panel of independent experts helps to make sure our reporting is balanced, relevant and responsive to stakeholders' interests.

Lloyd's Register Quality Assurance Ltd has provided limited assurance of our direct and indirect greenhouse gas emissions (GHG) data for 2017. Limited assurance means nothing has come to the auditor's attention that would indicate that the GHG data and information as presented in the GHG Assertion were not materially correct. The assurance statements are available at [shell.com](http://shell.com).

Conversions into US and Canadian dollars are based on the average exchange rates for 2017.

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## Environmental data

|  | 2017  | 2016  | 2015  | 2014  | 2013  | 2012  | 2011  | 2010  | 2009  | 2008  |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Greenhouse gas emissions (GHGs)</b>   |       |       |       |       |       |       |       |       |       |       |
| Direct total GHGs (million tonnes CO <sub>2</sub> equivalent) [A]                | 73    | 70    | 72    | 76    | 73    | 72    | 74    | 76    | 69    | 75    |
| Carbon dioxide (CO <sub>2</sub> ) (million tonnes)                               | 70    | 67    | 68    | 73    | 71    | 69    | 71    | 72    | 66    | 72    |
| Methane (CH <sub>4</sub> ) (thousand tonnes)[B]                                  | 123   | 138   | 132   | 126   | 120   | 93    | 133   | 128   | 127   | 126   |
| Nitrous oxide (N <sub>2</sub> O) (thousand tonnes)                               | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 2     | 2     | 2     |
| Hydrofluorocarbons (HFCs) (tonnes)   | 23    | 21    | 18    | 16    | 17    | 23    | 22    | 23    | 25    | 23    |
| Energy indirect total GHGs (million tonnes CO <sub>2</sub> equivalent) [C]       | 12    | 11    | 9     | 10    | 10    | 9     | 10    | 9     | 9     | n/c   |
| <b>Flaring</b>   |       |       |       |       |       |       |       |       |       |       |
| Flaring (Upstream) (million tonnes CO <sub>2</sub> equivalent) [D]               | 8.2   | 7.6   | 11.8  | 13.0  | 7.4   | 7.7   | 10.0  | 10.4  | 7.8   | 8.8   |
| Flaring (Upstream) (million tonnes hydrocarbon flared) [D]                       | 2.5   | 2.3   | 3.5   | 3.8   | 2.1   | 2.3   | 3.4   | 3.6   | 2.6   | 2.8   |
| Nigeria [E]  | 0.8   | 0.5   | 0.9   | 1.3   | 1.1   | 1.5   | 2.0   | 2.4   | 1.9   | 2.3   |
| Rest of the world [E]  | 1.7   | 1.8   | 2.6   | 2.5   | 1.0   | 0.8   | 1.4   | 1.2   | 0.7   | 0.5   |
| <b>Energy intensity</b>  |       |       |       |       |       |       |       |       |       |       |
| Upstream excl. oil sands, LNG and GTL (gigajoules per tonne production) [D], [F] | 1.05  | 1.02  | 0.83  | 0.87  | 0.89  | 0.83  | 0.75  | 0.74  | 0.76  | 0.74  |
| Refineries: Refinery Energy Index [G]  | 94.8  | 95.4  | 95.4  | 94.9  | 95.6  | 98.4  | 100.8 | 101.8 | 102.2 | 98.9  |
| Chemical plants: Chemicals Energy Index  | 88.2  | 91.0  | 91.6  | 90.3  | 89.8  | 91.7  | 90.8  | 89.3  | 92.0  | 93.0  |
| <b>Acid gases and VOCs</b>   |       |       |       |       |       |       |       |       |       |       |
| Sulphur oxides (SO <sub>x</sub> ) (thousand tonnes SO <sub>2</sub> )             | 81    | 83    | 88    | 97    | 99    | 113   | 136   | 139   | 141   | 175   |
| Nitrogen oxides (NO <sub>x</sub> ) (thousand tonnes NO <sub>2</sub> )            | 107   | 122   | 104   | 146   | 156   | 147   | 146   | 159   | 142   | 150   |
| Volatile organic compounds (VOCs) (thousand tonnes)                              | 95    | 146   | 125   | 151   | 89    | 89    | 129   | 147   | 126   | 130   |
| <b>Ozone-depleting emissions</b>   |       |       |       |       |       |       |       |       |       |       |
| CFCs/halons/trichloroethane (tonnes)   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.4   | 1.4   |
| Hydrochlorofluorocarbons (HCFCs) (tonnes)  | 7     | 8     | 8     | 6     | 8     | 8     | 12    | 21    | 24    | 26    |
| <b>Spills and discharges [H] [I] [J]</b>   |       |       |       |       |       |       |       |       |       |       |
| Sabotage spills – volume (thousand tonnes) [K]                                   | 1.4   | 3.9   | 2.3   | 2.7   | 2.2   | 3.3   | 1.6   | 3.0   | 14.0  | 6.5   |
| Sabotage spills – number [K]   | 62    | 49    | 95    | 139   | 157   | 137   | 118   | 112   | 95    | 115   |
| Operational spills – volume (thousand tonnes)                                    | 0.3   | 0.8   | 0.8   | 0.7   | 0.9   | 2.1   | 6.0   | 2.9   | 1.4   | 8.8   |
| Nigeria [L]  | 0.1   | 0.3   | 0.2   | 0.3   | 0.4   | 0.2   | 5.3   | 0.7   | 0.3   | 7.1   |
| Rest of the world  | 0.2   | 0.5   | 0.7   | 0.4   | 0.5   | 1.9   | 0.7   | 2.2   | 1.1   | 1.7   |
| Operational spills – number  | 99    | 72    | 108   | 153   | 174   | 207   | 211   | 195   | 275   | 275   |
| Nigeria [M]  | 9     | 8     | 16    | 38    | 31    | 37    | 64    | 32    | 37    | 42    |
| Rest of the world  | 90    | 64    | 92    | 115   | 143   | 170   | 147   | 163   | 238   | 233   |
| Hurricane spills – volume (thousand tonnes) [N]                                  | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Oil in effluents to surface environment (thousand tonnes) [O]                    | 1.2   | 1.0   | 1.0   | 0.9   | 1.0   | 1.0   | 1.3   | 1.6   | 1.5   | 1.7   |
| <b>Water</b>   |       |       |       |       |       |       |       |       |       |       |
| Fresh water withdrawn (million cubic metres)                                     | 201   | 195   | 186   | 199   | 198   | 203   | 209   | 202   | 198   | 224   |
| Fresh water consumed (million cubic metres)                                      | 150   | 152   | 141   | 165   | n/c   | n/c   | n/c   | n/c   | n/c   | n/c   |
| <b>Waste disposal</b>  |       |       |       |       |       |       |       |       |       |       |
| Hazardous (thousand tonnes)  | 638   | 658   | 455   | 529   | 770   | 820   | 740   | 1,048 | 962   | 688   |
| Non-hazardous (thousand tonnes)  | 1,382 | 1,491 | 1,680 | 1,674 | 2,065 | 2,295 | 1,850 | 1,079 | 1,139 | 996   |
| Total waste (thousand tonnes) [P]  | 2,202 | 2,148 | 2,135 | 2,203 | 2,835 | 3,115 | 2,590 | 2,127 | 2,101 | 1,684 |

[A] Greenhouse gas emissions (GHG) comprise carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. The data are calculated using locally regulated methods where they exist. Where there is no locally regulated method, the data are calculated using the 2009 API Compendium, which is the recognised industry standard under the GHG Protocol Corporate Accounting and Reporting Standard. There are inherent limitations to the accuracy of such data. Oil and gas industry guidelines (IPECA/API/IOGP) indicate that several sources of uncertainty can contribute to the overall uncertainty of a corporate emissions inventory. 2015-2017 emissions are calculated using Global Warming Potential factors from the IPCC's Fourth Assessment Report. Data for prior years were calculated using Global Warming Potential factors from the IPCC's Second Assessment Report.

[B] We have updated our 2015-2016 figures following review of data.

[C] These emissions were calculated using the market-based approach in line with the GHG Protocol Corporate Accounting and Reporting Standard.

[D] The term upstream in this context includes assets and activities from our Upstream, Integrated Gas and Oil Sands operations.

[E] Nigeria includes SPDC onshore operations (0.6 million tonnes flared in 2017) and SNEPCo offshore operations (0.1 million tonnes flared in 2017). Flaring from the Majnoon field in Iraq and from Malaysia amounted to 0.9 and 0.1 million tonnes of hydrocarbons respectively in 2017. Due to the rounding of numbers, flaring volumes for Nigeria and the rest of the world might not add up to the exact total volume of flaring.

[F] Since 2012, data are prepared in accordance with IPECA/API/IOGP guidance 2010. Data for prior years are not directly comparable.

[G] Data are indexed to 2002, based on Solomon Associates Energy Intensity Index 2006 methodology.

[H] All spill volumes and numbers are for spills over 100 kilograms. Due to the rounding of numbers, spill volumes for Nigeria and the rest of the world might not add up to the exact total volume of spills.

[I] As of the end of March 2018, there were 3 spills under investigation in Nigeria that may result in adjustments.

[J] Spills data for 2016 have been updated for Nigeria following completion of investigations.

[K] All sabotage and theft-related spills have occurred in Nigeria except in 2016 (one spill of 0.001 thousand tonnes) and 2015 (one spill of 0.005 thousand tonnes).

[L] Nigeria includes SPDC onshore operations and SNEPCo offshore operations. A single spill at the Bonga offshore field, Nigeria, amounted to 4.8 thousand tonnes in 2011.

[M] Nigeria includes SPDC onshore operations (8 operational spills in 2017) and SNEPCo offshore operations (1 operational spill in 2017).

[N] 2017 data reflect 4 spills caused by Hurricane Harvey in the USA.

[O] We have updated our 2016 figures following review of data.

[P] In 2017, we sent waste off-site for recycling or reuse, or sold close to 600 thousand tonnes of material that would otherwise have been disposed of as waste.

n/c = not calculated.

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## Social and safety data

|   | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 |
|---|------|------|------|------|------|------|------|------|------|------|
| <b>Fatalities [A]</b>   |      |      |      |      |      |      |      |      |      |      |
| Total number  | 2    | 3    | 7    | 5    | 5    | 8    | 6    | 12   | 20   | 26   |
| Employees   | 0    | 0    | 1    | 3    | 0    | 3    | 1    | 0    | 1    | 2    |
| Contractors   | 2    | 3    | 6    | 2    | 5    | 5    | 5    | 12   | 19   | 24   |
| Fatal accident rate (FAR)   | 0.4  | 0.53 | 1.11 | 0.74 | 0.79 | 1.32 | 0.96 | 1.56 | 2.3  | 3.4  |
| Fatalities per 100 million working hours (employees and contractors)                        |      |      |      |      |      |      |      |      |      |      |
| <b>Injuries and process safety incidents [A]</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable case frequency (TRCF)  | 0.8  | 1.0  | 0.9  | 1.0  | 1.2  | 1.3  | 1.2  | 1.2  | 1.4  | 1.8  |
| Injuries per million working hours (employees and contractors)                              |      |      |      |      |      |      |      |      |      |      |
| Lost time injury frequency (LTIF)   | 0.2  | 0.25 | 0.26 | 0.28 | 0.36 | 0.34 | 0.36 | 0.35 | 0.4  | 0.6  |
| Lost time injuries per million working hours (employees and contractors)                    |      |      |      |      |      |      |      |      |      |      |
| Operational process safety events   |      |      |      |      |      |      |      |      |      |      |
| Tier 1 [B]  | 49   | 39   | 51   | 57   | 65   | 91   | n/c  | n/c  | n/c  | n/c  |
| Tier 2 [B]  | 117  | 107  | 169  | 194  | 246  | 308  | n/c  | n/c  | n/c  | n/c  |
| <b>Illnesses</b>  |      |      |      |      |      |      |      |      |      |      |
| Total recordable occupational illness frequency (TROIF)                                     | 0.30 | 0.40 | 0.60 | 0.96 | 0.77 | 0.51 | 0.66 | 0.76 | 0.6  | 1.2  |
| Illnesses per million working hours (employees only)  |      |      |      |      |      |      |      |      |      |      |
| <b>[I] Security</b>   |      |      |      |      |      |      |      |      |      |      |
| Using armed security (% of countries)   | 14   | 17   | 19   | 24   | 19   | 17   | 14   | 9    | 17   | 17   |
| Using armed company security (% of countries)   | 1    | 1    | 1    | 1    | 3    | 0    | 1    | 1    | 1    | 1    |
| Using armed contractor security (% of countries)  | 3    | 7    | 8    | 10   | 8    | 10   | 9    | 6    | 10   | 9    |
| <b>Gender diversity [C]</b>   |      |      |      |      |      |      |      |      |      |      |
| In supervisory/professional positions (% women)   | 29.1 | 28.0 | 28.0 | 29.0 | 28.8 | 28.1 | 27.3 | 26.3 | 26.4 | 24.7 |
| In management positions (% women)   | 22.3 | 21.0 | 20.0 | 21.0 | 18.8 | 18.2 | 17.6 | 17.0 | 16.1 | 15.3 |
| In senior leadership positions (% women)  | 22.2 | 20.0 | 19.0 | 18.2 | 17.2 | 16.2 | 16.6 | 15.3 | 14.0 | 13.6 |
| <b>[I] Staff forums and grievance procedures</b>  |      |      |      |      |      |      |      |      |      |      |
| % countries with staff access to staff forum, grievance procedure or other support system   | 100  | 100  | 100  | 100  | 100  | 100  | 99   | 100  | 99   | 100  |
| <b>[I] Child labour (% countries with procedures in place)</b>                              |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | 100  |
| Contractors   | 100  | 100  | 100  | 100  | 100  | 100  | 97   | 96   | 97   | 99   |
| Suppliers   |      |      |      |      |      |      |      |      |      |      |
| <b>[I] Forced labour (% countries with procedures in place)</b>                             |      |      |      |      |      |      |      |      |      |      |
| Own operations  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 99   | 98   | n/c  |
| Contractors and suppliers   | 100  | 100  | 100  | 100  | 100  | 100  | 97   | 95   | 89   | n/c  |
| <b>Integrity</b>  |      |      |      |      |      |      |      |      |      |      |
| Code of Conduct violations [D]  | 261  | 341  | 217  | 267  | 181  | 209  | 226  | 205  | 165  | 204  |
| <b>[E] Contracting and procurement</b>  |      |      |      |      |      |      |      |      |      |      |
| Estimated expenditure on goods and services in lower income countries (\$ billion) [E][F]   | 4.9  | 4.4  | 6    | 14   | 12   | 14   | 12   | 13   | 12   | 12   |
| <b>Social investment [G]</b>  |      |      |      |      |      |      |      |      |      |      |
| Estimated voluntary social investment (equity share) (\$ million)                           | 111  | 103  | 122  | 160  | 159  | 149  | 125  | 121  | 132  | 148  |
| Estimated social investment spend (equity share) in lower income countries (\$ million) [H] | 107  | 96   | 43   | 73   | 74   | 67   | 45   | 61   | 54   | 61   |

[A] In line with industry standards, we distinguish three contract modes. Mode 1: contractor/supplier performs work under Shell's HSSE Management System (HSSE MS); Mode 2: contractor/supplier performs work under its own HSSE MS, which is materially equivalent to the Shell's HSSE MS; Mode 3: contractor/supplier performs work under its own HSSE MS. Also in line with industry standards, we report on safety performance only for contract modes 1 and 2.

[B] Process safety events are classified based on guidance from the IOGP and API. In 2017, there were 9 Tier 1 and 0 Tier 2 sabotage-related events.

[C] Diversity data obtained from our human resources system.

[D] Code of Conduct violations represent the number of reported incidents in the Shell Global Helpline (excluding queries or customer service queries), which have been investigated and closed during the relevant period and where the allegation was found to be (at least partially) true.

[E] Estimated expenditure in countries where gross domestic product amounts to less than \$15,000 per year per person (source: UNDP Human Development Index 2015). In 2015, the UNDP index update no longer includes some of the countries in which Shell invests, which impacts on our reported spend amount.

[F] From 2013 onwards, this figure only includes the amount spent on goods and services by Shell group companies.

[G] Social investment spending varies from year to year depending on business climate, locations and type of activities under way. This is voluntary social investment and does not include social investments made through contractual agreements with host governments, voluntary work by Shell employees and donations of equipment.

[H] Estimated voluntary social investment spending in countries where gross domestic product amounts to less than \$15,000 a year per person (source: UNDP Human Development Index 2016).

[I] Social investment and contracting and procurement data collected via our financial system since 2007.

[I] Data obtained from an internal survey completed by the senior Shell representative in each country.

n/c = not calculated.

## Definition and Cautionary note

Divestments is a measure used to monitor the progress of our divestment programme. This measure comprises proceeds from sale of property, plant and equipment and businesses, joint ventures and associates, and other Integrated Gas, Upstream and Downstream investments, reported within "Cash flow from investing activities (CFFI)" in the Consolidated Statement of Cash Flows, adjusted onto an accruals basis and for any share consideration received or contingent consideration recognised upon the related divestment, as well as proceeds from the sale of interests in entities while retaining control (for example, proceeds from sale of interest in Shell Midstream Partners, L.P.), which are included within "Change in non-controlling interest" in "Cash flow from financing activities (CFFF)".

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this report, "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to Royal Dutch Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities: "Subsidiaries", "Shell subsidiaries" and "Shell companies" as used in this publication refer to entities over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations" respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

We also refer to "Shell's net carbon footprint" in this report. This includes Shell's carbon emissions from the production of our energy products, our suppliers' carbon emissions in supplying energy for that production and our customers' carbon emissions associated with their use of the energy products we sell. Shell only controls its own emissions but, to support society in achieving the Paris Agreement goals, we aim to help and influence such suppliers and consumers to likewise lower theirs. The use of the terminology "Shell's net carbon footprint" is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

This report contains forward-looking statements (within the meaning of the US Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements.

Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual

results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "aim", "ambition", "anticipate", "believe", "could", "estimate", "expect", "goals", "intend", "may", "objectives", "outlook", "plan", "probably", "project", "risks", "schedule", "seek", "should", "target", "will" and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this report, including (without limitation):

(a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell's Form 20-F for the year ended December 31, 2017 (available at [www.shell.com/investor](http://www.shell.com/investor) and [www.sec.gov](http://www.sec.gov)). These risk factors also expressly qualify all forward-looking statements contained in this report and should be considered by the reader. Each forward-looking statement speaks only as of the date of this report, April 9, 2018. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this report.

We may have used certain terms, such as resources, in this report that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. US investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website [www.sec.gov](http://www.sec.gov).

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- Comprehensive financial information on our activities throughout 2017
- Detailed operational information including maps
- Report on our progress in contributing to sustainable development



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# ATTACHMENT 83

Confidential and Proprietary

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[REDACTED]

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[REDACTED]

Confidential and Proprietary

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[REDACTED]



CONFIDENTIAL



# ATTACHMENT 84

[REDACTED]

CONFIDENTIAL

[REDACTED]

[REDACTED]

# ATTACHMENT 85

| United States (Renewables) - Entity Name     | Domestic Jurisdiction |
|--|-----------------------|
| Allendale Biomass, LLC                       | DE                    |
| Alta Mesa Phase III Partners                 | CA                    |
| Alta Mesa Power Corporation                  | CA                    |
| ARROW CANYON SOLAR, LLC                      | DE                    |
| Atlantic Shores Offshore Wind Project 1, LLC | DE                    |
| Atlantic Shores Offshore Wind Project 2, LLC | DE                    |
| Atlantic Shores Offshore Wind Project 3, LLC | DE                    |
| Atlantic Shores Offshore Wind Project 4, LLC | DE                    |
| Atlantic Shores Offshore Wind, LLC           | DE                    |
| Avalon Wind 2, LLC                           | DE                    |
| Avalon Wind, LLC                             | DE                    |
| BAR13 SOLAR, LLC                             | DE                    |
| Beacon Landfill Gas Holdings LLC             | DE                    |
| Bellevue Solar, LLC                          | DE                    |
| Bigbeau Solar, LLC                           | DE                    |
| Bobcat Bluff Wind Project, LLC               | DE                    |
| Brickyard Hills Project, LLC                 | DE                    |
| BR-OE WT2 Holdings, LLC                      | DE                    |
| Brother Solar, LLC                           | DE                    |
| Cahaba Fields, LLC                           | DE                    |
| Calstor, LLC                                 | DE                    |
| Catalina Solar Interconnection Manager, LLC  | DE                    |
| Catalina Solar Lessee Holdco Member, LLC     | DE                    |
| Catalina Solar Lessee Holdco, LLC            | DE                    |
| Catalina Solar Lessee, LLC                   | DE                    |
| Catalina Solar, LLC                          | DE                    |

|  |    |
|--|----|
| Central Power Partners, LLC                | DE |
| Champepadan Wind Power Partners, LLC       | MN |
| Chanarambie Land Holdings, LLC             | DE |
| Chandler Finance 2, LLC                    | DE |
| Chandler Finance 3, LLC                    | DE |
| Chandler Real Estate 2, LLC                | DE |
| Chandler Real Estate 3, LLC                | DE |
| Chandler Wind Farms 2, LLC                 | DE |
| Chandler Wind Farms 3, LLC                 | DE |
| Chestnut Flats Lessee, LLC                 | DE |
| Chestnut Flats Wind, LLC                   | DE |
| Copenhagen Wind Farm Holdings, LLC         | DE |
| Copenhagen Wind Farm, LLC                  | DE |
| Corona Wind Power, LLC                     | CO |
| Cowboy Ridge Project, LLC                  | DE |
| Coyote Wind, LLC                           | DE |
| Deep Creek Solar Partners, LLC             | DE |
| Desert Claim Wind Power, LLC               | WA |
| Desert Harvest II LLC                      | DE |
| Desert Harvest Interconnection Manager LLC | DE |
| Desert Harvest, LLC                        | DE |
| DifWind Farms Limited IX                   | CA |
| DifWind Farms Limited VI                   | CA |
| DifWind Farms Limited VII                  | CA |
| DifWind Farms Limited VIII                 | CA |
| Dorchester Biomass, LLC                    | DE |
| ECG Utah Solar 1, LLC                      | UT |
| EDF Lancaster Solar LLC                    | DE |

|  |    |
|--|----|
| EDF Lepomis Solar LLC                      | DE |
| EDF Massachusetts Solar Holdings, LLC      | DE |
| EDF Massachusetts Sponsor Member, LLC      | DE |
| EDF NC Solar, LLC                          | DE |
| EDF Renewable DG Services LLC              | DE |
| EDF Renewable East Coast, Inc.             | DE |
| EDF Renewable Land Holdings, Inc.          | DE |
| EDF Renewable LFG Holdings, LLC            | DE |
| EDF Renewable Solar Holdings, Inc.         | DE |
| EDF Renewable Windfarm I, Inc.             | DE |
| EDF Renewable Windfarm III, Inc.           | DE |
| EDF Renewable Windfarm IV, Inc.            | DE |
| EDF Renewable Windfarm V, Inc.             | DE |
| EDF Renewable Windfarm VI, Inc.            | DE |
| EDF Renewables Asset Holdings, Inc.        | DE |
| EDF Renewables Development, Inc.           | DE |
| EDF Renewables Distributed Solutions, Inc. | DE |
| EDF Renewables Services, Inc.              | DE |
| EDF Renewables, Inc.                       | DE |
| EDF S&F, LLC                               | DE |
| EDF Solar I, LLC                           | DE |
| EDF Spring Field WPC, LLC                  | DE |
| EDF Tigers Storage LLC                     | DE |
| EDF Zebra Energy Storage, LLC              | DE |
| EDFR DS EnterSolar Holdings, LLC           | DE |
| EDF-RE Offshore Development, LLC           | DE |
| EDF-RE Texas Development I, LLC            | DE |
| EDF-RE US Development, LLC                 | DE |

|  |    |
|--|----|
| Entersolar, LLC                              | DE |
| Evergreen Wind Power Partners, LLC           | DE |
| Federal Energy Infrastructure Solutions, LLC | DE |
| Fenton Power Partners I, LLC                 | DE |
| Forest Trail Solar Partners, LLC             | DE |
| Glaciers Edge Wind Project, LLC              | DE |
| Gil, LLC                                     | DE |
| Golden Rock Wind, LLC                        | DE |
| Goodranch Solar, LLC                         | DE |
| Great Western Holdco, LLC                    | DE |
| Great Western Wind Energy, LLC               | DE |
| Greentree Landfill Gas Company LLC           | PA |
| GW DSSA Holdco, LLC                          | DE |
| Hawi Renewable Development, LLC              | DE |
| Heartland Biogas, LLC                        | DE |
| Heartland DPS, LLC                           | DE |
| High Ridge Wind, LLC                         | DE |
| Hinsdale Solar Partners, LLC                 | DE |
| Holliday Creek Solar, LLC                    | DE |
| Hoosier Wind Project, LLC                    | DE |
| Imperial Landfill Gas Company LLC            | PA |
| Ivester Wind Energy, LLC                     | DE |
| IWF Holdings, LLC                            | DE |
| Jetmore Wind, LLC                            | DE |
| Johannes Gutenberg Solar LLC                 | NC |
| KC DSSA Holdco, LLC                          | DE |
| Kelly Creek Holdco, LLC                      | DE |
| Kelly Creek Wind, LLC                        | DE |

|  |    |
|--|----|
| Kennebec PV Partners, LLC              | DE |
| Lakefield Wind Holdco, LLC             | DE |
| Lakefield Wind Project, LLC            | DE |
| Las Majadas Wind Farm, LLC             | DE |
| Lepomis PV Energy LLC                  | DE |
| Linden Wind Project, LLC               | DE |
| Lodi Wind, LLC                         | DE |
| Logan County Land Partners, LLC        | DE |
| Longhorn South Wind Project, LLC       | DE |
| Longhorn Wind Holdings, LLC            | DE |
| Longhorn Wind Project, LLC             | DE |
| Longspur Wind Holdings, LLC            | DE |
| Longspur Wind, LLC                     | DE |
| Louise Solar Project, LLC              | DE |
| Lowell Wind, LLC                       | DE |
| Lower Imrie Wind Project, LLC          | DE |
| LWP Lessee, LLC                        | DE |
| Macochee Creek Wind Farm Holdings, LLC | DE |
| Macochee Creek Wind Farm, LLC          | DE |
| Magnet Wind Farm Holdings, LLC         | DE |
| Magnet Wind Farm LLC                   | DE |
| Maverick Solar 2, LLC                  | DE |
| Maverick Solar 3, LLC                  | DE |
| Maverick Solar 4, LLC                  | DE |
| Maverick Solar 5, LLC                  | DE |
| Maverick Solar, LLC                    | DE |
| McHenry Battery Storage LLC            | DE |
| Merlin Solar, LLC                      | DE |

|   |    |
|---|----|
| Merricourt Power Partners, LLC            | DE |
| Mid-Columbia Wind, LLC                    | DE |
| Miller Wind Project, LLC                  | DE |
| Milligan 1 Wind LLC                       | DE |
| Milo Wind Project IRB Company, LLC        | DE |
| Milo Wind Project, LLC                    | DE |
| Mirose Holdco, LLC                        | DE |
| Moccasin Pumped Storage, LLC              | DE |
| Mojave Land, LLC                          | DE |
| Morris Ridge Solar Energy Center, LLC     | DE |
| Mount Nebo Solar Partners, LLC            | DE |
| Mountain Power Partners, LLC              | DE |
| Ness Trego Wind Farm, LLC                 | DE |
| Nevada Legacy Solar, LLC                  | DE |
| Northland Power Partners 1, LLC           | DE |
| Northland Power Partners 2, LLC           | DE |
| Northland Power Partners 3, LLC           | DE |
| Northwest Wind Partners, LLC              | DE |
| Oasis Power Partners, LLC                 | DE |
| OE IWF Holdings, LLC                      | DE |
| OE Macochee Creek Wind Farm Holdings, LLC | DE |
| OE Ness Trego Holdings, LLC               | DE |
| OE Ringer Hill Holdings, LLC              | DE |
| OE Tyler Bluff Wind Holdings, LLC         | DE |
| OE WH2 Holdings, LLC                      | DE |
| OE White Horse Holdings, LLC              | DE |
| OSO Grande HV, LLC                        | DE |
| OSO Grande Wind, LLC                      | DE |

|   |        |
|---|--------|
| Own Development Company, LLC              | DE, NY |
| OwnAssets, LLC                            | DE     |
| OwnEnergy, Inc                            | DE     |
| Oxford PV Partners, LLC                   | DE     |
| Pacific Northwest Partners, LLC           | DE     |
| Pacific Wind 2, LLC                       | DE     |
| Pacific Wind Interconnection Manager, LLC | DE     |
| Pacific Wind Lessee, LLC                  | DE     |
| Pacific Wind, LLC                         | DE     |
| Palen Segs I, LLC                         | DE     |
| Palen Segs II, LLC                        | DE     |
| Palen Solar Holdings, LLC                 | DE     |
| Palen Solar III, LLC                      | DE     |
| Patterson Pass Repower LLC                | DE     |
| Payne Mountain, LLC                       | DE     |
| Pecan Solar, LLC                          | NC     |
| Pilot Hill Holding, LLC                   | DE     |
| Pilot Hill Wind, LLC                      | DE     |
| Pinelands Biomass, LLC                    | DE     |
| Playa Solar 1, LLC                        | DE     |
| Playa Solar 2, LLC                        | DE     |
| Playa Solar, LLC                          | DE     |
| Ponderosa Solar, LLC                      | DE     |
| Potato Run Wind, LLC                      | DE     |
| Power Partners Midwest, LLC               | DE     |
| Power Partners Southwest, LLC             | DE     |
| Progression Hawaii Offshore Wind, LLC     | DE     |
| Pukana Solar, LLC                         | DE     |

|   |    |
|---|----|
| Randall Wind LLC                        | TX |
| Rattlesnake Wind Project, LLC           | DE |
| Red Pine DSSA Class B Holdco, LLC       | DE |
| Red Pine Holdings, LLC                  | DE |
| Red Pine Wind Project, LLC              | DE |
| Ringer Hill Wind Holdings, LLC          | DE |
| Riviera Wind, LLC                       | DE |
| Rock Falls Dssa Class B Holdco, LLC     | DE |
| Rock Falls Holdings LLC                 | DE |
| Rock Falls Wind Farm IRB, LLC           | DE |
| Rock Falls Wind Farm LLC                | DE |
| Roosevelt Holdco, LLC                   | DE |
| Roosevelt Milo Interconnect, LLC        | DE |
| Roosevelt Wind Project IRB Company, LLC | DE |
| Roosevelt Wind Project, LLC             | DE |
| Sacramento Soleil, LLC                  | DE |
| Shiloh III Lessee, LLC                  | DE |
| Shiloh Interconnection Manager, LLC     | DE |
| Shiloh IV Lessee, LLC                   | DE |
| Shiloh Wind Partners, LLC               | DE |
| Shiloh Wind Project 2, LLC              | DE |
| SIIF Energies S.A.                      | NY |
| Slate Creek Wind Holdings, LLC          | DE |
| Slate Creek Wind Project, LLC           | DE |
| Southeast Power Partners, LLC           | DE |
| Spearville 3, LLC                       | DE |
| Spinning Spur 3 Holdings, LLC           | DE |
| Spinning Spur Interconnect LLC          | TX |

|                                  |    |
|----------------------------------|----|
| Spinning Spur Wind LLC           | TX |
| Spinning Spur Wind Three, LLC    | DE |
| Spinning Spur Wind Two, LLC      | DE |
| Spur TransCo, LLC                | DE |
| Spur Two Sponsor, LLC            | DE |
| Stonehagen Holdco, LLC           | DE |
| Stonehagen Holdings, LLC         | DE |
| Stoneray Power Partners, LLC     | DE |
| Sugar River Wind, LLC            | DE |
| SummitWind Farm, LLC             | DE |
| SummitWind Holdings, LLC         | DE |
| Sumter Solar, LLC                | DE |
| Sunspear Holdco, LLC             | DE |
| Tiger Solar Partners, LLC        | DE |
| Toms River Merchant Solar, LLC   | DE |
| Toms River Net Meter Solar, LLC  | DE |
| Turks Island Solar Partners, LLC | DE |
| TX Hereford Wind Holdings, LLC   | DE |
| TX Hereford Wind, LLC            | DE |
| Tyler Bluff Wind Holdings, LLC   | DE |
| UGT Renewable Energy 10 LLC      | DE |
| Valedge Holdco, LLC              | DE |
| Valedge Holdings, LLC            | DE |
| Valentine Solar, LLC             | DE |
| Vindy Power Partners, LLC        | NY |
| Vista Mountain, LLC              | DE |
| Wapsipinicon Power Partners, LLC | DE |
| Wapsipinicon Wind Holdings, LLC  | DE |

|                                       |    |
|---------------------------------------|----|
| Wapsipinicon Wind Project, LLC        | DE |
| Westlake Solar Partners, LLC          | DE |
| Wheatland Wind Project, LLC           | DE |
| White Horse Wind Farm, LLC            | DE |
| White Horse Wind Holdings, LLC        | DE |
| Windthorst-2 Holdings, LLC            | DE |
| Windthorst-2, LLC                     | DE |
| Woodward EHV Wind Interconnection LLC | DE |
| Wt2 Intermediate Holdings, LLC        | DE |
| WWH Holdings, LLC                     | DE |
| Wyoming Land Partners, LLC            | DE |
| WyWind Power Partners, LLC            | DE |
| YamHill Solar, LLC                    | DE |

**United States - Entity Name (EDF Trading)**

**Domestic  
Jurisdiction**

|  |    |
|--|----|
| EDF Energy Services, LLC               | DE |
| EDF Industrial Power Services (CA) LLC | DE |
| EDF Trading North America, LLC         | DE |
| NPM Energy, LLC                        | DE |

**Canada - Entity Name**

**Domestic  
Jurisdiction  
(Province)**

|  |                               |
|--|-------------------------------|
| Barlow Energy Centre GP Inc.                 | NB, AB, BC,<br>ON, QC, NS, NL |
| Barlow Energy Centre Limited Partnership     | ON, QC, AB,<br>BC, NB, NL, NS |
| Bull Trail Energy Centre GP Inc.             | AB                            |
| Bull Trail Energy Centre Limited Partnership | AB                            |

|   |                                    |
|---|------------------------------------|
| Churchill Energy Centre GP Inc.                     | ON, AB                             |
| Churchill Energy Centre Limited Partnership         | ON, AB                             |
| Churchill Wind Park 1 GP Inc.                       | ON, AB                             |
| Churchill Wind Park 1 Limited Partnership           | ON, AB                             |
| Cypress Renewable Energy Centre GP Inc.             | ON, AB                             |
| Cypress Renewable Energy Centre Limited Partnership | ON, AB                             |
| EDF EN Canada Solar Arnprior A GP Inc.              | ON, AB                             |
| EDF EN Canada Solar Arnprior A Limited Partnership  | ON, AB                             |
| EDF EN Canada Solar Arnprior B GP Inc.              | BC                                 |
| EDF EN Canada Solar Arnprior B Limited Partnership  | BC                                 |
| EDF EN SK Wind Energy 1 GP Inc.                     | BC                                 |
| EDF EN SK Wind Energy 1 Limited Partnership         | BC                                 |
| EDF Renewables Canada Inc.                          | Federal, BC, ON,<br>QC, SK, AB, NS |
| EDF Renewables Development Inc.                     | BC                                 |
| EDF Renewables Services Inc.                        | BC                                 |
| EEN CA Blackspring Ridge I Wind Project L.P.        | ON, NB                             |
| EEN CA Lac Alfred L.P.                              | ON, NB                             |
| EEN CA Massif du Sud L.P.                           | ON                                 |
| EEN CA Mont-Rothery L.P.                            | ON                                 |
| EEN CA Nicolas-Riou L.P.                            | ON                                 |
| EEN CA Riviere du Moulin L.P.                       | ON                                 |
| EEN CA SRB Holding L.P.                             | ON                                 |
| EEN GP Blackspring Ridge I Wind Project Inc.        | ON                                 |
| EEN GP La Mitis Inc.                                | QC                                 |
| EEN GP Lac Alfred Inc.                              | QC                                 |
| EEN GP Le Granit Inc.                               | QC                                 |
| EEN GP Massif du Sud Inc.                           | QC                                 |

|  |        |
|--|--------|
| EEN GP Mont-Rothery Inc.                               | QC     |
| EEN GP Nicolas-Riou Inc.                               | QC     |
| EEN GP Riviere du Moulin Inc.                          | QC     |
| EEN GP SRB Holding Inc.                                | QC     |
| Groundmount Solar GP Inc.                              | QC     |
| Groundmount Solar Limited Partnership                  | QC     |
| Hand Hills Renewable Energy Centre GP Inc.             | QC     |
| Hand Hills Renewable Energy Centre Limited Partnership | QC     |
| Hermine GP Saint-Robert Bellarmin Inc.                 | QC     |
| Hermine Saint-Robert Bellarmin L.P.                    | QC     |
| Hermine SRB Holding General Partnership                | QC     |
| Parc éolien Nicolas-Riou commandité Inc.               | QC     |
| Parc éolien Nicolas-Riou S.E.C.                        | QC     |
| Pendleton Energy Centre GP Inc.                        | QC     |
| Pendleton Energy Centre Limited Partnership            | QC     |
| Red Rock Renewable Energy Centre GP Inc.               | QC     |
| Red Rock Renewable Energy Centre Limited Partnership   | QC     |
| Romney Energy Centre GP Inc.                           | ON, SK |
| Romney Energy Centre Limited Partnership               | ON, SK |
| Société en commandite EEN CA La Mitis                  | ON     |
| Société en commandite EEN CA Le Granit                 | ON     |
| Sundance Wind Project GP Inc.                          | ON     |
| Sundance Wind Project Limited Partnership              | ON     |
| Taylor Wind Project GP Inc.                            | ON     |
| Taylor Wind Project Limited Partnership                | ON     |
| Vulcan Solar Hybrid Energy Centre GP Inc.              | ON     |
| Vulcan Solar Hybrid Energy Centre Limited Partnership  | ON     |

|   |    |
|---|----|
| Wartenbe Wind Project GP Inc.                         | ON |
| Wartenbe Wind Project Limited Partnership             | ON |
| Yorkshire Renewable Energy Centre GP Inc.             | AB |
| Yorkshire Renewable Energy Centre Limited Partnership | AB |

| <b>Mexico - Entity Name</b>                          | <b>Domestic Jurisdiction</b> |
|--|------------------------------|
| Bluemex Power 1 S.A. de C.V.                         | MX                           |
| Bluemex Power 2 S.A. de C.V.                         | MX                           |
| Bluemex Power 3 S.A. de C.V.                         | MX                           |
| EDF Renewables México, S. de R. L. de C.V.           | MX                           |
| EDF Renewables Servicios Eólicos, S. de R.L. de C.V. | MX                           |
| EDF Renewables Servicios México, S. de R.L. de C.V.  | MX                           |
| Eléctrica del Valle de México, S. de R. L. de C.V.   | MX                           |
| Energía del Istmo, S. A. de C.V.                     | MX                           |
| Eoliatec del Istmo, S.A.P.I. de C.V.                 | MX                           |
| Eoliatec del Pacífico, S.A.P.I. de C.V.              | MX                           |
| Eólica de Oaxaca S.A.P.I. de C.V.                    | MX                           |

| <b>Major International Affiliates - Entity Name</b> | <b>Domestic Jurisdiction</b> |
|---|------------------------------|
| CHAM SAS  | FRANCE                       |
| Citelum   | FRANCE                       |
| Dalkia  | FRANCE                       |
| Dunkerque LNG                                       | FRANCE                       |
| EDF (China) Holding Ltd.                            | CHINA                        |
| EDF Alpes Investissements SARL                      | SWITZERLAND                  |
| EDF Belgium SA                                      | BELGIUM                      |
| EDF Chile Spa                                       | CHILE                        |

|  |         |
|--|---------|
| EDF Démász Zrt.  | HUNGARY |
| EDF Development Company Ltd.                               | UK      |
| EDF Développement Environnement SA                         | FRANCE  |
| EDF DIN UK Ltd.  | UK      |
| EDF Energy Holdings Limited                                | UK      |
| EDF Energy UK Ltd.   | UK      |
| EDF Gas Deutschland GmbH                                   | GERMANY |
| EDF Holding SAS  | FRANCE  |
| EDF IMMO   | FRANCE  |
| EDF Inc.   | USA     |
| EDF International SAS                                      | FRANCE  |
| EDF Luminus SA   | BELGIUM |
| EDF Norte Fluminense SA                                    | BRAZIL  |
| EDF Paliwa Sp. z o.o.                                      | POLAND  |
| EDF Polska SA  | POLAND  |
| EDF Production Électrique Insulaire                        | FRANCE  |
| EDF Renouvelables S.A. (f/k/a EDF Énergies Nouvelles S.A.) | FRANCE  |
| EDF Trading Ltd.   | UK      |
| EDF Investissements Groupe SA                              | BELGIUM |
| Edison SpA   | ITALY   |
| Edvance  | FRANCE  |
| Electricité de France SA                                   | FRANCE  |
| Électricité de Strasbourg                                  | FRANCE  |
| Elektrocieplownia Zielona Gora SA                          | POLAND  |
| Enedis   | FRANCE  |
| Framatome  | FRANCE  |
| French Investment Guangxi Laibin Electric Power Co, Ltd.   | CHINA   |

|   |            |
|---|------------|
| Friedeburger Speicherbetriebsgesellschaft GmbH                          | GERMANY    |
| Group Support Services (G2S)  | FRANCE     |
| Immo C47  | FRANCE     |
| Mekong Energy Company Ltd.  | VIETNAM    |
| Océane Re   | LUXEMBOURG |
| Société C2  | FRANCE     |
| Société C3  | FRANCE     |
| Société Française d'Ingénierie Electronucléaire et<br>d'Assistance      | FRANCE     |
| Société pour le Conditionnement des Déchets et Effluents<br>Industriels | FRANCE     |
| Transalpina di Energia SpA  | ITALY      |
| Unistar Nuclear Energy LLC  | USA        |
| Ute Paracambi SA  | BRAZIL     |
| Wagram Insurance Company Ltd.   | IRELAND    |
| Zec Kogeneracja SA  | POLAND     |

# ATTACHMENT 86

# Exhibit 8.1

## SIGNIFICANT SUBSIDIARIES AND OTHER RELATED UNDERTAKINGS (AUDITED)

Significant subsidiaries and other related undertakings at December 31, 2017, are set out below. Significant subsidiaries are shaded and each meets the threshold specified under rule 1-02(w) of Regulation S-X. Shell's percentage of share capital is shown to the nearest whole number. All subsidiaries have been included in the "Consolidated Financial Statements" on pages 137-178, and those held directly by the Company are marked with the footnote [a]. A number of the entities listed are dormant or not yet operational. Entities that are proportionately consolidated are identified by the footnote [b]. Shell-owned shares are ordinary (voting) shares unless identified with one of the following annotations against the company name: [c] Membership interest; [d] Partnership capital; [e] Non-redeemable; [f] Ordinary, Membership interest; [g] Ordinary, Non-redeemable; [h] Ordinary, Partnership capital; [i] Ordinary, Redeemable; [j] Ordinary, Redeemable, Non-redeemable; and [k] Redeemable, Non-redeemable.

| Company by country of incorporation               | Address of registered office                                   | %   |
|---|--|-----|
| ARGENTINA   |  |     |
| Deheza S.A.I.C.F. e I.                            | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| Energina Compañía Argentina de Petróleo S.A.      | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| Estación Lima S.A.                                | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| O & G Developments Ltd S.A.                       | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| Shell Compañía Argentina de Petróleo S.A.         | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| Shell Gas S.A.                                    | Av. Pte. Roque Sáenz Pena 788, 4th floor, Buenos Aires, 1383   | 100 |
| AUSTRALIA   |  |     |
| A.C.N. 081 118 292 Pty Limited                    | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Arrow Energy Holdings Pty Ltd                     | Level 39, 111 Eagle Street, Brisbane, QLD 4000                 | 50  |
| Austen & Butta Pty Ltd                            | Shell House, 562 Wellington Street, Perth, WA 6000             | 100 |
| Australian Oil & Gas Corporation Pty Ltd          | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| BC 789 Holdings Pty Ltd                           | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| BG CPS Pty Limited                                | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| BG Pacific Holdings Pty Ltd                       | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| BNG (Surat) Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Condamine 1 Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Condamine 2 Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Condamine 3 Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Condamine 4 Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Condamine Power Station Pty Ltd                   | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Fuelink Pty Ltd                                   | Shell House, 562 Wellington Street, Perth, WA 6000             | 100 |
| Interstate Pipelines Pty Limited                  | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Monash Energy Pty Ltd                             | Level 14, 390 St Kilda Road, South Melbourne, VIC, 3004        | 50  |
| New South Oil Pty Ltd                             | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| North West Shelf LNG Pty Ltd                      | Shell House, 562 Wellington Street, Perth, WA 6000             | 100 |
| OME Resources Australia Pty Ltd                   | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Petroleum Exploration Australia Pty Limited       | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Petroleum Resources (Thailand) Pty. Limited       | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| Provident & Pensions Holdings Proprietary Limited | Shell House, 562 Wellington Street, Perth, WA 6000             | 100 |
| Pure Energy Resources Pty Limited                 | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QCLNG Operating Company Pty Ltd [i]               | Level 30, 275 George Street, Brisbane, QLD 4000                | 75  |
| QCLNG Pty Ltd                                     | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC (B7) Pty Ltd                                  | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC (Exploration) Pty Ltd                         | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC (Infrastructure) Pty Ltd                      | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Common Facilities Company Pty Ltd             | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 2 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 3 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 4 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 5 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 6 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 7 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 8 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Holdings 9 Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Midstream Holdings Pty Ltd                    | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Midstream Investments Pty Ltd                 | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Midstream Land Pty Ltd                        | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Midstream Limited Partnership                 | Level 42, Bourke Place, 600 Bourke Street, Melbourne, VIC 3000 | 100 |
| QGC Midstream Services Pty Ltd                    | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Northern Forestry Pty Ltd                     | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Pty Limited                                   | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |
| QGC Sales Qld Pty Ltd                             | Level 30, 275 George Street, Brisbane, QLD 4000                | 100 |



| Company by country of incorporation                        | Address of registered office                                       | %   |
|--|--|-----|
| QGC Train 1 Tolling Pty Ltd                                | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Train 1 UJV Manager Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Train 2 Pty Ltd  | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Train 2 Tolling No.2 Pty Ltd                           | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Train 2 Tolling Pty Ltd                                | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Train 2 UJV Manager Pty Ltd                            | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Upstream Holdings Pty Ltd                              | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Upstream Finance Pty Ltd                               | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Upstream Investments Pty Ltd                           | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| QGC Upstream Limited Partnership                           | Level 42, Bourke Place, 600 Bourke Street, Melbourne, VIC 3000     | 100 |
| Queensland Gas Company Pty Ltd                             | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Roma Petroleum Pty Limited                                 | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| SASF Pty Ltd   | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| SGA (Queensland) Pty Ltd                                   | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Sgai Pty Limited   | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Shell Australia FLNG Pty Ltd                               | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Australia Lubricants Production Pty Ltd              | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Australia Pty Ltd                                    | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Australia Services Company Pty Ltd                   | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Custodian Pty Ltd                                    | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Development (PSC19) Pty Ltd                          | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Development (PSC20) Pty Ltd                          | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Energy Australia Pty Ltd                             | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Shell Energy Holdings Australia Limited                    | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Energy Investments Australia Pty Ltd                 | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Global Solutions Australia Pty Ltd                   | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Shell Tankers Australia Pty Ltd                            | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Starzap Pty Ltd  | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Sunshine 685 Pty Limited                                   | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Sunshine Gas Pty Limited                                   | Level 30, 275 George Street, Brisbane, QLD 4000                    | 100 |
| Trident LNG Shipping Services Pty Ltd                      | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Trident Shipping Services Pty Ltd                          | Shell House, 562 Wellington Street, Perth, WA 6000                 | 100 |
| Walloons Coal Seam Gas Company Pty Limited [i]             | Level 30, 275 George Street, Brisbane, QLD 4000                    | 75  |
| <b>AUSTRIA</b>   |  |     |
| Salzburg Fuelling GmbH                                     | Innsbrucker Bundesstrasse 95, Salzburg, 5020                       | 33  |
| Shell Austria Gesellschaft mbH                             | Tech Gate, Donau-City-Str. 1, Vienna, 1220                         | 100 |
| Shell Brazil Holding GmbH                                  | Tech Gate, Donau-City-Str. 1, Vienna, 1220                         | 100 |
| Shell China Holding GmbH                                   | Schulhof 6/1, Vienna, 1010   | 100 |
| TBG Tanklager Betriebsgesellschaft m.b.H.                  | Rettenlackstrasse 3, Salzburg, 5020                                | 50  |
| Transalpine Ölleitung in Österreich GmbH                   | Kienburg 11, Matri in Osttirol, 9971                               | 19  |
| <b>BAHAMAS</b>   |  |     |
| Shell E & P Ireland Offshore Inc.                          | P.O. Box N4805, St. Andrew's Court, Frederick Street Steps, Nassau | 100 |
| <b>BARBADOS</b>  |  |     |
| Shell Trinidad and Tobago Resources SRL                    | One Welches, Welches, St. Thomas, BB22025                          | 100 |
| Shell Western Supply and Trading Limited                   | Mahogany Court, Wildey Business Park, Wildey, St. Michael, BB11000 | 100 |
| <b>BELGIUM</b>   |  |     |
| Belgian Shell S.A.   | Cantersteen 47, Brussels, 1000                                     | 100 |
| CRI Catalyst Company Belgium N.V.                          | Pantserschipstraat 331, Gent, 9000                                 | 100 |
| Ethyleen Pijpleiding Maatschappij (Belgie) N.V.            | Kantersteen 47, Brussels, 1000                                     | 100 |
| New Market Belgium   | Cantersteen 47, Brussels, 1000                                     | 100 |
| <b>BERMUDA</b>   |  |     |
| Egypt LNG Shipping Limited                                 | Clarendon House, 2 Church Street, Hamilton, HM 11                  | 25  |
| Gas Investments & Services Company Limited                 | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 85  |
| Kuwait Shell Limited                                       | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Pecten Middle East Services Company Limited                | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Pecten Somalia Company Limited                             | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Qatar Shell GTL Limited                                    | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Sakhalin Energy Investment Company Ltd                     | Clarendon House, 2 Church Street, Third Floor, Hamilton, HM 11     | 28  |
| Shell Australia Natural Gas Shipping Limited               | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Bermuda (Overseas) Limited                           | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Caribbean & Central America Ltd                      | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Deepwater Borneo Limited                             | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell EP International Limited                             | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Exploration and Production Guyana Limited            | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Holdings (Bermuda) Limited                           | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell International Trading Middle East Limited            | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Markets (Middle East) Limited                        | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Mexico Exploration and Production Investment Limited | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |



| Company by country of incorporation             | Address of registered office   | %   |
|---|--|-----|
| Shell Offshore Central Gabon Ltd                | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Oman Trading Limited                      | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Overseas Holdings (Oman) Limited          | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Petroleum (Malaysia) Ltd                  | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Saudi Arabia (Refining) Limited           | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell South Syria Exploration Limited           | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Trading (M.E.) Private Limited            | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Trust (Bermuda) Limited                   | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Shell Trust (U.K. Property) Limited             | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Solen Insurance Limited                         | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Solen Life Insurance Limited                    | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| Tacoma Company Limited                          | 3rd Floor Continental Building, 25 Church Street, Hamilton, HM 12  | 100 |
| <b>BRAZIL</b>                                   |  |     |
| BG Comercio e Importacao Ltda.                  | Av. República do Chile 330, 23o andar, Torre 2, Centro, Rio de Janeiro, 20031-170                          | 100 |
| BG do Brasil Ltda.                              | Av. República do Chile 330, 23o andar, Torre 2, sala 2309, Centro, Rio de Janeiro, 20031-170               | 100 |
| BG Petroleo & Gas Brasil Ltda                   | Av. República do Chile 330, 23o andar, Torre 2, sala 2309, Centro, Rio de Janeiro, 20031-170               | 100 |
| Fusus Comercio e Participacoes Ltda.            | Calçada das Orquideas 40, 1 E 2 Andares, Centro Comercial 1, Alphaville, Barueri - SP, 06453-017           | 100 |
| Icolub - Industria de Lubrificantes S.A.        | Praia Intendente Bittencourt, 2 (Parte), Ilha do Governador, Rio de Janeiro, 21930-030                     | 100 |
| Pecten do Brasil Servicos de Petroleo Ltda      | Av.das Americas 4200, Bloco 6, 4th Floor (parte), Barra da Tijuca, Rio de Janeiro, 22640-102               | 100 |
| Raizen Combustíveis S.A.                        | Victor Civita, 77, Block 1, Edifício: Rio Office Park, 4 floor, Barra da Tijuca, Rio de Janeiro, 22775-044 | 50  |
| Raizen Energia S.A.                             | Av. Brigadeiro Faria Lima, 4100, 11th floor, part V, Itaim Bibi, São Paulo, 04538-132                      | 50  |
| Seapos Ltda.                                    | Av.das Americas 4200, Bloco 6, sala 301 (parte), Barra da Tijuca, Rio de Janeiro, 22640-102                | 100 |
| Shell Brasil Participações Ltda.                | Av. Brigadeiro Faria Lima 3311, Conj 81 Sala 02, Itam Bibi, São Paulo, 04538-133                           | 100 |
| Shell Brasil Petroleo Ltda.                     | Av.das Americas 4200, Bloco 6, salas 101,201,301,401,501,601, Barra da Tijuca, Rio de Janeiro, 22640-102   | 100 |
| Shell Energy do Brasil Ltda                     | Av.das Americas 4200, Bloco 6, sala 501 (parte), Barra da Tijuca, Rio de Janeiro, 22640-102                | 100 |
| <b>BRUNEI</b>                                   |  |     |
| Brunei LNG Sendirian Berhad                     | Lumut, Seria, KC2935   | 25  |
| Brunei Shell Marketing Company Sendirian Berhad | Brunei Shell Petroleum Company, Sendirian Berhad, Seria, KB2933  | 50  |
| Brunei Shell Petroleum Company Sendirian Berhad | Jalan Utara, Panaga, Seria, KB2933   | 50  |
| Brunei Shell Tankers Sendirian Berhad           | Jalan Utara, Panaga, Seria, KB2933   | 25  |
| Shell Borneo Sendirian Berhad                   | c/o BSP Head Office, NDCO Block, Ground Floor, Jalan Utara, Panaga Seria, KB2933                           | 100 |
| <b>BULGARIA</b>                                 |  |     |
| Shell Bulgaria Ead                              | 48, Sitnyakovo Blvd., Serdika Offices, 8th floor, Sofia, 1505  | 100 |
| <b>CAMBODIA</b>                                 |  |     |
| Angkor Resources Co Ltd                         | Office No. 186 C, Street 155 Sangkat Toul Tumpoung I, Khan Chamkamorn, Phnom Penh                          | 49  |
| <b>CANADA</b>                                   |  |     |
| 10084751 Canada Limited                         | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| 1745844 Alberta Ltd.                            | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 50  |
| 3095381 Nova Scotia Company                     | 1959 Upper Water Street, Suite 1100, Halifax, Nova Scotia, B3J 3E5   | 100 |
| 6581528 Canada Ltd.                             | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| 7026609 Canada Inc.                             | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| 7645929 Canada Limited                          | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Alberta Products Pipe Line Ltd.                 | 5305 McCall Way N.E., Calgary, Alberta, T2E 7N7  | 20  |
| BG Canada Ltd.                                  | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| BlackRock Ventures Inc.                         | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| BR Oil Sands Corporation                        | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Cansolv Technologies Inc.                       | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Coral Cibola Canada Inc.                        | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Criterion Catalysts & Technologies Canada, Inc. | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| FP Solutions Corporation                        | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 33  |
| LNG Canada Development Inc. [b]                 | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 50  |
| Sable Offshore Energy Inc.                      | 1701 Hollis Street, Suite 1400, Halifax, Nova Scotia, B3J 3M8  | 33  |
| SCL Pipeline Inc.                               | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| SFJ Inc.  | 199 Bay Street, Suite 5300, Commerce Court West, Toronto, Ontario, M5L 1B9                                 | 50  |
| Shell Americas Funding (Canada) Limited         | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Energy [c]                         | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Exploration [c]                    | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Limited                            | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada OP Inc.                            | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Products                           | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Resources [c]                      | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Canada Services Limited                   | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Chemicals Canada [c]                      | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Energy Merchants Canada Inc.              | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Energy North America (Canada) Inc.        | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Global Solutions Canada Inc.              | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |
| Shell Quebec Limitée                            | 400 boul de Maisonneuve Ouest, Montreal, Quebec, H3A 1L4   | 100 |
| Shell Trading Canada [c]                        | 400 4th Avenue S.W., Calgary, Alberta, T2P 0J4   | 100 |



| Company by country of incorporation                             | Address of registered office  | %   |
|---|---|-----|
| Sun-Canadian Pipe Line Company Limited                          | 830 Highway No. 6 North, Flamborough, Ontario, L0R 2H0  | 45  |
| Trans-Northern Pipelines Inc.                                   | 45 Vogel Road, Suite 310, Richmond Hill, Ontario, L4B 3P6   | 33  |
| <b>CAYMAN ISLANDS</b>   |   |     |
| Beryl North Sea Limited   | Sterling Trust (Cayman) Limited, Whitehall House, 238 North Church Street, P.O. Box 1043, George Town, KY1-1102   | 100 |
| BG Egypt S.A.   | 5th Floor, Bermuda House, Dr Roy's Drive, George Town, Grand Cayman, KY1-1102   | 100 |
| BG Exploration and Production India Limited                     | Floor 4, Willow House, Cricket Square, George Town, P.O. Box 268, Grand Cayman, KY1-1104  | 100 |
| Gas Resources Limited   | Caribbean Management Ltd, 5th Floor, Bermuda House, 36C Dr Roy's Drive, Grand Cayman, KY1- 1102   | 100 |
| Schiehallion Oil & Gas Limited                                  | Sterling Trust (Cayman) Limited, Whitehall House, 238 North Church Street, P.O. Box 1043, George Town, KY1-1102   | 100 |
| Shell Bolivia Corporation                                       | PricewaterhouseCoopers Services, Strathvale House, P.O. Box 258, Grand Cayman, KY1-1104   | 100 |
| Shell North Sea Holdings Limited                                | Maples Corporate Services Limited, Ugland House, P.O. Box 309, Grand Cayman, KY1-1104   | 100 |
| <b>CHINA</b>  |   |     |
| Beijing Shell Petroleum Company Ltd.                            | Unit 1101-1104, level 11, Building 1, No. 19 Chaoyang Park Road, Chaoyang District, Beijing, 100125   | 49  |
| Cansolv Technologies (Beijing) Company Limited                  | Unit 09, Level 31 No. 16 Building, No. 1 Jian Guo Men Wai Avenue, Chaoyang District, Beijing, 100004  | 100 |
| Chongqing Doyen Shell Petroleum and Chemical Co. Ltd.           | No. 196, Shuang Yuan Street, Beibei Zone, Chongqing, 400700   | 49  |
| CNOOC and Shell Petrochemicals Company Limited                  | Dayawan Petrochemical Industrial Park, Huizhou, Guangdong, 516086   | 50  |
| Hangzhou Natural Gas Company Limited                            | 10/F, Meiqi Mansion, No. 30 Tianmushan Road, Hangzhou, 310007   | 25  |
| Infineum (China) Co. Ltd.                                       | No. 1 Dongxin Road, Jiangsu Yangtze River International, Chemical Industry Park, Zhangjiagang, Jiangsu  | 50  |
| Shell (Beijing) Real Estate Consulting Ltd.                     | Unit 01, 32/F, No. 16 Building, No. 1 Courtyard Jian Guo Men Wai Avenue, Chaoyang District, Beijing, 100004   | 100 |
| Shell (China) Limited   | 30/F Unit 01-02, No. 16 Building, No. 1 Courtyard, Jian Guo Men Wai Avenue, Chaoyang District, Beijing, 100004  | 100 |
| Shell (China) Projects & Technology Limited                     | Unit 01 - 08, Level 31, No. 16 Building, No. 1 Jian Guo Men Wai Avenue, Chaoyang District, Beijing, 100004  | 100 |
| Shell (Shanghai) Petroleum Company Limited                      | Room 522, The British Road No. 38, China (Shanghai) Pilot Free Trade Zone, Shanghai, 200131   | 100 |
| Shell (Shanghai) Technology Limited                             | Building 4, Jin Chuang Building, No. 4560, Jin Ke Road, Pilot Free Trade Zone, Shanghai   | 100 |
| Shell (Tianjin) Lubricants Company Limited                      | North to Gang Bei Road and east to Hai Gang Road, Nangang Industrial Zone, Tianjin Economic-Technological Development Area, Tianjin, 300280             | 100 |
| Shell (Tianjin) Oil and Petrochemical Company Limited           | No. 286 Nansan Road, Tianjin Harbour, Nanjiang Development Zone, Tanggu District, Tianjin, 300452   | 100 |
| Shell (Zhejiang) Petroleum Trading Limited                      | No. 1 Wangjiaba, Xinmiaozi Village, Puyuan Town, Tongxiang, Jiaxing, Zhejiang, 314502   | 100 |
| Shell (Zhuhai) Lubricants Company Limited                       | Nanjin Wan, Gaolan Dao, Zhuhai Harbour Industrial Zone, Guangdong, 519050   | 100 |
| Shell Energy (China) Limited                                    | Room 530, 5th Floor, Building 1, No. 239 Gang'ao Road, China (Shanghai) Free Trade Zone, Shanghai, 200137   | 100 |
| Shell North China Petroleum Group Co., Ltd.                     | 5th Floor, Administrative Commission Building, Wuqing Development Area, No. 18 Fuyuan Road, Wuqing District, Tianjin, 300203                            | 49  |
| Shell Road Solutions (Zhenjiang) Co. Ltd                        | Dagang District, New Zone, Zhenjiang, Jiangsu, 212132   | 100 |
| Shell Road Solutions Xinyue (Foshan) Co. Ltd.                   | Baisha, Hekou, Sanshui District, Foshan, Guangdong, 528133  | 60  |
| Sinopec and Shell (Jiangsu) Petroleum Marketing Company Limited | No. 100, Xingang Dadao, Nanjing Economic and Technological Development Zone, Nanjing, Jiangsu, 210000   | 40  |
| Suzhou Liyuan Retail Site Management Co., Ltd.                  | No. 358 Zhuhui Road, Suzhou, 215000   | 50  |
| Yanchang and Shell (Guangdong) Petroleum Co., Ltd.              | 39th Floor as Planning-designed (41st Floor as Self-designated), Leatop Plaza, No. 32 East Zhujiang Road, Zhujiang New Town, Tianhe District, Guangzhou | 49  |
| Yanchang and Shell (Sichuan) Petroleum Company Limited          | 23F, Yanlord Square, Section 2, Renmin South Road, Chengdu, Sichuan, 610016   | 45  |
| Yanchang and Shell Petroleum Company Limited                    | Room 1801 Building B, 18F City Gateway, No. 1 Jinye Road, Hi-Tech Zone, Xi'an, 710075   | 45  |
| Yueyang Sinopec and Shell Coal Gasification Company Limited     | Qilishan, Yueyang, Hunan, 414003  | 50  |
| Zhejiang Shell Fuels Company Limited                            | Room 2103, North Tower, Yefeng Modern Center, No. 161, Shaoxing Road, Xiacheng District, Hangzhou City (Zhejiang Province), 310004                      | 100 |
| Zhejiang Shell Oil and Petrochemical Company Limited            | The Port of Zhapu, Jiaxing Municipality, Zhejiang, 314201   | 100 |
| <b>COLOMBIA</b>   |   |     |
| C.I. Shell Comercializadora Colombia, S.A.S                     | Calle 100 No. 7 - 33, Piso 20, Edificio "Capital Tower", Bogotá, 452  | 100 |
| Shell Colombia S.A.   | Calle 90 No. 19 - 41, Oficina 702- Edificio Quantum, Bogotá, 452  | 100 |
| Unión Temporal Bloque Sin Off 7                                 | Calle 100 No. 7 - 33, Piso 20, Edificio "Capital Tower", Bogotá, 452  | 65  |
| <b>COOK ISLANDS</b>   |   |     |
| Branstone (International) Limited [i]                           | Bermuda House, Tutakimoa Road, Rarotonga  | 100 |
| <b>CÔTE D'IVOIRE</b>  |   |     |
| Cote d'Ivoire GNL   | 14, Blvd Carde, Imm. Les Heveas, Plateau, Abidjan, BP V 194   | 13  |
| <b>CYPRUS</b>   |   |     |
| Rosneft-Shell Caspian Ventures Limited [g]                      | 8 Michalaki Karaoli Street, Anemomylos Office Building, 4th Floor, Office 401, Nicosia, 1095  | 49  |
| <b>CZECH REPUBLIC</b>   |   |     |
| Shell Czech Republic A.S.                                       | Antala Staska 2027/77, Praha 4, 140 00  | 100 |
| <b>DENMARK</b>  |   |     |
| A/S Dansk Shell   | Egeskovvej 265, Fredericia, 7000  | 100 |
| Shell EP Holdingselskab Danmark ApS                             | Midtermolen 3, 4, Copenhagen, 2100  | 100 |
| Shell Olie-og Gasudvinding Danmark Pipelines ApS                | Midtermolen 3, 4, Copenhagen, 2100  | 100 |
| <b>EGYPT</b>  |   |     |
| Alam El Shawish Petroleum Company [b]                           | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958  | 20  |
| Badr Petroleum Company [b]                                      | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958  | 50  |
| Burullus Gas Company S.A.E. [b]                                 | 28 Road 270, Maadi, Cairo   | 25  |
| El Behera Natural Gas Liquefaction Company S.A.E.               | City of Rashid, El Behera Governorate   | 36  |
| IDKU Natural Gas Liquefaction Company S.A.E.                    | City of Rashid, El Behera Governorate   | 38  |
| Obaiyed Petroleum Company [b]                                   | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958  | 50  |

|                                     |  |     |
|-------------------------------------|--|-----|
| Rashid Petroleum Company S.A.E. [b] | 38 Street No. 270, Maadi, Cairo  | 40  |
| Shell Egypt Trading                 | Business View Building, No. 79, 90 Street (South), Fifth Settlement- New Cairo, Cairo, 11835 | 100 |
| Shell Lubricants Egypt              | Business View Building, No. 79, 90 Street (South), Fifth Settlement- New Cairo, Cairo, 11835 | 100 |

| Company by country of incorporation   | Address of registered office   | %   |
|---|--|-----|
| Sitra Petroleum Company [b]   | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958                               | 50  |
| The Egyptian LNG Company S.A.E.   | City of Rashid, El Behera Governorate  | 36  |
| The Egyptian Operating Company for Natural Gas Liquefaction Projects S.A.E. | City of Rashid, El Behera Governorate  | 36  |
| Tiba Petroleum Company [b]  | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958                               | 26  |
| West Sitra Petroleum Company [b]  | 127 Abdel Aziz Fahmy St., Heliopolis, P.O. Box 5958, Cairo, 5958                               | 50  |
| FINLAND   |  |     |
| Shell Aviation Finland Oy   | Ayritie 12 A, Vantaa, 01510  | 100 |
| FRANCE  |  |     |
| Avitair SAS   | Immeuble "Les portes de la Défense", 307 Rue d'Estienne d'Orves, Colombes, 92708               | 100 |
| Groupement d'Exploitation du Dépôt de Réception Chennevières [b] [c]        | Chemin de Livry, Dépôt de Chennevières, Chennevières-lès-Louvres, 95380                        | 11  |
| Groupement Pétrolier Aviation SNC   | Aéroport Roissy Charles de Gaulle, Zone de Frêt 1, 3 Rue des Vignes, Tremblay-en-France, 93290 | 20  |
| Infineum France   | Chemin départemental 54, Berre-L'Etang, 13130  | 50  |
| Service Aviation Paris (G.I.E.)   | Orly Sud No. 144 - Bat. 438, Orly Aerogares, 94541   | 33  |
| Shell Retraites SAS   | Immeuble "Les portes de la Défense", 307 Rue d'Estienne d'Orves, Colombes, 92708               | 100 |
| Société de Gestion Mobilière et Immobilière SAS                             | Immeuble "Les portes de la Défense", 307 Rue d'Estienne d'Orves, Colombes, 92708               | 100 |
| Société des Pétroles Shell SAS  | Immeuble "Les portes de la Défense", 307 Rue d'Estienne d'Orves, Colombes, 92708               | 100 |
| Ste du Pipeline Sud Européen S.A.   | 7-9, Rue des Freres Morane, Paris Cedex 15, 75738  | 21  |
| The New Motion France SAS   | 15 Avenue du Centre, Guyancourt, 78280   | 100 |
| GERMANY   |  |     |
| AGES Maut System GmbH & Co. KG  | Berghausener Straße 96, Langenfeld, 40764  | 25  |
| BEB Erdgas und Erdoel GmbH & Co. KG [b]                                     | Riethorst 12, Hannover, 30659  | 50  |
| BEB Holding GmbH [b]  | Caffamacherreihe 5, Hamburg, 20355   | 50  |
| Carissa Einzelhandel- und Tankstellenservice GmbH & Co. KG                  | Willinghusener Weg 5 D-E, Oststeinbek, 22113   | 100 |
| Carissa Verwaltungsgesellschaft mbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| CRI Catalyst Leuna GmbH   | Am Haupttor, Bau 8322, Leuna, 06237  | 100 |
| CRI Deutschland GmbH  | Am Haupttor, Bau 8322, Leuna, 06237  | 100 |
| Deutsche Infineum GmbH & Co. KG   | Neusser Landstraße 16, Köln, 50735   | 50  |
| Deutsche Shell GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Deutsche Shell Holding GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Deutsche Transalpine Oelleitung GmbH  | Paul Wassermann Str. 3, Munchen, 81829   | 19  |
| Erdoel-Raffinerie Deurag-Nerag GmbH   | Riethorst 12, Hannover, 30659  | 50  |
| euroShell Deutschland GmbH & Co. KG   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| euroShell Deutschland Verwaltungsgesellschaft mbH                           | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| FBG Ferngasbeteiligungsgesellschaft mbH                                     | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| H2 Mobility Deutschland GmbH and Co. KG                                     | Linienstrasse 160, Berlin, 10115   | 28  |
| HPRDS und SPNV Deutschland Oil GmbH & Co. KG                                | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| HPRDS und SPNV Deutschland Verwaltungsges. mbH                              | Suhrenkamp 71 - 77, Hamburg, 22335   | 90  |
| Infineum Deutschland Verwaltungsgesellschaft mbH                            | Neusser Landstraße 16, Köln, 50735   | 50  |
| Mineraloelraffinerie Oberrhein Verwaltungs GmbH                             | DEA-Scholven-Str., Karlsruhe, 76187  | 32  |
| Nord-West Oelleitung GmbH [b]   | Zum Oelhafen 207, Wilhelmshaven, 26384   | 20  |
| Oberrheinische Mineraloelwerke GmbH [b]                                     | DEA-Scholven-Str., Karlsruhe, 76187  | 42  |
| PCK Raffinerie GmbH [b]   | Passower Chaussee 111, Schwedt/Oder, 16303   | 38  |
| Rheinland Kraftstoff GmbH   | Auf dem Schollbruch 24-26, Gelsenkirchen, 45899  | 100 |
| Rhein-Main-Rohrleitungstransportgesellschaft mbH [b]                        | Godorfer Hauptstrasse 186, Köln, 50997   | 63  |
| Shell Algeria Zerafa GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Deutschland Additive GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Deutschland Oil GmbH  | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Energy Deutschland GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Erdgas Beteiligungsgesellschaft mbH                                   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Erdgas Marketing GmbH & Co. KG  | Suhrenkamp 71 - 77, Hamburg, 22335   | 75  |
| Shell Erdoel und Erdgas Exploration GmbH                                    | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration and Development Libya GmbH I                              | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration and Production Colombia GmbH                              | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration and Production Libya GmbH                                 | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration et Production du Maroc GmbH                               | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration New Ventures One GmbH                                     | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Exploration und Produktion Deutschland GmbH                           | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Global Solutions (Deutschland) GmbH                                   | Hohe-Schaar-Straße 36, Hamburg, 21107  | 100 |
| Shell Grundstücksgesellschaft Wesseling GmbH & Co. KG                       | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Hydrogen Deutschland GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Tunisia El Jem GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Tunisia Kairouan GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Tunisia Offshore GmbH   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| Shell Verwaltungsgesellschaft für Erdgasbeteiligungen mbH                   | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| SPNV Deutschland Beteiligungsges. mbH                                       | Suhrenkamp 71 - 77, Hamburg, 22335   | 100 |
| The New Motion Deutschland GmbH   | c/o Mindspace, Friedrichstraße 68, Berlin, 10117   | 100 |



| Company by country of incorporation                           | Address of registered office   | %   |
|---|--|-----|
| <b>GIBRALTAR</b>  |  |     |
| Shell LNG Gibraltar Limited                                   | 57/63 Line Wall Road, P.O. Box 199, Gibraltar  | 51  |
| <b>GREECE</b>   |  |     |
| Attiki Natural Gas Distribution Company S.A.                  | 11 Sofokli Venizelou Ave. & Serron Str, 141 23 Lykovryssi, Athens, 104 47  | 49  |
| Shell & MOH Aviation Fuels A.E.                               | 151 Kifisias Ave., Marousi, Athens, 15124  | 51  |
| <b>GREENLAND</b>  |  |     |
| Shell Greenland A/S   | Aqqusinersuaq 48A, P.O. Box 1728, Nuuk, 3900   | 100 |
| <b>GUAM</b>   |  |     |
| Shell Guam Inc.   | 643 Chalan San Antonio, Suite 100, Tamuning, GU 96911  | 100 |
| <b>HONG KONG</b>  |  |     |
| AFSC Management Limited                                       | 3 Scenic Road, Chek Lap Kok, Lantau  | 11  |
| AFSC Operations Limited                                       | 3 Scenic Road, Chek Lap Kok, Lantau  | 11  |
| AFSC Refuelling Limited                                       | 3 Scenic Road, Chek Lap Kok, Lantau  | 11  |
| Branstone Company Limited                                     | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Fulmart Limited   | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Hong Kong Response Limited                                    | Esso Tsing Yi Terminal, Lot 46 Tsing Yi Road, Tsing Yi Island, New Territories   | 25  |
| Ocean Century Tf Limited [j]                                  | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Shell Developments (HK) Limited [i]                           | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Shell Hong Kong Limited                                       | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Shell Korea Limited   | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| Shell Macau Limited   | 35/F AIA Kowloon Tower, Landmark East, 100 How Ming Street, Kwun Tong (Kowloon)  | 100 |
| <b>HUNGARY</b>  |  |     |
| Shell Hungary Trading close Company Limited by shares         | Bocskai út 134-146., Budapest, 1113  | 100 |
| <b>INDIA</b>  |  |     |
| BG India Energy Private Limited                               | 3-C World Trade Tower, New Barakhamba Lane, New Delhi, 110001  | 100 |
| BG India Energy Services Private Limited                      | 3-C World Trade Tower, New Barakhamba Lane, New Delhi, 110001  | 100 |
| BG India Energy Solutions Private Limited                     | 3-C World Trade Tower, New Barakhamba Lane, New Delhi, 110001  | 100 |
| BG LNG Regas India Private Limited                            | 3-C World Trade Tower, New Barakhamba Lane, New Delhi, 110001  | 100 |
| Hazira LNG Private Limited                                    | 101-103 Abhijeet-II, Mithakhali Circle, Ahmedabad 380 006, Gujarat, 380006   | 74  |
| Hazira Port Private Limited                                   | 101-103 Abhijeet-II, Mithakhali Circle, Ahmedabad 380 006, Gujarat, 380006   | 74  |
| Mahanagar Gas Limited   | MGL House, G-33 Block, Bandra-Kurla Complex, Bandra (East), Mumbai, 400051   | 32  |
| Pennzoil Quaker State India Limited                           | Plot No. T-5, MIDC, Talaja Industrial Area, Tal-Panvel, Raigad District, Maharashtra (Mumbai), 410208                    | 100 |
| Shell Energy Marketing and Trading India Private Limited [b]  | Ikeva Venture and Knowledge Advisory, Services Pvt Ltd, Level 1, MB Towers, Road no 10, Banjara Hills, Hyderabad, 500034 | 100 |
| Shell India Markets Private Limited                           | 2nd floor, Campus 4A, RMZ Millenia Business Park, 143 Dr MG Road, Kandanchavady, Perungudi, Chennai, 600096              | 100 |
| Shell MRPL Aviation Fuels and Services Limited                | 102, Prestige Sigma, Vittal Mallya Road, Bangalore, 560001   | 50  |
| <b>INDONESIA</b>  |  |     |
| PT. Gresik Distribution Terminal                              | Talavera Office Park 22-26th Floor, Jl. Letjen. TB Simatupang Kav. 22-26, Jakarta Selatan, Jakarta, 12430                | 100 |
| PT. Shell Indonesia   | Talavera Office Park 22-26th Floor, Jl. Letjen. TB Simatupang Kav. 22-26, Jakarta Selatan, Jakarta, 12430                | 100 |
| PT. Shell Manufacturing Indonesia                             | Talavera Office Park 22-26th Floor, Jl. Letjen. TB Simatupang Kav. 22-26, Jakarta Selatan, Jakarta, 12430                | 100 |
| PT. Shell Solar Indonesia                                     | Talavera Office Park 22-26th Floor, Jl. Letjen. TB Simatupang Kav. 22-26, Jakarta Selatan, Jakarta, 12430                | 100 |
| <b>IRAQ</b>   |  |     |
| Basrah Gas Company  | Khor Al Zubair, Basrah   | 44  |
| <b>IRELAND</b>  |  |     |
| Asiatic Petroleum Company (Dublin) Limited                    | Embassy House, Herbert Park Lane, Ballsbridge, Dublin, D04 H6Y0  | 100 |
| Irish Shell Trust Designated Activity Company                 | Embassy House, Herbert Park Lane, Ballsbridge, Dublin, D04 H6Y0  | 100 |
| Shell and Topaz Aviation Ireland Limited                      | Suite 7 Northwood House, Northwood Business Park, Santry, Dublin, 9  | 50  |
| Shell E&P Ireland Limited                                     | Embassy House, Herbert Park Lane, Ballsbridge, Dublin, D04 H6Y0  | 100 |
| <b>ISLE OF MAN</b>  |  |     |
| Petrolon Europe Limited                                       | Fort Anne, Douglas, IM1 5PD  | 100 |
| Petrolon International Limited                                | Fort Anne, Douglas, IM1 5PD  | 100 |
| Shell Marine Personnel (I.O.M.) Limited                       | Euromanx House, Freeport, Ballasalla, IM9 2AP  | 100 |
| Shell Ship Management Limited                                 | Euromanx House, Freeport, Ballasalla, IM9 2AP  | 100 |
| <b>ITALY</b>  |  |     |
| Alle S.R.L.   | Via Vittor Pisani 16, Milano, 20124  | 100 |
| Aquila S.p.A.   | Via Vittor Pisani 16, Milano, 20124  | 100 |
| BG Italia Power S.p.A.  | Via Tortona 25, Milano, 20144  | 100 |
| Brindisi LNG S.p.A.   | Via Tortona 25, Milano, 20144  | 100 |
| Infineum Italia S.R.L.  | Strada di Scorrimento 2, Vado Ligure (SA), 17047   | 50  |
| Shell Energy Italia S.R.L.                                    | Via Vittor Pisani 16, Milano, 20124  | 100 |
| Shell International Exploration and Development Italia S.p.A. | Piazza dell'Indipendenza 11/B, Rome, 00185   | 100 |
| Shell Italia E&P S.p.A.                                       | Piazza dell'Indipendenza 11/B, Rome, 00185   | 100 |
| Shell Italia Holding S.p.A.                                   | Via Vittor Pisani 16, Milano, 20124  | 100 |
| Shell Italia Oil Products S.R.L.                              | Via Vittor Pisani 16, Milano, 20124  | 100 |
| Societa Italiana per l'Oleodotto Transalpino S.p.A.           | Via Muggia #1, San Dorligo della Valle, Trieste, 34147   | 19  |
| Societa' Oleodotti Meridionali S.p.A.                         | Via Emilia 1, San Donato Milanese, 20097   | 30  |
| <b>JAPAN</b>  |  |     |



| Company by country of incorporation                    | Address of registered office  | %   |
|--|---|-----|
| Japan Chemtech Ltd.                                    | 3-2 Daiba 2-Chome, Minato-Ku, Tokyo, 135-8074   | 30  |
| Sakhalin LNG Services Company Ltd.                     | 2-3, Kanda, Awaji-cho, Chiyoda-ku, Tokyo, 101-0063  | 50  |
| Shell Chemicals Japan Ltd.                             | 3-2 Daiba 2-Chome, Minato-Ku, Tokyo, 135-8074   | 100 |
| Shell Japan Limited                                    | 16F Pacific Century Place, 1-11-1, Marunouchi, Chiyoda-ku, Tokyo, 100-6216  | 100 |
| Shell Japan Trading Ltd.                               | 3-2 Daiba 2-Chome, Minato-Ku, Tokyo, 135-8074   | 53  |
| <b>JERSEY</b>  |   |     |
| Morzine Limited  | Ogier House, The Esplanade, St. Helier, JE4 9WG   | 33  |
| Shell Service Station Properties Limited               | Queensway House, Hilgrove Street, St. Helier, JE1 1ES   | 100 |
| <b>LUXEMBOURG</b>                                      |   |     |
| Shell Finance Luxembourg Sarl                          | 7, Rue de l'Industrie, Bertrange, Luxembourg, L-8069  | 100 |
| Shell Luxembourgeoise Sarl                             | 7, Rue de l'Industrie, Bertrange, Luxembourg, L-8005  | 100 |
| Shell Treasury Luxembourg Sarl                         | 7, Rue de l'Industrie, Bertrange, Luxembourg, L-8069  | 100 |
| <b>MACAU</b>   |   |     |
| Shell Macau Petroleum Company Limited                  | 876 Avenida da Amizade, Edificio Marina Gardens, Room 310, 3rd Floor  | 100 |
| <b>MALAYSIA</b>  |   |     |
| Bonuskad Loyalty Sdn. Bhd. [i]                         | Level 8, Symphony House, Block D13, Pusat Dagangan Dana 1, Jalan PJU 1A/46, Petaling Jaya/Selangor Darul Ehsan, 47301 | 33  |
| IOT Management Sdn. Bhd.                               | Lot 7689 and Lot 7690, Section 64, Kuching Town Land District, Jalan Pending, Kuching, Sarawak, 93450                 | 7   |
| Kebangunan Petroleum Operating Company Sdn. Bhd. [b]   | Suite 13.03, 13 Floor, Menara Tan & Tan, 207 Tun Razak, Kuala Lumpur/Federal Territory, 50400                         | 30  |
| P S Pipeline Sendirian Berhad                          | Level 30, Tower 1, Petronas Twin Towers, KLCC, Kuala Lumpur/Federal Territory, 50088                                  | 50  |
| P S Terminal Sendirian Berhad                          | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 35  |
| Pertini Vista Sdn. Bhd.                                | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Provista Ventures Sdn. Bhd.                            | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Sarawak Shell Berhad                                   | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell Business Service Centre Sdn. Bhd.                | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell Global Solutions (Malaysia) Sdn. Bhd.            | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell Malaysia Trading Sendirian Berhad                | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell MDS (Malaysia) Sendirian Berhad                  | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 72  |
| Shell New Ventures Malaysia Sdn. Bhd. [i]              | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell People Services Asia Sdn. Bhd.                   | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell Sabah Selatan Sendirian Berhad                   | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 100 |
| Shell Timur Sdn. Bhd.                                  | Lot 6.05, Level 6, KPMG Tower, 8 First Avenue Bandar Utama, Petaling Jaya/Selangor Darul Ehsan, 47800                 | 70  |
| Shell Treasury Malaysia (L) Limited                    | Kensington Gardens, No. U1317, Lot 7616, Jalan Jumidar Buyong, Labuan F.T., 87000                                     | 100 |
| Tanjung Manis Oil Terminal Management Sdn. Bhd.        | Lot 7689 and Lot 7690, Section 64, Kuching Town Land District, Jalan Pending, Kuching, Sarawak, 93450                 | 14  |
| <b>MAURITIUS</b>                                       |   |     |
| BG Mauritius LNG Holdings Ltd                          | 6th Floor, Tower A, 1 Cybercity, Ebene, 72201   | 100 |
| BG Mumbai Holdings Limited                             | 6th Floor, Tower A, 1 Cybercity, Ebene, 72201   | 100 |
| Pennzoil Products International Company                | 33 Edith Cavell Street, Port Louis, 11324   | 100 |
| <b>MEXICO</b>  |   |     |
| BG Group Mexico Exploration, S.A. de C.V.              | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| BG Group Mexico Services, S.A. de C.V.                 | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| Gas Del Litoral, S. de R.L. de C.V.                    | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 75  |
| Shell Exploración y Extracción de México, S.A. de C.V. | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| Shell México Gas Natural, S. de R.L. de C.V.           | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| Shell México, S.A. de C.V.                             | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| Shell Servicios México, S.A. de C.V.                   | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| Shell Trading México, S. de R.L. de C.V.               | Paseo de las Palmas 425, Piso 3, Colonia Lomas de Chapultepec, Ciudad de México, 11000                                | 100 |
| <b>MONGOLIA</b>  |   |     |
| BGMEP, LLC   | Suite 403, Floor 4, New Century Plaza, Chinggis Avenue, 1st Khoroo, Sukhbaatar, Ulaanbaatar                           | 100 |
| <b>NETHERLANDS</b>                                     |   |     |
| Amsterdam Schiphol Pijpleiding Beheer B.V.             | Amsterdamseweg 55, 1182 GP Amstelveen, P.O. Box 75650, Luchthaven Schiphol, 1118 ZS                                   | 40  |
| Attiki Gas B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| B.R.E. B.V.  | Lelystad, Deventer, 7425 SB   | 100 |
| B.V. Dordtsche Petroleum Maatschappij                  | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| B.V. Petroleum Assurantie Maatschappij                 | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Atlantic Holdings B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Brazil E&P 12 B.V.                              | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Brazil Holdings B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Brazilian Investment B.V.                       | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Global Holdings B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas International B.V.                              | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas International Holdings B.V.                     | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Netherlands Holdings B.V.                       | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BG Gas Sao Paulo Investments B.V.                      | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| BJS Oil Operations B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 80  |
| BJSA Exploration and Production B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| Caspi Meruerty Operating Company B.V.                  | Prins Bernhardplein 200, 1097JB Amsterdam, Amsterdam, 1077 XX   | 40  |
| Chosun Shell B.V.                                      | Carel van Bylandtlaan 30, The Hague, 2596 HR  | 100 |
| Cicerone Holding B.V.                                  | Herikerbergweg 238, Amsterdam, 1101 CM  | 51  |



| Company by country of incorporation              | Address of registered office                                  | %   |
|--|---|-----|
| ELLBA B.V. [b]                                   | Vondelingenweg 601, Vondelingenplaat, Rotterdam, 3196 KK      | 50  |
| ELLBA C.V. [b] [d]                               | Vondelingenweg 601, Vondelingenplaat, Rotterdam, 3196 KK      | 50  |
| Euroshell Cards B.V.                             | Weena 70, Rotterdam, 3012 CM                                  | 100 |
| Gasterra B.V.                                    | P.O. Box 477, Groningen, 9700 AL                              | 25  |
| Guara B.V.                                       | Weena 722, Rotterdam, 3014 DA                                 | 30  |
| Infineum Holdings B.V.                           | Herikerbergweg 238, Amsterdam, 1101 CM                        | 50  |
| Integral Investments B.V.                        | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Jordan Oil Shale Company B.V.                    | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Karachaganak Petroleum Operating B.V.            | Strawinskylaan 1725, Amsterdam, 1077 XX                       | 29  |
| Libra Oil & Gas B.V.                             | Weena 762, Rotterdam, 3014 DA                                 | 20  |
| LNG Shipping Operation Services Netherlands B.V. | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Loyalty Management Netherlands B.V.              | Polaris Avenue 81, P.O. Box 2047, 2130 GE, Hoofddorp, 2132 JH | 40  |
| Maasvlakte Olie Terminal C.V. [d]                | Europaweg 975, Maasvlakte, Rotterdam, 3199 LC                 | 16  |
| Multi Tank Card B.V.                             | Antareslaan 39, P.O. Box 3068, 2130 KB, Hoofddorp, 2132 JE    | 30  |
| N.V. Rotterdam-Rijn Pijpleiding Maatschappij [b] | Butaanweg 215, Vondelingplaat-Rotterdam, 3196 KC              | 56  |
| Nederlandse Aardolie Maatschappij B.V.           | Schepersmaat 2, Assen, 9405 TA                                | 50  |
| Netherlands Alng Holding Company B.V.            | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Noordzeewind B.V.                                | 2e Havenstraat 5b, IJmuiden, 1976 CE                          | 50  |
| Noordzeewind C.V. [d]                            | 2e Havenstraat 5b, IJmuiden, 1976 CE                          | 50  |
| Paqell B.V.                                      | Tjalke de Boerstrjitte 24, Balk, 8561 EL                      | 50  |
| Raffinaderij Shell Mersin N.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| RESCO B.V.                                       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Rub' Al-Khali Gas Development B.V.               | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Salym Petroleum Development N.V. [b]             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 50  |
| Shell Abu Dhabi B.V.                             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Additives Holdings (I) B.V.                | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Additives Holdings (II) B.V.               | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell and Vivo Lubricants B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 50  |
| Shell Asset Management Company B.V.              | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Bab Gas Development B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Brazil Holding B.V.                        | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Business Development Central Asia B.V.     | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Caspian B.V.                               | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Caspian Pipeline Holdings B.V.             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Chemicals Europe B.V.                      | Weena 70, Rotterdam, 3012 CM                                  | 100 |
| Shell Chemicals Ventures B.V. [k]                | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell China B.V.                                 | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell China Holdings B.V.                        | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Deepwater Tanzania B.V.                    | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Development Iran B.V.                      | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Downstream Services International B.V.     | Weena 70, Rotterdam, 3012 CM                                  | 100 |
| Shell E and P Offshore Services B.V.             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Egypt N.V. [e]                             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Energy Europe B.V.                         | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Holdings (EE&ME) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Middle East Holdings B.V.               | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Russia Investments (III) B.V.           | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Russia Investments (V) B.V.             | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Somalia B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell EP Wells Equipment Services B.V.           | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (78) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (79) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (82) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (83) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (84) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (85) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (86) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (87) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (88) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (89) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (90) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (91) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (XL) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (LI) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (LVII) B.V.     | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (LIX) B.V.      | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (LX) B.V.       | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |
| Shell Exploration and Production (LXI) B.V.      | Carel van Bylandtlaan 30, The Hague, 2596 HR                  | 100 |



| Company by country of incorporation                            | Address of registered office                             | %   |
|--|--|-----|
| Shell Exploration and Production (LXIII) B.V.                  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXIV) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXV) B.V.                    | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXVI) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXVII) B.V.                  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXXI) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXXIV) B.V.                  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production (LXXV) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Holdings B.V.                 | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Investments B.V.              | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Services (RF) B.V.            | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production South Africa B.V.             | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Ukraine I B.V.                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Ukraine Investments (I) B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Ukraine Investments (II) B.V. | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration and Production Ukraine Investments (IV) B.V. | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration B.V.   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration Company (RF) B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration Company (West) B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration Company B.V.                                 | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Exploration Venture Services B.V.                        | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Finance (Netherlands) B.V.                               | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas & Power Developments B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas (LPG) Holdings B.V.                                  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas B.V.   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas Iraq B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas Nigeria B.V.   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Gas Venezuela B.V.                                       | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Generating (Holding) B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Global Solutions (Eastern Europe) B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Global Solutions International B.V.                      | Kessler Park 1, Rijswijk, 2288 GS                        | 100 |
| Shell Global Solutions Services B.V.                           | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Information Technology International B.V.                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell International B.V.                                       | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell International Exploration and Production B.V.            | Carel van Bylandtlaan 16, The Hague, 2596 HR             | 100 |
| Shell International Finance B.V. [a]                           | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Internationale Research Maatschappij B.V.                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Internet Ventures B.V.                                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Iraq B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Iraq Petroleum Development B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Iraq Services B.V.                                       | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Kazakhstan B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Kazakhstan Development B.V.                              | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Kuwait Exploration and Production B.V.                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell LNG Port Spain B.V.                                      | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Lubricants Supply Company B.V.                           | Weena 70, Rotterdam, 3012 CM                             | 100 |
| Shell Manufacturing Services B.V.                              | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Mozambique B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell MSPO 2 Holding B.V.                                      | Vondelingenweg 601, Vondelingenplaat, Rotterdam, 3196 KK | 100 |
| Shell Namibia Upstream B.V.                                    | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Nanhai B.V.  | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Nederland B.V.   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Nederland Chemie B.V. [j]                                | Chemieweg 25, P.O. Box 6060, Moerdijk, 4780 LN           | 100 |
| Shell Nederland Raffinaderij B.V.                              | Vondelingenweg 601, Vondelingenplaat, Rotterdam, 3196 KK | 100 |
| Shell Nederland Verkoopmaatschappij B.V.                       | Weena 70, Rotterdam, 3012 CM                             | 100 |
| Shell Nusantara Trading B.V.                                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Offshore (Personnel) Services B.V.                       | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Offshore North Gabon B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Offshore Services B.V.                                   | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell OKLNG Holdings B.V.                                      | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Olie - OG Gasudvinding Danmark B.V.                      | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Olie OG Gas Holding B.V. [k]                             | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Oman Exploration and Production B.V.                     | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Overseas Investments B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Pensioenbureau Nederland B.V.                            | Postbus 157, The Hague, 2501 CD                          | 100 |
| Shell Petroleum N.V. [a]                                       | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Philippines Exploration B.V.                             | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |
| Shell Project Development (VIII) B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR             | 100 |



| Company by country of incorporation                        | Address of registered office   | %   |
|--|--|-----|
| Shell Sakhalin Holdings B.V.                               | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Sakhalin Services B.V.                               | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Salym Development B.V.                               | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Services Oman B.V.                                   | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Shared Services (Asia) B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell South Africa Upstream B.V.                           | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell TapUp B.V.   | Hofplein 20, Rotterdam, 3032 AC  | 100 |
| Shell Technology Ventures B.V.                             | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Technology Ventures Fund 1 B.V.                      | Teleportboulevard 140, Amsterdam, 1043 EJ  | 52  |
| Shell Technology Ventures Investments B.V.                 | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Trademark Management B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Trading Rotterdam B.V.                               | Weena 70, Rotterdam, 3012 CM   | 100 |
| Shell Trading Russia B.V.                                  | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Upstream Albania B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Upstream Development B.V.                            | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Upstream Indonesia Services B.V.                     | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Upstream Spain B.V.                                  | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Upstream Turkey B.V.                                 | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Western LNG B.V.                                     | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Windenergy Netherlands B.V.                          | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Shell Windenergy NZW I B.V.                                | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 100 |
| Snijders Olie B.V.   | Weena 70, Rotterdam, 3012 CM   | 100 |
| Syria Shell Petroleum Development B.V. [j]                 | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 65  |
| Tamba B.V.   | Carel van Bylandtlaan 30, The Hague, 2596 HR   | 50  |
| Tankstation Exploitatie Maatschappij Holding B.V.          | Weena 70, Rotterdam, 3012 CM   | 100 |
| The New Motion B.V.  | Rigakade 20, Amsterdam, 1013 BC  | 100 |
| Tupi B.V.  | Wilhelminatoren, Wilhelminaplein 14, Rotterdam, 3072                                 | 25  |
| Waalbrug Exploitatie Maatschappij B.V.                     | Henri Bessenbruggestraat 9, Deventer, 7425 SB  | 100 |
| Zeolyst C.V.   | Oosterhorn 36, Farmsum, 9936 HD  | 50  |
| NEW ZEALAND  |  |     |
| Energy Finance NZ Limited                                  | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Energy Holdings Offshore Limited                           | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Energy Infrastructure Limited                              | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Energy Petroleum Holdings Limited                          | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Energy Petroleum Investments Limited [i]                   | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Energy Petroleum Taranaki Limited                          | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Maui Development Limited                                   | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 84  |
| Shell (Petroleum Mining) Company Limited                   | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell Energy Asia Limited                                  | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell Exploration NZ Ltd [i]                               | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell GSB Limited  | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell Investments NZ Limited                               | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell New Zealand (2011) Limited [i]                       | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell New Zealand Pensions Limited                         | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Shell Taranaki Limited                                     | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Southern Petroleum No Liability                            | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| Taranaki Offshore Petroleum Company of New Zealand         | Level 10, ASB Tower, 2 Hunter Street, P.O. Box 1873, Wellington, 6011                | 100 |
| NICARAGUA  |  |     |
| Compañía Química Nicaragüense S.A.                         | Hospital Militar, 1C al Norte 10, VRS Oeste Cas Bolonia, Managua                     | 100 |
| NIGERIA  |  |     |
| All on Partnerships for Energy Access Limited by Guarantee | 44 Bourdillon Road, Ikoyi, Lagos   | 100 |
| BG Exploration and Production Nigeria Limited              | Eko Nominees Limited, 252E Muri Okunola Street, Victoria Island, Lagos               | 100 |
| BG Upstream A Nigeria Limited                              | Eko Nominees Limited, 252E Muri Okunola Street, Victoria Island, Lagos               | 100 |
| Delta Business Development Limited                         | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Nigeria LNG Limited  | Corporate Office, Intels Aba Road Estate, Km16 Aba Expressway, Port Harcourt, 500211 | 26  |
| NLNG Ship Manning Limited                                  | Corporate Office, Intels Aba Road Estate, Km16 Aba Expressway, Port Harcourt, 500211 | 20  |
| Shell Exploration and Production Africa Limited            | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Closed Pension Fund Administrator Ltd        | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration and Production Company Ltd       | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration and Production Delta Limited     | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration and Production Echo Limited      | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration Properties Alpha Limited         | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration Properties Beta Limited          | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Exploration Properties Charlie Limited       | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Gas Ltd (SNG)                                | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Infrastructure Development Limited           | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Offshore Prospecting Limited                 | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |
| Shell Nigeria Oil Products Limited (SNOP)                  | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos                                      | 100 |



| Company by country of incorporation                               | Address of registered office  | %   |
|---|---|-----|
| Shell Nigeria Upstream Ventures Limited                           | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos   | 100 |
| Shell Thrift & Loan Fund Trustees Nig Ltd                         | Freeman House, 21/22 Marina, P.M.B. 2418, Lagos   | 99  |
| The Shell Petroleum Development Company of Nigeria Limited        | Shell Industrial Area, Port Harcourt, Rivers State, P.O. Box 263, Port Harcourt   | 100 |
| <b>NORWAY</b>   |   |     |
| A/S Norske Shell  | Tankvegen 1, Tananger, 4056   | 100 |
| Aviation Fuelling Services Norway AS                              | Karenslyst Allé 2, Oslo, 0278   | 50  |
| Gasnor AS   | Helganesvegen 59, Karmoy, 4262 Avalsnes   | 100 |
| Ormen Lange Eiendom DA  | Nyhamna, Aukra, 6480  | 18  |
| Shell Marine Products AS  | Karenslyst Allé 2, Oslo, 0278   | 100 |
| Vestprosess DA  | Forusbeen 50, Stavanger, 4035   | 8   |
| <b>OMAN</b>   |   |     |
| Oman LNG LLC  | P.O. Box 560, Mina Al Fahal, Muscat, 116  | 30  |
| Petroleum Development Oman LLC                                    | P.O. Box 81, Mina Al Fahal, Muscat, 113   | 34  |
| Shell Development Oman LLC  | P.O. Box 74, Mina Al Fahal, Muscat, 116   | 100 |
| Shell Oman Marketing Company SAOG                                 | P.O. Box 38, Mina Al Fahal, Muscat, 116   | 49  |
| <b>PAKISTAN</b>   |   |     |
| Pak Arab Pipeline Company Limited                                 | House No. 2-B, Nazimuddin Road, F-8/1, Islamabad, 75400   | 20  |
| Pakistan Refinery Limited   | Korangi Creek Road, P.O. Box 4612, Karachi, 75190   | 32  |
| Shell Pakistan Limited  | Shell House, 6 Ch. Khaliqzaman Road, Karachi, 75530   | 76  |
| <b>PERU</b>   |   |     |
| Shell GNL Peru S.A.C.   | Calle Dean Valdivia 111, Oficina 802, San Isidro, Lima, Lima 27   | 100 |
| Shell Operaciones Peru S.A.C.                                     | Calle Dean Valdivia 111, Oficina 802, San Isidro, Lima, Lima 27   | 100 |
| <b>PHILIPPINES</b>  |   |     |
| Bonifacio Gas Corporation   | 2nd Floor, Bonifacio Tech. Center, 31st Street cor. 2nd Avenue, Crescent Park West, Bonifacio Global City, Taguig, Metro Manila | 24  |
| First Philippine Industrial Corporation                           | 6F, Rockwell Business Center Tower, Ortigas Avenue, Pasig City, 1605  | 40  |
| Kamayon Realty Corporation  | NDC Bldg., 116 Tordesillas St., Salcedo Village, Makati City, Metro Manila, 1227  | 22  |
| Pilipinas Shell Petroleum Corporation                             | Shellhouse, 156 Valero Street, Salcedo Village, Brgy. Bel-Air, Makati City, Metro Manila, 1227                                  | 55  |
| Shell Chemicals Philippines, Inc.                                 | Shellhouse, 156 Valero Street, Salcedo Village, Brgy. Bel-Air, Makati City, Metro Manila, 1227                                  | 100 |
| Shell Gas and Energy Philippines Corporation                      | Shellhouse, 156 Valero Street, Salcedo Village, Brgy. Bel-Air, Makati City, Metro Manila, 1227                                  | 100 |
| Shell Gas Trading (Asia Pacific), Inc.                            | Subic Bay Free Port Zone, Olangapo City, 2200   | 100 |
| Shell Solar Philippines Corporation                               | Shellhouse, 156 Valero Street, Salcedo Village, Brgy. Bel-Air, Makati City, Metro Manila, 1227                                  | 100 |
| Tabangao Realty, Inc.   | Shellhouse, 156 Valero Street, Salcedo Village, Brgy. Bel-Air, Makati City, Metro Manila, 1227                                  | 40  |
| <b>POLAND</b>   |   |     |
| Shell Polska Sp. z o.o.   | ul. Bitwy Warszawskiej 1920 r. nr 7A, Warsaw, 02-366  | 100 |
| <b>PORTUGAL</b>   |   |     |
| Shell Madeira Praia Formosa                                       | Av. dos Combatentes da Grande Guerra nº 17, Freguesia de S. Juliao, Setúbal, 2900-329   | 100 |
| <b>PUERTO RICO</b>  |   |     |
| BG Puerto Rico, Inc.  | 403 Munoz Rivera Avenue, (Hato Rey), San Juan, 00918-3345   | 100 |
| Station Managers of Puerto Rico, Inc.                             | P.O. Box 186, Yabucoa, PR 00767-0186  | 100 |
| <b>QATAR</b>  |   |     |
| Qatar Liquefied Gas Company Limited (4)                           | P.O. Box 22666, Doha  | 30  |
| Qatar Shell Research & Technology Centre QSTP-LLC                 | Qatar Science & Technology Park Tech1, Office 101, P.O. Box 3747, Doha  | 100 |
| Qatar Shell Service Company W.L.L.                                | Al Mirqab Tower, West Bay, P.O. Box 3747, Doha  | 100 |
| <b>RUSSIA</b>   |   |     |
| Khanty-Mansiysk Petroleum Alliance Closed Joint Stock Company [b] | 24 A Yakubovicha ul., Saint Petersburg, 190000  | 50  |
| Limited Liability Company "Shell Neftegaz Development (IV)"       | Novinsky blvd, 31, Moscow, 123242   | 100 |
| Limited Liability Company "Shell Neftegaz Development (V)"        | Novinsky blvd, 31, Moscow, 123242   | 100 |
| Limited Liability Company "Shell Neft"                            | 24 Bld D Smolnaya street, Moscow, 125445  | 100 |
| Syriaga Neftegaz Development                                      | Novinsky blvd, 31, Moscow, 123242   | 100 |
| <b>SAINT KITTS AND NEVIS</b>                                      |   |     |
| Shell Oil & Gas (Malaysia) LLC                                    | Morning Star Holdings Limited, Main Street, Suite 556, Charlestown, Nevis, West Indies  | 90  |
| <b>SAINT LUCIA</b>  |   |     |
| BG Atlantic 1 Holdings Limited                                    | Mercury Court, Choc Estate, Castries  | 100 |
| BG Atlantic 2/3 Holdings Limited                                  | Mercury Court, Choc Estate, Castries  | 100 |
| BG Atlantic 4 Holdings Limited                                    | Mercury Court, Choc Estate, Castries  | 100 |
| BG Central Holdings Limited                                       | Mercury Court, Choc Estate, Castries  | 100 |
| BG West Indies No. 2 Limited                                      | Mercury Court, Choc Estate, Castries  | 100 |
| <b>SAUDI ARABIA</b>   |   |     |
| Al Jomaih and Shell Lubricating Oil Co.Ltd.                       | P.O. Box 41467, Riyadh, 11521   | 50  |
| Peninsular Aviation Services Company Limited                      | P.O. Box 6369, Jeddah, 21442  | 25  |
| Saudi Aramco Shell Refinery Company [b]                           | P.O. Box 10088, Madinat Al-Jubail Al-Sinaiyah, Al Jubail, 31961   | 50  |
| Shell Global Solutions Saudi Arabia LLC                           | P.O. Box 16996, Riyadh, 11474   | 100 |
| <b>SINGAPORE</b>  |   |     |
| BG Asia Pacific Holdings Pte. Limited                             | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588  | 100 |
| BG Asia Pacific Services Pte. Ltd.                                | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588  | 100 |
| BG Exploration & Production Myanmar Pte. Ltd.                     | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588  | 100 |

BG Insurance Company (Singapore) Pte Ltd  
BG Myanmar Pte. Ltd.

10 Collyer Quay, #10-01 Ocean Financial Centre, Singapore, 049315  
The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588

100  
100

| Company by country of incorporation                             | Address of registered office   | %   |
|---|--|-----|
| BG Oil Marketing Pte Ltd  | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| CRI/Criterion Marketing Asia Pacific Pte Ltd                    | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Ellba Eastern (Pte) Ltd   | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Fuelng Pte. Ltd   | 50 Gul Road, Singapore, 629351   | 50  |
| Infineum Singapore Pte Ltd                                      | 31 International Business Park, #04-08, Creative Resource, Singapore, 609921     | 50  |
| QPI and Shell Petrochemicals (Singapore) Pte Ltd                | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 51  |
| Shell Chemicals Seraya Pte. Ltd.                                | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Eastern Petroleum (Pte) Ltd [i]                           | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Eastern Trading (Pte) Ltd [i]                             | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Gas Marketing Pte. Ltd.                                   | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell India Ventures Pte. Ltd.                                  | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Integrated Gas Thailand Pte.Limited                       | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell International Shipping Services (Pte) Ltd                 | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Myanmar Energy Pte. Ltd.                                  | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Myanmar Petroleum Pte. Ltd.                               | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Pulau Moa Pte Ltd   | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Seraya Pioneer (Pte) Ltd                                  | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Singapore Trustees (Pte) Ltd                              | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Tankers (Singapore) Private Limited                       | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Shell Treasury Centre East (Pte) Ltd                            | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 100 |
| Singapore Lube Park Pte. Ltd. [b]                               | The Metropolis Tower 1, 9 North Buona Vista Drive, #07-01, Singapore, 138588     | 44  |
| Sirius Well Manufacturing Services Pte. Ltd.                    | 83 Clemenceau Avenue #04-00, Singapore, 239920                                   | 50  |
| SLOVAKIA  |  |     |
| SHELL Slovakia s.r.o.   | Einsteinova 23, Bratislava, 851 01   | 100 |
| SLOVENIA  |  |     |
| Shell Adria d.o.o.  | Bravnicarjeva ulica 13, Ljubljana, 1000  | 100 |
| SOUTH AFRICA  |  |     |
| Bituguard Southern Africa (Pty) Ltd                             | Twickenham, The Campus, 57 Sloan Street, Epsom Downs, Bryanston, 2021            | 36  |
| Blendcor (Pty) Ltd. [b]   | Honshu Road, Durban, 4001  | 36  |
| Sekelo Oil Trading (Pty) Limited                                | Suite OE/1, The Nautica, The Waterclub, Beach Road, Granger Bay, Cape Town, 8001 | 43  |
| Shell & BP South African Petroleum Refineries (Pty) Limited [b] | Reunion, Durban, 4001  | 36  |
| Shell Downstream South Africa (Pty) Ltd                         | Twickenham, The Campus, 57 Sloan Street, Epsom Downs, Bryanston, 2021            | 72  |
| Shell Global Customer Services Centre CA                        | Media City, 10 Rua Vasco Da Gama, Cape Town, 8001                                | 100 |
| Shell South Africa Energy (Pty) Ltd                             | Twickenham, The Campus, 57 Sloan Street, Epsom Downs, Bryanston, 2021            | 100 |
| Shell South Africa Exploration (Pty) Limited                    | Twickenham, The Campus, 57 Sloan Street, Epsom Downs, Bryanston, 2021            | 100 |
| Shell South Africa Holdings (Pty) Ltd                           | Twickenham, The Campus, 57 Sloan Street, Epsom Downs, Bryanston, 2021            | 100 |
| STISA (Pty) Limited   | Suite OE/2, The Nautica, The Waterclub, Beach Road, Granger Bay, Cape Town, 8001 | 72  |
| SOUTH KOREA   |  |     |
| Hankook Shell Oil Company                                       | No 250, Sinsun-ro, Nam-gu, Busan, 48561  | 54  |
| Hyundai and Shell Base Oil Co., Ltd                             | 640-6, Daejuk-ri, Daesan-eup, Seosan-shi, Chungchongnam-do, 356-713              | 40  |
| SPAIN   |  |     |
| BG Energy Iberian Holdings, S.L.                                | Paseo de la Castellana, 257-6º, Madrid, 28046                                    | 100 |
| Shell & Disa Aviation España, S.L.                              | Rio Bullaque, 2, Madrid, 28034   | 50  |
| Shell España, S.A.  | Paseo de la Castellana, 257-6º, Madrid, 28046                                    | 100 |
| Shell Spain LNG, S.A.U.   | Paseo de la Castellana, 257-6º, Madrid, 28046                                    | 100 |
| SUDAN   |  |     |
| Shell (Sudan) Petroleum Development Company Limited             | Shell House, P.O. Box 320, Khartoum  | 100 |
| SWEDEN  |  |     |
| A Flygbranslehanterning Aktieföretag                            | P.O. Box 135, Stockholm-Arlanda, 190 46  | 25  |
| BG International Services AB                                    | Deloitte, P.O. Box 450, Ostersund, 831 26  | 100 |
| Gothenburgh Fuelling Company AB                                 | P.O. Box 2154, Gothenburg, 438 14  | 33  |
| Malmö Fuelling Services AB                                      | Sturup Flygplats, P.O. Box 22, Malmö, 230 32                                     | 33  |
| Shell Aviation Sweden AB  | Gustavslundsvägen 22, Bromma, 16751  | 100 |
| Stockholm Fuelling Services AB                                  | P.O. Box 85, Stockholm-Arlanda, 190 45   | 25  |
| SWITZERLAND   |  |     |
| Bully 1 (Switzerland) GmbH                                      | Dorfstrasse 19a, Baar, 6340  | 50  |
| Bully 2 (Switzerland) GmbH                                      | Dorfstrasse 19a, Baar, 6340  | 50  |
| Saraco SA   | Route de Pré-Bois 17, Cointrin, 1216   | 20  |
| Shell (Switzerland) AG  | Baarermatte, Baar, 6340  | 100 |
| Shell Brands International AG                                   | Baarermatte, Baar, 6340  | 100 |
| Shell Corporate Services Switzerland AG                         | Baarermatte, Baar, 6340  | 100 |
| Shell Finance Switzerland AG                                    | Baarermatte, Baar, 6340  | 100 |
| Shell Holdings Switzerland AG                                   | Baarermatte, Baar, 6340  | 100 |
| Shell Lubricants Switzerland AG                                 | Steigerhubelstrasse 8, Bern, 3008  | 100 |
| Shell Trading Switzerland AG                                    | Baarermatte, Baar, 6340  | 100 |
| Shell Treasury Company Switzerland AG                           | Baarermatte, Baar, 6340  | 100 |
| SOGEP Société Genevoise des Pétroles SA                         | Route de Vernier 132, Vernier, 1214  | 34  |
| Solen Versicherungen AG   | Baarermatte, Baar, 6340  | 100 |



| Company by country of incorporation                  | Address of registered office  | %   |
|--|---|-----|
| UBAG - Unterflurbetankungsanlage Flughafen Zürich AG | Zwüscheiteich, Rümlang, 8153  | 20  |
| SYRIA  |   |     |
| Al Badiah Petroleum Company                          | Damascus New Sham Western Dummar, Island No 1 - Property 2299, P.O. Box 7660, Damascus                | 22  |
| Al Furat Petroleum Company                           | Damascus New Sham Western Dummar, Island No 1 - Property 2299, P.O. Box 7660, Damascus                | 20  |
| TAIWAN   |   |     |
| CPC Shell Lubricants Co. Ltd                         | No 2, Tso-Nan Road, Nan-Tze District, P.O. Box 25-30, Kaohsiung, 811                                  | 51  |
| Shell Taiwan Limited                                 | International Trade Building, Room 2001, 20th Floor, 333, Keelung Road Section 1, Taipei, 110         | 100 |
| TANZANIA   |   |     |
| Fahari Gas Marketing Company Limited                 | 1st Floor Kilwa House, Plot 369, Toure Drive, Oyster Bay, P.O. Box 105833, Dar es Salaam              | 53  |
| Mzalendo Gas Processing Company Limited              | 1st Floor Kilwa House, Plot 369, Toure Drive, Oyster Bay, P.O. Box 105833, Dar es Salaam              | 53  |
| Ruvuma Pipeline Company Limited                      | 1st Floor Kilwa House, Plot 369, Toure Drive, Oyster Bay, P.O. Box 105833, Dar es Salaam              | 53  |
| Shell Tanzania Limited                               | De Ocean Plaza, 3rd Floor, Plot 400, Toure Drive, Masaki, P.O. Box 9404, Dar es Salaam                | 100 |
| Tanzania LNG Limited                                 | 1st Floor Kilwa House, Plot 369, Toure Drive, Oyster Bay, P.O. Box 105833, Dar es Salaam              | 100 |
| THAILAND   |   |     |
| Pattanaadhorn Company Limited                        | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 42  |
| Sahapanichkijphun Company Limited                    | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 42  |
| Shell Global Solutions (Thailand) Limited            | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 48  |
| Shell Global Solutions Holdings (Thailand) Limited   | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 49  |
| Thai Energy Company Limited                          | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 100 |
| Unitas Company Limited                               | 10 Soonthornkosa Road, Klongtoey, Bangkok, 10110  | 42  |
| TRINIDAD AND TOBAGO                                  |   |     |
| BG 2/3 Investments Limited                           | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| Point Fortin LNG Exports Limited                     | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 63  |
| Shell Gas Supply Trinidad Limited                    | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| Shell LNG T&T Ltd                                    | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| Shell Manatee Limited                                | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| Shell Trinidad Central Block Limited                 | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| Shell Trinidad Ltd                                   | Shell Energy House, 5 St. Clair Avenue, Point Lisas, Port of Spain                                    | 100 |
| The International School of Port of Spain Limited    | 1 International Drive, Westmoorings   | 25  |
| TRINLING Limited                                     | 5 Saint Clair Avenue, Saint Clair, Port of Spain  | 100 |
| TUNISIA  |   |     |
| Amilcar Petroleum Operations S.A.                    | Immeuble Mezghenni, Rue Windermere BP36, Les Berges du Lac, Tunis, 1053                               | 50  |
| Shell Tunisia LPG S.A.                               | Immeuble Rue du Lac Windermere, Les Berges du Lac, Tunis, 1053  | 100 |
| Tunisian Processing S.A.                             | Immeuble Rue du Lac Windermere, Les Berges du Lac, Tunis, 1053  | 100 |
| TURKEY   |   |     |
| Ambarli Depolama Hizmetleri Ltd. Sti.                | Yakuplu Mah. Gencosman Cad. No:7, Beylikduzu, Istanbul, 34524   | 35  |
| Cekisan Depolama Hizmetleri Ltd. Sti.                | Yakuplu Mah. Gencosman Cad. No:3, Beylikduzu, Istanbul, 34524   | 35  |
| Marmara Depoculuk Hizmetleri A.S.                    | Sultankoy Mahallesi Maltepe Sokak No:66, Marmara Ereglisi, Tekirdag, 59750                            | 32  |
| Samsun Akaryakit ve Depolama A.S.                    | Dilovasi Organize Sanayi Bolgesi 1.Kisim 1004 Sokak No:10, Dilovasi, Kocaeli                          | 35  |
| Shell & Turcas Petrol A.S.                           | Gulbahar Mah.Salih Tozan Sok., Karamancilar Is Merkezi B Blok No:18, Esentepe, Sisli, Istanbul, 34394 | 70  |
| Shell Enerji A.S.                                    | Gulbahar Mah.Salih Tozan Sok., Karamancilar Is Merkezi B Blok No:18, Esentepe, Sisli, Istanbul, 34394 | 100 |
| Shell Petrol A.S.                                    | Gulbahar Mah.Salih Tozan Sok., Karamancilar Is Merkezi B Blok No:18, Esentepe, Sisli, Istanbul, 34394 | 70  |
| UKRAINE  |   |     |
| Shell Ukraine Exploration and Production I LLC       | 4 Mykoly Grinchenka street, Kiev, 03038   | 100 |
| UNITED ARAB EMIRATES                                 |   |     |
| ADNOC Gas Processing                                 | P.O. Box 665, Abu Dhabi   | 15  |
| Emdad Aviation Fuel Storage FZCO                     | Emdad Aviation Fuel Storage FZCO, P.O. Box 261781, Jebel Ali, Dubai                                   | 32  |
| Sharjah Fuelling Services Company Ltd.               | P.O. Box 4225, Sharjah, 4225  | 49  |
| UK   |   |     |
| Alie Investments Limited                             | Shell Centre, London, SE1 7NA   | 100 |
| Angkor Shell Limited                                 | Shell Centre, London, SE1 7NA   | 100 |
| Autogas Limited                                      | Athena House, Athena Drive, Tachbrook Park, Warwick, CV34 6RL   | 50  |
| BG Aruba Limited                                     | Shell Centre, London, SE1 7NA   | 100 |
| BG Atlantic Finance Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG Central Holdings Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG Central Investments Limited                       | Shell Centre, London, SE1 7NA   | 100 |
| BG CSB2 Limited                                      | Shell Centre, London, SE1 7NA   | 100 |
| BG Cyprus Limited                                    | Shell Centre, London, SE1 7NA   | 100 |
| BG Delta Limited                                     | Shell Centre, London, SE1 7NA   | 100 |
| BG Employee Shares Trustees Limited                  | Shell Centre, London, SE1 7NA   | 100 |
| BG Energy Capital Plc                                | Shell Centre, London, SE1 7NA   | 100 |
| BG Energy Holdings Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| BG Energy Marketing Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG Energy Trading Limited                            | Shell Centre, London, SE1 7NA   | 100 |
| BG Equatorial Guinea Limited                         | Shell Centre, London, SE1 7NA   | 100 |
| BG Exploration and Production Limited                | Shell Centre, London, SE1 7NA   | 100 |
| BG Finance Investments Limited                       | Shell Centre, London, SE1 7NA   | 100 |
| BG Gas Marketing Limited                             | Shell Centre, London, SE1 7NA   | 100 |



| Company by country of incorporation                 | Address of registered office  | %   |
|---|---|-----|
| BG Gas Supply (UK) Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG General Holdings Limited                         | Shell Centre, London, SE1 7NA   | 100 |
| BG General Investments                              | Shell Centre, London, SE1 7NA   | 100 |
| BG General Partner Limited                          | 50 Lothian Road, Festival Square, Edinburgh, EH3 9WJ                            | 100 |
| BG Global Employee Resources Limited                | Shell Centre, London, SE1 7NA   | 100 |
| BG Global Energy Limited                            | Shell Centre, London, SE1 7NA   | 100 |
| BG Great Britain Limited                            | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Company Secretaries Limited                | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Employee Benefit Trust Limited             | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Employee Shares Trustees Limited           | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Healthcare Trustee Limited                 | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Limited                                    | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Pension Trustees Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| BG Group Trustees Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| BG Intellectual Property Limited                    | Shell Centre, London, SE1 7NA   | 100 |
| BG International Limited                            | Shell Centre, London, SE1 7NA   | 100 |
| BG Iran Limited                                     | Shell Centre, London, SE1 7NA   | 100 |
| BG Karachaganak Limited                             | Shell Centre, London, SE1 7NA   | 100 |
| BG Karachaganak Trading Limited                     | Shell Centre, London, SE1 7NA   | 100 |
| BG Kenya L10A Limited                               | Shell Centre, London, SE1 7NA   | 100 |
| BG Kenya L10B Limited                               | Shell Centre, London, SE1 7NA   | 100 |
| BG LNG Investments Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG LNG Transport No.5 Limited                       | Shell Centre, London, SE1 7NA   | 100 |
| BG Mongolia Holdings Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| BG Netherlands                                      | Shell Centre, London, SE1 7NA   | 100 |
| BG Netherlands Financing Unlimited                  | Shell Centre, London, SE1 7NA   | 100 |
| BG Norge Exploration Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| BG Norge Limited                                    | Shell Centre, London, SE1 7NA   | 100 |
| BG North Investments Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| BG North Sea Holdings Limited                       | Shell Centre, London, SE1 7NA   | 100 |
| BG OKLNG Limited                                    | Shell Centre, London, SE1 7NA   | 100 |
| BG Omikron Limited                                  | Shell Centre, London, SE1 7NA   | 100 |
| BG Overseas Holdings Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| BG Overseas Investments Limited                     | Shell Centre, London, SE1 7NA   | 100 |
| BG Overseas Limited                                 | Shell Centre, London, SE1 7NA   | 100 |
| BG Pension Funding Scottish Limited Partnership [1] | 50 Lothian Road, Festival Square, Edinburgh, EH3 9WJ                            | 100 |
| BG Rosetta Limited                                  | Shell Centre, London, SE1 7NA   | 100 |
| BG Singapore Limited                                | Shell Centre, London, SE1 7NA   | 100 |
| BG South Asia LNG Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| BG South East Asia Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| BG Subsea Well Project Limited                      | Shell Centre, London, SE1 7NA   | 100 |
| BG Tanzania Holdings Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| BG Thailand Limited                                 | Shell Centre, London, SE1 7NA   | 100 |
| BG Trinidad LNG Limited                             | Shell Centre, London, SE1 7NA   | 100 |
| BG UK Capital II Limited                            | Shell Centre, London, SE1 7NA   | 100 |
| BG UK Capital Limited                               | Shell Centre, London, SE1 7NA   | 100 |
| BG UK Holdings Limited                              | Shell Centre, London, SE1 7NA   | 100 |
| Brazil Shipping I Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| Brazil Shipping II Limited                          | Shell Centre, London, SE1 7NA   | 100 |
| British Pipeline Agency Limited                     | 5-7 Alexandra Road, Hemel Hempstead, Herts, HP2 5BS                             | 50  |
| CRI Catalyst Company Europe Limited                 | Shell Centre, London, SE1 7NA   | 100 |
| CRI/Criterion Catalyst Company Limited              | Shell Centre, London, SE1 7NA   | 100 |
| Dragon LNG Group Limited                            | Main Road, Waterston, Milford Haven, Pembrokeshire, SA73 1DR                    | 50  |
| Eastham Refinery Limited [b]                        | 8 York Road, London, SE1 7NA  | 50  |
| Enterprise Oil Limited                              | 8 York Road, London, SE1 7NA  | 100 |
| Enterprise Oil Middle East Limited                  | 8 York Road, London, SE1 7NA  | 100 |
| Enterprise Oil Norge Limited                        | 8 York Road, London, SE1 7NA  | 100 |
| Enterprise Oil Operations Limited                   | 8 York Road, London, SE1 7NA  | 100 |
| Enterprise Oil U.K. Limited                         | 8 York Road, London, SE1 7NA  | 100 |
| Farepilot Limited                                   | Shell Centre, London, SE1 7NA   | 87  |
| Framecroft Limited                                  | Shell Centre, London, SE1 7NA   | 100 |
| Gainrace Limited                                    | 8 York Road, London, SE1 7NA  | 100 |
| Gatwick Airport Storage and Hydrant Company Limited | 8 York Road, London, SE1 7NA  | 13  |
| Glossop Limited                                     | 8 York Road, London, SE1 7NA  | 100 |
| GOGB Limited  | 8 York Road, London, SE1 7NA  | 100 |
| Heathrow Airport Fuel Company Limited               | Building 1204, Sandringham Road, Heathrow Airport, Hounslow, Middlesex, TW6 3SH | 14  |
| Heathrow Hydrant Operating Company Limited          | Building 1204, Sandringham Road, Heathrow Airport, Hounslow, Middlesex, TW6 3SH | 10  |

[1] Established by BG Group plc and the BG Trustee in 2013 as part of funding agreements associated with the BG pension scheme. Under the exemption conferred by Regulation 7 of the Partnerships (Accounts) Regulations 2008, the accounts of this partnership have not been appended to Shell's Consolidated Financial Statements and have not been filed at the Companies House.



| Company by country of incorporation                       | Address of registered office                    | %   |
|---|---|-----|
| Holaw (619) Limited                                       | Shell Centre, London, SE1 7NA                   | 100 |
| International Inland Waterways, Limited                   | 8 York Road, London, SE1 7NA                    | 100 |
| Karachaganak Project Development Limited [b]              | Shell Centre, London, SE1 7NA                   | 38  |
| Khmer Shell Limited                                       | Shell Centre, London, SE1 7NA                   | 100 |
| Kite Power Systems Limited                                | 146 New London Road, Chelmsford, Essex, CM2 0AW | 34  |
| Lensbury Limited  | Broom Road, Teddington, Middlesex, TW11 9NU     | 100 |
| Manchester Airport Storage and Hydrant Company Limited    | 50 Broadway, London, SW1H 0BL                   | 25  |
| Maritime Association for Risk Mitigation & Safety Limited | Shell Centre, London, SE1 7NA                   | 100 |
| Methane Services Limited                                  | Shell Centre, London, SE1 7NA                   | 100 |
| Murphy Schiehallion Limited                               | Shell Centre, London, SE1 7NA                   | 100 |
| Octane Holdings Limited                                   | Shell Centre, London, SE1 7NA                   | 100 |
| Octane Properties Limited                                 | Shell Centre, London, SE1 7NA                   | 100 |
| Private Oil Holdings Oman Limited                         | 8 York Road, London, SE1 7NA                    | 85  |
| Sabah Shell Petroleum Company Limited                     | Shell Centre, London, SE1 7NA                   | 100 |
| Saxon Oil Limited   | 8 York Road, London, SE1 7NA                    | 100 |
| Saxon Oil Miller Limited                                  | 8 York Road, London, SE1 7NA                    | 100 |
| Schooner Trustees Limited                                 | Shell Centre, London, SE1 7NA                   | 100 |
| SELAP Limited   | 8 York Road, London, SE1 7NA                    | 100 |
| SF Investment Management Limited                          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Aircraft Limited                                    | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Arabia Car Service Limited                          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Aviation Limited                                    | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Benin Upstream Ltd                                  | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Business Development Middle East Limited            | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Caribbean Investments Limited                       | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Chemical Company of Eastern Africa Limited          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Chemicals (Hellas) Limited                          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Chemicals Limited                                   | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Chemicals Support Services Asia Limited             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Chemicals U.K. Limited                              | Shell Centre, London, SE1 7NA                   | 100 |
| Shell China Exploration and Production Company Limited    | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Clair UK Limited                                    | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Club Corringham Limited                             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Company (Hellas) Limited                            | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Company (Pacific Islands) Limited                   | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Corporate Director Limited                          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Corporate Secretary Limited                         | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Direct (U.K.) Limited                               | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Distributor (Holdings) Limited                      | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Employee Benefits Trustee Limited                   | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Energy Europe Limited                               | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Energy Investments Limited                          | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Energy Supply UK LTD.                               | Shell Centre, London, SE1 7NA                   | 100 |
| Shell EP Offshore Ventures Limited                        | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Exploration and Production Oman Limited             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Exploration and Production Tanzania Limited         | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Gas Holdings (Malaysia) Limited                     | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Hasdrubal Limited                                   | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Holdings (U.K.) Limited                             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Information Technology International Limited        | 8 York Road, London, SE1 7NA                    | 100 |
| Shell International Gas Limited                           | Shell Centre, London, SE1 7NA                   | 100 |
| Shell International Limited                               | Shell Centre, London, SE1 7NA                   | 100 |
| Shell International Petroleum Company Limited             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell International Trading and Shipping Company Limited  | 80 Strand, London, WC2R 0ZA                     | 100 |
| Shell Malaysia Limited                                    | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Marine Products Limited                             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Overseas Holdings Limited                           | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Overseas Services Limited                           | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Pension Reserve Company (SIPF) Limited              | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Pension Reserve Company (SOCPF) Limited             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Pension Reserve Company (UK) Limited                | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Pensions Trust Limited                              | Shell Centre, London, SE1 7NA                   | 100 |
| Shell Property Company Limited                            | Shell Centre, London, SE1 7NA                   | 100 |
| Shell QGC Holdings Limited [i]                            | Shell Centre, London, SE1 7NA                   | 100 |
| Shell QGC Midstream 2 Limited                             | Shell Centre, London, SE1 7NA                   | 100 |
| Shell QGC Midstream 1 Limited [i]                         | Shell Centre, London, SE1 7NA                   | 100 |
| Shell QGC Upstream 2 Limited                              | Shell Centre, London, SE1 7NA                   | 100 |
| Shell QGC Upstream 1 Limited                              | Shell Centre, London, SE1 7NA                   | 100 |



| Company by country of incorporation                   | Address of registered office  | %   |
|---|---|-----|
| Shell Response Limited                                | 80 Strand, London, WC2R 0ZA   | 100 |
| Shell Shared Service Centre - Glasgow Limited         | Shell Centre, London, SE1 7NA   | 100 |
| Shell Subsidiary Distributors Pension Trustee Limited | Shell Centre, London, SE1 7NA   | 100 |
| Shell Supplementary Pension Plan Trustees Limited     | Shell Centre, London, SE1 7NA   | 100 |
| Shell Tankers (U.K.) Limited                          | 3 Savoy Place, London, WC2R 0DX   | 100 |
| Shell Trading International Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| Shell Treasury Centre Limited                         | Shell Centre, London, SE1 7NA   | 100 |
| Shell Treasury Dollar Company Limited                 | Shell Centre, London, SE1 7NA   | 100 |
| Shell Treasury Euro Company Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| Shell Treasury UK Limited                             | Shell Centre, London, SE1 7NA   | 100 |
| Shell Trinidad 5(A) Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| Shell Trinidad and Tobago Limited                     | Shell Centre, London, SE1 7NA   | 100 |
| Shell Trinidad Block E Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| Shell Trustee Solutions Limited                       | 1 Altens Farm Road, Nigg, Aberdeen, AB12 3FY  | 100 |
| Shell Tunisia Upstream Limited                        | Shell Centre, London, SE1 7NA   | 100 |
| Shell U.K. Limited                                    | Shell Centre, London, SE1 7NA   | 100 |
| Shell U.K. North Atlantic Limited                     | Shell Centre, London, SE1 7NA   | 100 |
| Shell U.K. Oil Products Limited                       | Shell Centre, London, SE1 7NA   | 100 |
| Shell Upstream Overseas Services (I) Limited          | Shell Centre, London, SE1 7NA   | 100 |
| Shell Ventures New Zealand Limited                    | Shell Centre, London, SE1 7NA   | 100 |
| Shell Ventures U.K. Limited                           | Shell Centre, London, SE1 7NA   | 100 |
| Shell Windenergy Limited                              | Shell Centre, London, SE1 7NA   | 100 |
| Shell-Mex and B.P. Limited                            | Shell Centre, London, SE1 7NA   | 60  |
| Stansted Fuelling Company Limited                     | Exxonmobil House, Ermyn Way, Leatherhead, KT22 8UX  | 14  |
| STT (Das Beneficiary) Limited [a]                     | Shell Centre, London, SE1 7NA   | 100 |
| Synthetic Chemicals (Northern) Limited                | 8 York Road, London, SE1 7NA  | 100 |
| Telegraph Service Stations Limited                    | 8 York Road, London, SE1 7NA  | 100 |
| The Anglo-Saxon Petroleum Company Limited             | Shell Centre, London, SE1 7NA   | 100 |
| The Asiatic Petroleum Company Limited                 | Shell Centre, London, SE1 7NA   | 100 |
| The Consolidated Petroleum Company Limited            | Shell Centre, London, SE1 7NA   | 50  |
| The Consolidated Petroleum Supply Company Limited     | Shell Centre, London, SE1 7NA   | 50  |
| The Mexican Eagle Oil Company Limited                 | 8 York Road, London, SE1 7NA  | 100 |
| The New Motion EVSE Limited                           | C/O Jag Shaw Baker, Berners House, 47-48 Berners Street, London, W1T 3NF                          | 100 |
| The Shell Company (W.I.) Limited                      | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of Hong Kong Limited                | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of India Limited                    | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of Nigeria Limited                  | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of Thailand Limited                 | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of The Philippines Limited          | Shell Centre, London, SE1 7NA   | 75  |
| The Shell Company of Turkey Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Company of West Africa Limited              | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Marketing Company of Borneo Limited         | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Petroleum Company Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| The Shell Transport and Trading Company Limited       | Shell Centre, London, SE1 7NA   | 100 |
| Thermocomfort Limited                                 | 8 York Road, London, SE1 7NA  | 100 |
| UK Shell Pension Plan Trust Limited                   | Shell Centre, London, SE1 7NA   | 100 |
| United Kingdom Oil Pipelines Limited [b]              | 5-7 Alexandra Road, Hemel Hempstead, Herts, HP2 5BS   | 48  |
| Walton-Gatwick Pipeline Company Limited [b]           | 5-7 Alexandra Road, Hemel Hempstead, Herts, HP2 5BS   | 52  |
| West London Pipeline and Storage Limited [b]          | 5-7 Alexandra Road, Hemel Hempstead, Herts, HP2 5BS   | 38  |
| Wonderbill Limited                                    | Shell Centre, London, SE1 7NA   | 87  |
| Woodlea Limited                                       | Shell Centre, London, SE1 7NA   | 100 |
| URUGUAY   |   |     |
| BG (Uruguay) S.A.                                     | La Cumparsita, 1373 4th Floor, Montevideo, 11200  | 100 |
| Dinarel S.A.  | La Cumparsita, 1373 4th Floor, Montevideo, 11200  | 50  |
| Gasoducto Cruz del Sur S.A.                           | La Cumparsita, 1373 4th Floor, Montevideo, 11200  | 40  |
| USA   |   |     |
| Aera Energy LLC [b]                                   | 10000 Ming Avenue, Bakersfield, CA 93311  | 52  |
| Aera Energy Services Company                          | 10000 Ming Avenue, Bakersfield, CA 93311  | 50  |
| Airbiuity Inc.  | 1011 Western Avenue, Suite 600, Seattle, WA 98104   | 26  |
| Amberjack Pipeline Company LLC                        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 63  |
| Atlantic 1 Holdings LLC [c]                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 46  |
| Atlantic 2/3 Holdings LLC [c]                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 58  |
| Atlantic 4 Holdings LLC [c]                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 51  |
| Au Energy, LLC  | 41805 Albrae Street, Fremont, CA, 94538   | 50  |
| Baconton Power LLC [c]                                | 1499 38th Boulevard N.W., Cairo, GA 31728   | 35  |
| Bengal Pipeline Company LLC                           | 1185 Sanctuary Parkway, Suite 100, Alpharetta, GA 30009   | 31  |
| BG Alaska E&P, Inc.                                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Brasilia, LLC                                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |



| Company by country of incorporation            | Address of registered office  | %   |
|--|---|-----|
| BG Energy Merchants, LLC                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Exploration America, Inc.                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Gulf Coast LNG, LLC                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Lake Charles Operations, LLC                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG LNG Services, LLC                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG LNG Trading, LLC                            | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG North America, LLC                          | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Production Company (PA), LLC                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG Production Company (WV), LLC                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG US Gathering Company, LLC                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG US Production Company, LLC                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| BG US Services, Inc.                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Brazil Crude Services, LLC                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Brazos Wind Ventures, LLC [c]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 50  |
| Caesar Oil Pipeline Company, LLC               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 15  |
| Colbea Enterprises, LLC                        | 2050 Plainfield Pike, Cranston, RI 02921  | 50  |
| Colonial Pipeline Company                      | P.O. Box 1624, Alpharetta, GA 30009-9934  | 13  |
| Colorado Wind Ventures, LLC                    | 825 Ne Multnomah, Portland, OR 97232  | 50  |
| Concha Chemical Pipeline LLC [c]               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Crestwood Permian Basin LLC                    | 811 Main Street, Suite 3400, Houston, TX 77002  | 24  |
| CRI Catalyst Company LP [d]                    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| CRI Sales and Services Inc.                    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| CRI U.S. LP [d]                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| CRI Zeolites Inc.                              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| CRI/Criterion, Inc.                            | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Criterion Catalyst Company                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Criterion Catalysts & Technologies L.P. [d]    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Deer Park Refining Limited Partnership [b] [c] | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 51  |
| Endymion Oil Pipeline Company, LLC             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 5   |
| Enterprise Oil North America Inc.              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| EPP LLC  | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| Equilon Enterprises LLC [c]                    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| EXCO Appalachia Midstream, LLC                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 50  |
| EXCO Resources (PA), LLC [b]                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 50  |
| Explorer Pipeline Company                      | P.O. Box 2650, Tulsa, OK 74101  | 32  |
| Gaviota Terminal Company [d]                   | (Mail address) 910 Louisiana Street, Houston, TX 77002  | 20  |
| Infineum USA Inc.                              | 1900 East Linden Avenue, Linden, NJ 07036   | 50  |
| Infineum USA L.P.                              | Corporation Service Company, 2711 Centerville Road, Suite 400, Wilmington, DE 19808               | 50  |
| Jiffy Lube International, Inc.                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Lake Charles Exports, LLC                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 80  |
| Laurentide E&P, LLC                            | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| LOCAP LLC                                      | 111 Veterans Blvd, Suite 600, Metairie, LA 70005  | 20  |
| LOOP LLC                                       | 137 Northpark Blvd., Covington, LA 70433  | 46  |
| Maple Power Holdings LLC                       | Bechtel Enterprises, P.O. Box 193965, San Francisco, CA, 94119-3965                               | 68  |
| Mars Oil Pipeline Company LLC [d]              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 35  |
| Mattox Pipeline Company LLC [c]                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 79  |
| Mertvyi Kultuk LLC                             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Motiva Company                                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| MP2 Energy LLC [d]                             | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Energy NE LLC                              | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Energy NY LLC                              | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Energy Retail Holdings LLC                 | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Energy Texas LLC                           | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Generation LLC                             | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| MP2 Mesquite Creek Wind LLC                    | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| Mpower2 LLC                                    | 2441 High Timbers Drive, Suite 220, The Woodlands, TX 77380                                       | 100 |
| Nedpower Mount Storm LLC [f]                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 50  |
| Noble Assurance Company                        | C T Corporation System, 1999 Bryan Street, Suite 900, Dallas, TX 75201                            | 100 |
| Odyssey Pipeline L.L.C. [c]                    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 34  |
| Oryx Caspian Pipeline, L.L.C. [c]              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pacwest Energy, LLC.                           | 3450 E. Commercial Ct., Meridian, ID 83642  | 50  |
| Pecten Arabian Company                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pecten Brazil Exploration Company              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pecten Midstream LLC [c]                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 48  |
| Pecten Orient Company                          | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pecten Orient Company LLC [c]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pecten Producing Company                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pecten Trading Company                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |



| Company by country of incorporation                 | Address of registered office  | %   |
|---|---|-----|
| Pecten Yemen Masila Company                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pelican Transmission, LLC [c]                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pennzoil-Quaker State Company                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pennzoil-Quaker State International Corporation     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Pennzoil-Quaker State Nominee Company               | The Corporation Trust Company of Nevada, 311 South Division Street, Carson City, NV 89703         | 100 |
| Peru LNG Company LLC [c]                            | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 20  |
| Poseidon Oil Pipeline Company, LLC                  | Corporation Service Company, 1013 Center Road, Wilmington, DE 19805                               | 17  |
| Power Limited Partnership [d]                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Proteus Oil Pipeline Company, LLC                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 5   |
| Quaker State Investment Corporation                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| RDK Ventures, LLC                                   | 4080 West Jonathan Moore Pike, Columbus, IN 47201   | 50  |
| Rilette Springs, LLC                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| RK Caspian Shipping Company, LLC [c]                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| S T Exchange, Inc.                                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Salamander Inc.                                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| San Pablo Bay Pipeline Company LLC [c]              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Sand Dollar Pipeline LLC [c]                        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 48  |
| SCOGI GP [d]  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell (US) Gas & Power M&T Holdings, Inc.           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Broadwater Holdings LLC                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell California Pipeline Company LLC [c]           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Catalysts Ventures Inc.                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Chemical Appalachia LLC [c]                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Chemical LP [h]                               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Chemicals Arabia LLC [c]                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Communications, Inc.                          | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Deepwater Royalties Inc.                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Downstream Inc.                               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Energy Company                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Energy Holding GP LLC [c]                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Energy North America (US), L.P. [d]           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Energy Resources Company                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell EP Holdings Inc.                              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Expatriate Employment US Inc.                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Exploration & Production Company              | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Exploration Company Inc.                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Frontier Oil & Gas Inc.                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Gas Gathering Corp. #2                        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Global Solutions (US) Inc.                    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell GOM Pipeline Company LLC [c]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Gulf of Mexico Inc.                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Information Technology International Inc.     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell International Exploration and Production Inc. | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Leasing Company                               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Marine Products (US) Company                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Midstream LP Holdings LLC [c]                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Midstream Operating LLC [c]                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 48  |
| Shell Midstream Partners GP LLC [c]                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Midstream Partners, L.P. [h]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 48  |
| Shell NA Gas & Power Holding Company                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell NA LNG LLC [c]                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell North America Gas & Power Services Company    | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Offshore and Chemical Investments Inc.        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Offshore Inc.                                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Offshore Response Company LLC [c]             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Oil Company                                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Oil Company Investments Inc.                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Oil Products Company LLC [c]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Onshore Ventures Inc.                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Petroleum Inc.                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Pipeline Company LP [d]                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Pipeline GP LLC [c]                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Rail Operations Company                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell RSC Company                                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Technology Ventures LLC [c]                   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Thailand E&P Inc.                             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Trademark Management Inc.                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |
| Shell Trading (US) Company                          | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801 | 100 |



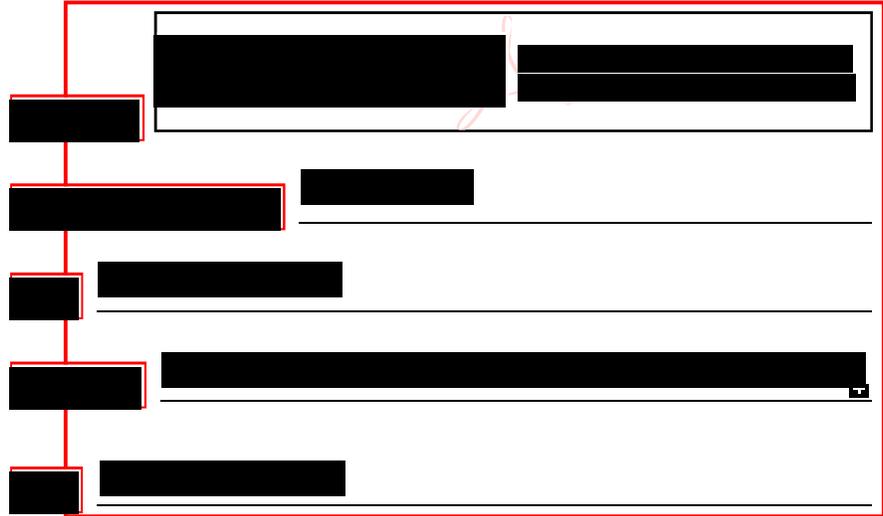
| Company by country of incorporation                    | Address of registered office   | %   |
|--|--|-----|
| Shell Trading Risk Management, LLC [c]                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell Trading Services Company                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell Transportation Holdings LLC [c]                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell Treasury Center (West) Inc.                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell US E&P Investments LLC [c]                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell US Gas & Power LLC [c]                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell US Hosting Company                               | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell WindEnergy Inc.                                  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Shell WindEnergy Services Inc.                         | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Ship Shoal Pipeline Company [d]                        | (Mail address) 910 Louisiana Street, Houston, TX 77002   | 43  |
| SOI Finance Inc.                                       | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| SOPC Holdings East LLC [c]                             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| SOPC Holdings West LLC                                 | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| SWEPI LP [d]   | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Tejas Coral GP, LLC [c]                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Tejas Coral Holding, LLC [c]                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Tejas Power Generation, LLC [c]                        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Texas Petroleum Group LLC                              | 11111 Wilcrest Green, Suite 100, Houston, TX 77042   | 50  |
| Texas-New Mexico Pipe Line Company                     | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| The Valley Camp Coal Company                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Three Wind Holdings LLC                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 50  |
| TMR Company  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Tri Star Energy LLC                                    | 1740 Ed Temple Blvd, Nashville, TN 37208   | 33  |
| Triton Diagnostics Inc.                                | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Triton Terminaling LLC [c]                             | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 100 |
| Triton West LLC  | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 48  |
| True North Energy LLC                                  | 10346 Brecksville Rd, Brecksville, OH 44141  | 50  |
| URSA Oil Pipeline Company LLC [c]                      | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 45  |
| West Shore Pipe Line Company                           | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 19  |
| Zeolyst International                                  | (Mail address) 910 Louisiana Street, Houston, TX 77002   | 50  |
| Zydeco Pipeline Company LLC [c]                        | The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, DE 19801                              | 52  |
| VENEZUELA  |  |     |
| Petroregional del Lago, S.A.                           | Calle 78 con Av. 3H, Sector Dr. Portillo, Edificio Centro Empresarial Plaza, # 3G-81, Piso 1 a PH, Maracaibo, Zulia, 4002      | 40  |
| Shell Venezuela Productos, C.A.                        | Av. Orinoco, Edificio Centro Empresarial Premium, Piso 2, Oficinas 2-A y 2-B, Urb. Las Mercedes, Caracas, Miranda, 1060        | 100 |
| Shell Venezuela, S.A.                                  | Calle 77 (5 de Julio), entre Av. 3C y Av. 3D, Edificio Torre Financiera BOD, Piso 4, Sector 5 de Julio, Maracaibo, Zulia, 4001 | 100 |
| Sucre Gas, S.A.  | Av. Leonardo Da Vinci, Edificio PDV Servicios, Caracas, Distrito Capital   | 30  |
| VIETNAM  |  |     |
| Shell Vietnam Ltd                                      | Go Dau Industrial Zone, Phuoc Thai Commune, Long Thanh District, Dong Nai Province   | 100 |
| ZIMBABWE   |  |     |
| Central African Petroleum Refineries (Private) Limited | Block 1, Tendeseka Office Park, CNR Samora Machel Avenue, Renfrew Road, Harare   | 21  |

**ATTACHMENT 87**  
**RESERVED**

**ATTACHMENT 88**  
**RESERVED**

# ATTACHMENT 89

[REDACTED]



[REDACTED]

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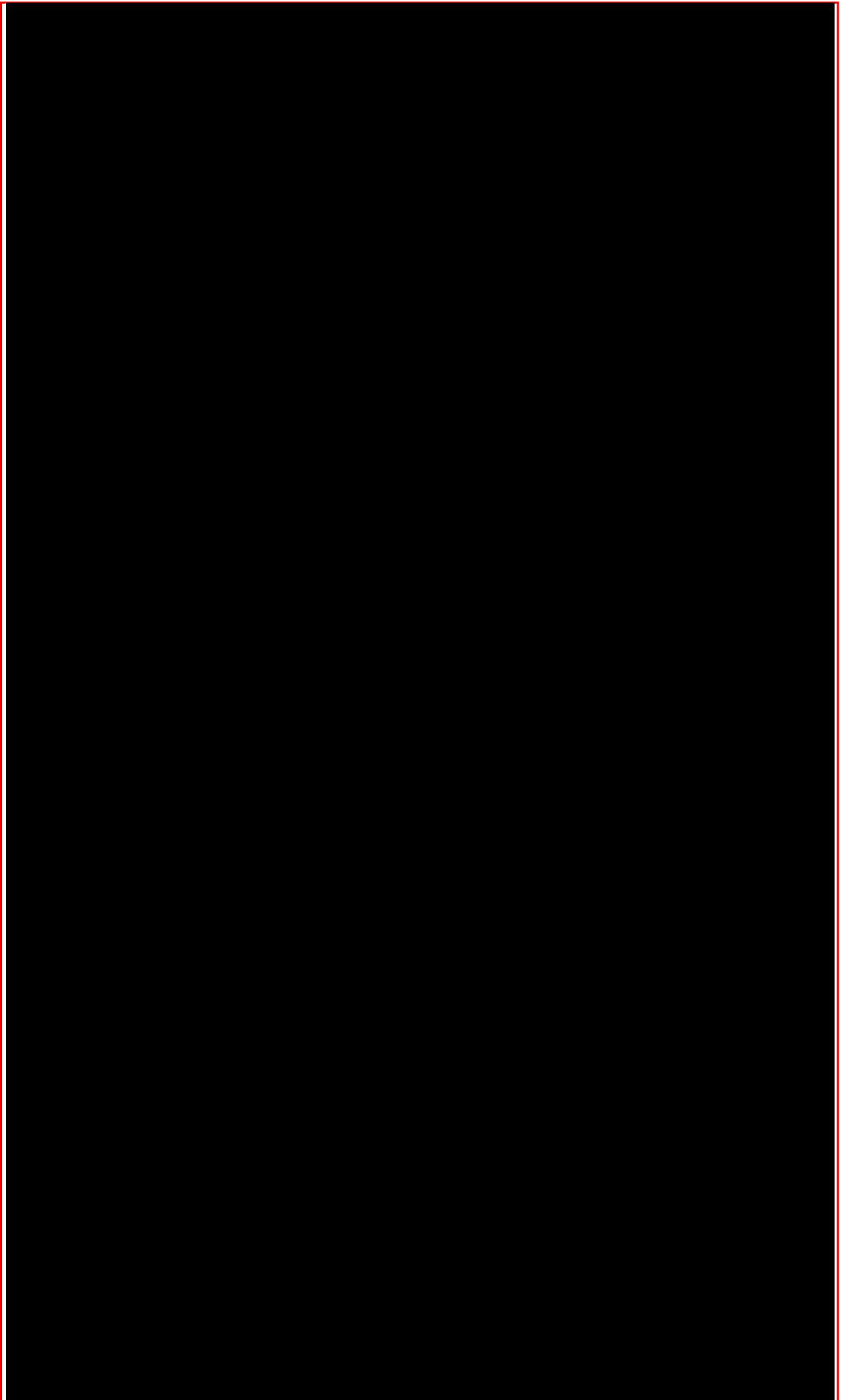
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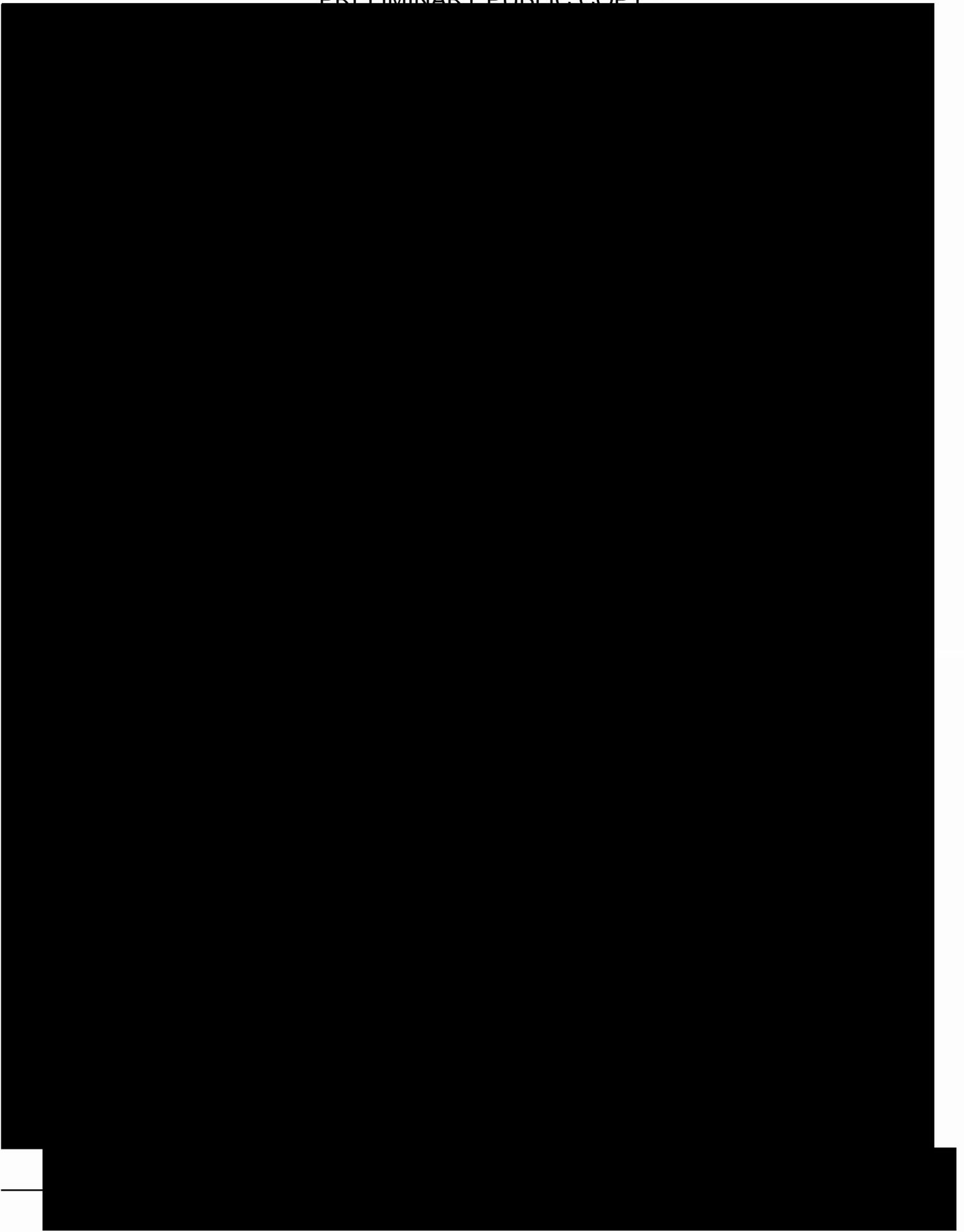
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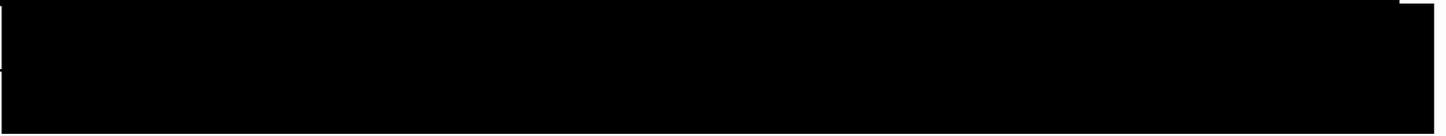








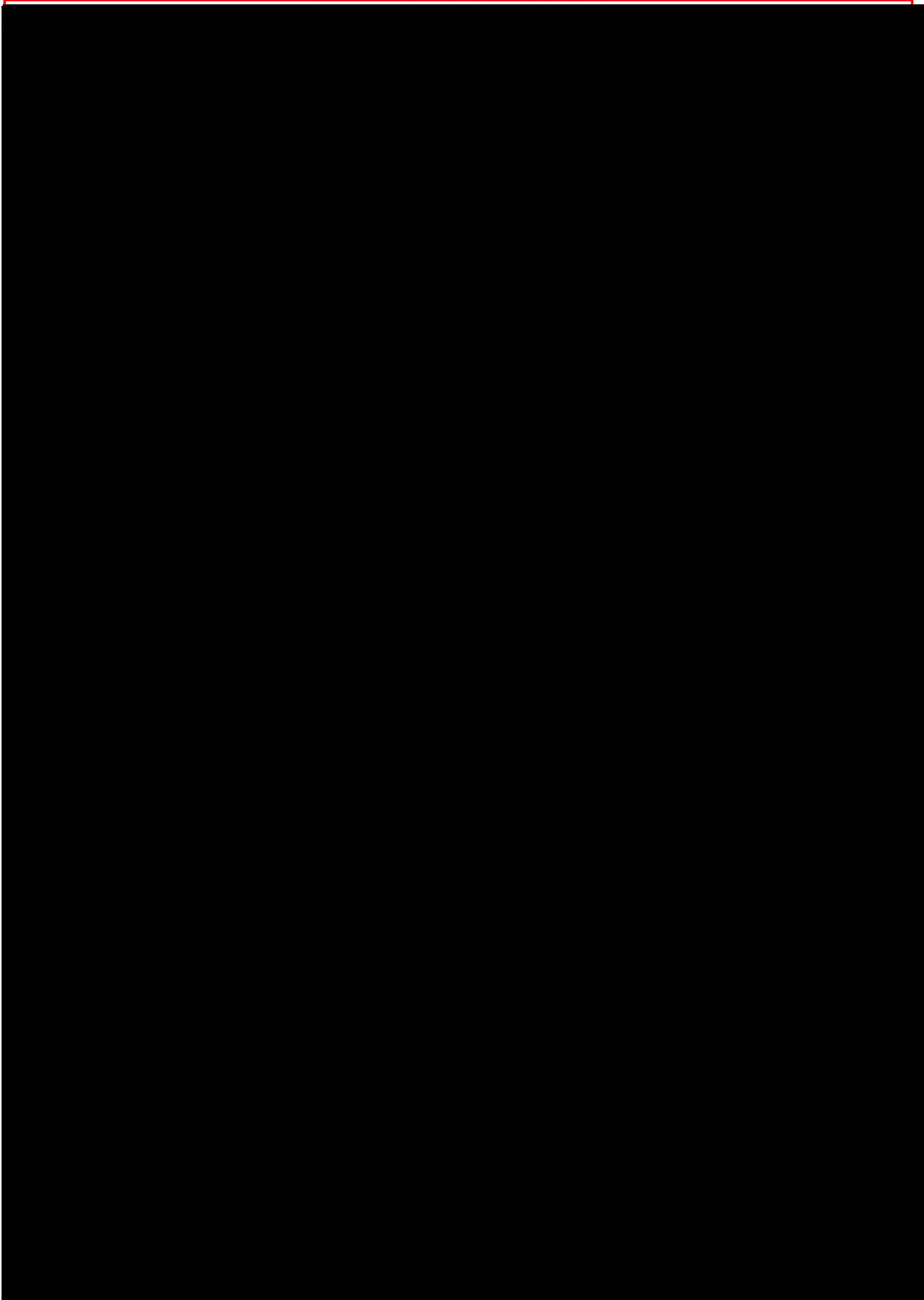
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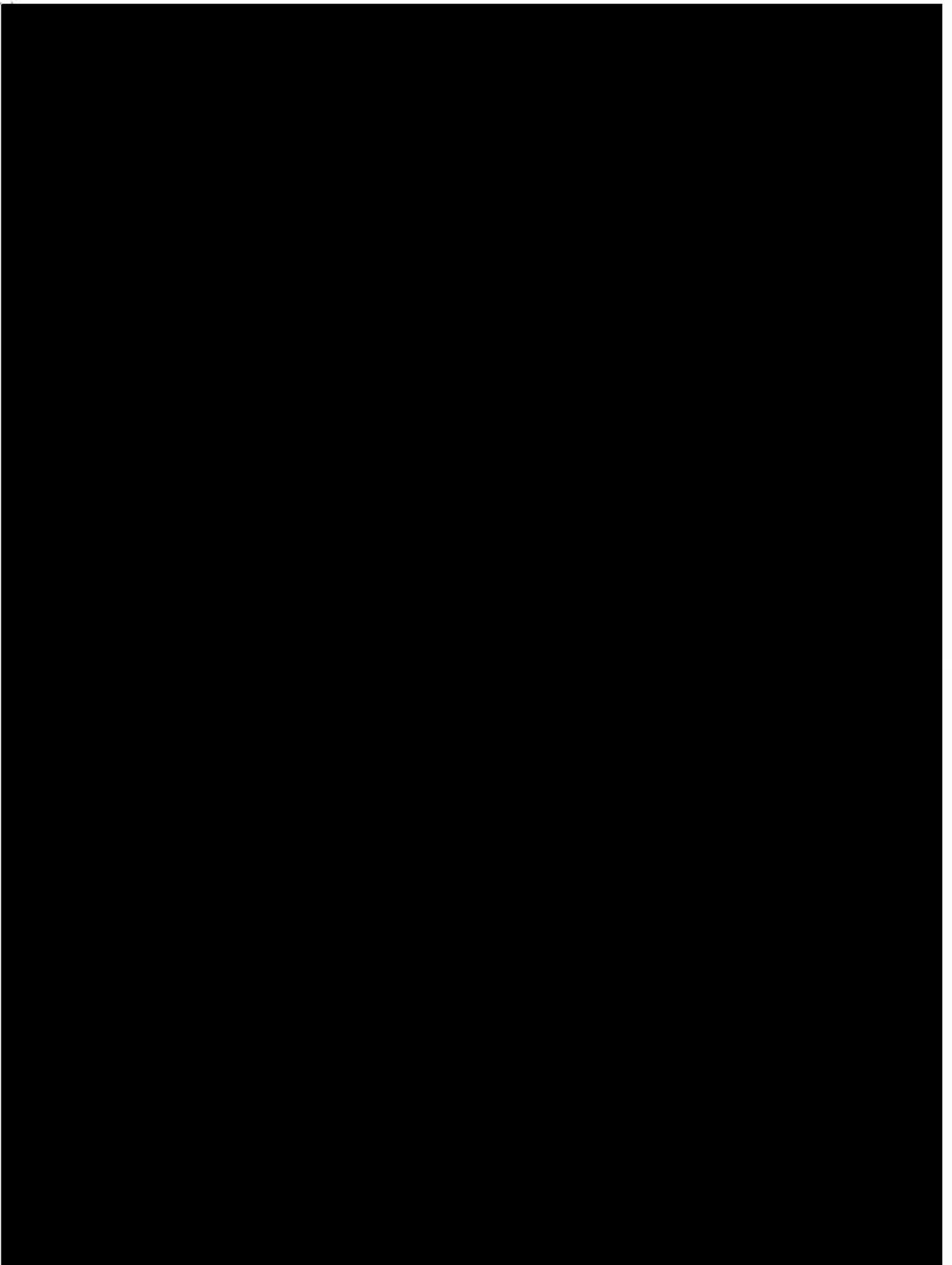


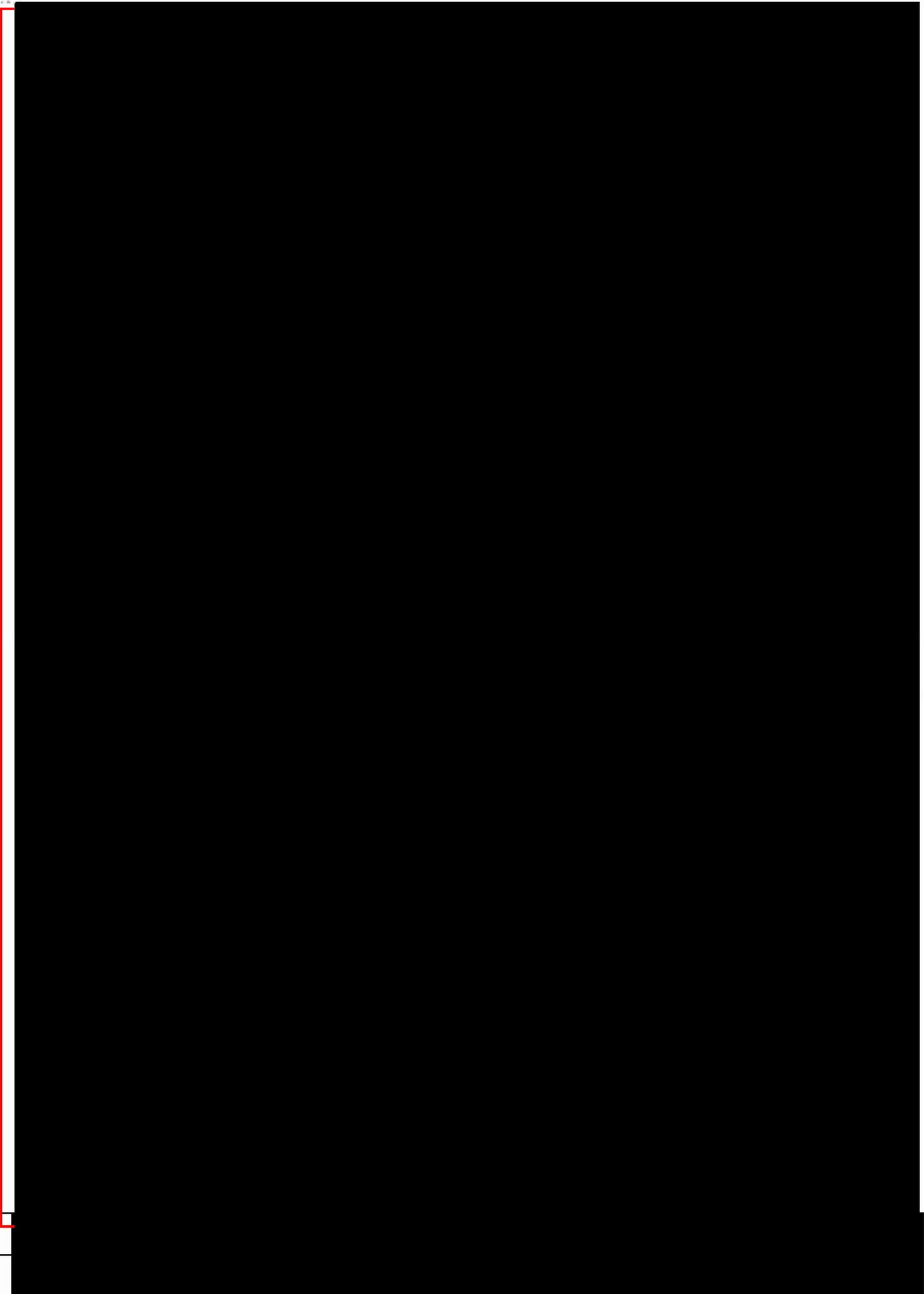
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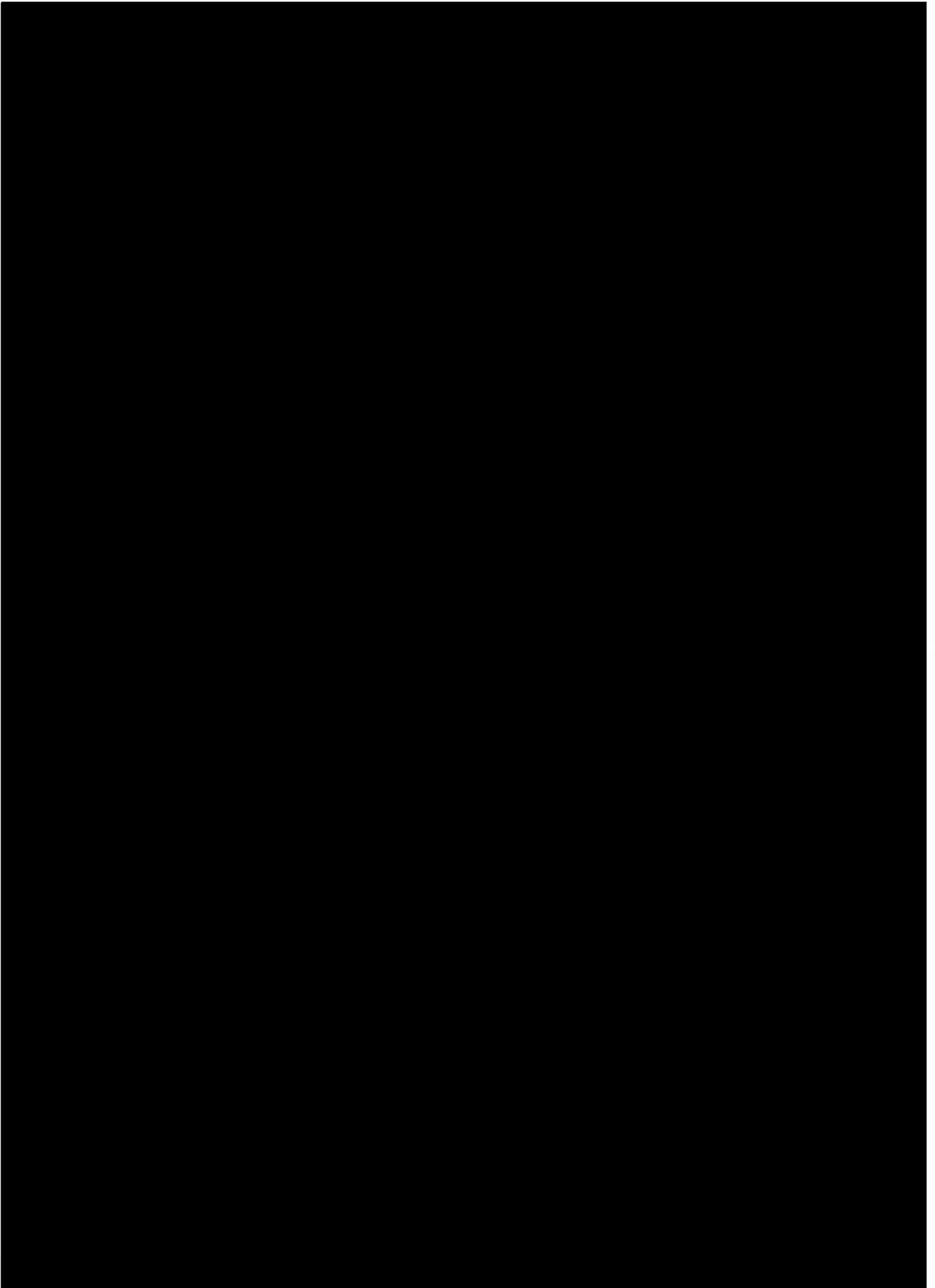
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# ATTACHMENT 90

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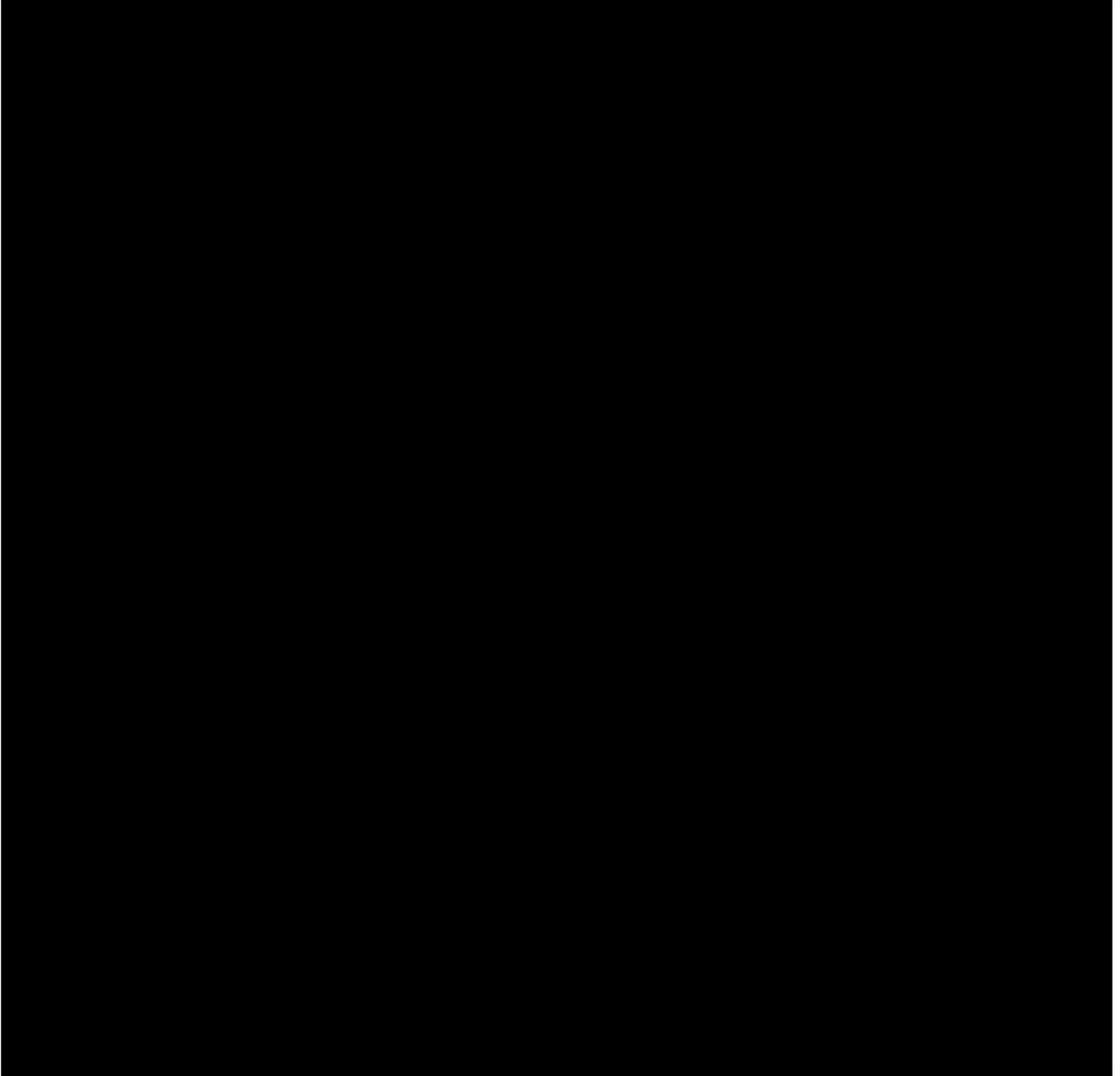
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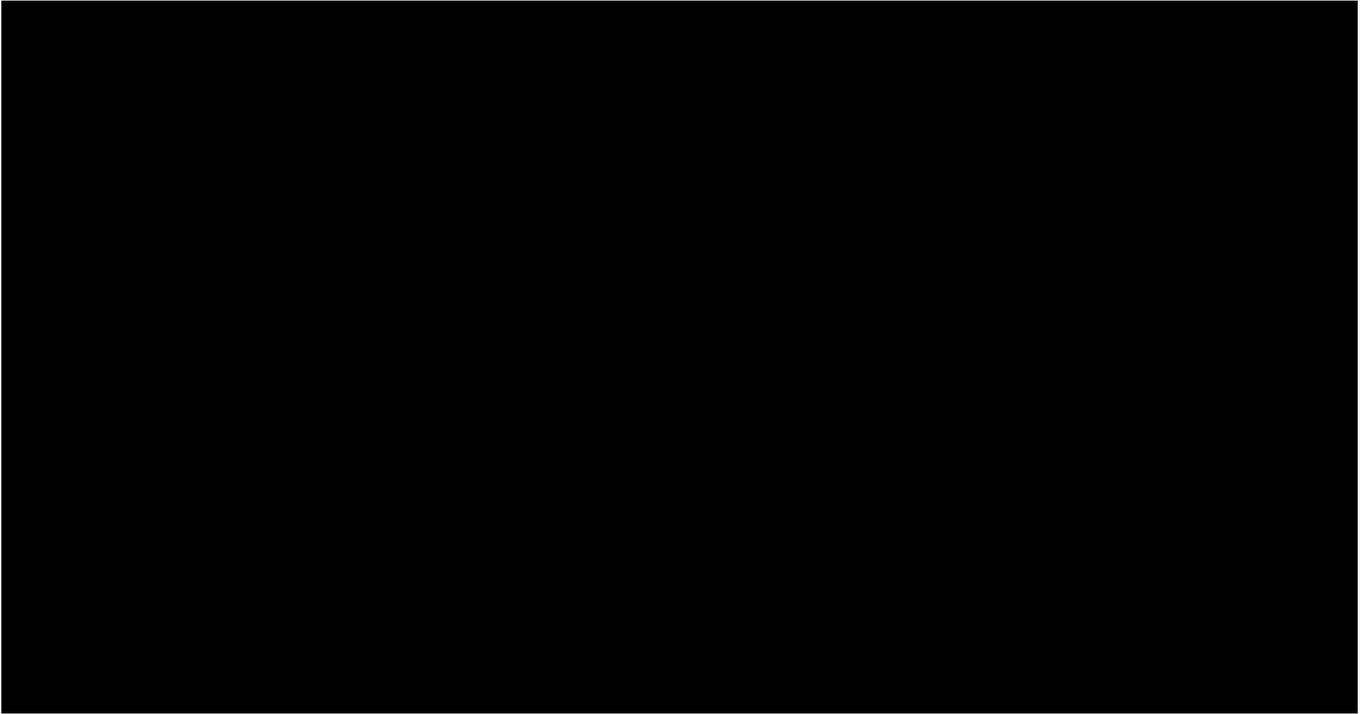
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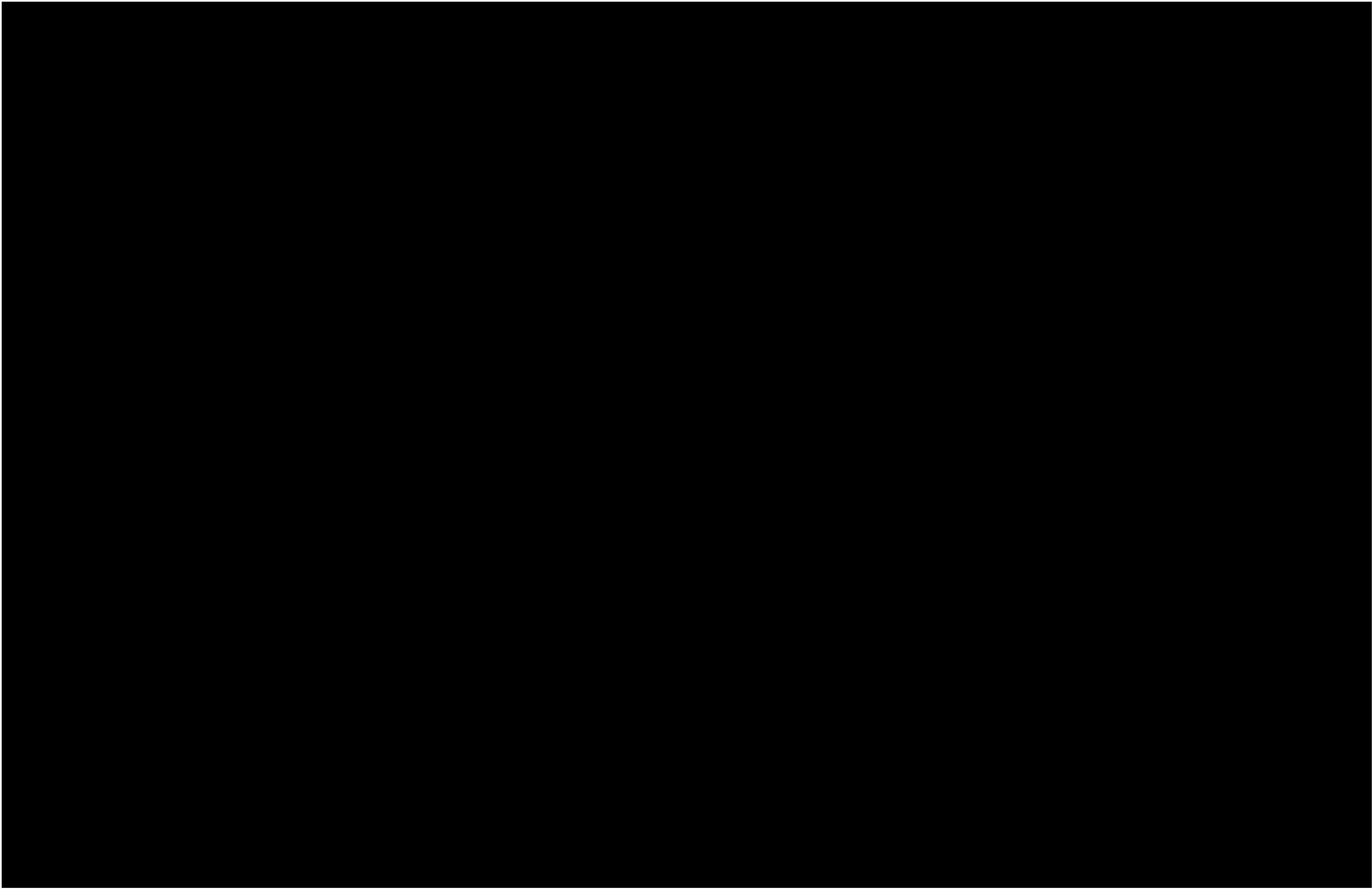
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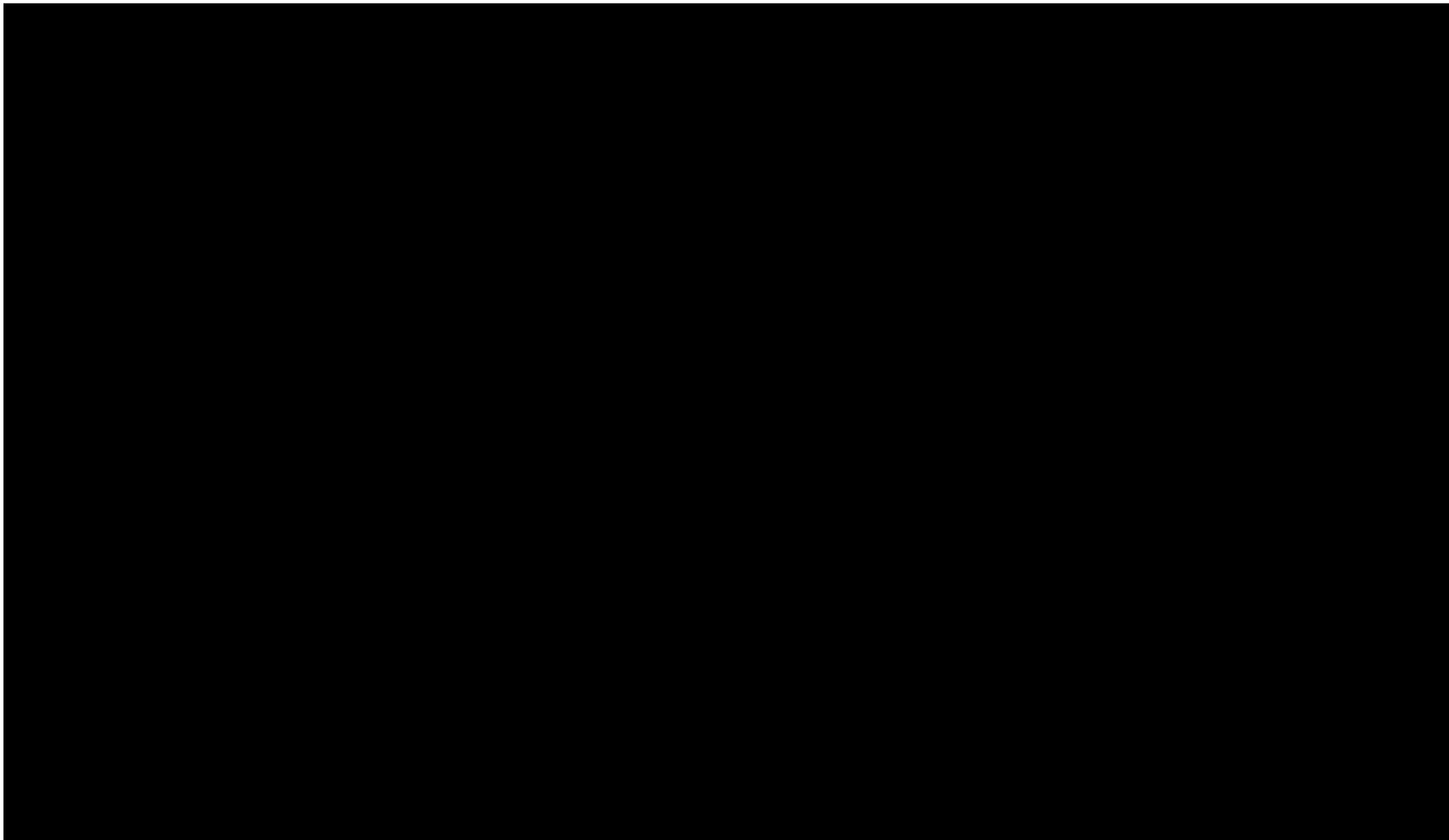


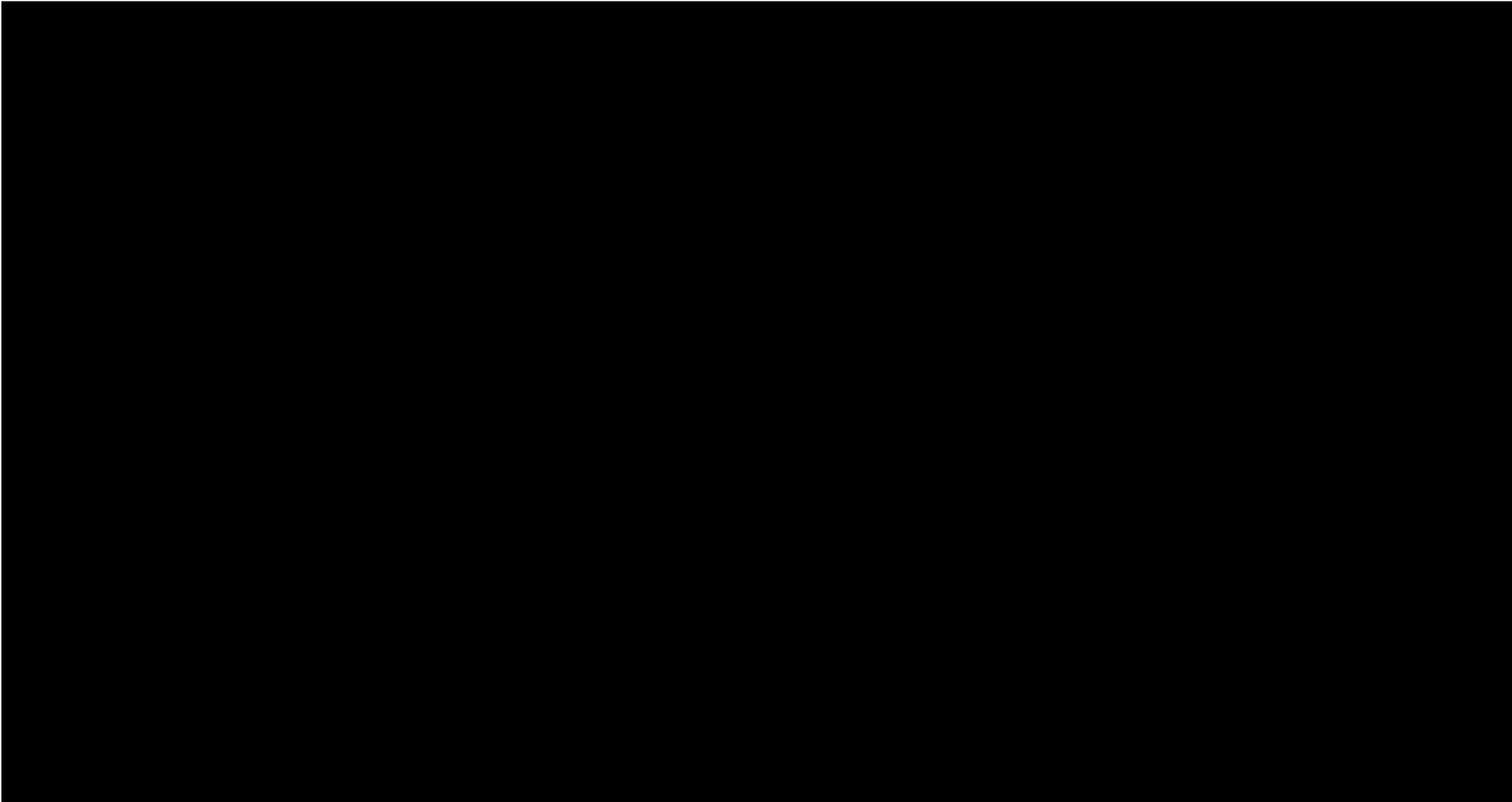
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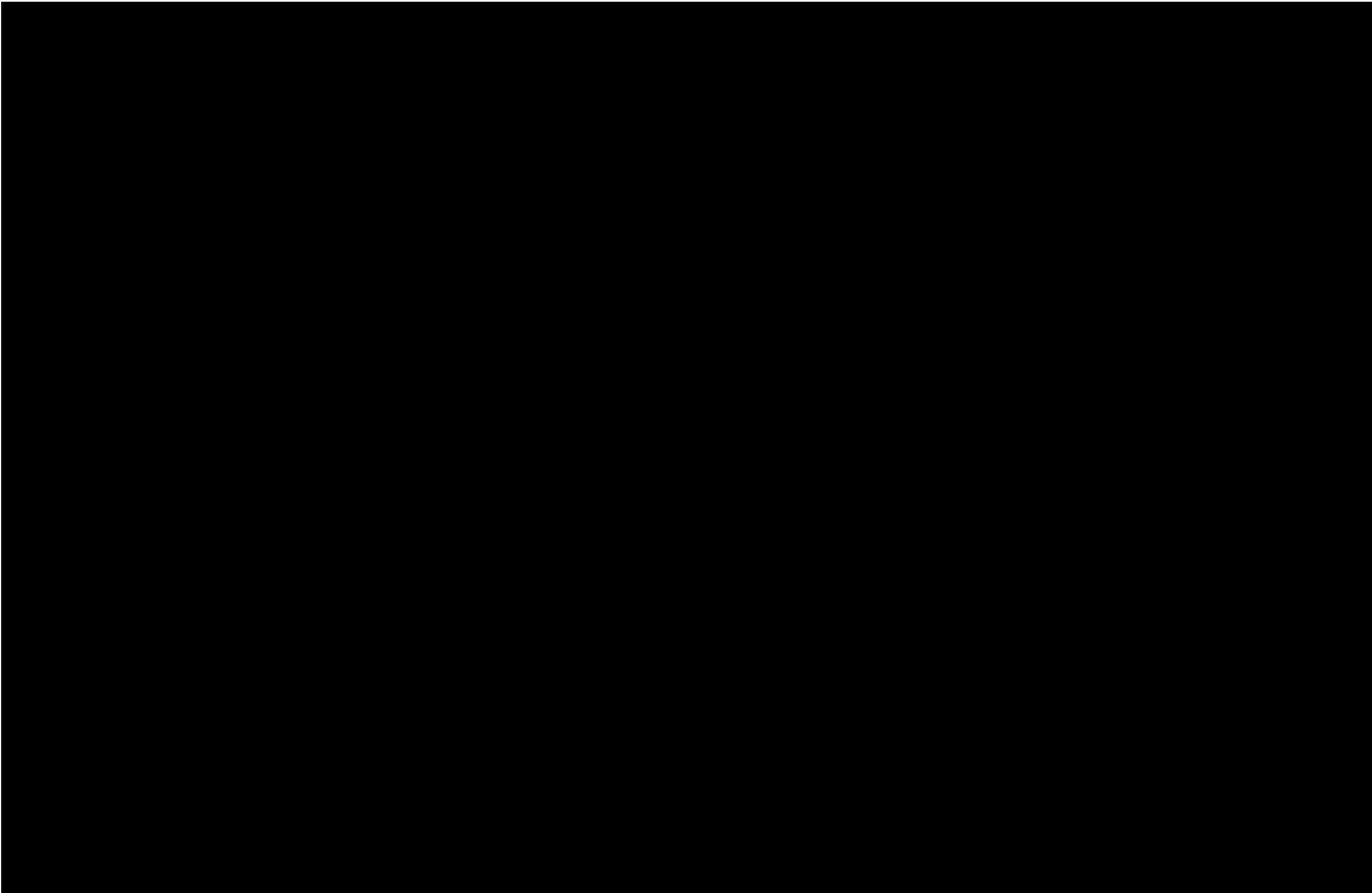
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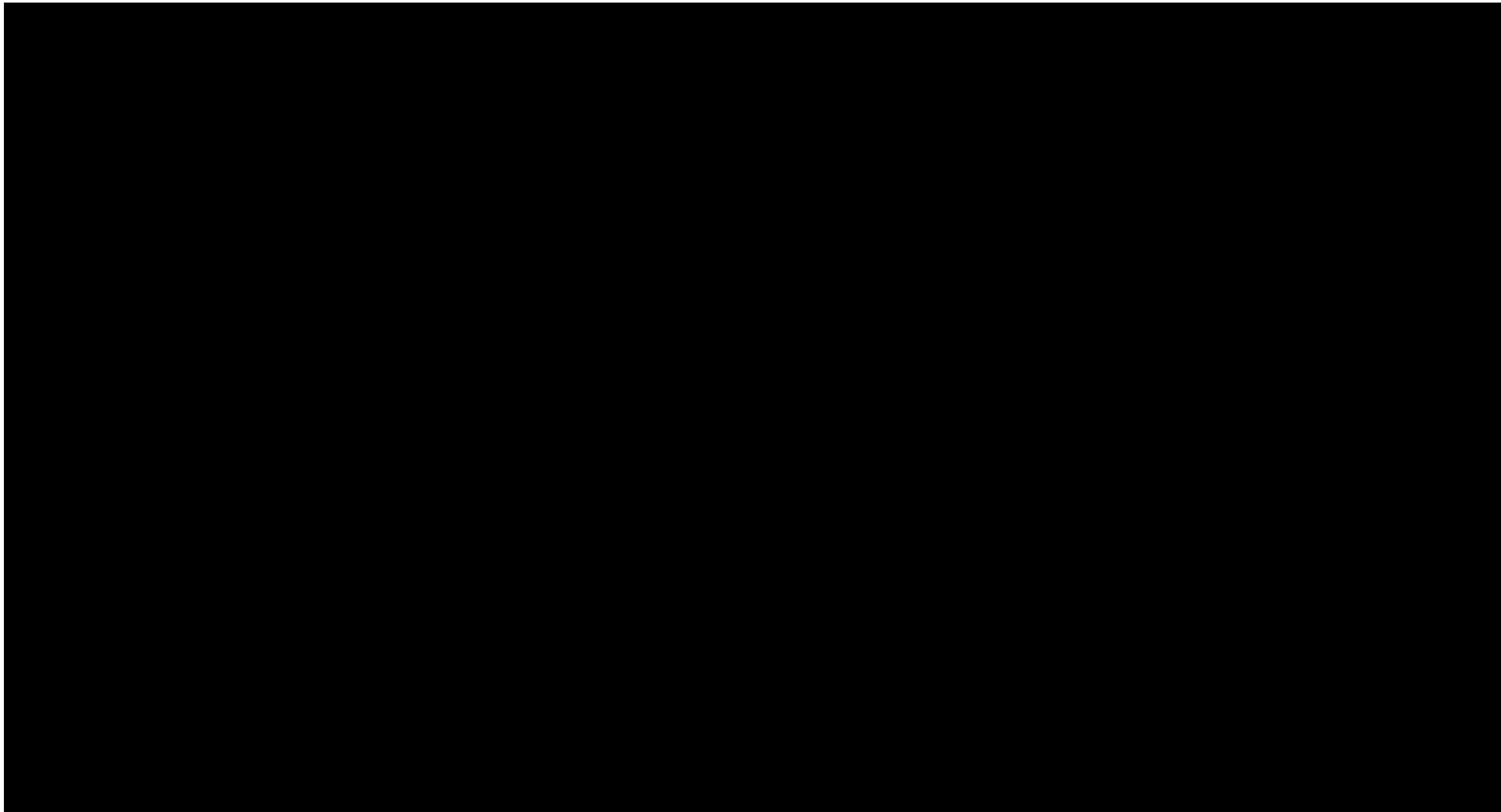
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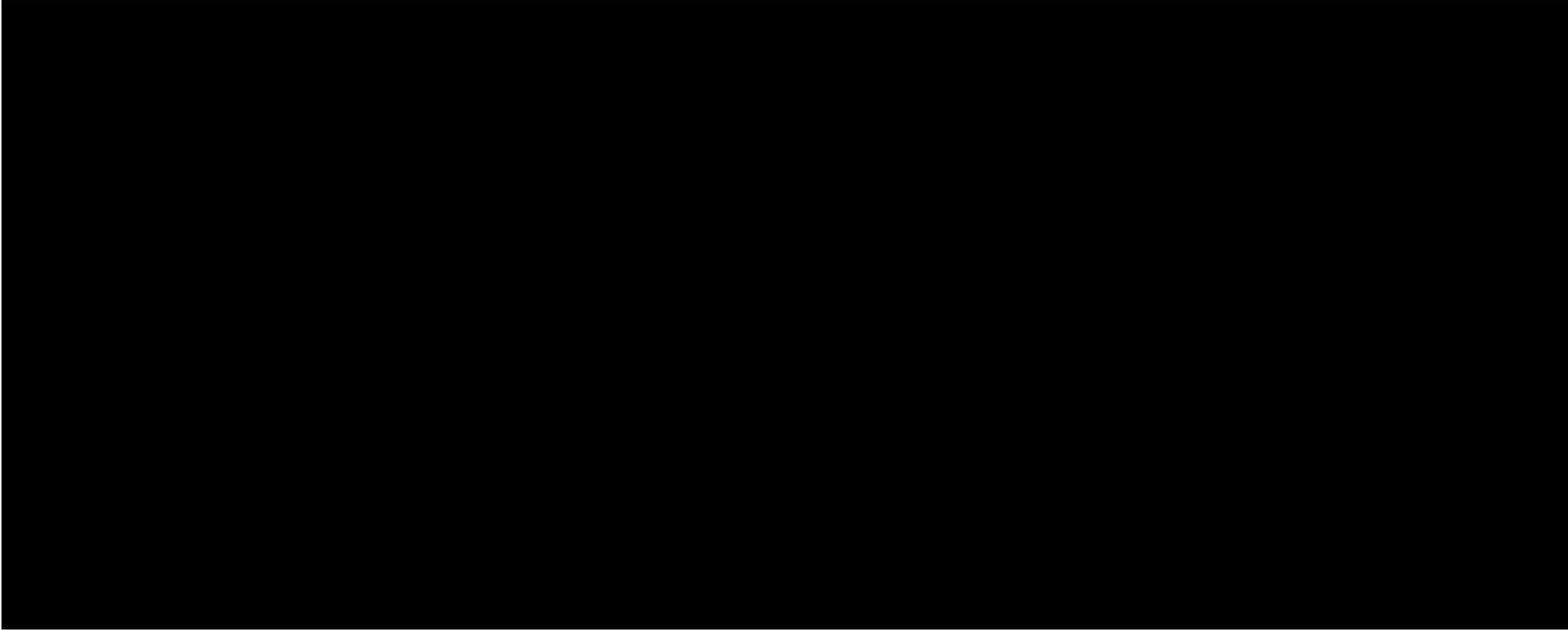














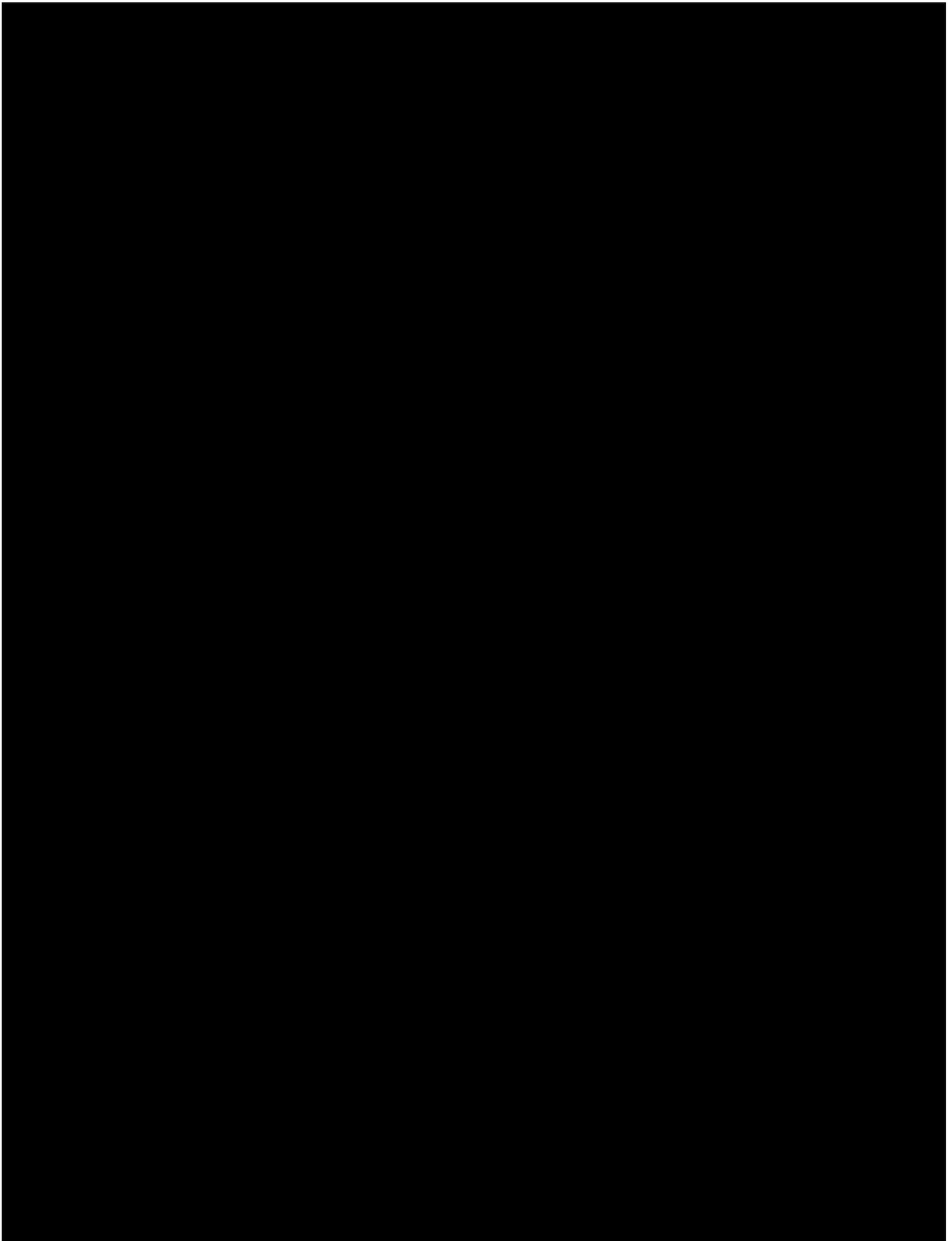






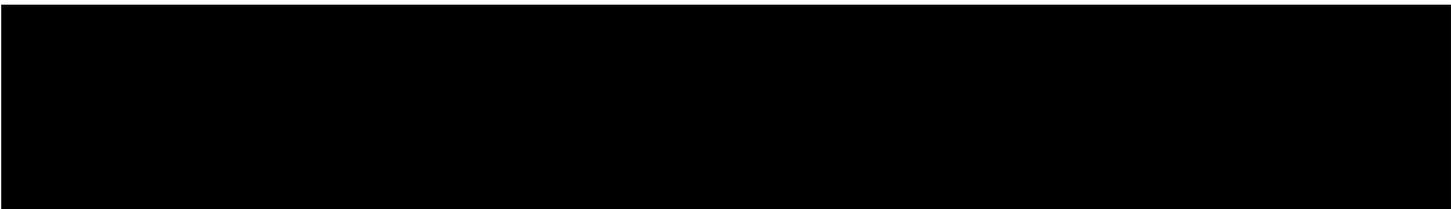
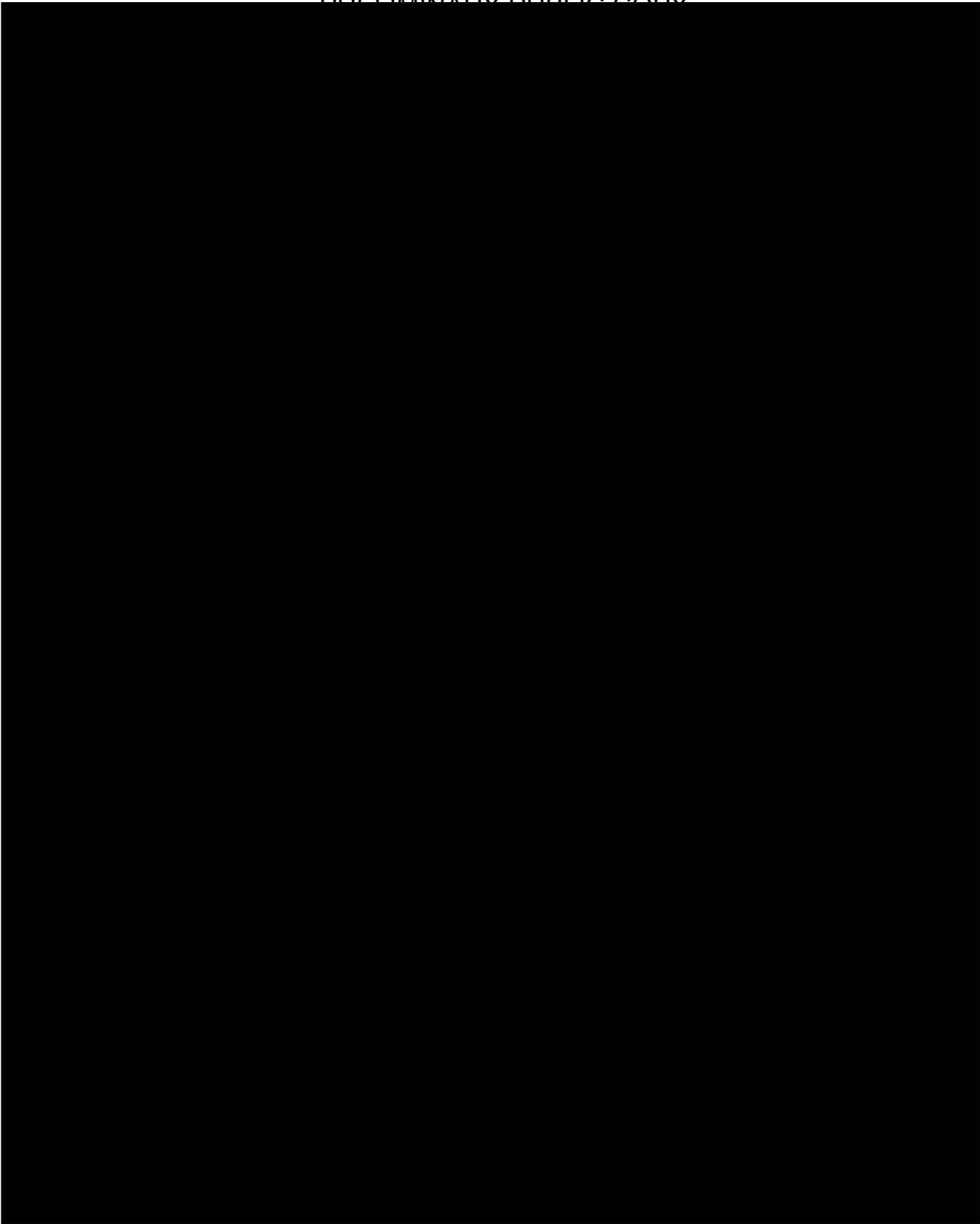
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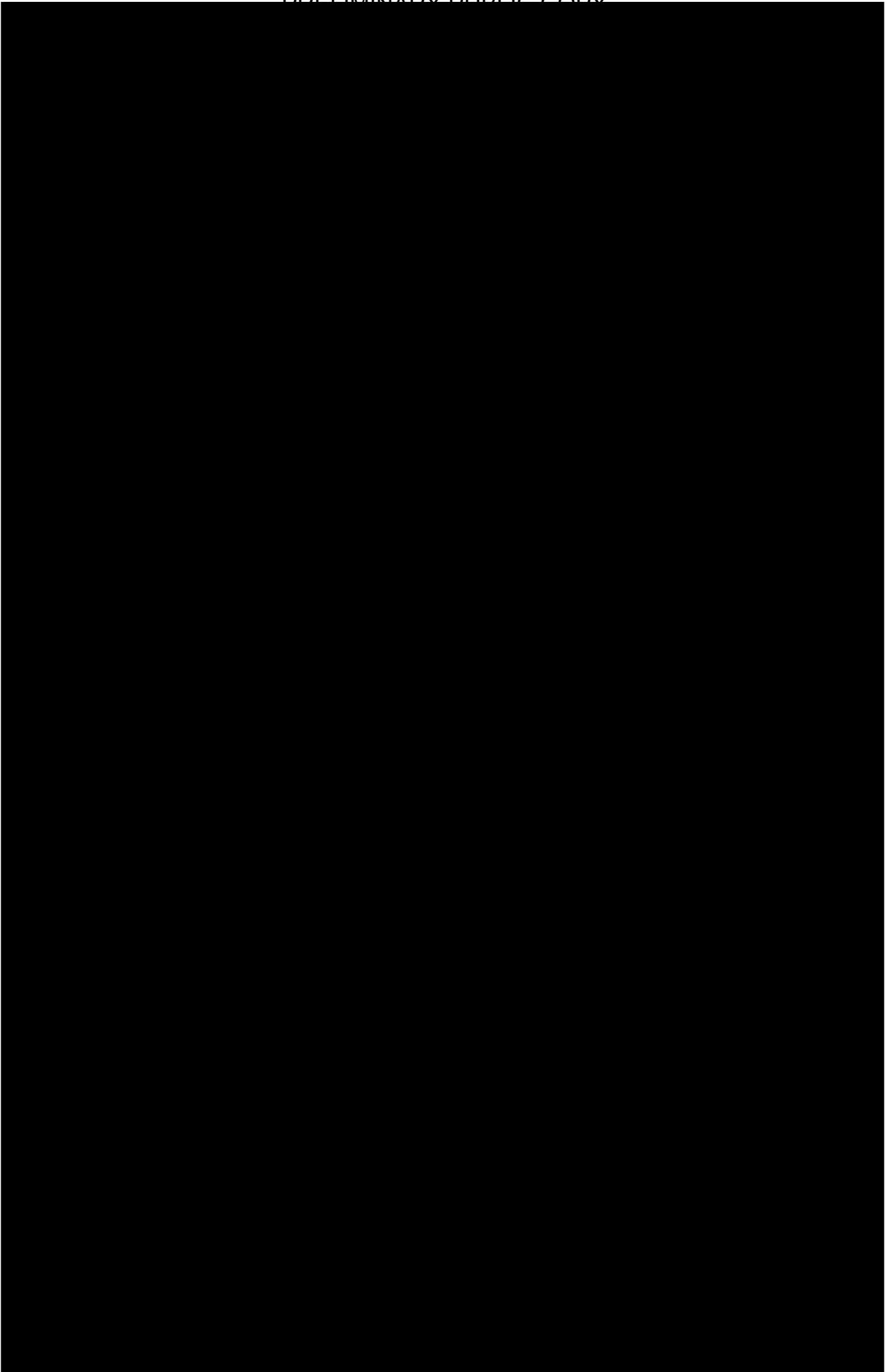
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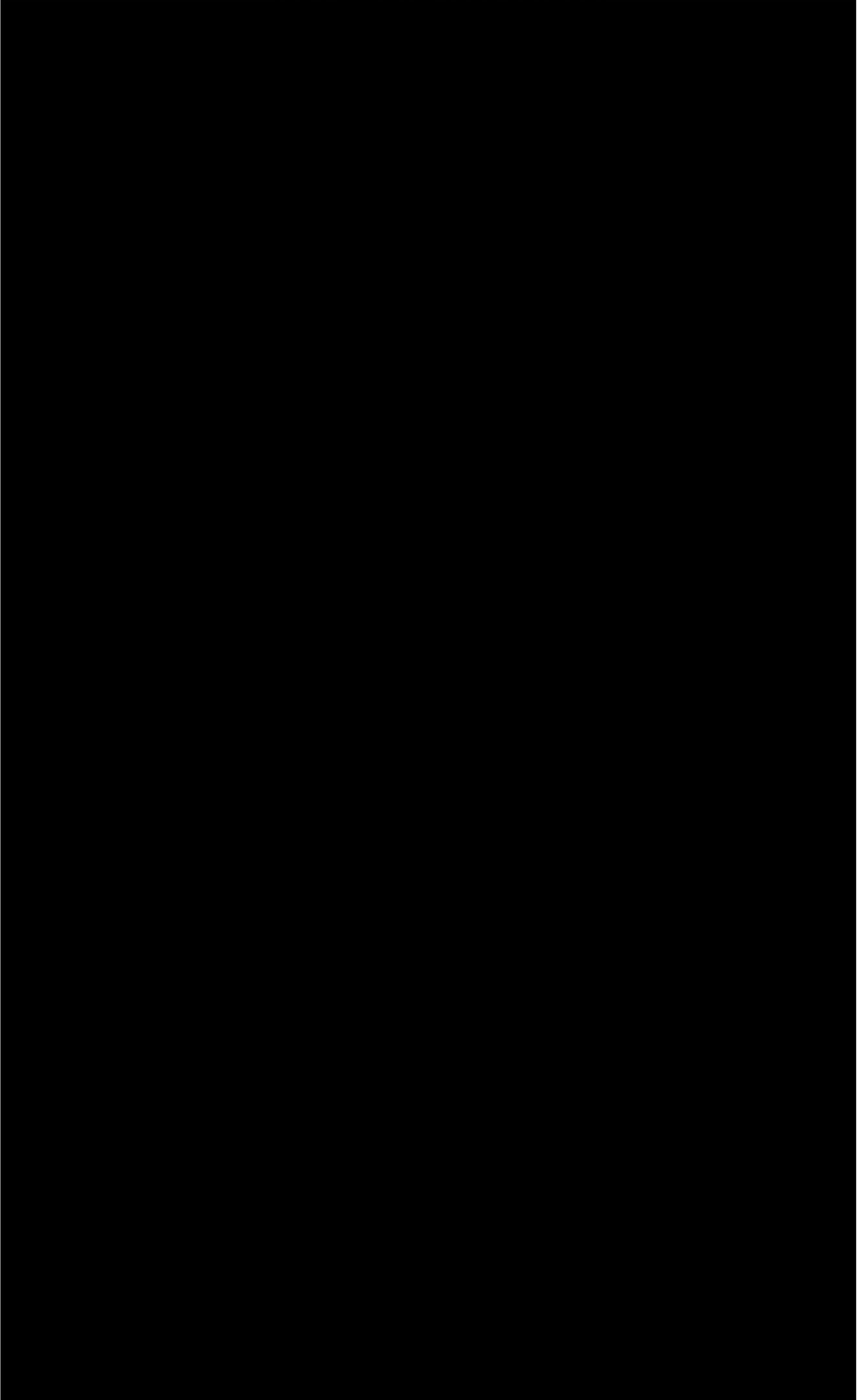


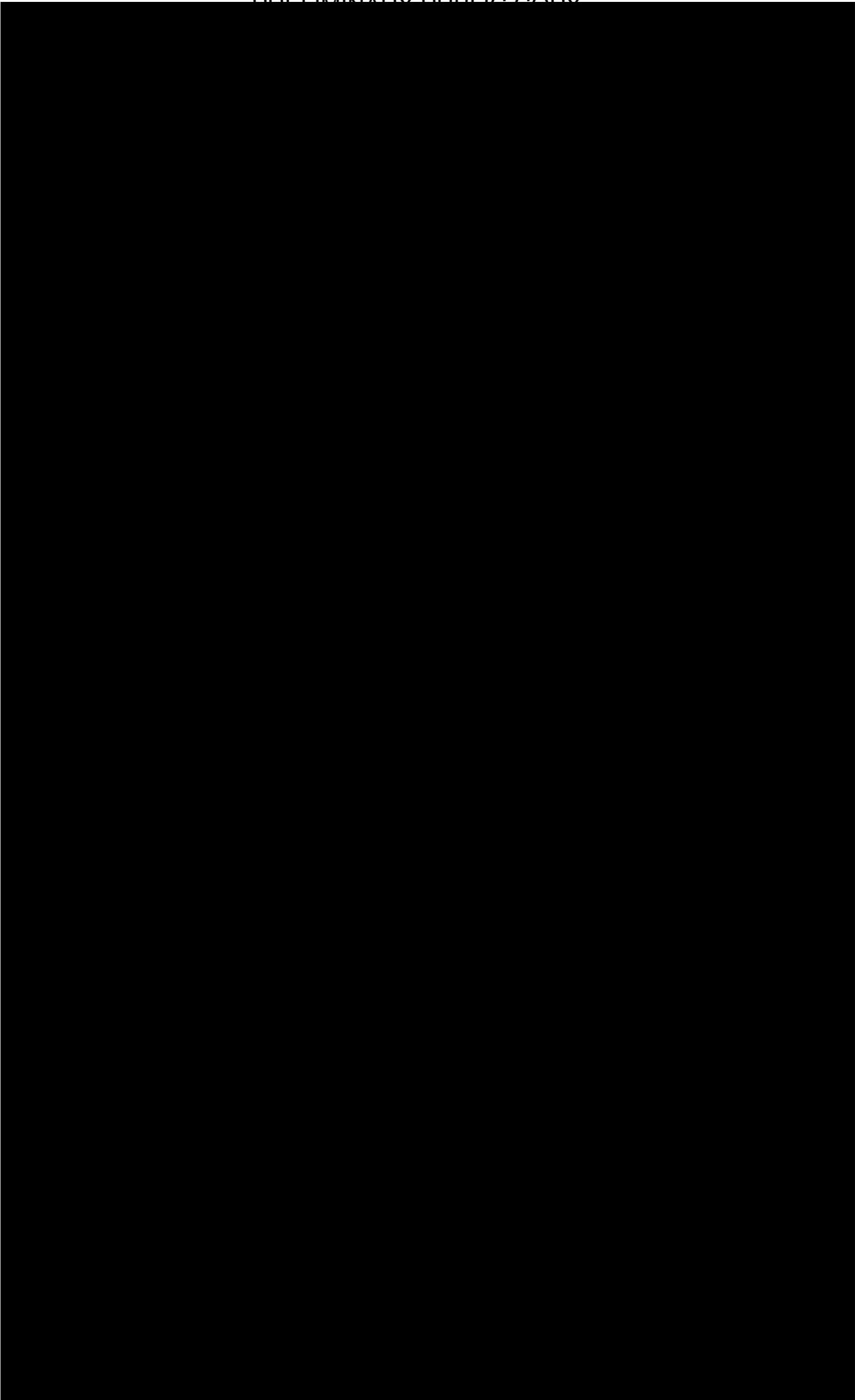
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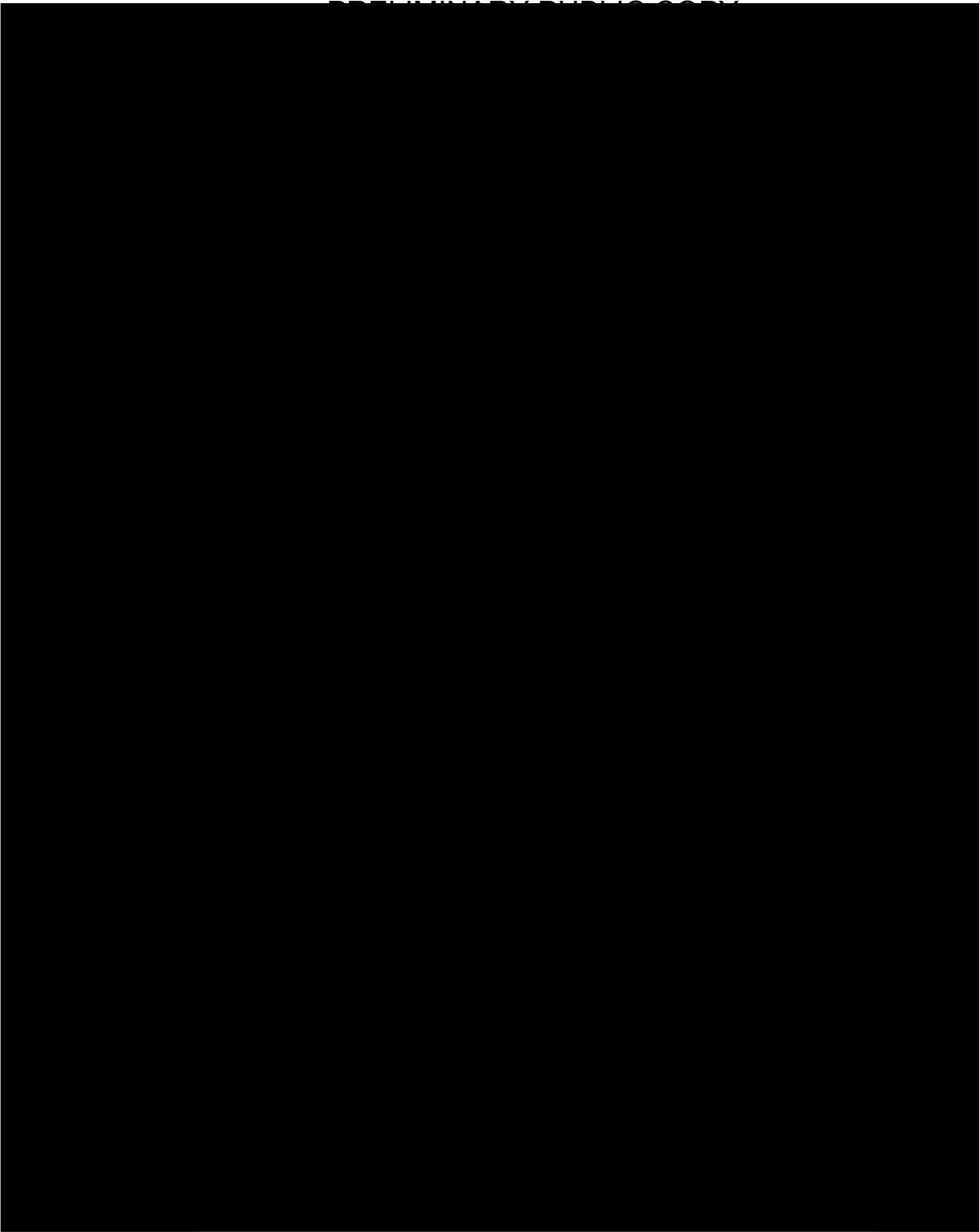








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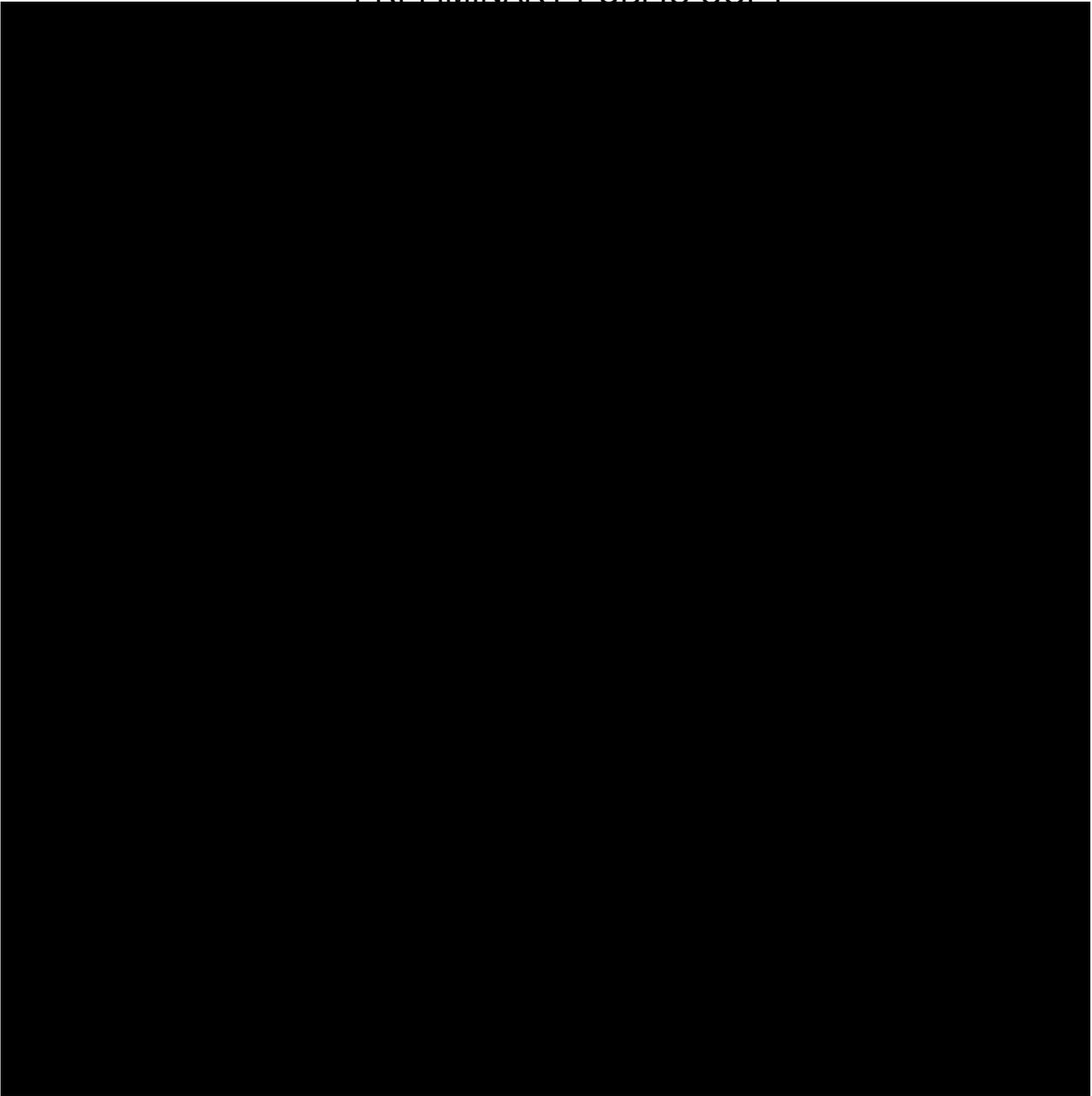
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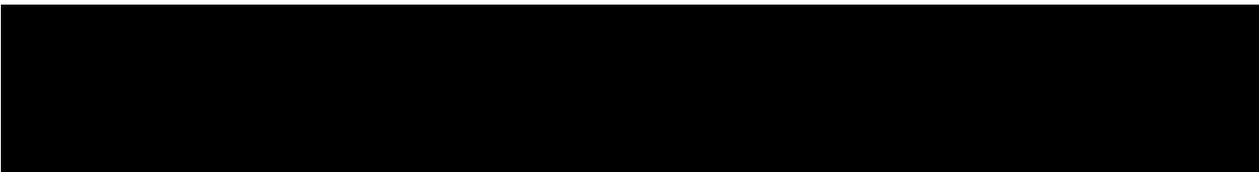
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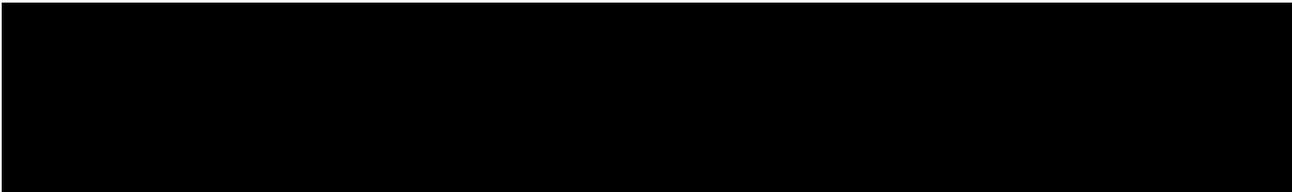
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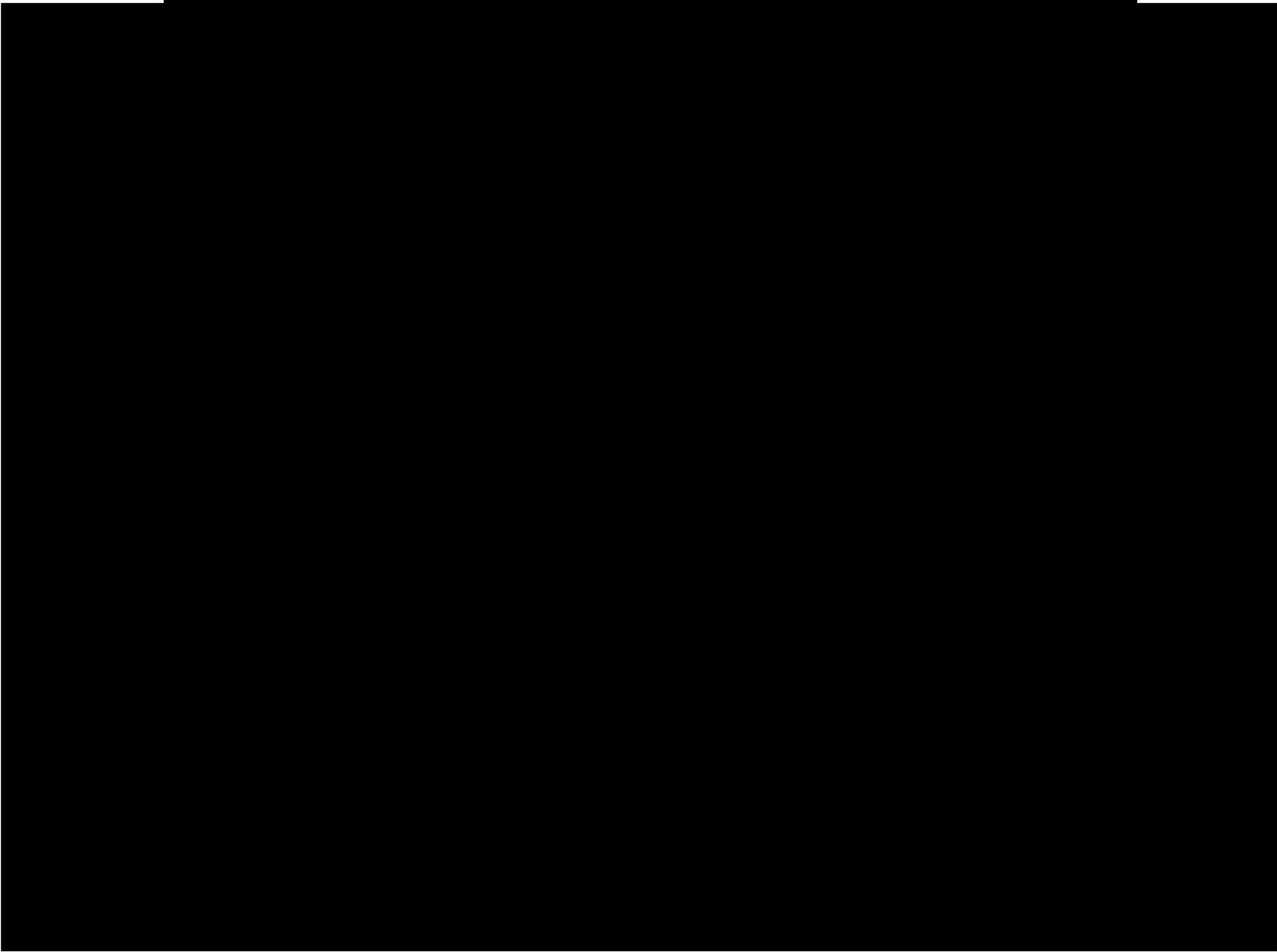
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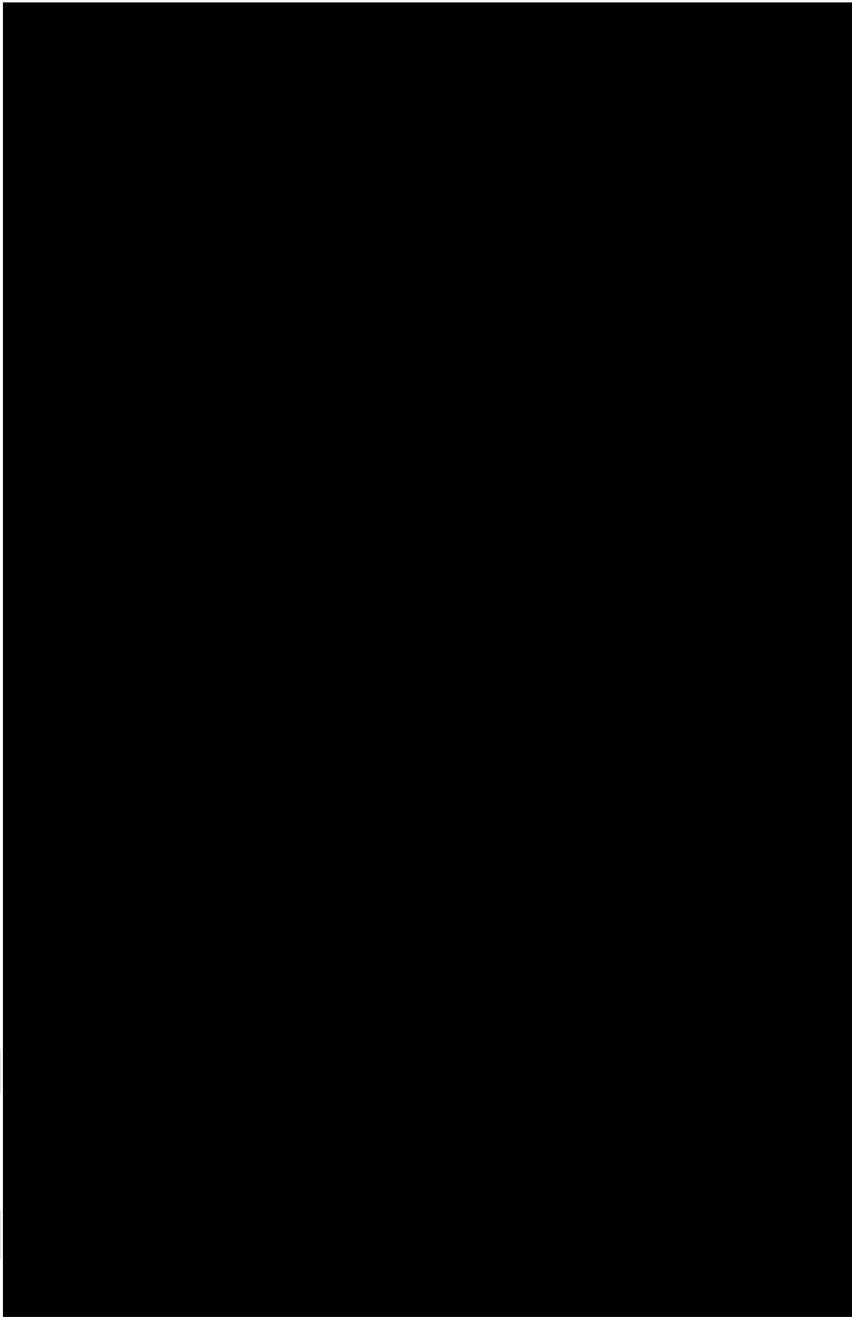
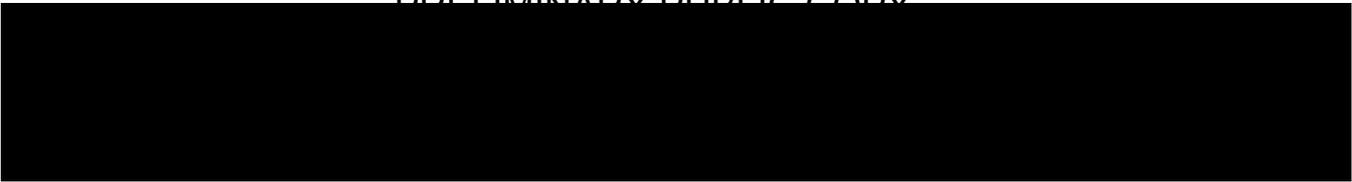
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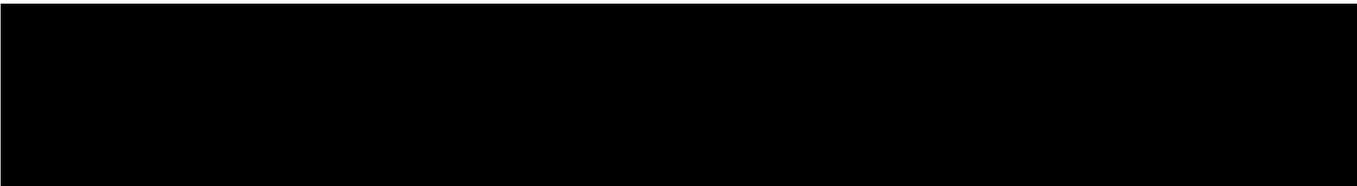
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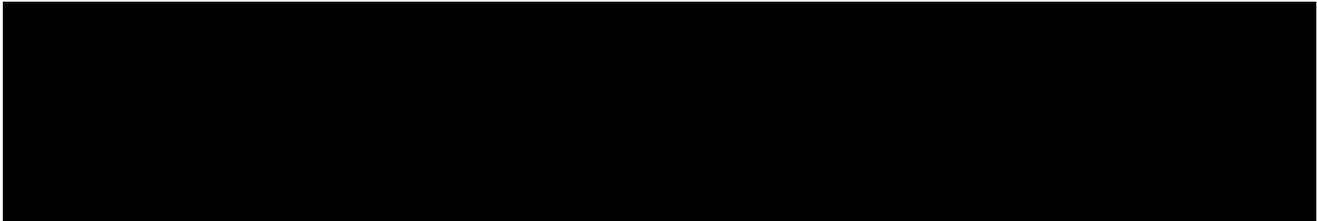
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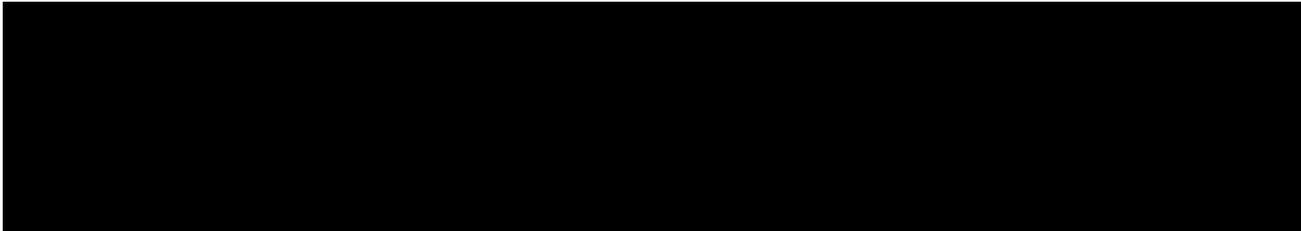
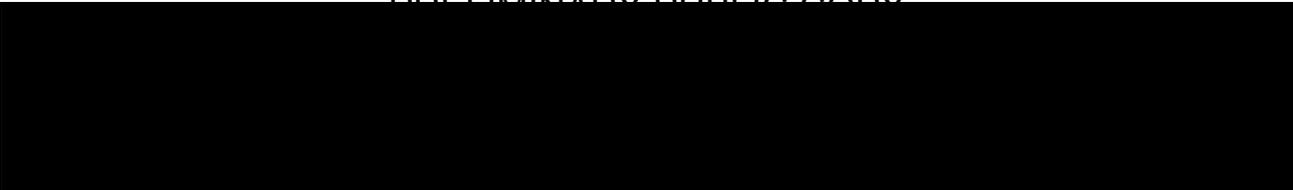
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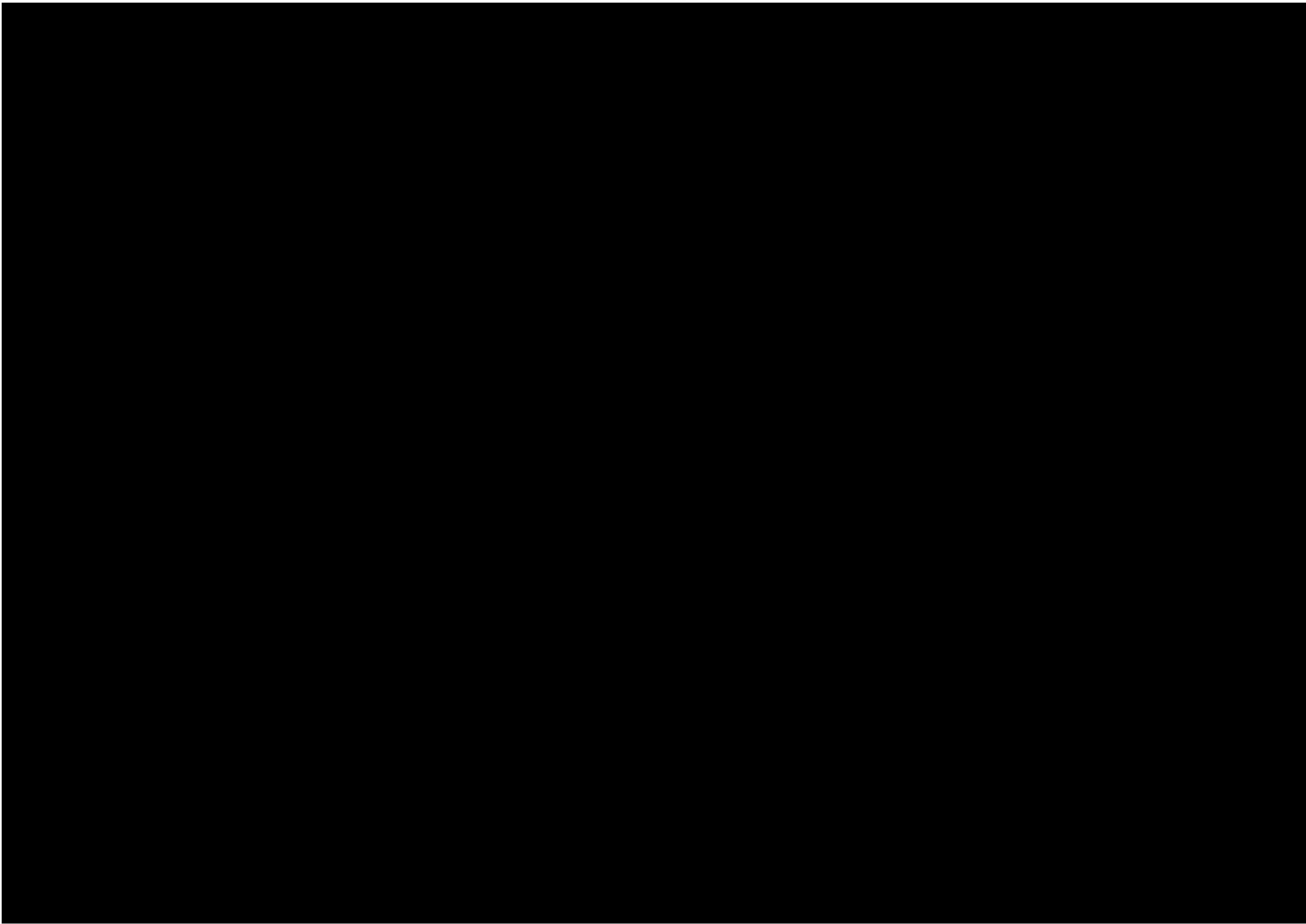
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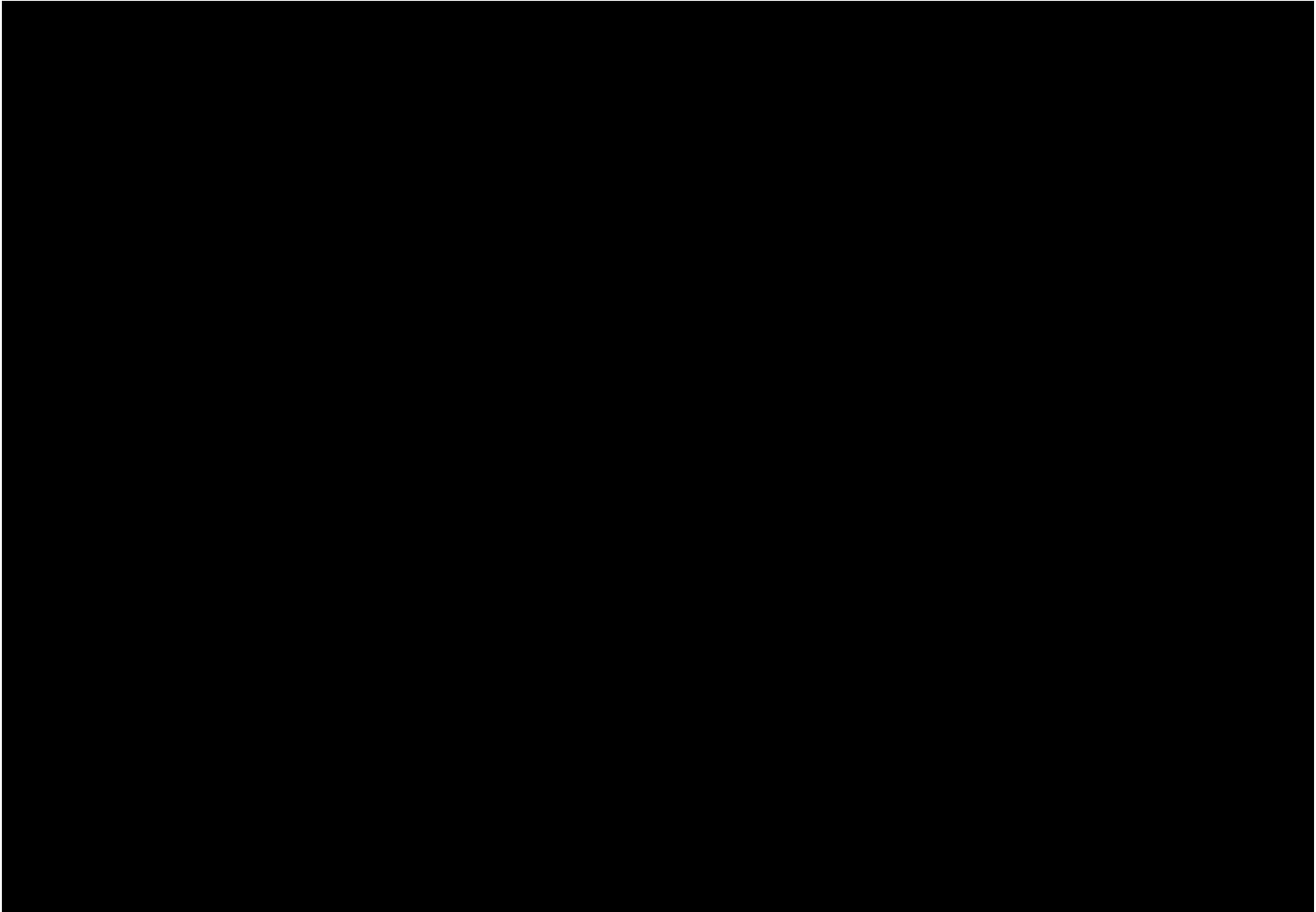
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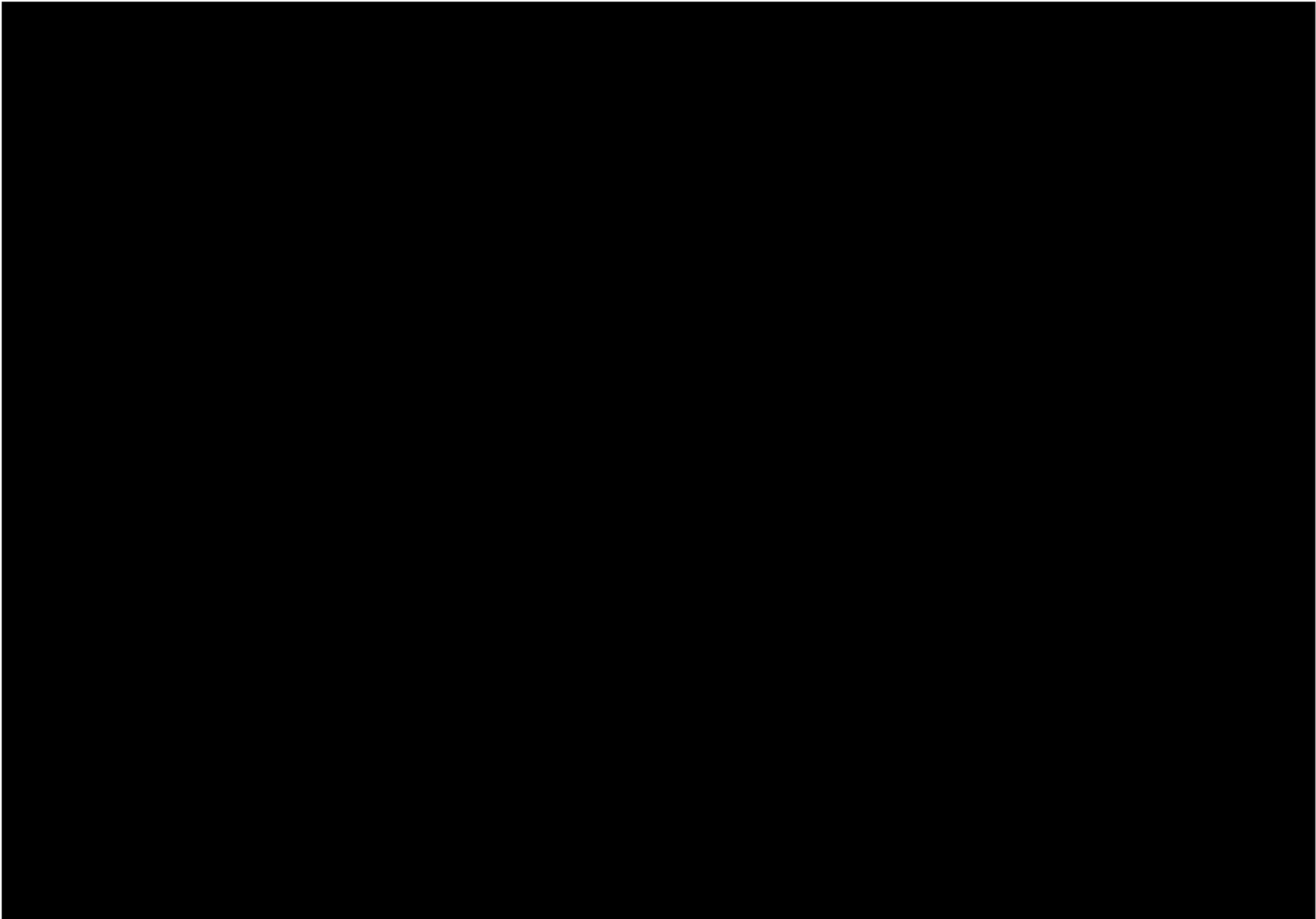
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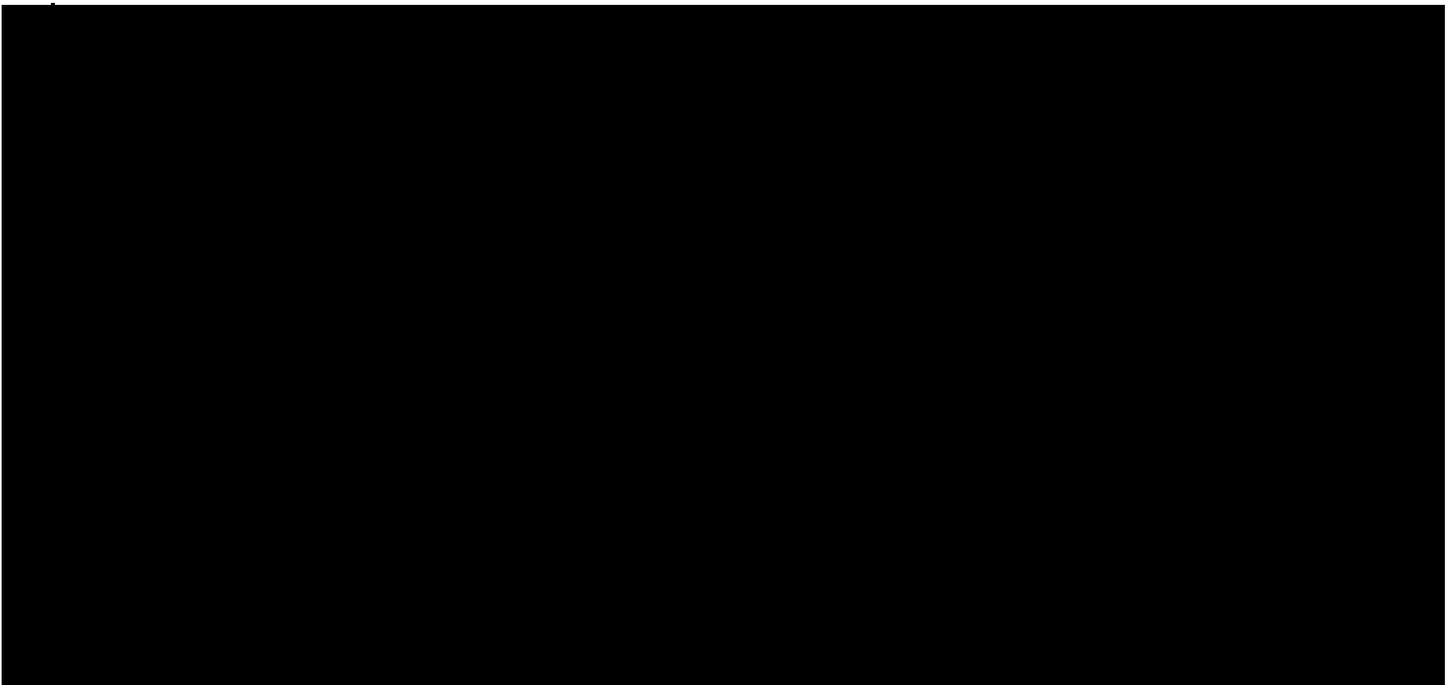
# ATTACHMENT 98

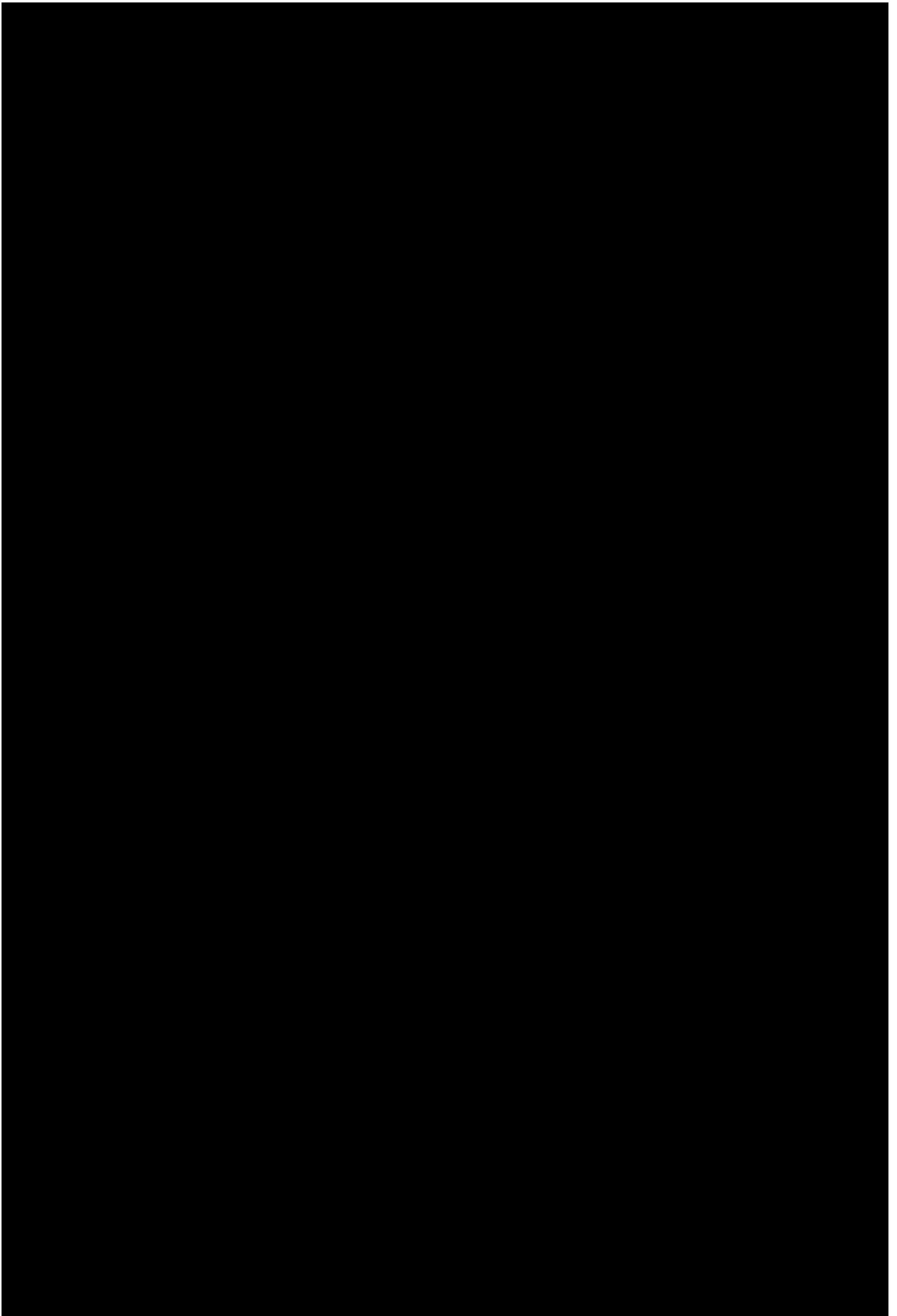
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[REDACTED]

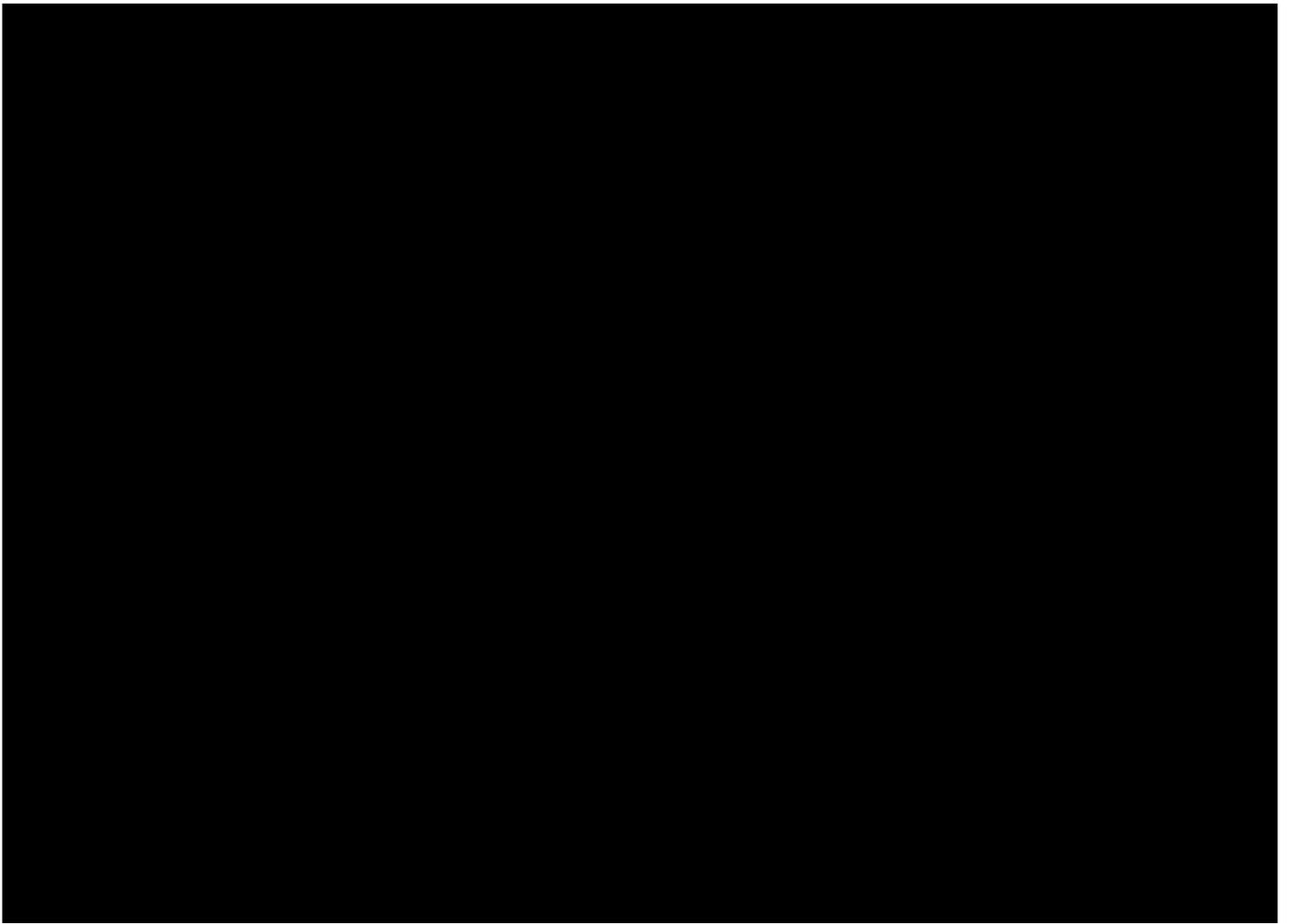
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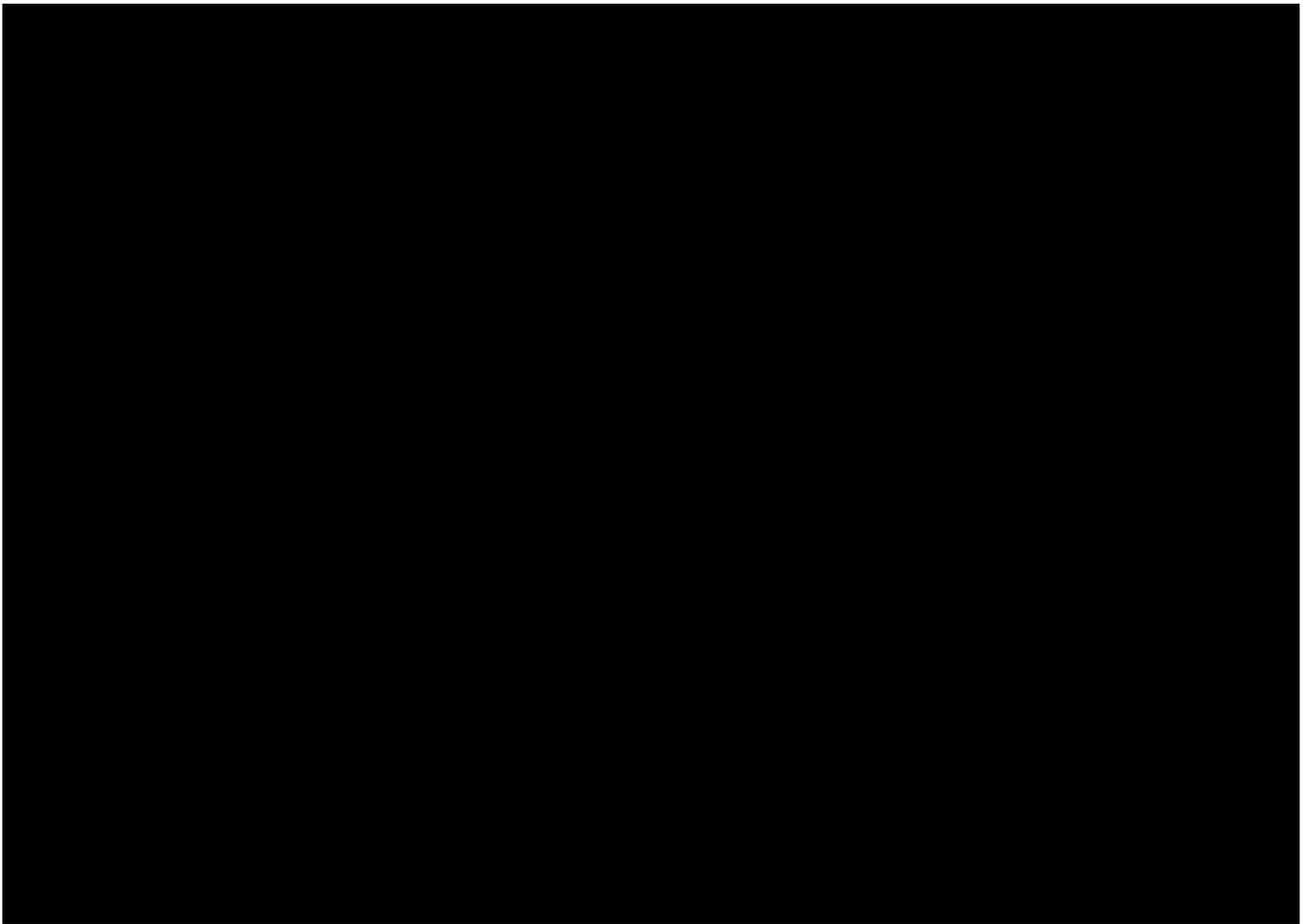
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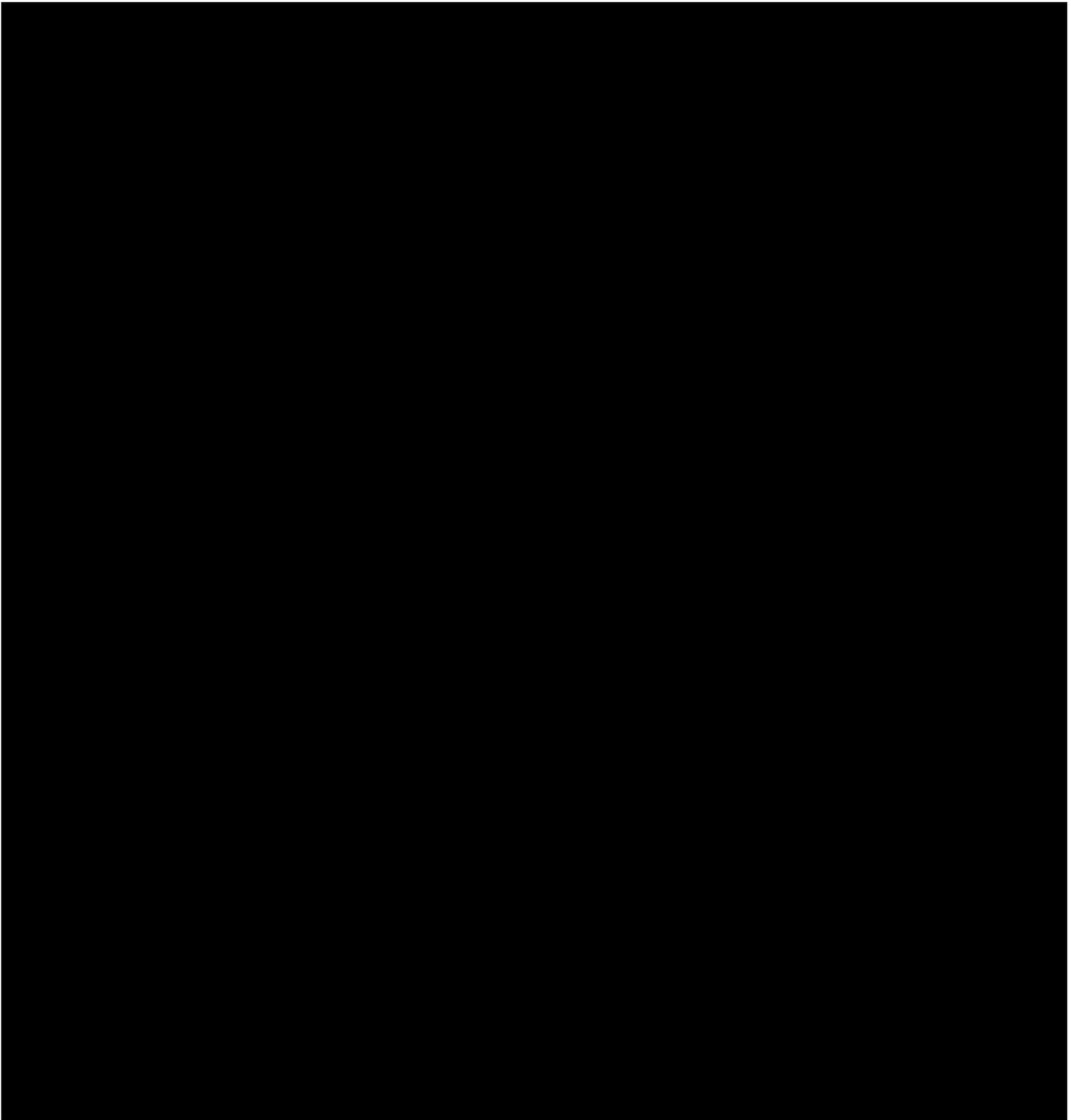












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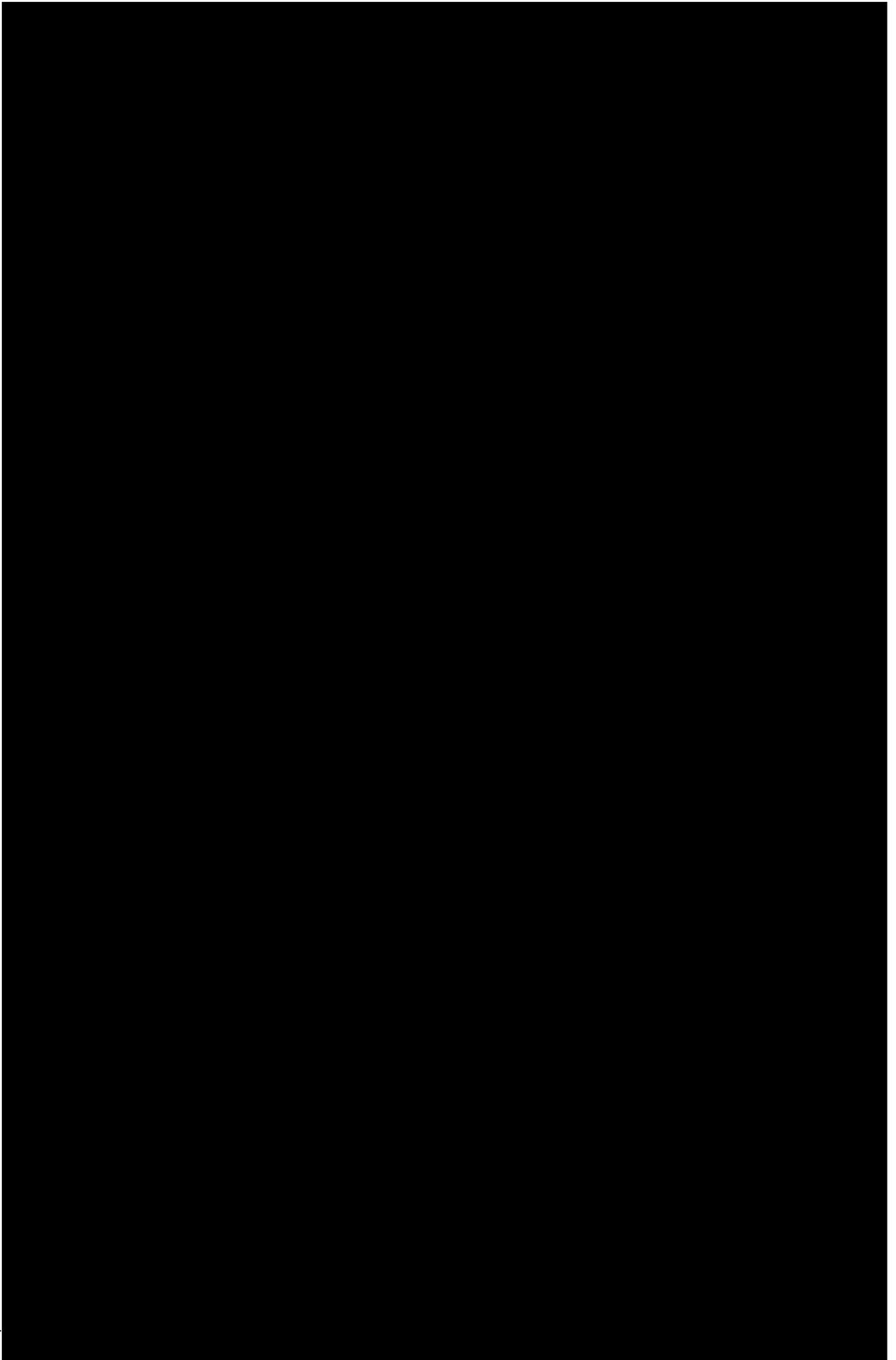
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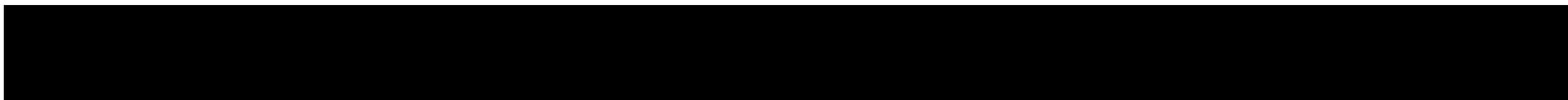
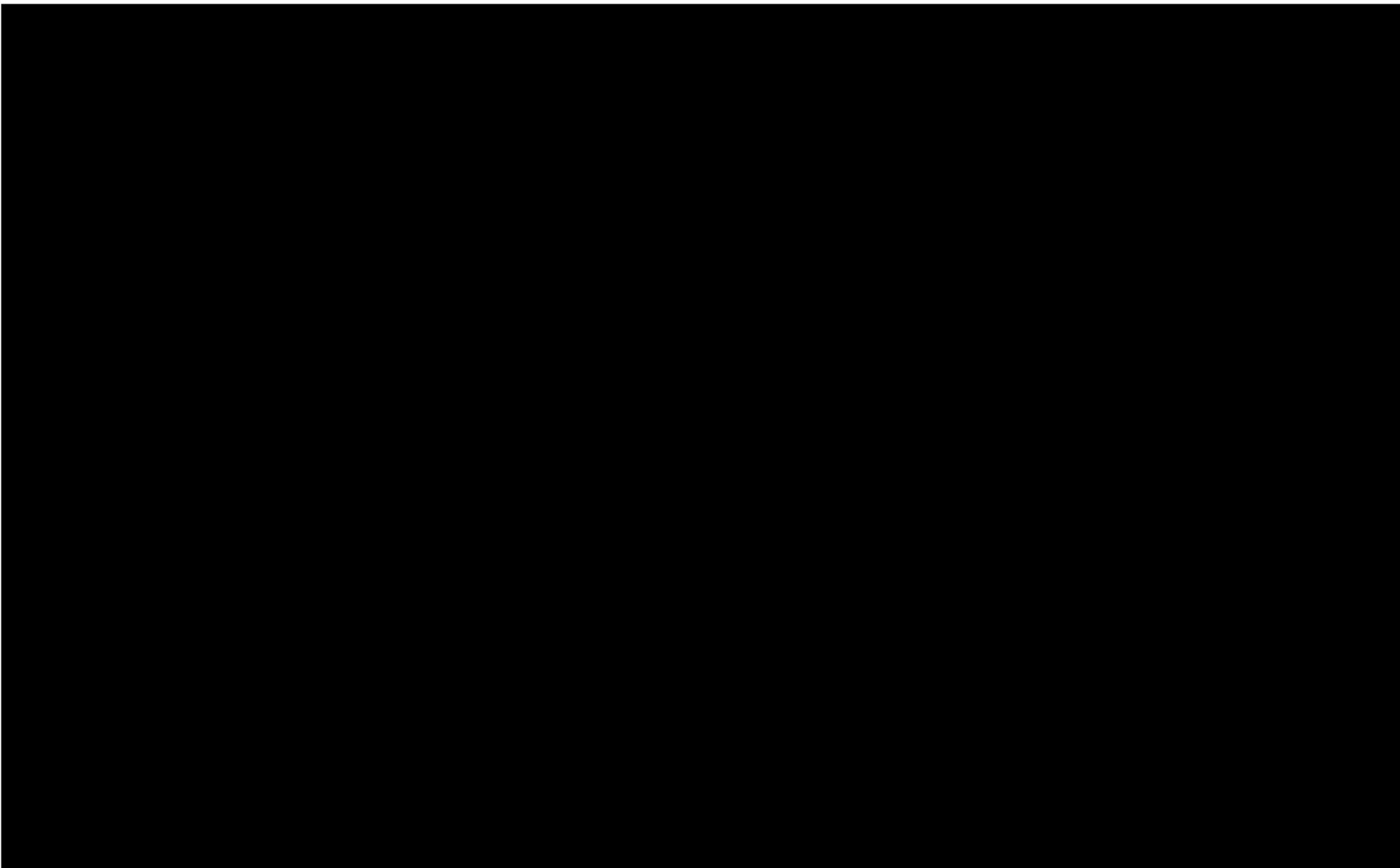
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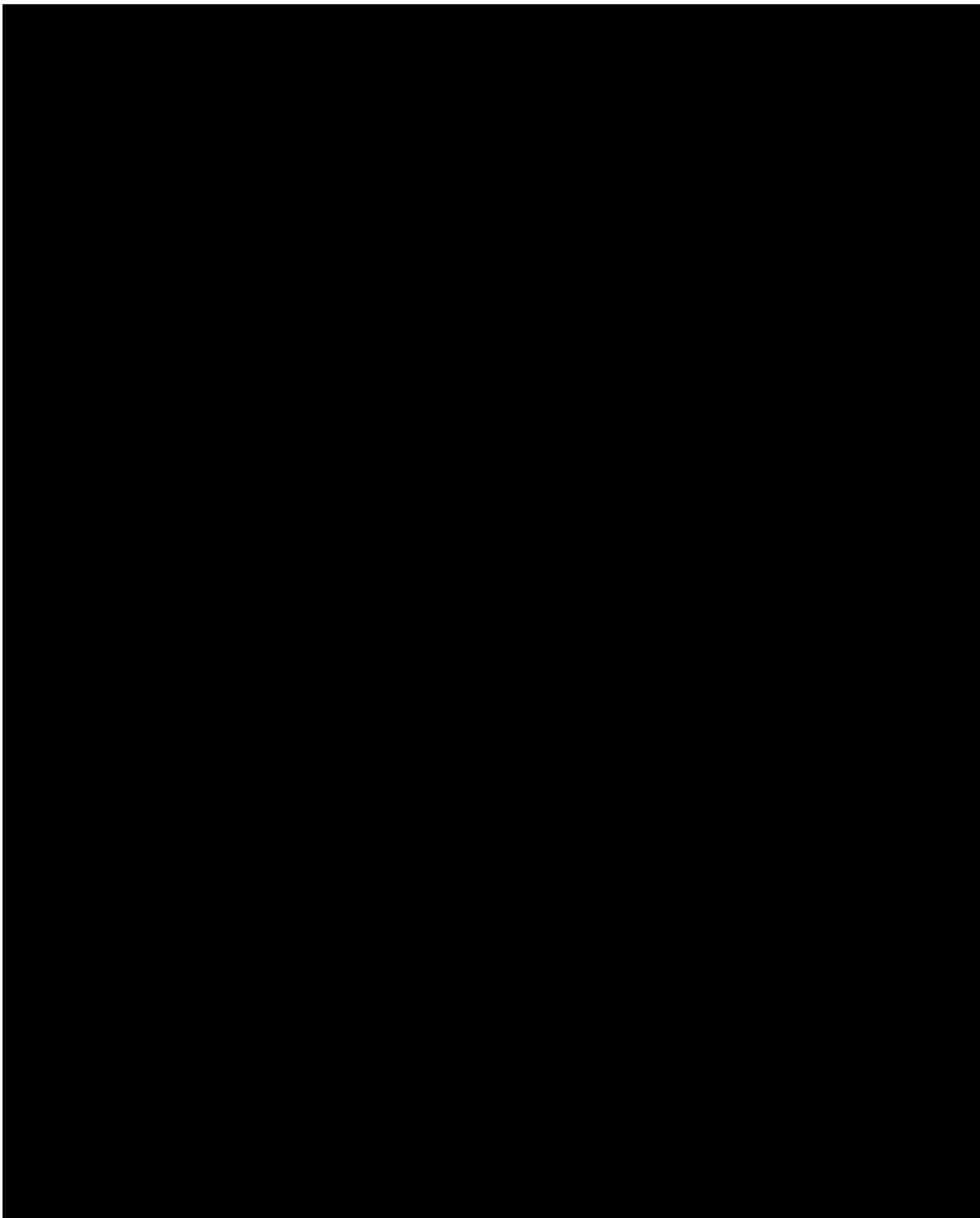
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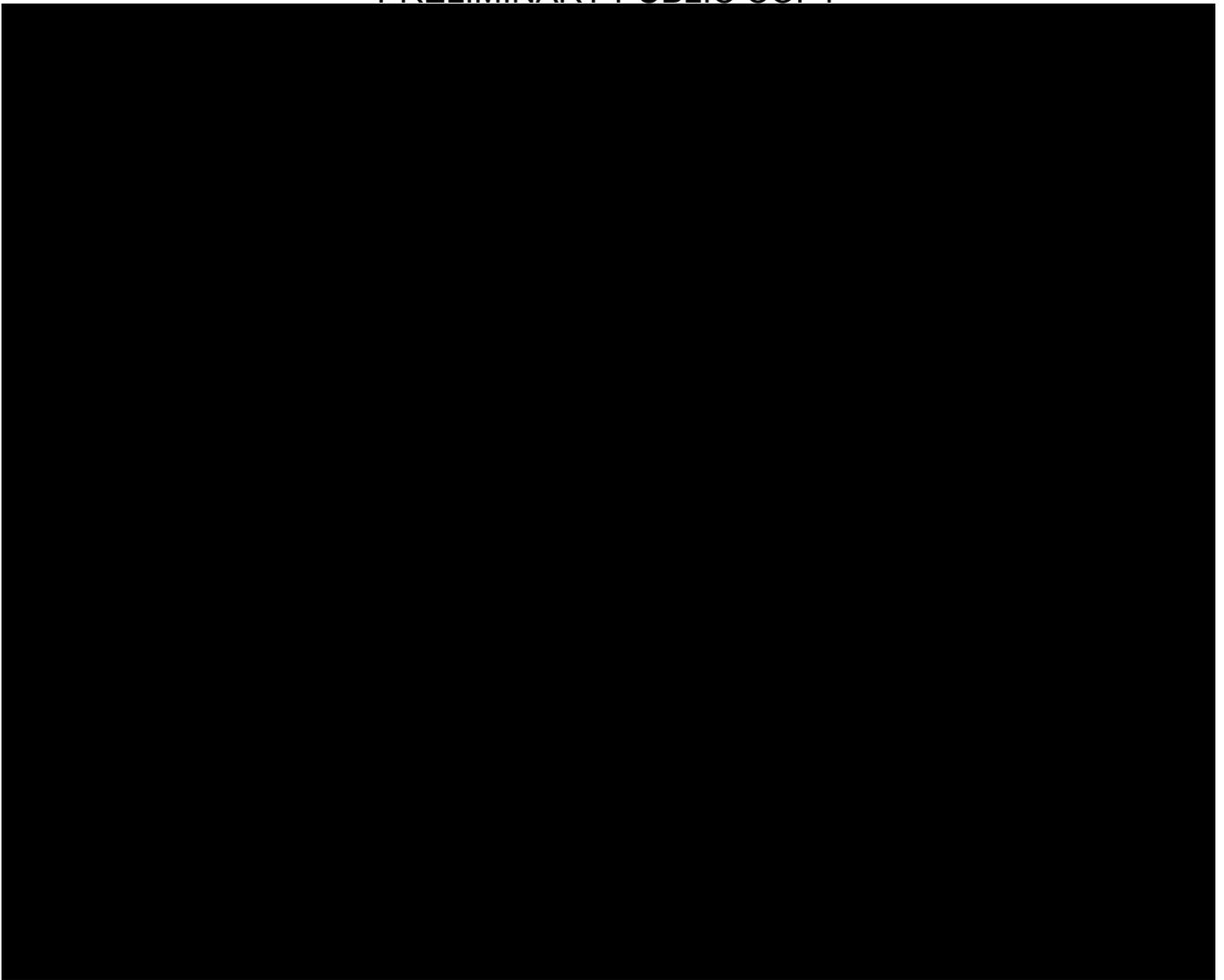
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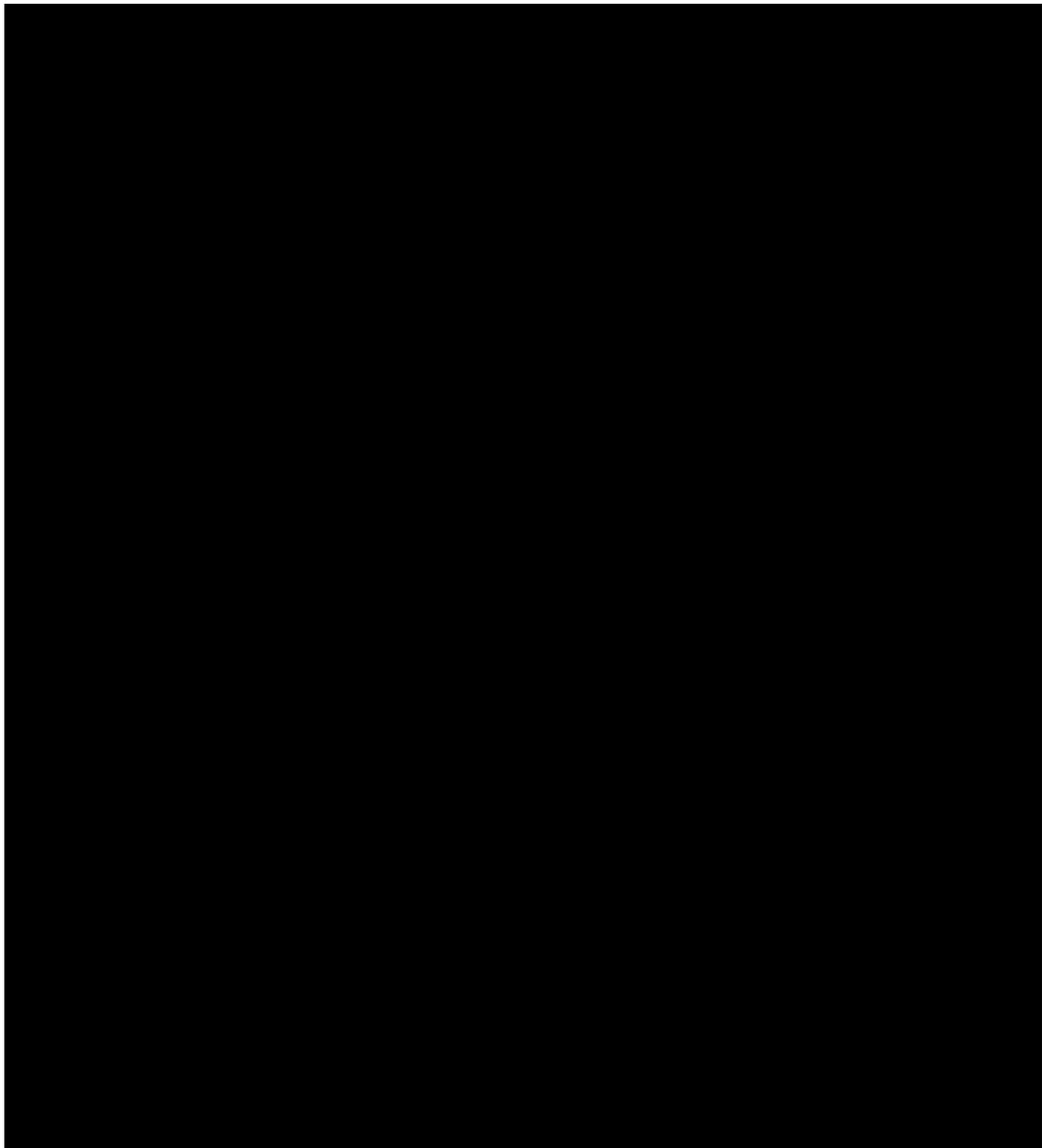
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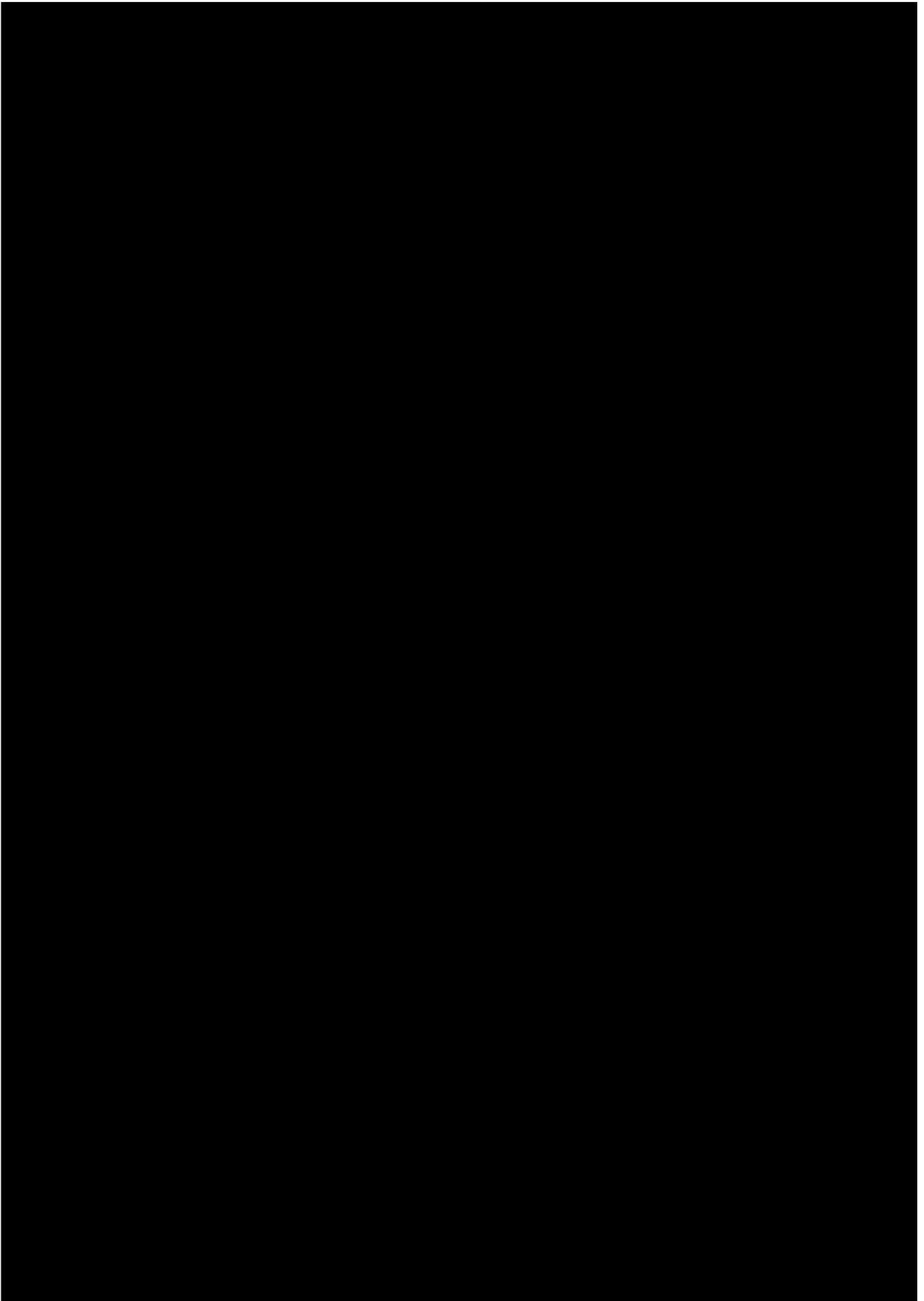


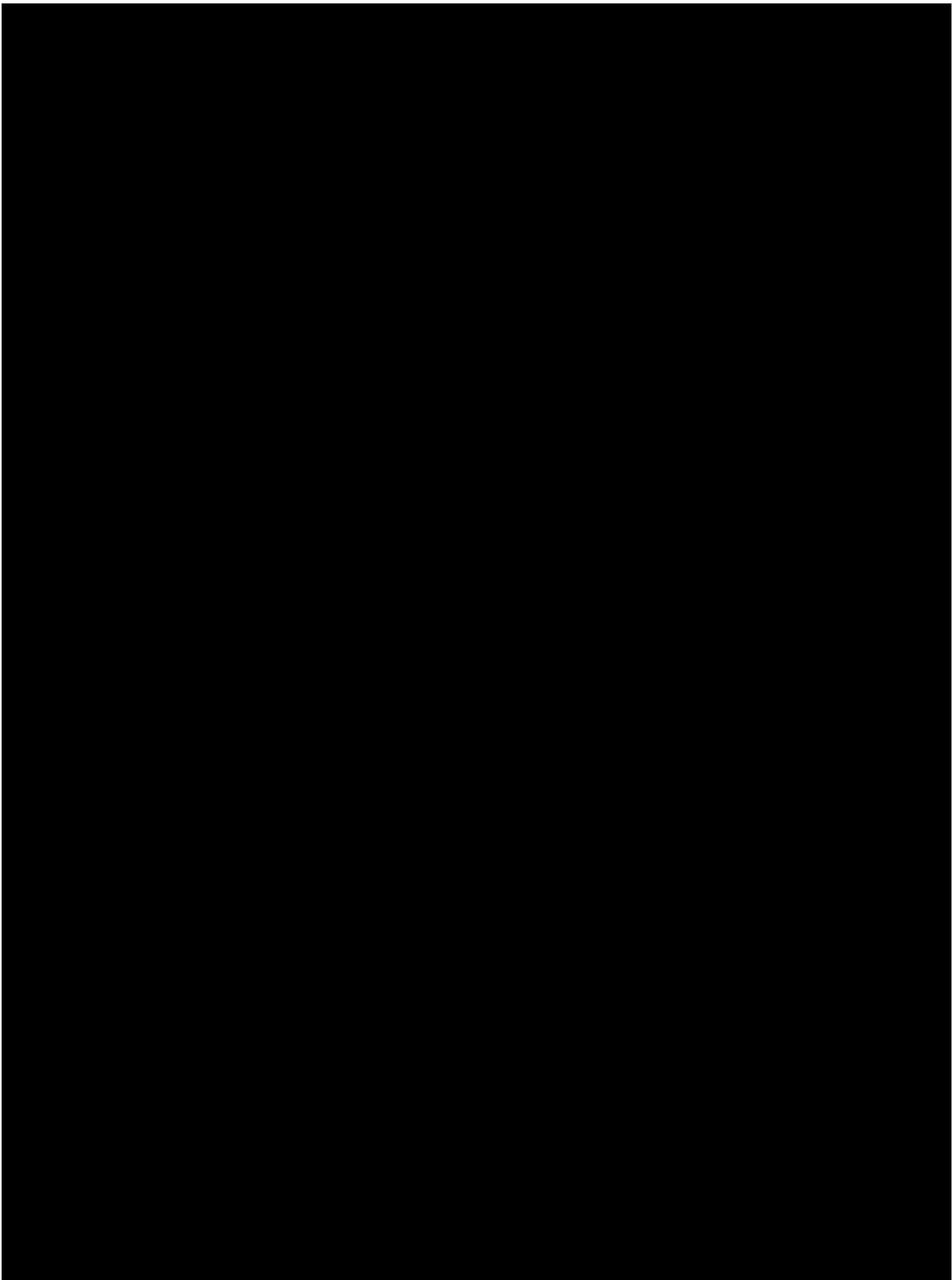


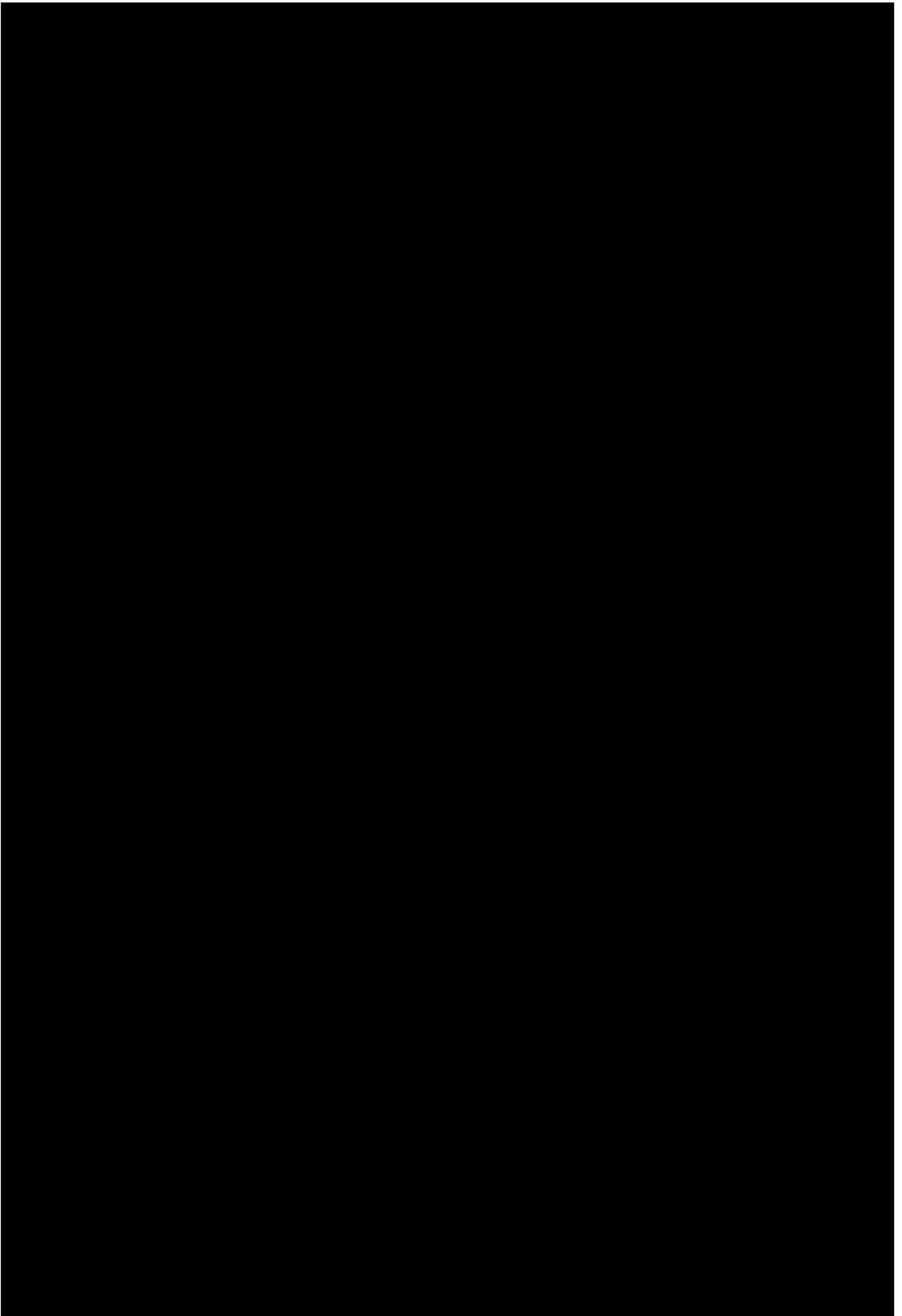


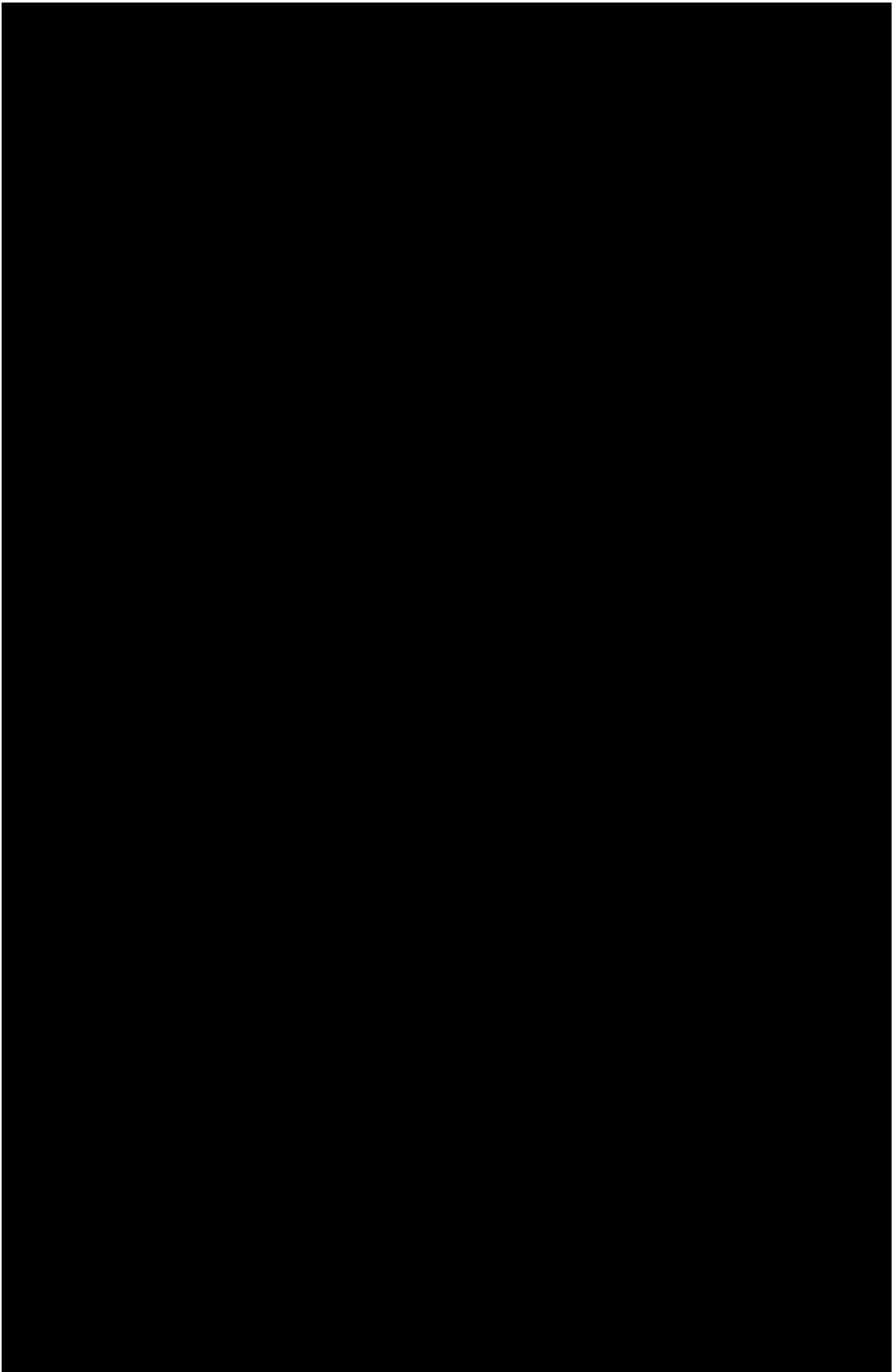


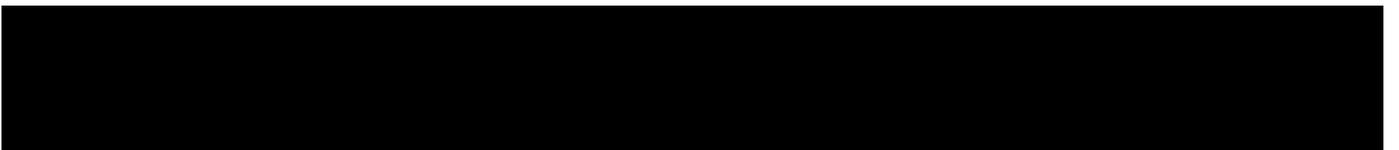
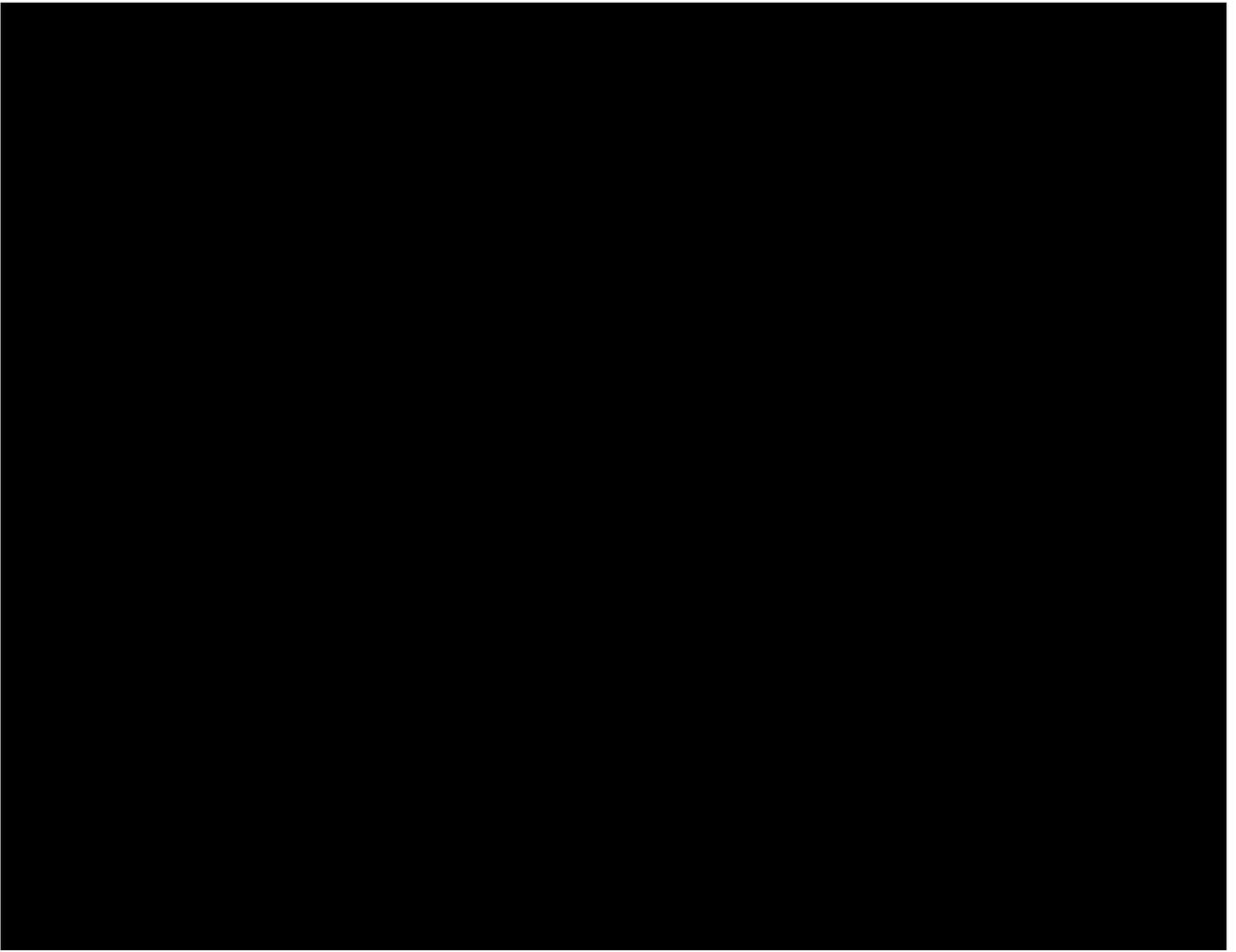


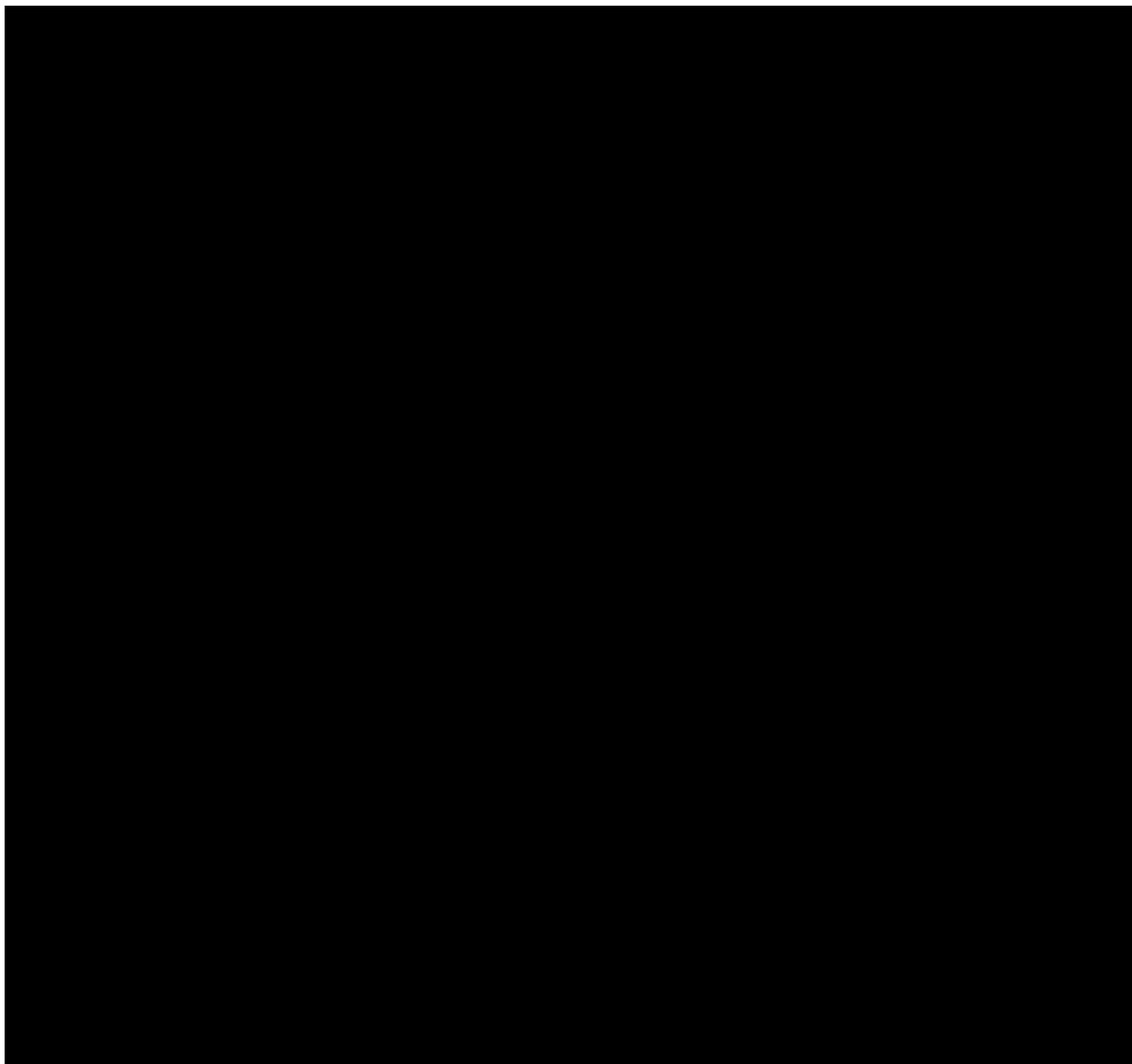


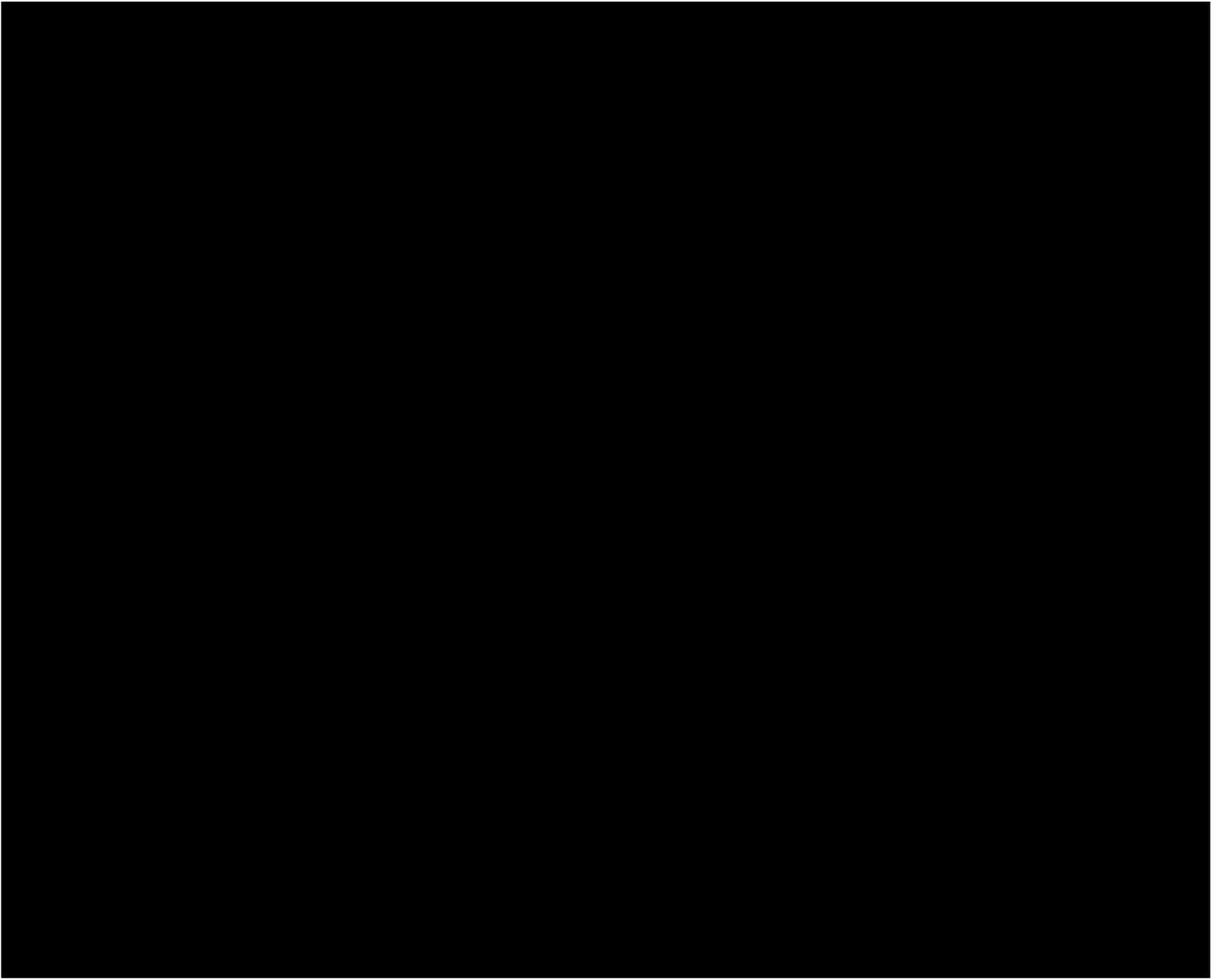




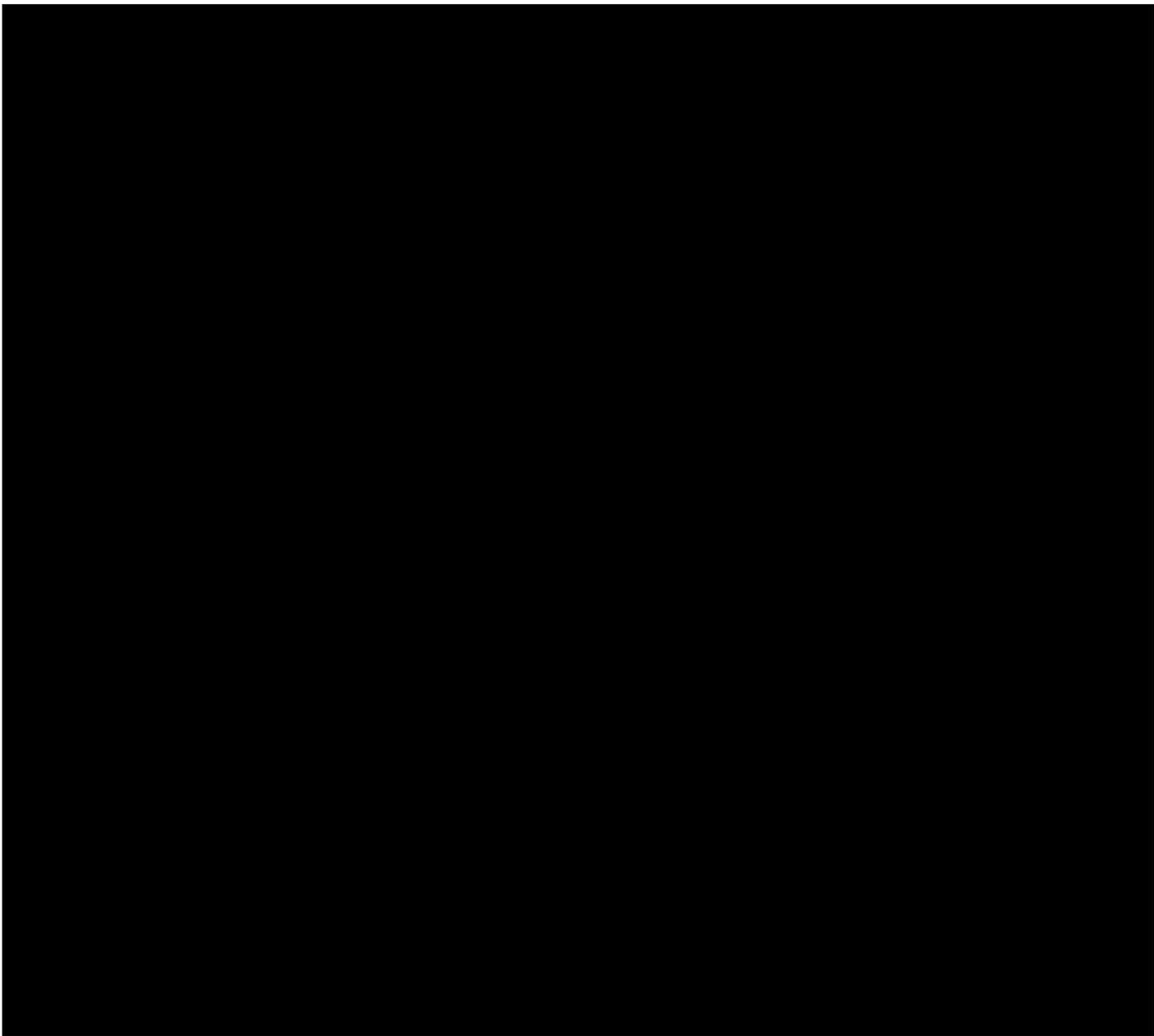


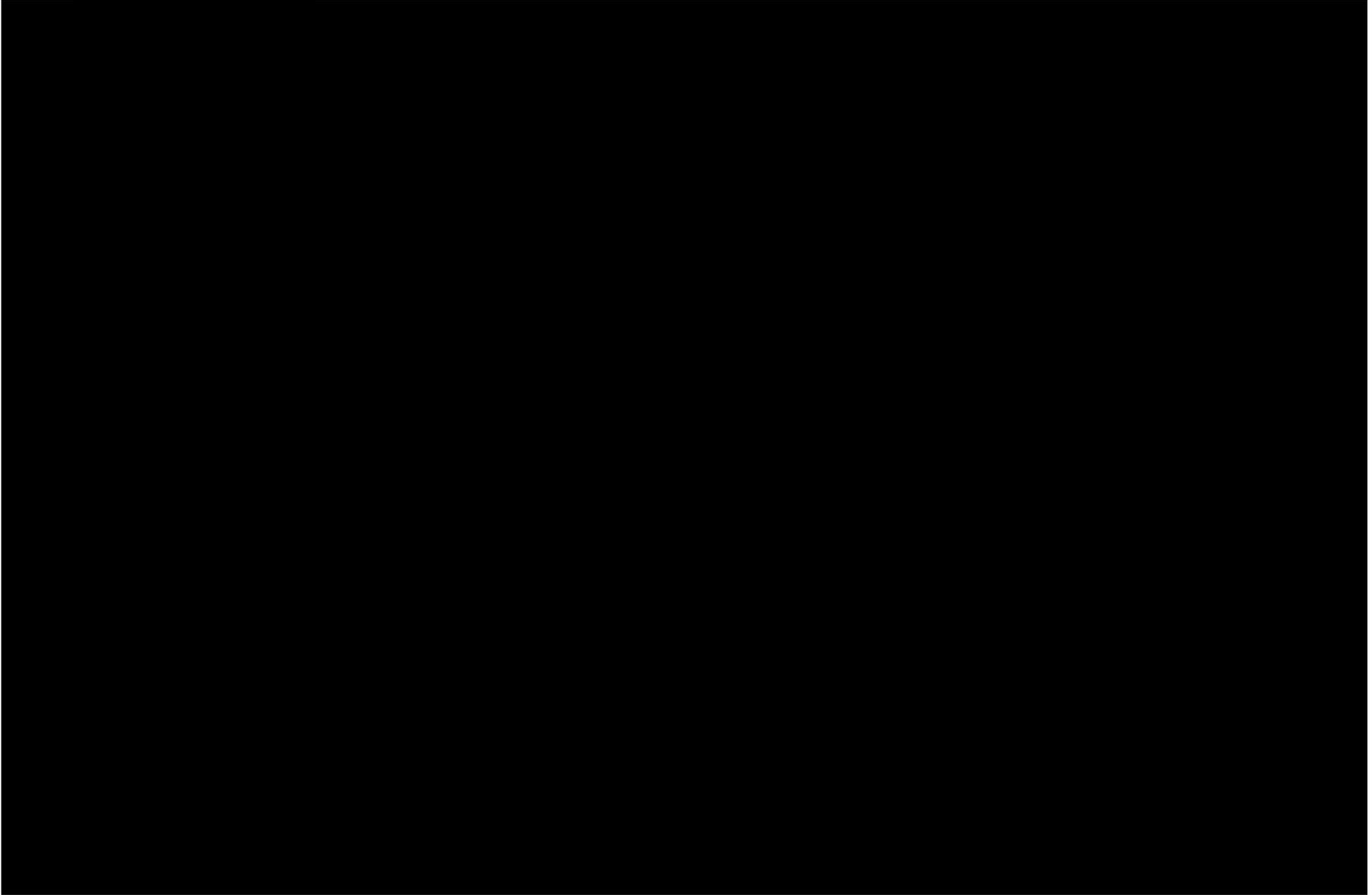


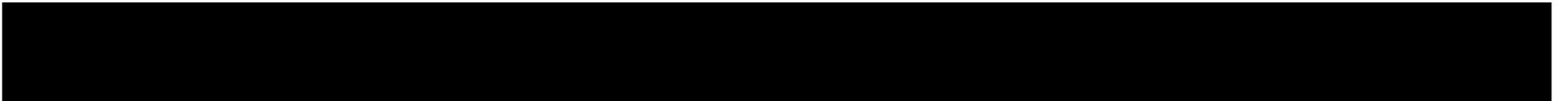
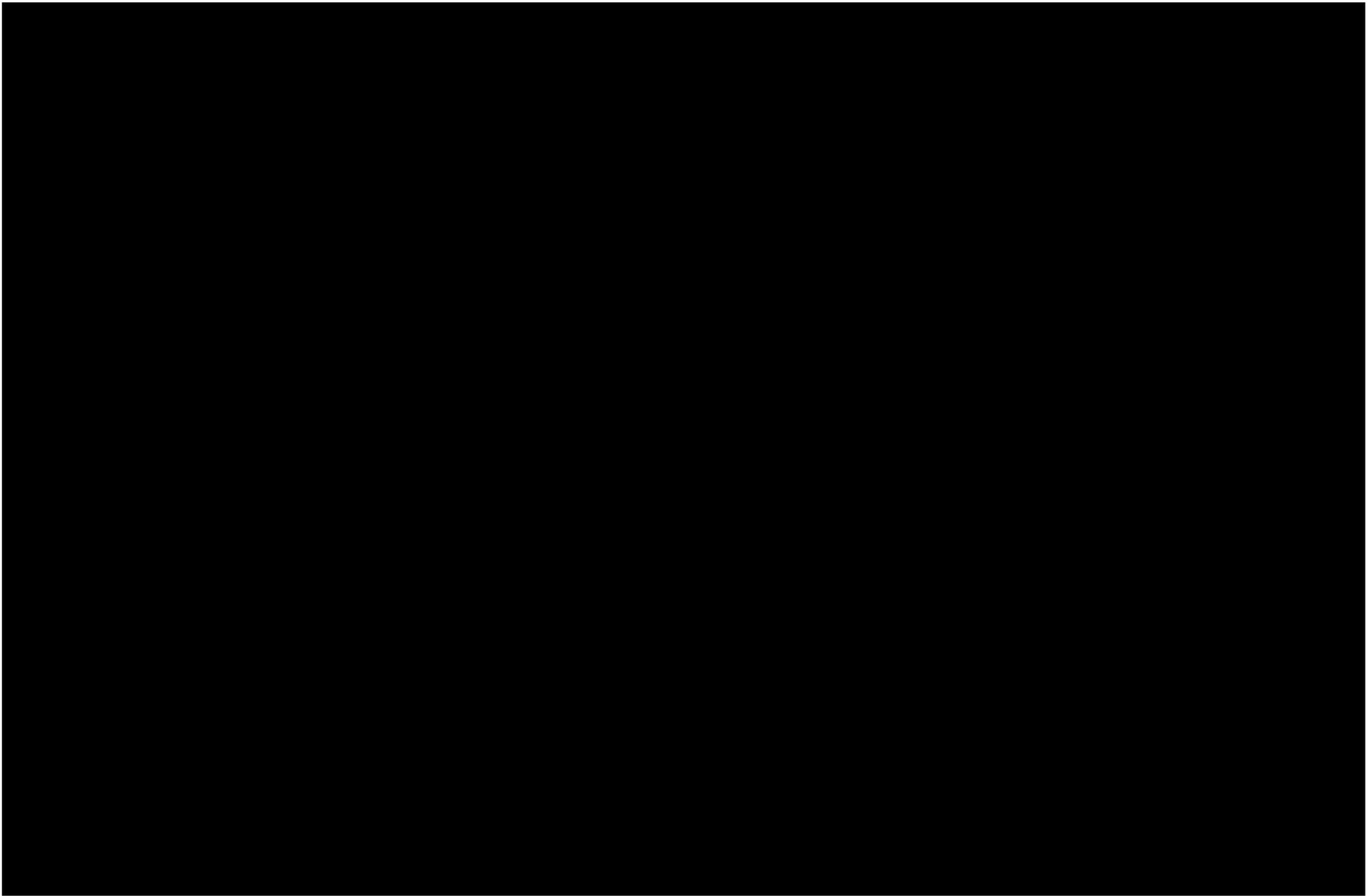


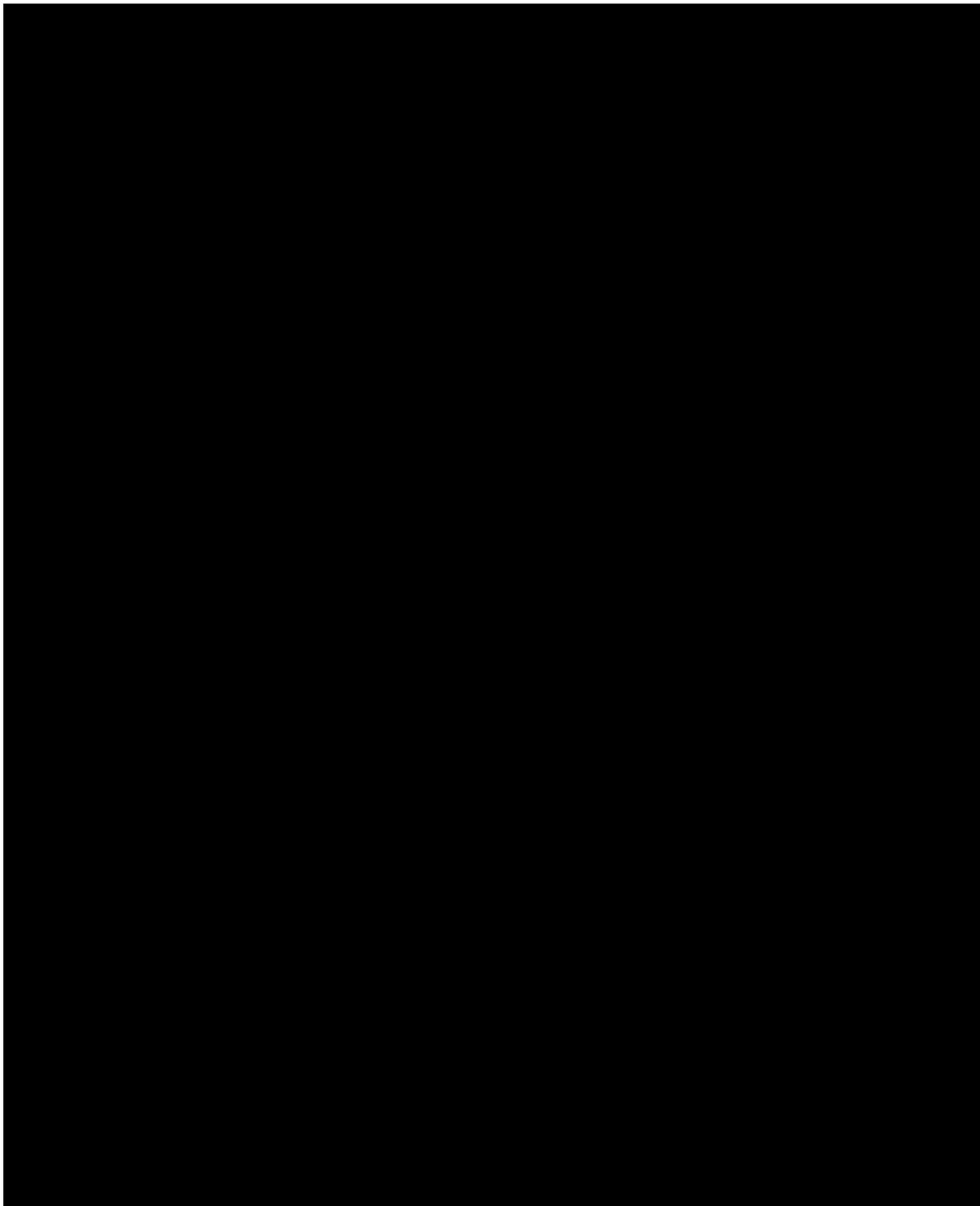


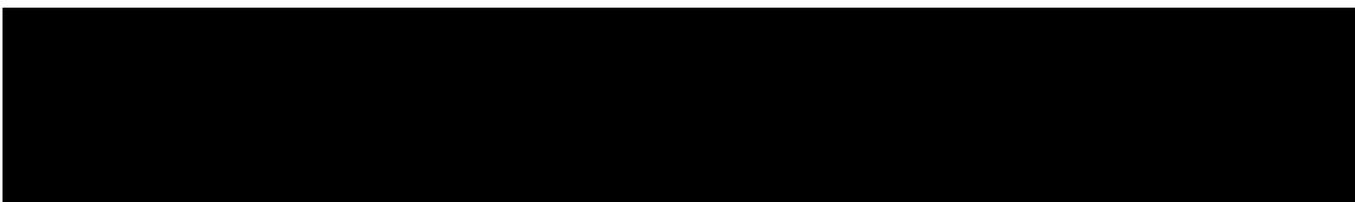
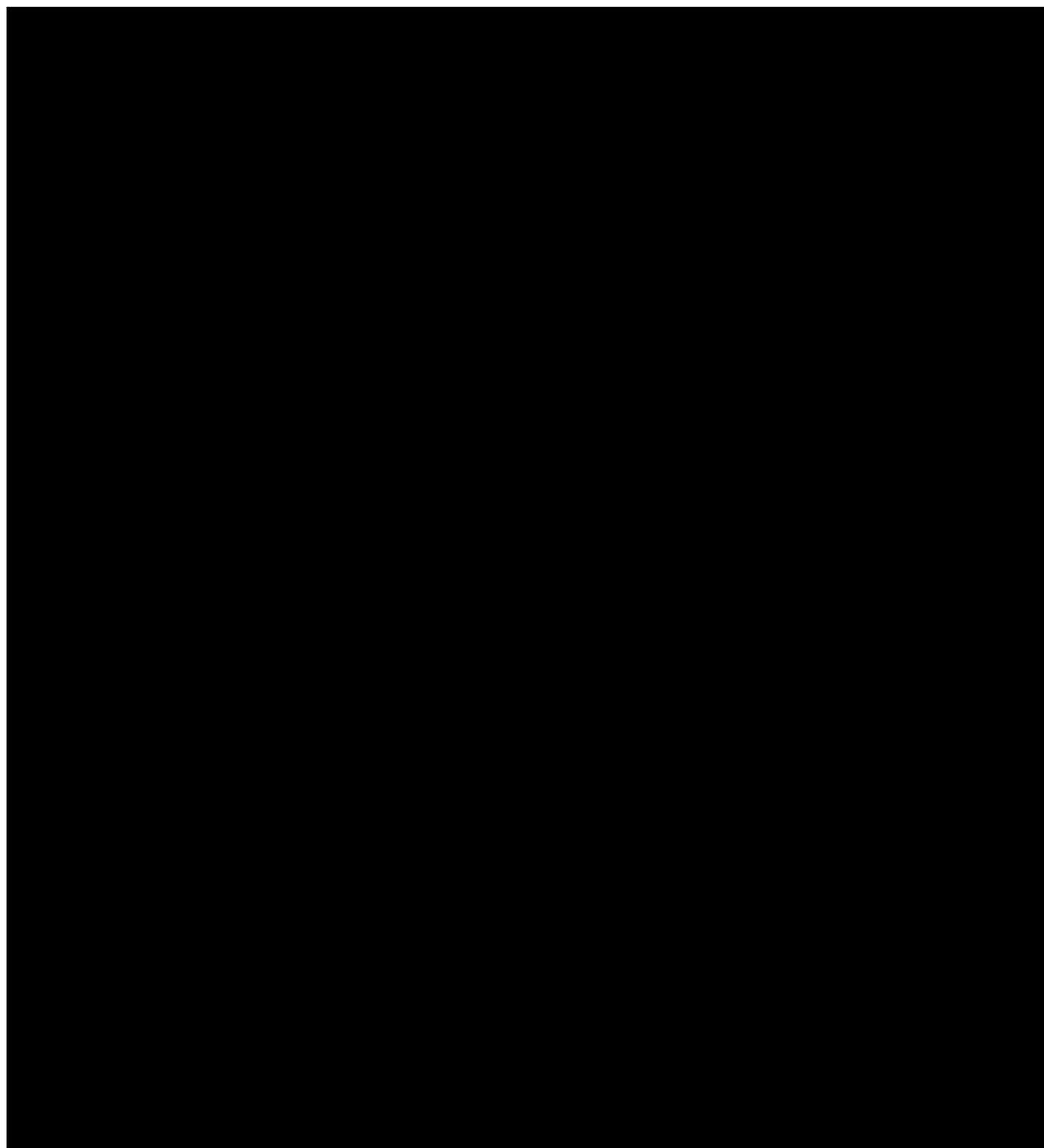


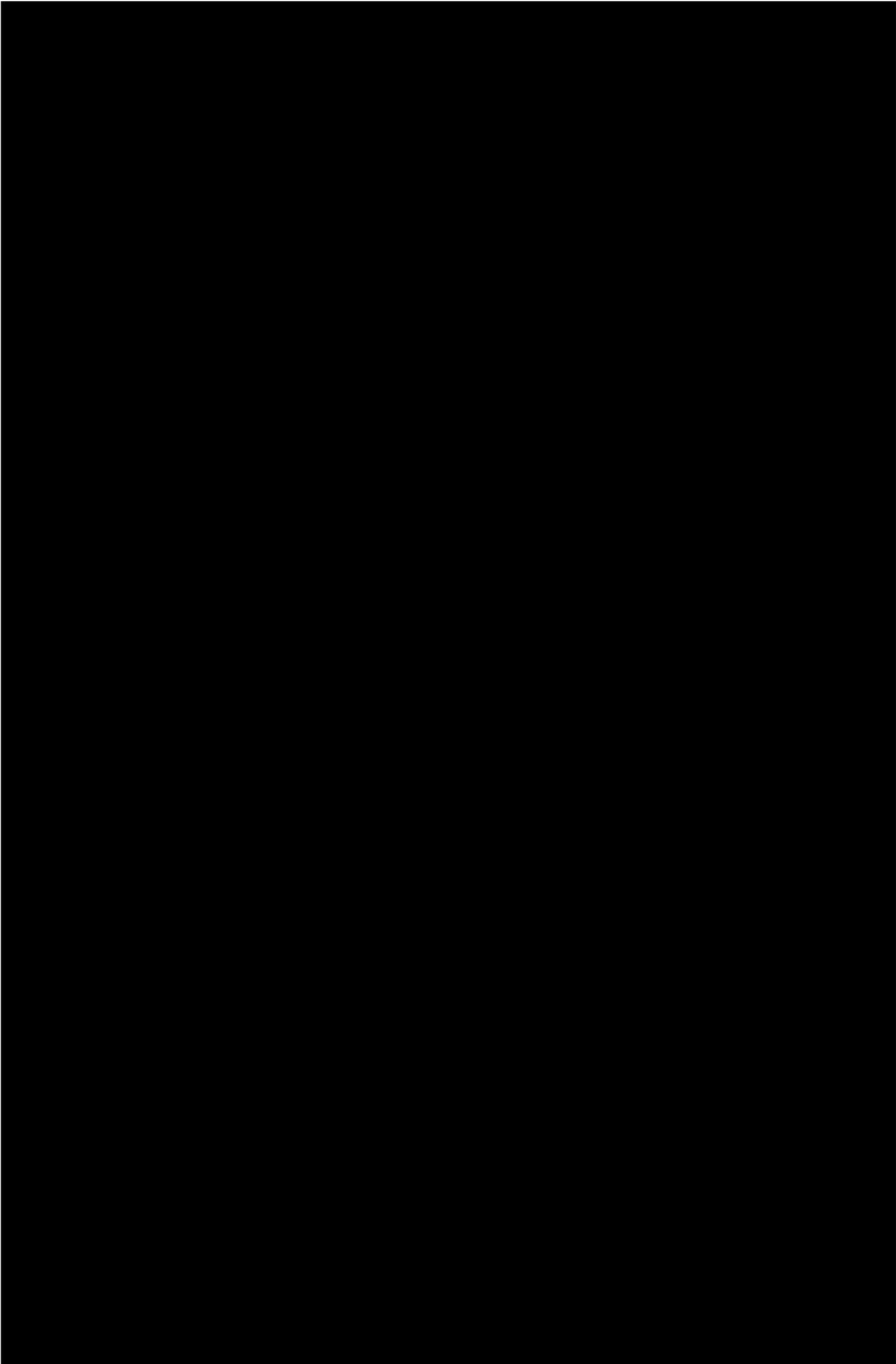


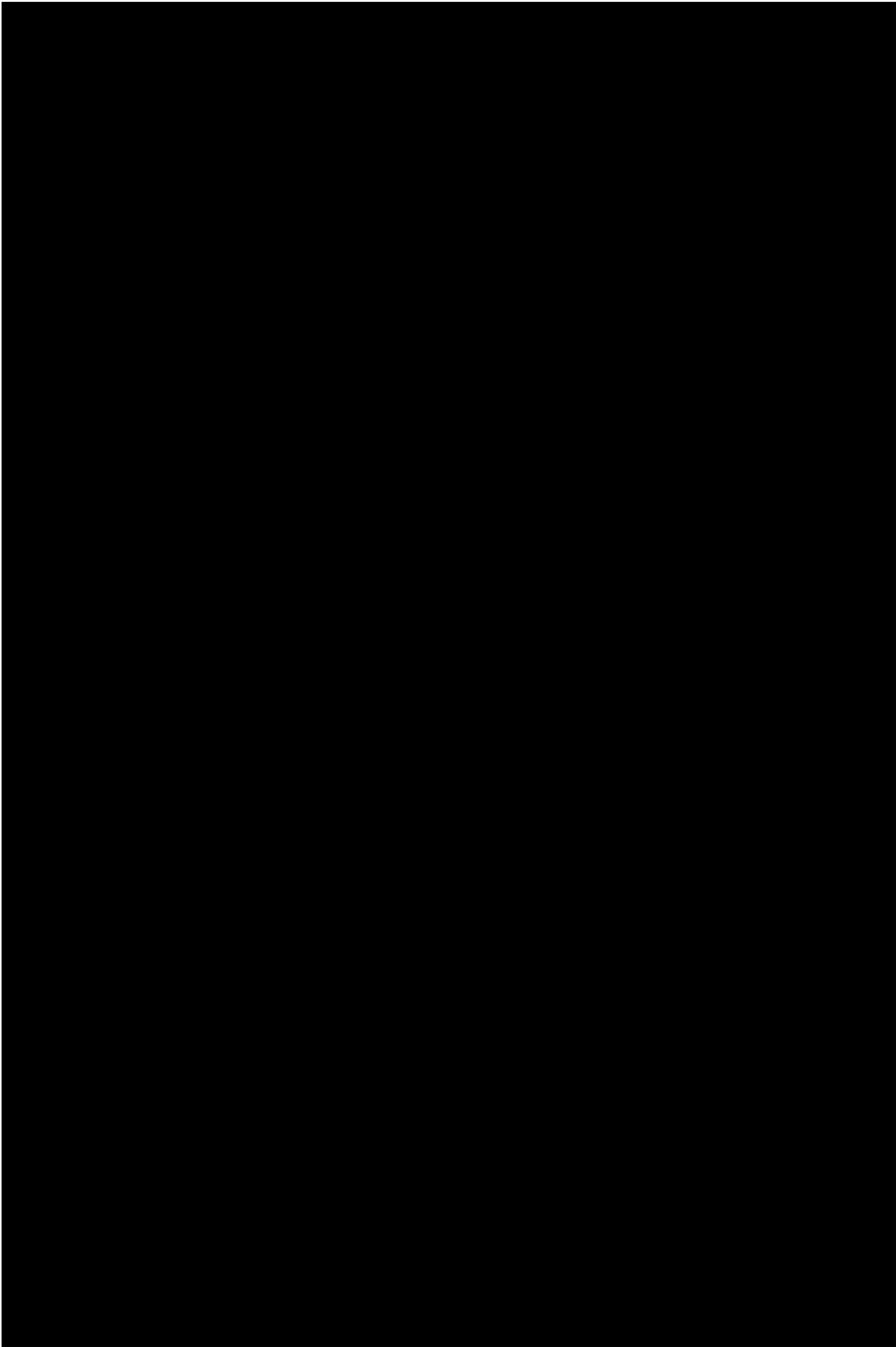


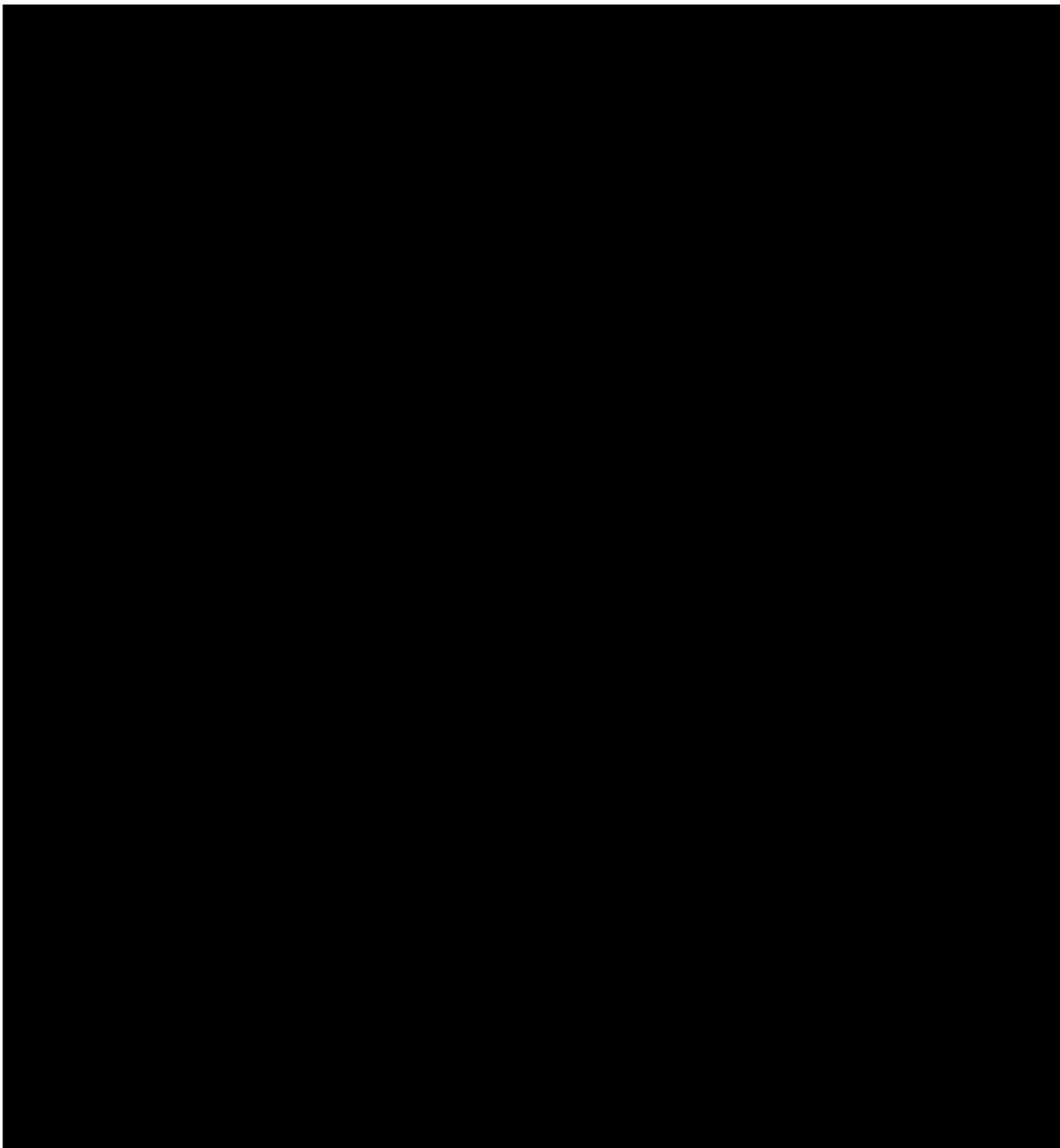


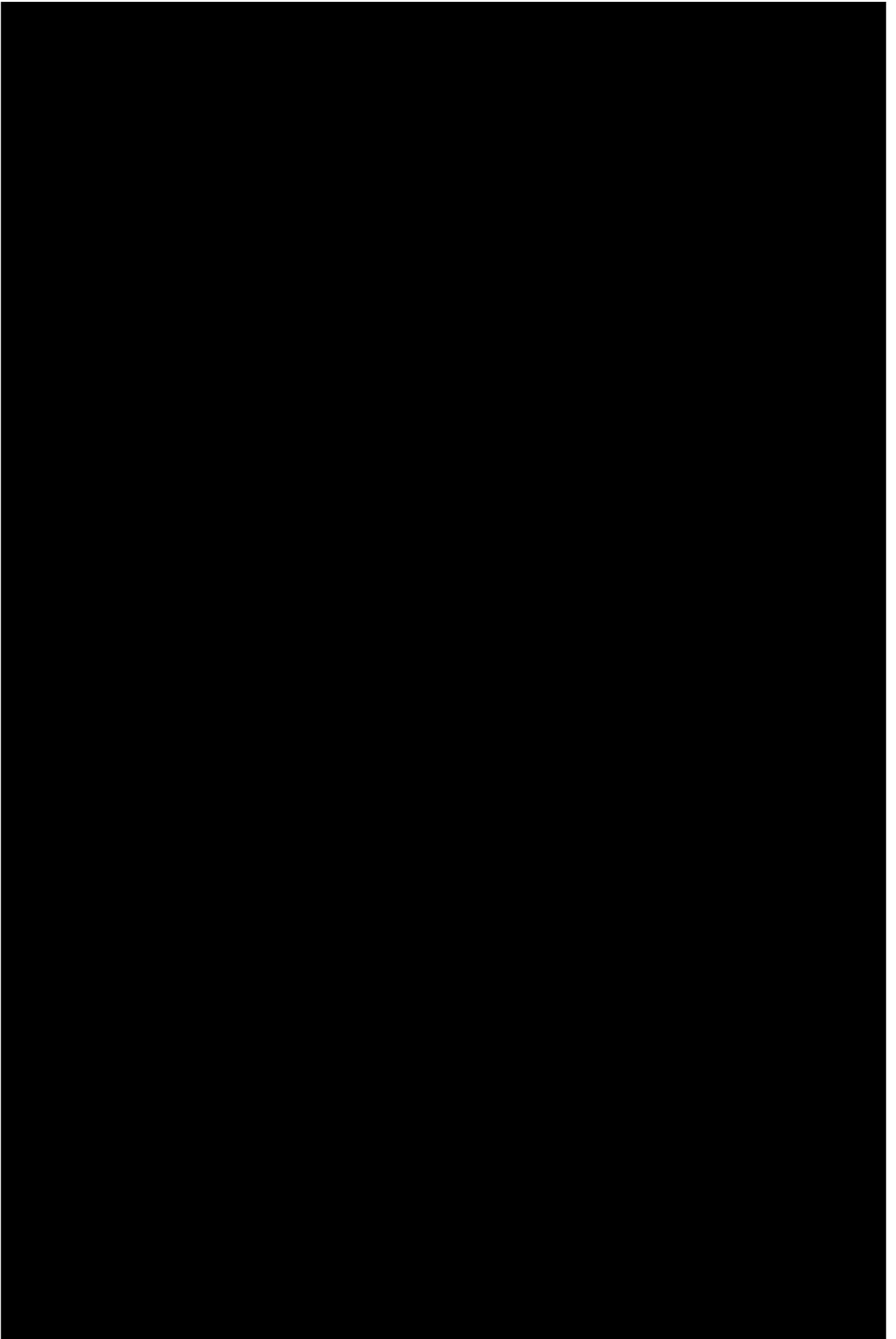


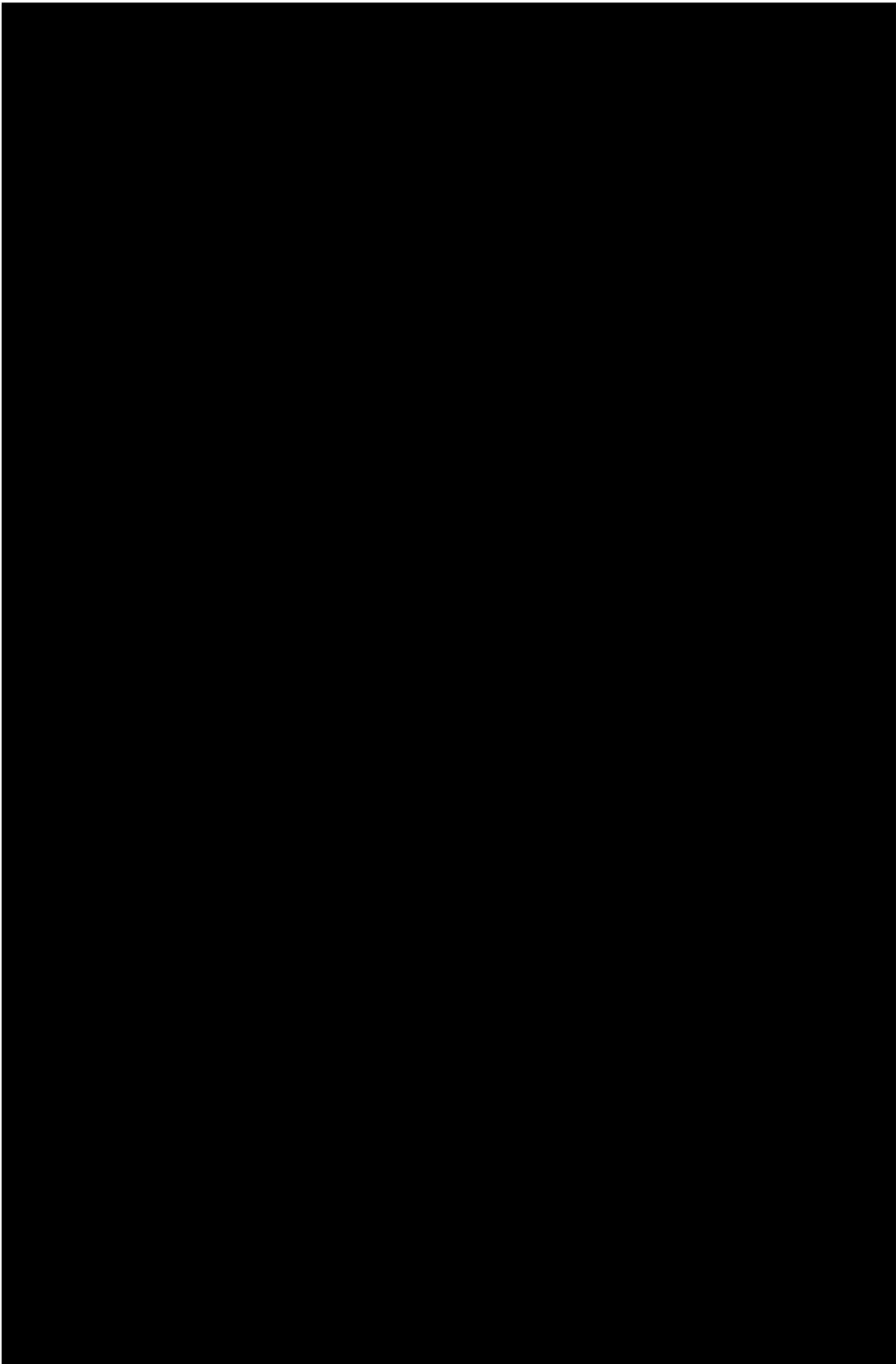


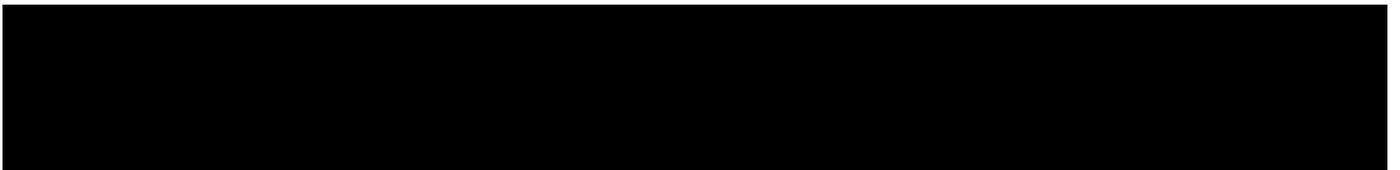
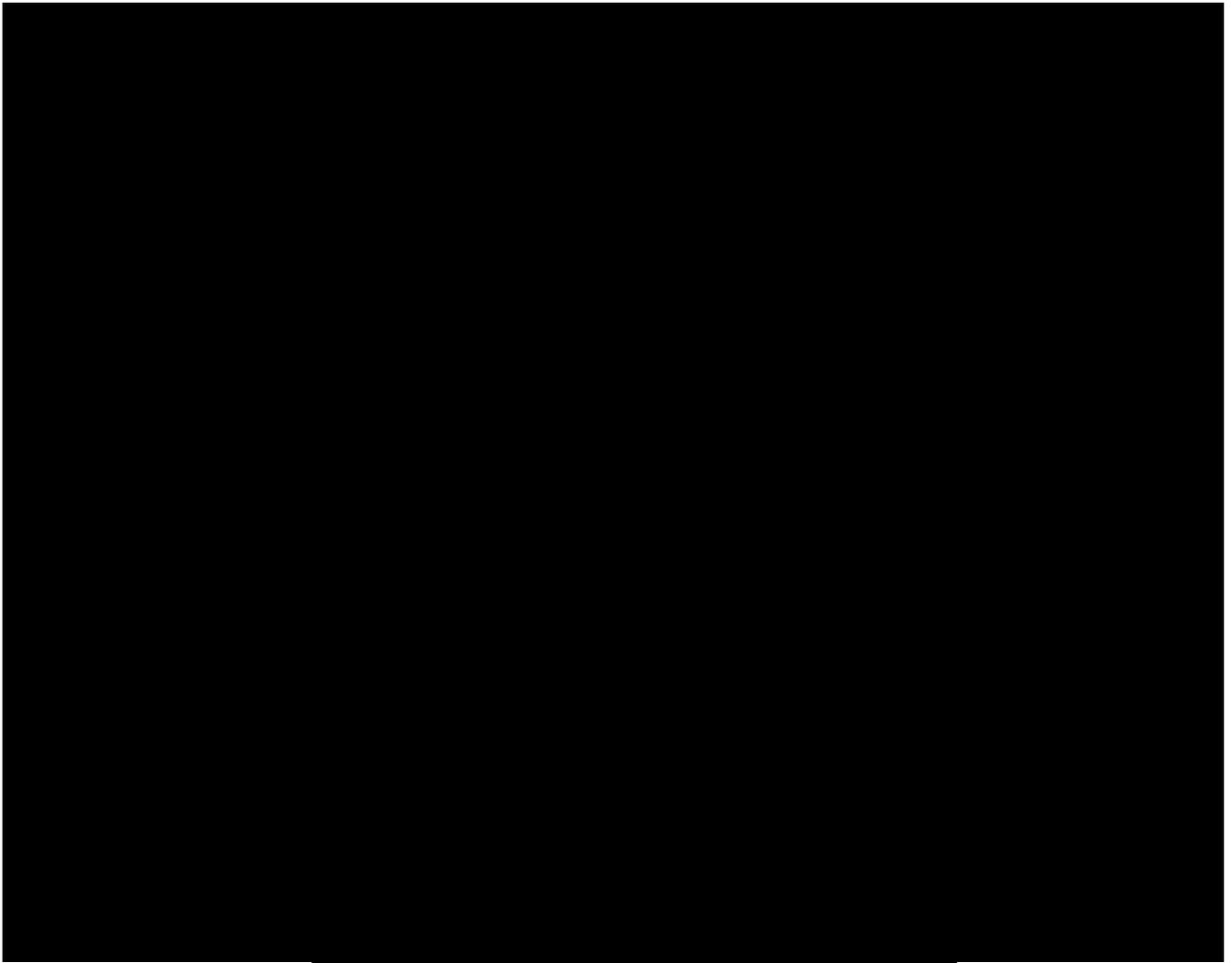


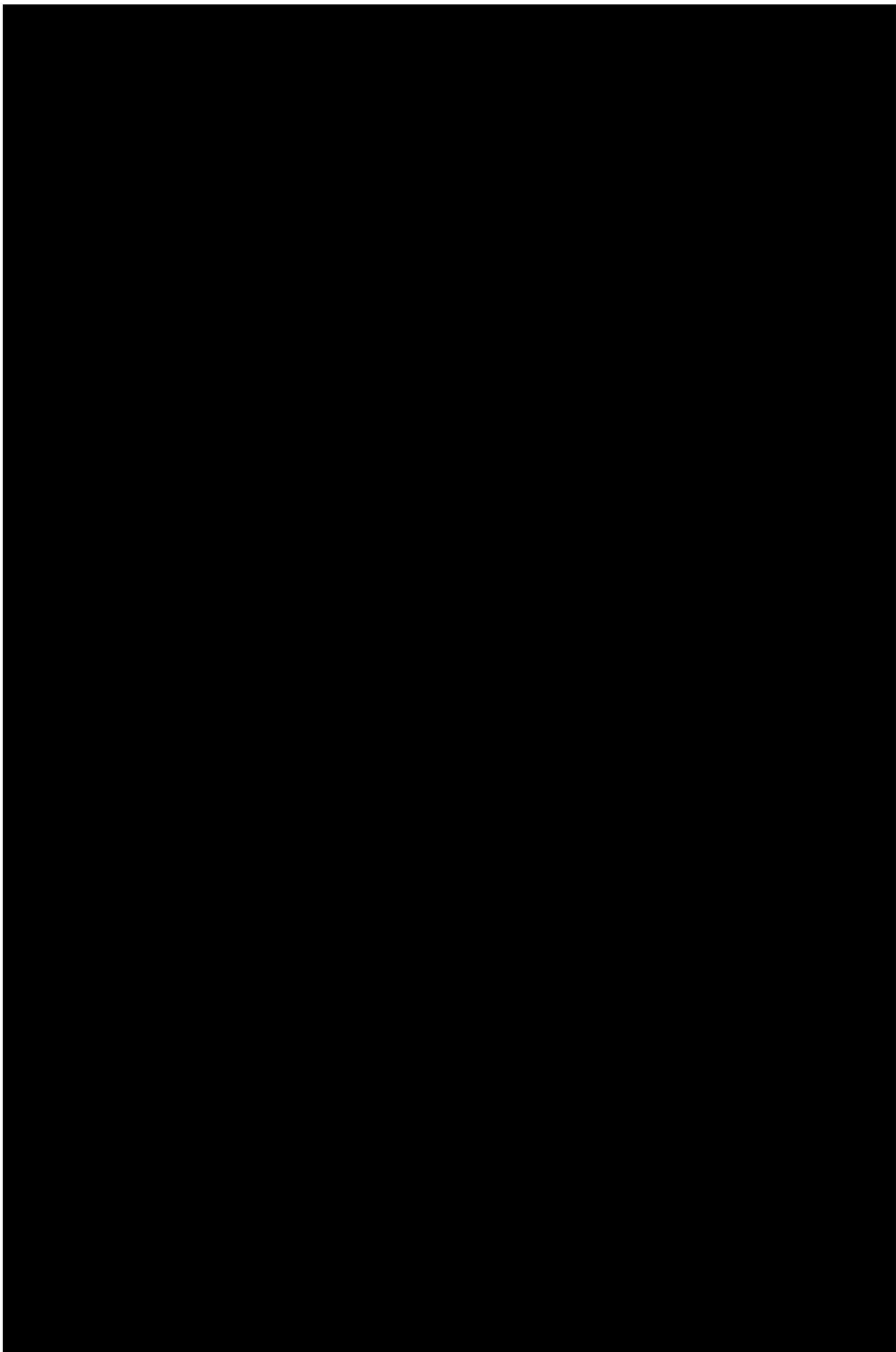










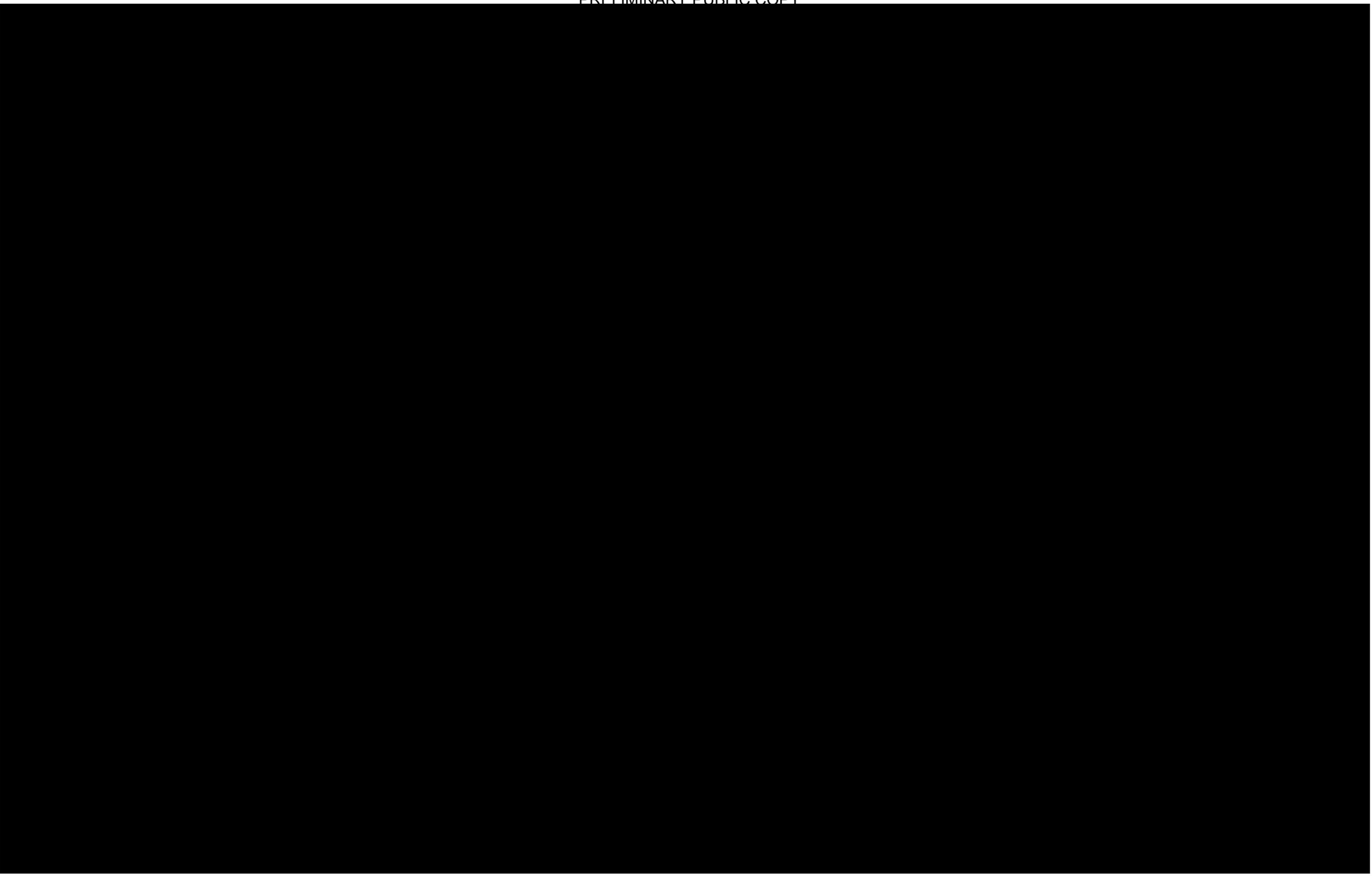


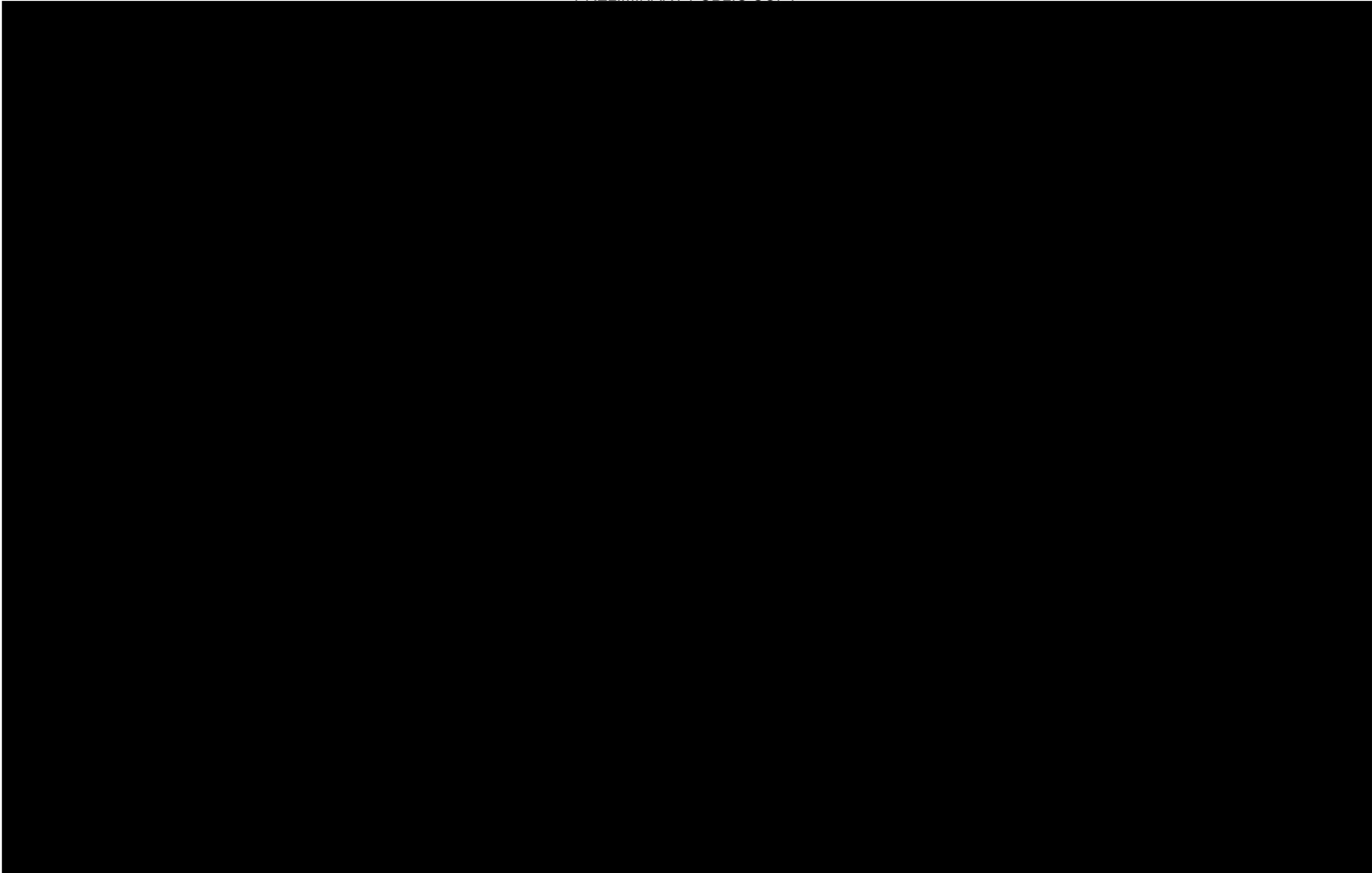


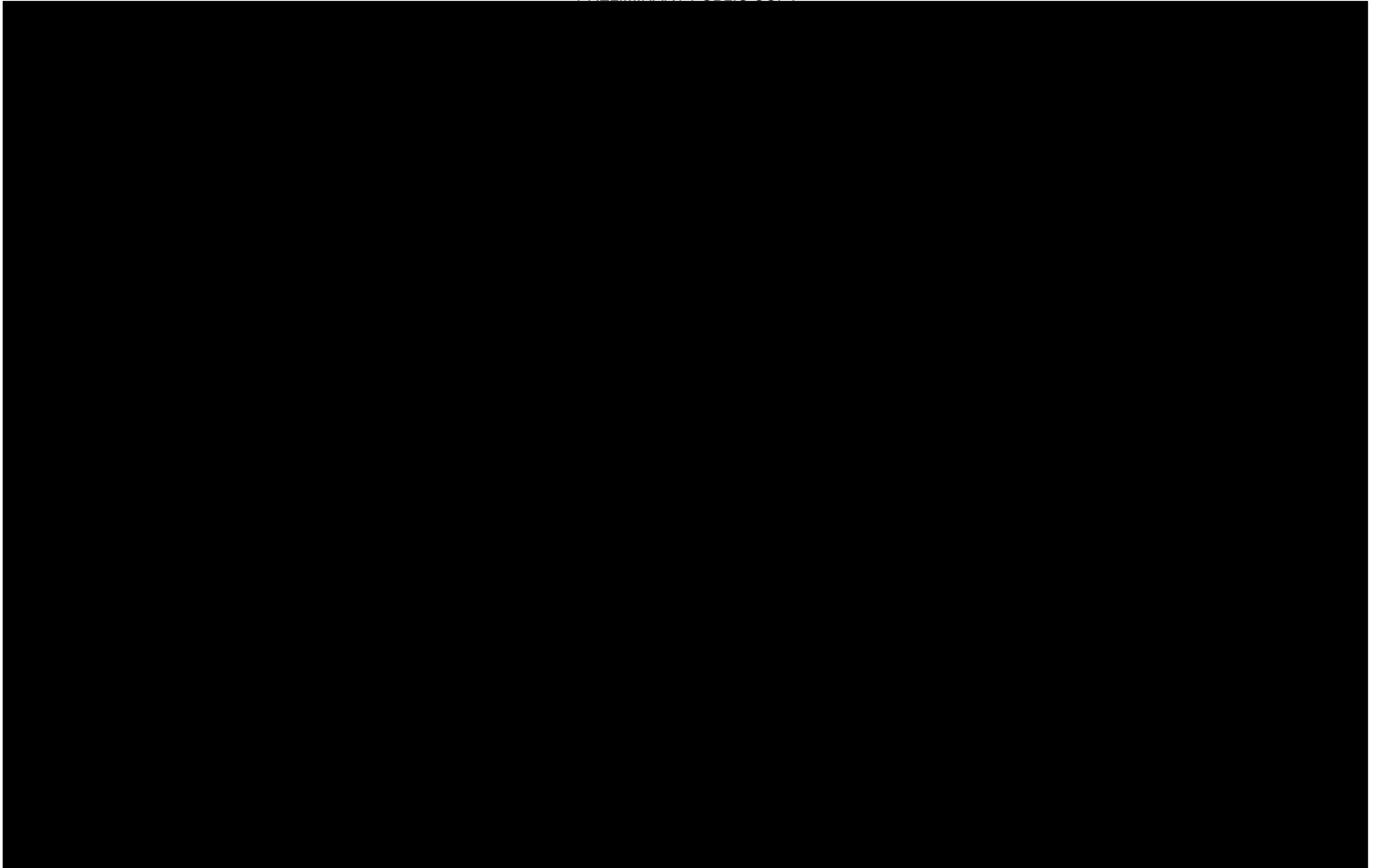
**ATTACHMENT 99**  
**RESERVED**

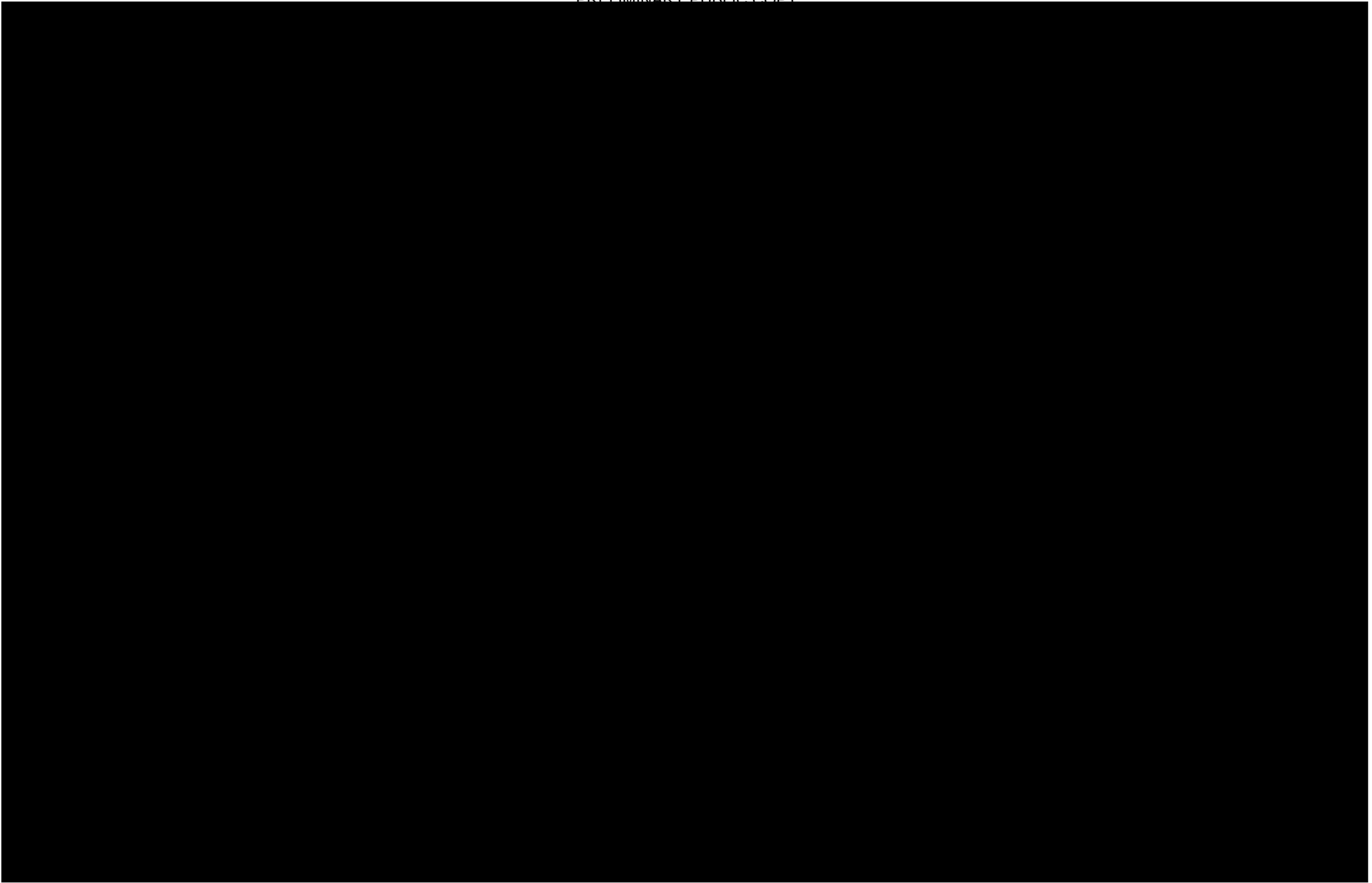
**ATTACHMENT 100**  
**RESERVED**

# ATTACHMENT 101

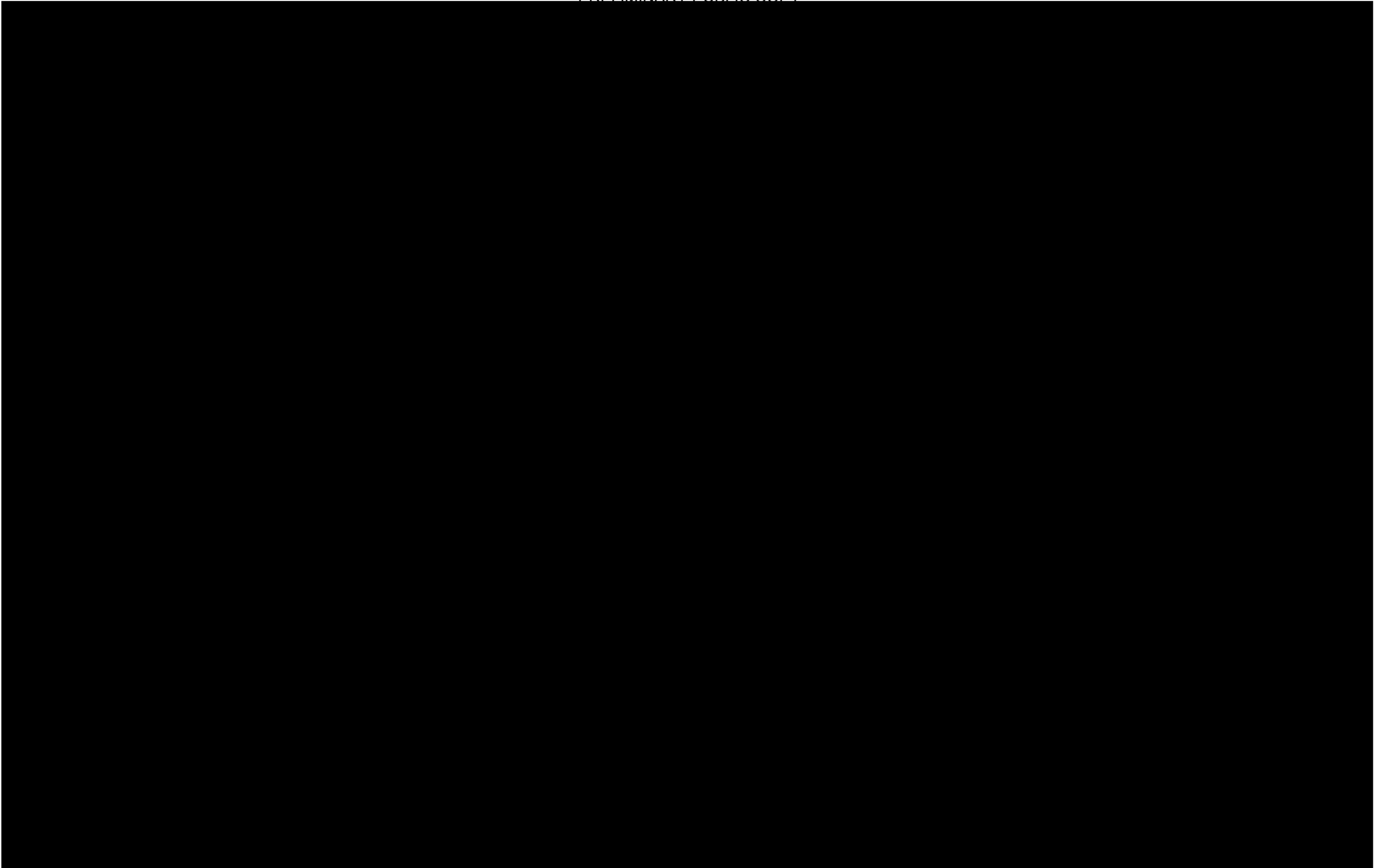


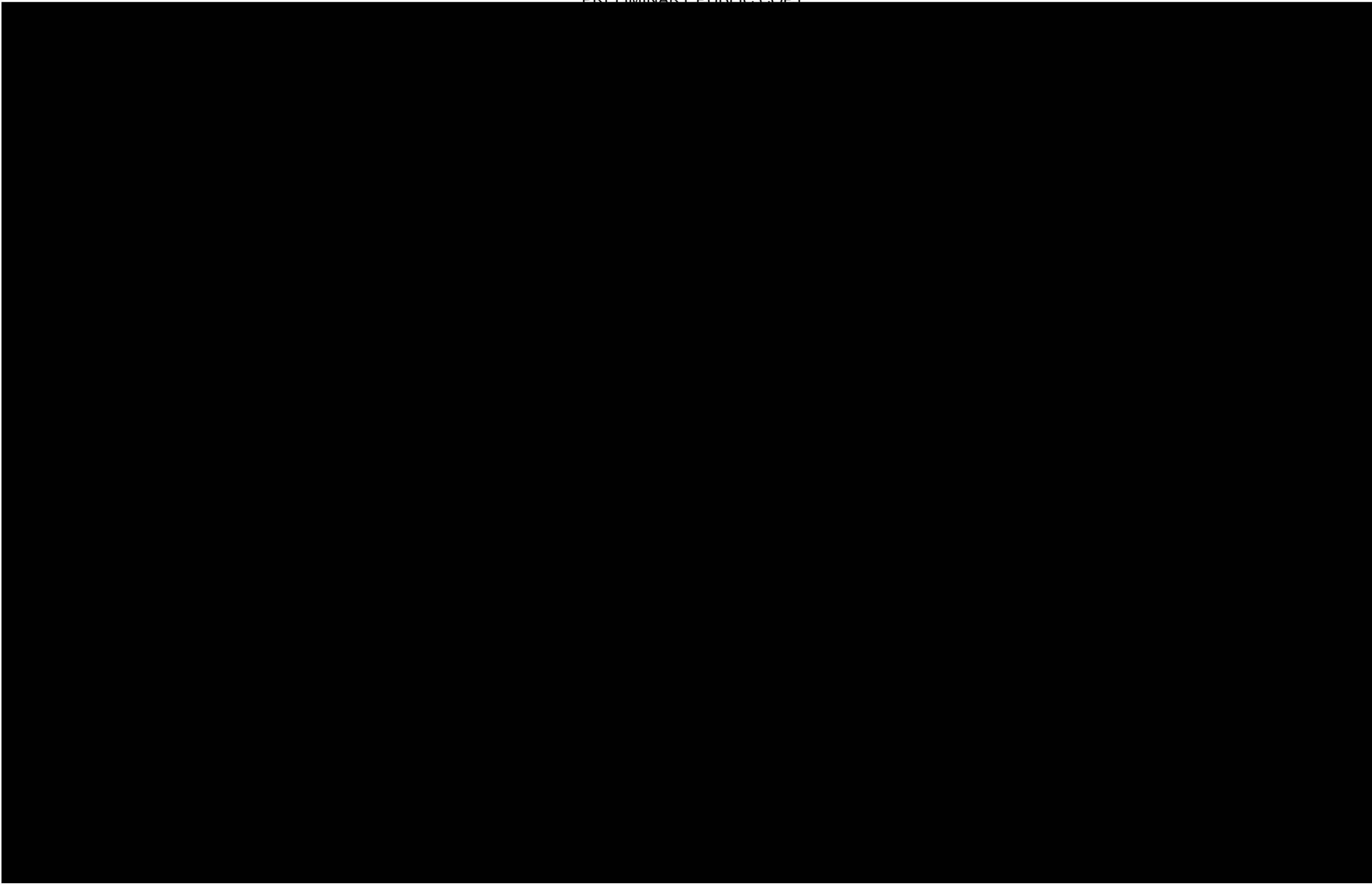


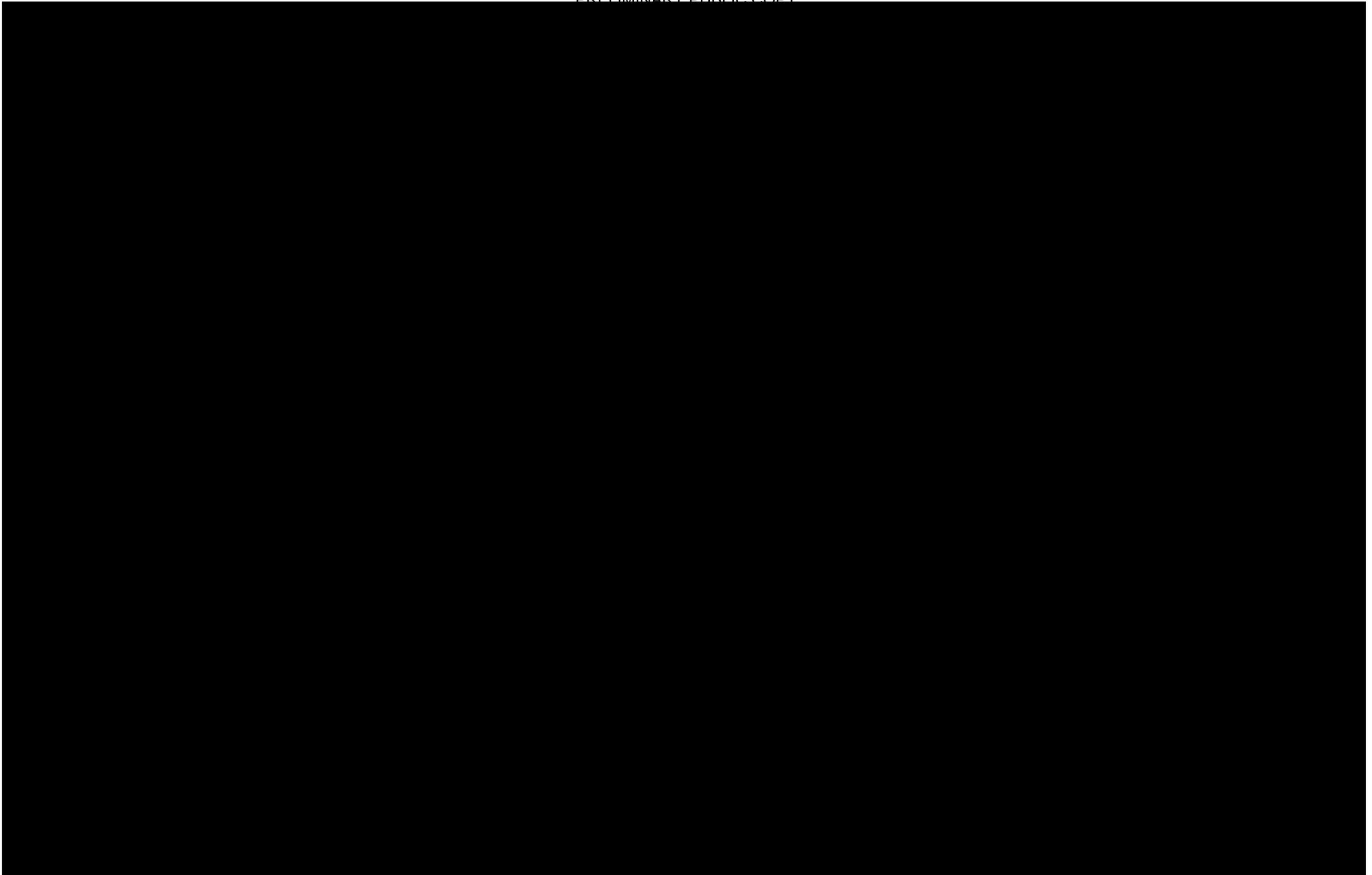


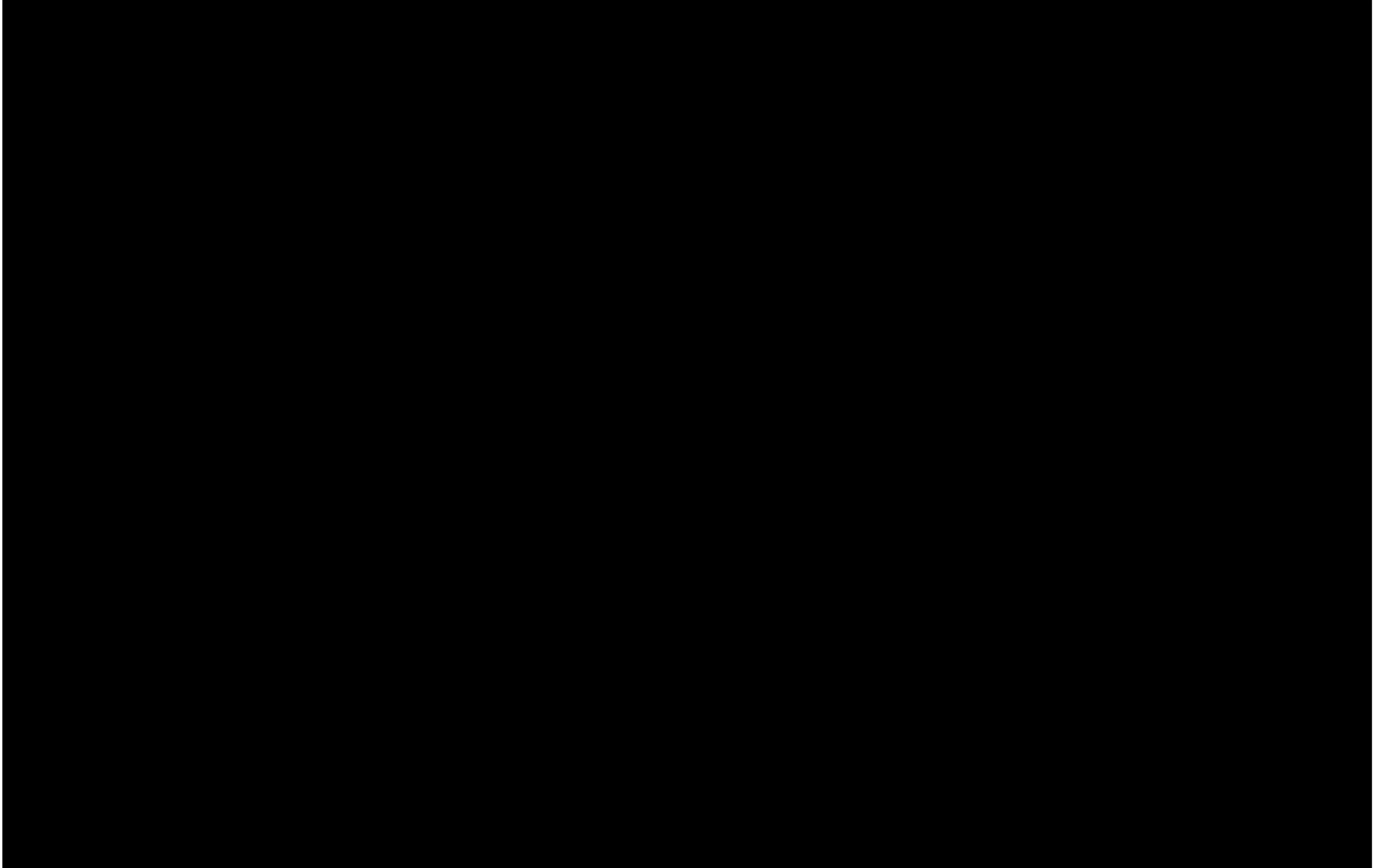


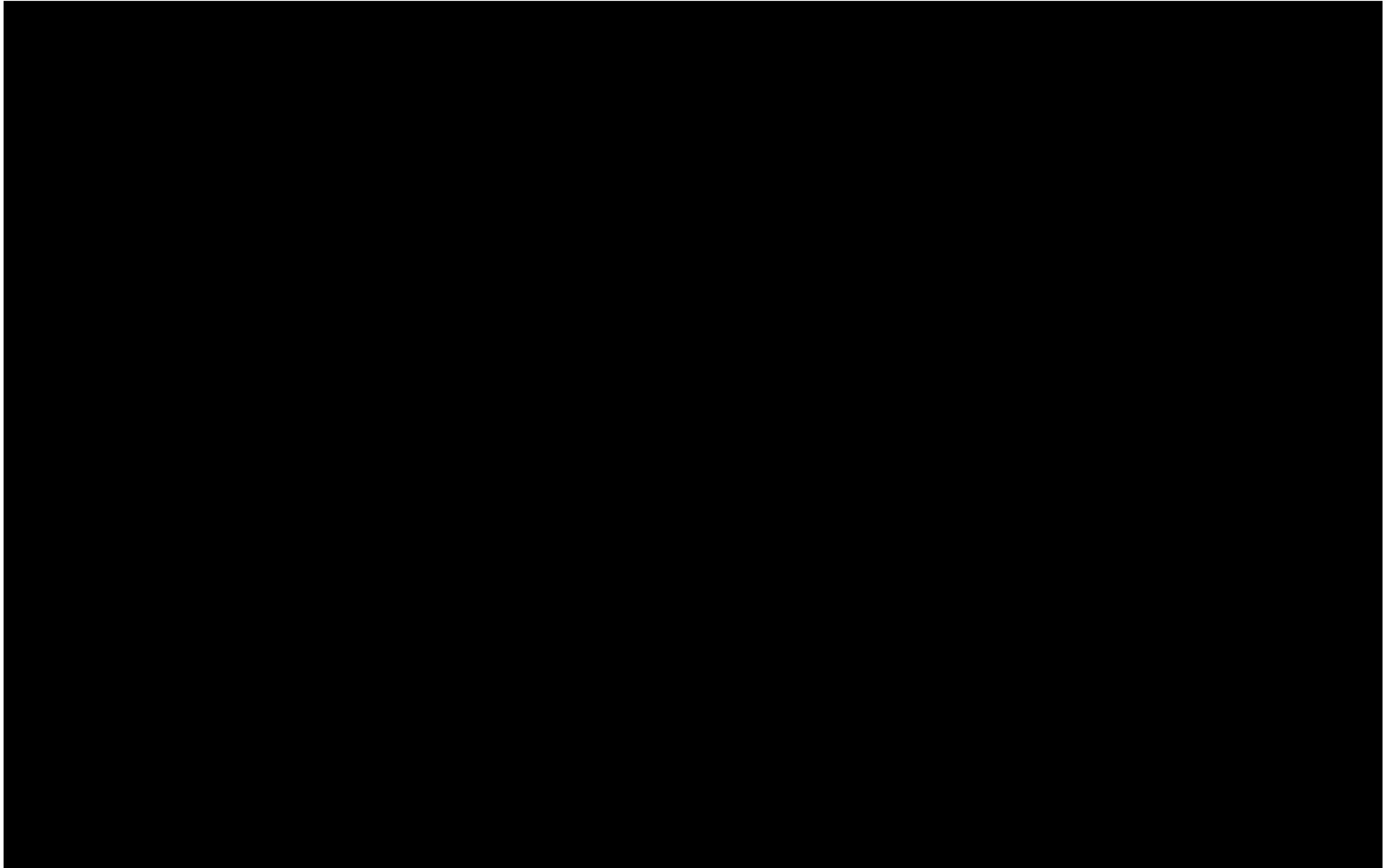












# **ATTACHMENT 102a**































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































# ATTACHMENT 102b



















































































































































































































































































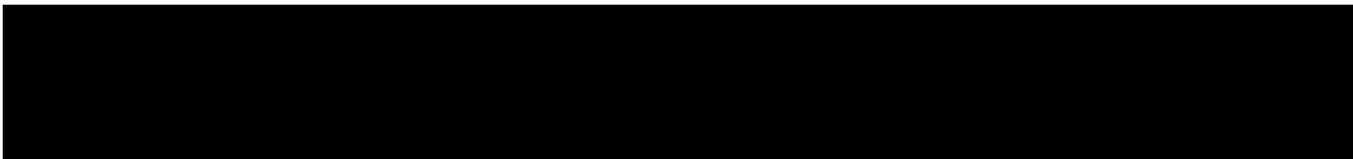
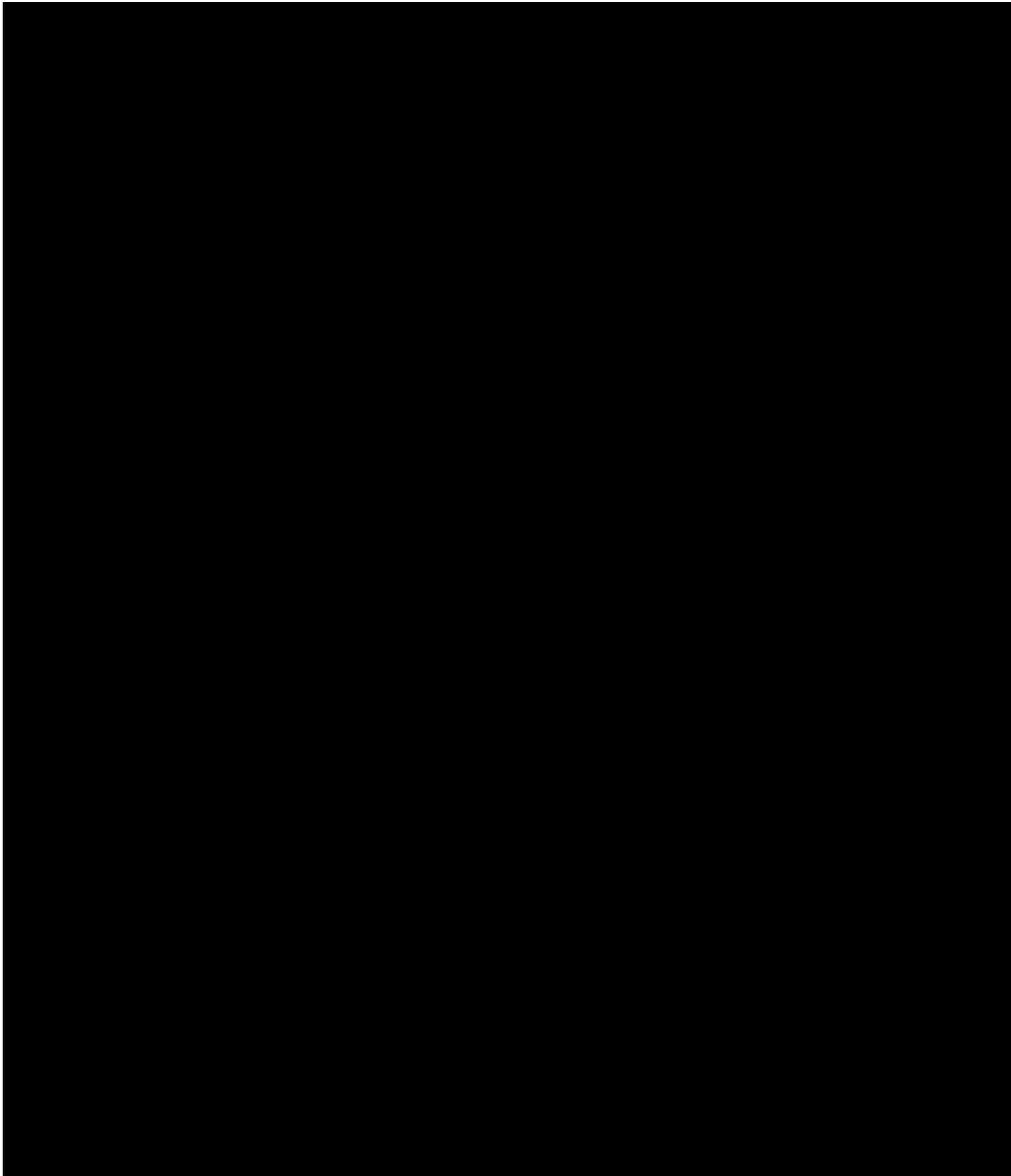


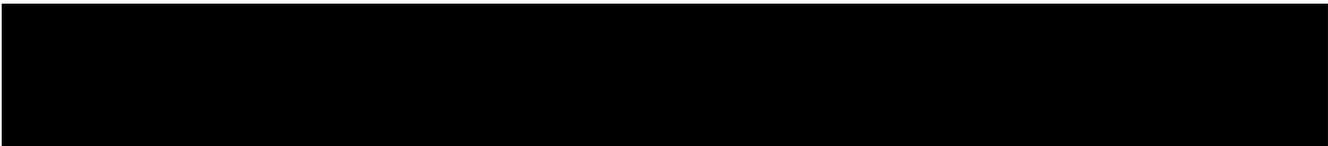


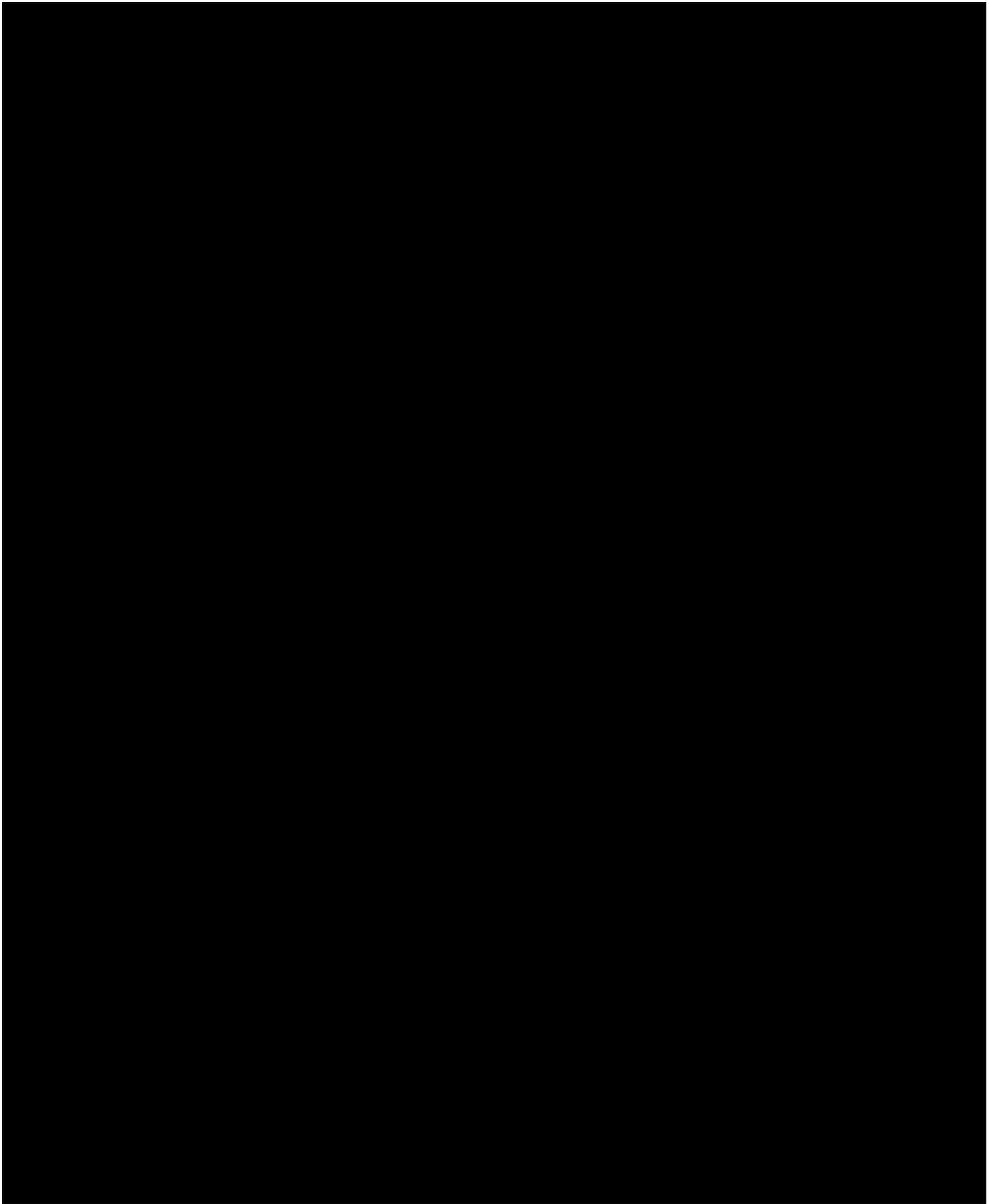


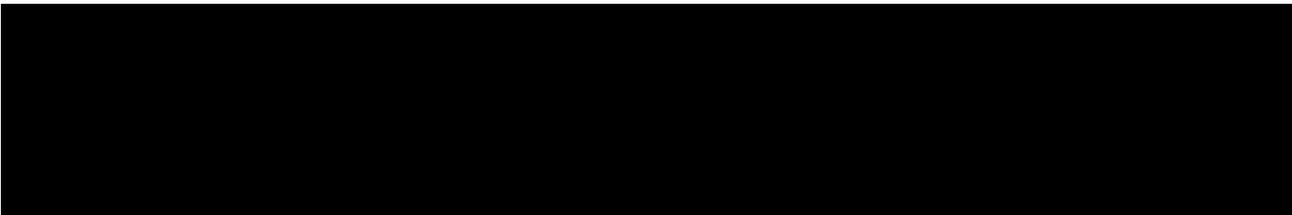
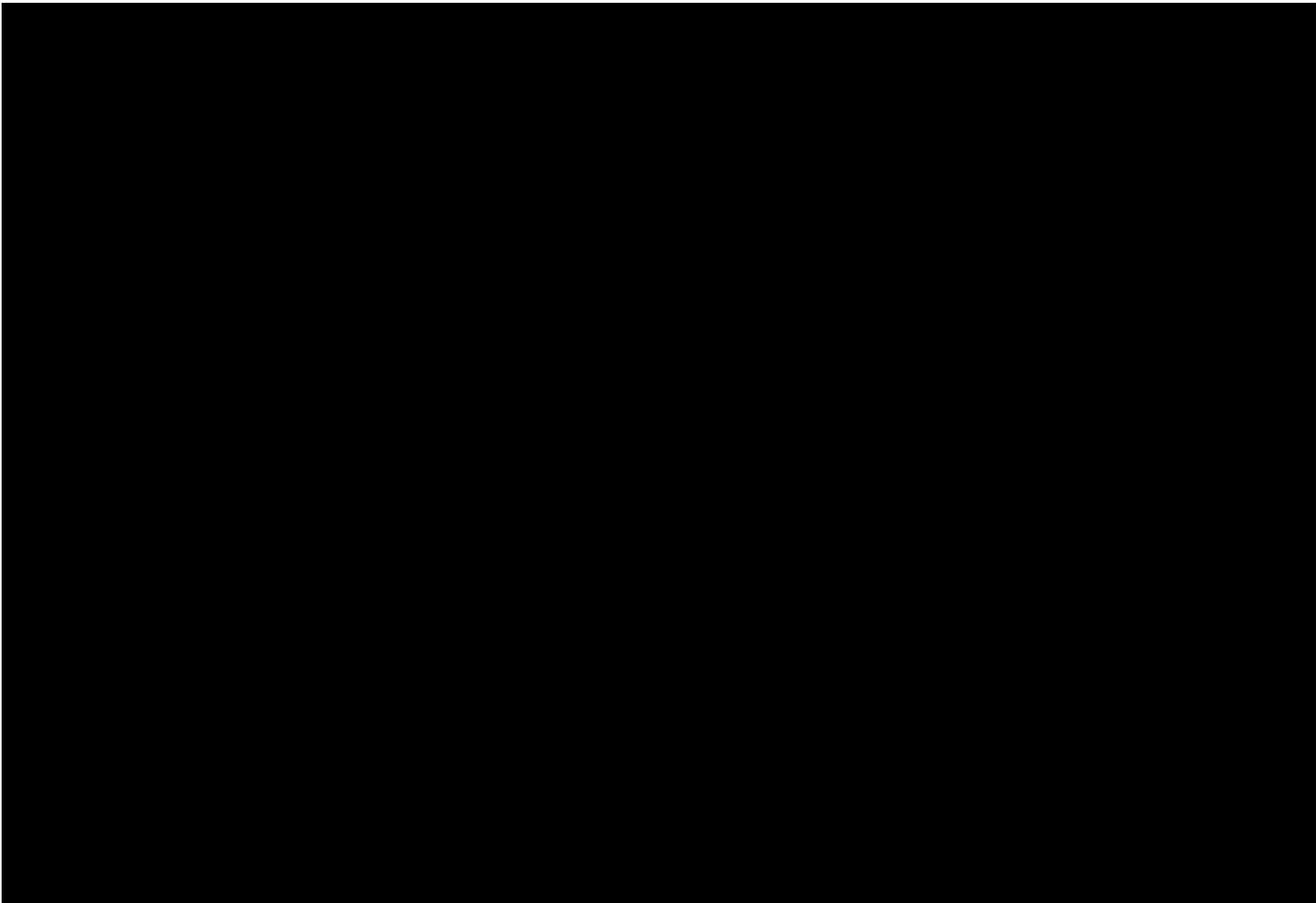


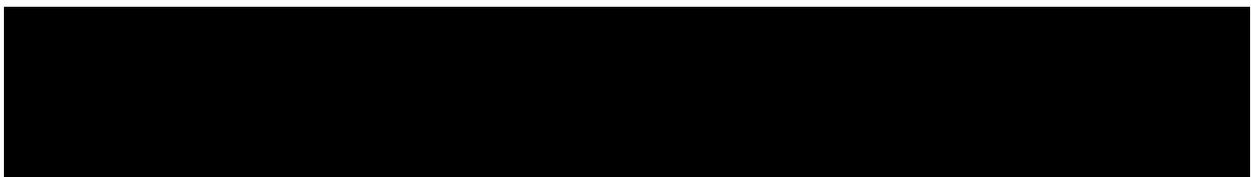
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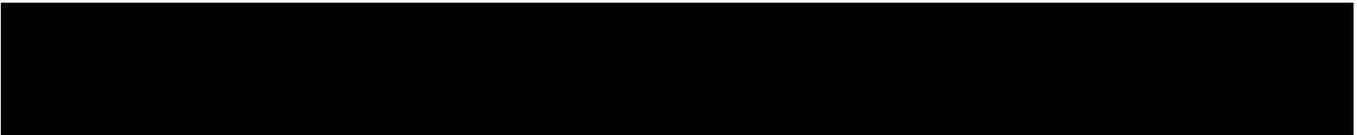
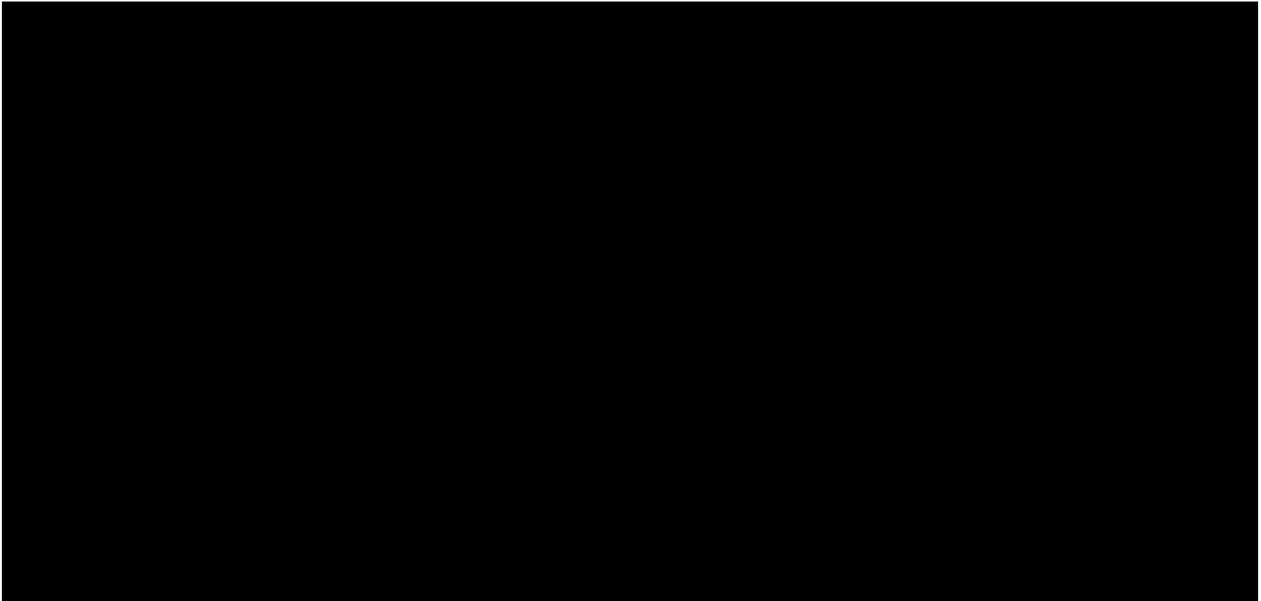




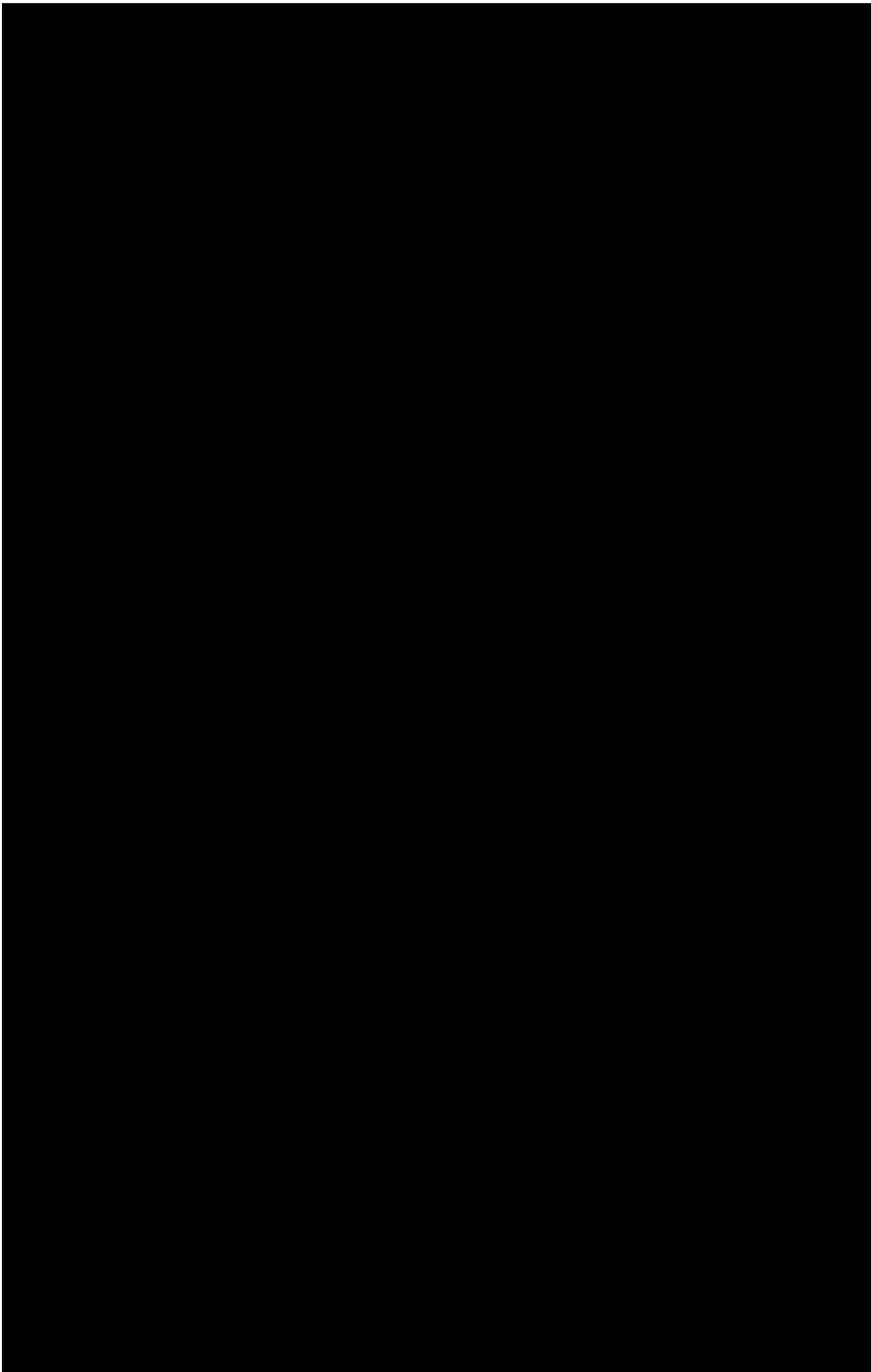


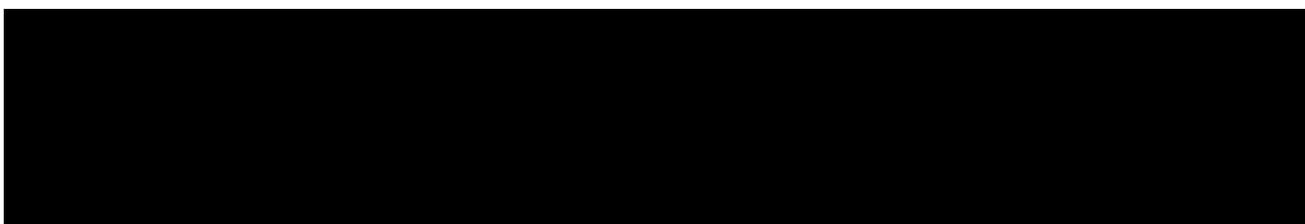
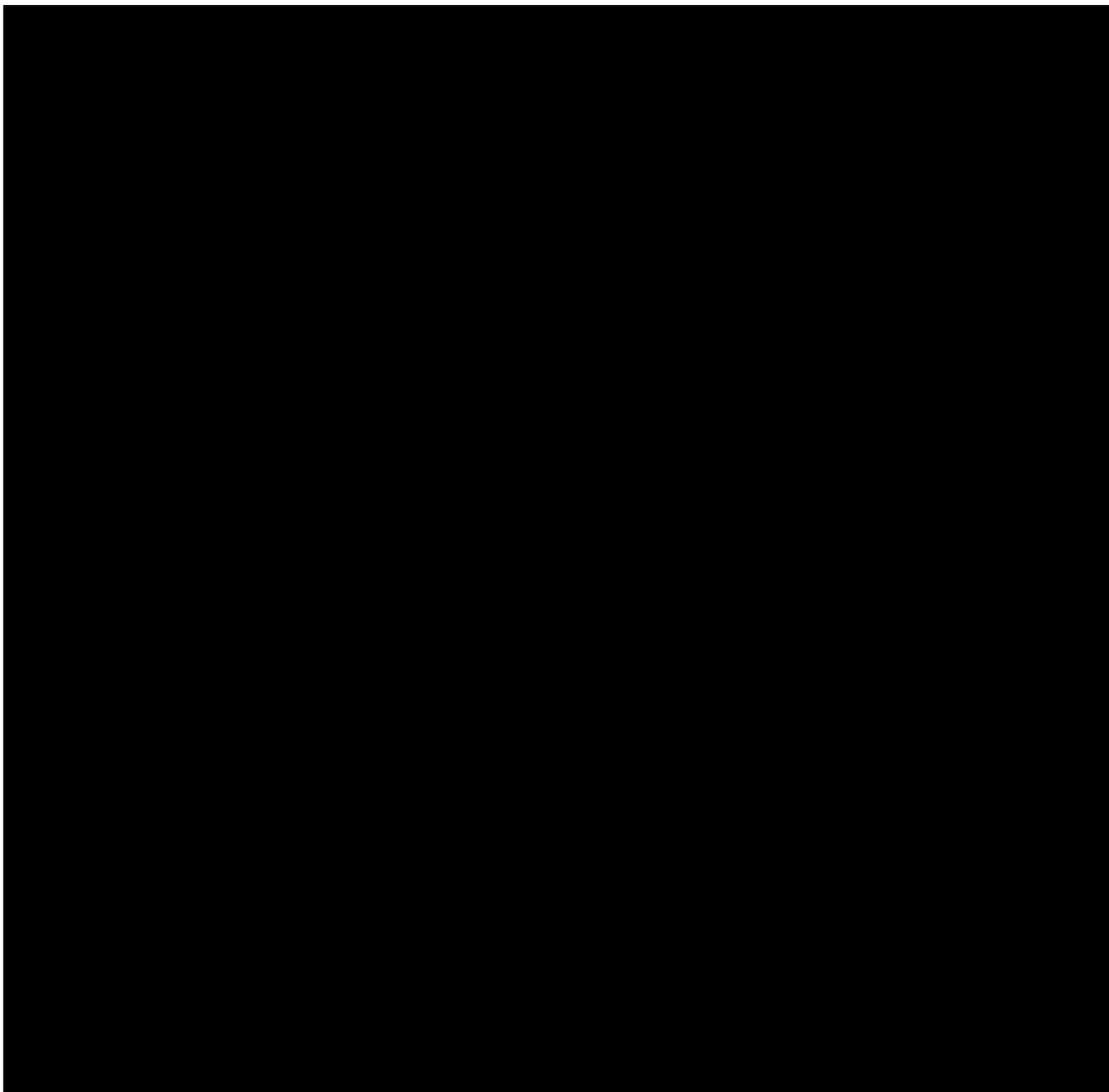


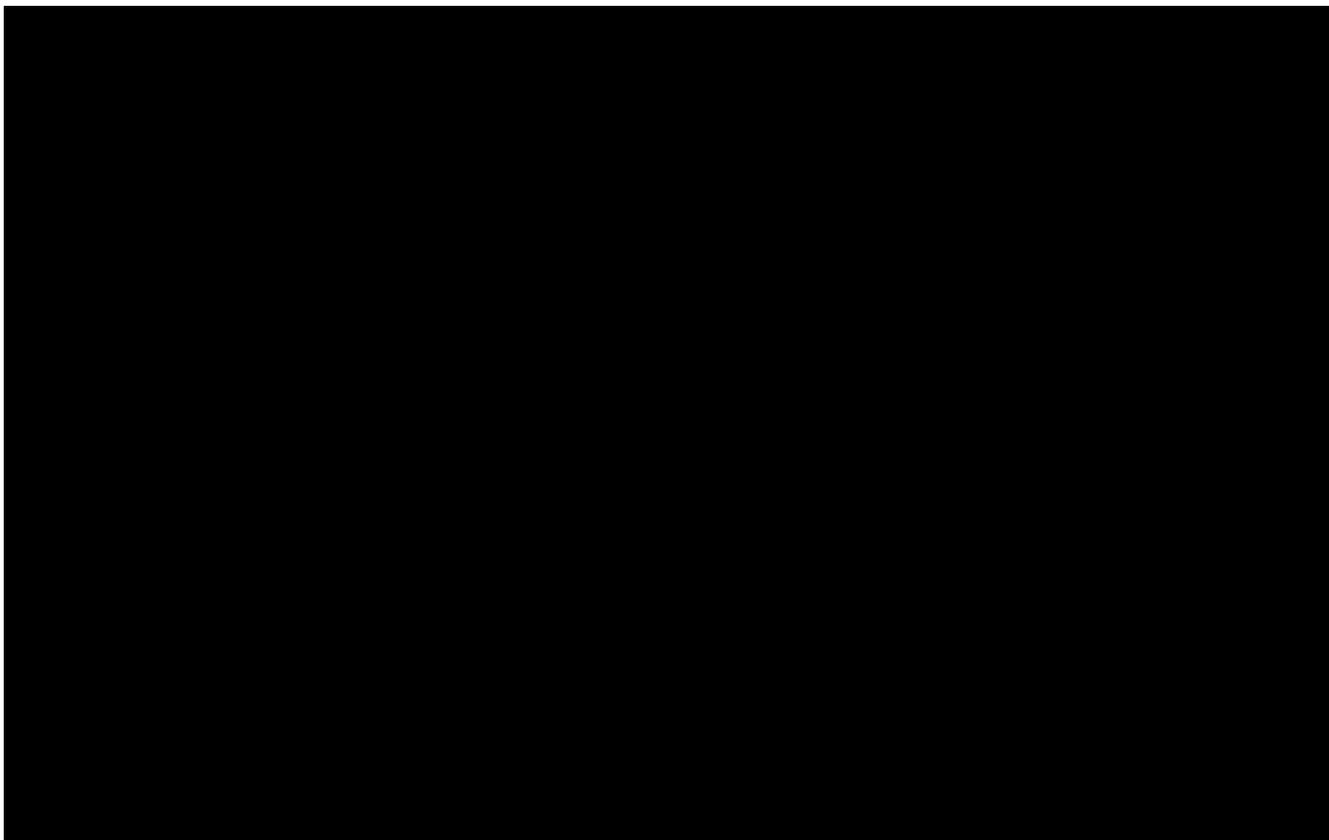


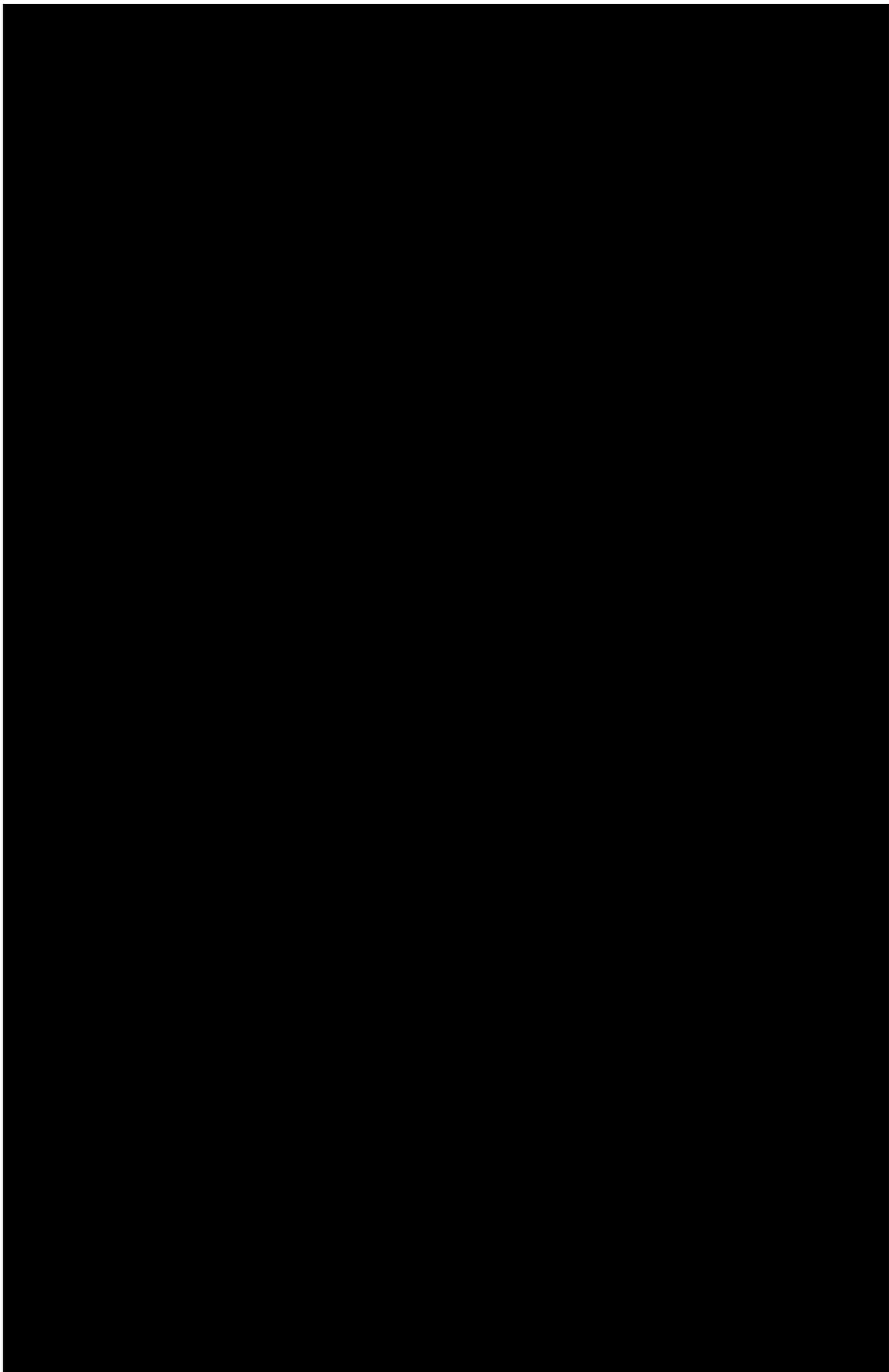


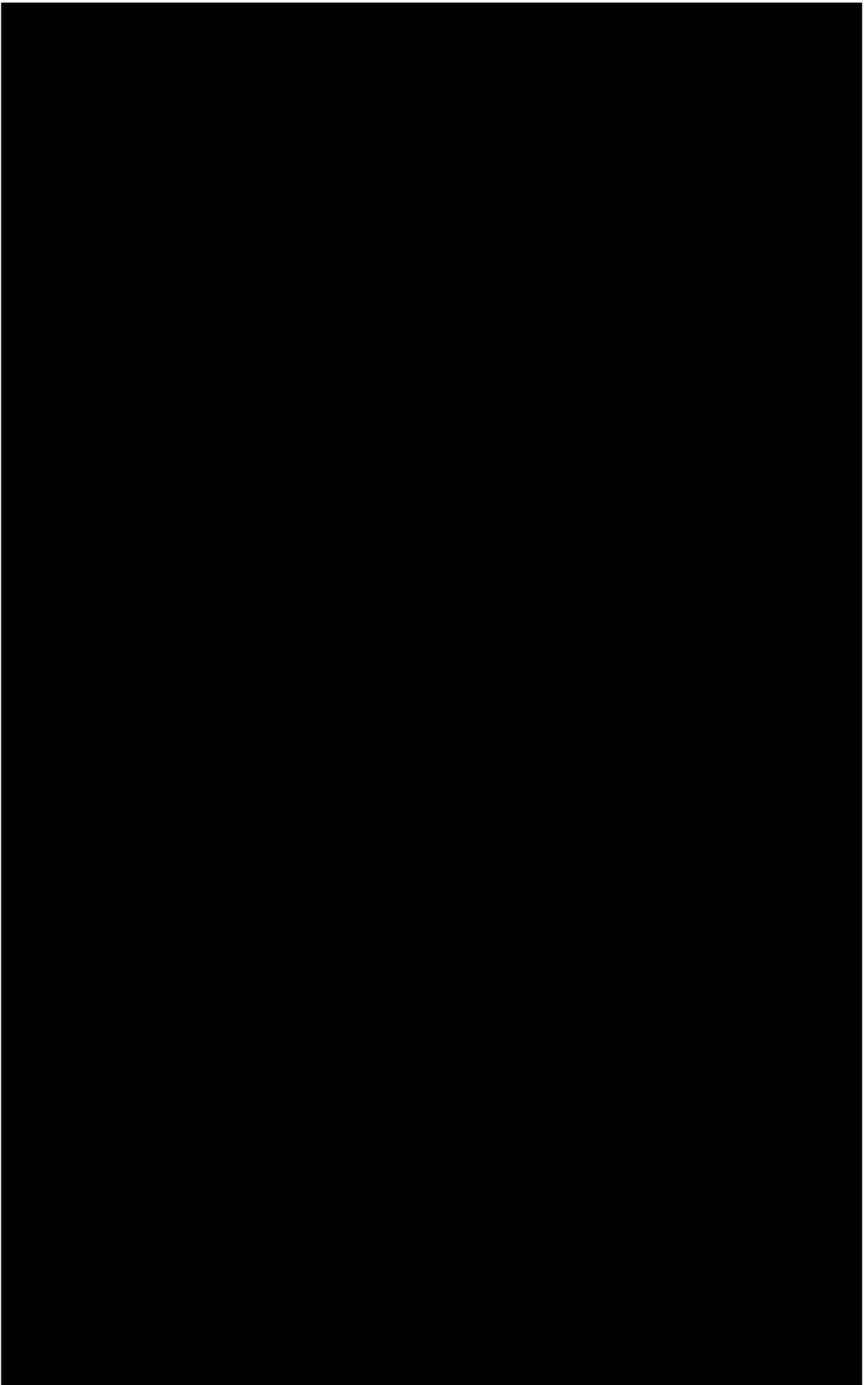


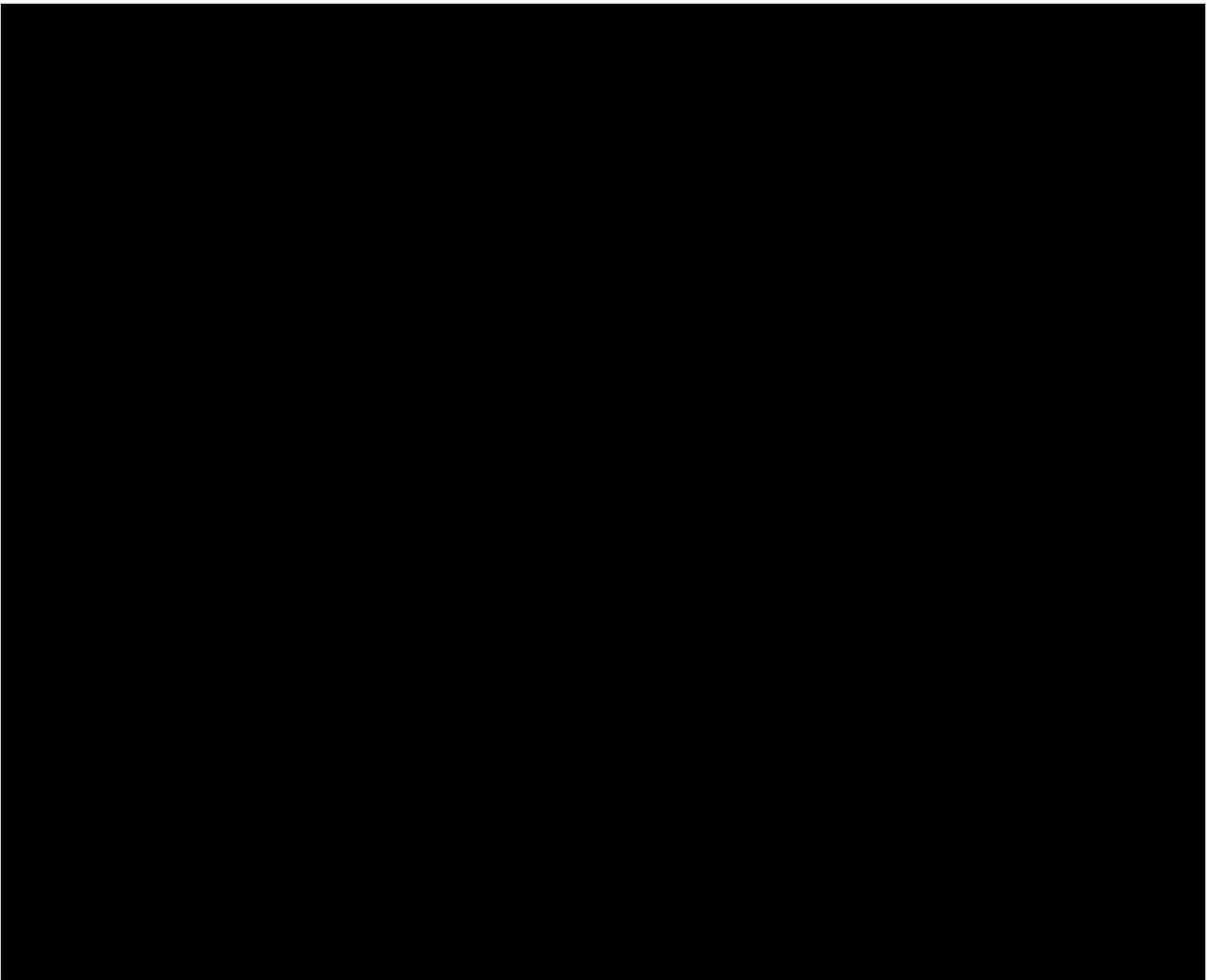


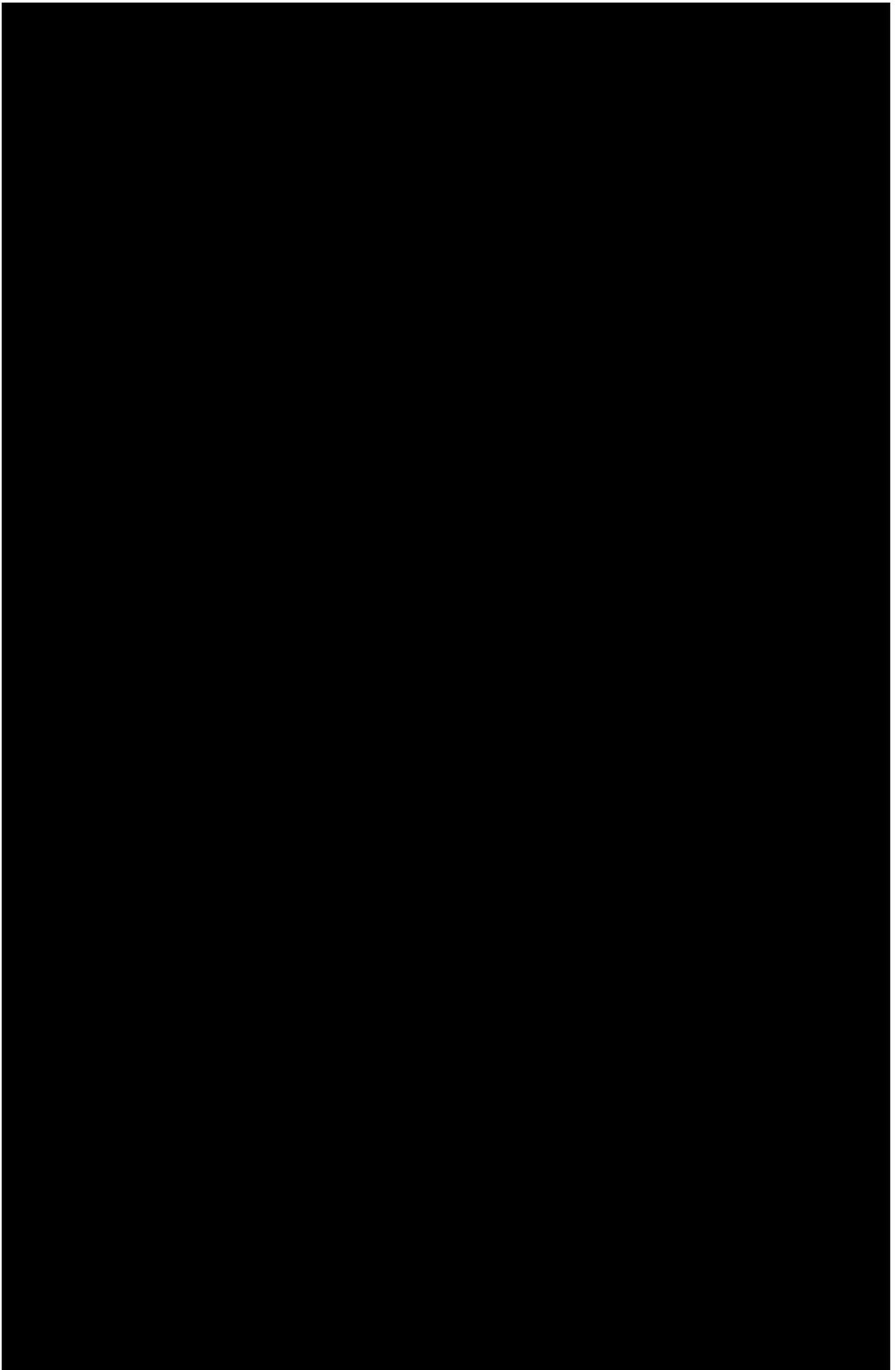




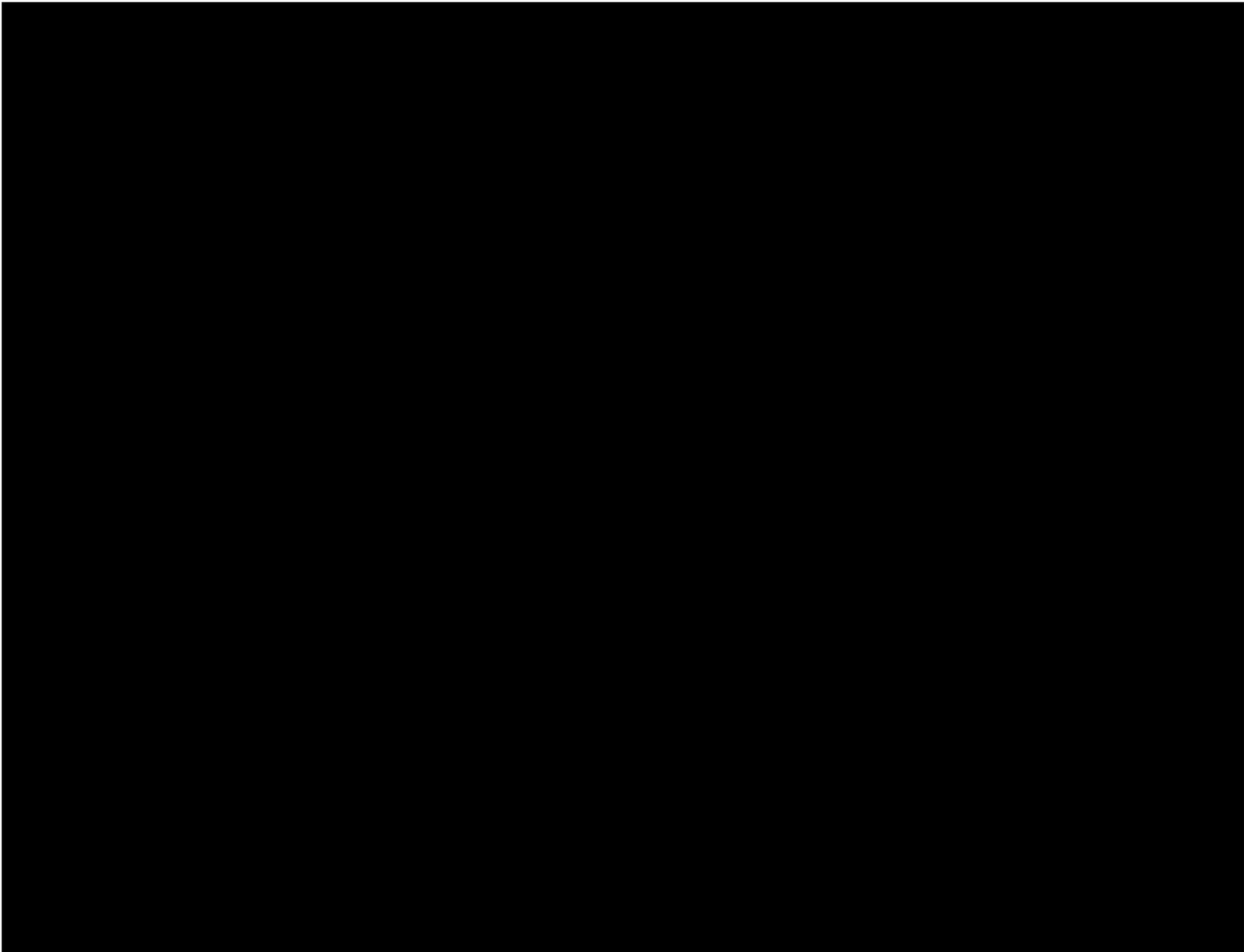








# ATTACHMENT 104



# ATTACHMENT 105

# ATLANTIC SHORES OFFSHORE WIND PROJECT 2 FISHERIES MITIGATION PLAN



*EDF Renewables*



**February 2019**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

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[REDACTED]

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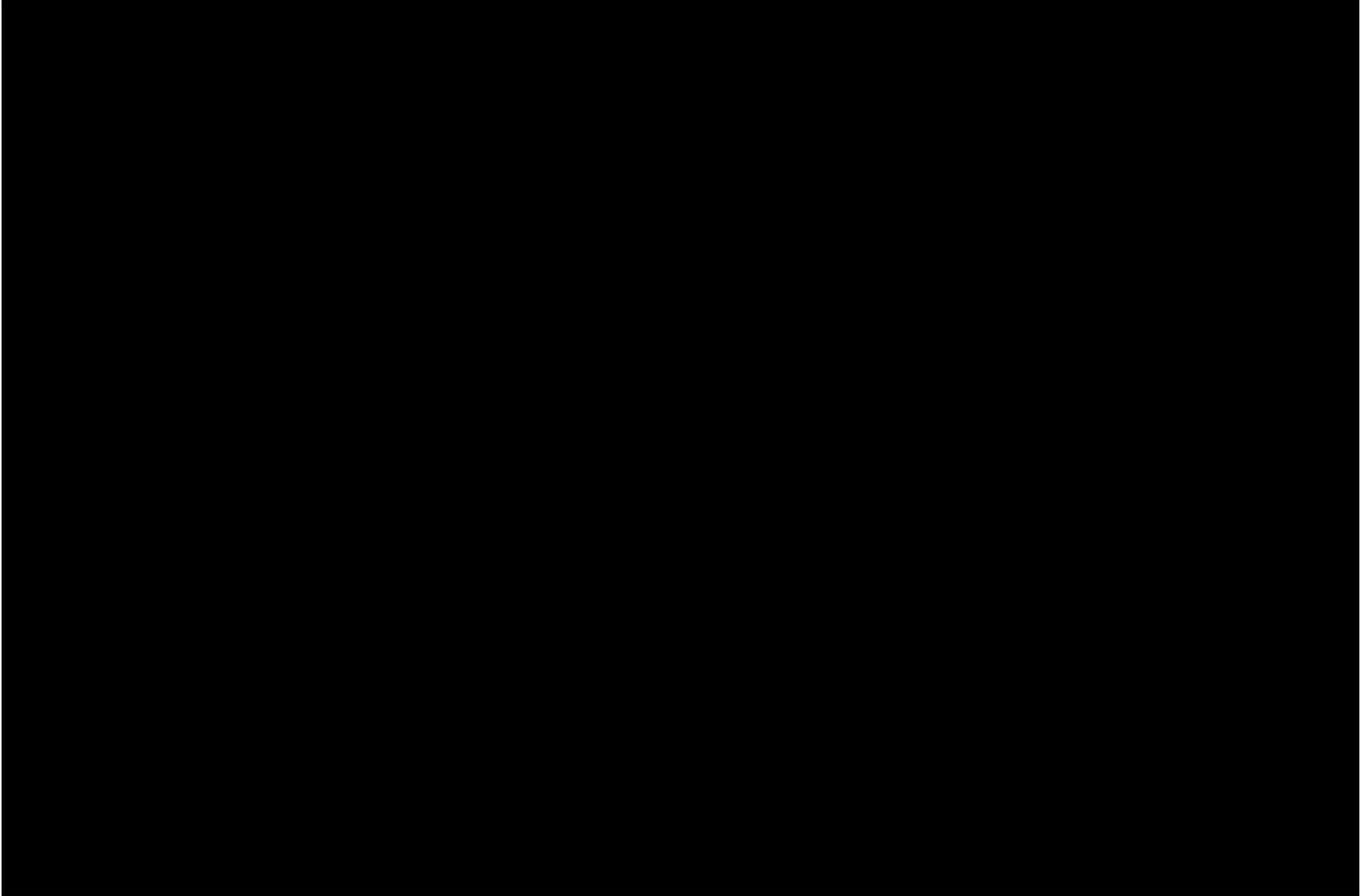
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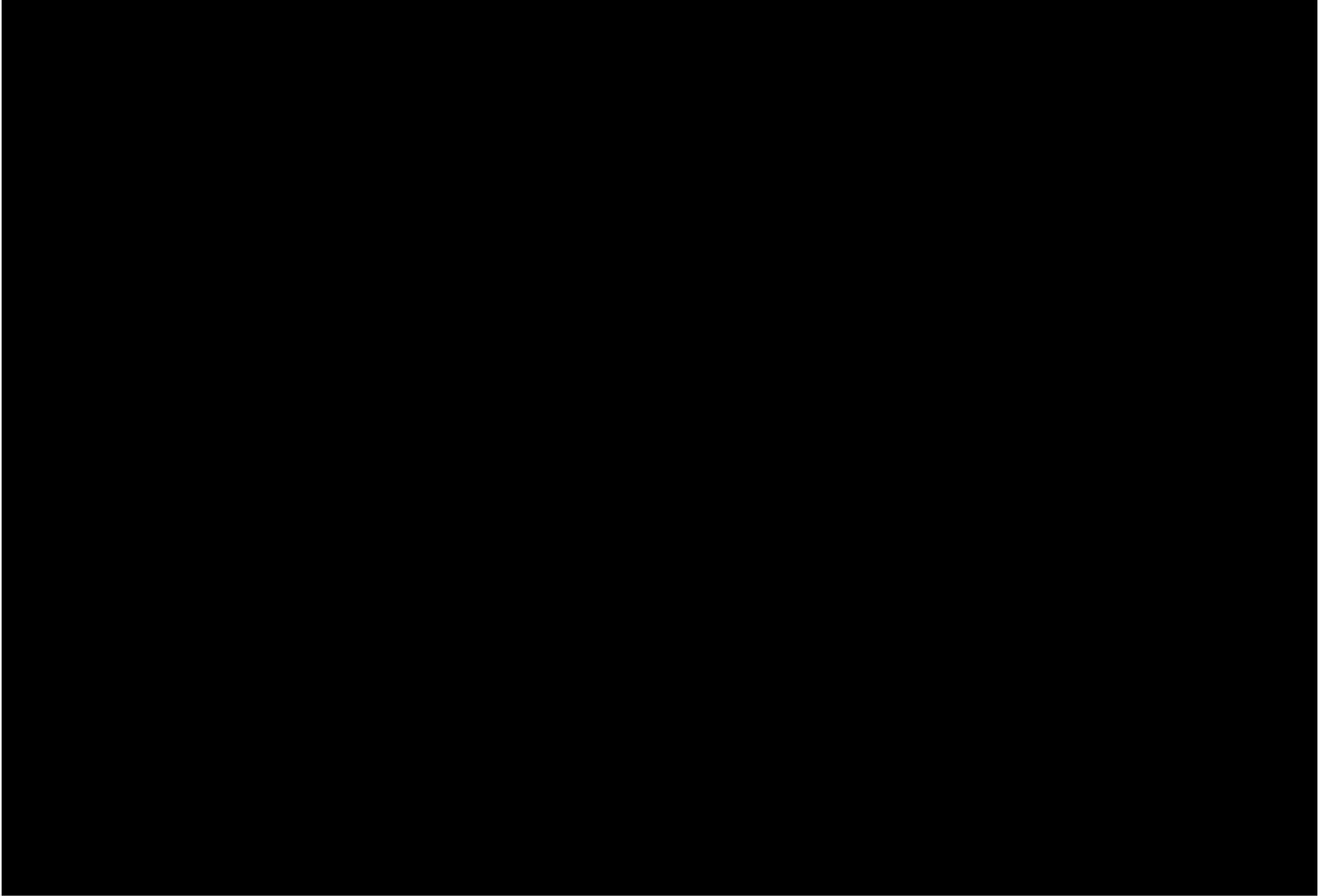
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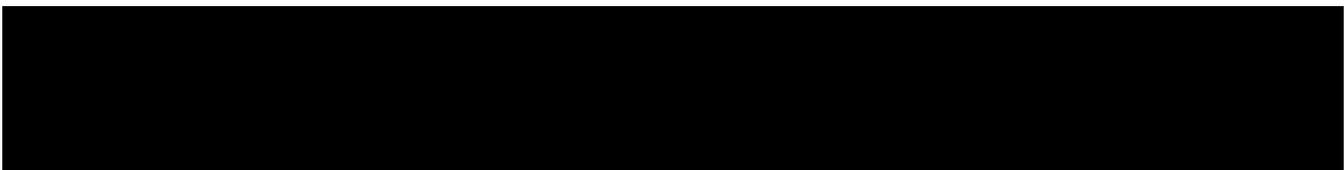
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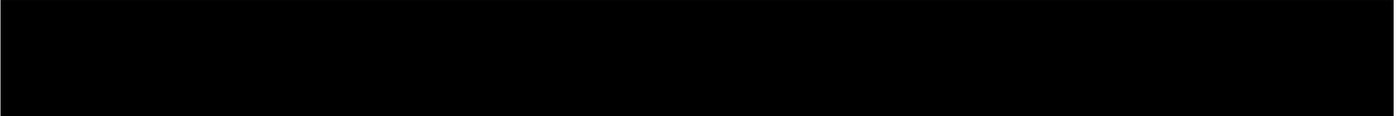
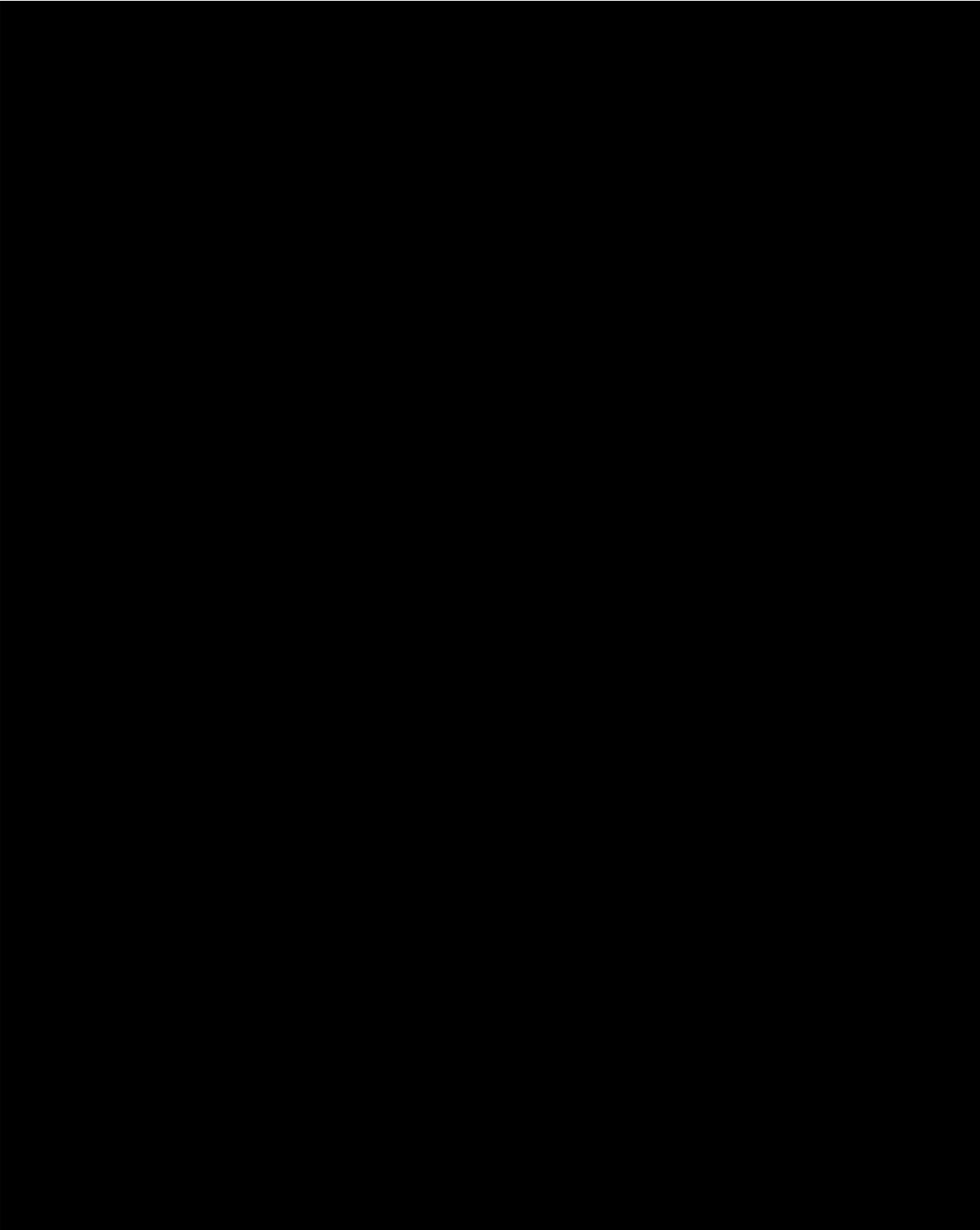
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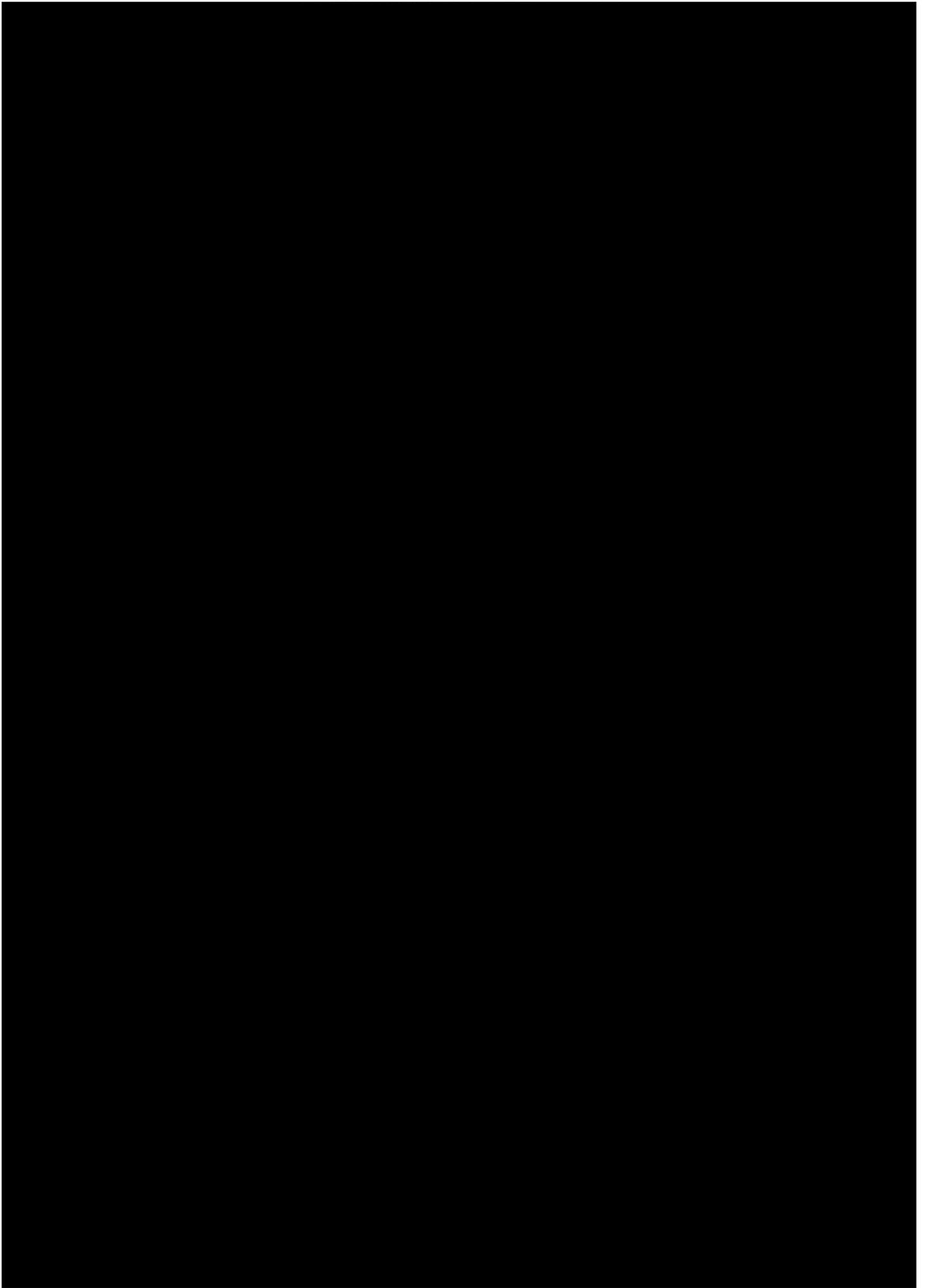
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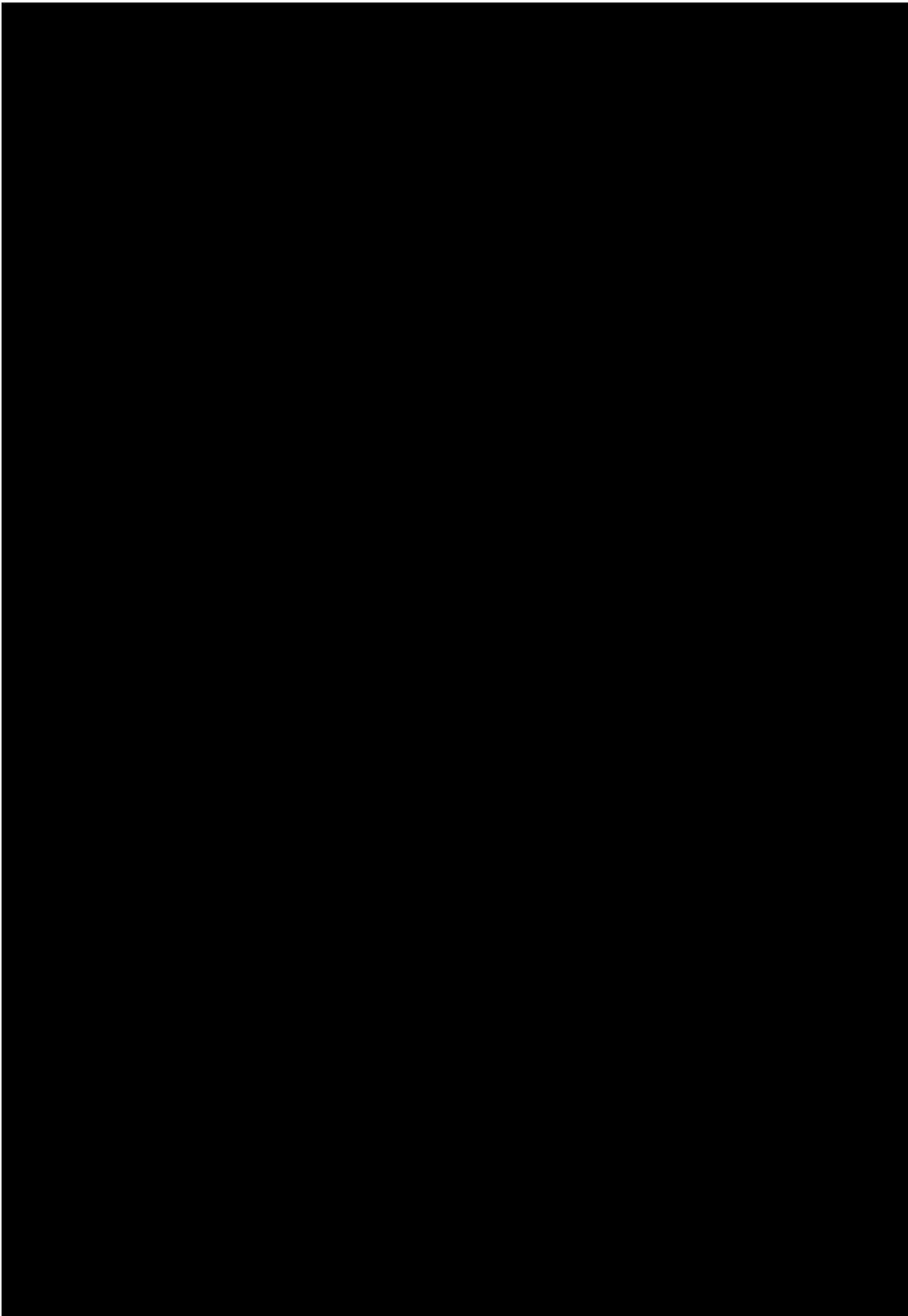
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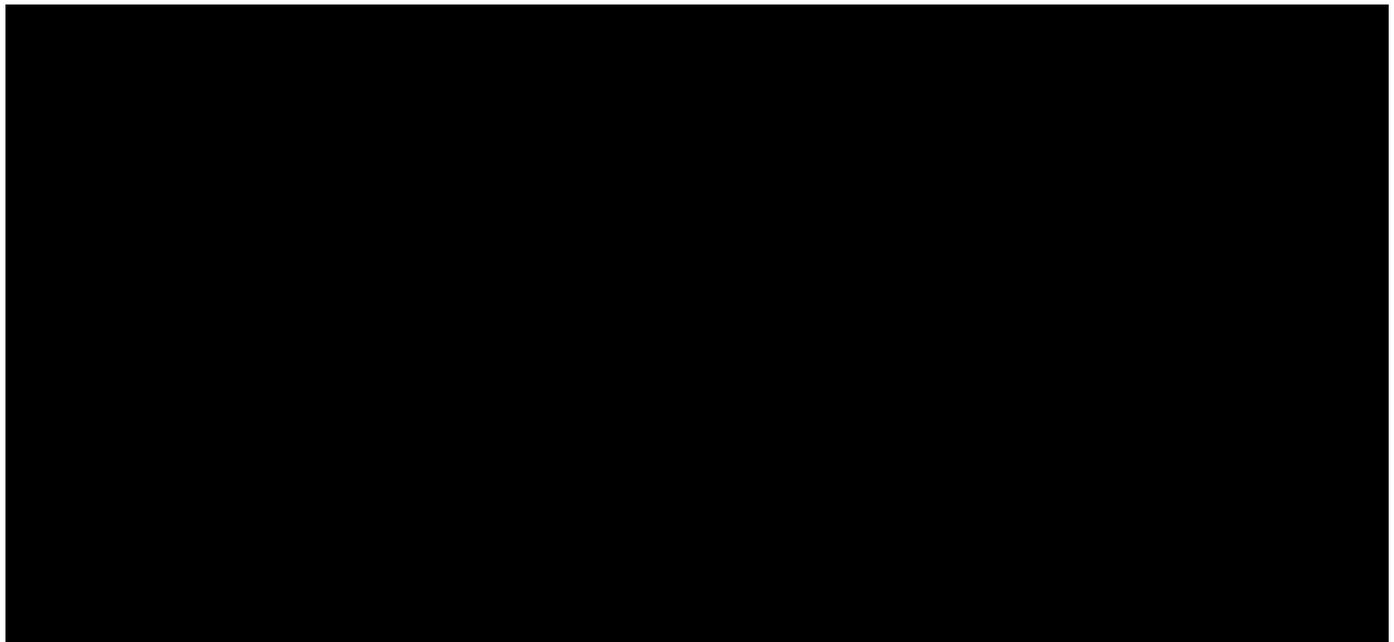
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Section 2.1.7).





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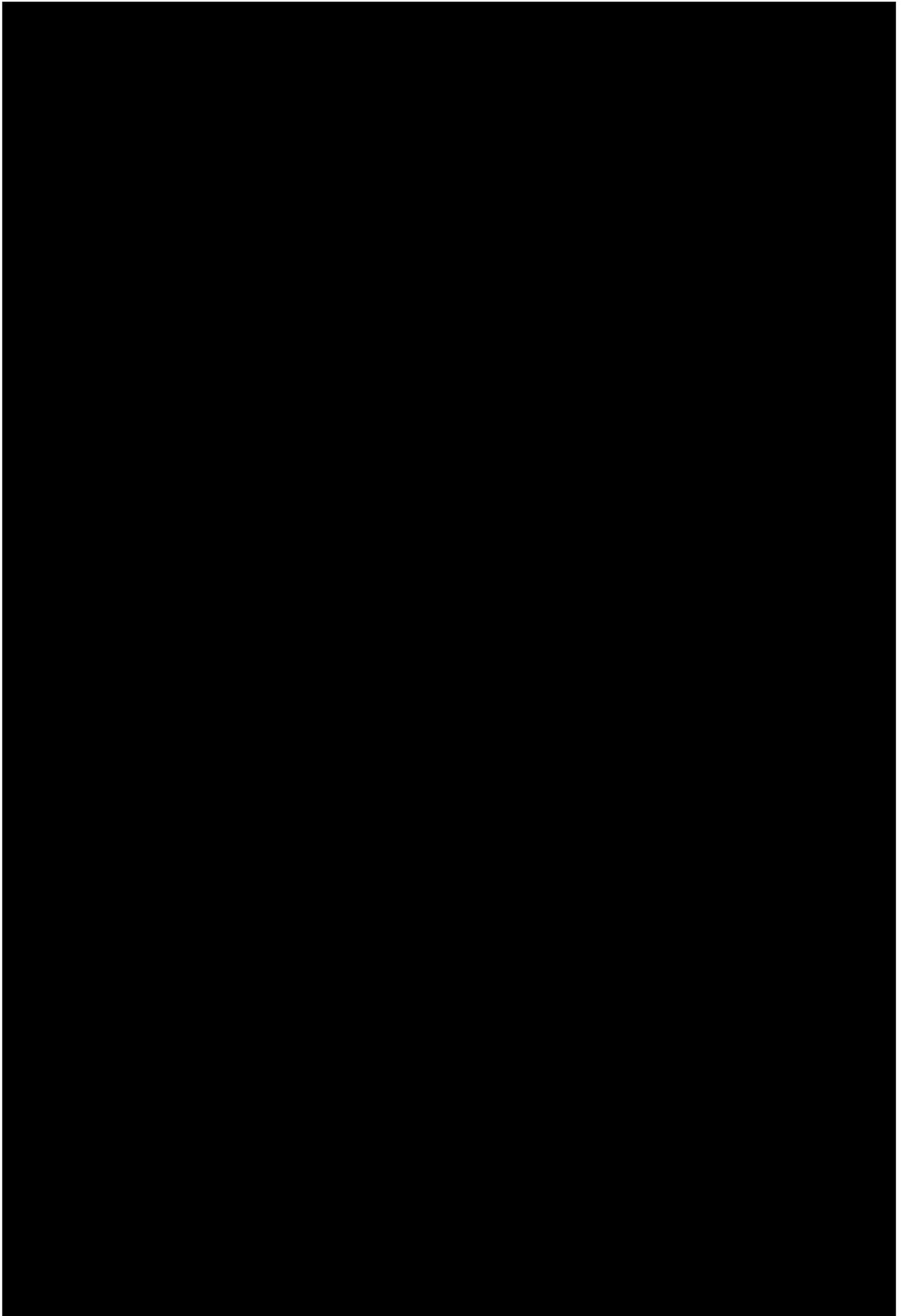
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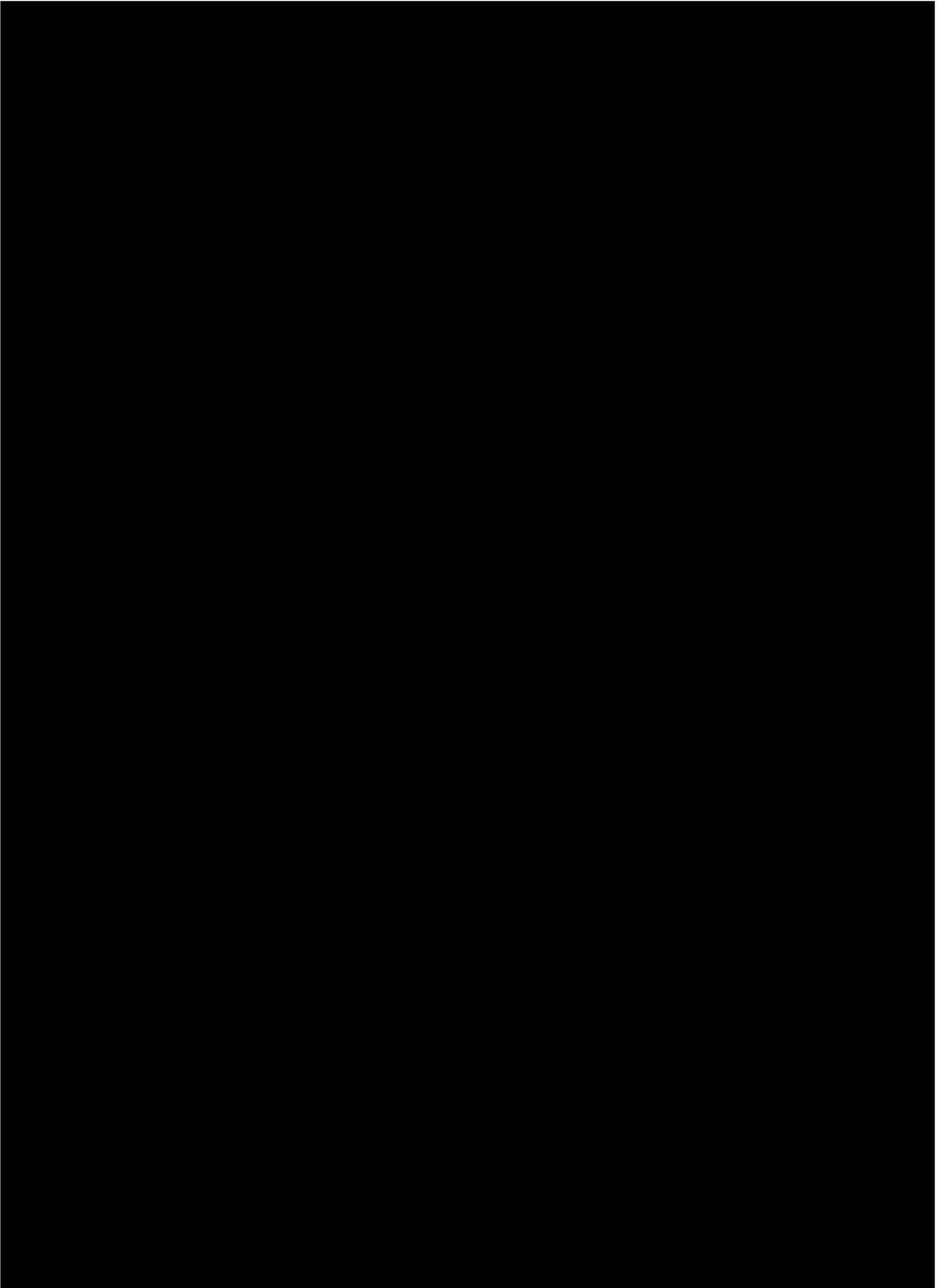
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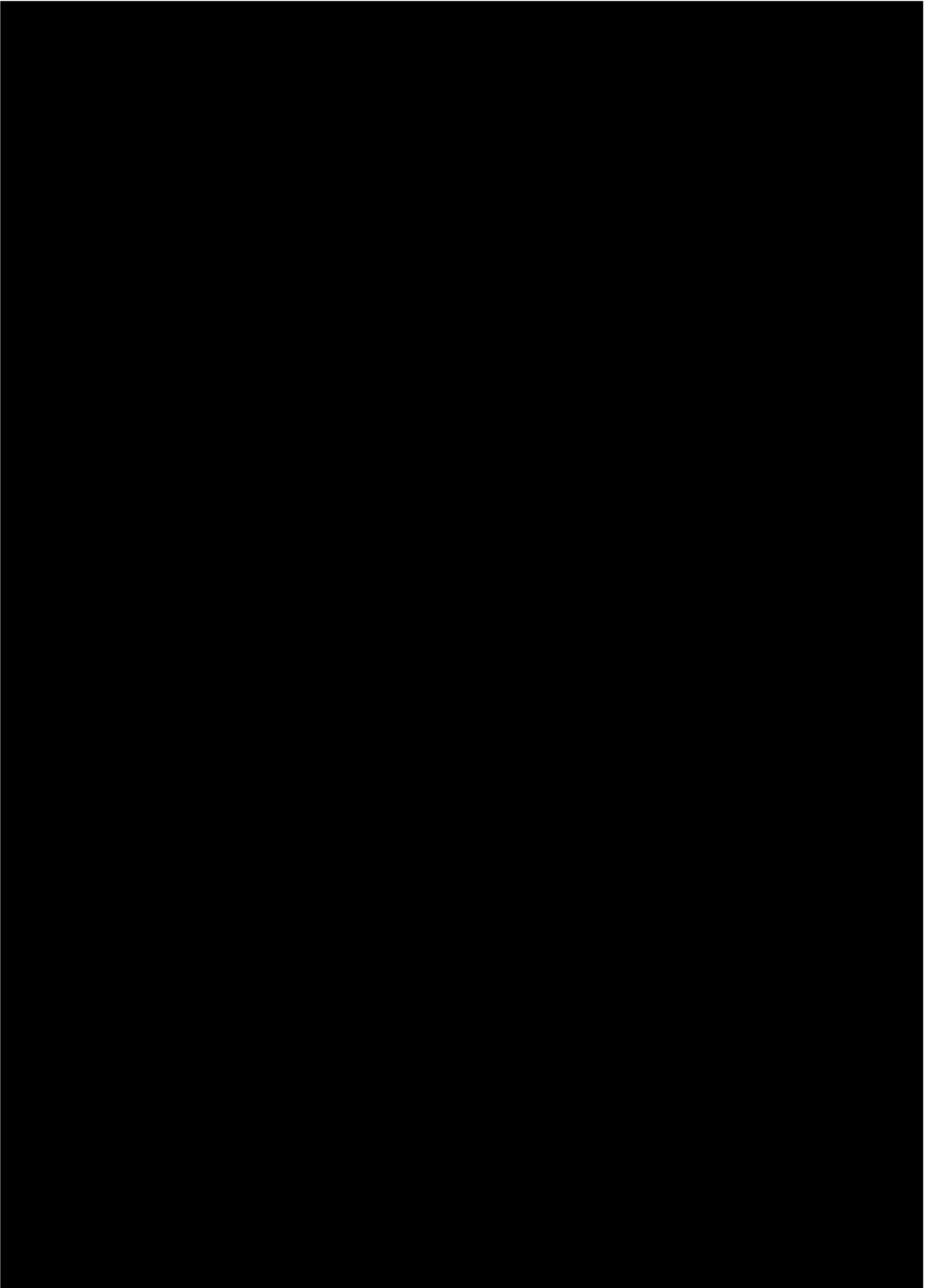
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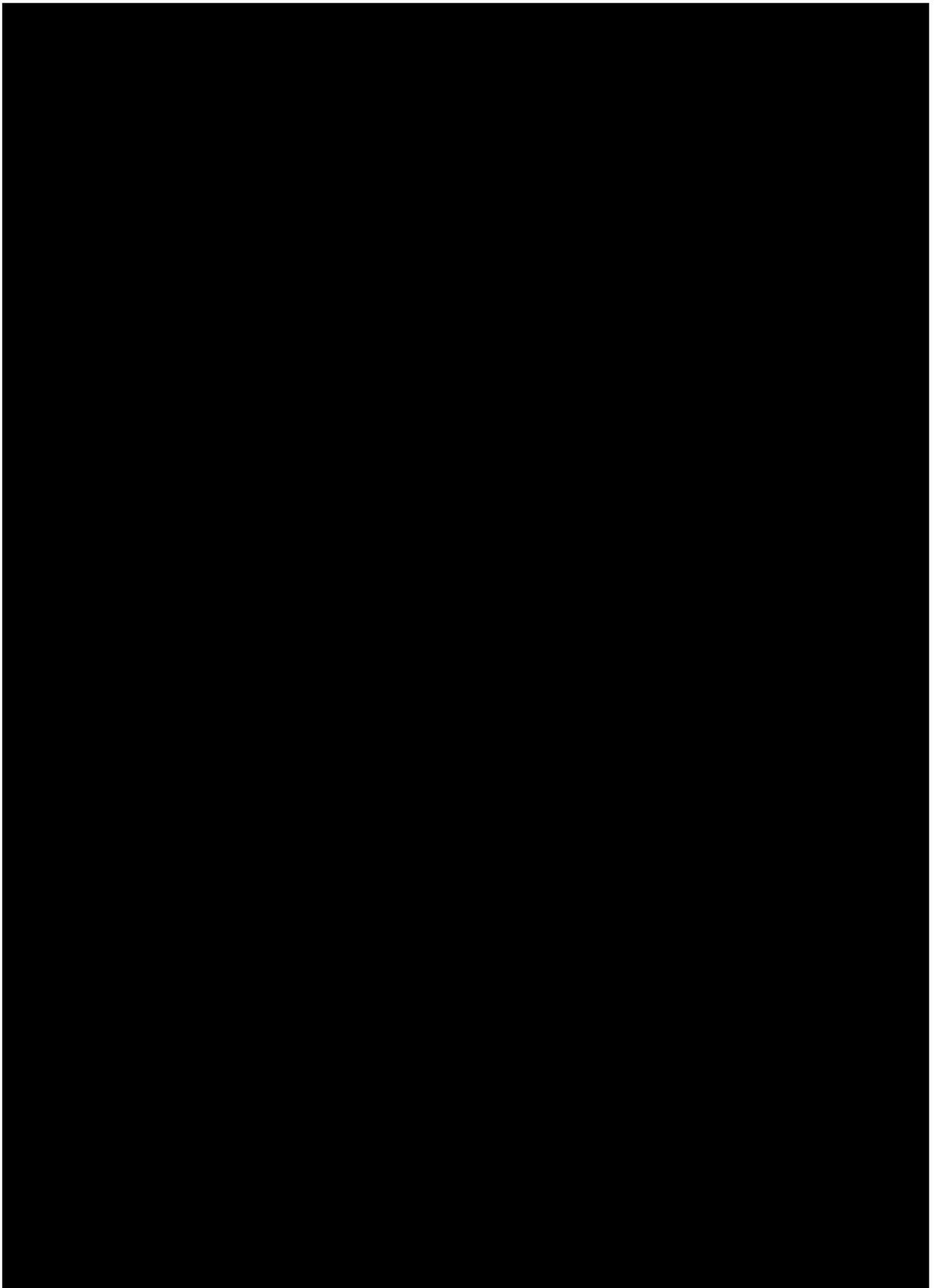


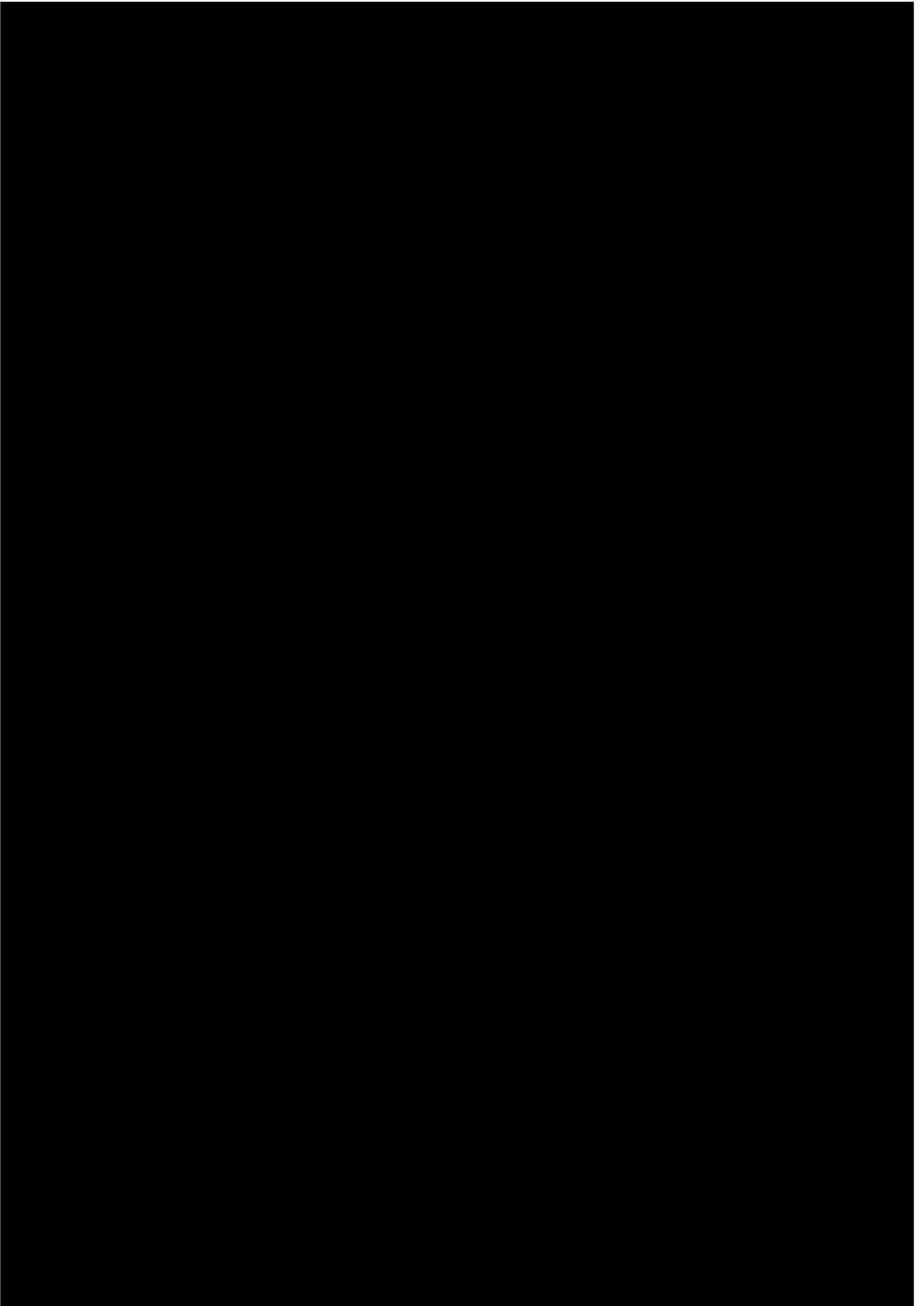
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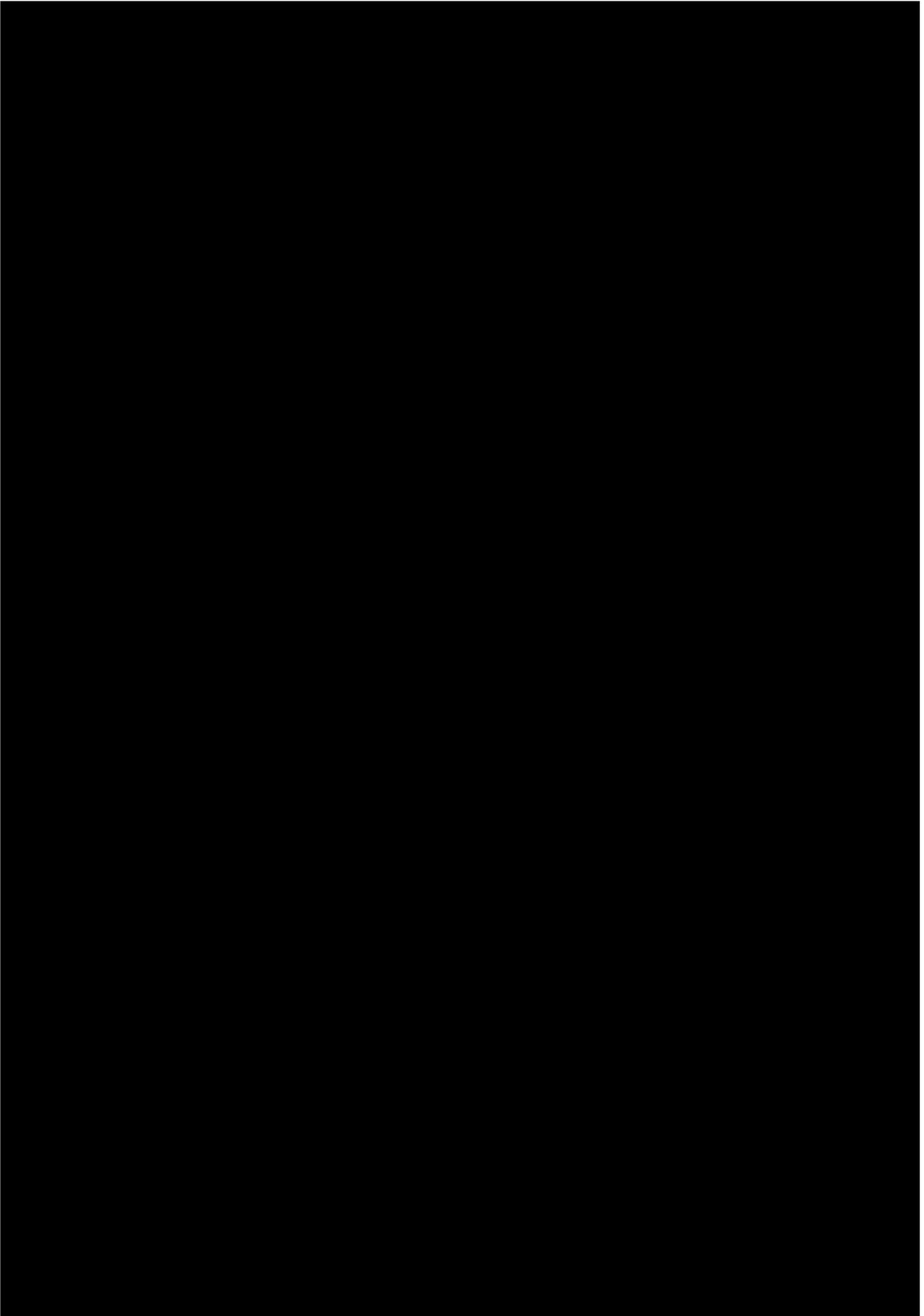


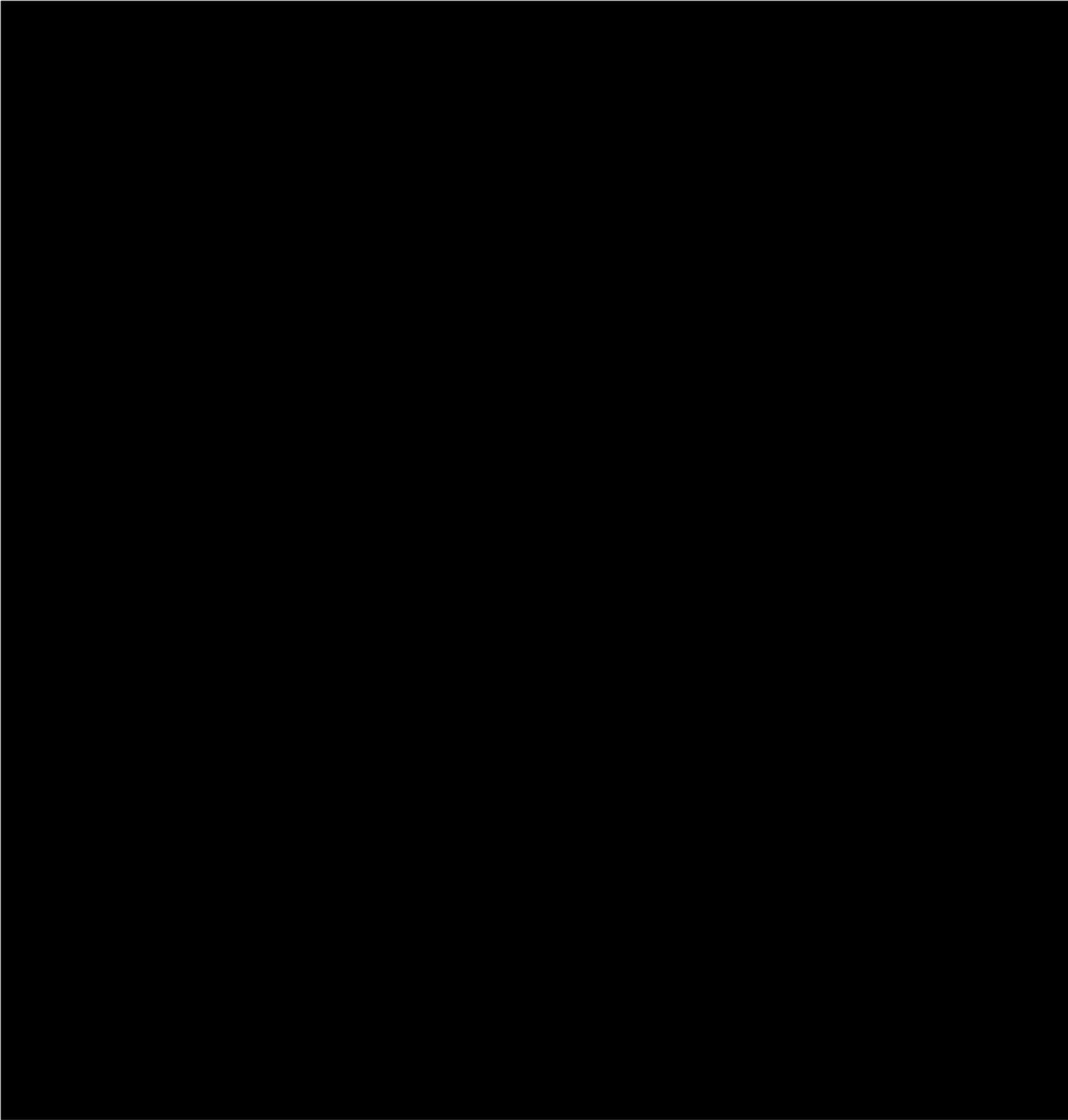




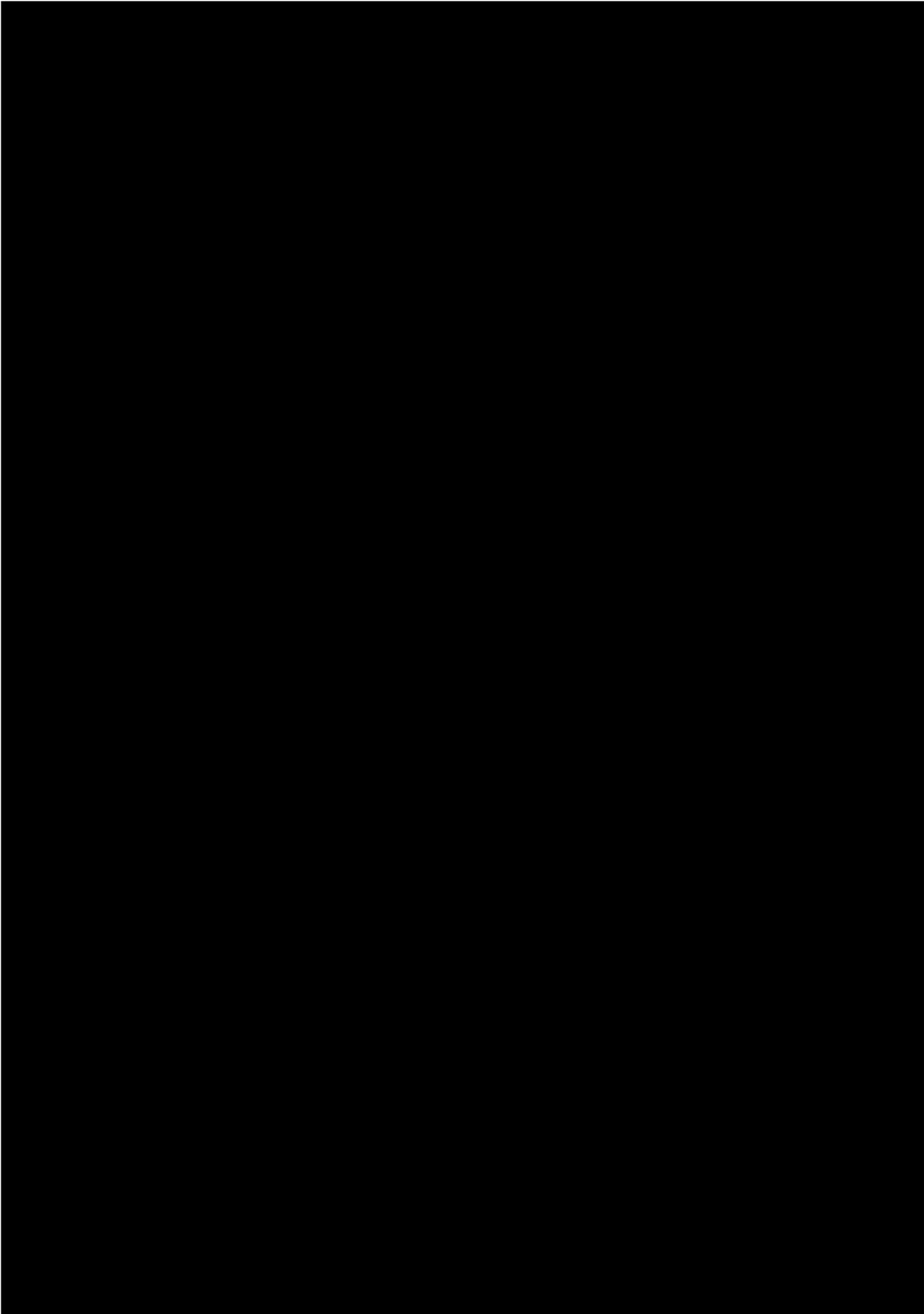








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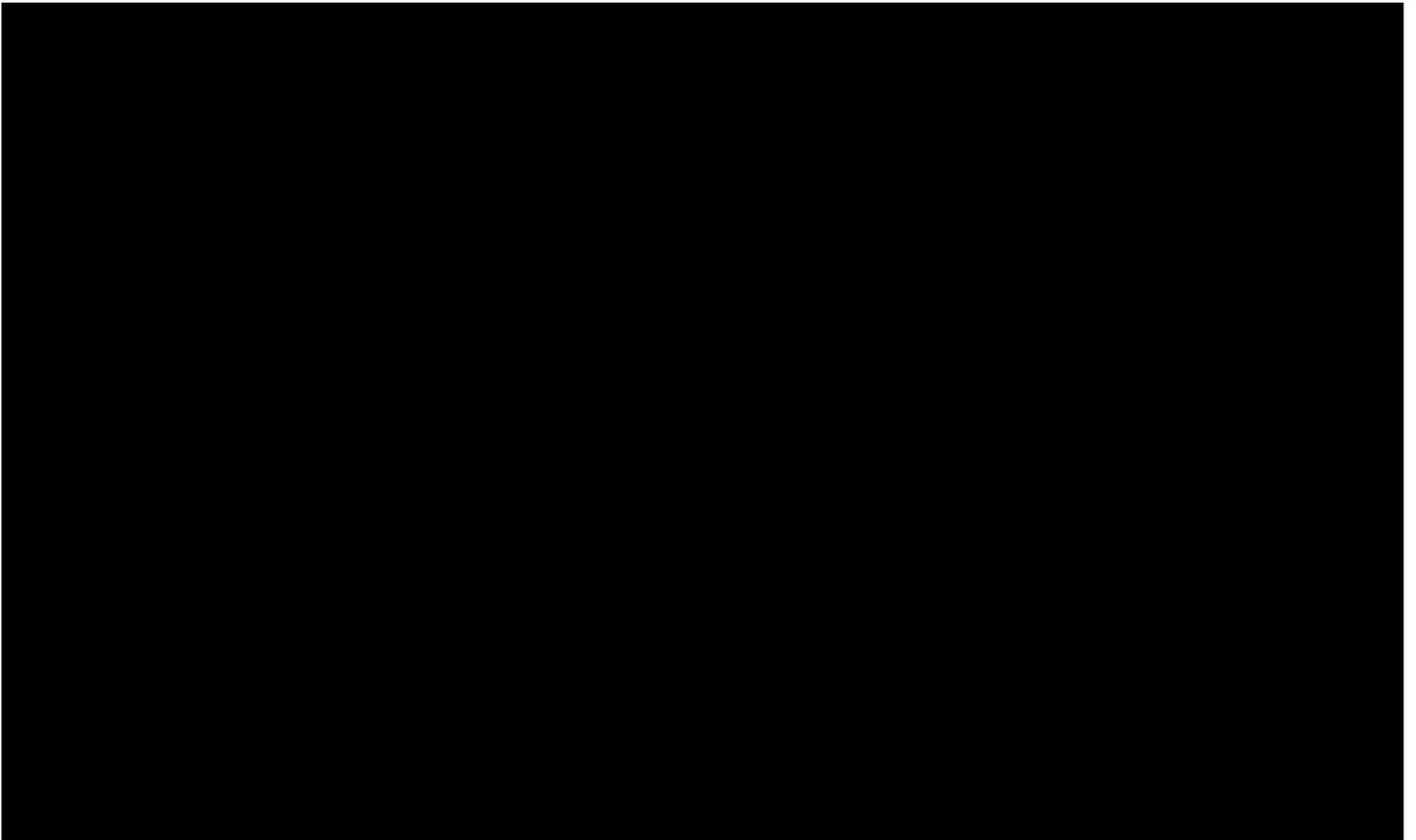
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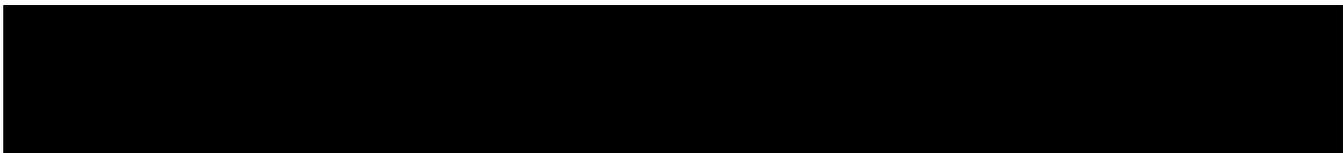
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148:29-42. doi: 10.1111/j.1474-919X.2006.00516.x.

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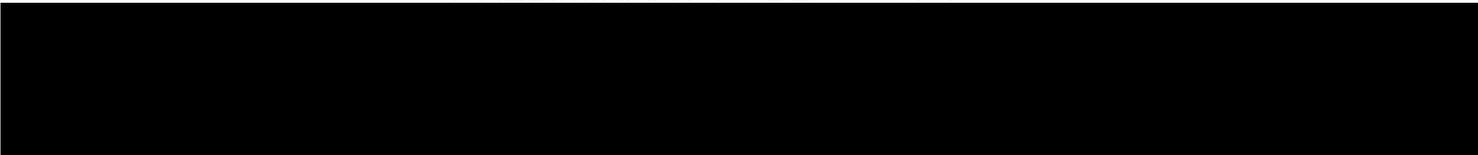
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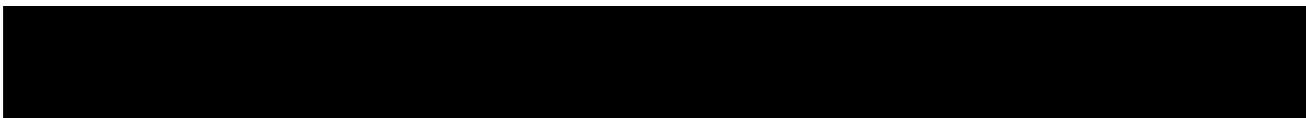
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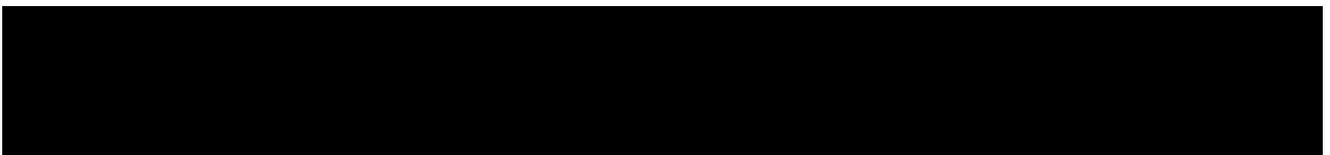
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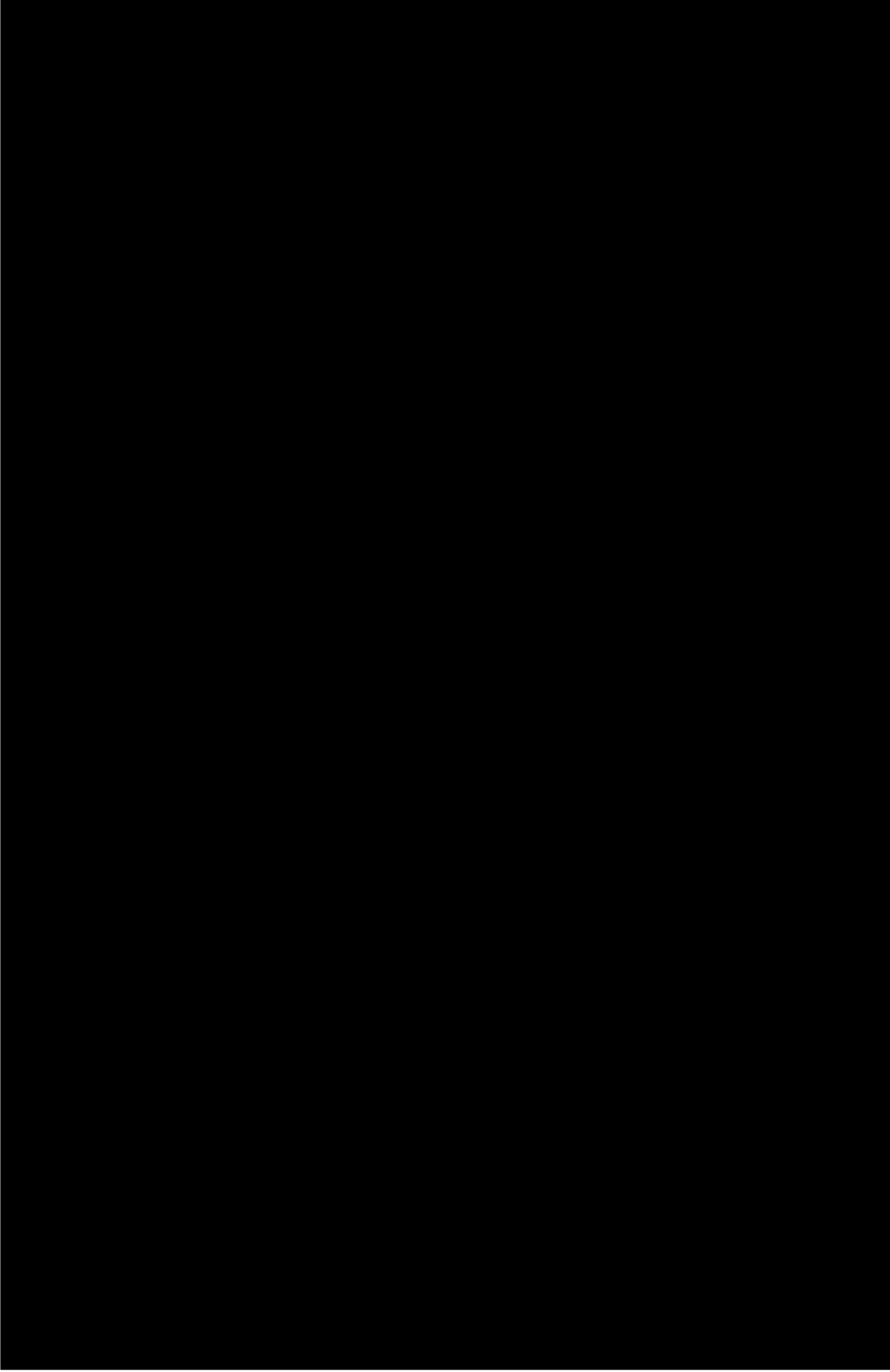
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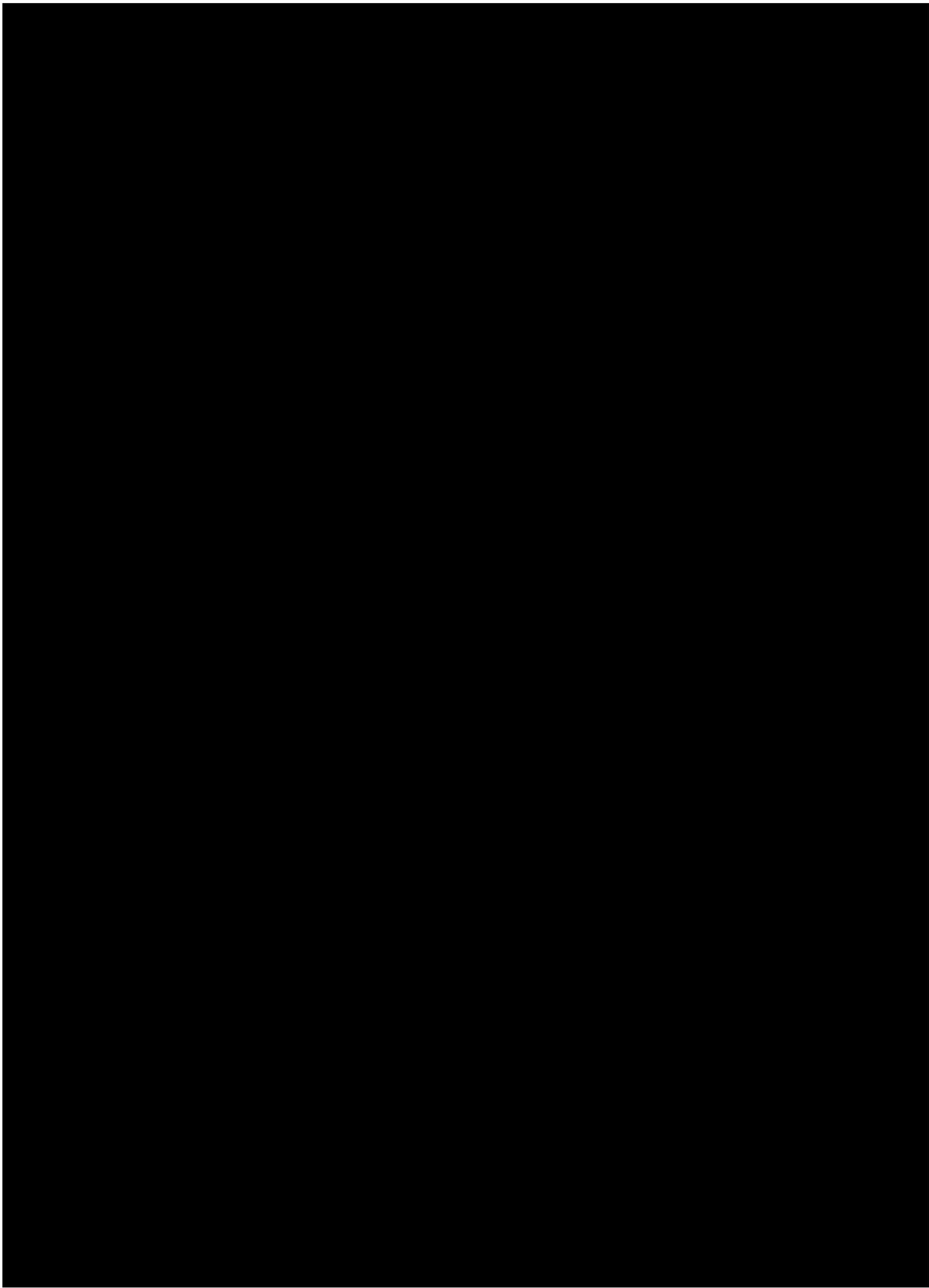




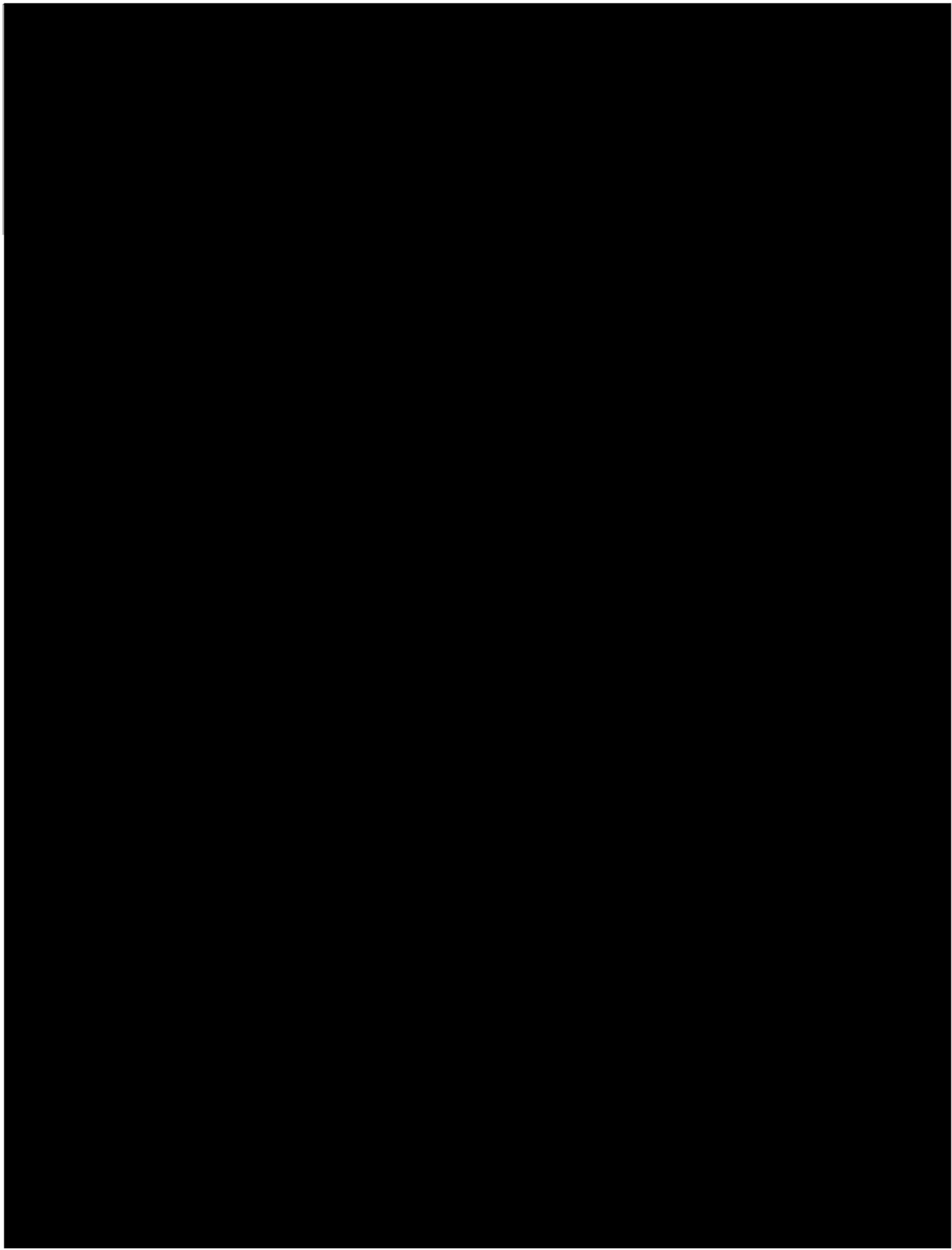












# ATTACHMENT 106

# ATLANTIC SHORES OFFSHORE WIND PROJECT 2 ENVIRONMENTAL MITIGATION PLAN



*EDF Renewables*



**February 2019**

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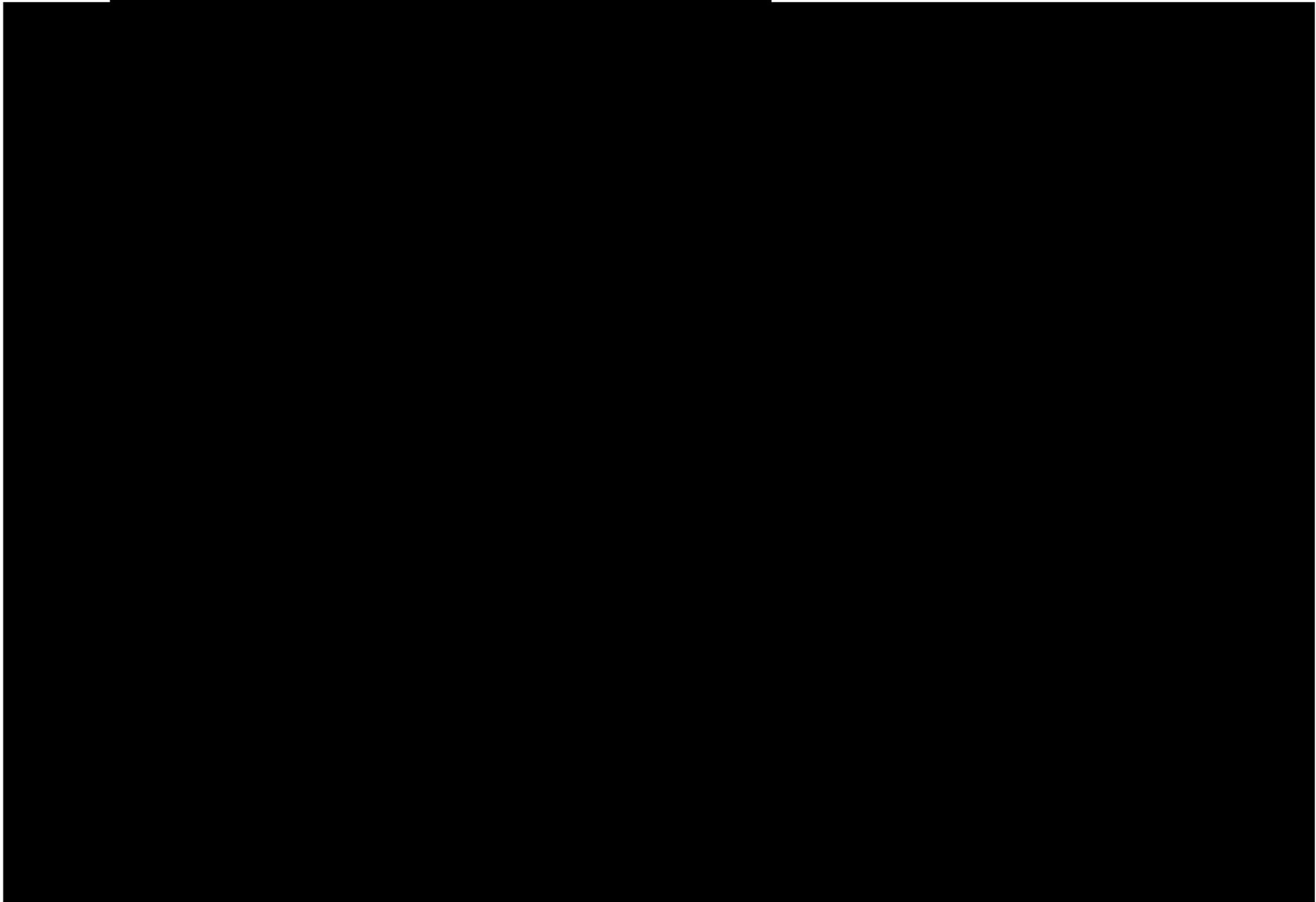
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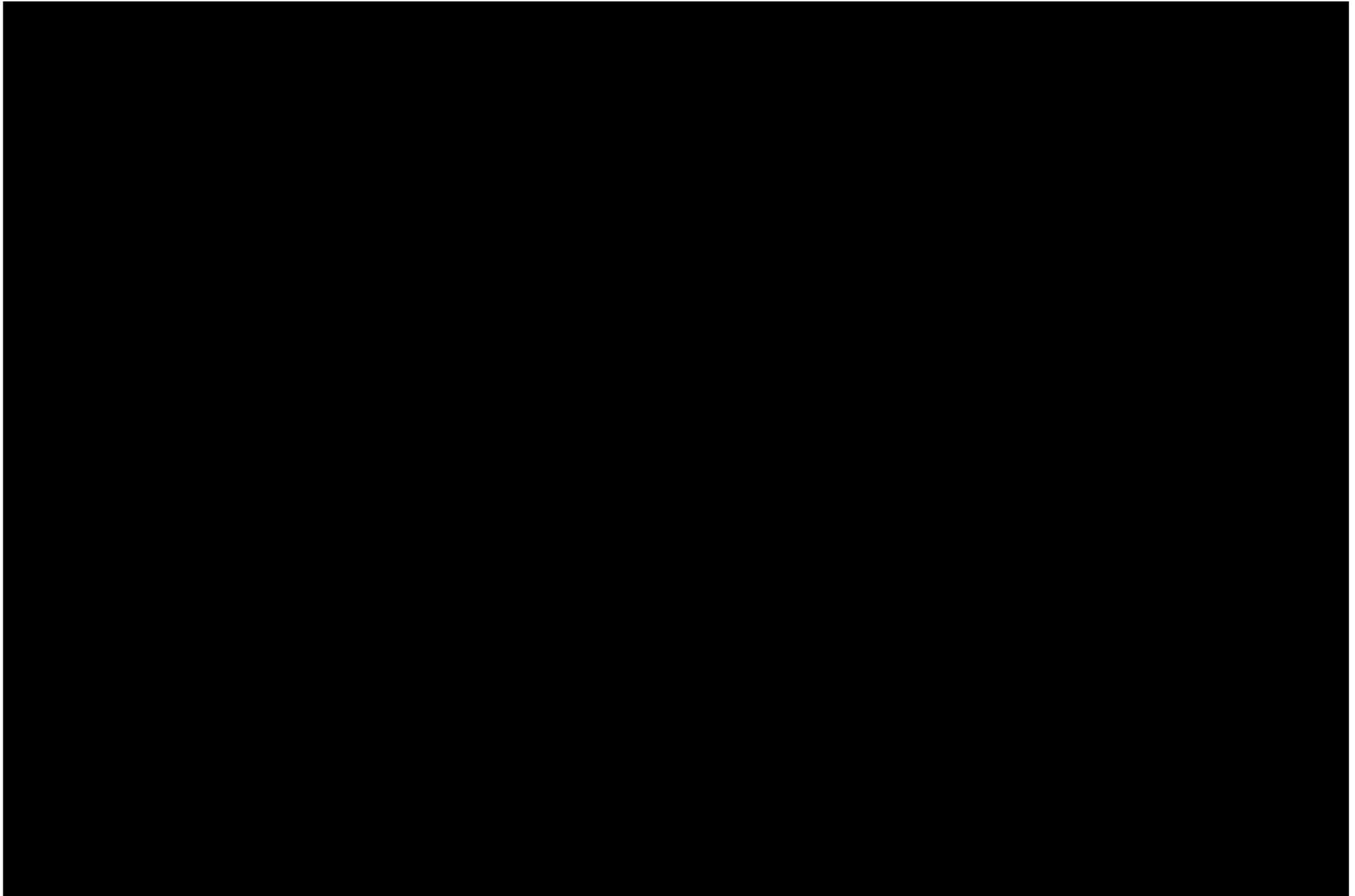
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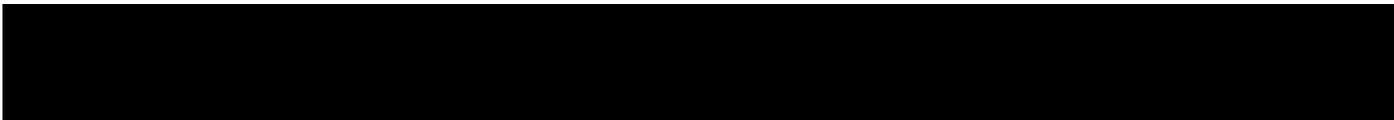
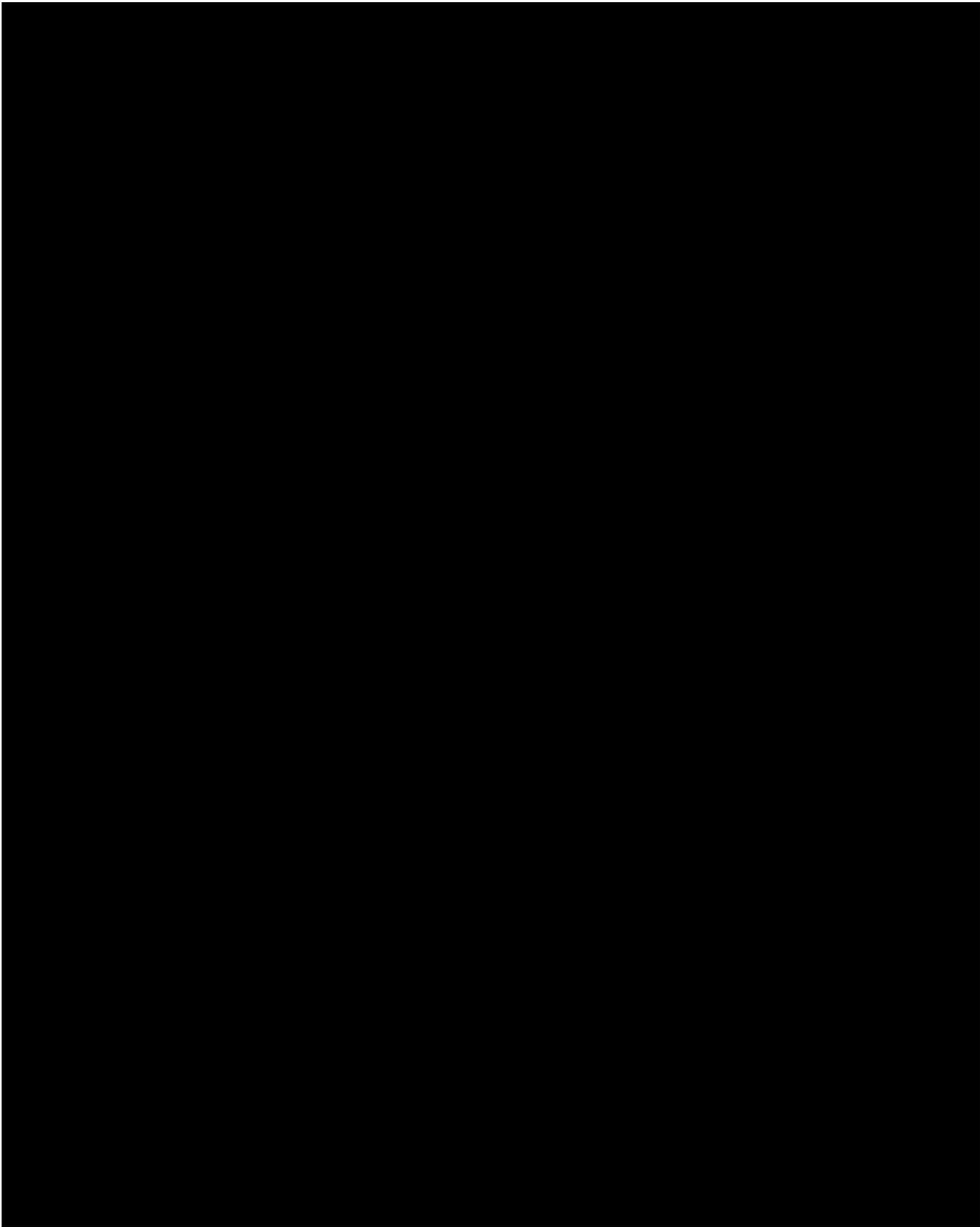


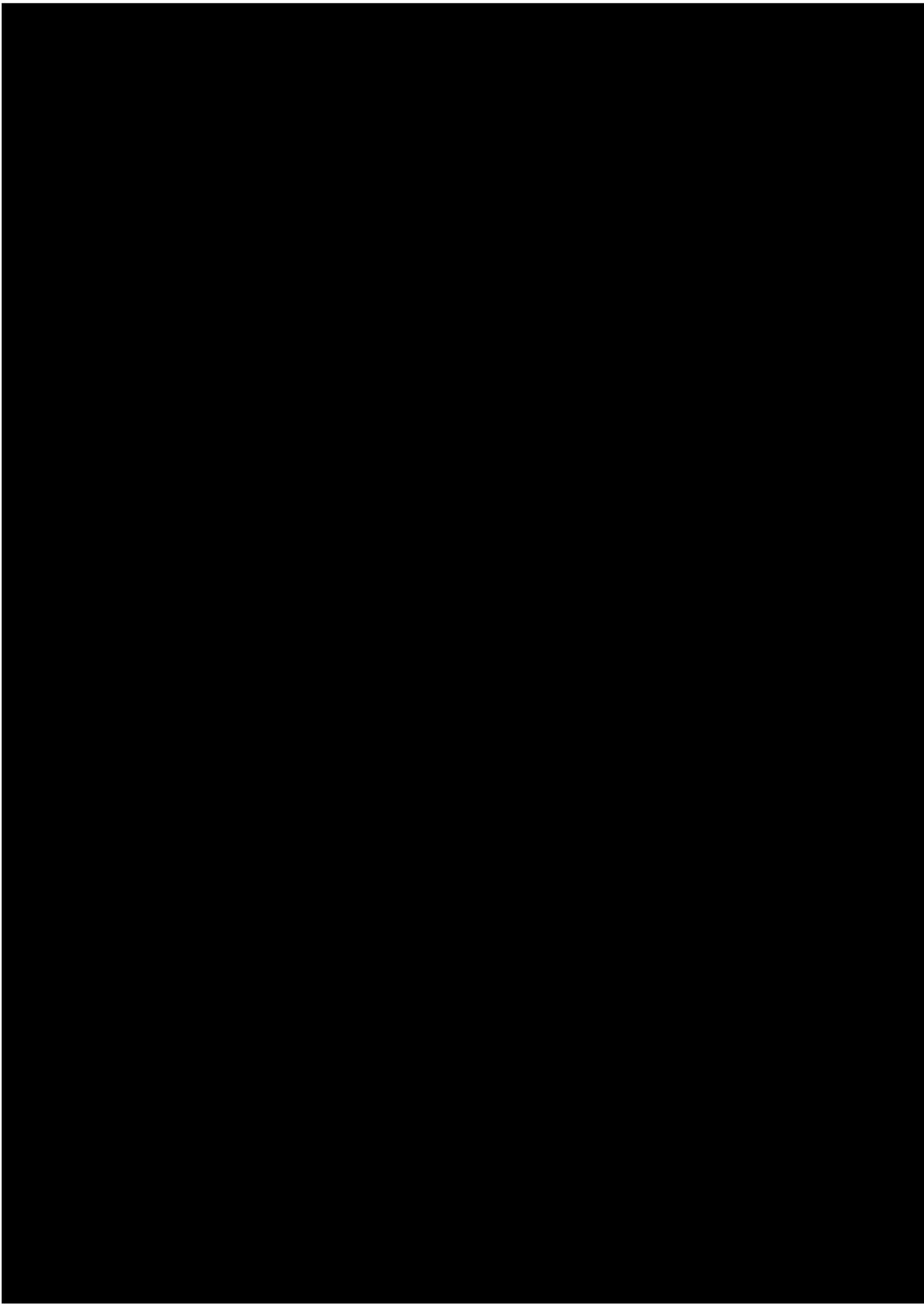
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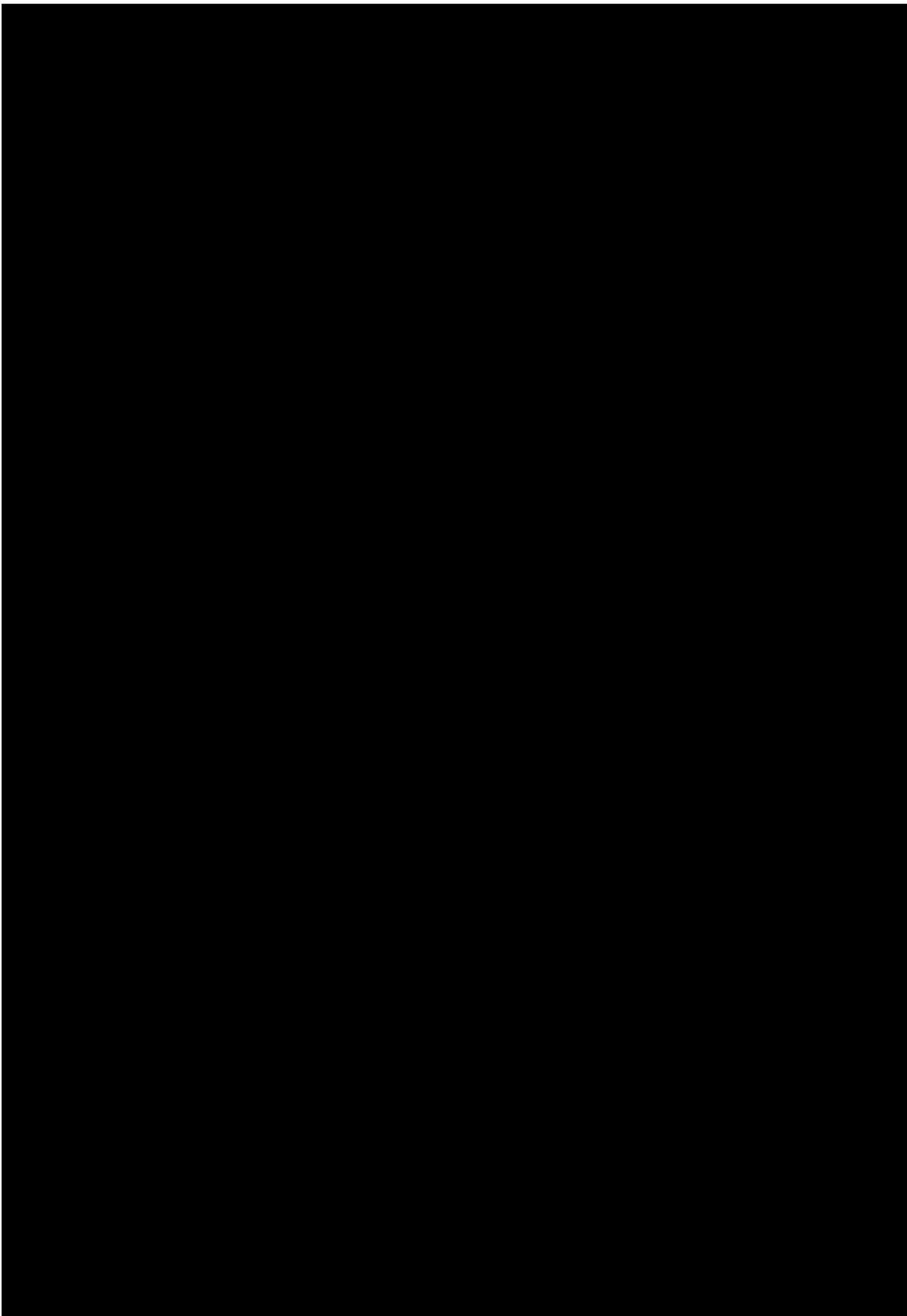




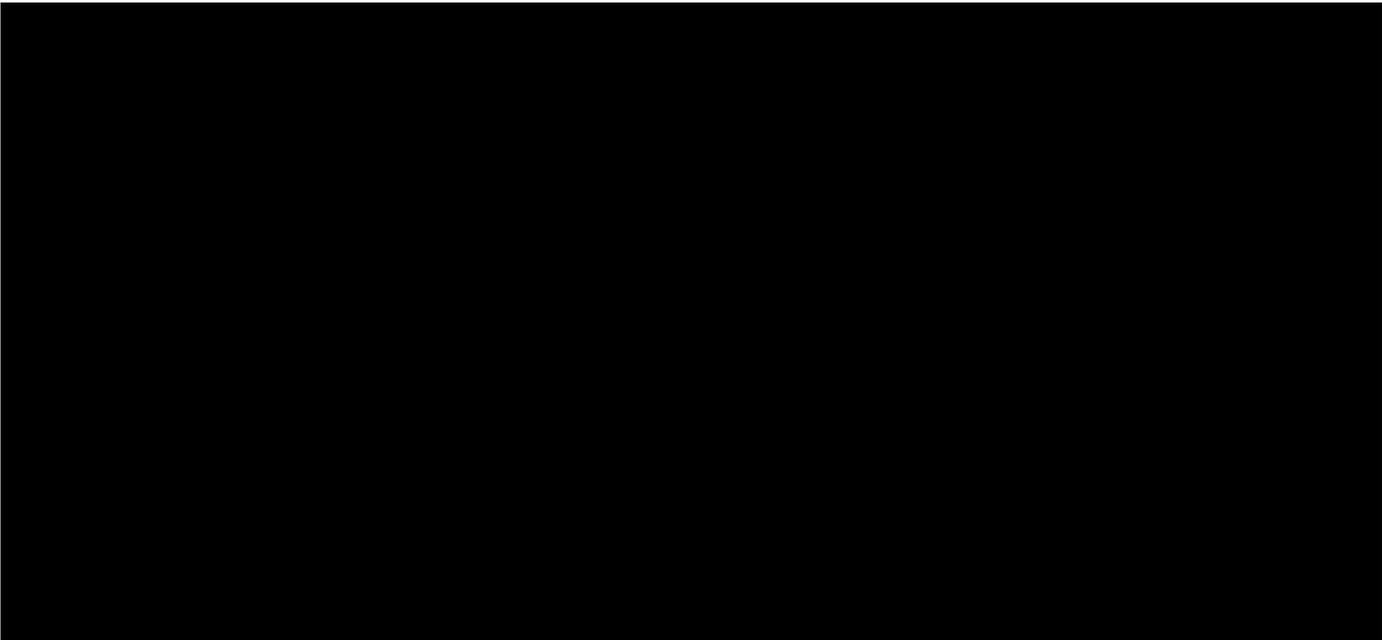
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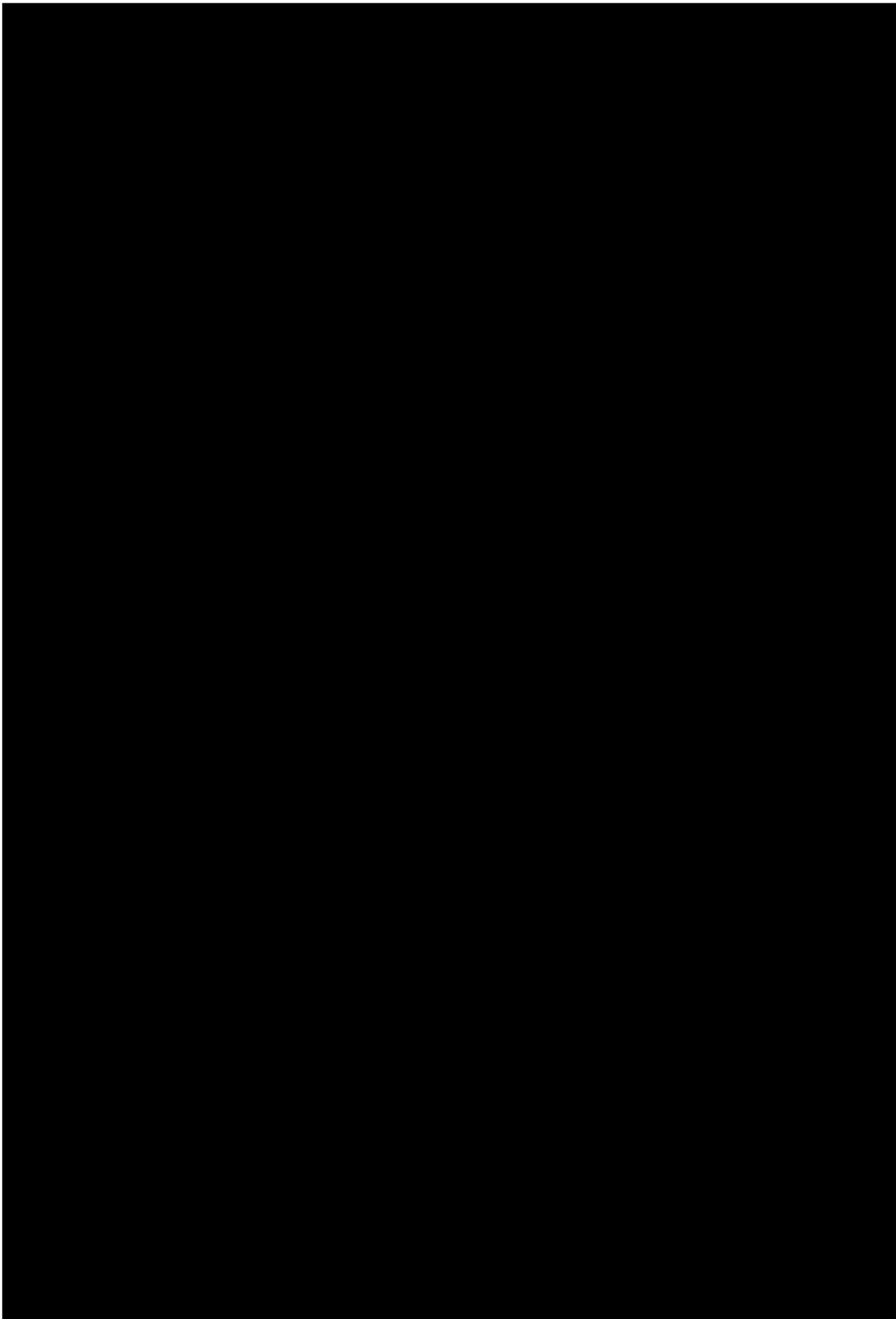
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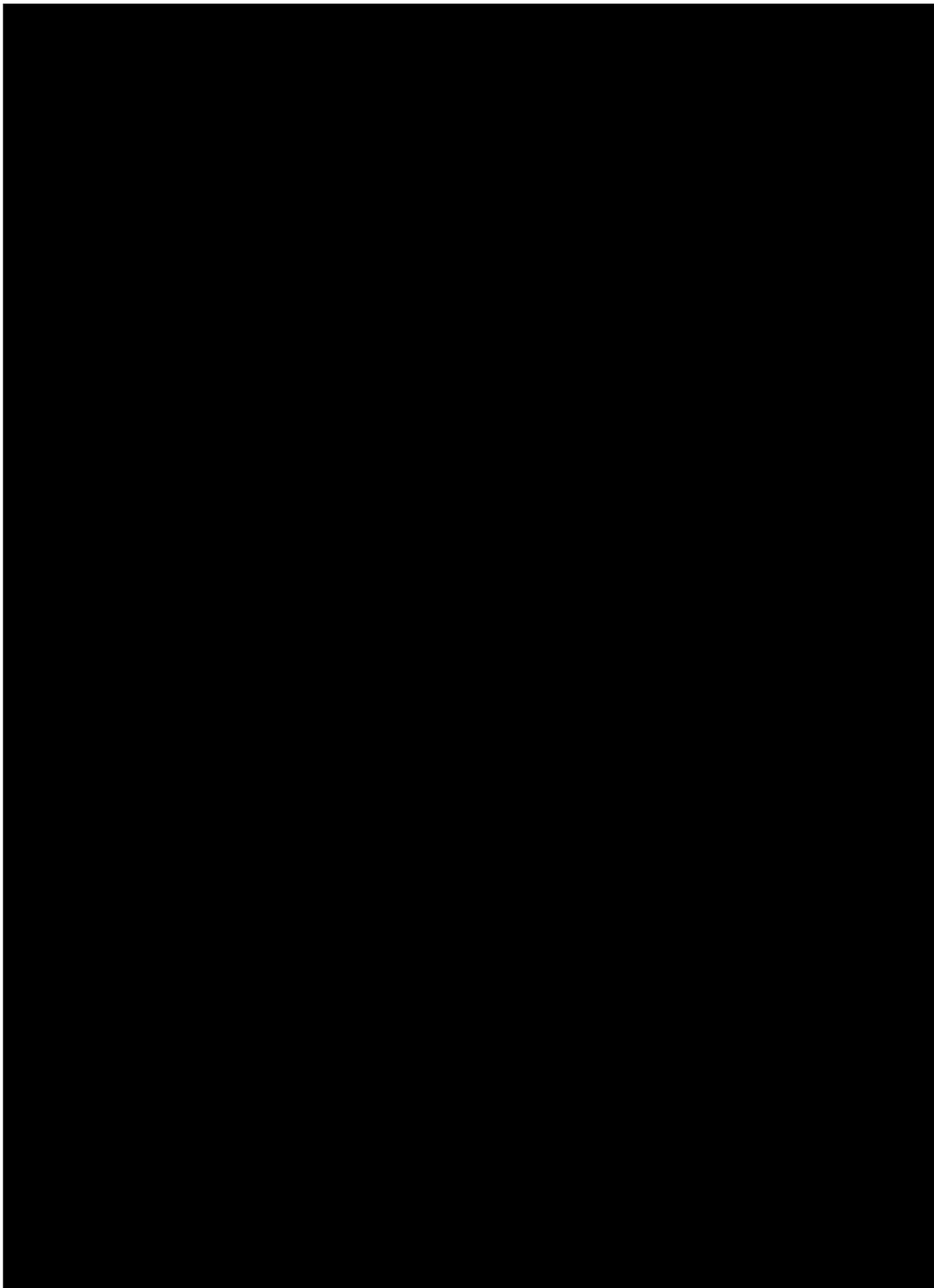
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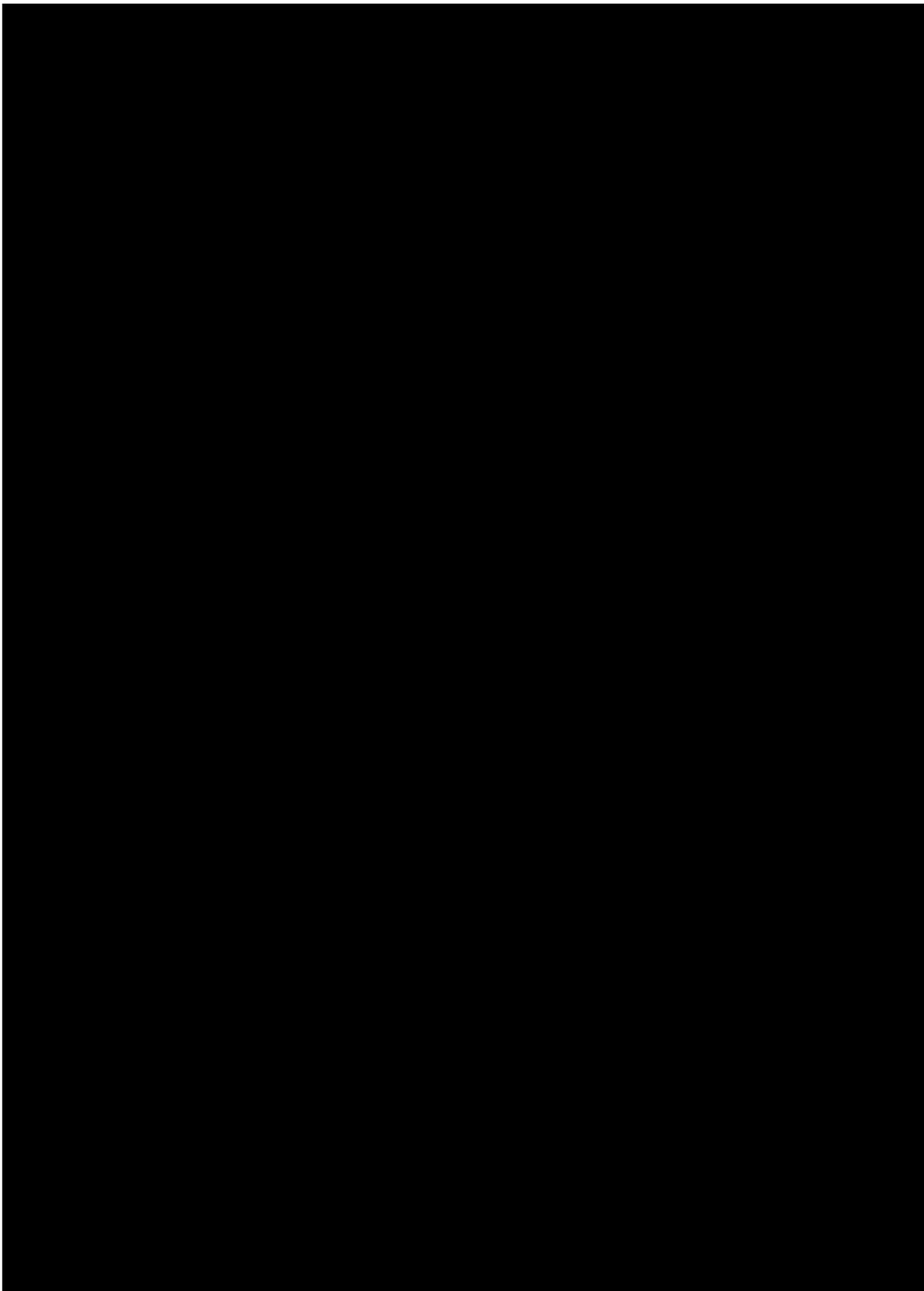
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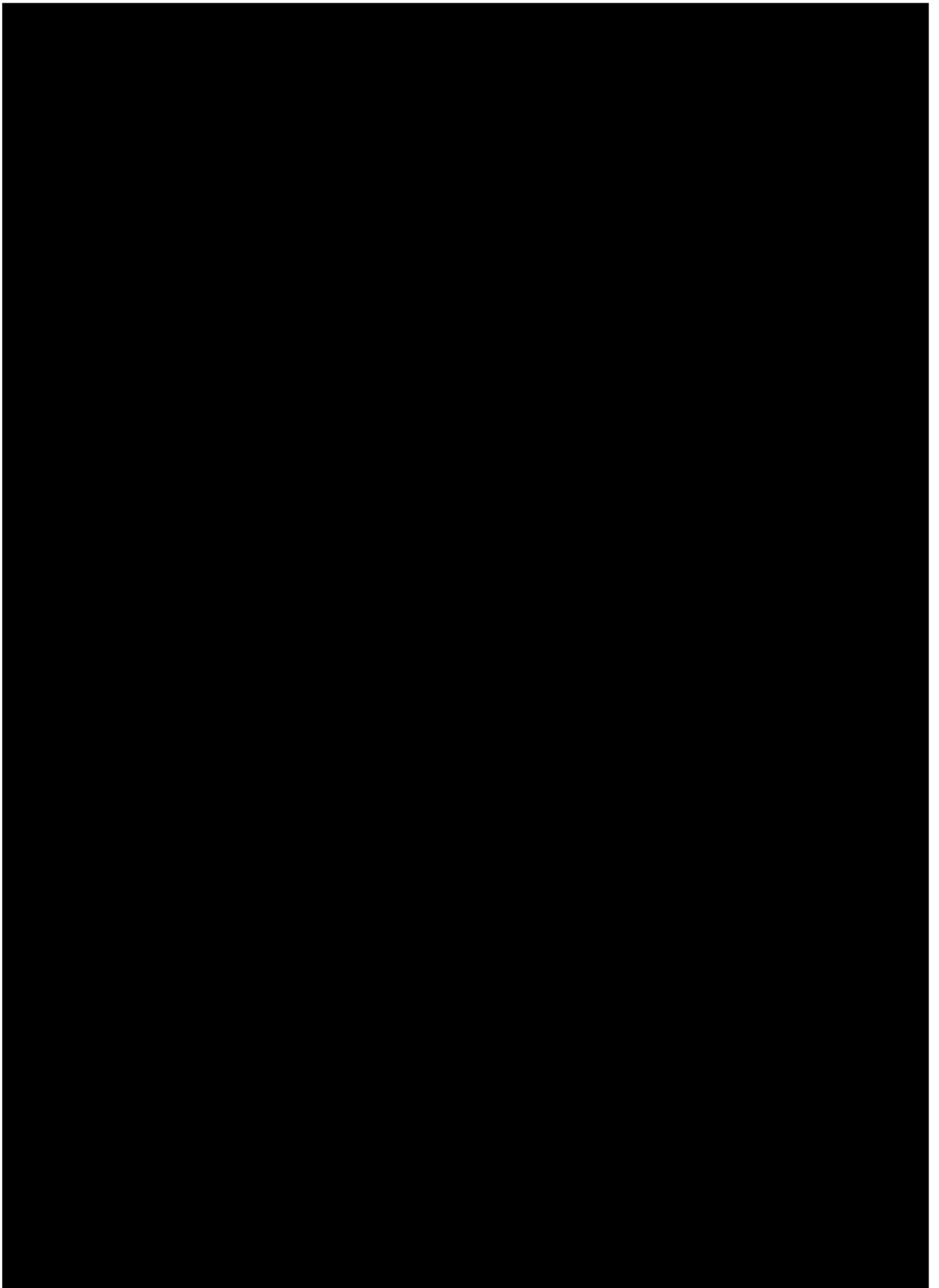
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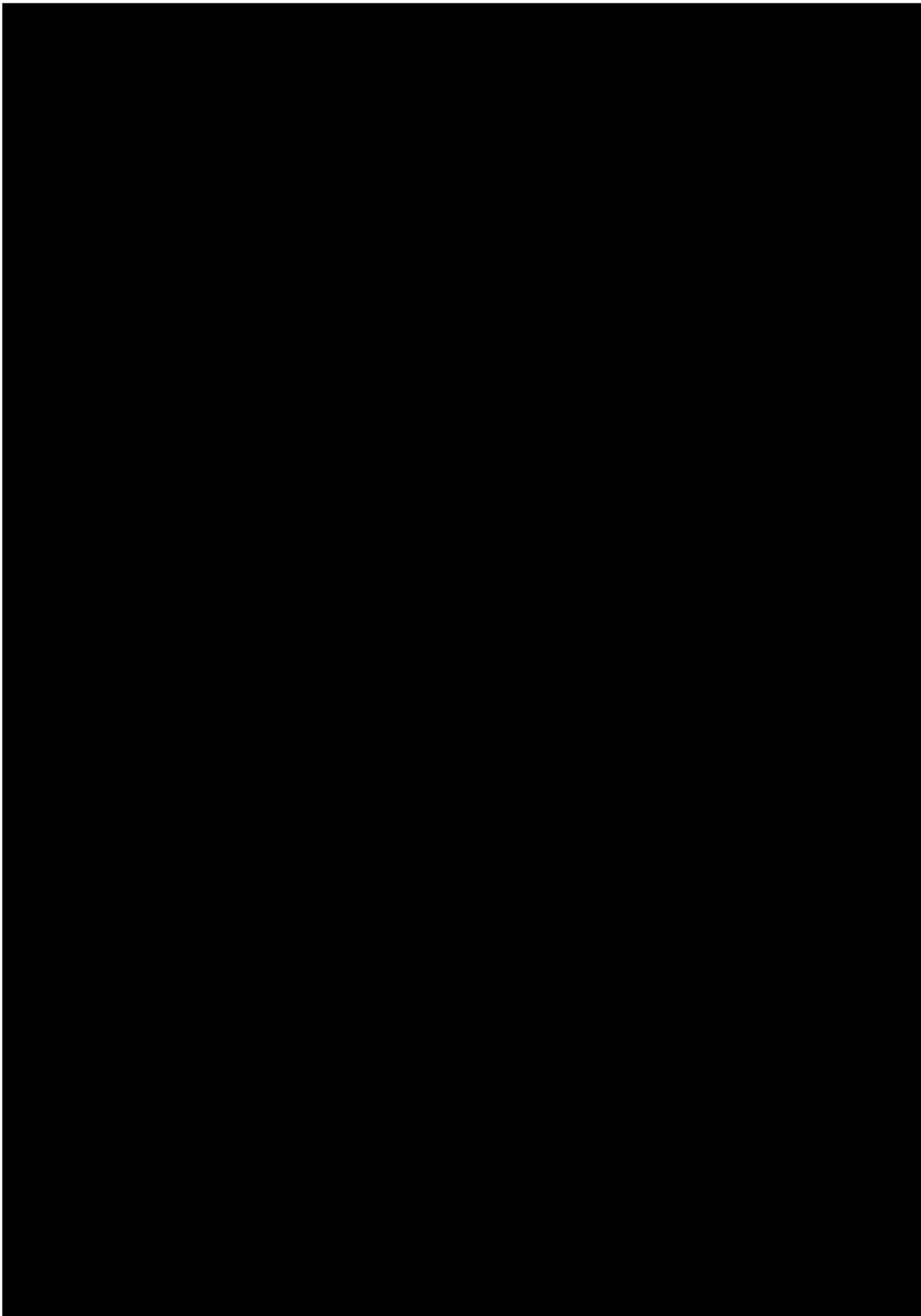
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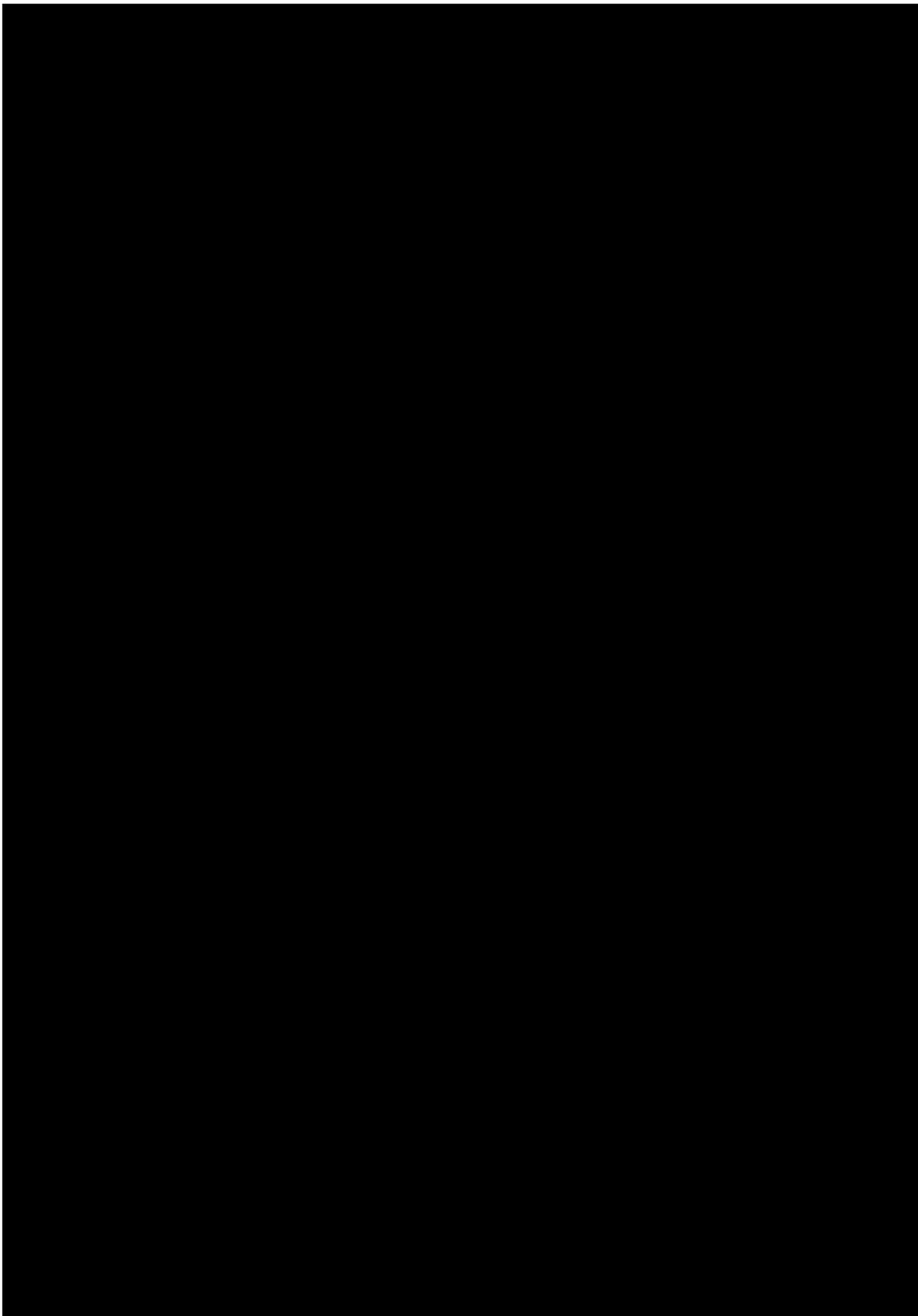


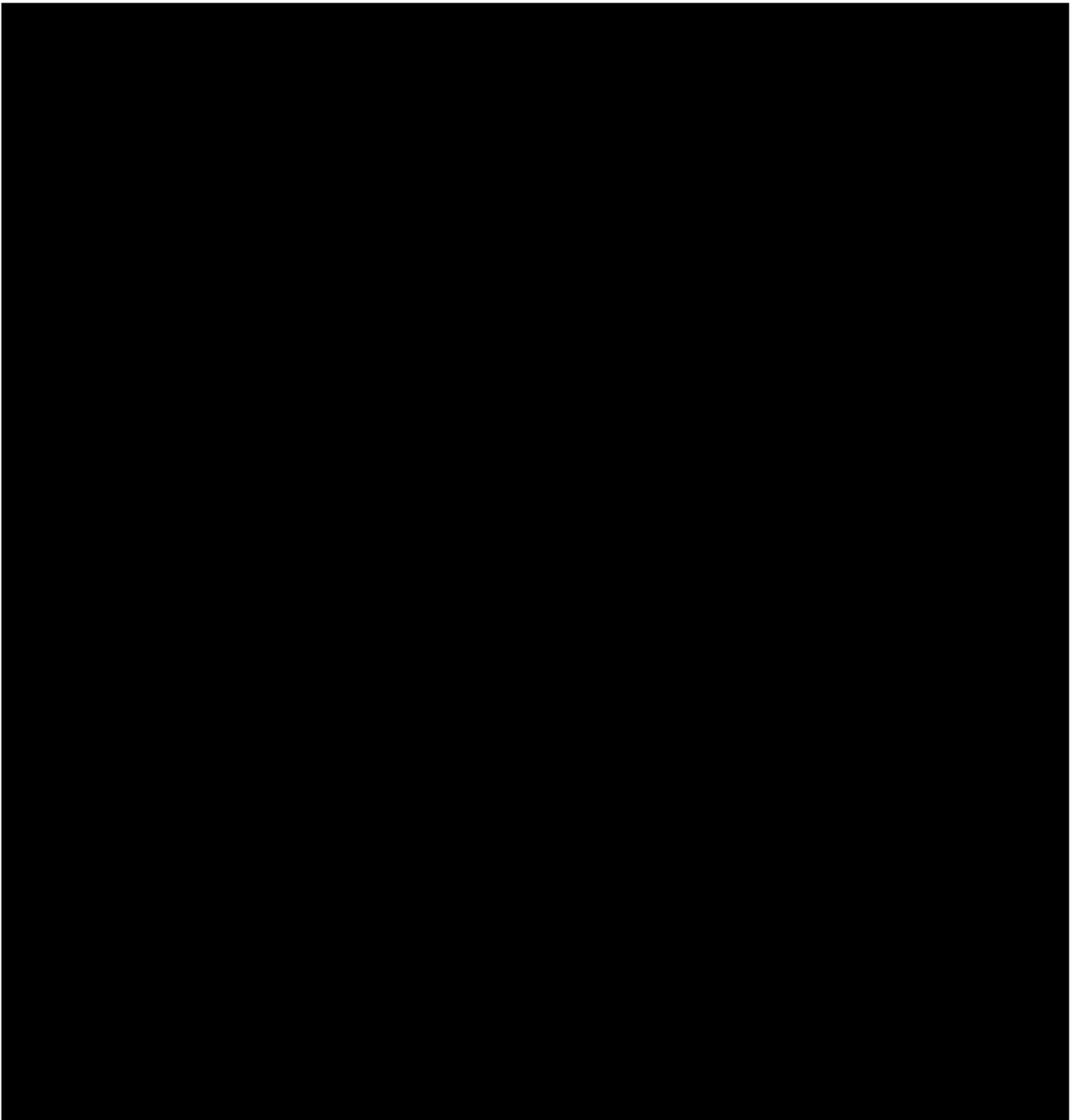












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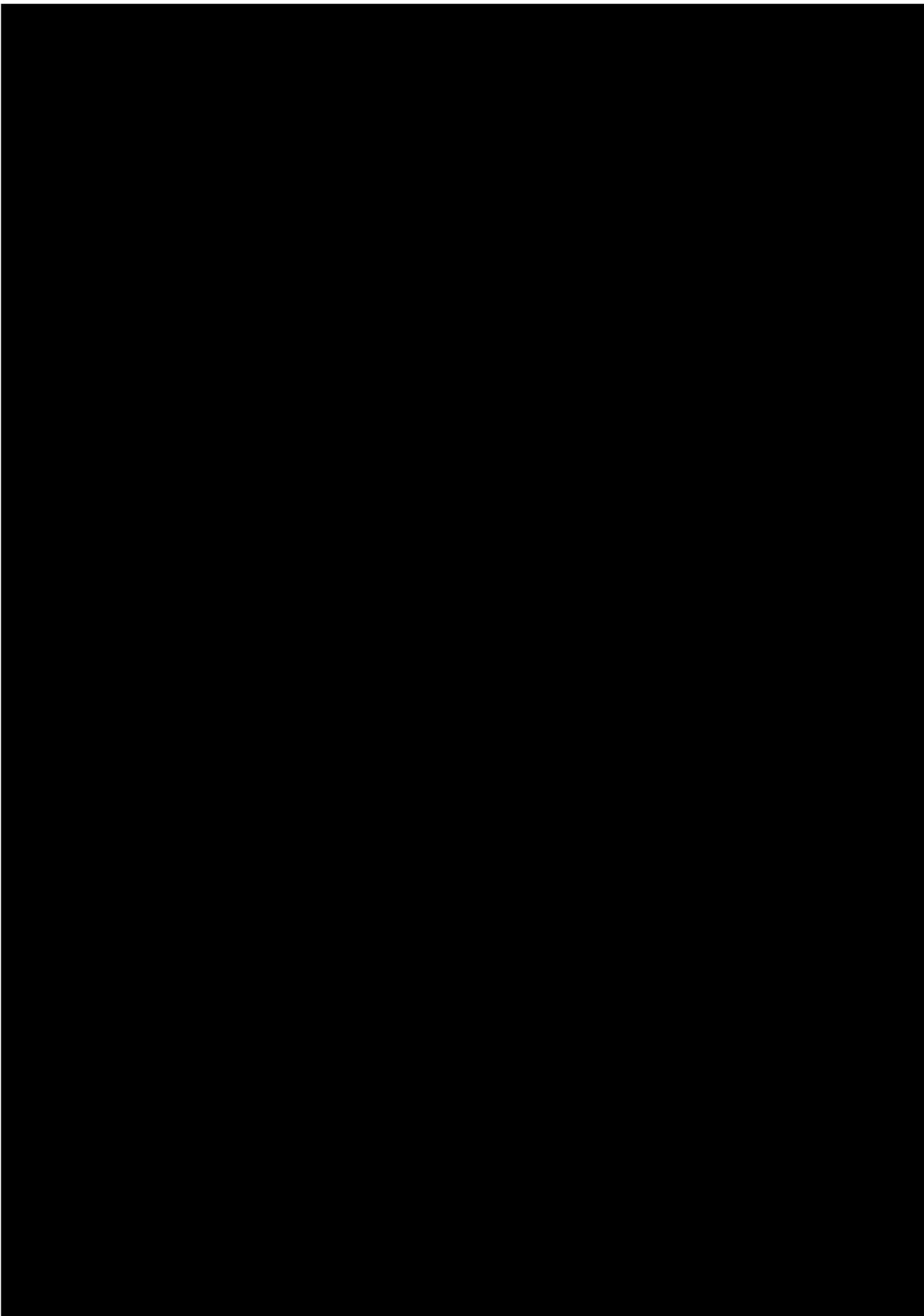
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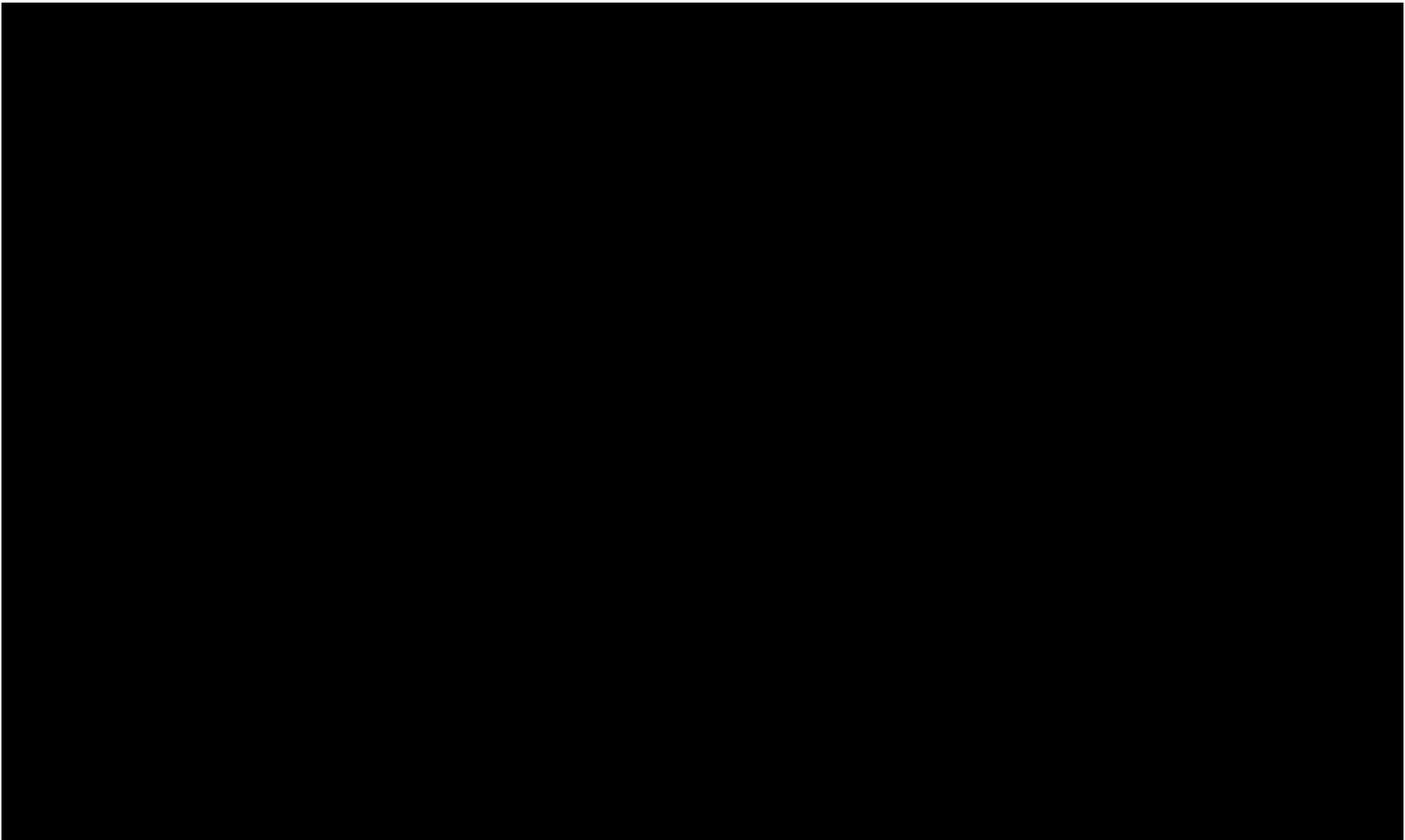
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148:29-42. doi: 10.1111/j.1474-919X.2006.00516.x.

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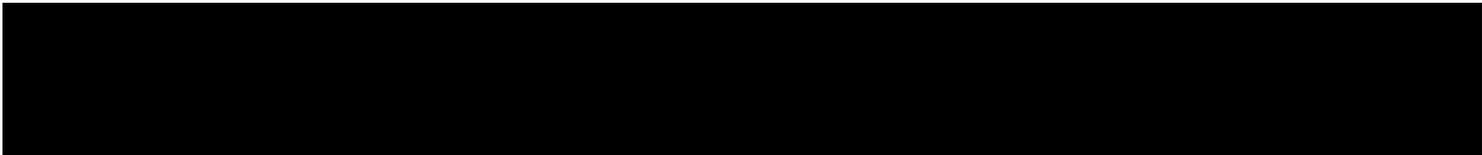
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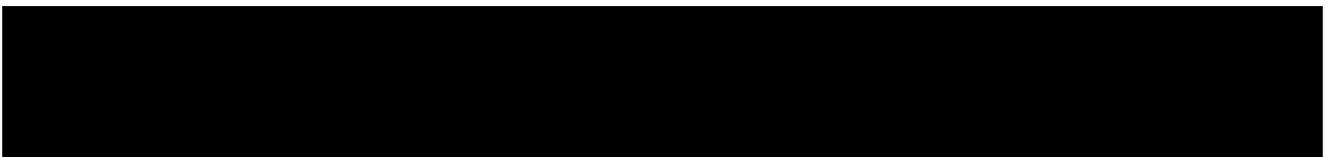
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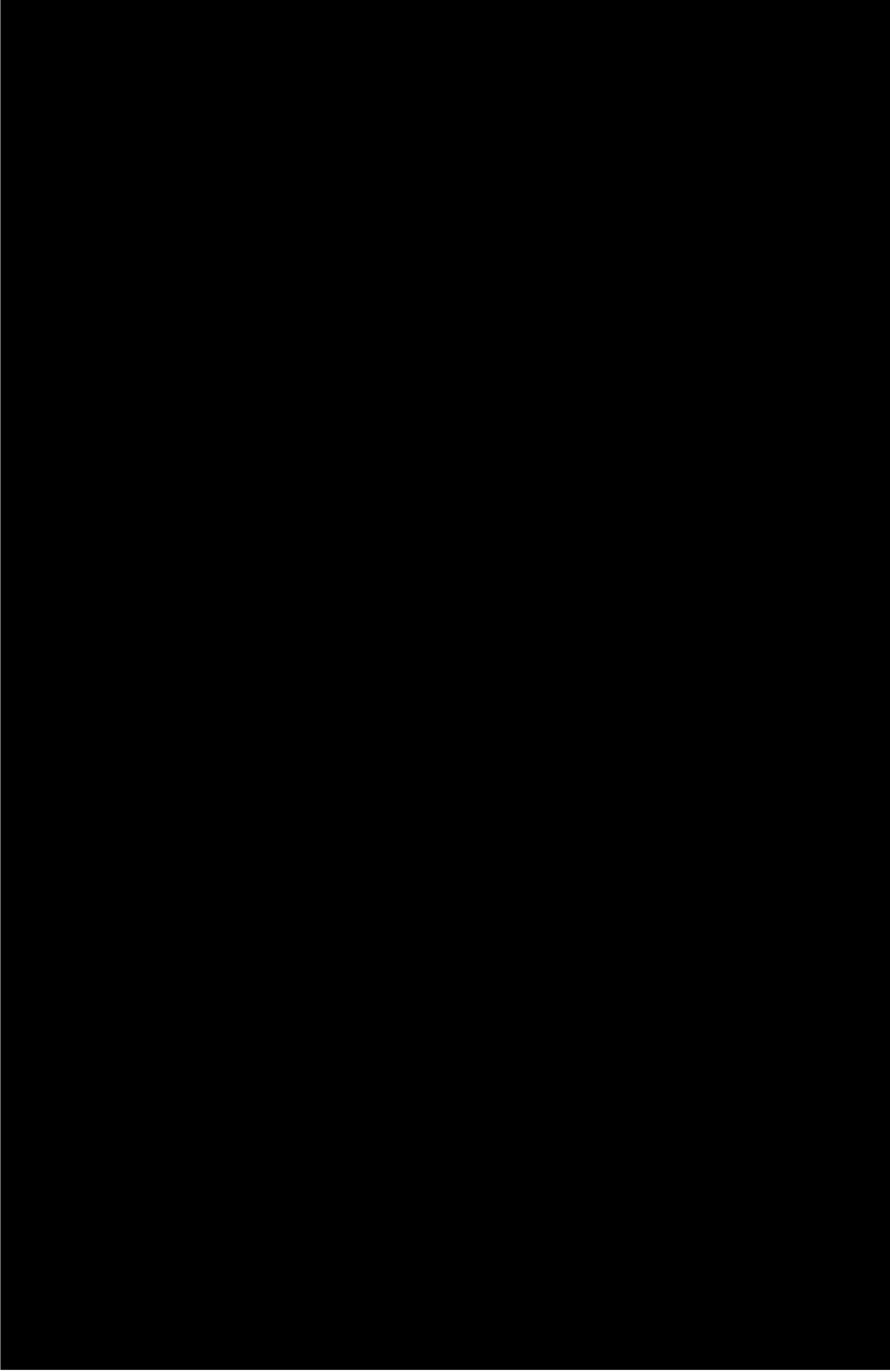
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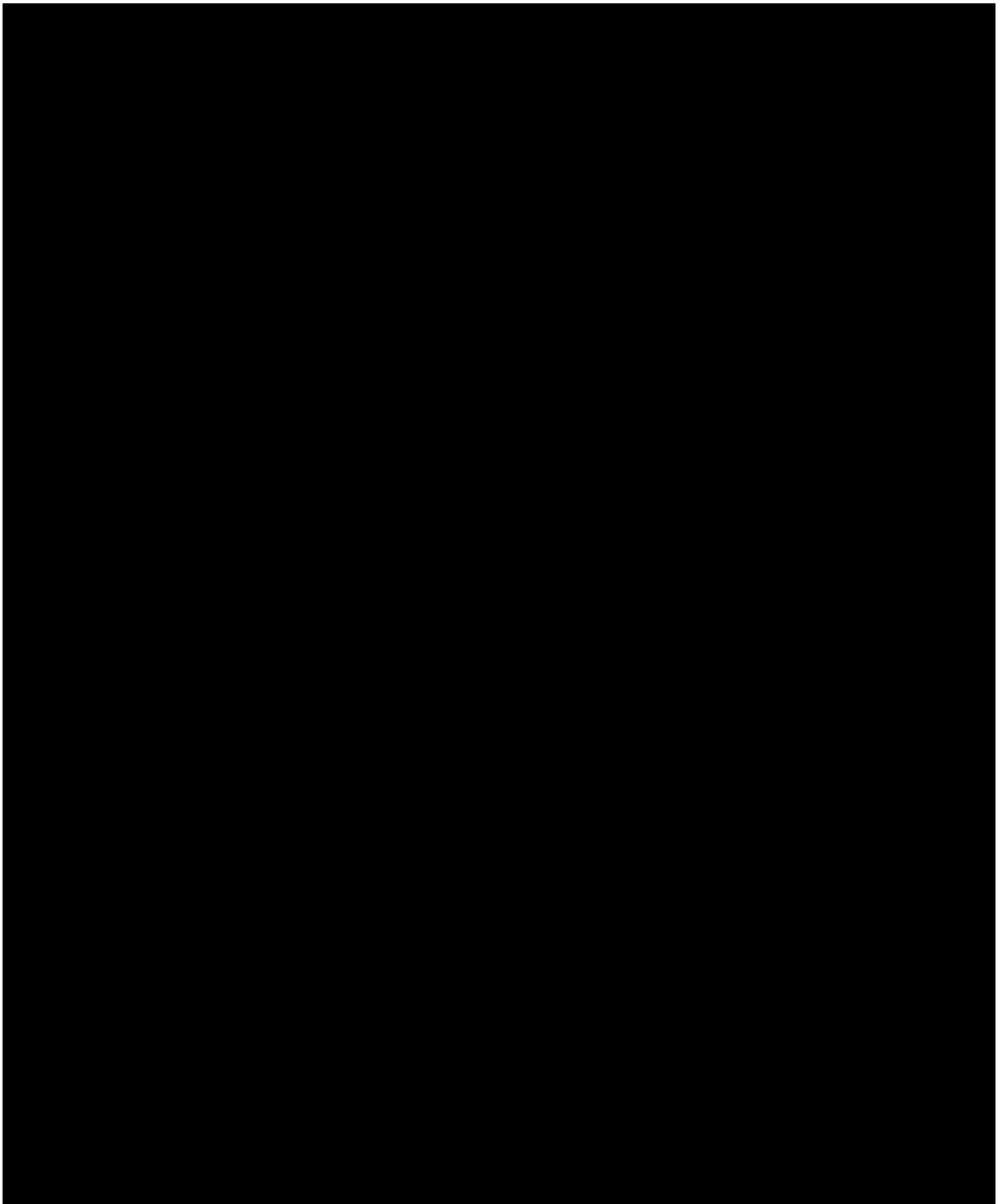


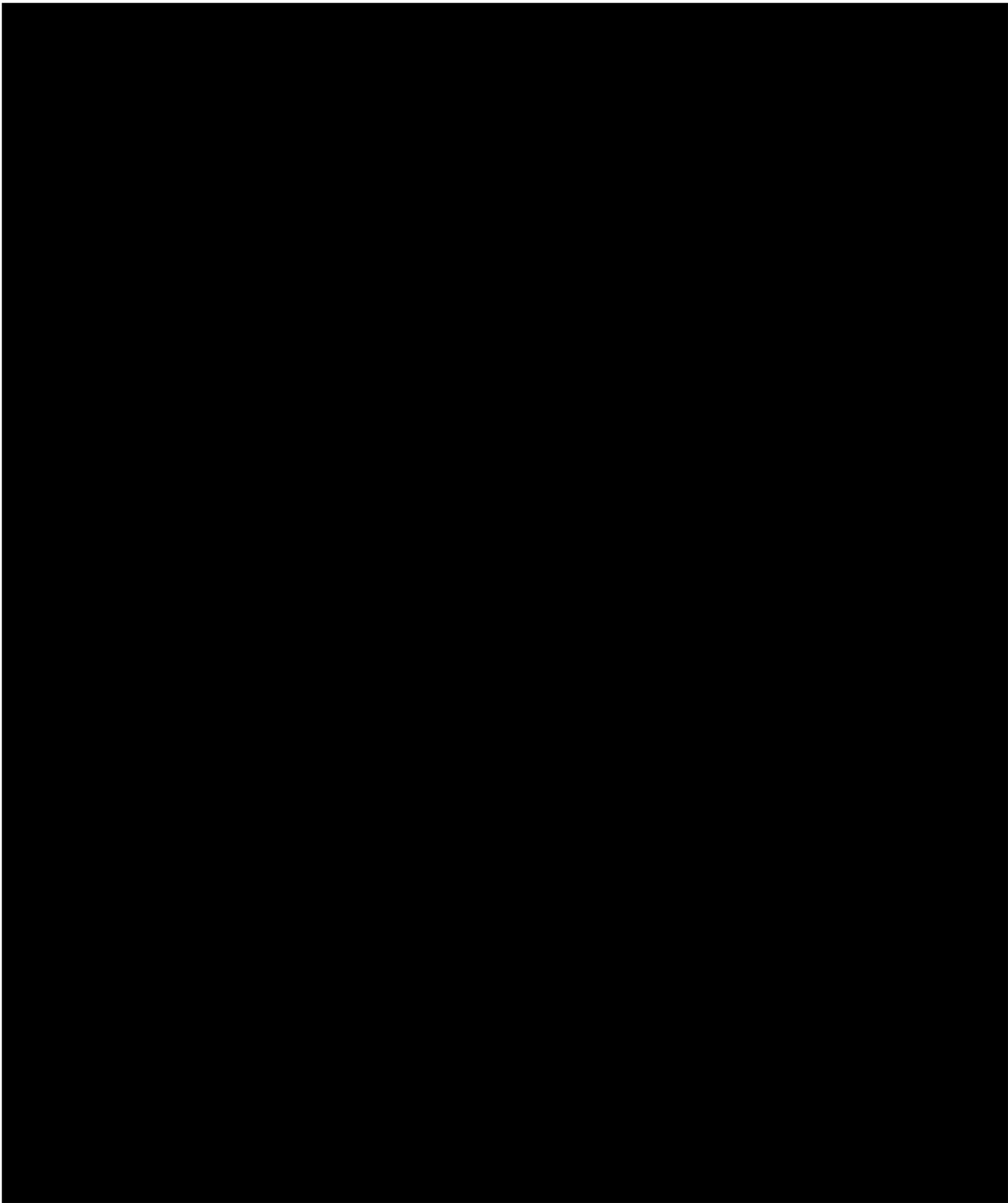




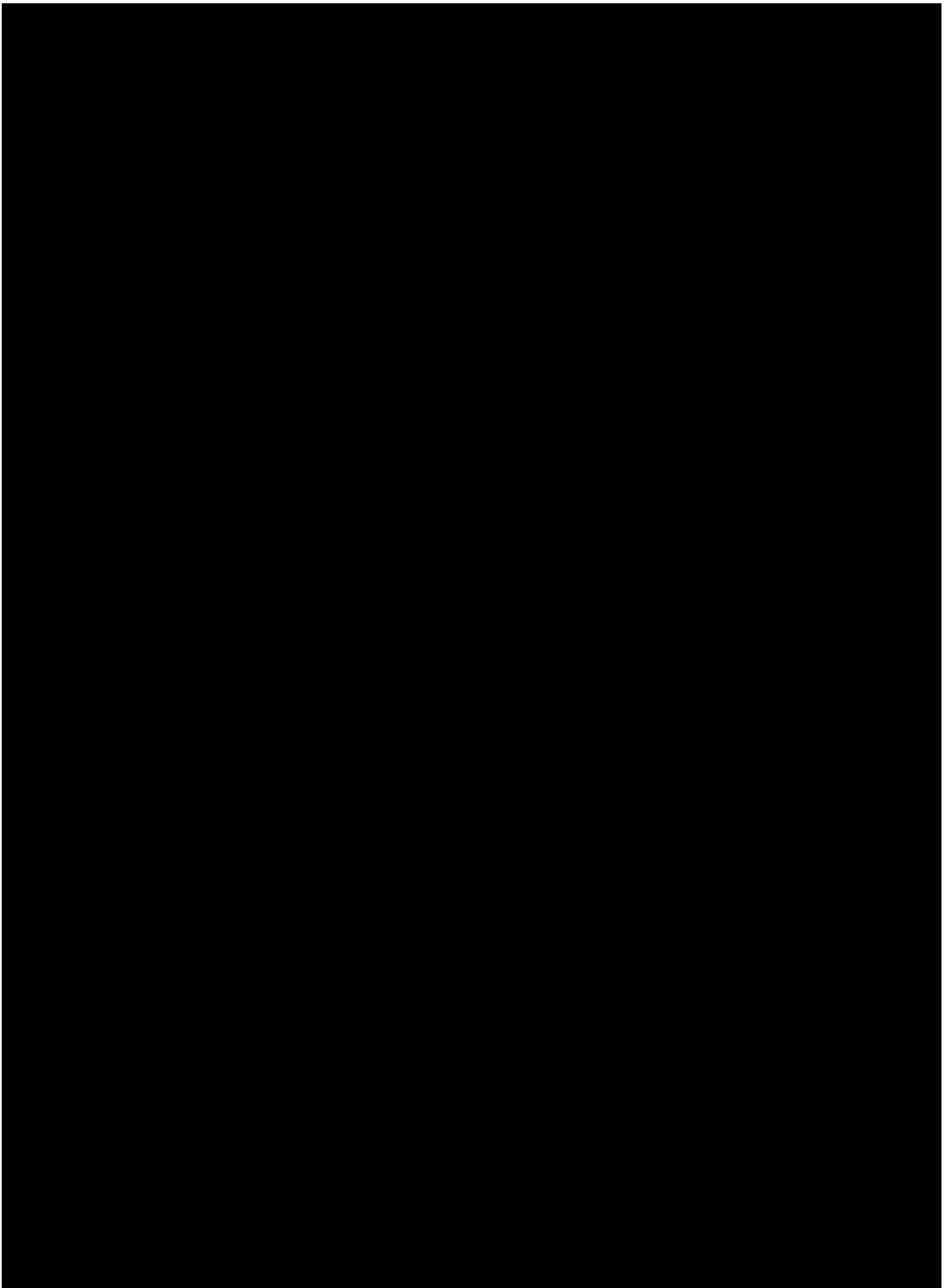












# ATTACHMENT 107

# ATLANTIC SHORES OFFSHORE WIND PROJECT 2

## COMMUNITY OUTREACH PLAN



*EDF Renewables*



**February 2019**

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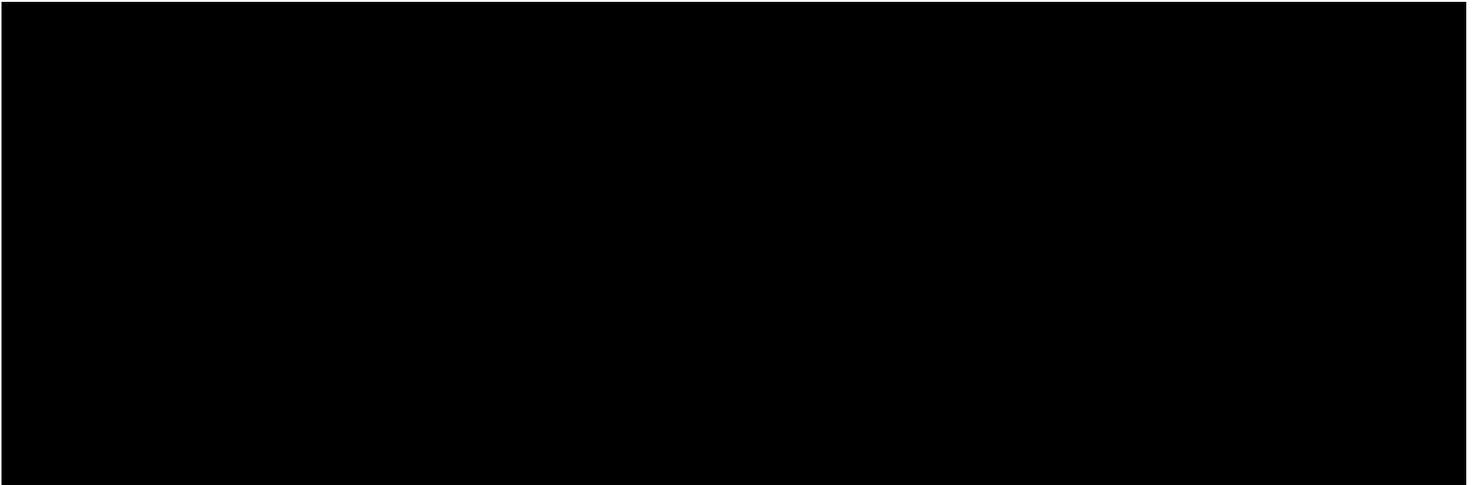
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# ATTACHMENT 108

# ATLANTIC SHORES OFFSHORE WIND PROJECT 2

## ██████████ NAMEPLATE CAPACITY

### VISIBILITY AND VIEWSHED IMPACTS

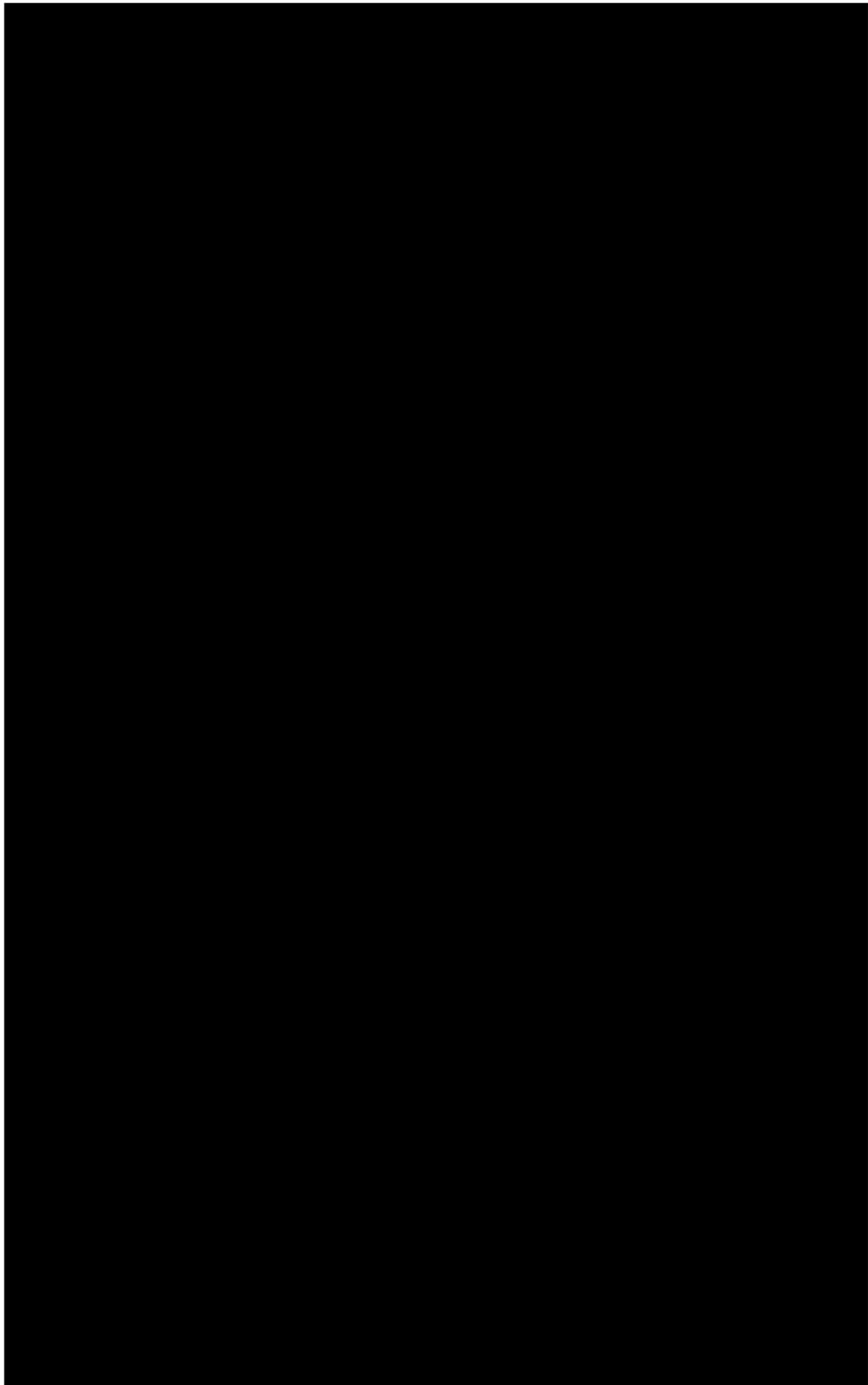


*EDF Renewables*



**February 2019**

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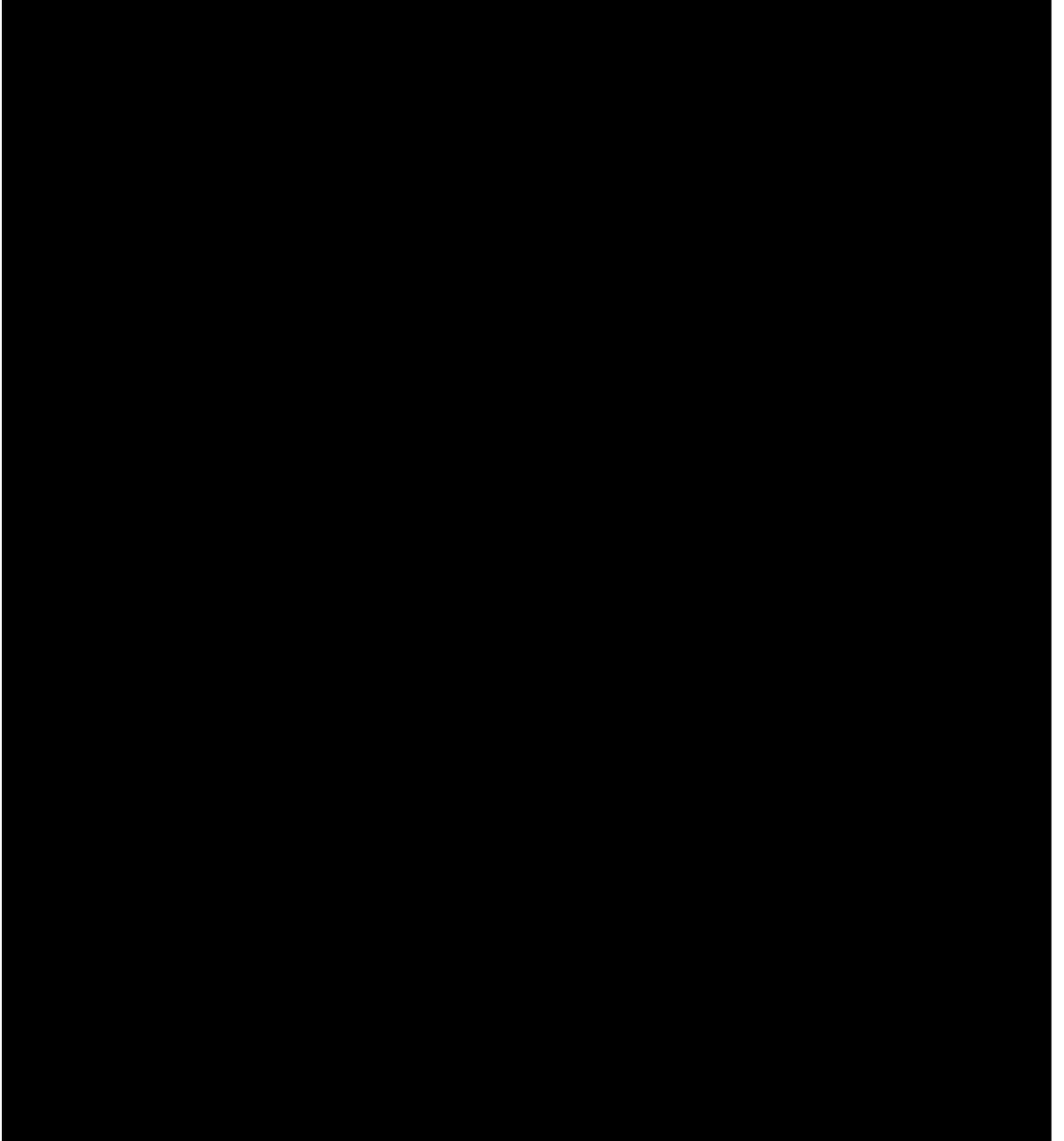
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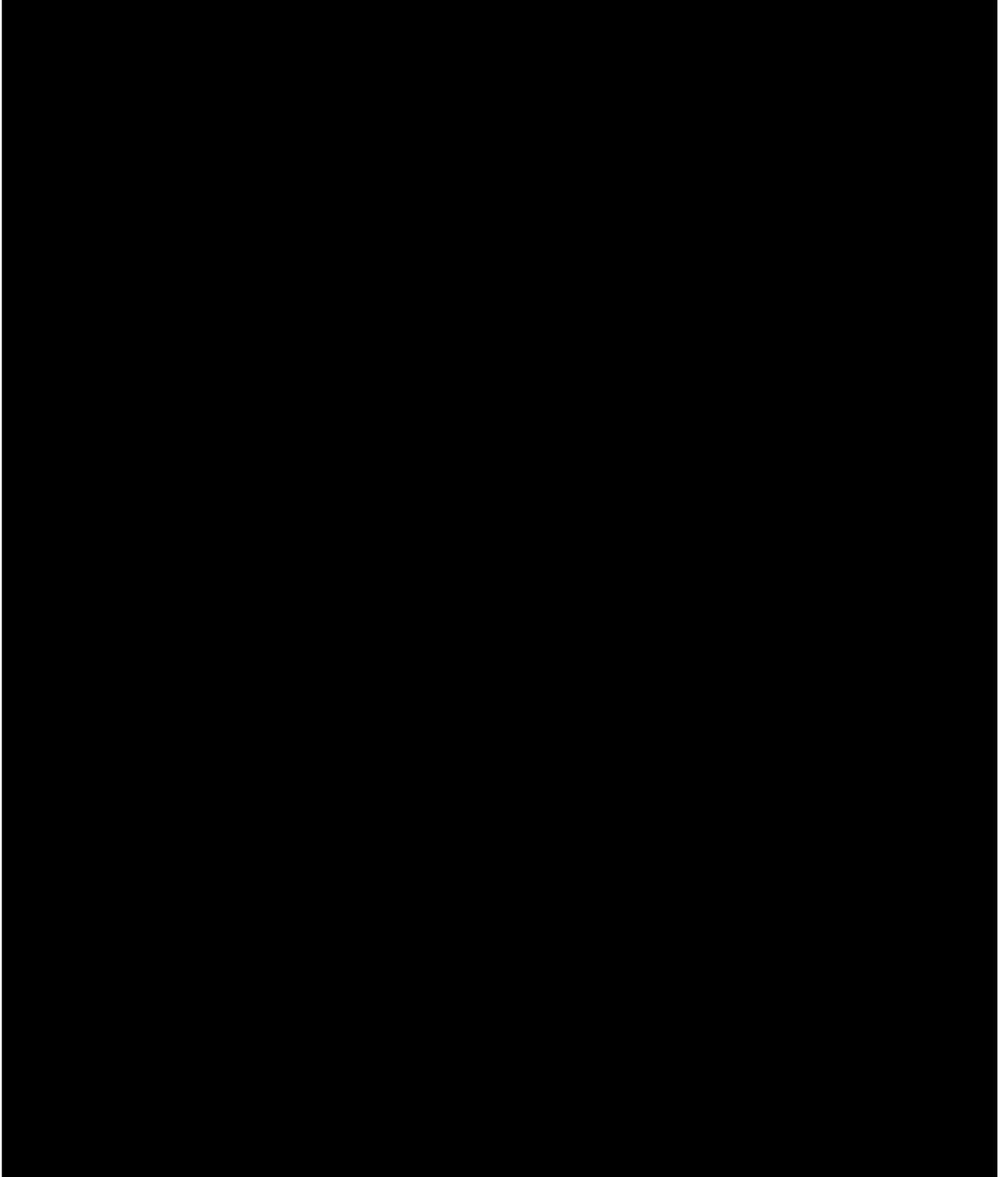
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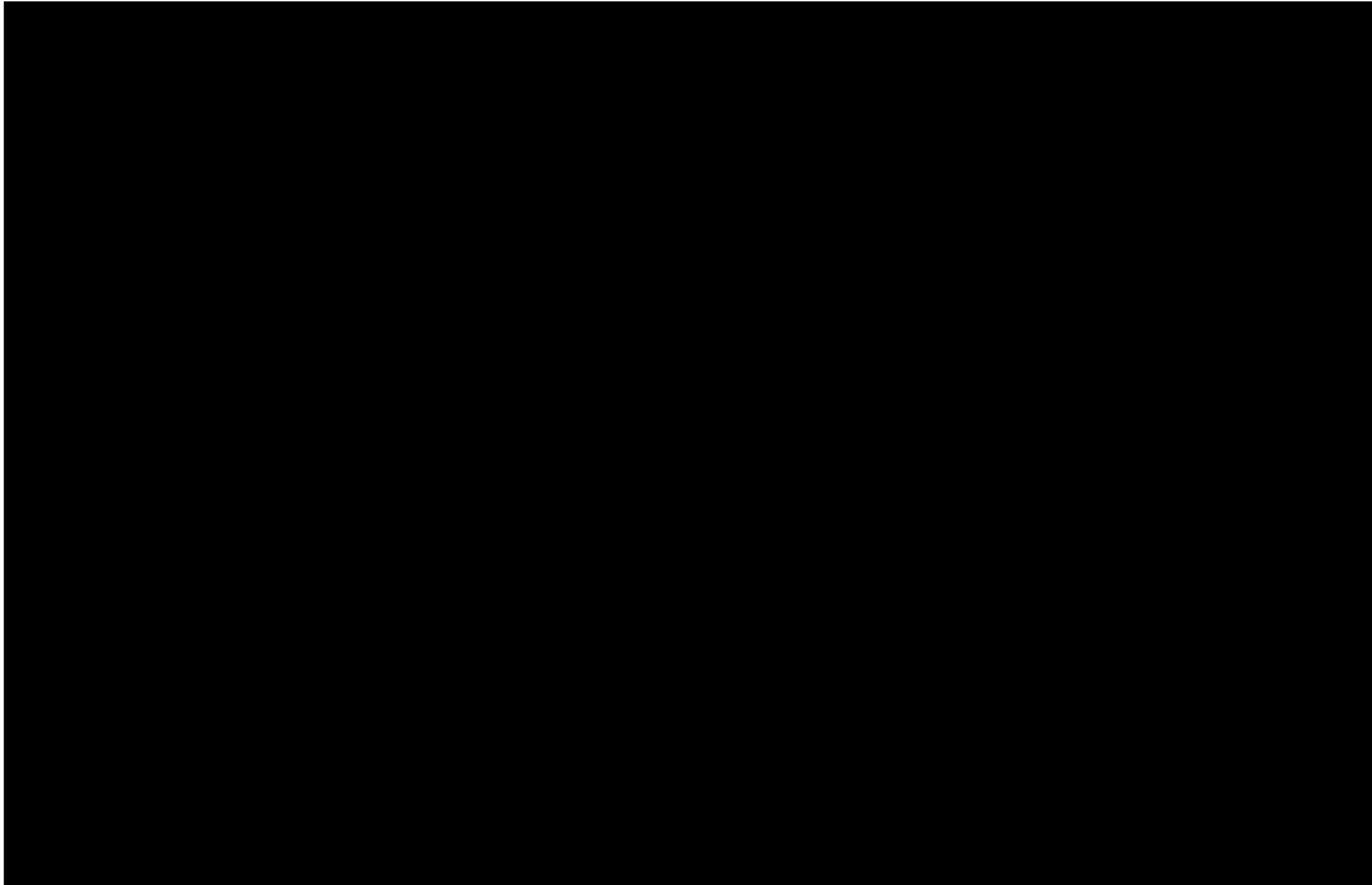
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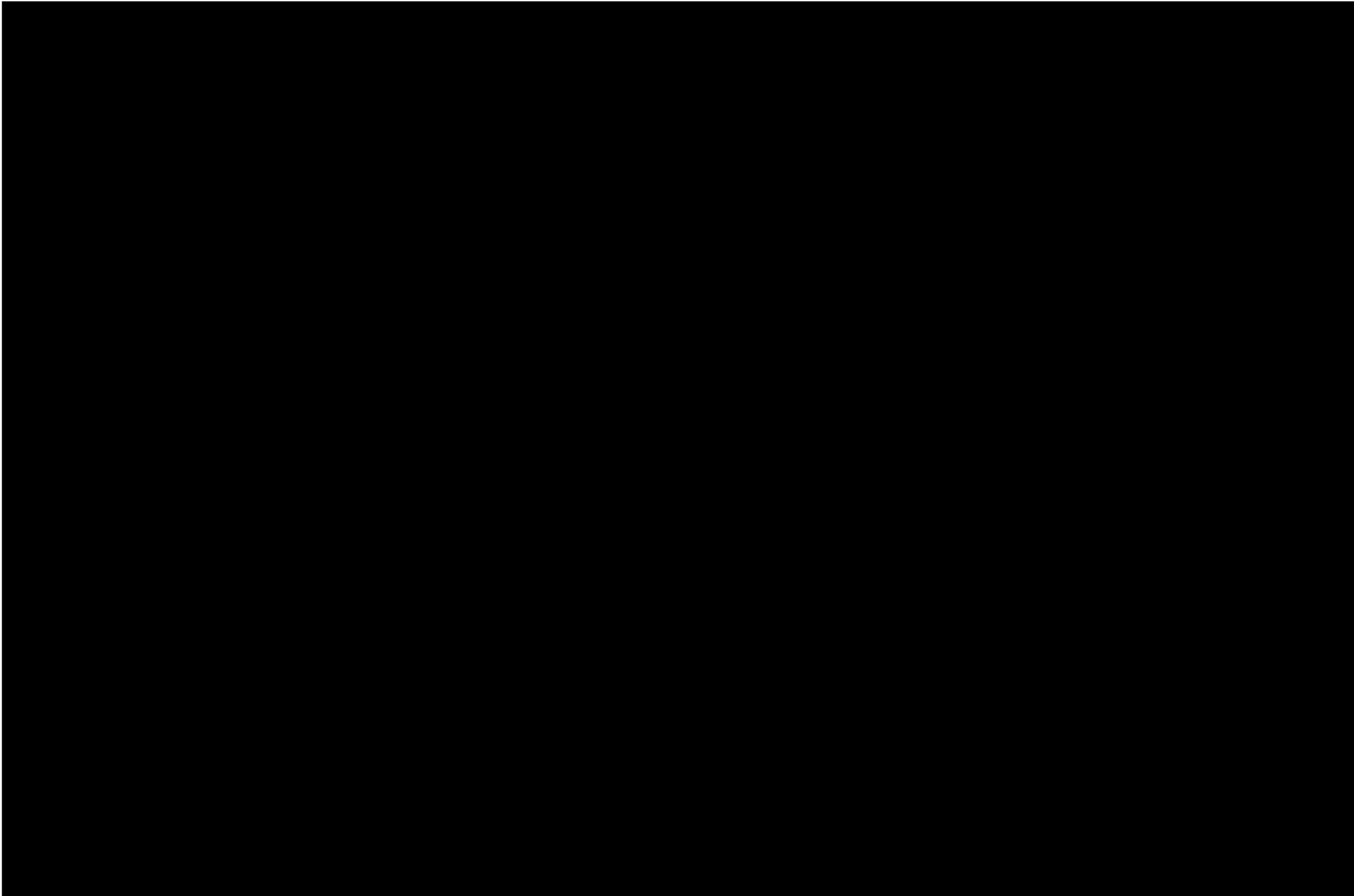


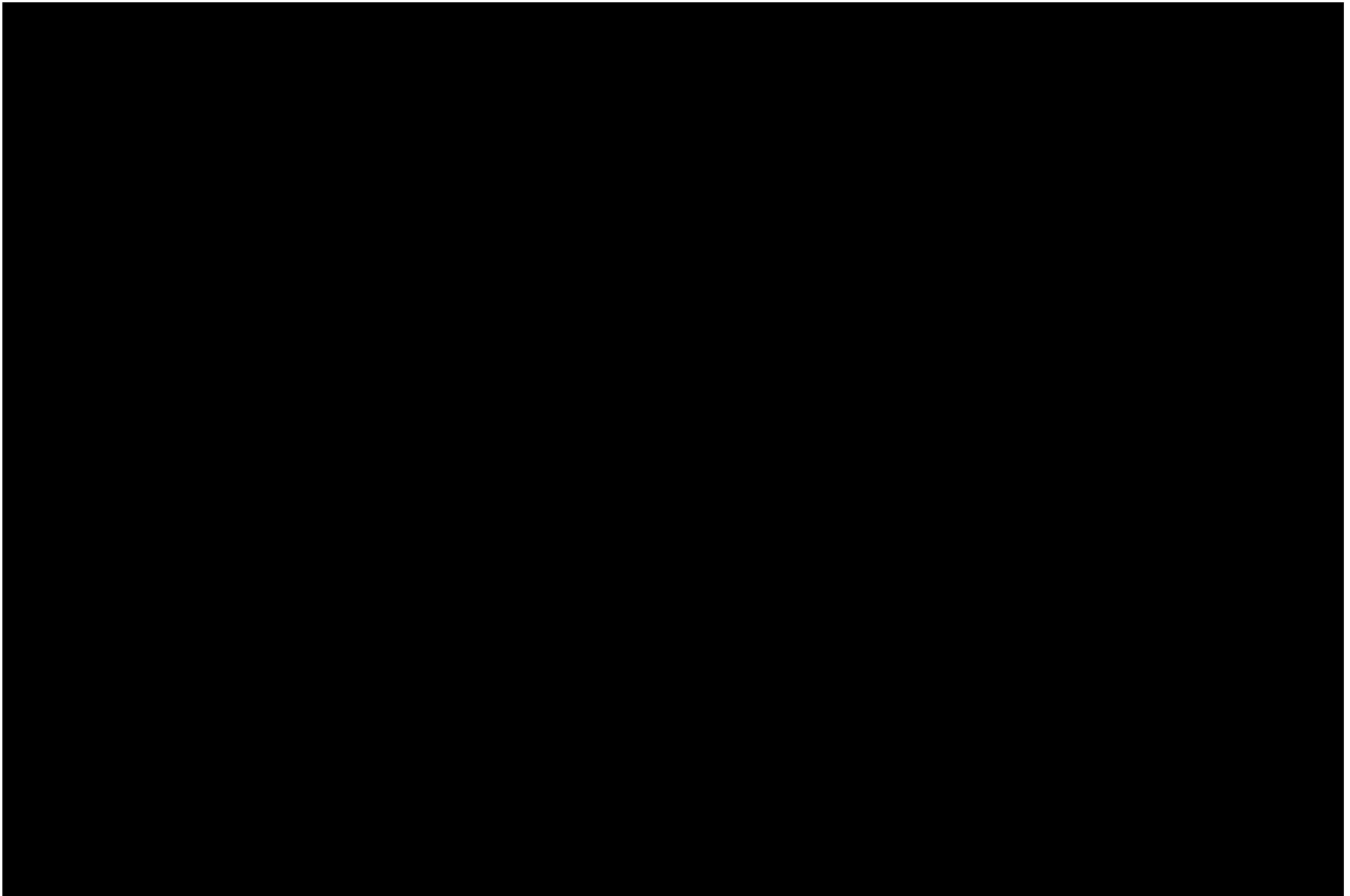


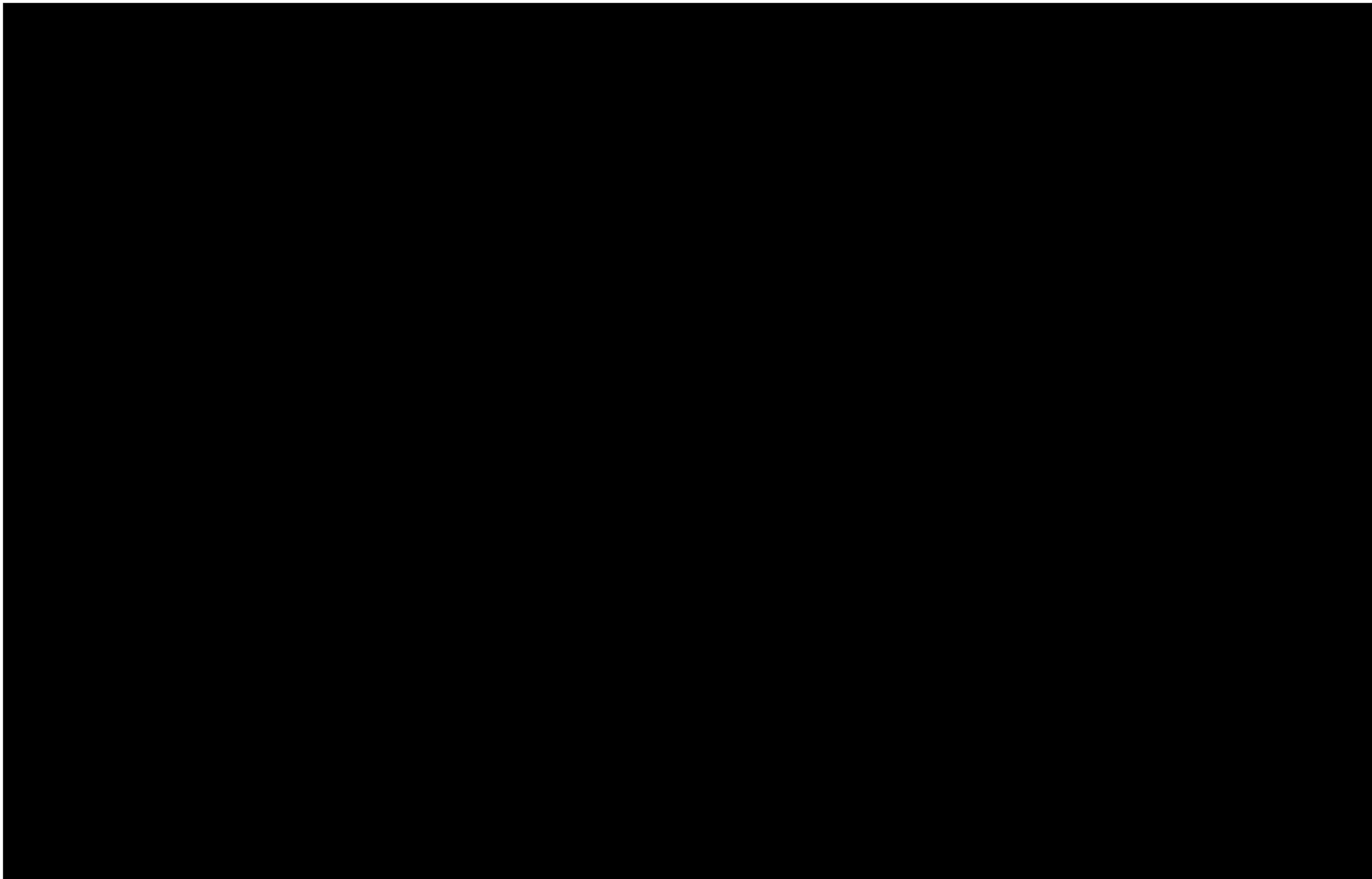


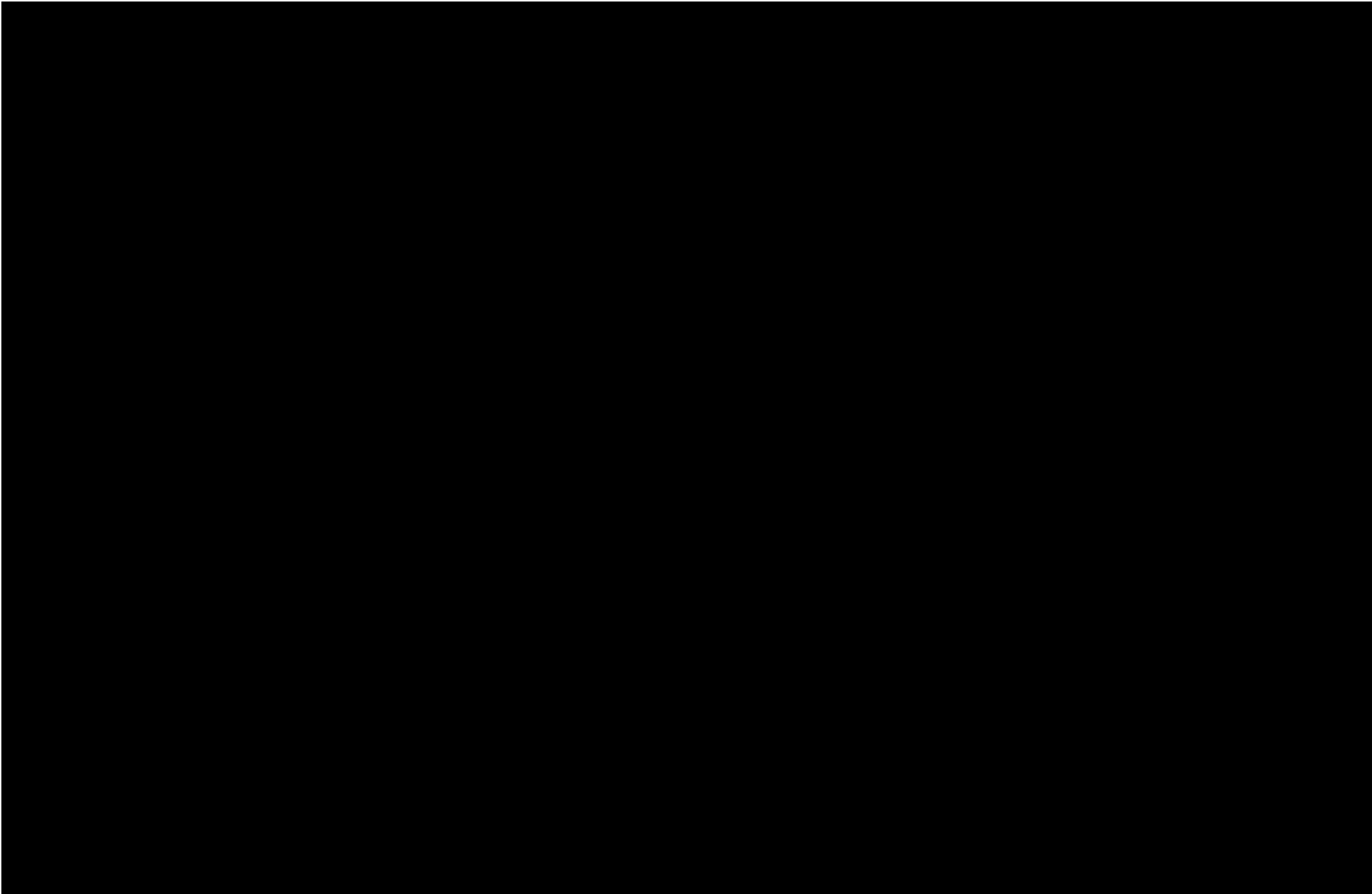
# ATTACHMENT 109

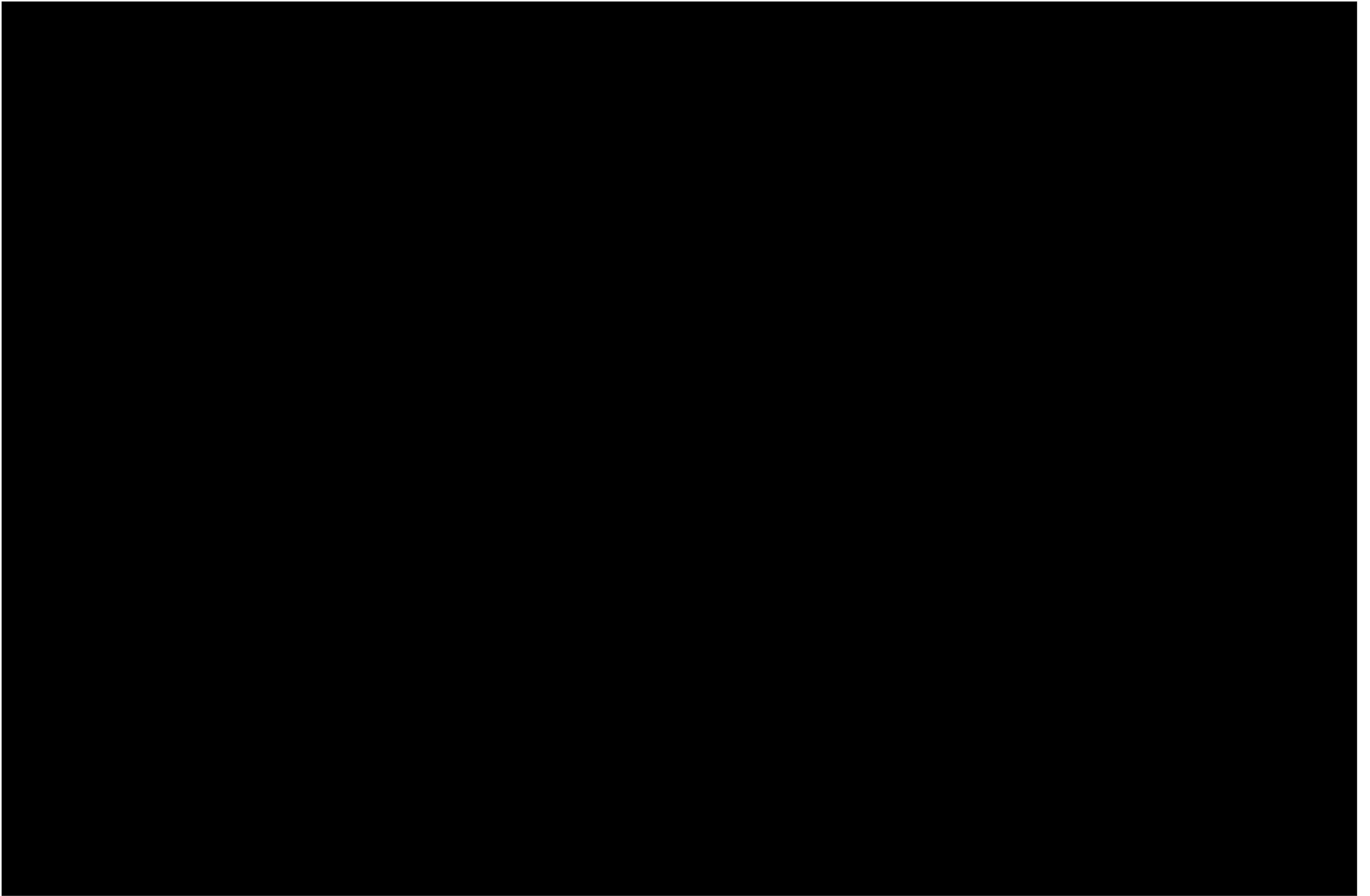




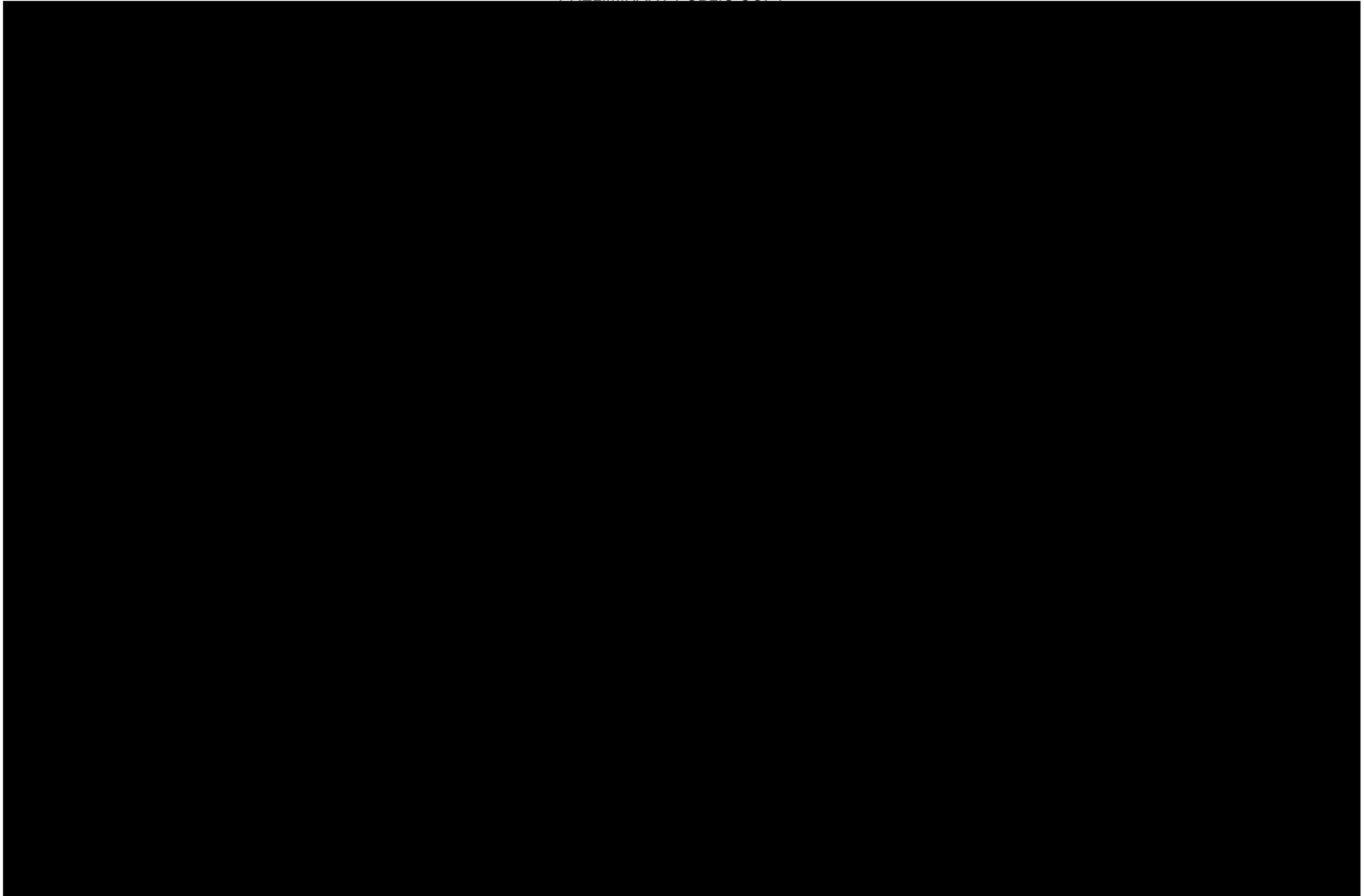




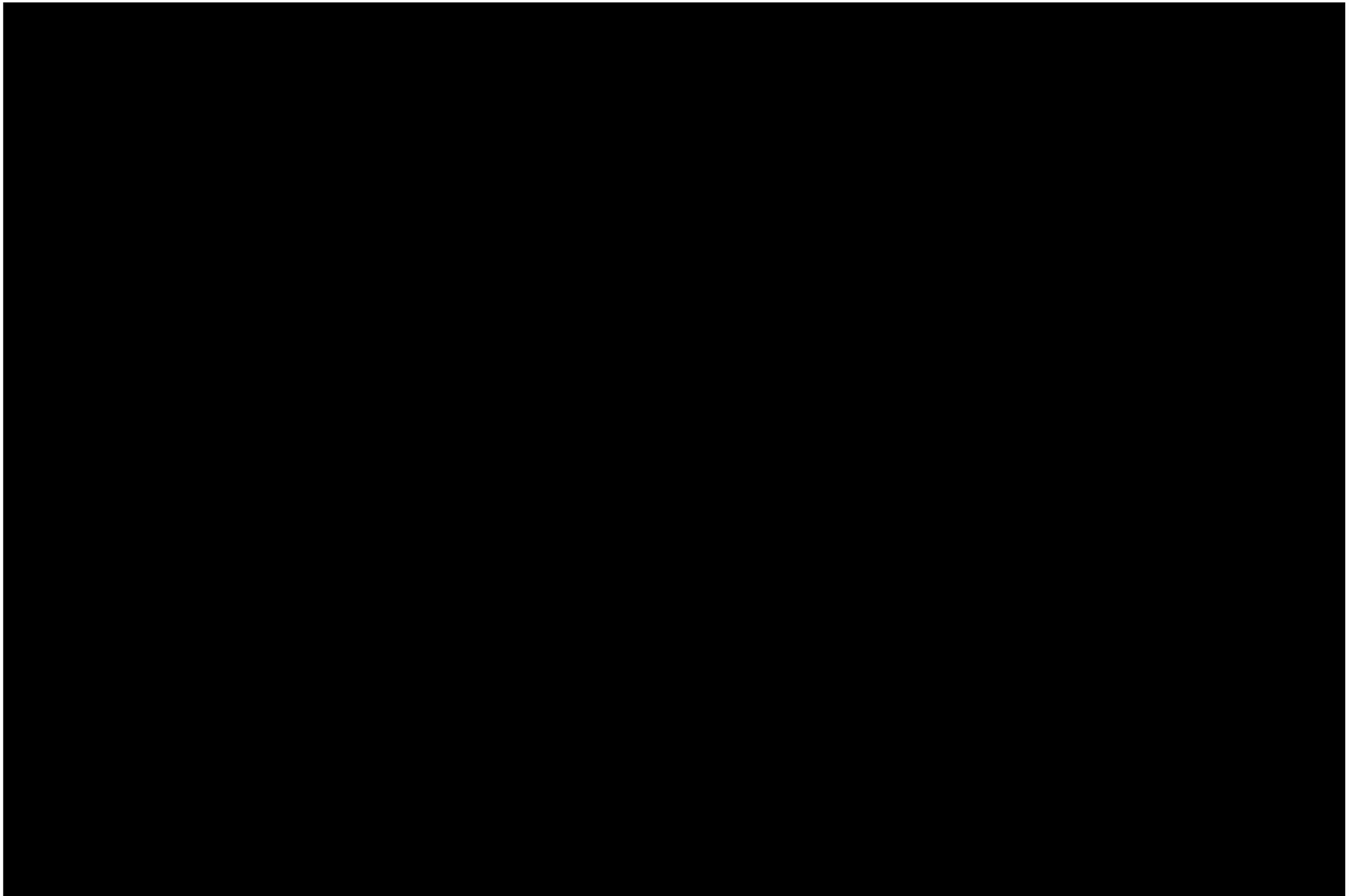


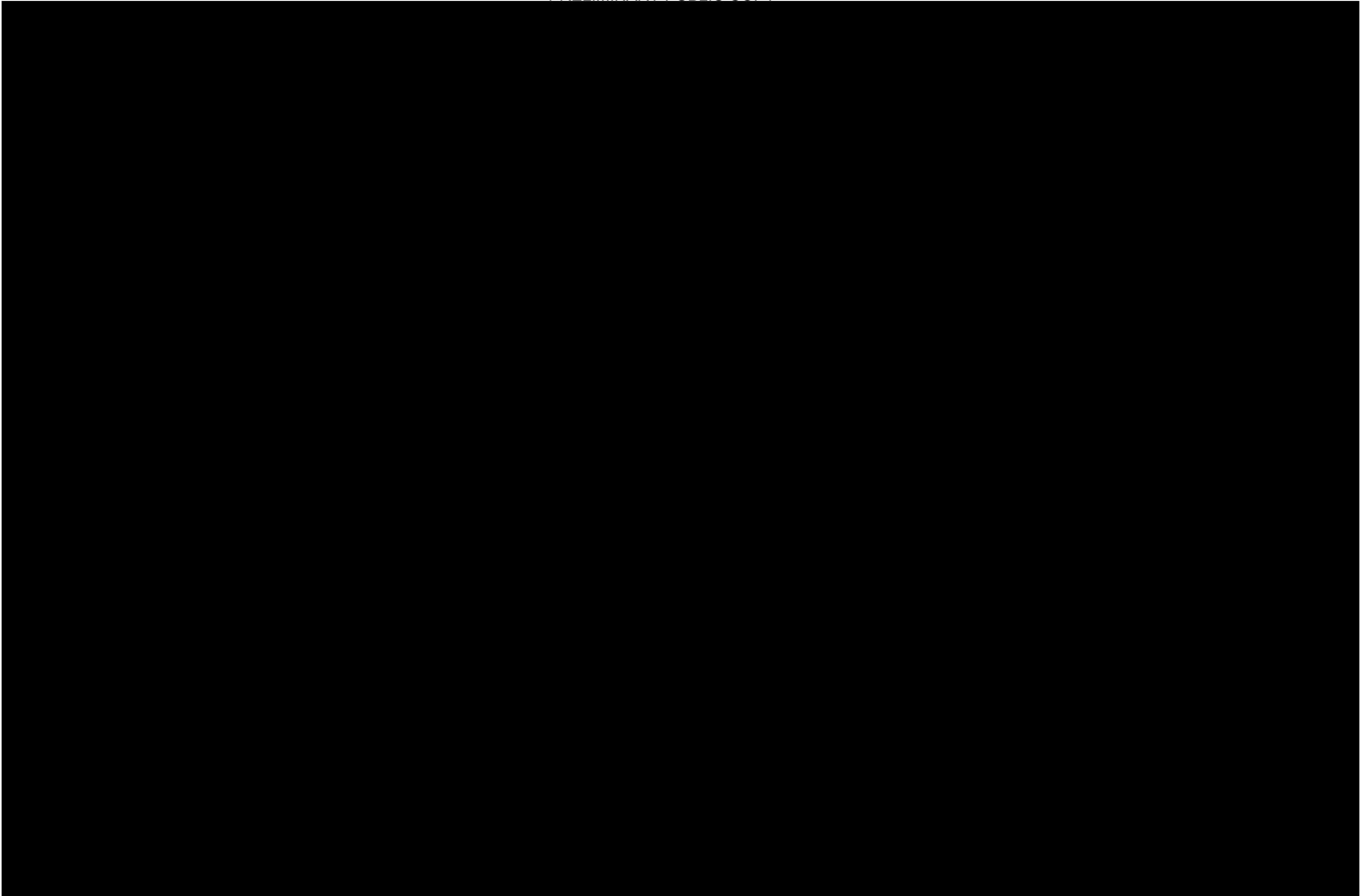


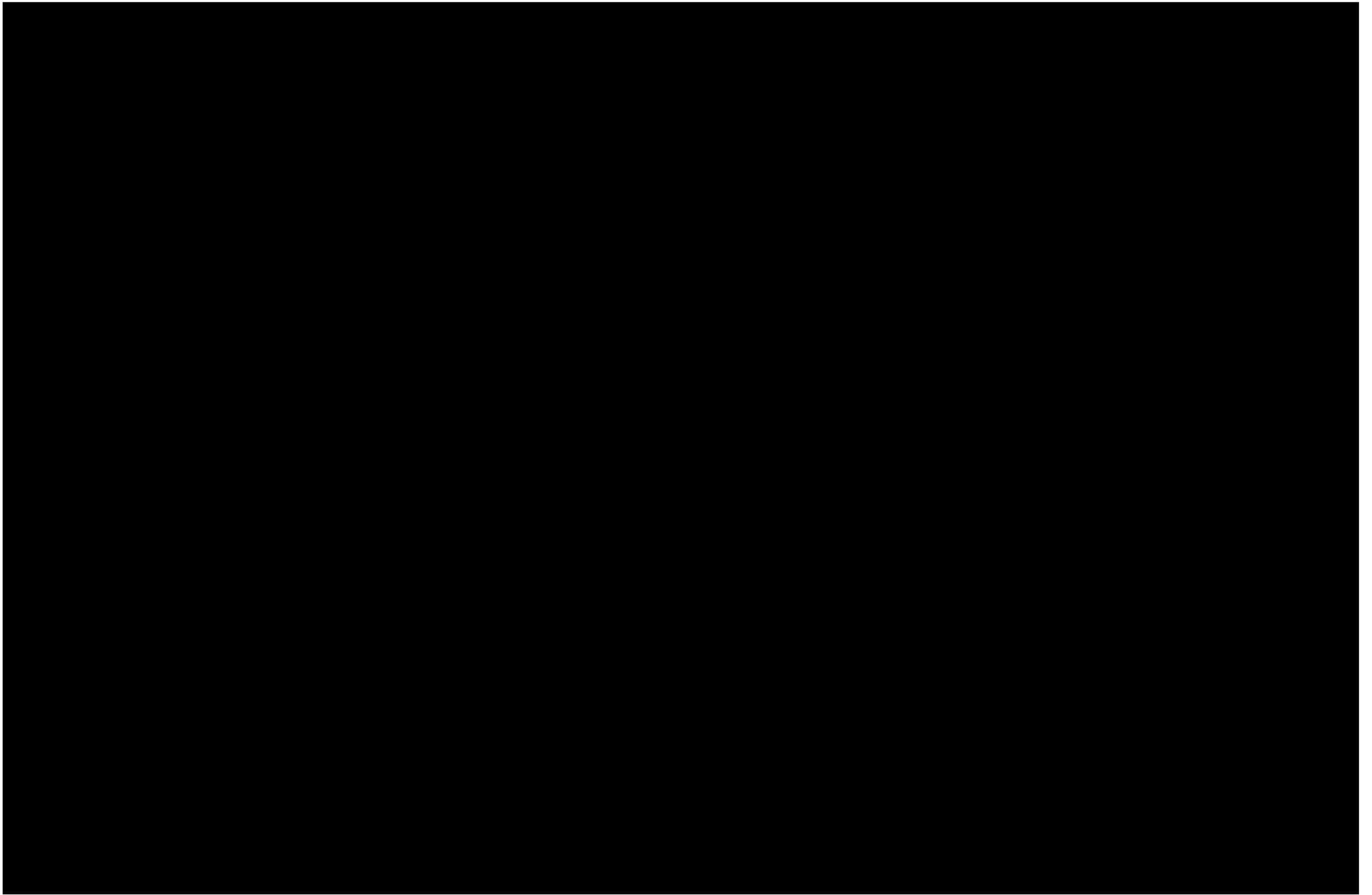


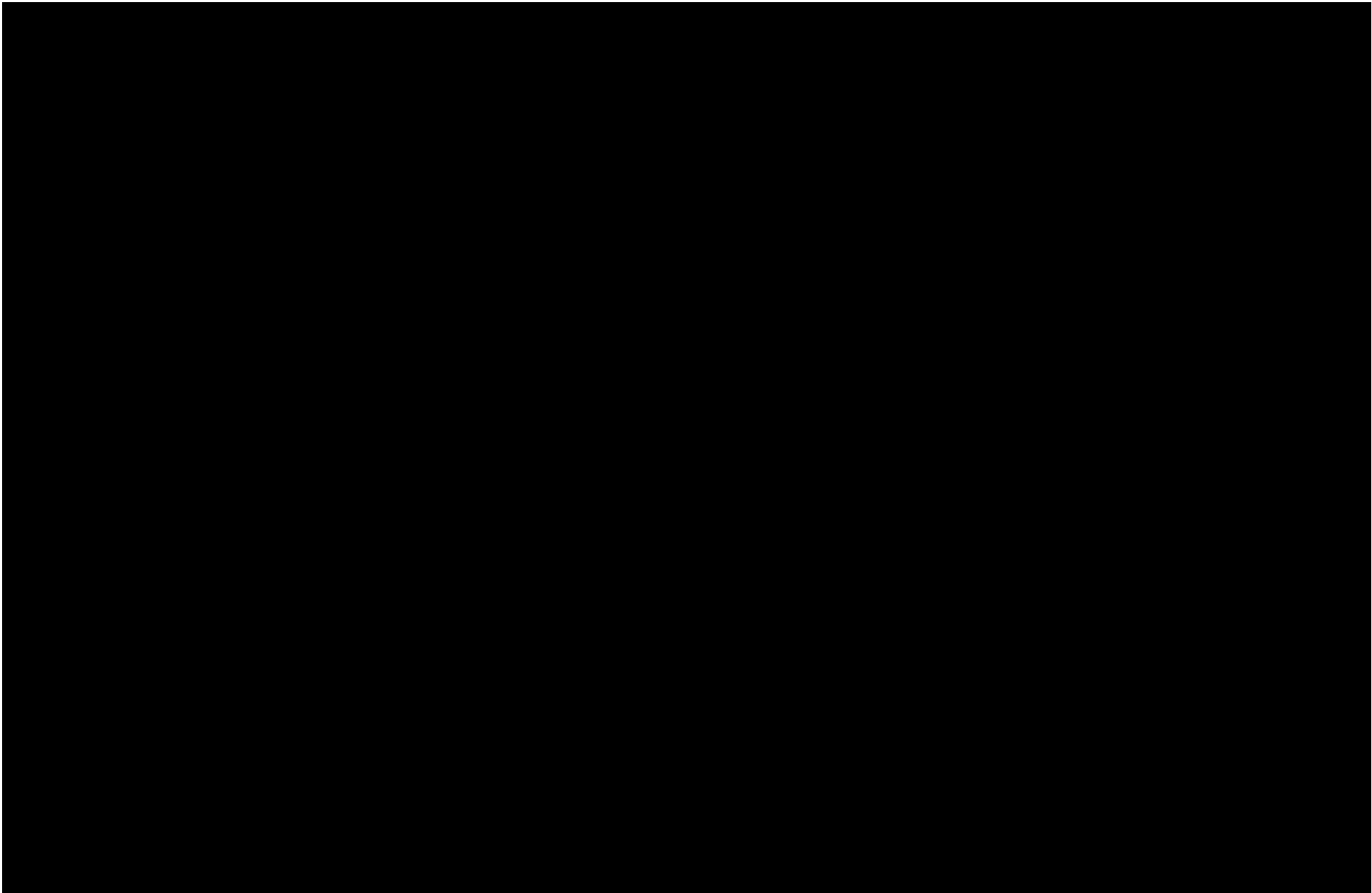


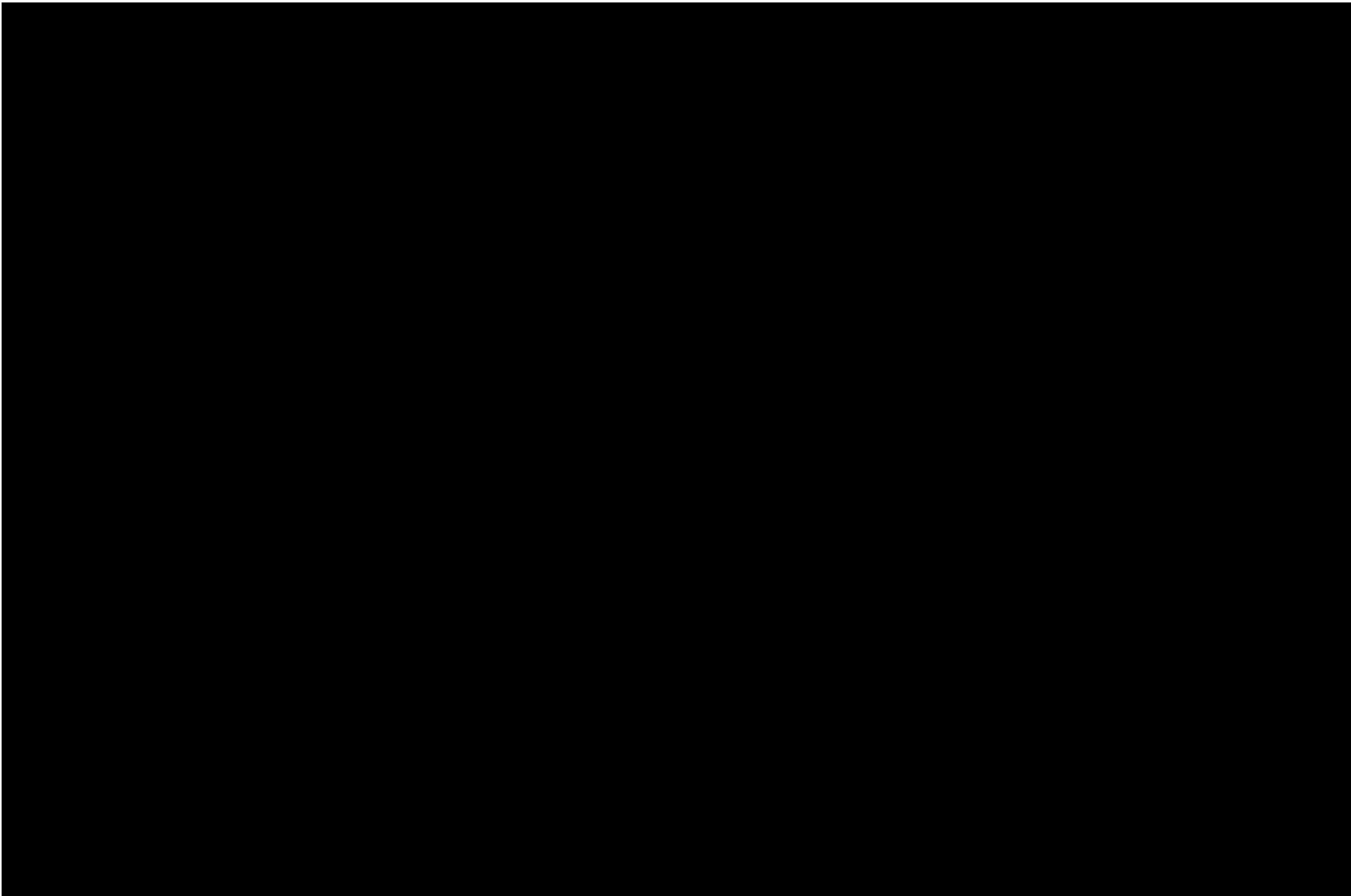


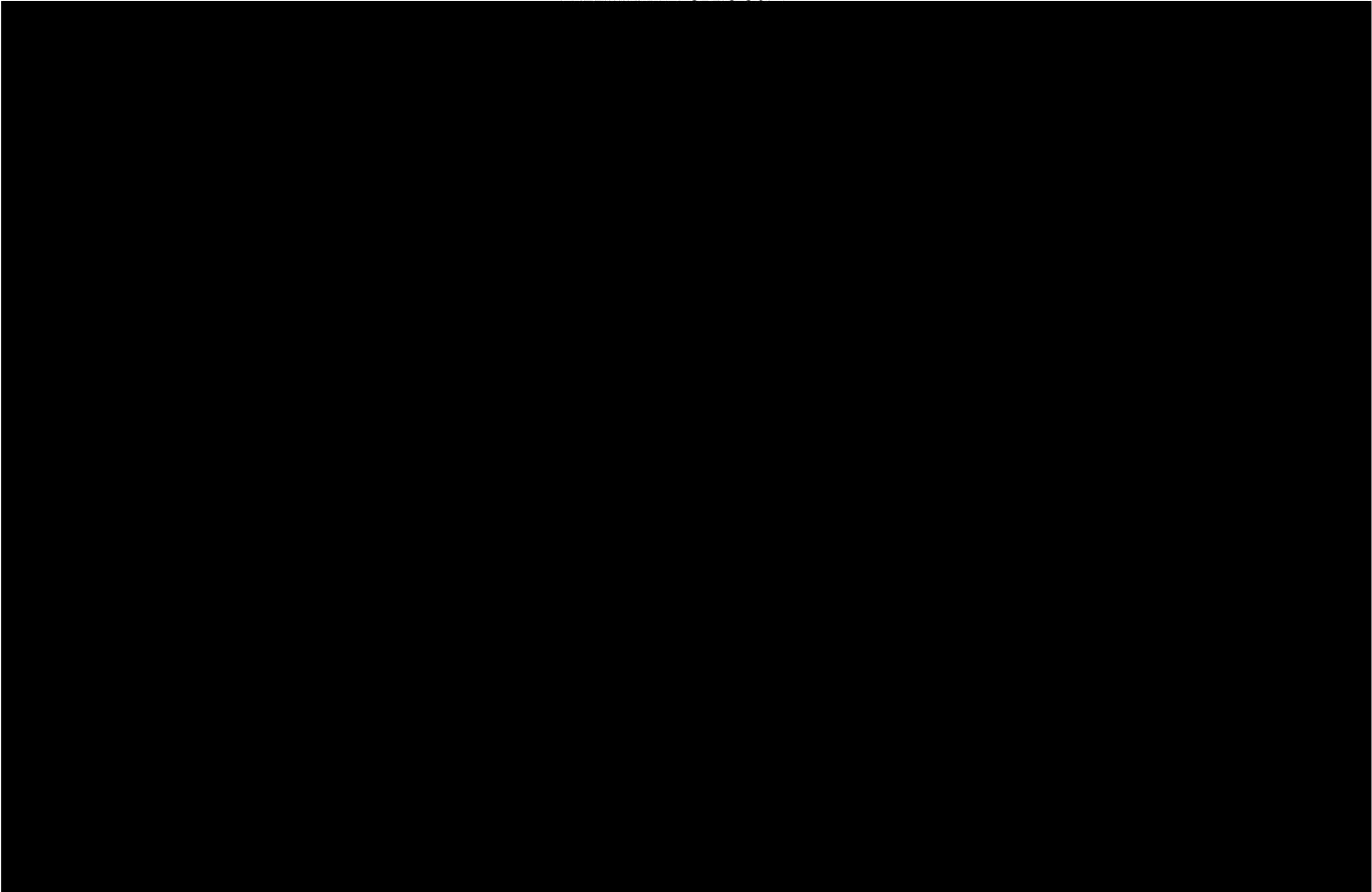


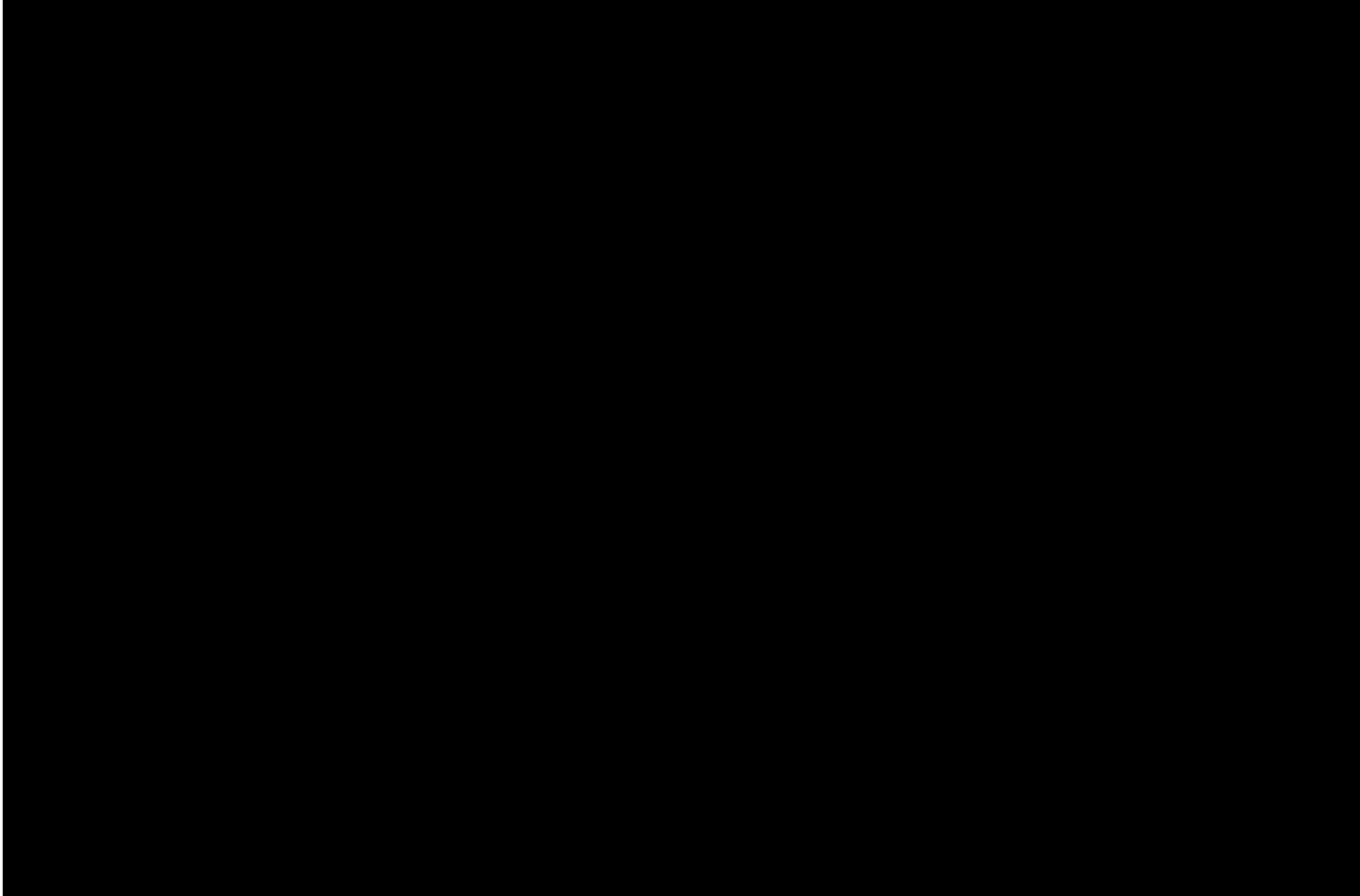


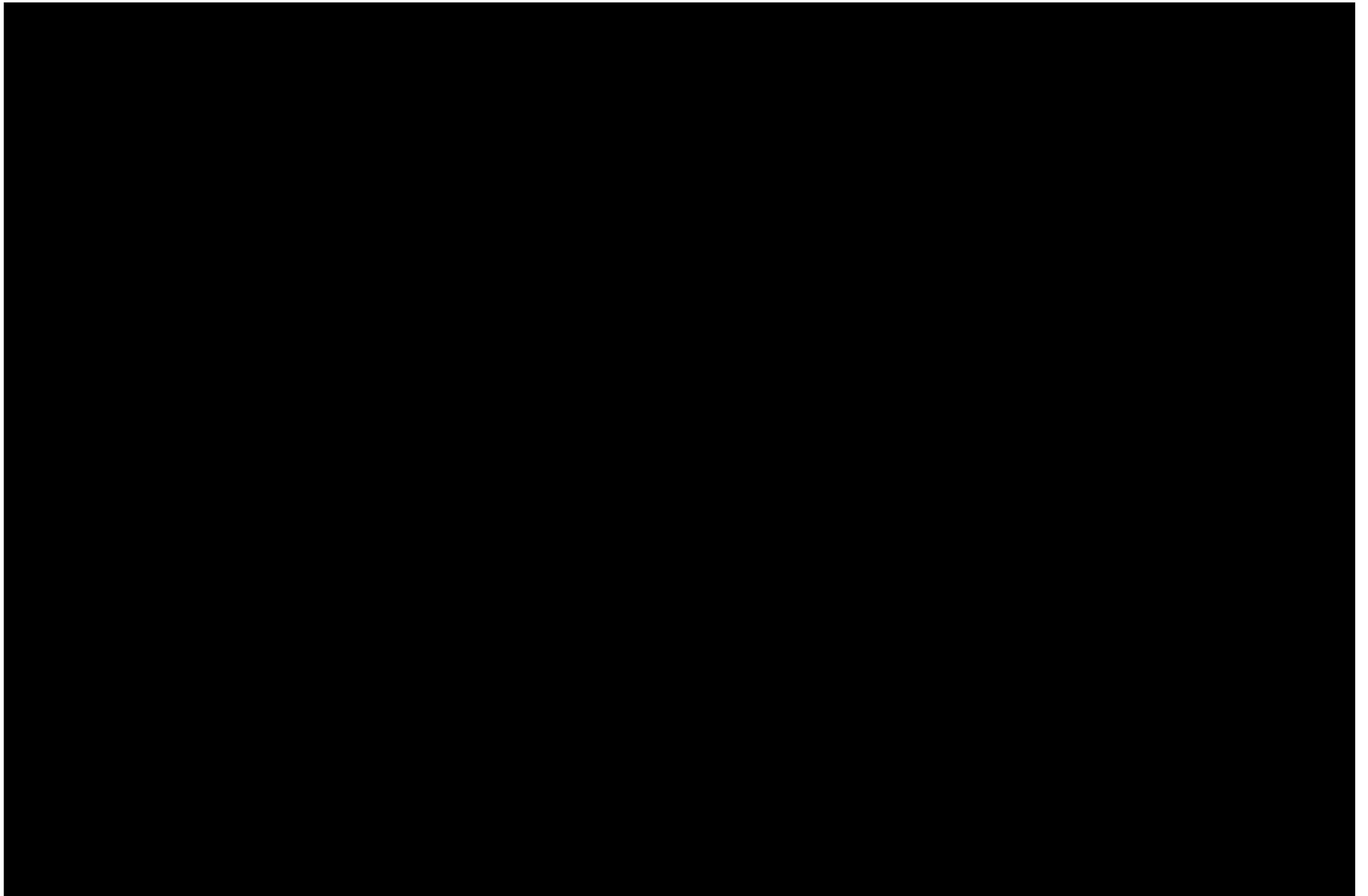


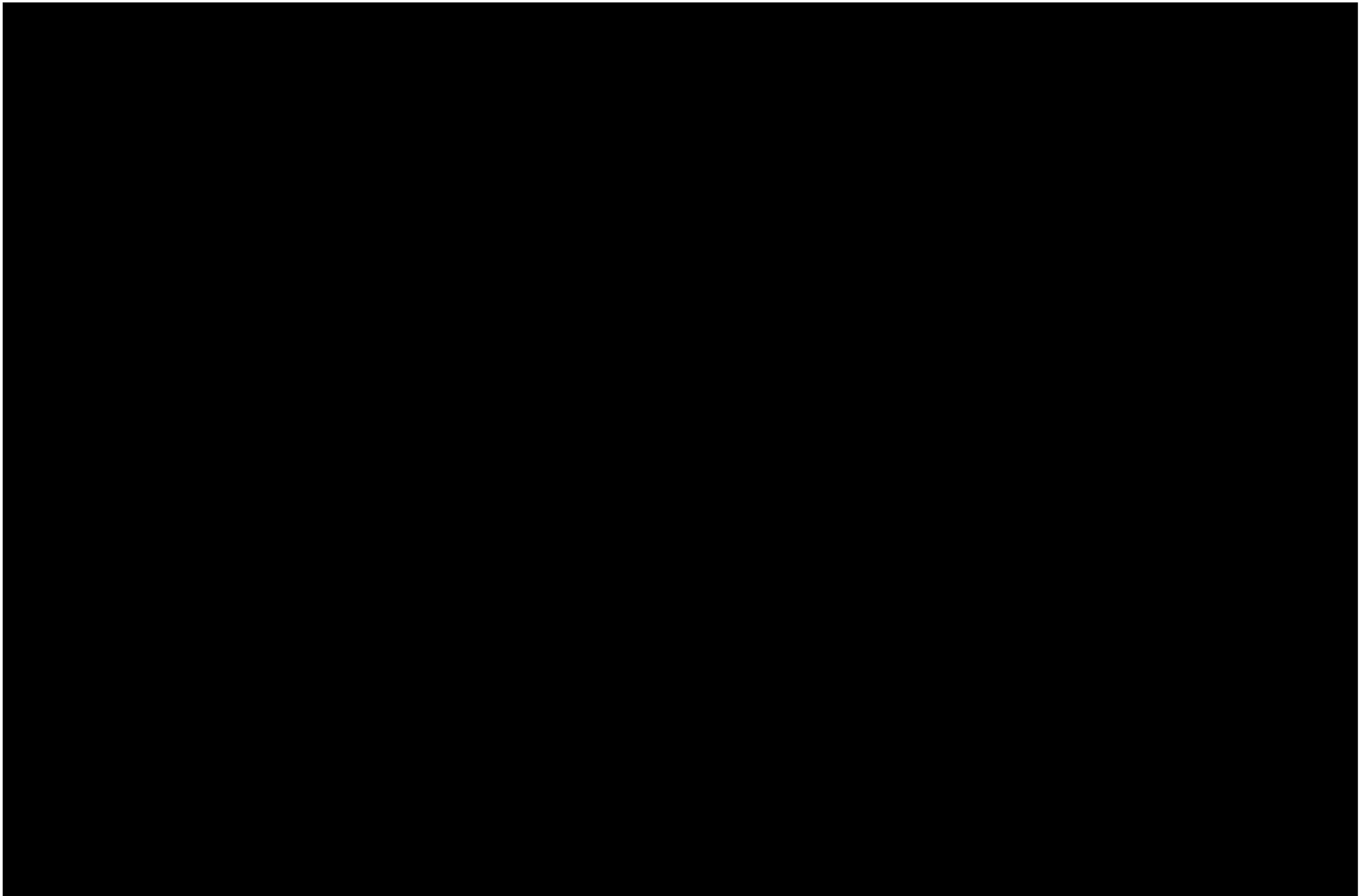


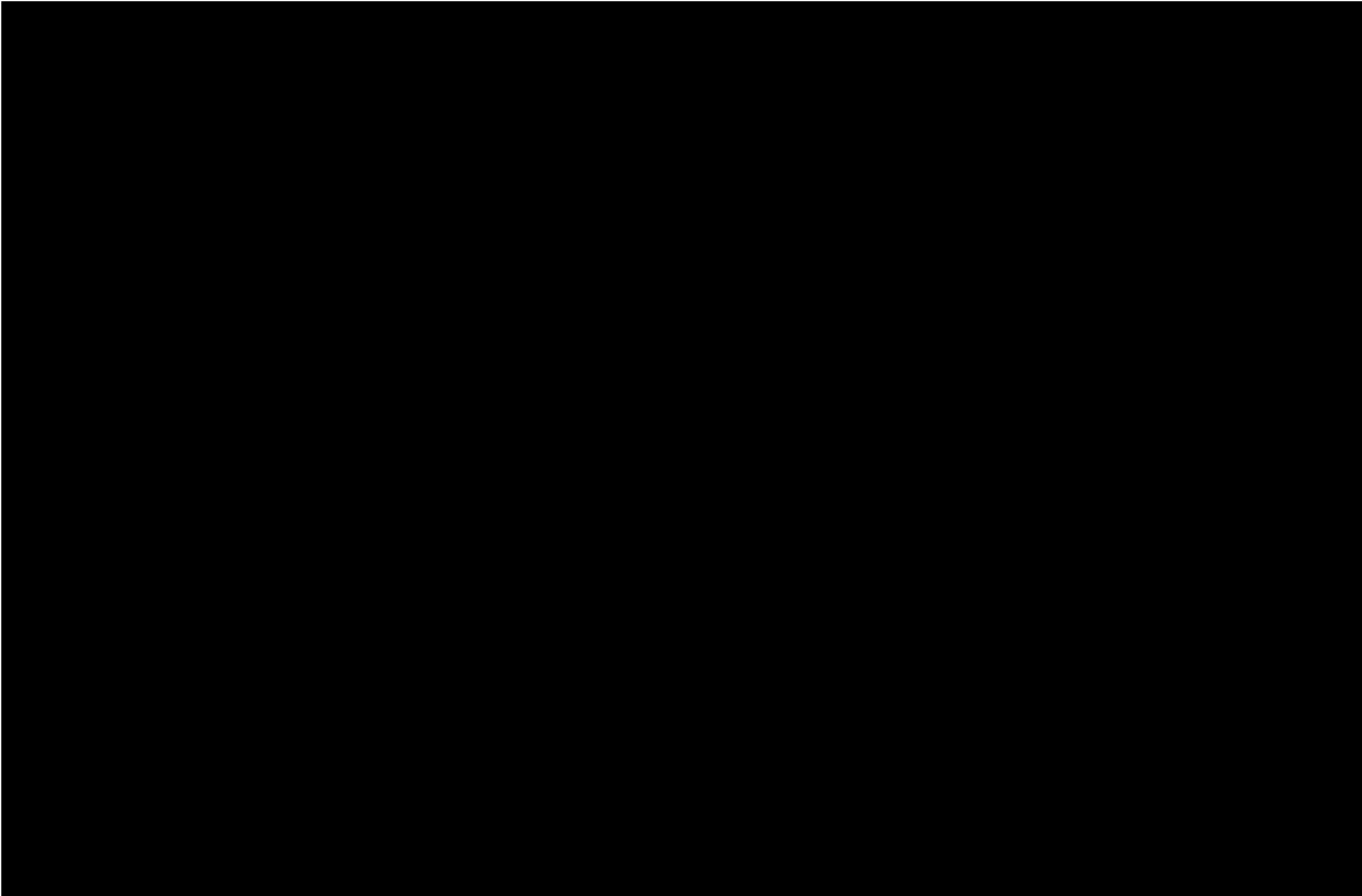




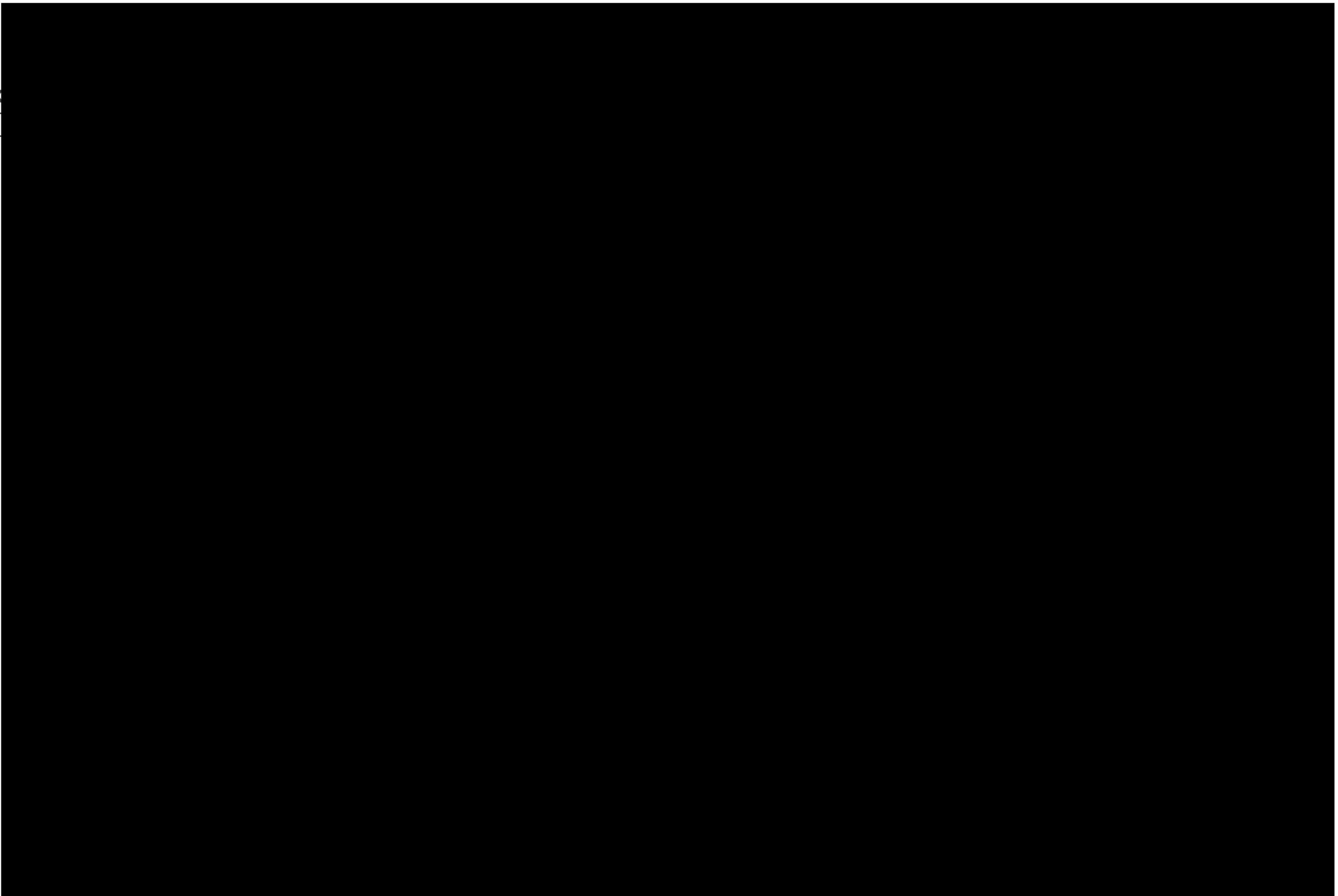


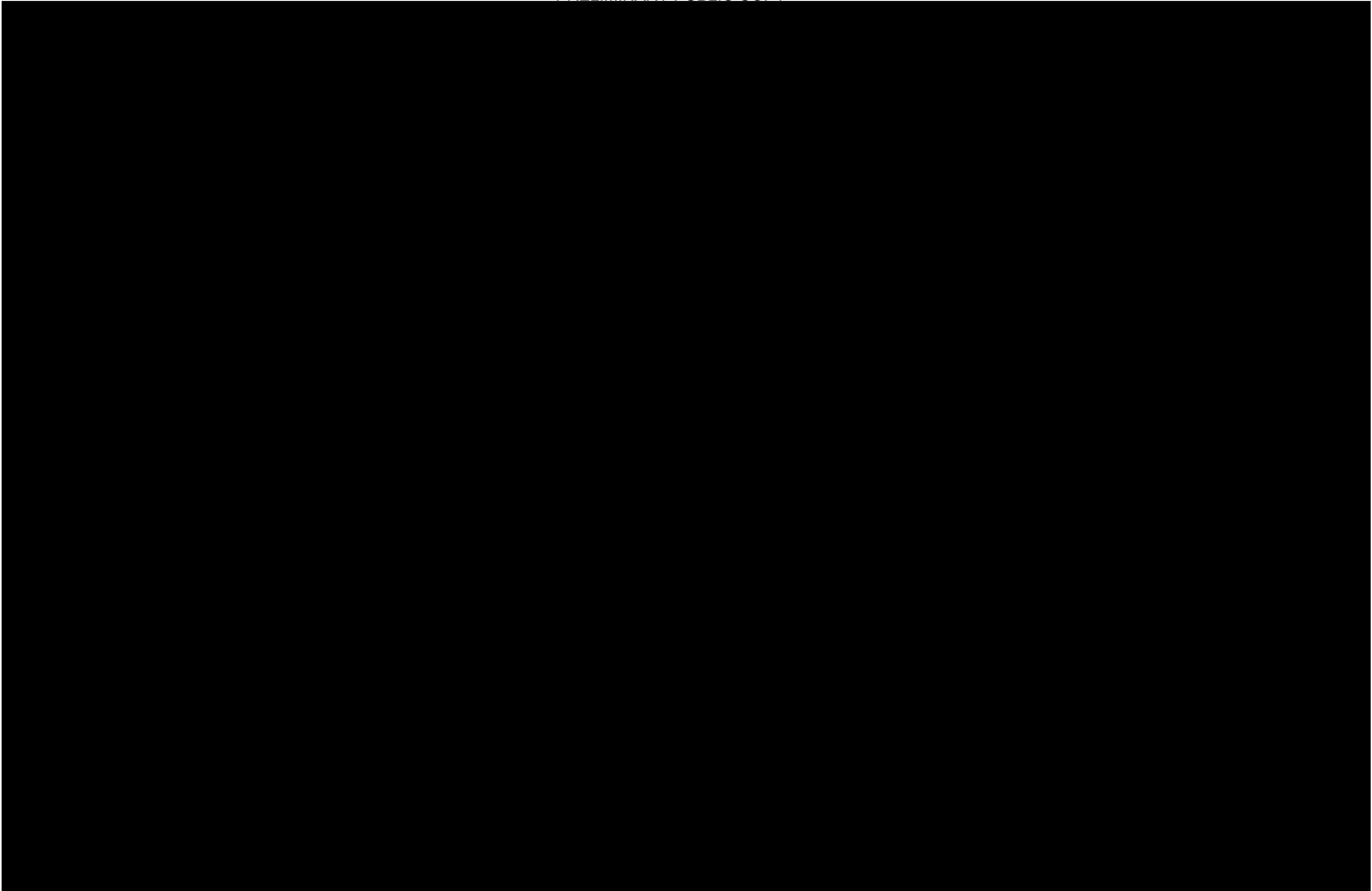


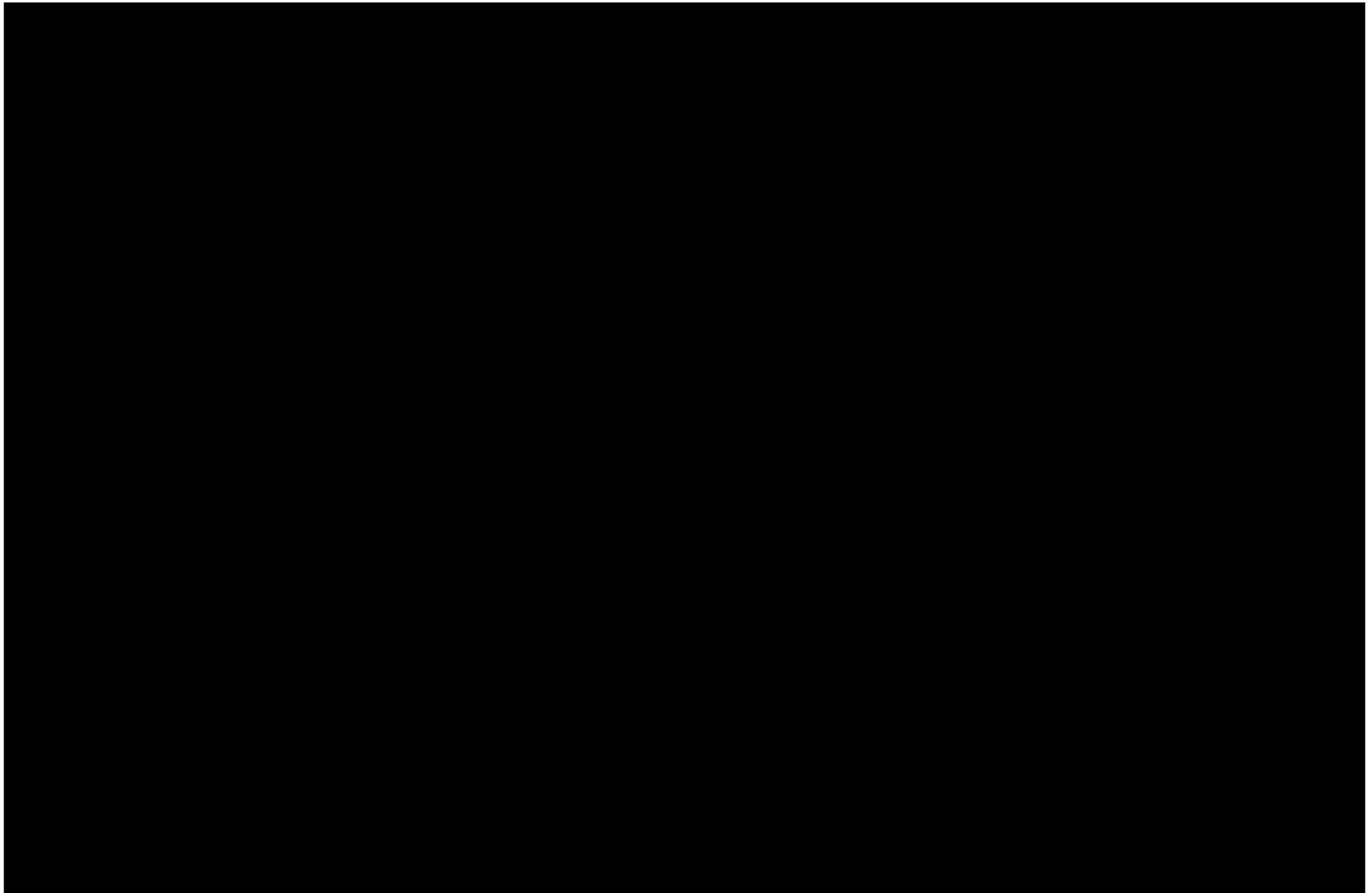


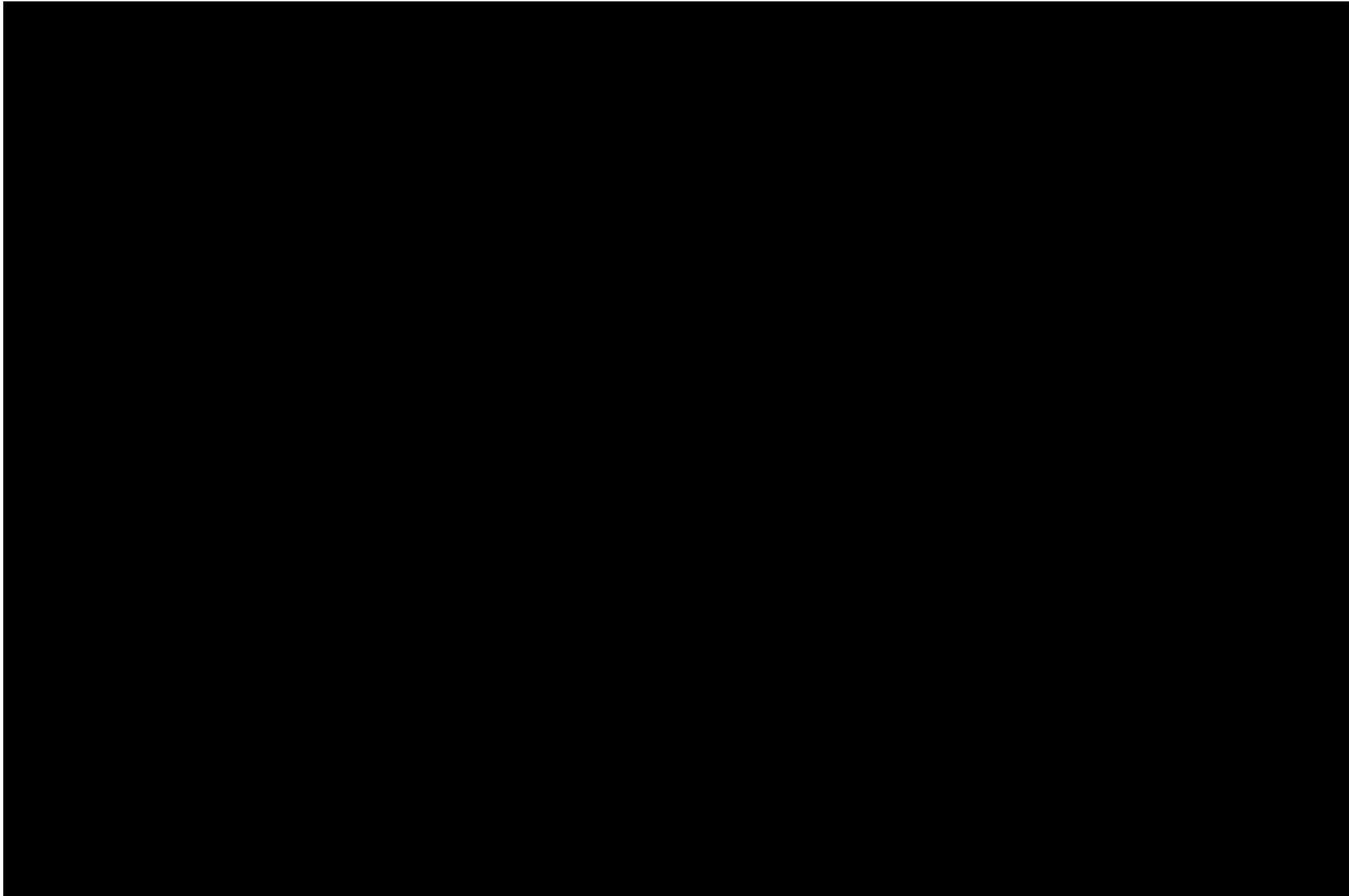


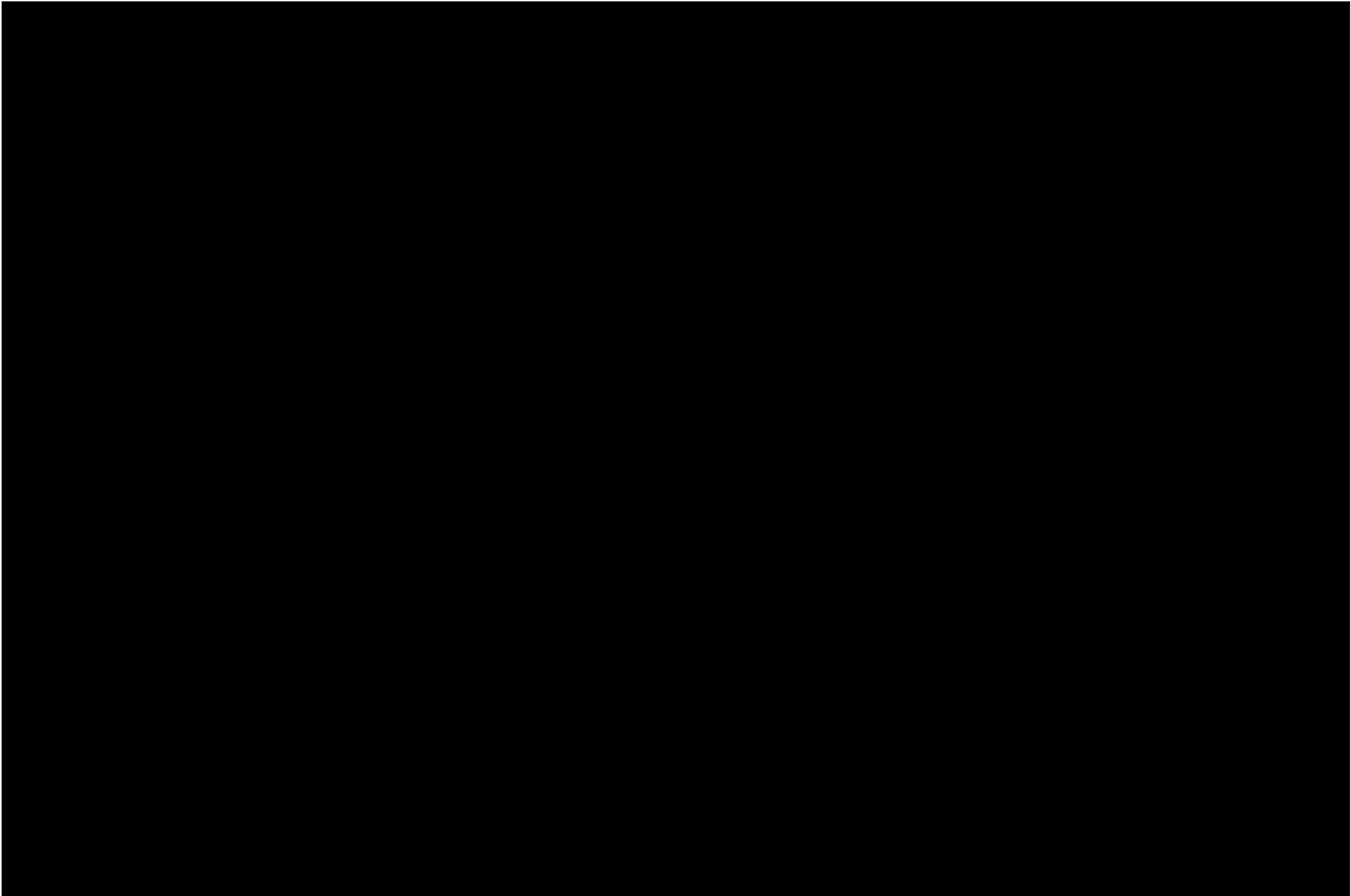
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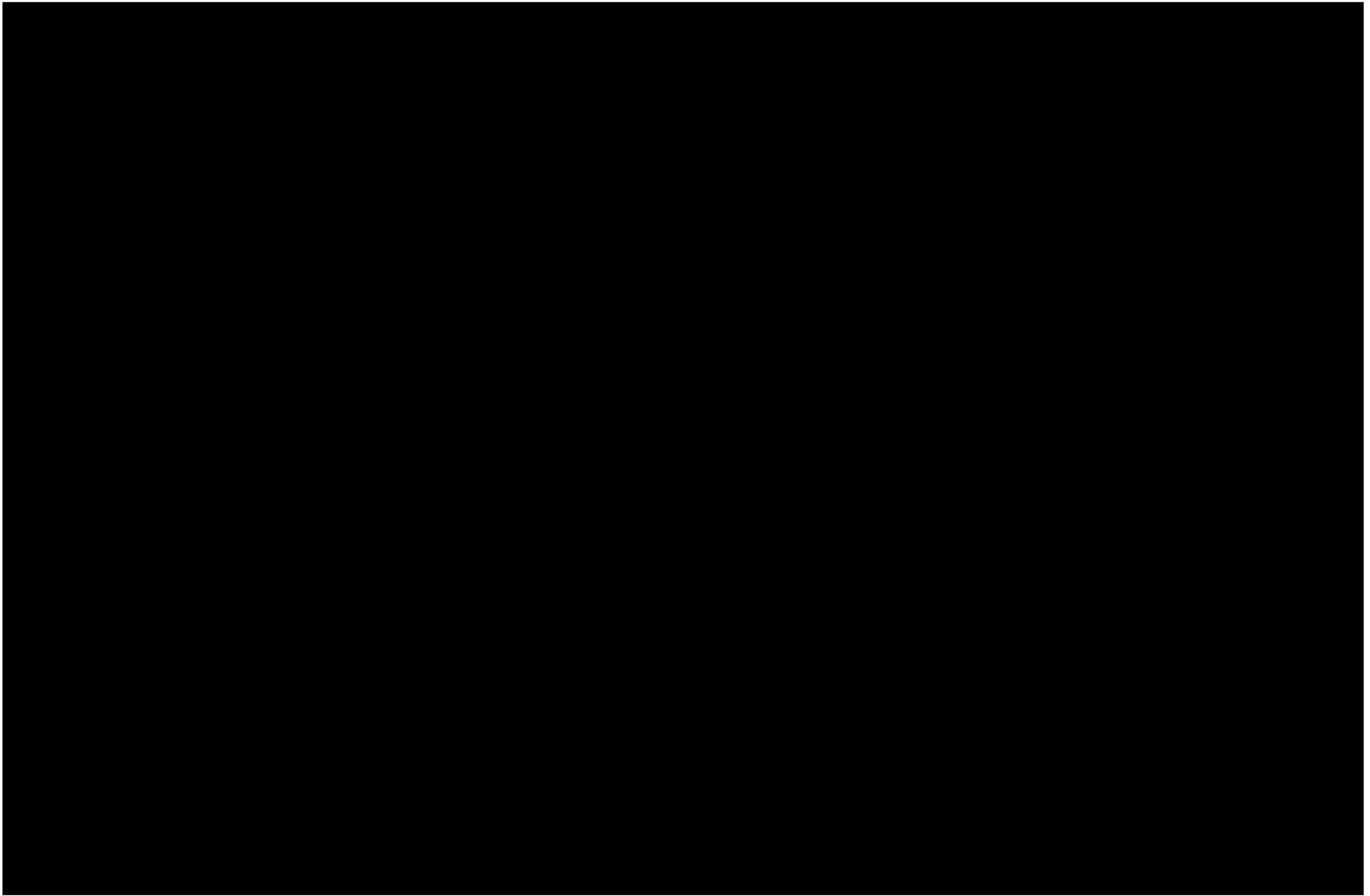


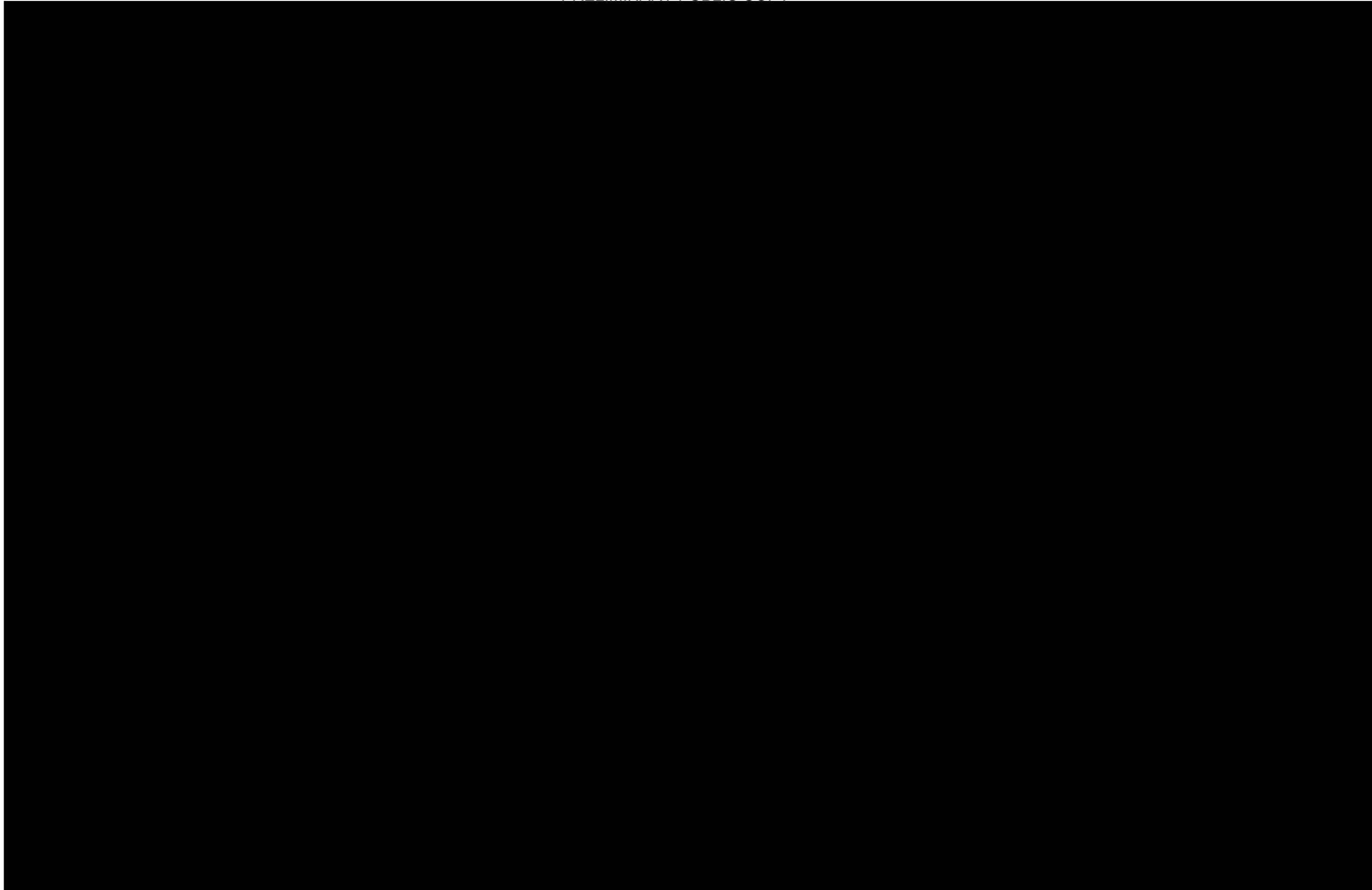


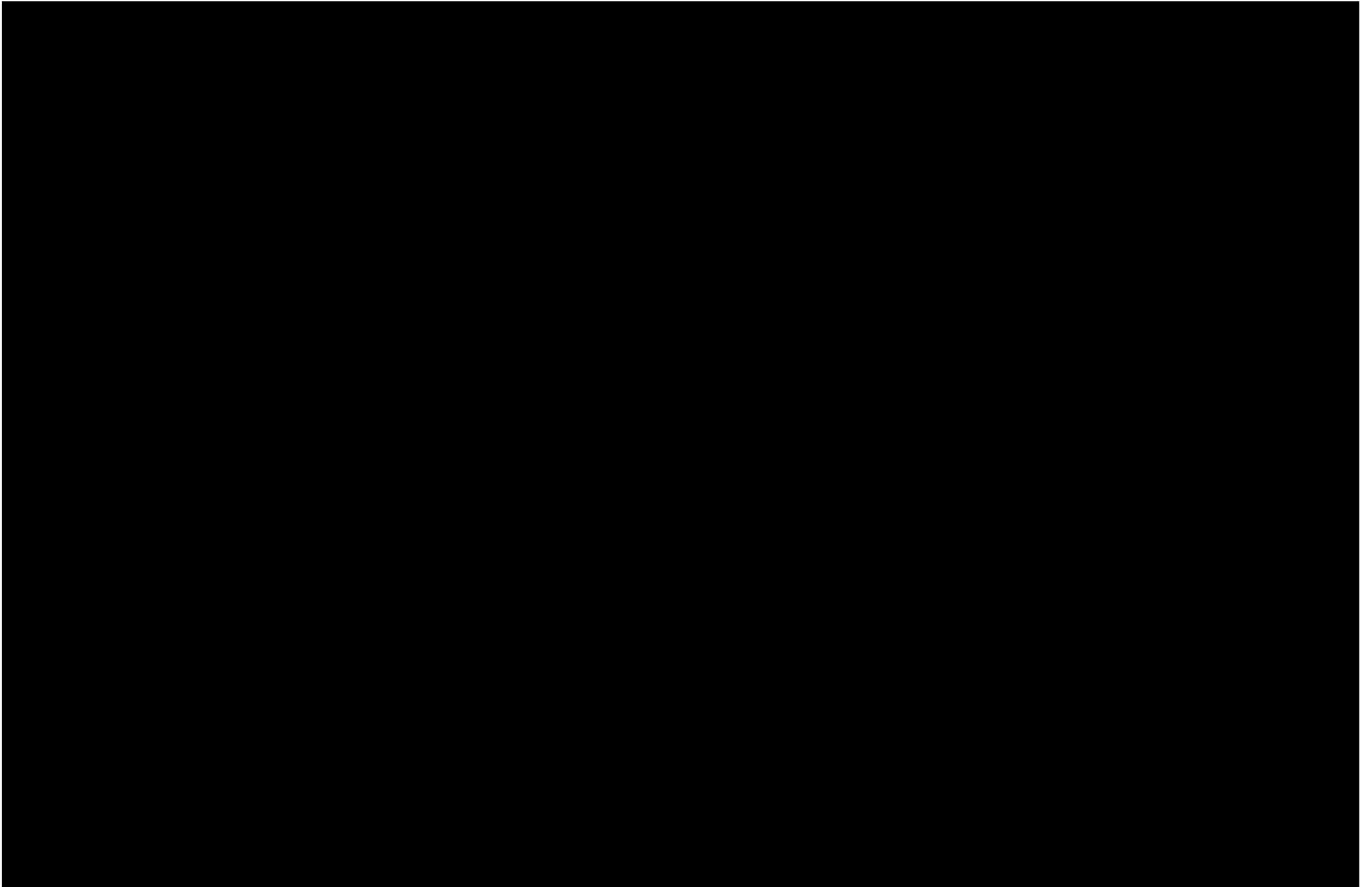












# ATTACHMENT 110

# ATLANTIC SHORES OFFSHORE WIND PROJECT 2, LLC

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Response to New York State Energy Research and Development  
Authority Request for Proposals ORECRFP18-1

## ECONOMICS BENEFITS PLAN

 TOTAL INSTALLED  
CAPACITY



February 14, 2019





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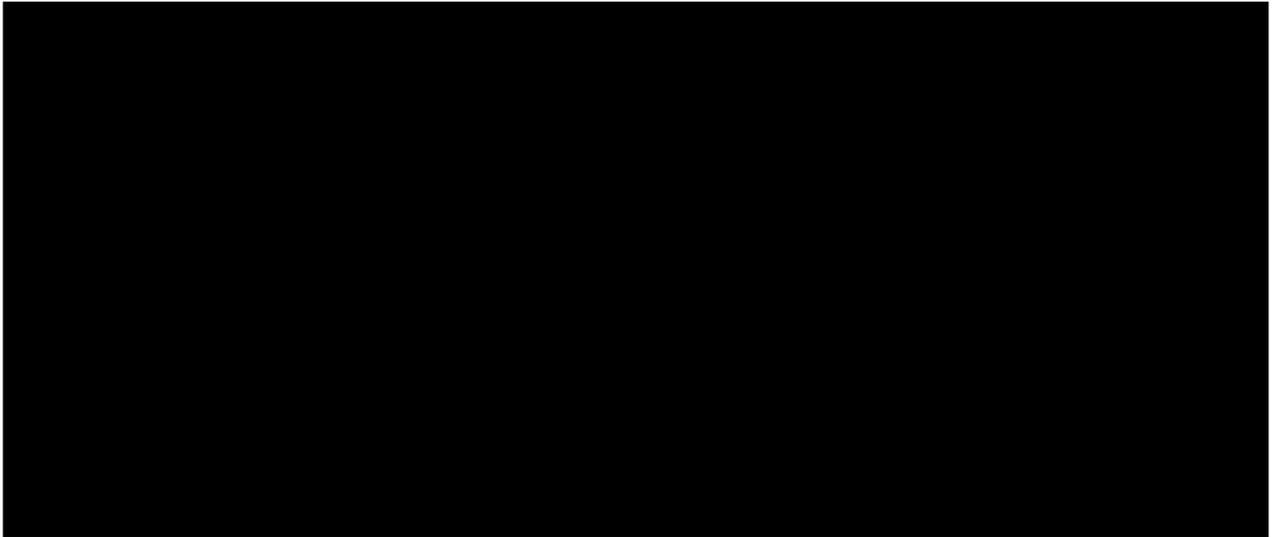
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**ATTACHMENT 110 - ECONOMIC BENEFITS PLAN TABLES**

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**ATTACHMENT 110 - EMISSIONS MODEL TABLES**

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