

Master Plan For Responsible Advanced Nuclear Development in New York:

Environmental and Climate Justice Study

NEW YORK STATE

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Notice

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Summary

The Environmental and Climate Justice (ECJ) Study examines ECJ considerations can be identified and addressed across the advanced nuclear project lifecycle from siting and licensing through construction, operations, decommissioning, and long-term stewardship. New York State's commitment to ECJ is established in law and implemented through agency regulations, policy and program design. This provides an important foundation to build upon ensuring that meaningful community input and meaningful engagement occurs in early siting decisions, before many federal U.S. Nuclear Regulatory Commission (NRC) requirements regarding community engagement take effect.

In New York, the Climate Leadership and Community Protection Act (CLCPA, Climate Act) establishes that to the extent practicable, relevant programmatic resources shall be invested in a manner designed to achieve a goal for disadvantaged communities to receive 40% of overall benefits of State clean energy and energy efficiency programmatic investments, with a goal of 45%. In addition, Section 7(3) of the CLCPA requires all state agencies, offices, authorities and divisions to ensure their administrative decisions – including permits, licenses, grants, loans, and contracts - do not disproportionately burden disadvantaged communities.

The Public Service Law Article 10 statute provides a unified review and approval process for major electric generating facilities in New York State (NYS). Overseen by the Board on Electric Generation Siting and the Environment (Siting Board), the Article 10 permitting process includes a detailed review of the cumulative impacts on the local community including environmental justice areas. In addition, the Environmental Justice Siting Law requires consideration of whether an action may cause or increase a disproportionate pollution burden on a disadvantaged community for non-Article 10 facilities. Article 48 of the Environmental Conservation Law also establishes the Permanent Environmental Justice Advisory Group and requires State agencies to adopt environmental justice policies. Department of Environmental Conservation (DEC) Commissioner Policies 29 and 42 govern environmental justice in permitting and establish that the Department's relations with Indigenous or Indian Nations are conducted on a government-to-government basis. State agency and authority policies further govern how ECJ input, engagement, concerns and benefits are embedded into decision making.

New York's ECJ requirements, including state-level permit reviews, provide an opportunity for earlier input and community engagement because these requirements inform State authority and actions earlier in the project development lifecycle than NRC requirements. These state-level permit reviews complement federal reviews by incorporating ECJ considerations before

major siting and development decisions are concluded and significant investments are committed. Conversely, federal environmental review, including environmental analysis conducted as part of NRC licensing, begins after a site has been identified and a reactor design has advanced far enough to support a license application.

An aggregated summary of findings and conclusions follows, with more detailed descriptions within each of the relevant sections in this study. Other Master Plan studies are relevant to the issues considered in this study. These include the Regulatory Issues and Safety, Siting, and Workforce Development studies.

Findings

Provide robust and accessible public education. New York State's energy development history shows that community outcomes depend on how physical project infrastructures, outcomes, and benefits are structured and delivered, and whether long-term project maintenance responsibilities are implemented effectively. Building trust through education and community engagement is central to developing advanced nuclear projects. Credible, timely, and transparent communication; accessible public health information; and sustained engagement that acknowledges perceived and potential risks can help communities make informed decisions and participate meaningfully in project development. By the time federal environmental reviews begin, developers and communities have already made site selection decisions and substantial licensing process investments. Existing New York State ECJ policies, tools, and best practices, including state-level permit reviews, as applicable, can complement federal environmental reviews by incorporating ECJ considerations before major siting and development decisions are concluded and significant investments are committed.

Engage Indigenous Nations throughout the project development lifecycle. Engaging Indigenous Nations early in project planning builds the trust and sustained relationships necessary for successful outcomes. Formal government-to-government consultation, including through state-level permit reviews, as applicable, early in the project lifecycle can provide meaningful additional engagement. Federal consultation requirements also provide important mechanisms for federally recognized Indigenous Nation engagement in the NRC licensing process. However, this typically occurs after early-stage project development and site locations have been identified.

Examples of ECJ Considerations in Current Processes

DPS's large-scale generation siting processes include detailed requirements for the identification and description of disadvantaged communities, including those in Indigenous Nations. Notably, the permitting requirements for major renewable energy generation facilities pursuant to Public Service Law (PSL) Article VIII and major generation facilities pursuant to PSL Article 10 require any application to include:

- Identification and description of environmental justice/disadvantaged communities within the project study area
- Assessment of the potential adverse disproportionate pollution impacts impacting environmental justice/disadvantaged communities
- Detailed assessment and description of measures to avoid, minimize, and/or offset disproportionate pollution impacts

Article VIII and Article 10 also include opportunities for potentially affected environmental justice/disadvantaged communities to participate in the permitting review processes, including but not limited to, opportunities to provide on the record, recommendations for avoidance, minimization, and mitigation strategies, and potential party status.

In addition, both processes establish requirements for availability of intervenor funding for potentially affected municipalities and other parties, including environmental justice/disadvantaged communities and Indigenous Nations, to ensure full and equitable opportunities for participation in the application review and permitting processes.

Clear information and sustained engagement are essential for successful advanced nuclear development. Credible, timely, and accessible communication and public health information, and sustained engagement build public trust and help communities make informed decisions and participate meaningfully in project planning.

Emergency preparedness and planning needs to incorporate community circumstances. Existing economic constraints, mobility and transportation limitations, communications constraints, and lack of emergency response capacity can impact a community's ability to prepare for, respond to, and recover from potential crisis events. These conditions may be highly variable throughout communities across New York State. Effective emergency preparedness planning must therefore evaluate the likelihood and consequence of potential incidents alongside the existing

conditions that shape community resilience. Incorporating these factors into planning and siting decisions early can help ensure environmental, public health, and emergency preparedness disparities are examined and addressed.

Conclusions

The conclusions set out here apply in addition to the consideration given to ECJ matters throughout the Master Plan, in particular in the Master Plan workforce, regulatory issues and safety, and siting studies.

- **Advance dedicated ECJ stakeholder and Indigenous Nations information sharing, education, and engagement activities.**

Coordinated information sharing and educational efforts are critical to new project development success. Residents need access to resources that easily clarify what advanced nuclear is and how it differs from nuclear developed half a century ago. This should also include credible, timely, accessible communication and public health information, as well as inherent passive and active safety mechanisms in the most state-of-the-art advanced nuclear generation technologies which can build public trust and help communities make informed decisions and participate meaningfully in project planning.

Effective emergency preparedness planning must consider existing conditions that shape community resilience. Incorporating these factors into planning and siting decisions early can minimize perpetuation of historic harms, and help prevent existing environmental, public health, socioeconomic, and emergency preparedness disparities.

- **Integrate ECJ and Indigenous Nation considerations into advanced nuclear community engagement efforts and project development.**

ECJ considerations can be embedded across the various stages of a project development lifecycle. This includes methods for meaningful community stakeholder engagement, evaluation of intergenerational impacts, and identification of potential uncertainties, benefits, and concerns.

1. Introduction

This Environmental and Climate Justice (ECJ) Study is one of a collection of studies prepared by the New York State Energy Research and Development Authority (NYSERDA) and the Department of Public Service (DPS) as part of the "Master Plan for Responsible Advanced Nuclear Development in New York" (Master Plan). Collectively, these studies examine the technical, economic, workforce, supply chain, regulatory, environmental, community, and infrastructure considerations associated with the deploying advanced nuclear technologies in New York State (NYS). Each study addresses a distinct topic area and offers analysis, findings and conclusions to contribute to a comprehensive roadmap for advanced nuclear development in New York.

NYSERDA and DPS acknowledge the contributions of Karp Strategies and E-Source, working as subcontractors to The Brattle Group, in preparing this study, as well as supporting the discussion of ECJ matters in other Master Plan studies. Contractor Eastern Research Group (ERG) provided support for stakeholder engagement to inform this study.

The ECJ Study evaluates the advanced nuclear project lifecycle, with particular attention devoted to how potential benefits, burdens, and opportunities for participation may be distributed among potential host communities. The study does not assess whether advanced nuclear technologies should be deployed in New York State; rather it examines how ECJ considerations can be identified and addressed across the project lifecycle.

The study methodology began with a qualitative literature review that examined relevant ECJ research, policies, regulatory frameworks, and documented experiences with nuclear and other infrastructure development projects. Community members of NYSERDA's Energy Equity Collaborative and all nine federally and state-recognized Indigenous Nations collocated within New York State were invited to provide input on the ECJ Study. Feedback and insights were also obtained through interviews with frontline community-based organizations, environmental and environmental justice organizations, labor groups, and New York State Agencies and Authorities. Findings from the other Master Plan studies were also considered within this study from the perspective of ECJ.

The following questions guided this study. First, how can advanced nuclear development occur in a manner that promotes ECJ, community engagement, equitable distribution of benefits and impacts, and reduction of real or perceived risks? Second, how will communities be engaged in a

way that recognizes various levels of understanding as it relates to advanced nuclear development and the distribution of potential impacts and benefits? What resources are available or should be developed to create a shared foundation for all parties involved? Third, how can advanced nuclear development respect Indigenous Nations sovereignty and rights by incorporating reliable, predictable, meaningful consultation with Nations while simultaneously addressing potential impacts. Finally, what are the potential impacts to surrounding communities, disadvantaged communities and Indigenous Nations associated with advanced nuclear development including sociocultural, demographic, economic, environmental, public health, and long-term stewardship?

The ECJ Study includes the following sections:

- **Section 2, Environmental and Climate Justice Principles**, reviews the core environmental and climate justice principles applied throughout this study, New York's ECJ legal and policy framework, and community and Indigenous Nation engagement principles.
- **Section 3, Experiences in Nuclear Development,** describes histories with nuclear development in New York State as well as ECJ practices and engagement approaches used in recent nuclear electric generation projects elsewhere.
- **Section 4, Public Health Priorities**, addresses public health topics including emergency response and preparedness.
- **Section 5, Embedding Community Engagement into Future Development**, provides a framework to build upon for project developers when engaging with the community in advanced nuclear potential projects.

Important ECJ issues are also discussed across a number of other Master Plan studies, in particular:

- the Workforce Development Study, which addresses economic considerations assessing workforce opportunities and barriers, transferable skills, business and supplier access, community economic benefits, and the potential effects of population growth/reduction within a community as a result of advanced nuclear projects;
- the Siting Study, which describes siting issues such as water resource impacts and community aspects; and
- the Regulatory Issues and Safety Study, which deals with environmental review and permits.

2. Environmental and Climate Justice Principles

This section identifies the ECJ principles established under New York State law and agency and authority policies that will help guide the evaluation of environmental, economic, social, and public health implications of advanced nuclear development.

2.1 New York State's Foundation for Environmental and Climate Justice Principles

As a national leader in the integration of ECJ principles into state laws and regulations, New York has implemented several requirements governing the distribution of benefits and burdens, community engagement processes, and the remediation of historical inequities. This commitment is established in law and implemented through agency policy and program design. Key elements include the Climate Leadership and Community Protection Act (CLCPA, Climate Act), the Article 10 permitting process, the Environmental Justice Siting Law, Article 48 of the Environmental Conservation Law, and related agency/authority policies. Together, these provide a framework to address equitable distribution of benefits and burdens, environmental review and permitting, stakeholder and Indigenous Nation engagement, and interagency coordination on environmental justice matters.

The CLCPA frames New York's environment and climate justice legal and policy outlook. In addition to instituting statewide greenhouse gas reduction and clean energy goals, the Climate Act establishes that to the extent practicable, relevant programmatic resources shall be invested in a manner designed to achieve a goal for disadvantaged communities to receive 40% of overall benefits of State clean energy and energy efficiency programmatic investments, with a goal of 45%.

2.2 Equity and Justice Principles

Equity considerations are foundational to achieving State goals and each dimension has a counterpart in environmental justice literature and best practices.

- **Distributional equity** refers to the fair distribution of the benefits and burdens of energy policies and programs. In an equitable energy system, all communities receive a fair share of clean energy investments, job opportunities, cost savings, and pollution reductions.[1]
- **Procedural equity** refers to fair and transparent processes used for decision-making, resource allocation, and policy development. Decision makers create inclusive and

accessible processes for developing and implementing clean energy programs such that all stakeholders have equitable access to participate.[2]

ECJ frameworks emphasize that historical harms and inequities should be considered when evaluating potential impacts, designing engagement processes, and identifying opportunities for community benefits. Incorporating these considerations into advanced nuclear planning can help improve transparency, strengthen trust-based relationships with communities, and support more equitable and inclusive project decision-making. Similar principles also encourage avoiding disproportionate concentration of environmental burdens on communities that may already experience existing environmental, socioeconomic, or public health challenges.

Recognition justice emphasizes that Indigenous Nations should be recognized as distinct sovereign governments, as well as rights, territory, and traditional knowledge holders whose status should be respected.[3] Consultation can provide opportunities for Indigenous Nations to identify environmental, cultural, and resource concerns, and Nation standards for environmental review, and for project planning to incorporate Indigenous knowledge alongside technical, environmental, and economic considerations.

2.2.1 Distributional Equity

Distributive equity focuses on the specific communities slated to receive project benefits and burdens, and how those outcomes are distributed across that community. Distributive equity also includes intergenerational equity considerations. Distributive equity requires evaluating how the impacts of nuclear energy are shared between current and future generations, and between communities.

2.2.2 Procedural Equity

New York State's Environmental Justice policies and the CLCPA recognize the importance of ensuring that communities, particularly disadvantaged communities, have opportunities to participate in planning and deliberations that inform decision making. Procedural equity focuses on the fairness, accessibility, and transparency of these processes, including how information is shared and how community input is considered. Inclusive engagement can strengthen public trust and support more informed and effective decision-making.[4] Such meaningful participation requires providing potential host communities with timely and accessible opportunities to participate in discussions, input, and processes.

Ensuring that community input and concerns are addressed can improve and streamline decision-making and reduce project development impacts and risks. These principles emphasize that effective engagement requires timely, accessible, and credible information, recognition of participants' time and expertise, and opportunities for communities to proactively shape decisions that affect them rather than simply respond to predetermined proposals.

3. New York Nuclear Experience

Commercial nuclear power emerged in the United States during the late 1950s and early 1960s. Most of the current U.S. nuclear fleet was constructed between 1967 and 1990.[5] Beginning in the 1960s, New York hosted one of the nation's first nuclear power plants and was home to a nuclear fuel reprocessing facility in Western New York. Indian Point operated in Westchester County for nearly sixty years before a closure agreement was reached in 2021. New York currently has three operating nuclear plants in Central New York. This history highlights how nuclear power benefits and responsibilities can be distributed among communities and can evolve across a facility's full lifecycle.

3.1 Community Benefits

Community benefits from nuclear power plants fall into four primary categories:

- **Property tax revenues** – large industrial facilities such as nuclear plants are generally one of the largest taxpayers in the community supporting local government, schools, first responders, libraries, roads and other infrastructure. These tax revenues take the form of direct tax payments and Payments in Lieu of Taxes (PILOTs) negotiated with surrounding communities and directly reduce the tax obligations of residents. New York's three operating nuclear plants contribute approximately $51 million annually in local tax revenues in addition to state taxes. In Oswego County, for example, the two operating nuclear plants contribute approximately $44 million in tax revenue annually, representing about 18% of the County's total budget.[6]
- **Employment** – Nuclear generating plants employ significant numbers of well-paid permanent workers including engineers, operators, skilled tradespeople, security and safety personnel, and administrative staff. The majority of these jobs do not require a four-year degree; rather, specialized training is provided on site.[7] Indirect benefits also occur throughout surrounding communities at local businesses and suppliers. New York's three operating nuclear plants currently employ approximately 2,000 permanent workers and support 12,000 indirect jobs in surrounding communities.[8] Before closing, Indian Point employed approximately 1,000 full-time permanent workers and now has approximately 300 employees and contractors handling decommissioning.[9]
- **Reliable zero carbon electricity** since nuclear plants operate continuously day and night when operating. New York's three operating plants generate almost 20 percent of New York's annual electricity needs and estimates project that replacing this electricity with other sources could cost New Yorkers up to $50 billion annually in increased costs. Until closing, Indian Point generated approximately 25 percent of New York City's

electricity. Its closing highlights the interconnected nature of our electric generation choices and tradeoffs.

- **Other community benefits**. Nuclear plants also support community benefit funds and scholarships, science, technology, engineering, and mathematics (STEM) education, apprenticeships, and partnerships with non-profit organizations and colleges.

3.2 Community Engagement Experiences

The history of the Shoreham Nuclear Power Station in Long Island provides New York with an example of the need for robust community engagement throughout a facility's development. Despite the plant never entering commercial operation, public concerns regarding feasibility of the proposed evacuation strategies in such a large and densely populated geographically-constrained area grew. The facility was permanently closed in 1989 and decommissioned.

The importance of community engagement remains an important component of a decommissioning process. When the agreement to close Indian Point was reached, DPS established the Indian Point Decommissioning Oversight Board to assess how to protect the financial, environmental and physical interests of communities, including the existing workforce. The Board's membership includes State entities, Westchester County, Village of Buchanan, Town of Cortlandt, Hendrick Hudson Central School District, State legislators, and environmental and technical representatives. The creation of this Board recognized that public confidence requires ongoing community participation, information sharing, and independent oversight as decommissioning occurs. This also highlights the importance of evaluating how environmental stewardship, economic impacts, and health considerations are realized at each stage of a nuclear project's lifecycle.

The Indian Point experience extends the State's long history of active community engagement. At West Valley in Cattaraugus County, the site of the nation's first privately-owned reprocessing facility, the Western New York Nuclear Service Center reprocessed spent nuclear fuel between 1966 and 1972. When the operator determined that significant upgrades would be required to meet evolving federal safety and waste management requirements, operations ceased and the company withdrew from the reprocessing business.[10] Radioactive waste remained on site including liquid waste stored in underground tanks and the processing facilities. As a result, Congress passed the West Valley Demonstration Project Act[11] to establish a federal and state partnership between DOE and NYSERDA to manage the site's cleanup. The West Valley Citizen Task Force was formed in 1997 and continues to meet regularly to help support this partnership and to ensure that decisions take account of host community issues. Members include local

governments, environmental advocates, community organizations, and Indigenous Nations. Additionally, the federal and state agencies hold quarterly public meetings to update stakeholders as cleanup continues and to receive input. While the site is recognized for its successful demonstration of cleanup technologies and strategies, it highlights the responsibilities of intergenerational environmental stewardship and public health.

4. Public Health Priorities

Factors such as existing environmental exposure, socio-economic conditions, access to healthcare, food, housing, transportation, and emergency response capacity can influence how communities experience and respond to potential health risks.[12,13] Since advanced nuclear technologies are intended to operate for many decades, consideration of both immediate and long-term public health is an important component of environmental planning, community engagement, and intergenerational equity. Stakeholder feedback reinforced the importance of evaluating advanced nuclear development within the broader context of existing and future public health conditions and cumulative environmental burdens. Readers are also encouraged to review the Regulatory Issues and Safety Study for a comprehensive examination of these areas.

4.1 Environmental and Radiological Monitoring

Environmental impact surveillance and reporting provide important mechanisms for protecting and maintaining public health and community confidence throughout a nuclear facility's lifecycle. As such, the U.S. Nuclear Regulatory Commission (NRC) requires nuclear power reactor licensees to establish radiological environmental monitoring programs to measure radiation and radioactive materials in the environment surrounding the facility. The NRC also establishes requirements for monitoring and reporting legal discharges of low-level processed radionuclides from normal plant operations in the water or air (effluents) such as from water that cools equipment and their impacts on the surrounding environment and residents. Effluent is not spent nuclear fuel and not high-level radioactive waste which is currently contained and stored on-site according to specific federal requirements. The NRC also conducts inspections of licensee effluent and environmental monitoring programs to verify compliance with applicable requirements. All NRC inspection reports, including those demonstrating compliance requirement failures, are available to the public on the NRC website.

In addition to federal monitoring requirements, the New York State Department of Health's (NYSDOH) Environmental Radiation Surveillance Program monitors radionuclide levels in environmental media near commercial nuclear power plants, other reactors and selected industrial sites, and background locations. Based on laboratory processing timeframes and reporting timelines, data are made publicly available through NYSDOH's online Health Data Portal and through Annual Environmental Radiation in New York State reports. The surveillance program is not a mandated requirement, and NYSDOH is responsible for the program. In addition to the NYSDOH Environmental Radiation Surveillance Program, New York State

authorizes the State Disaster Preparedness Commission to directly monitor and record the off-site presence of radioactive material. This commission is resourced through an annual fee payable by nuclear electric generating facility licensees to support State and local radiological emergency preparedness responsibilities.

4.1.1 Radiation Exposure

Radiation occurs naturally in the universe and human exposure to radiation depends on the combination of these natural sources and man-made sources. Radiation is a natural part of the environment. People are continuously exposed to it from cosmic rays, radioactive elements in soil, rock, and building materials, from radon gas, and from naturally occurring radionuclides in food and water. In addition to this natural background, people receive exposure from human-made sources, principally medical imaging and nuclear medicine. Federal standards govern public radiation limits: U.S. Environmental Protection Agency (EPA) standards govern acceptable levels of radiation from man-made sources including medical, commercial and industrial activity; and NRC standards establish maximum limits for those working in a nuclear plant as well as for radiation exposure to the public. These limits are designed to control radiation-associated public health risk.

The average US resident receives approximately 620 millirem (mrem) per year of radiation – about half from natural background radiation and half from man-made sources including medical, commercial, and industrial activity. NRC regulations are designed to keep any additional radiation exposure from a nuclear plant's operations to 100 mrem/year[14]. For comparison purposes, a chest X-ray provides approximately 10 mrem, a mammogram 40 mrem, and a CT scan can exceed 1,000 mrem. Dose limits and dose estimates are generally calculated for a hypothetical representative member of the public using standard assumptions about diet, behavior and physiology. Actual exposure can differ in communities whose patterns of life diverge from those assumptions.

The health effects of low-dose radiation risk has been, and continues to be subject to scientific study. This is an area where it is important to ensure that findings are clearly communicated in an accurate and understandable manner. Several stakeholders interviewed referenced a 2026 Harvard University report that examined U.S. counties located closer to operating nuclear power plants and higher cancer mortality rates than counties located farther away. The study authors emphasized that these findings did not establish a causal relationship between cancer mortality rates and proximity to a nuclear power plant and recommended additional research to better understand potential contributing factors.[15] For example, the report did not consider air or water

emissions from nearby factories, fossil fueled electric generating plants, industrial emissions, or pesticides.

4.2 Emergency Preparedness

As further discussed in the Regulatory Issues and Safety Study, emergency preparedness for commercial nuclear reactors in the United States is governed by a coordinated Federal, State, and local framework. Under NRC Regulations, reactor licensees are responsible for maintaining on-site emergency plans, while state and local governments are responsible for off-site radiological emergency preparedness. U.S. Federal Emergency Management Agency (FEMA) administers the Federal Radiological Emergency Preparedness (REP) Program, which establishes planning standards, evaluates emergency response capabilities, and supports training to ensure that protective actions can be effectively implemented.

Federal Emergency Planning Zones (EPZ) for large Light Water Reactors (LWRs) have included a plume exposure pathway zone of approximately 10 miles and an ingestion exposure pathway zone of approximately 50 miles. The plume exposure pathway zone is intended to protect the public from direct exposure to airborne radioactive materials that could be released during an accident through inhalation or external radiation exposure. Emergency planning within this zone focuses on protective actions such as evacuation, sheltering, and distribution of public information. The ingestion exposure pathway zone addresses the potential for radioactive materials to contaminate food, livestock, crops, water supplies, and other agricultural products over a broader geographic area. Emergency planning within this zone focuses on monitoring and controlling the consumption and distribution of potentially affected food and water resources.

In 2023, the NRC adopted a new (10 CFR 50.160) emergency preparedness framework for small modular reactors (SMRs) and microreactors that allows EPZ sizing based on projected radiological doses and site-specific accident consequence analysis.[16] This approach reflects a shift toward distinguishing evolving technology types of advanced nuclear reactors. While the framework recognizes enhanced safety characteristics of advanced nuclear designs, clear and ongoing communication will be important for developing collaborative local emergency response partnerships, maintaining public confidence and supporting informed community engagement.

4.3 Findings and Conclusion

Emergency preparedness and planning needs to incorporate community circumstances. Existing economic constraints, mobility and transportation limitations, communications constraints, and lack of emergency response capacity can impact a community's ability to prepare for, respond to, and recover from potential crisis events.

Clear information and sustained engagement are essential for successful advanced nuclear development. Credible, timely, and accessible communication and public health information, sustained engagement builds public trust and help communities make informed decisions and participate meaningfully in project planning.

Conclusion:

- **Advance dedicated ECJ stakeholder and Indigenous Nations information sharing, education, and engagement activities.**

This should include the following aspects:

1. Continue to monitor changes to federal regulations and programs to address any identified gaps.
2. Transparent communication of research findings and sustainable public health monitoring continue to be important components that should be incorporated into project development.

5. Embedding Community Engagement into Future Development

Community engagement decisions regarding nuclear energy development can have long-term implications for public health, environmental quality and ecosystem resilience, economic opportunities, land use, cultural resources, and community well-being. To address these considerations, transparent and meaningful engagement can be used to build public trust, support procedural justice, and distribute risks and benefits more equitably.

The need for meaningful education and engagement was echoed by all stakeholders interviewed as part of this study. Stakeholders engaged in the development of this study represented community-based organizations, environmental and environmental justice organizations, labor groups, and Indigenous Nations. This input aggregated into four primary categories described in the following sections, and the information gathered has been organized in a manner to help ensure these principles and best practices can inform pre-development work and site-specific project development.

5.1 Provide Accessible, Digestible, Credible Information

Credible, timely, accessible communication and public health information, and sustained engagement can build public trust and help communities make informed decisions and participate meaningfully in project planning. Stakeholders consistently highlighted the importance of producing materials that are concise, accessible, and written in plain language while still providing comprehensive information about potential impacts, benefits, risks, and uncertainties. Participants expressed interest in information regarding advanced nuclear technologies, facility operations, decommissioning and long-term stewardship, emergency preparedness, public health considerations, spent fuel management, water use, and cumulative community impacts.

Stakeholders noted that communication efforts should avoid oversimplifying complex issues and should clearly present benefits and risks. Potential host communities should have meaningful opportunities to participate in project development, regardless of language, disability status, transportation access, technology and internet access, or technical expertise. Particular attention should be given to disadvantaged communities and others who may face unique barriers and constraints to participation in what can at times be complex regulatory or technical processes.

5.2 Early Community Engagement

Early community engagement is a key component of a successful and equitable nuclear siting process. Starting engagement early builds public trust, provides opportunities to understand community priorities, incorporate local knowledge, understand potential concerns, and address issues before major project decisions become fixed.

Early engagement provides opportunities to identify community priorities related to workforce development, emergency preparedness, environmental protection, cultural resources, and long-term economic benefits. It also provides an important pathway for information sharing and unbiased, layperson education so that all parties understand proposed advanced nuclear project approaches, safety and regulatory requirements, benefits, potential risks, and risk mitigation mechanisms. New York's state and regulatory framework, New York's Permanent Environmental Justice Advisory Group, and agency/authority-specific environmental justice and consultation policies provide a strong State-level ECJ framework to build upon.

5.3 Reduce Barriers to Participation

Across stakeholder interviews, participants emphasized that meaningful engagement requires more than public meetings or informational webinars. In addition to detailed information online, recommended in-person approaches included outreach through community centers, libraries, community health centers, schools, senior centers, places of worship, local events, and trusted community organizations. Several stakeholders also highlighted the value of supportive services such as childcare, transportation assistance, and multilingual and hearing/visually impaired materials to reduce barriers to participation. Engagement approaches that create bi-directional dialogue and collaborative relationship-building rather than one-way information sharing should be emphasized.

New York State has examples to build upon. Under the Article 10 siting framework for major electric generating facilities, project developers are required to contribute to an intervenor fund. This fund can then be used by impacted municipalities and local parties to defray costs associated with participating in the siting proceedings. Funds can support technical expert review, consultation, legal assistance, and other efforts necessary to allow potential host communities to make effective contributions to project review processes through independent subject matter experts to be available to help communities navigate project development and misinformation.

Information associated with new advanced nuclear project development should be timely, accurate, understandable, and accessible. Participants should be able to understand how their input was considered and how it influenced project outcomes.

Demonstrating responsiveness and accountability helps strengthen the legitimacy of decision-making processes and builds confidence in the institutions responsible for project oversight. Public trust is developed through sustained accountability, responsiveness, and demonstrated commitment over time.

5.4 Consultation with Indigenous Nations

Engagement with Indigenous Nations differs from traditional public outreach because Indigenous Nations are sovereign governments with distinct cultural, historical, and legal interests. Consultation meetings with Indigenous Nations during this study identified concerns with protecting sacred and culturally significant landscapes and sites, archaeological resources, traditional land and water use relationships and practices, natural resources, treaty rights, and long-term environmental stewardship. Project-related engagement with state and federally-recognized Indigenous Nations must recognize this sovereignty through formal government-to-government consultation and understand that the Nation's territorial, cultural, and environmental interests may extend well beyond the footprint of a proposed facility.

New York State provides a specific framework for this distinction through New York State DEC CP-42, Contact, Cooperation, and Consultation with Indian Nations (CP-42). CP-42 which establishes that DEC relations with Indian Nations are conducted on a government-to-government basis and provides protocols for consultation on environmental and cultural resource issues.[17]

Respectful engagement should also acknowledge that there may be Indigenous concerns for cultural, spiritual, and historically significant landscapes and areas of importance. Relevant considerations in this area include archaeological resources, sacred sites, traditional land use practices, ecosystems, transportation routes, ancestral lands, and treaty-protected resources. Early identification of these considerations can help inform project planning while reducing the potential for misunderstandings and conflict later in the development process.

Nations stressed that project impacts may extend beyond siting to include unique considerations prioritized by Indigenous communities. Nations also emphasized that community benefits should not be viewed as substitutes for decision making control over territorial impacts,

meaningful consultation, or recognition of historic experiences. The importance of receiving information in accessible formats was also noted as well as having sufficient time to review materials and having access to technical expertise and resources that support informed participation and community education.

5.5 Findings and Conclusion

Provide robust and accessible public education. Stakeholders emphasized that engagement should begin with foundational education about New York's energy system before focusing on specific advanced nuclear reactor technologies. Participants noted that many community members have limited familiarity with how the electric system works today and this foundational knowledge is important. This could also include practical information about projected electricity demands, decarbonization goals, reliability and grid needs, and the role different energy resources will play including advanced nuclear. A coordinated interagency communication and engagement strategy can also provide credible, timely, transparent, scientifically based, and accessible information on advanced nuclear technologies, potential impacts, benefits, and risks.

Engage Indigenous Nations throughout the project development lifecycle. Indigenous Nations consulted in this study emphasized that engagement around future project planning should recognize past harms and problematic experiences with energy, industrial, and infrastructure development and should not assume that potential benefits are always desirable or outweigh historical or ongoing experiences.

Conclusion:

- **Integrate ECJ and Indigenous Nation considerations into advanced nuclear community engagement efforts and project development.**

This should include the following aspects:

1. Pursue multiple methods of public participation in project development that reduce barriers that would otherwise prevent robust engagement. This approach can acknowledge that many more sites are likely to be considered than are ultimately concluded as viable for development. Accordingly, this approach can ensure that a wide range of engagement opportunities exist early in pre-development work and that as projects mature communities have access to independent subject matter experts and other resources to help inform their perspectives and participation.

2. Consult with Indigenous Nations to help inform and guide engagement on site-specific nuclear projects and the range of relevant topics. This could include project siting, operations, emergency preparedness, decommissioning, and long-term stewardship and Government-to-Government Consultation Protocols where needed.

Acronyms and Abbreviations

CLCPA	Climate Leadership and Community Protection Act
CP-42	Commissioner Policy 42: Contact, Cooperation, and Consultation with Indian Nations
DEC	New York State Department of Environmental Conservation
DOE	U.S. Department of Energy
DPC	New York State Disaster Preparedness Commission
DPS	New York State Department of Public Service
ECJ	environmental and climate justice
EPA	U.S. Environmental Protection Agency
EPZ	emergency planning zone
FEMA	U.S. Federal Emergency Management Agency
LWR	light-water reactor
Master Plan	Master Plan for Responsible Advanced Nuclear Development in New York
NRC	U.S. Nuclear Regulatory Commission
NYS	New York State
NYSDOH	New York State Department of Health
NYSERDA	New York State Energy Research and Development Authority
REP	radiological emergency preparedness
STEM	science, technology, engineering, and mathematics

Endnotes

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