

Just Transition Working Group

Meeting #9

March 23, 2021
1:00pm-3:00pm



Department
of Labor



NYSERDA



Climate Action
Council

Just Transition Working Group (JTWG)

Meeting #9 Agenda

1. Introduction/Roll Call
2. Member Updates
3. Initial Workforce Recommendations
4. Business Impacts
 - a) Preliminary EITE Identification
 - b) Business Challenges and Opportunities
5. Presentation from Professor Emily Grubert, Georgia Tech
6. Power Plants Inventory and Site Reuse Updates
7. Jobs Study Update
8. Next Steps

Member Updates

Recent highlights from Working Group Members

Project Overview - Social Impact Partnerships to Pay For Results Act (SIPPRA)

- **US Dept. of Treasury announced on 3/22 it awarded NYSERDA \$8.2 million in SIPPRA funding**
 - \$7.1 million in potential outcome payments to support clean energy career pathway training and job placement services to unemployed and low-wage workers
 - \$1.1 million to evaluate training effectiveness
- **Project Snapshot:**
 - **Scale & Schedule:** ~660 low-income individuals/priority populations trained over 3 years (soft skills, technical skills, job placement services)
 - **Services & Costs:** Clean energy job training + wrap-around services (~\$10,500 pp)
 - **Payment-linked outcome metric:** increase in earnings relative to comparison group, annually over 6-year period
 - **Partners:**
 - Evaluation: Led by MDRC via randomized control trials comparing earnings of treatment and control groups
 - Project Management: Led by Social Finance with support from TRC

Initial Workforce Recommendations



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Just Transition Working Group Workforce Recommendations

- > CLCPA: The Working Group shall...
 - *...advise the council on issues and opportunities for workforce development and training related to energy efficiency measures, renewable energy and other clean energy technologies, with specific focus on training and workforce opportunities for disadvantaged communities, and segments of the population that may be underrepresented in the clean energy workforce such as veterans, women and formerly incarcerated persons;*
 - *...identify sector specific impacts of the state's current workforce and avenues to maximize the skills and expertise of New York state workers in the new energy economy;*
 - *...advise the council and conduct stakeholder outreach on any other workforce matters directed by the council;*
 - ***prepare and publish recommendations to the council on how to address: workforce development for trade-exposed entities, disadvantaged communities and underrepresented segments of the population***
- > These workforce recommendations:
 - Are preliminary/initial based on input from the JTWG, CAC Advisory Panels and stakeholder input
 - Include “no regrets” strategies that will be useful across pathways scenarios/scoping plans
 - Build on activities already underway by NYSERDA/NYSDOL, others and address gaps
- > Reminder:
 - JTWG also charged with conducting a holistic climate Jobs Study, which will inform more specific recommendations to come from the JTWG upon completion, including much more detailed granularity about workforce opportunities and needs by sector.
 - Outputs from that Jobs Study will be available over the course of 2021 to inform related analyses, with the full study deliverable expected to be complete by the end of 2021

Enabling Initiatives

Initiatives and components required for delivery	Implementation Lead	Time to Develop/Launch	Other key stakeholders
<p>1) Direct Displaced Worker Support:</p> <ul style="list-style-type: none"> • Training fund, On-the-Job Training (OJT), job fairs • More advanced support where facility closures are known ahead of time • Implement training and other support services while individuals are still working; leverage decarbonization-related roles at employers where appropriate (e.g., where business lines align) <ul style="list-style-type: none"> • Retention: need to <i>retain</i> workers at plants where continued operation needed, as well as <i>retrain</i> workers • Leverage opportunities at dual-commodity utilities • Identify distinct strategies and responses for key existing traditional energy sectors: Electric Power Generation, Transmission, Distribution, Storage Fuels, Motor Vehicles <ul style="list-style-type: none"> • Recommended: Survey of conventional power plant workforce to identify career status, future interests, timing needs, and other considerations 	NYS DOL	6-18 months	NYSERDA, DPS, NYPA, unions, Workforce Dev. Institute, developers, training organizations

Enabling initiatives

Initiatives and components required for delivery	Implementation lead	Time to Develop/Launch	Other key stakeholders
<p>2. Further Evaluate Labor Standards (and reach implementation where possible) - Promoting good wages, benefits, local and targeted hiring, employer-led pre-apprenticeship and apprenticeship training through the following, where appropriate, feasible, and permitted by law:</p> <p>Project Labor Agreements, and Community Benefits/Workforce Agreements</p>	NYS DOL	6-12 months	NYSERDA, labor unions, clean energy developers and contractors, Workforce Dev. Institute
<p>3. Targeted Financial Support for Businesses to address DEI and build an inclusive clean energy economy (OJT, support for recruitment, training, hiring, job retention etc. for Disadvantaged Communities and MWBEs, design and installation firms, community-based organizations, start-ups)</p>	NYSERDA	4-6 months	NYS DOL, MWBEs, Start-ups, ESD, Chambers of Commerce
<p>4. Develop Climate Justice and Clean Energy Training Curriculum and Programs with focus on Disadvantaged Communities: Fund programs for K-12 Schools, Technical/P-TECH, Community Colleges and 4-year Colleges/Universities</p>	NYSERDA	12-18 months	NYS DOL, SUNY, CUNY, NYPA, SED, representatives from K-12 schools, BOCES

Enabling initiatives

Initiatives and components required for delivery	Implementation lead	Time to Develop/Launch	Other key stakeholders
<p>5. Comprehensive Career Pathway Programs</p> <p><i>Future Workers (primarily entry-level):</i> Youth Build skills development programs, Job Corp programs, youth apprenticeships, pre-apprenticeships and internships (16-24 yr. olds)</p> <ul style="list-style-type: none"> • Career awareness and supportive services for job placement • Climate Justice Job Corp Fellowships (entry-level and transitioning workers) and OJT <p><i>Existing Workers (transitioning fossil fuel workers, manufacturers, clean energy workers, CBOs, MWBEs, SDVOBs, state/public workforce, etc.):</i></p> <ul style="list-style-type: none"> • Technical Upskilling (curriculum and training equipment) • Career Advancement and management/leadership training 	<p>NYSERDA</p>	<p>3-15 months</p>	<p>NYS DOL, SUNY, CUNY, community-based orgs, labor unions, trade organizations, manufacturing associations including MACNY</p>

Enabling Initiatives

Initiatives and components required for delivery	Implementation lead	Time to Develop/Launch	Other key stakeholders
6. Community Engagement, Stakeholder Input, Market Assessments Complete Jobs Study Continued stakeholder engagement to identify/assess industry demand, training/curriculum needs; facilitating communication/forum to share needs and best practices; supporting industry opportunity awareness and recruitment efforts Fossil Fuel Workers: Understand and leverage transferrable skills with complementary training (in both energy and non-energy roles); surveys to understand worker plans for retirement and interest in retraining opportunities	NYSERDA NYSERDA and NYS DOL NYS DOL, NYSERDA, DPS	Ongoing 3-24 months 3-18 months	CAC, Advisory Panels and Working Groups Unions, developers, manufacturers, building owners training orgs, trades associations, K-12 Unions, trade associations, large project developers, clean energy design and install firms

Enabling strategy summary

Initiative #	Description	Action Type	Ease of Implementation	Cost to Develop & Implement
1	Direct Displaced Worker Support	Enabling	Medium/Difficult	\$\$
2	Labor Standards: PLAs and Community Agreements	Enabling	Medium/Difficult	--
3	Targeted Financial Support for Businesses	Enabling	Easy	\$
4	CJ and CE Training Curriculum and Programs	Enabling	Medium	\$
5	Career Pathway Programs (new & existing workers)	Enabling	Easy	\$
6	Community Engagement, Stakeholder Input, Market Assessments	Enabling	Easy/Medium	\$

Business Impacts



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BI Subgroup Members

Subgroup Membership

From JTWG

- > Omar Freilla, Green Worker Cooperatives
- > Patrick Jackson, Corning, Inc.
- > Gary LaBarbera, Construction and Trades Council of Greater New York
- > Michael Padgett, Alcoa
- > Brian Raley, GLOBALFOUNDRIES
- > Randy Wolken, MACNY

From EITE

- > Heather Briccetti, Business Council of New York State
- > Jason Curtis, Nucor Steel
- > Carlos Garcia, NYC-EJA
- > Michael LeMonds, LafargeHolcim

Energy-Intensive Industries and Related Trades

Preliminary Identification



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Reminder: Objective

Climate Leadership and Community Protection Act, § 75-0103:

- > "The Just Transition Working Group shall...Identify **energy-intensive industries** and **related trades**..."

Reminder: Identifying Industries/Trades in NYS: Data Sources, Inputs

> Key Data Sources – Energy-Intensive Industries:

- Value of Shipments, Electricity and Fuel Expenditures and Consumption:
 - U.S. Annual Survey of Manufacturers (2018)
 - U.S. Economic Census: Mining (2017)
 - U.S. EIA Manufacturing Energy Consumption Survey (2018)
- Imports and Exports:
 - U.S. International Trade Commission (2018)
- Process Emissions:
 - **Emissions factors:**
 - IPCC Emissions Factors Database
 - U.S. EPA Office of Air & Radiation, *Estimation of Eligible Sectors and Emissions under H.R. 2454* (2010)
 - **Global Warming Potential source:**
 - Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment (AR5) 20-year figures
 - **Pricing**
 - International Monetary Fund Commodity Pricing
 - United States Geological Survey

> Key Data Sources – Related Trades:

- Employment, Establishments and Worker Wages
 - New York State Department of Labor, Quarterly Census of Employment and Wages (QCEW), Q3 2020
 - EMSI Data Run 2021.1, QCEW Data 2020 Q2 (most recent)
- Occupations
 - New York State Department of Labor Occupational Employment Statistics (OES) Survey, 2016-2019

> Other Inputs:

- Value of Carbon:
 - NYS DEC Value of Carbon Guidance: \$125 (2020)
- GHG Emission Factors
 - A combination of U.S.-level and NYS-specific factors were applied to estimate electricity, fuel combustion emissions and non-combustion process emissions across industries.

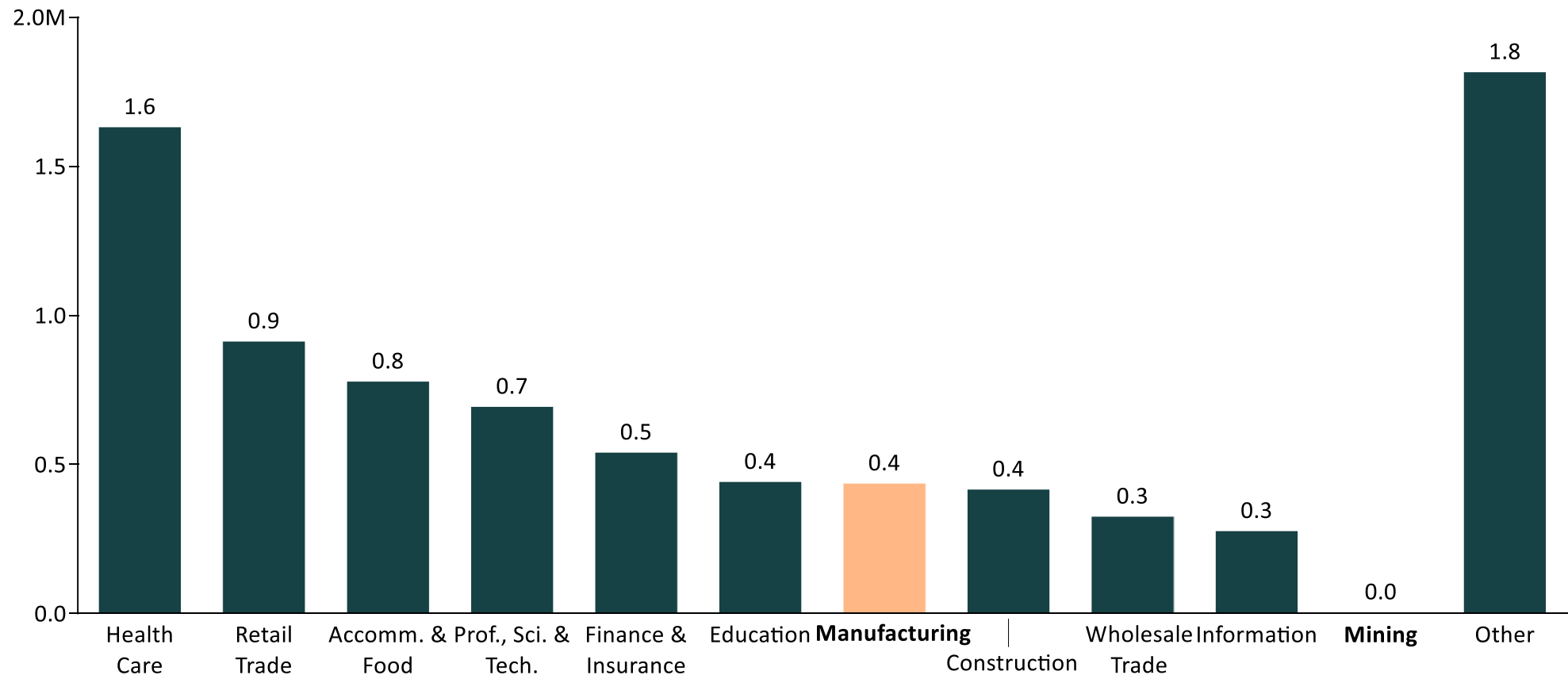
Reminder: Identifying Industries/Trades in NYS:

Key Limitations

- > Industry data was available at U.S.-level only
- > Industry data was available for Manufacturing, Mining only
- > Certain data was unavailable at 6-digit NAICS industry and was estimated based on 4-digit or 5-digit NAICS sector-level.
- > Trade data was available at the international trade-level only
- > Electricity and fuel combustion GHG emissions were based on estimates of amounts of electricity and fuel consumed.
- > Process GHG emissions were estimated only for a subset of industries likely to have significant process emissions based on estimated production volumes.
- > The NYS value of carbon was used to quantify GHG emissions intensity due to the lack of an applicable emission price.
- > Data was compiled across different sources and reporting years.

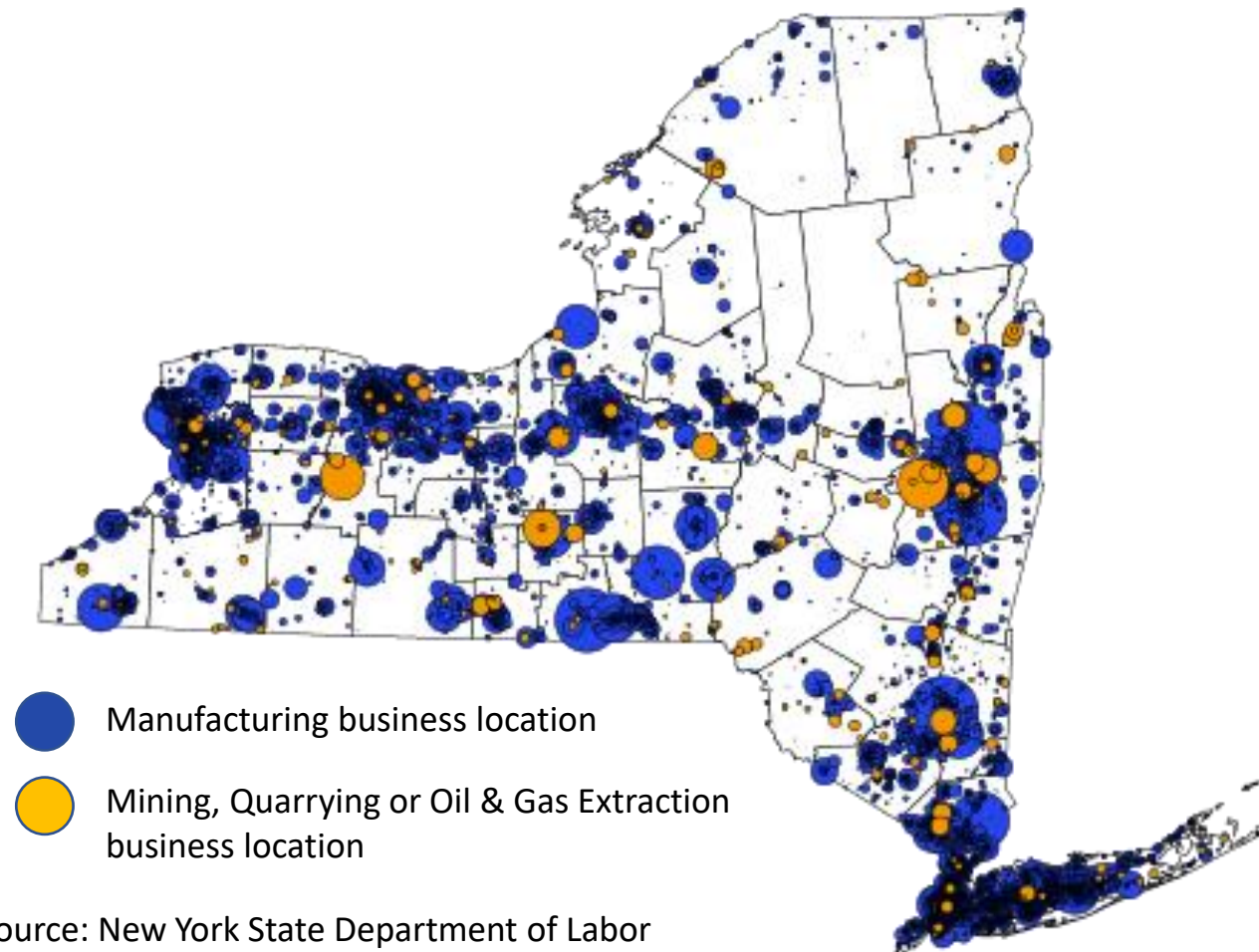
Reminder: EITE sectors have historically been concentrated in Manufacturing, Mining

Private Sector Employment in New York State
(Millions of Jobs, 2019)



Source: Economic Modeling Systems, Intl. (EMSI) 2020.3, 2019 QCEW Q4
Note: Other includes Agriculture, Forestry, Utilities, Transportation, Warehousing, Real Estate, Management of Companies, Admin and Support, Arts, Entertainment and Other Services.

Reminder: Manufacturing and Mining Sectors Span the State



Source: New York State Department of Labor

Manufacturing and Mining Industries in New York State:

- ~17,000 Business Locations
- ~404,000 Jobs
 - ~399,000 Manufacturing
 - ~5,000 Mining, Quarrying or Oil & Gas Extraction
- Top Manufacturing industries (by jobs)
 - Pharmaceutical Preparation Manufacturing
 - Commercial Printing (except Screen and Books)
 - All Other Plastics Product Manufacturing
 - Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
 - Machine Shops

Top New York State Occupations within Manufacturing Industries

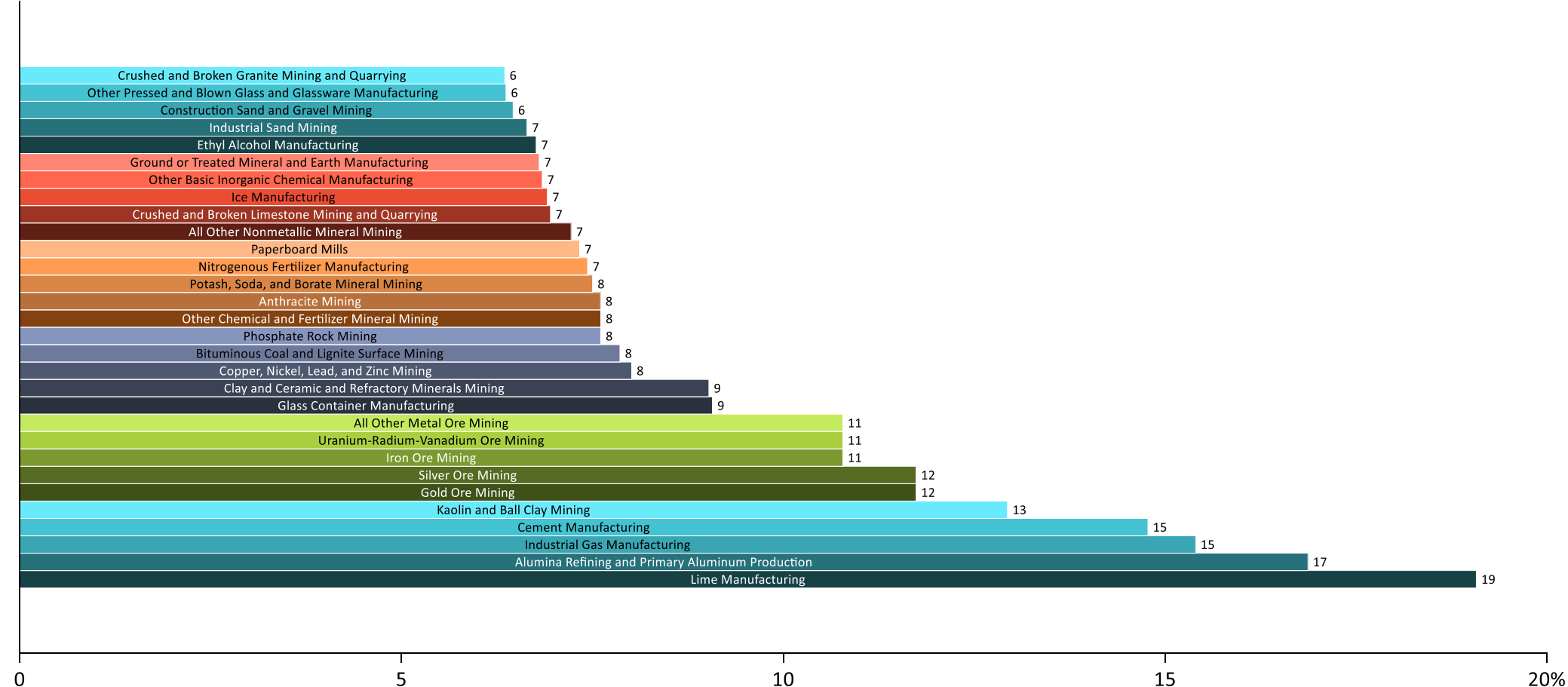
SOC Code	Occupational Title	Employment	% Of Industry Employment
-	Total all occupations	440,547	100.00%
51-2090	Miscellaneous Assemblers and Fabricators	29,125	6.61%
51-1011	First-Line Supervisors of Production and Operating Workers	17,531	3.98%
51-9111	Packaging and Filling Machine Operators and Tenders	14,744	3.35%
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	13,825	3.14%
51-2028	Electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers	11,969	2.72%
51-4041	Machinists	11,875	2.70%
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	9,992	2.27%
11-1021	General and Operations Managers	9,782	2.22%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	9,038	2.05%
17-2112	Industrial Engineers	8,685	1.97%
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	7,546	1.71%
51-4121	Welders, Cutters, Solderers, and Brazers	7,337	1.67%
51-6031	Sewing Machine Operators	7,116	1.62%
51-5112	Printing Press Operators	6,904	1.57%
43-5071	Shipping, Receiving, and Inventory Clerks	6,746	1.53%
43-9061	Office Clerks, General	6,462	1.47%
51-3092	Food Batchmakers	6,265	1.42%
43-4051	Customer Service Representatives	6,258	1.42%
49-9041	Industrial Machinery Mechanics	5,996	1.36%
53-7064	Packers and Packagers, Hand	5,670	1.29%
49-9071	Maintenance and Repair Workers, General	5,236	1.19%
43-5061	Production, Planning, and Expediting Clerks	5,137	1.17%
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	4,910	1.11%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	4,881	1.11%
17-2141	Mechanical Engineers	4,770	1.08%
53-7051	Industrial Truck and Tractor Operators	4,765	1.08%
51-3011	Bakers	4,753	1.08%
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	4,487	1.02%

Top New York State Occupations within Mining & Natural Resources

SOC Code	Occupational Title	Employment	Percent Of Industry Employment
-	<i>Total all occupations</i>	8,222	100.00%
53-3032	Heavy and Tractor-Trailer Truck Drivers	714	8.68%
39-2021	Animal Caretakers	712	8.66%
47-2073	Operating Engineers and Other Construction Equipment Operators	520	6.33%
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	391	4.75%
47-2061	Construction Laborers	390	4.74%
45-4022	Logging Equipment Operators	355	4.32%
53-7064	Packers and Packagers, Hand	327	3.97%
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	233	2.84%
11-1021	General and Operations Managers	233	2.84%
51-9111	Packaging and Filling Machine Operators and Tenders	227	2.76%
43-9061	Office Clerks, General	213	2.60%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	177	2.16%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	167	2.03%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	154	1.87%
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	141	1.71%
39-2011	Animal Trainers	135	1.64%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	132	1.60%
47-5097	Earth Drillers, Except Oil and Gas; and Explosives Workers, Ordnance Handling Experts, and Blasters	122	1.49%
51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	120	1.46%
49-9041	Industrial Machinery Mechanics	114	1.38%
49-9071	Maintenance and Repair Workers, General	96	1.16%
25-3021	Self-Enrichment Teachers	95	1.15%
47-5051	Rock Splitters, Quarry	89	1.08%
51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders	89	1.08%
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	87	1.06%
45-2021	Animal Breeders	83	1.00%

Reminder - Preliminary Results:

Energy Intensity by U.S. Industry – Top 30 (2018)



Source: Business Impacts Subgroup Staff Working Group Analysis.
 Note: Energy intensity is defined as the sum of fuel and electricity expenditures by each industry divided by its value of shipments.

Top New York State Occupations within Top 30 U.S. Industries by *Energy Intensity*

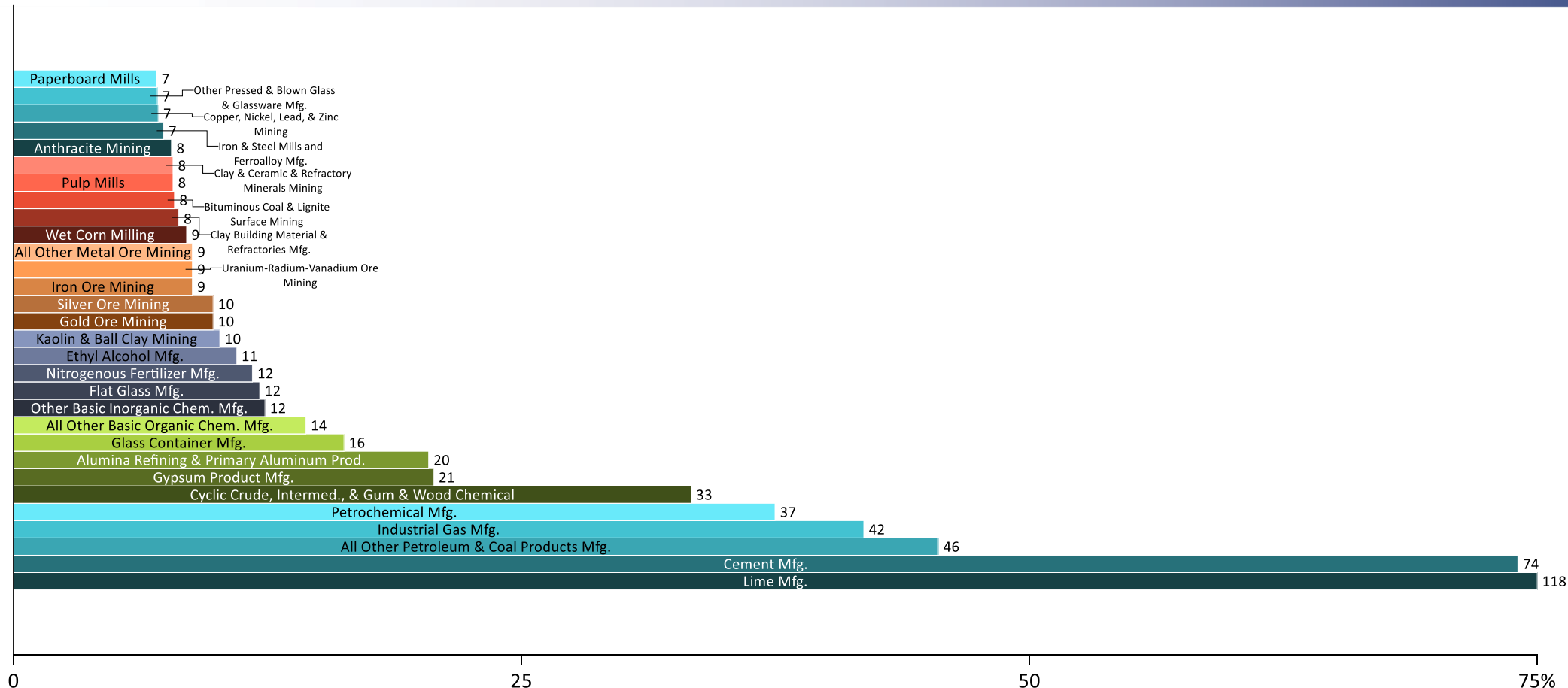
Occupational Title	Employment	% of Industry Employment
Total all occupations	9,391	100.00%
Heavy and Tractor-Trailer Truck Drivers	586	6.24%
Chemical Equipment Operators and Tenders	444	4.73%
Industrial Machinery Mechanics	415	4.42%
Operating Engineers and Other Construction Equipment Operators	407	4.34%
Excavating and Loading Machine and Dragline Operators, Surface Mining	342	3.64%
Construction Laborers	323	3.44%
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	304	3.24%
Packaging and Filling Machine Operators and Tenders	267	2.84%
Inspectors, Testers, Sorters, Samplers, and Weighers	266	2.83%
First-Line Supervisors of Production and Operating Workers	262	2.79%
Miscellaneous Assemblers and Fabricators	239	2.54%
Laborers and Freight, Stock, and Material Movers, Hand	225	2.40%
Maintenance and Repair Workers, General	224	2.39%
Industrial Engineers	186	1.98%
Packers and Packagers, Hand	176	1.88%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	170	1.81%
Mobile Heavy Equipment Mechanics, Except Engines	161	1.72%
General and Operations Managers	148	1.58%
First-Line Supervisors of Construction Trades and Extraction Workers	116	1.24%
Paper Goods Machine Setters, Operators, and Tenders	116	1.24%
Industrial Truck and Tractor Operators	113	1.20%
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	113	1.20%
Electricians	107	1.14%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	104	1.11%
Light Truck Drivers	103	1.10%
Mixing and Blending Machine Setters, Operators, and Tenders	99	1.05%
Bookkeeping, Accounting, and Auditing Clerks	97	1.04%
Office Clerks, General	97	1.03%
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	*	*

Source: New York State Department of Labor, Occupational Employment Statistics (OES) survey, 2016-2019.

Note: *Indicates data is not releasable under DOL confidentiality protocols.

New - Preliminary Results:

Emission Intensity by U.S. Industry – Top 30 (2018)



Source: Business Impacts Subgroup Staff Working Group Analysis.

Notes 1. Emission intensity is defined for each industry as: i) the product of: a) the sum of direct fuel, direct non-combustion process and indirect electricity emissions; and b) the NYS value of carbon \$125; ii) divided by its value of shipments. 2. X-axis has been capped at 75% to enhance visibility of industries relative to extreme value of Lime Manufacturing.

Top New York State Occupations within Top 30 U.S. Industries by *Emission Intensity*

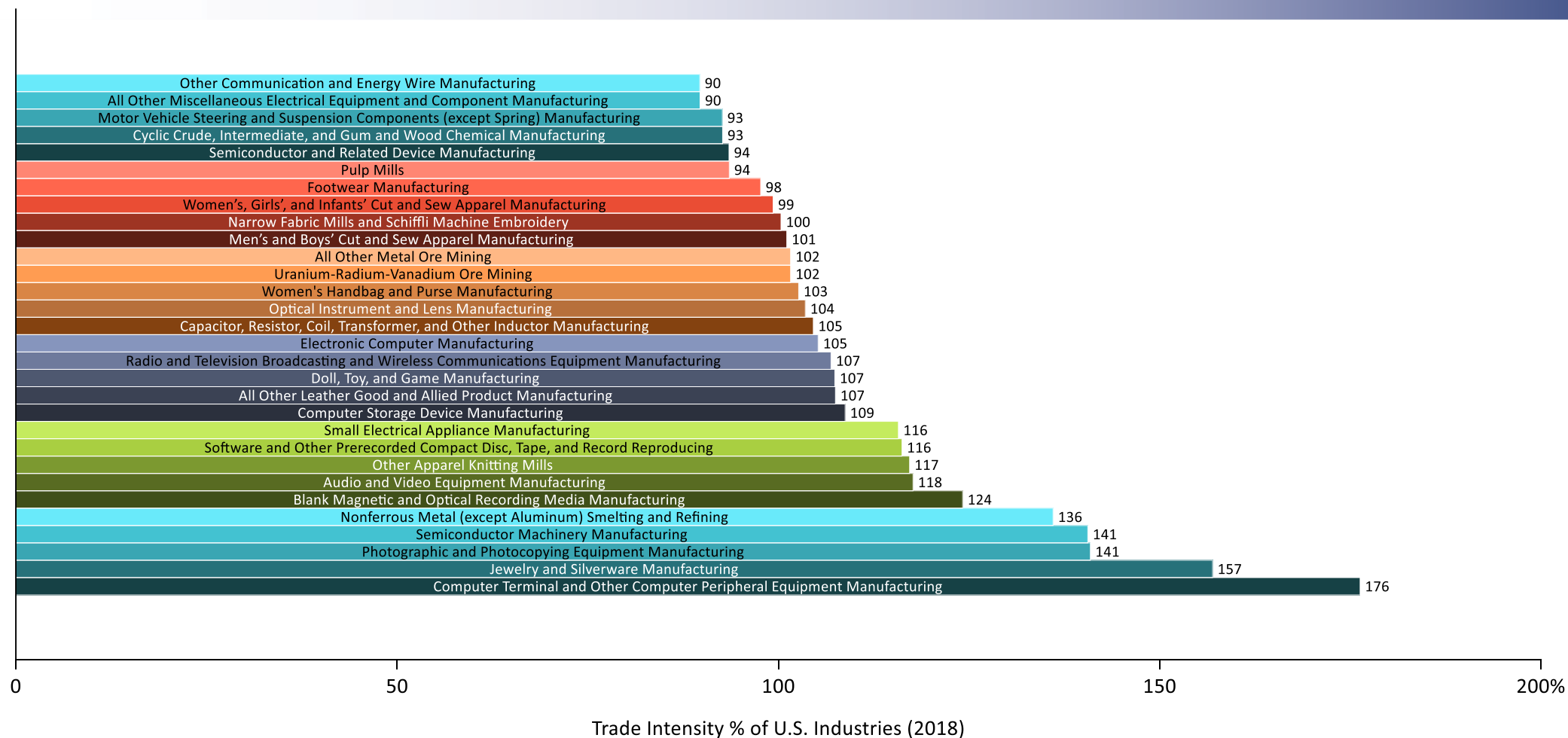
SOC Code	Occupational Title	Employment	% Of Industry Employment
-	Total all occupations	8,756	100.00%
51-9011	Chemical Equipment Operators and Tenders	685	7.82%
49-9041	Industrial Machinery Mechanics	554	6.32%
51-2090	Miscellaneous Assemblers and Fabricators	431	4.92%
51-1011	First-Line Supervisors of Production and Operating Workers	420	4.79%
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	298	3.41%
17-2112	Industrial Engineers	278	3.18%
49-9071	Maintenance and Repair Workers, General	273	3.12%
47-2111	Electricians	264	3.01%
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	256	2.93%
51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	212	2.43%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	208	2.37%
53-7064	Packers and Packagers, Hand	196	2.24%
51-9111	Packaging and Filling Machine Operators and Tenders	196	2.23%
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	182	2.08%
43-5071	Shipping, Receiving, and Inventory Clerks	146	1.67%
53-7051	Industrial Truck and Tractor Operators	141	1.61%
11-1021	General and Operations Managers	139	1.59%
11-3051	Industrial Production Managers	127	1.45%
51-4041	Machinists	122	1.39%
51-8091	Chemical Plant and System Operators	120	1.37%
51-9196	Paper Goods Machine Setters, Operators, and Tenders	116	1.33%
51-9195	Molders, Shapers, and Casters, Except Metal and Plastic	104	1.19%
43-5061	Production, Planning, and Expediting Clerks	101	1.16%
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	94	1.07%
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	*	*
51-4051	Metal-Refining Furnace Operators and Tenders	*	*

Source: New York State Department of Labor, Occupational Employment Statistics (OES) survey, 2016-2019.

Note: *Indicates data is not releasable under DOL confidentiality protocols.

Reminder - Preliminary Results:

Trade Intensity by U.S. Industry – Top 30



Source: Business Impacts Subgroup Staff Working Group Analysis

Note: Trade intensity is defined as each industry's sum of imports and exports divided by the sum of its value of shipments and imports.

Top New York State Occupations within Top 30 U.S. Industries by *Trade Intensity*

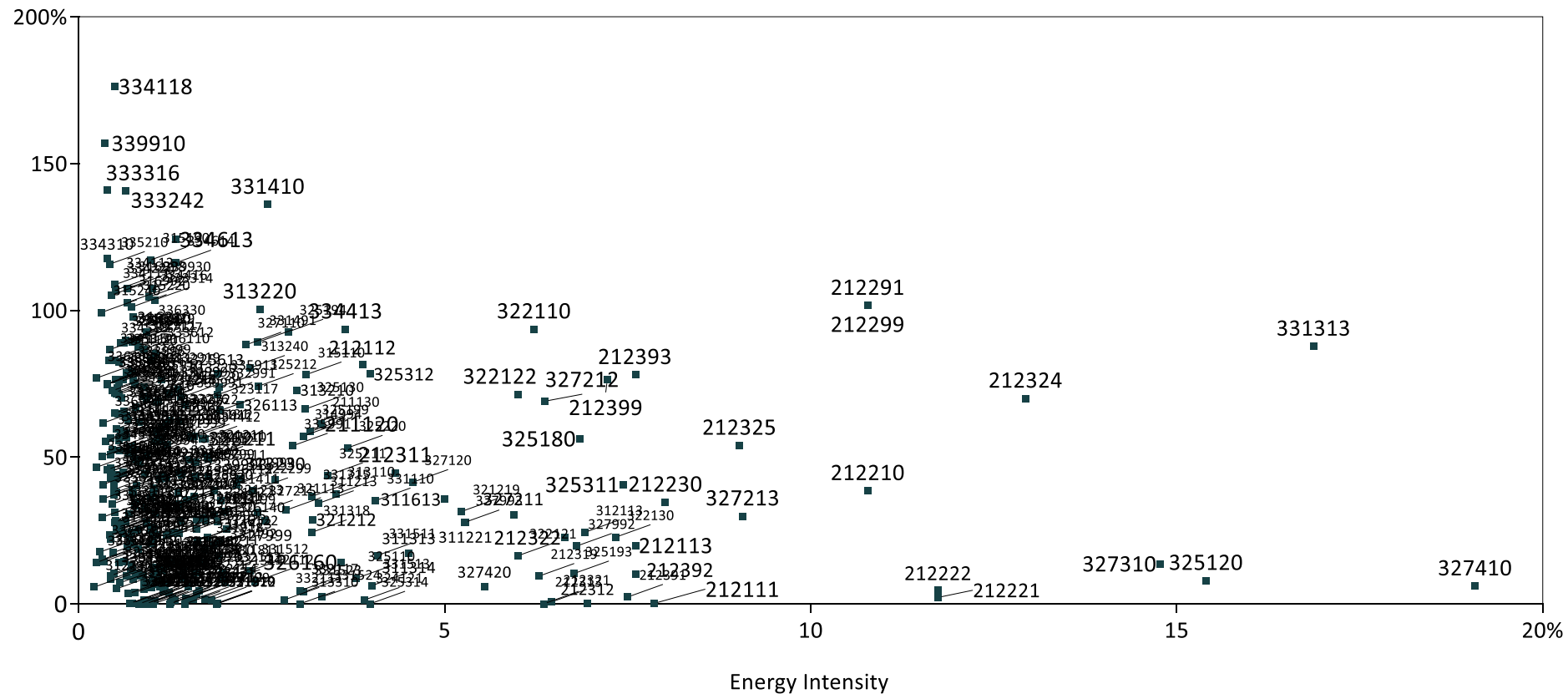
SOC Code	Occupational Title	Employment	% Of Industry Employment
-	Total all occupations	45,817	100.00%
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	3,747	8.18%
51-2028	Electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers	2,543	5.55%
51-6031	Sewing Machine Operators	2,138	4.67%
17-2112	Industrial Engineers	1,759	3.84%
51-9071	Jewelers and Precious Stone and Metal Workers	1,724	3.76%
17-2071	Electrical Engineers	1,498	3.27%
11-1021	General and Operations Managers	1,149	2.51%
51-1011	First-Line Supervisors of Production and Operating Workers	1,089	2.38%
17-2141	Mechanical Engineers	1,066	2.33%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	1,009	2.20%
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	983	2.14%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	907	1.98%
43-4051	Customer Service Representatives	860	1.88%
51-2090	Miscellaneous Assemblers and Fabricators	857	1.87%
15-1211	Computer Systems Analysts	775	1.69%
13-1020	Buyers and Purchasing Agents	714	1.56%
17-3026	Industrial Engineering Technologists and Technicians	704	1.54%
43-5071	Shipping, Receiving, and Inventory Clerks	619	1.35%
43-9061	Office Clerks, General	586	1.28%
15-1232	Computer User Support Specialists	584	1.28%
11-9041	Architectural and Engineering Managers	560	1.22%
13-1161	Market Research Analysts and Marketing Specialists	554	1.21%
13-2011	Accountants and Auditors	530	1.16%
11-3021	Computer and Information Systems Managers	529	1.15%
51-9083	Ophthalmic Laboratory Technicians	519	1.13%
43-5061	Production, Planning, and Expediting Clerks	501	1.09%
17-2072	Electronics Engineers, Except Computer	488	1.07%
27-1022	Fashion Designers	482	1.05%
17-2199	Engineers, All Other	470	1.03%
13-1198	Project Management Specialists and Business Operations Specialists, All Other	467	1.02%
51-9141	Semiconductor Processing Technicians	*	*
13-1111	Management Analysts	*	*
51-2031	Engine and Other Machine Assemblers	*	*

Source: New York State Department of Labor, Occupational Employment Statistics (OES) survey, 2016-2019.

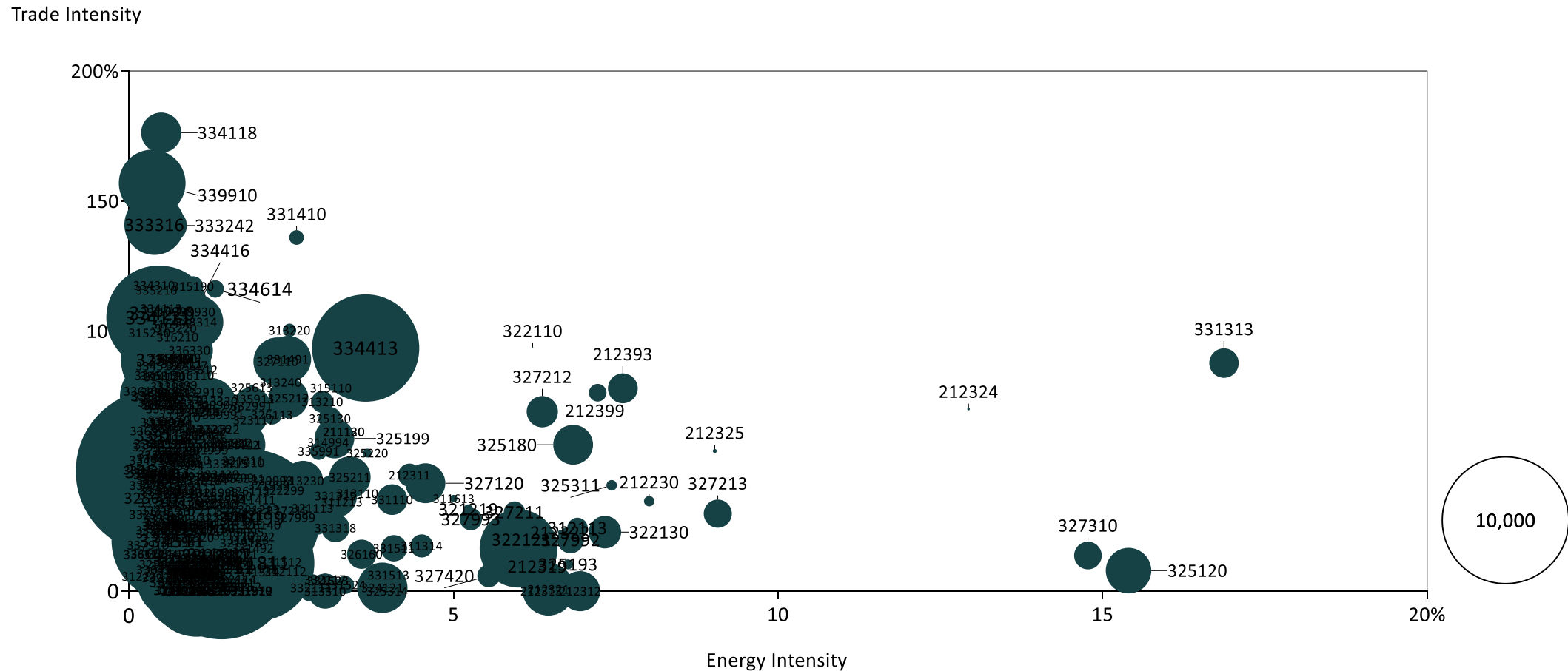
Note: *Indicates data is not releasable under DOL confidentiality protocols.

Preliminary Results: Energy vs. Trade Intensity U.S. Manufacturing and Mining Industries (2018)

Trade Intensity



Preliminary Results: Energy vs. Trade Intensity by NYS Employment: Manufacturing and Mining

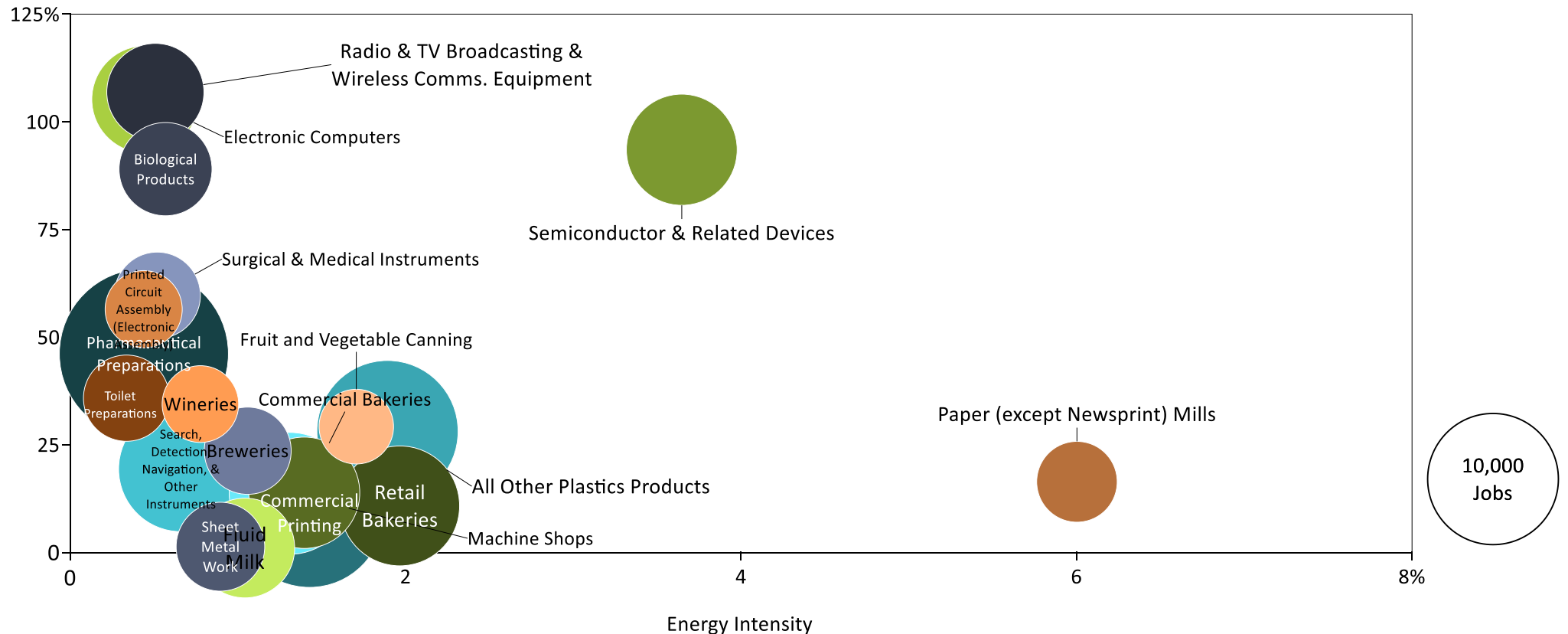


Source: Business Impacts Subgroup Staff Working Group Analysis
Note: Industries are denoted by six-digit NAICS code.

Preliminary Results: Energy vs. Trade Intensity

Top 20 Manufacturing Industries by NYS Jobs

Trade Intensity

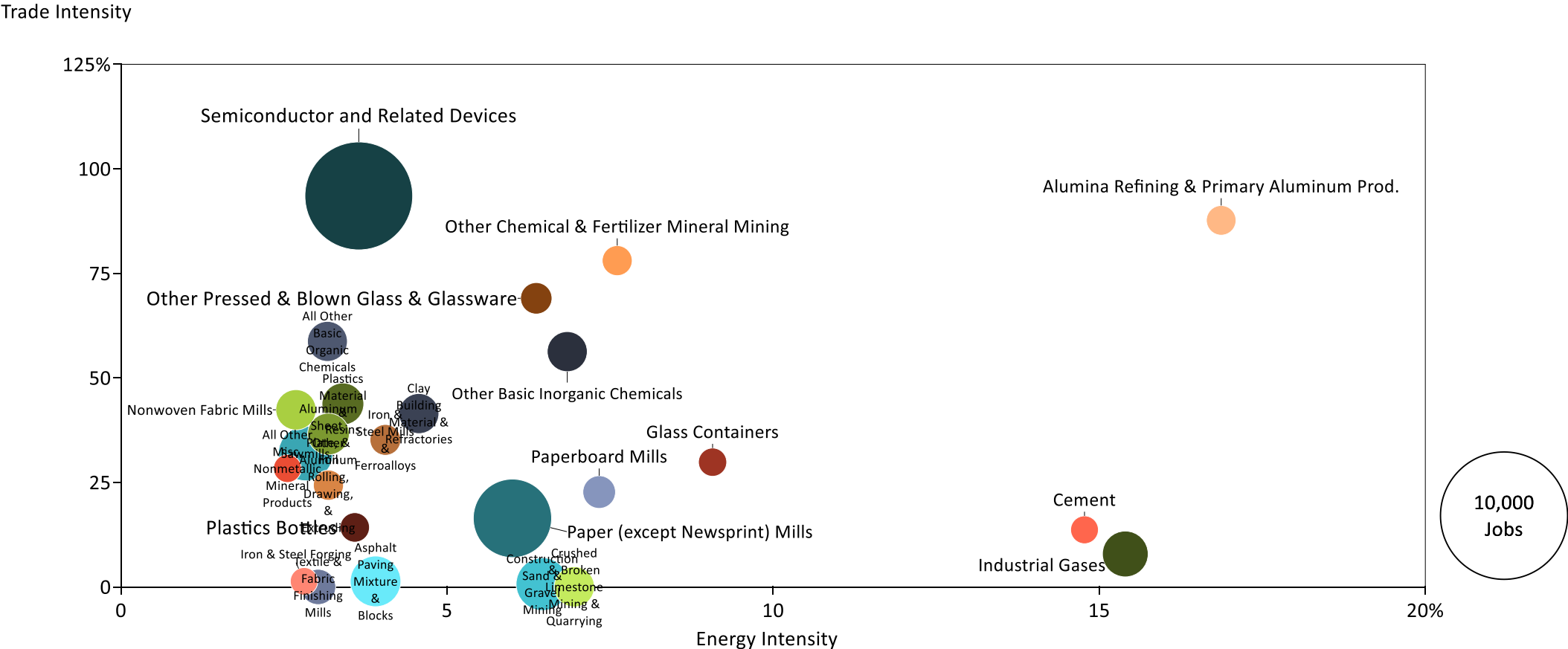


Source: Business Impacts Subgroup Staff Working Group Analysis

Note: Includes top 20 largest Manufacturing industries regardless of energy or trade intensity; no Mining industries were in the top 20.

Preliminary Results: Energy vs. Trade Intensity

NYS Industries >2.5% Energy Intensity, >450 Jobs



Source: Business Impacts Subgroup Staff Working Group Analysis.
Note: Energy intensity and jobs thresholds used only for data visualization and do not represent formal criteria.

Discussion: Reflections on Energy-Intensive Industries and Related Trades Analysis

> For Full Results, See Companion Excel File

Business Impacts

Challenges and Opportunities

March 23, 2021



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Just Transition Workstream: Business Challenges and Opportunities

Scope workstream: Business Impacts

Context:	The Business Impacts subgroup identified the following for consideration by the Just Transition Working Group. These suggestions should be viewed as preliminary, broadly crafted for the whole of industry based on a general understanding of what a transition to a clean energy economy could mean, and warrant further exploration on a sector and subsector basis before prescribing any course of action. In accordance with the statute and to complement the EITE panel, these are not mitigation or enabling strategies (i.e., result in direct or indirect sectoral greenhouse gas emissions reductions). Potential national-level policy should be monitored for its implications to state industries and proposed courses of action provided here.
Statutory objectives:	Recommendations on how to address: <ul style="list-style-type: none">• Issues and opportunities related to the energy intensive and trade exposed entities• Measures to minimize the carbon leakage risk and minimize anti-competitiveness impacts of any potential carbon policies and energy sector mandates
Deliverable:	An initial identification and cataloging of challenges, including leakage, and opportunities with a menu of potential options for minimization (challenges) and realization (opportunities).

Business Challenges and Opportunities List

Catalog List

Challenges 1. Business and emissions leakage 2. Electricity/fuel costs, system reliability	Potential Strategies 1a. Incentives for early action, benchmarks 1b. Cap and invest*, output-based rebates* 2. Low cost, clean power programs, energy efficiency, on-site renewable electricity and energy storage,
Opportunities 1. Build and foster strategic partnerships 2. Promote low carbon products	Potential Strategies 1. Consortia, economic development groups, partnerships with K-12, technical schools, and colleges, business outreach and awareness 2. Recognition, procurement policies, regional/national cooperation to expand markets for low carbon products

**Potential strategies should an emissions scheme applicable to industry be contemplated*

Business Challenges and Strategies

Challenge:	Business and Emissions Leakage (1 of 5)
Nature of the challenge:	<ul style="list-style-type: none">• When there is an increase in greenhouse gas emissions (GHGs) in one jurisdiction as a result of an emissions reduction in another jurisdiction.• Leakage can occur when economic activity that emits GHGs relocates from a jurisdiction that has adopted climate change mitigation policies to another jurisdiction that has not.
Additional considerations:	<ul style="list-style-type: none">• Studies suggest the occurrence of leakage may be less than perceived: most project less than 10% leakage, many project less than 5% leakage (Aldy, 2017).*• The World Trade Organization (WTO) General Agreement on Tariffs and Trade (GATT) limits the nature of economic attraction activity and should be considered in any economic development and retention strategies including clean energy.**• Potential national-level policy should be monitored for its implications to any state-proposed course of action.

* Greg Dotson, Presentation to the Just Transition Working Group, Nov. 2020

** World Trade Organization, United States – Certain Measures Relating to the Renewable Energy Sector, Report of the Panel, WT/DS510/R, June 27, 2019.

Business Challenges and Strategies

Challenge: Business and Emissions Leakage (2 of 5)	
Potential Strategy	Examples, including case studies
<p>Incentives for Early Action</p> <p><u>Description:</u> Support early adopters of decarbonization technologies/solutions. Provide a means of inducing or supporting early emission reductions by industrial actors, including reason to act as early technology/solutions adopters.</p> <p><u>Considerations:</u></p> <ul style="list-style-type: none">• Benchmarking between state-based industries, nationally, globally• Baseline year for emissions reductions• Alignment with other requirements or programs (e.g., Science-based Targets Initiative)• Ensure that early actors are not later penalized for taking early actions (i.e., industrial opportunities only go to those who have not taken early action to reduce emissions)• Treatment of facilities in disadvantaged communities	<p><u>Extended compliance:</u> Facilities would commit to reducing GHG years ahead of the 2030 or 2050 deadlines and receive an extension for compliance with any DEC drafted regulations for specific sectors. Example: EPA's Hazardous Air Pollutant (HAP) Early Reduction: Program allows a qualifying facility to defer compliance with Maximum Available Control Technology (MACT) standards for 6 years if it reduces HAP emissions by 90 percent (95 percent for hazardous particulate emissions) before the applicable MACT is proposed.</p> <p><u>Emission Reductions Alberta Shovel-Ready Challenge:</u> Provides funding for industrial emissions reduction pilots, demonstrations, and first-of-its-kind deployment projects that can begin within 60 days.</p> <p><u>RD&D pilot funding:</u> De-risk initial investment in early-stage technologies and encourage early adoption.</p> <p><u>Low-cost financing:</u> De-risk initial investment in early-stage technologies and encourage early adoption.</p>

Business Challenges and Strategies

Challenge: Business and Emissions Leakage (3 of 5)

Potential Strategy	Examples, including case studies
<p>Set Industry Specific Benchmarks</p> <p><u>Description:</u> A tool used to compare emissions intensity of production. The benchmark can be used to determine compliance with a strategy or program; it can also be used to determine qualification for incentives. It can be measured on a percentage basis or an output basis.</p> <p><u>Considerations:</u></p> <ul style="list-style-type: none">• Alignment with reductions in any proposed emissions scheme• Different levels of emissions reductions already achieved by different industries• Benchmarks for fuel, process emissions (e.g., British Columbia)• Benchmarking between state-based industries, nationally, globally (e.g., only two cement manufacturers in NYS)• Connect to crediting early actors• Evolution as industry improves	<p><u>CA:</u> Uses sector product metrics. In order to account for energy flow carbon costs, adjustment factors were used. Finally, a targeted stringency level was created by the evaluation of production-weighted average emissions intensity for the duration of a historical base period. This evaluation was followed by a target that the benchmark allocate 90% of this stringency level per unit product.</p> <p><u>EU:</u> For ETS third phase (2013-2020), benchmarks were based on an amount which reflected the average emissions performance of the top 10% of installations which produced that product. The same method was used for the fourth phase, although benchmark values will be updated in order to accurately reflect technological progress (2021-2025 and again for 2026-2030).</p> <p><u>British Columbia:</u> (Fuel emissions only) The region's carbon tax applies to fuels combusted in industry. A program called CleanBC for Industry allocates funding equivalent to tax paid by industry to incentivize less-polluting operations.</p>

Business Challenges and Strategies

Challenge: Business and Emissions Leakage (4 of 5)

Potential Strategy	Examples, including case studies
<p>Cap and Invest</p> <p><u>Description:</u> Allowances to pollute are required for industrial emissions</p> <p><u>Considerations:</u></p> <ul style="list-style-type: none">• Allowances could be structured to allow an on-ramp to full compliance.• Likely easier to implement than a carbon border adjustment.• Cap, bankability, tradability of allowances• Benchmarking between state-based industries, nationally, globally• Treatment of facilities in disadvantaged communities.	<p><u>California:</u> Distribution through a combination of quarterly auctions and direct distribution (majority sold at auction). Percentage of total emissions covered by distributed emission allowances depends on the industry and facility efficiency in relation to industry intensity benchmarks.</p> <p><u>Canada:</u> Jurisdictions enact either a price-based system or a cap-and-trade system. For example, in the Nova Scotia cap-and-trade system, industrial facilities receive allowances based on production intensity benchmarks.</p> <p><u>EU:</u> Sectors and sub-sectors determined to be at risk of significant carbon leakage are allocated a greater share of distributed allowances in comparison to other industries. This policy is projected to continue through 2030.</p>

Business Challenges and Strategy

Challenge: Business and Emissions Leakage (5 of 5)

Potential Strategy

Output-based Rebates (OBRs)

Description: Receive a payment per unit of production for manufactured goods that fall below an emissions intensity benchmark. This solution potentially reduces the monetary burden of a carbon pricing regulatory scheme.

Considerations:

- Benchmarking between state-based industries, nationally, globally
- Frequently proposed in lieu of a carbon border adjustment mechanism
- Eligibility, structure, and level of compensation, including right-sizing the administrative burden relative to benefits
- Treatment of facilities in disadvantaged communities

Examples, including case studies

American Clean Energy and Security (ACES) Act: Proposed to grant OBRs to industries with annual carbon dioxide emissions of 731 million metric tons in 2006.*

Canadian Output Based Pricing Regulations: Rebate mechanism in Canada's Carbon Tax system for covered facilities generating greater than 50 kilotons CO₂e**. Benchmarks are set as a percentage of the production-weighted national average of emission intensity with careful attention to heterogeneity of processes within sectors.

*Kaufman et al., *Output-Based Rebates: An Alternative to Border Carbon Adjustments for Preserving US Competitiveness*, Dec. 2020.

**Covered facilities with emissions ranging from 10kt to 50kt CO₂e may opt-in.

Business Challenges and Strategy

Challenge:	Electricity/Fuel Costs, System Reliability (1 of 2)	
Nature of the challenge:	Electricity and fuel are two important industrial inputs that must be managed to avoid increased operational costs. Severe and sustained price increases may lead to underinvestment and, if sustained for a prolonged period of time, may result in business leakage and job losses. Industry also relies on a stable electricity (generation and transmission) system to power their operations and manufacture goods and provide services.	
Additional considerations:	<ul style="list-style-type: none">• Electricity and fuel prices are subject to many factors not solely controlled by the State.• Electric system reliability is critical to all economic sectors, including industry.• Power Generation Advisory Panel recommendations for how electricity, fuel costs, and system reliability.	
Potential Strategy		Examples, including case studies
Low-Cost, Clean Power Programs <u>Description:</u> Provide access to low cost, clean energy resources to help to reduce emissions associated with industrial electricity demand. Focus in areas/companies with high electricity demand and in-state jobs. <u>Considerations:</u> <ul style="list-style-type: none">• NYPA hydropower is a limited resource, already deployed to many EITEs• Building and fostering markets for competitive renewable resources		<ul style="list-style-type: none">• <u>NYPA Economic Development Hydropower Programs</u><ul style="list-style-type: none">○ NYPA Green Jobs Incentive Plan• <u>Washington State:</u> Benefits from low-cost electricity provided by the Grand Coulee Dam

Business Challenges and Strategies

Challenge:

Electricity/Fuel Costs, System Reliability (2 of 2)

Potential Strategy

Support On-Site Energy Efficiency, Renewable Electricity Generation, Energy Storage

Description: Some industrial users may be able to reduce electricity costs and emissions while securing back-up power by increasing energy efficiency and installing on-site, renewable energy and/or storage.

Considerations:

- Interconnection
- Local capacity/reliability
- Use cases/economics

Examples, including case studies

NYSERDA Programs: Flexible Technical Assistance (FlexTech) Program, Commercial and Industrial (C&I) Carbon Challenge, Commercial New Construction, Strategic Energy Management, NY-Sun, Energy Storage, Heat Pumps

NYPA Energy Services: Energy Efficiency, Solar PV, Wind, Energy Storage, Micro-Grids, New York Energy Manager, Electric Vehicle Charging Infrastructure and Streetlighting upgrades delivered on a turnkey, advisory and/or service basis.

New York Examples:

- Pepsi's bottling center in Newburgh has 400kW solar system on the roof
- GE Healthcare in Troy has a 950kW solar system
- GE Power in Schenectady has a 2.2MW solar system

Business Opportunities and Strategies

Opportunity	Strategic Partnerships
Nature of the opportunity:	Businesses, including manufacturers, can produce the goods and services of a clean energy economy. To help businesses understand the opportunity spaces and adopt best practices, outreach to and collaboration among relevant actors (e.g., clean energy developers, manufacturers, state agencies) should be fostered.
Potential Strategy	Examples, including case studies
Partnerships <ul style="list-style-type: none">• Consortia• Economic development working groups• Partnerships with K-12, technical schools, colleges• Business outreach and awareness (PEP/MI, Business Council, NYS Economic Development Council, MACNY) <u>Considerations:</u> <ul style="list-style-type: none">• Challenges for connecting with companies, including decisionmakers, whose headquarters is outside NY	Partnerships: <ul style="list-style-type: none">• <u>Consortia</u>: NY-Battery Energy and Storage Technology (NY-BEST), Offshore Wind R&D Consortium• <u>Economic Development Working Group</u>: NYS working group to facilitate clean economic development and provide consulting. One stop shop for businesses looking to expand, retain or meet CLCPA goals.• <u>NYSTAR-Funded Centers</u>: Stony Brook University, RPI, Syracuse• <u>EPA ENERGY STAR Industrial Partnership</u>: A network of industrial energy managers who share best practices and practical advice across industries in a non-competitive and no-sell environment.

Business Opportunities and Strategies

Opportunity	Promote Low Carbon Practices and Products
Nature of the opportunity:	Provide a means of distinguishing goods and services produced with lower greenhouse gas emissions to encourage development, demand, and consumption of such goods and services.
Potential Strategies	Examples, including case studies
<p>Recognition Program <u>Description:</u> Develop a state-focused program to identify and promote best practices and industrial leadership in emissions reduction and low carbon products. <u>Considerations:</u></p> <ul style="list-style-type: none">• Benchmarking <p>Public Procurement Policies <u>Description:</u> Develop preferential procurement standards for low-carbon building and other materials as appropriate.</p> <p>Cooperation to Expand Markets for Low Carbon Products <u>Description:</u> Coordinate with other states and at a national level to develop mutual mechanisms to support growing markets for low carbon products.</p>	<p>(Recognition) <u>DOE Better Plants:</u> Works with 223 leading manufacturers and water utilities to achieve energy efficiency improvements, providing national recognition, technical support, in-plant trainings, and energy-saving resources to partners. The partners generally set targets to decrease their energy intensity by 25% over a period of ten years.</p> <p>(Recognition) <u>EPA ENERGY STAR:</u> Provides recognition that validates good work, raises awareness of the value of energy management, and drives further energy savings. Manufacturing plants must achieve an ENERGY STAR score of 75 or higher using an industry-specific ENERGY STAR Energy Performance Indicator (EPI).</p> <p>(Procurement, Expanding Markets) <u>Buy Clean California Act:</u> Requires the California Department of General Services to establish maximum acceptable Global Warming Potential (GWP) for various products.</p> <p>(Expanding Markets) <u>Database:</u> State/national database for common standards, Environmental Product Declarations (EPDs) (expanding markets)</p>



Fossil electricity retirement deadlines

Emily Grubert

Assistant Professor

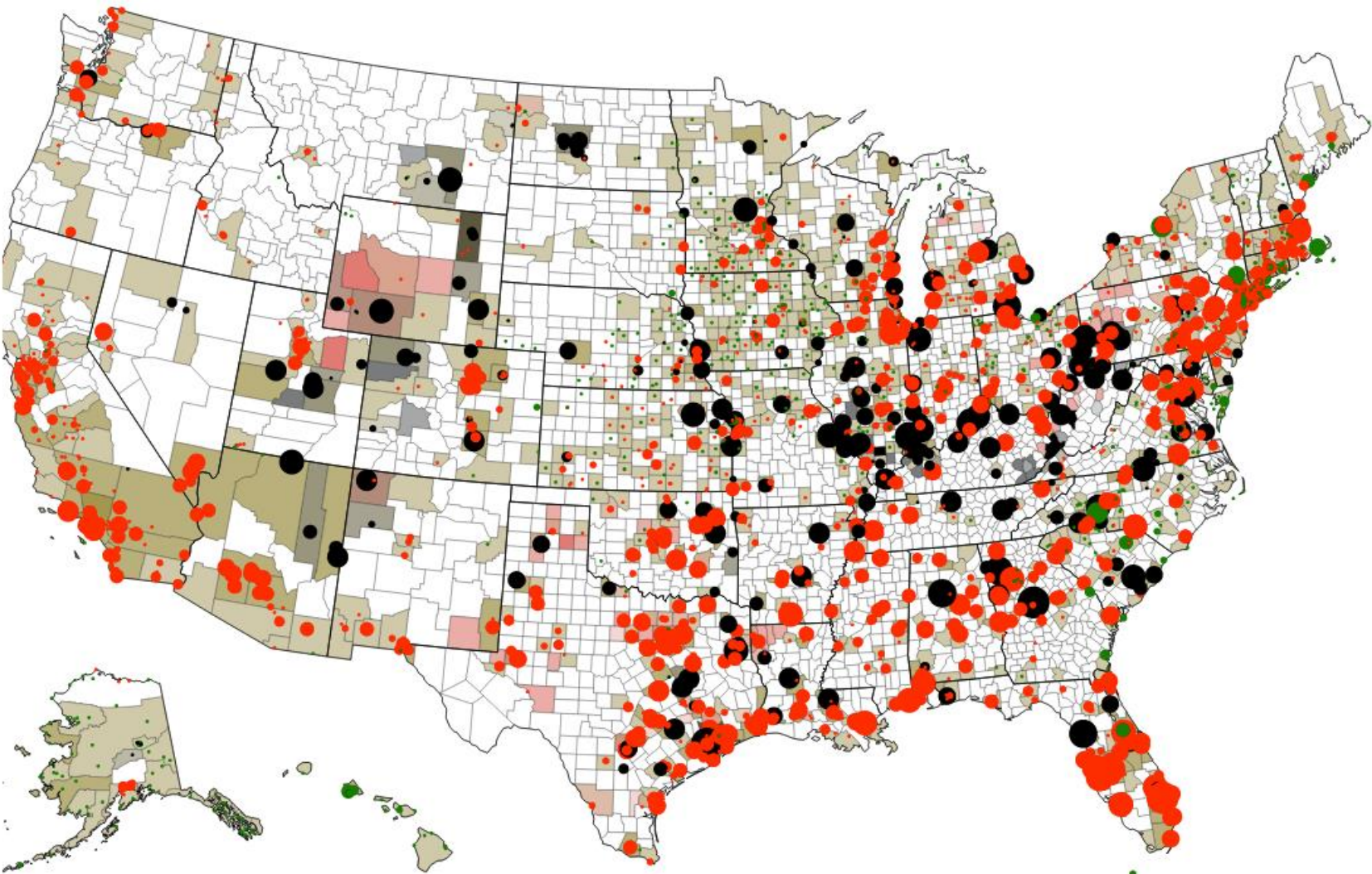
Civil and Environmental Engineering

23 March 2021

The future of United States fossil fuel-fired electricity

Environmental and labor implications of retiring generators at the end of their typical lifespans

Analysis: [E. Grubert, Georgia Tech](#). Web map implementation: R. Phillips. 2020.



Display Year

Move slider to display conditions for a given year

2018

Hover over a plant or county for details
Scroll or double click to zoom
Click and hold to drag

Totals in Selected Year

820 GW
2600 TWh
2100 million short tons CO₂
1300000 short tons NO_x
1500000 short tons SO₂
920 billion gallons water consumption
160000 jobs

Data

Background and calculations: [Grubert 2020, Science](#)
Major inputs: [EIA 860](#), [eGRID 2018v2](#),
[BLS Quarterly Census of Employment and Wages](#),
[Grubert & Sanders 2018, ES&T](#)

Legend

Power Plants

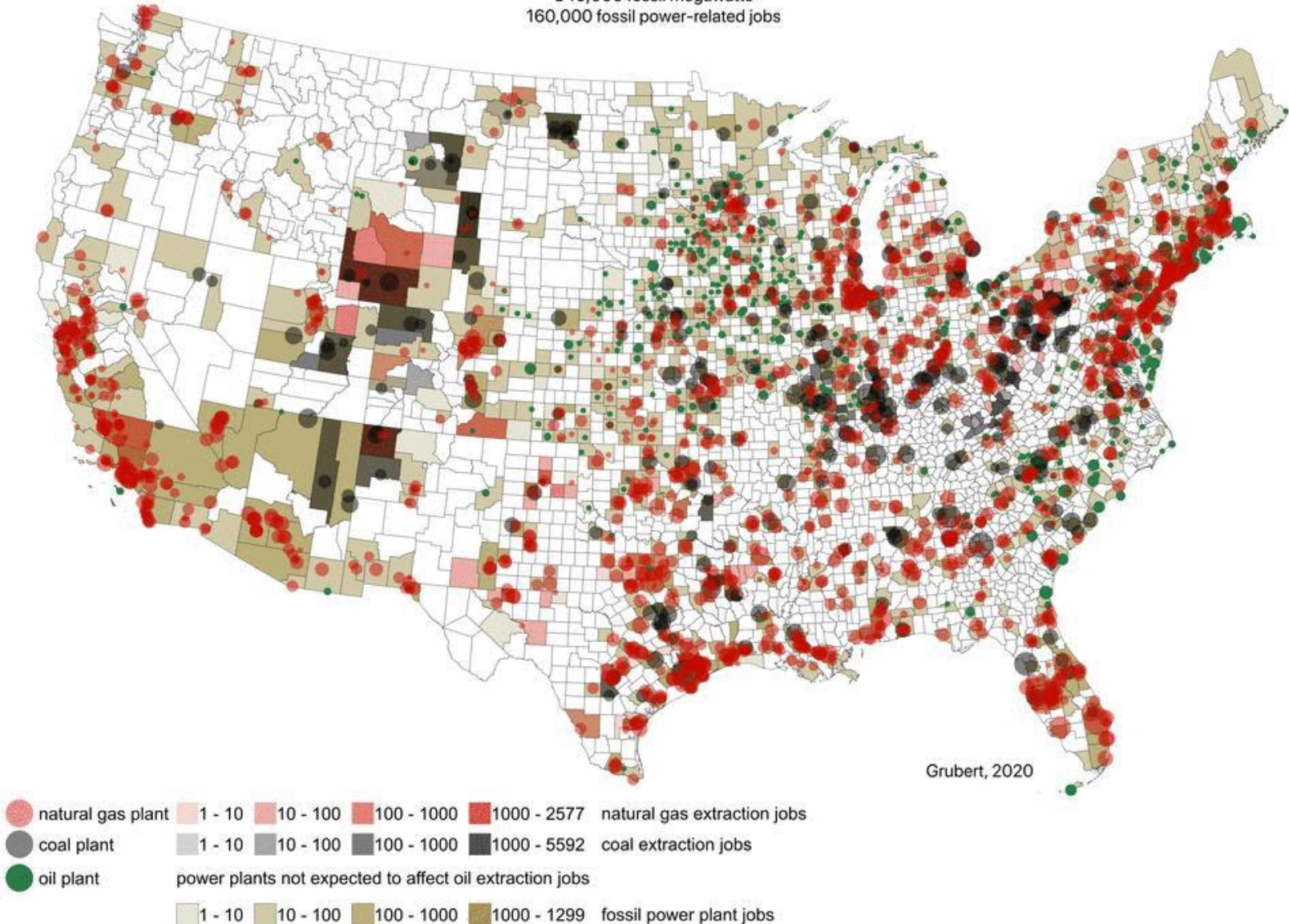
<50 MW •; 500 MW •; 5000 MW ●
● Natural Gas Plants
● Coal Plants
● Oil Plants

Jobs

Note that color blending occurs in counties with multiple job types
Color categories are orders of 10
<10 1300 Fossil Power Plant Jobs
<10 2600 Natural Gas Extraction Jobs
<10 5600 Coal Extraction Jobs

2018 Status

840,000 fossil megawatts
160,000 fossil power-related jobs



Source: Grubert 2020

We know more than we might think about what this transition will look like

- Fossil system:
 - We know **where** deindustrialization will occur
 - We can guess at approximately **when** deindustrialization will occur
- Nonfossil system:
 - Less certainty in general...but
 - We know **when** industrialization will occur (ish)
 - We can guess at approximately **where** industrialization will occur
 - ...and this isn't just power plants, despite colocation of extraction / conversion
- Opportunities:
 - Consider specific policy implications in modeling
 - Move away from a “cost, carbon, capacity” approach to anticipate response

Planning ahead is crucial for a just transition



Set retirement deadlines for fossil infrastructure to promote a just transition

Emily Grubert

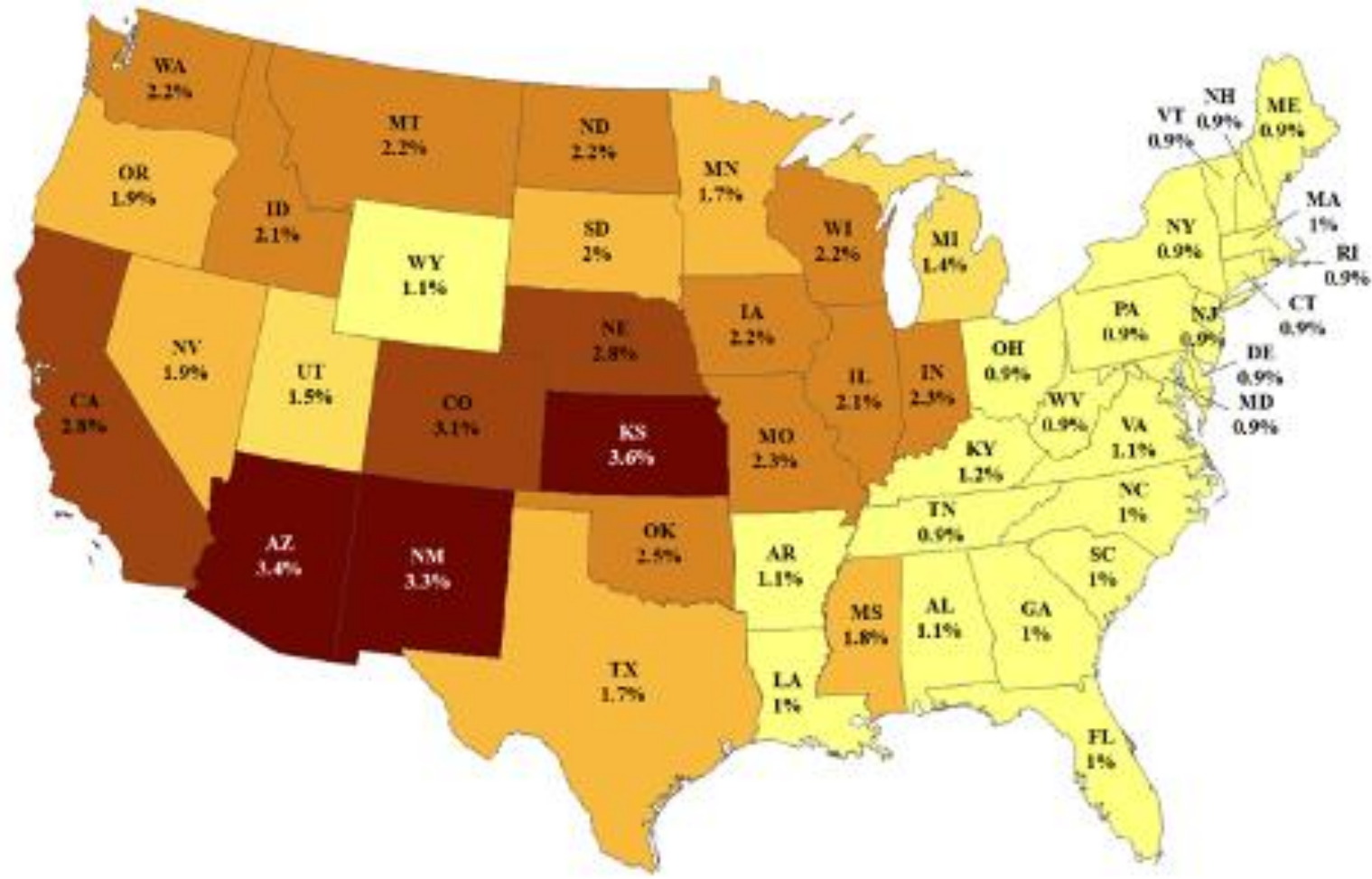
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New York's use of a 20-year GWP is unusual, with some electricity sector implications of methane leakage



Burns & Grubert 2021

Power Plants Inventory and Site Reuse

Power Plants Subgroup



**Climate Action
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Issues and Opportunities Presented by Power Plant Site Reuse

CLCPA directs JTWG to “identify issues and opportunities presented by site reuse”:

> Input received since 3/3 JTWG meeting:

- One comment received on issue of reduced local property tax revenues
 - Suggested response: add sub-bullet to our slide on issue of local property taxes: “Recognition that certain opportunities for reuse will have only partial ability to offset previous (power plant) property tax contributions by themselves.”
- Another email: highlighted benefits to residents of knowing in real time the power output of the facility in their neighborhoods (something done by Australia’s grid manager).
 - Commenter asked that NYISO post real time data for all NYS facilities

> Other changes made to Issues and Opportunities slides:

- Highlighting NYS Department of State’s (NYSDOS) Brownfield Opportunity Area (BOA) program on Environmental Remediation ‘Issue’ slide, and highlighting Sunset Park BOA case study on Port/Marine ‘Opportunity’ slide

> These changes highlighted briefly on the following three slides

Reuse Issue:

Reduced local property tax revenues

- > In many instances, major power generation facilities are **significant contributors to the local property tax base** via County, Municipality, School District and other tax payments – sometimes the largest single source of tax revenue (especially in more rural communities)
- > The State has recently expanded forward-looking funding for the **Electric Generation Facility Cessation Mitigation Fund**: [Press Release - PSC Provides \\$112.5 Million for Communities Impacted by Aging Power Plant Closures](#)
 - Time availability of awards: awards are available over a seven year period with a potential maximum award of 80% of lost revenues in the first year that decreases by 10% of lost revenues each year, to ultimately end in the seventh year in a potential maximum award of up to 20% of lost revenues.
 - *See re: Huntley: “School, town and county taxes paid by NRG for the Huntley site had shriveled as of last year to just \$515,000 combined. A state mitigation fund is providing money to offset the loss of the tax revenue from the plant, **but this pool of funding ends in 2023** – a deadline that looms over the sale process.”*
- > **Proactive efforts** will need to be taken at the local and state level to do the **long-term budgeting** that accounts for potential future tax revenue losses
 - Recognition that certain opportunities for reuse will have only partial ability to offset previous (power plant) property tax contributions by themselves

Reuse Issue: Environmental Remediation

- > A prerequisite for successful and safe site reuse will in many instances be environmental **assessment and remediation of any harmful site impacts** left behind after plant closure
- > These efforts may entail activities such as asbestos abatement, waste removal, other environmental remediation and restoration, including during and after the demolition of any **power plant structures and associated infrastructure** (e.g., fuel delivery and storage)
- > The extent of remediation **measures required will vary widely** by site and by plant type
 - For Somerset plant: “a roughly six-month process involving remediation of the coal yard, cleaning out water collection basins, draining, cleaning and disconnecting tanks and having them removed from the state’s chemical bulk storage registry, and capping the plant’s on-site landfill.”
- > **Funding to support remediation** activities may require a mix of public and private programs and sources, including federal and state brownfield-related opportunities
 - **Brownfield Opportunity Area (BOA)** program administered by NYS Department of State highlighted as a promising pathway supporting assessment, remediation, and productive reuse.
- > Certain environmental remediation needs (e.g., Asbestos) may link back to necessary support due to any plant workers who may have been exposed during their time at the plant

Reuse Opportunity: Port/Marine Uses & Infrastructure

- > Many plants situated on the waterfront may be valuable as opportunities to pursue **port/marine transport infrastructure uses**, especially for plants whose water-access is also connected to rail, highway, and **other transportation modes**
- > Power plant sites on the waterfront may have unique **access to deep-water ports** in particular, which would allow for uses that **protect/preserve the working waterfront**, with activities such as offshore wind staging, assembly, and manufacturing
- > Rebuilding the capacity for maritime dependent uses – both commercial and recreational – may be well-received as a way to **continue the history/tradition** of waterfront work and access
 - See: South Brooklyn Marine Terminal, as selected to serve as an offshore wind port facility, and the broader Sunset Park Brownfield Opportunity Area, as supported by NYSDOS's BOA program
- > Waterfront access may have the additional attribute of **supporting intermodal marine transit**, whether for routine use (e.g., ferry services) or as an asset to address climate vulnerability (e.g., storm infrastructure for response and evacuation)

Power Plant Inventory: Employment Updates

Updated look at power plant employment via NYSDOL data sources

- > **Subgroup Input:** employment figures contributed via subgroup members and agencies total approximately **1,520** workers across 22 plants (out of 61 facilities on the inventory)
- > **NYSDOL QCEW* Data:** provides ability to look at de-identified/aggregated employment numbers for other plants on our inventory
 - Confidentiality rules prevent data from being shared at a firm- or employee-specific level
 - QCEW data identifies approximately **586** additional employees at another 20 facilities on our inventory
 - Data remains unavailable or unable to verify for a small number of remaining facilities on our inventory
- > Combined, these data inputs suggest that the facilities on our inventory correspond to at least approximately 2,100 jobs, with additional jobs expected for plants where data is not available

Jobs Study



**Climate Action
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Just Transition WG Jobs Study: March 23, 2021 Update



JTWG March 23, 2021

Project Objectives

Project Objectives & Order of Operations

1. Develop structure & framework of the employment impact model (January – April)
2. Produce the initial employment model outputs by industry and occupation (March – October)
3. Examine the workforce implications associated with model outputs & scenarios (September – December)

JTWG March 23, 2021

Project Updates

Project Updates

1. Completed Initial Draft of the Literature Review (3/15)
2. Examining and revising the final list of sectors and sub-sectors for the model (3/25)
3. Working to get the initial model outputs from the Electricity sectors and the Solar Sub-Sectors (3/29)

JTWG March 23, 2021

Literature Review

Four Primary Questions

1. How are sectors, industries and occupational categories identified and defined?
2. What are the methods for estimating current or future job impacts?
3. What policy scenarios or recommendations were developed to examine a low-carbon economy?
4. What are the workforce implications of the comparable studies and did they assess job quality, labor standards, and unionization?

Next Steps



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Next Steps

Activity ahead under the CLCPA

- > **Climate Action Council:** next meeting is on April 12 (JTWG presenting alongside other Advisory Panels)
- > **Our work is far from done:**
 - Jobs Study remains ongoing, and further engagement with the JTWG is expected
 - Further opportunities for relevant presentations and discussions (e.g., on the BOA program)
 - The CAC may seek our input and guidance on other topics in the coming months
 - The CAC may ask us for clarification or more information on our work products
- > **Integration Analysis:** opportunity for feedback on draft cross-cutting and sector-specific *input assumptions* that will feed into E3's Integration Analysis.
 - Inputs and assumptions workbook and slide deck summary have been posted in the Integration Analysis section of the Resources page on the CLCPA website: <https://climate.ny.gov/Climate-Resources>
 - Please send any feedback to the JTWG Chairs by no later than March 31