

# New York State Climate Action Council

April 12, 2021  
Meeting 9



**Climate Action  
Council**

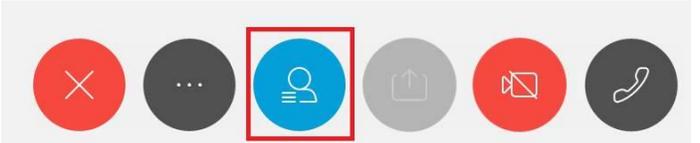
# Meeting Procedures

## Before beginning, a few reminders to ensure a smooth discussion:

- > CAC Members should be on mute if not speaking.
  - > If using phone for audio, please tap the phone mute button.
  - > If using computer for audio, please click the mute button on the computer screen (1<sup>st</sup> visual).
- > Video is encouraged for CAC members, in particular when speaking.
- > In the event of a question or comment, please use the hand raise function (2<sup>nd</sup> visual). You can find the hand raise button by clicking the participant panel button (3<sup>rd</sup> visual). The co-chairs will call on members individually, at which time please unmute.
- > If technical problems arise, please contact [NYS.CAC@cadmusgroup.com](mailto:NYS.CAC@cadmusgroup.com).



You'll see  when your microphone is muted



# Agenda

- > Welcome
- > Consideration of February 26, 2021 Minutes
- > Co-Chair Remarks and Reflections
- > Presentation and Discussion: Agriculture and Forestry and Waste Advisory Panel Recommendations
  - Noon – 1 pm: Break
- > Presentation and Discussion: Energy-Intensive and Trade-Exposed Industries Advisory Panel and Just Transition Working Group Recommendations
- > Next Steps

# **Consideration of February 26, 2021 Minutes**

# Welcome to Our New Climate Justice Advisor and Executive Director!

## Executive Director, Sarah Osgood

### > Previous:

- Director of Policy Implementation, Senior Policy Advisor – NYSDPS
- Chief of Staff, Program Manager - NYSERDA



## Climate Justice Advisor, Sameer Ranade

### > Previous:

- Policy and community organizing at *Front & Centered* (Washington state)
- Washington Environmental Council



# NYS Budget FY 2022

Historic \$3 billion dollar Restore Mother Nature Bond Act will be on the ballot November 2022  
\$300 million for the Environmental Protection Fund

Green economy investments to create:

- 12,400 megawatts of green energy - enough to power 6 million homes
- The largest offshore wind program in the nation
- Plans to make New York a global wind energy manufacturing powerhouse – with Buy American provisions
- Codify project labor standards for construction and operation/maintenance of large-scale renewables
- A \$2 billion green energy transmission superhighway
- A public-private partnership to build nearly 100 renewable energy projects
- \$20 million to electrify non-MTA buses

# Advisory Panel Recommendations

# Agriculture and Forestry

# Agriculture and Forestry Advisory Panel

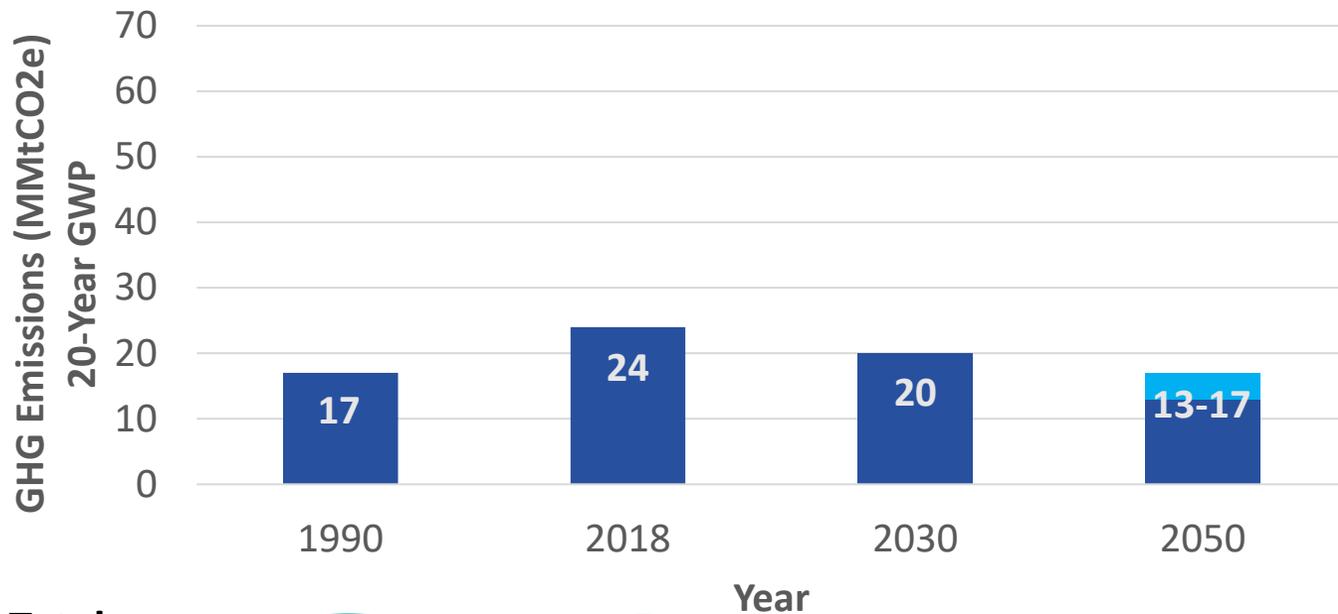
## Emissions Reduction and Carbon Sequestration Recommendations



**Climate Action  
Council**

# Aggregate GHG Emissions impact of Agriculture and Forestry panel recommendations

Estimated GHG Emissions  
Agriculture



% of Total  
NY Emissions\*



## Scope (2018 Subtotal DRAFT):

- Agricultural Emissions: Livestock and Fertilizer (24 MMt)

## Emission Reduction Goals

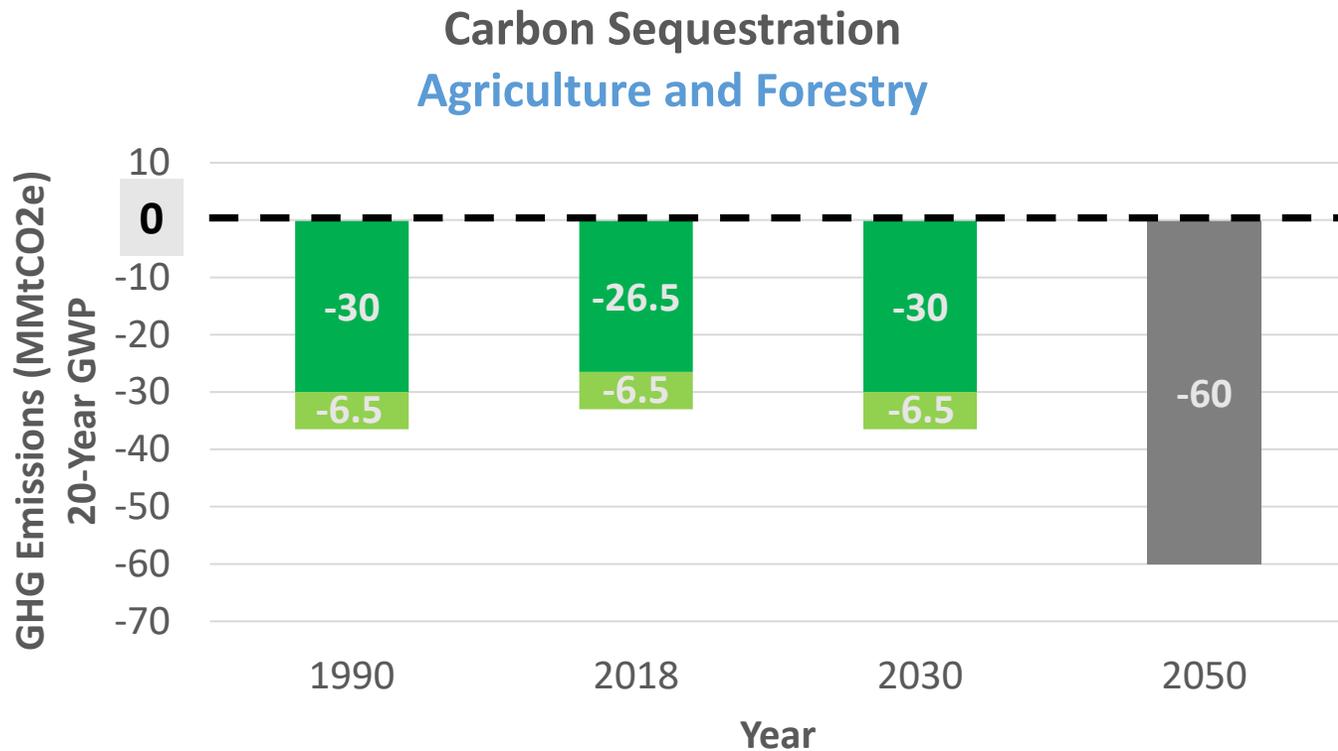
- 2030: Reduce 15% from current levels
- 2050:
  - Reduce 30% (return to 1990 levels)
  - Reduce 45% (additional ambition)

## Additional Goals

- Avoid leakage by maintaining and enhancing agriculture in NYS
- Increase carbon sequestration on agricultural lands (next slide)

\*Not including carbon sequestration. 2018 emission data are preliminary draft

# Carbon Sequestration impact of Agriculture and Forestry panel recommendations



## Scope (2018 Subtotal DRAFT):

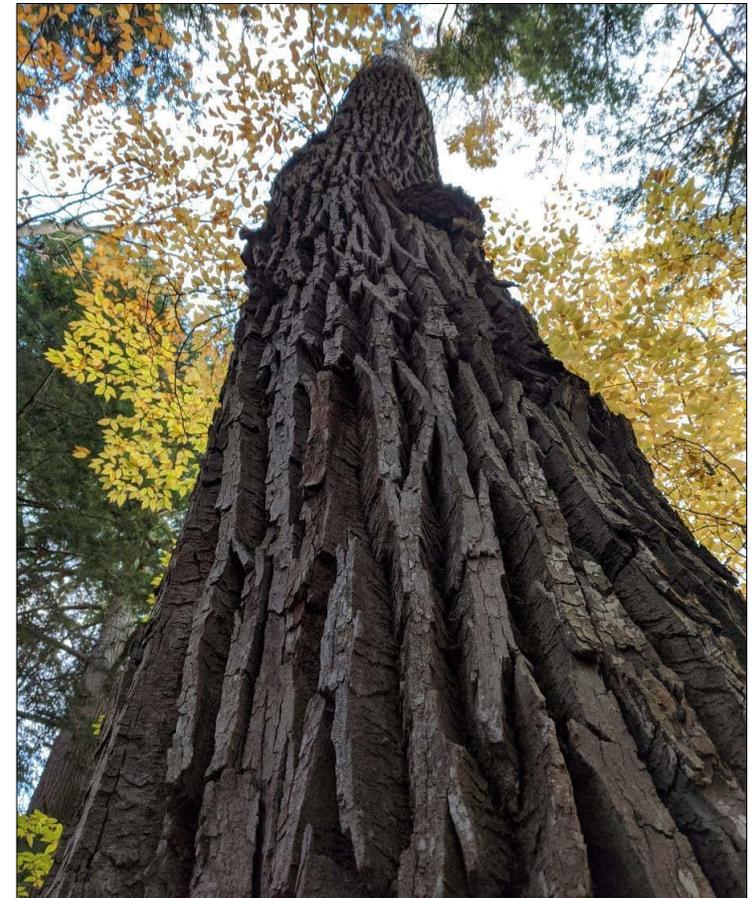
- Forestry and Agroforestry Sequestration (-26.5MMt)
- Cropland, Grassland, Urban Trees, Harvested Wood Products Sequestration (-6.5MMt)

## Carbon Sequestration Goals

- 2030: No Net Loss Forests (= 1990 levels)
- 2050: Achieve full Net Zero Goal across all sectors in NYS by enhancing carbon sequestration in Agriculture and Forestry

# Key themes

- > Focus on methane and nitrous oxide reduction and increasing carbon sequestration.
  - > Some emission/sequestration sources require long-term strategies, e.g., it takes decades to develop additional tree cover and years to build soil carbon.
  - > For agriculture, emissions reductions strategies are designed to keep farm operations viable and minimize the potential for emissions leakage.
- 
- > Two key themes of the panel:
    - Agricultural Emissions Reductions
    - Carbon Sequestration in Forests and on Farms



# Agricultural Emission Reduction

- > **Nutrient Management** - Reduce nitrous oxide (N<sub>2</sub>O) emissions while achieving desired crop yield and quality through continued and expanded nutrient management planning and implementation on crop fields, hay fields, pastures, orchards, vineyards, and other agricultural lands receiving nutrients.



# Agricultural Emission Reduction

- > **Alternative Manure Management** - Reduce methane emissions by implementing practice systems specifically planned and designed for each farm, such as cover and flare systems, anaerobic digester systems, and other innovative systems that collect, capture and combust methane from manure storages or prevent methane production from manure storage.



Compost Facility



Manure Storage Flare



Manure Storage Cover

# Agricultural Emission Reduction

- > **Precision Feed Forage and Herd Management** - Reduce methane and nitrous oxide emissions while achieving desired ruminant growth and lactation goals. Strategy acknowledges that additional methane emission reduction may be realized from feed additives developed in the future.



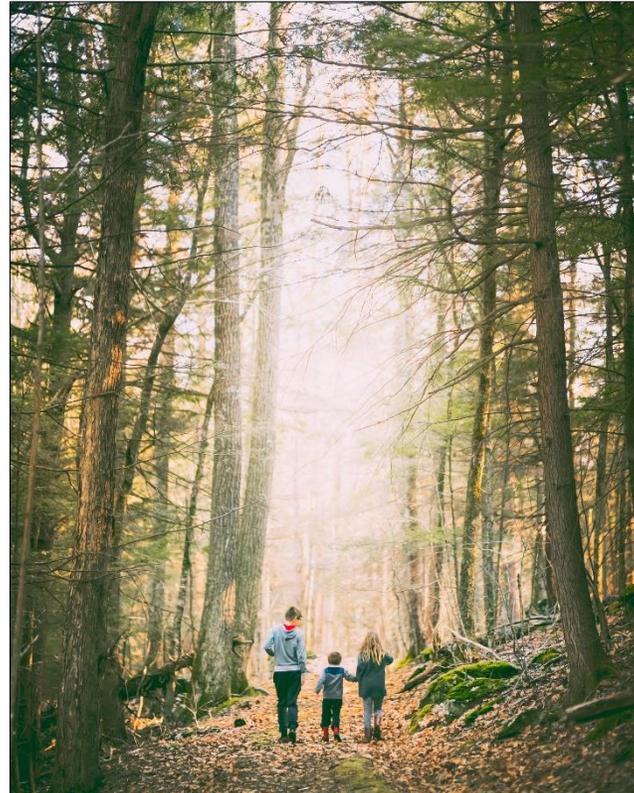
# Agricultural Emission Reduction Recommendations

## Mitigation and Enabling strategies summary

Initiative #	Description	Action type	Emissions impact	Ease of implementation	Cost
2A	Nutrient Management	Executive/ Financial/ Legislative	Low-Medium – 2030 Medium-High- 2050	Easy-Medium	\$
3A	Alternative Manure Management	Executive/ Financial/ Legislative	Medium - 2030 High – 2050	Easy - Medium	\$\$
4A	Precision Feed, Forage and Herd Management	Executive/ Financial/ Legislative	Medium – 2030 Medium – High - 2050	Easy	\$
Enabling Strategy 1A	AEM Planning for Climate Mitigation/Adaptation, aka “Carbon Farm Planning”	Planning (Exec/Financial)		Medium	\$
Enabling Strategy 2A	Establish a program for long-term, annual monitoring and benchmarking of GHG mitigation, carbon sequestration, and adaptation performance across applicable areas of management on farms in NYS. Information products provide useful, farm-level data for confidential benchmarking by farmers as well as publicly available data through farm case studies (with farmer agreement) and aggregated datasets to support future policy, research, and implementation.	Monitoring (Executive/ Financial/ Legislative)		Medium	\$\$

# Carbon Sequestration in Forests and on Farms

- > **Avoided Conversion of Forest and Farmland** - Maintain and enhance the state's carbon stocks and carbon sequestration potential through avoided forest and farmland use conversion.
- > **Forest Carbon Mitigation** – Establish a mitigation framework for conversion of forest land to development.



# Carbon Sequestration in Forests and on Farms

- > **Soil Health** - Reduce net GHG emissions and increase carbon sequestration/storage and other environmental benefits through adoption of soil health management practices (e.g., cover/double crops, reduced tillage, perennial crop systems. Also referred to as Regenerative Agricultural Practices).



Soil Health Technical Assistance



Soil Sampling



Tillage Radish



Cover crops

# Carbon Sequestration in Forests and on Farms

- > **Agroforestry** - Adding trees into areas of agricultural production to reliably increase carbon sequestration and other environmental benefits.



Silvopasturing



Tree Planting

# Carbon Sequestration in Forests and on Farms

- > **Forest Management** - Increase carbon sequestration through improved, sustainable forest management practices. Secure forest regeneration, improving forest health and productivity, and restore degraded forests.
- > **Forest Carbon Market** – Create a New York carbon market that forest and farm landowners can participate in.



# Carbon Sequestration in Forests and on Farms

## > Reforestation/Afforestation

- Tree planting focusing on underutilized lands.
- Increase tree seedlings in existing forest lands that are understocked.



2002 prior to planting (left), same field fall 2020 (right) more than 1,600 trees and shrubs have been planted on a farm in Delaware County using plants purchased from the Soil and Water Conservation District's annual tree program.

# Carbon Sequestration in Forests and on Farms

> **Urban Forestry – Planting** – Increase tree canopy cover in our urban/suburban areas through tree planting efforts on public and private lands. Dual benefits of reducing cooling costs associated with heat island effect and sequestering additional carbon.



> **Urban Forestry - Maintenance** – Improve maintenance of urban trees to increase their longevity and provide for increase canopy cover through larger and older trees.



# Carbon Sequestration in Forests and on Farms

- > **Climate-focused Bioeconomy** - the portion of an economy that produces sustainable, renewable bio-based feedstocks, rather than fossil fuel-based feedstocks, to produce products that achieve the climate and social justice goals of the CLCPA.



Fiber packaging



Shutterstock



WoodWorks.org

# Carbon Sequestration in Forests and on Farms Recommendations

## Avoided Conversions: Mitigation and Enabling strategies summary

Initiative #	Description	Action type	Emissions impact	Ease of implementation	Cost
1	Keep Forests as Forests: Maintain and enhance the state's carbon sequestration potential through avoided forest conversion	Executive/ Financial/ Legislative (Regulatory)	High – 2030 High - 2050	Easy for land acquisition. Difficult for new tax incentives and regulatory changes	\$\$\$
Avoided Conversions Enabling 1	Avoided agricultural land conversion - Maintain and protect the states' potential for carbon sequestration on agricultural lands through avoided farmland conversion	Executive/ Financial/ Legislative (Technical Assistance)		Easy	\$\$
Avoided Conversions Enabling 2	Bolstering Local Agricultural Economies	Executive/Financial/ Legislative		Easy	\$\$-
Avoided Conversions Enabling 3	Enhance local government planning for land conservation	Executive/Legislative (Technical Assistance)		Easy	\$

# Carbon Sequestration in Forests and on Farms Recommendations

## Mitigation and Enabling strategies summary

Initiative #	Description	Action type	Emissions impact	Ease of implementation	Cost
1A	Soil Health Management Practices (also referred to as Regenerative Agricultural Practices)	Executive/ Financial/ Legislative	Low – 2030 Medium - 2050	Easy-Hard	\$\$
5A	Agroforestry	Executive/ Financial/ Legislative	Low-2030 Medium - 2050	Easy-Medium	\$\$
1	Maintain and increase carbon sequestration in NYS forests by securing forest regeneration, improving forest health and productivity, and restoring degraded forests through the widespread adoption of improved, sustainable forest management practices	Executive/Financial/ Legislative (Incentives)	High -2030 High - 2050	Medium	\$\$-\$\$\$
2	Increase forested acres through afforestation and reforestation efforts to establish climate adapted and resilient forests. There are potentially 1.7 million acres of marginal lands available for establishing forests.	Executive/Financial/ Legislative (Incentives)	High – 2030 High – 2050	Medium	\$\$\$
3	Increase and maintain tree cover in urban and developed areas to reduce energy use and corresponding GHG emissions through the shading and cooling effect of trees. Increase carbon sequestration through tree establishment and extending the average life of urban trees through improved maintenance.	Executive/Financial/ Legislative (Incentives)	Medium – 2030 Medium - 2050	Medium	\$\$

# Carbon Sequestration in Forests and on Farms Recommendations

## Forest Management Enabling strategies summary

Initiative #	Description	Action type	Emissions impact	Ease of implementation	Cost
Forest Mgmt. Enabling Strategy 1	Expand funding for peer reviewed climate, forest carbon and applied forest management research	Scientific Research		Medium	\$-\$\$
Forest Mgmt. Enabling Strategy 2	Develop and support workforce development and training programs for forest sector workers to enable an increase demand in forestry services to be met. Incorporate forest carbon and forest carbon management into training programs and forestry curricula at the high school (e.g., BOCES) and college level.	Training, Implementation		Medium	\$
Forest Mgmt. Enabling Strategy 3	Facilitate the development of a forest-based culture and economy through state-of-the-art outreach, education and marketing techniques to inform the public and policy makers about forest and forest carbon issues	Outreach and Education		Hard	\$-\$\$

# Carbon Sequestration in Forests and on Farms Recommendations

## Bioeconomy Enabling strategies summary

Initiative #	Description	Action type	Emissions impact	Ease of implementation	Cost
Bioeconomy Enabling 1	Expand Markets for Sustainably Harvested Durable Wood Products	Market development, Research		Medium	\$\$
Bioeconomy Enabling 2	Sustainable biomass feedstock action plan for 2050 hard-to-decarbonize products	Research and Planning		Medium	\$
Bioeconomy Enabling 3	Increasing market access for NY low-carbon products	Market development; Research		Hard	\$\$
Bioeconomy Enabling 4	Financial and Technical Assistance for Low-Carbon Product Development	Technical support, financial incentives		Easy/Medium	\$\$
Bioeconomy Enabling 5	Bio-based Products Research Development & Demonstration Overview	Research initiative, pilots		Medium	\$
Bioeconomy Enabling 6	Net Negative Carbon Dioxide Removal	Research and policy development		Hard	\$\$

# Benefits and impacts - Disadvantaged communities

- > Increasing research, planning, technical services and financial assistance improves access to programs and effective practices for all farmers and forest landowners. These strategies will prioritize disadvantaged communities by placing emphasis on access to agricultural and forestry technical assistance and funding programs to historically underserved and disadvantaged community members.
- > Improvements in food production capacity, resiliency and diversity have a positive effect on disadvantaged communities.
- > Strategies will benefit rural economically disadvantaged communities, including those in Environmental Justice (EJ) areas, by improving the forest-based economy and increasing job opportunities. Strategies allow lower to middle income landowners to hold on to their forest lands, maintain open space, keep forest as forest, and sustainably manage their lands.
- > Urban communities in EJ areas will benefit from increased tree canopy and open spaces through increased public health benefits, property values, reduced energy costs, and recreational opportunities. A community engaged in urban forestry activities improves the overall quality of life.
- > Bioeconomy strategies have the potential to reinvigorate idled rural production sites, creating projects at existing NYS infrastructure that is able to support future deep decarbonization projects following the deployment of next-generation technology.

# Benefits and impacts - Health and co-benefits

- > Farm level projects that reduce GHG emissions and increase sequestration have many other co-benefits including increasing air and water quality, biodiversity, elevating local food production, diversifying farm incomes and increasing farm profitability.
- > Numerous studies in the U.S. and around the world are exploring the health benefits of spending time outside in nature, green spaces, and, specifically, forests.
- > Protected and well managed forests and farmland have the potential to maintain or improve local food production, community resiliency, water quality, air quality, storm/flood mitigation, outdoor recreation, public infrastructure protection, drought resiliency, wildlife habitat, scenic vistas/tourism, market diversification, economic development and employment.
- > Agricultural and forest land protection captures carbon in the land base and prevents future emissions from vehicle use from prevented sprawl development.

# Benefits and impacts - Health and co-benefits cont.

- > Bio-based products will also often have a safer profile when installed and from cradle to end of life. Bio-based products also have end-of-life opportunities, in a circular economy landfill wastes are reduced.
- > Modular application of mass timber drives cost efficiencies for construction projects by shortening the urban installation time which also reduces site emissions/nuisances.
- > In the transition to electrification and for applications that are difficult to electrify, low carbon fuels can have reduced co-pollutant emissions as compared to fossil fuel emissions at industrial emitters, leading to health benefits. Many low carbon product feedstocks (e.g., willow) provide ecosystems and bioremediation services during growth.
- > Low carbon, renewable fuels may aid applications that are difficult to electrify and in the transition to electrification. Such fuels result from forestry and farming practices that provide other ecosystem and bioremediation services. Continued compliance with State and federal air quality standards and regulations will reduce public health risks from low carbon fuel combustion.

# Benefits and impacts - Just transition: businesses and industries, workers

- > Inter-generational family transfer provides opportunities to encourage and incentivize GHG emission/sequestration management practices. Emphasis will be on improved access to technical and financial support for historically underserved, beginning farmers and forestry service providers such as urban tree care workers. This strategy will include youth engagement, internships, educational opportunities, public and private sector job creation through increased technical assistance and implementation (e.g., climate conservation corps, tree corps), and potentially on-farm job creation.
- > Forest Management mitigation strategies would expand the opportunities available to forestry-based businesses in rural areas of New York by increasing the demand for forestry services including natural resources professionals, forestry equipment operators, and mill operators with other benefits associated with forest recreation and forest-based recreation businesses.
- > Bioeconomy strategies would generate manufacturing and construction jobs, create new markets for existing secondary wood products industries such as flooring, millwork and molding for interior design. Mass timber has the potential to be designed and manufactured in modular capacity in rural locations, creating rural jobs with safer and more efficient conditions.

# Benefits and impacts - Just transition: businesses and industries, workers cont.

- > New York's forests and wood products industries are currently directly responsible for nearly 40,000 well-paying jobs and more than \$13 billion of economic output and are indirectly responsible for another 53,000 jobs and nearly \$10 billion of economic activity.
- > 20,000 new jobs are potentially expected in the low carbon products sector in NYS. Low carbon processing is an enabling technology for the broader transition to a decarbonized economy. Significant opportunities exist for worker training, especially within disadvantaged and rural communities, including partnering with local labor unions and community colleges. Investment in market development would provide the market certainty needed to deploy a thriving low carbon processing sector within NYS while minimizing opportunities for carbon leakage.
- > Significant opportunities exist for worker training, especially within disadvantaged and rural communities, including partnering with local labor unions and community colleges. Near-term decarbonization of existing supply chains is an enabling technology for the broader transition to a decarbonized economy via the maintenance of those supply chains. Supply chain retention is an important factor in carbon leakage prevention.

# Benefits and impacts - Other

- > **Agroforestry** - Woody perennial buffers are small reliable practices that have a high value of carbon sequestration per acre. Silvopasture and alleycropping have the potential to increase income streams for farms, providing an economic return on investment.
- > **Avoided Conversions** – These strategies will be supported by the Land Use and Local Government Advisory Panel’s recommendation on facilitating and supporting collaborative county-wide and regional smart growth comprehensive planning. Inter-agency collaboration is occurring to advance renewable energy development in a way that avoids, minimizes and mitigates impact to prime agricultural soils, and forest carbon stocks and ecosystems.
- > **Forest Management** – Retaining healthy forests provides a multitude of ecological services including clean air, water and biodiversity. Sustainability measures already in place or being developed through this strategy are integral to many of the proposed Bioeconomy recommendations.
- > **Bioeconomy** - The amount of material going to landfill will decrease. Building materials that sequester carbon will have additional market value; this may help drive down the costs of sequestration policies. There will be less uncertainty in the long-term market for initial producers of low carbon products.

# Thank you

**Richard Ball**, Chair, NYS Department of Agriculture & Markets

**Peter Innes**, NYS Department of Environmental Conservation

**Rafael Aponte**, Rocky Acres Community Farm

**Amanda Barber**, Cortland County Soil and Water Conservation District

**John Bartow**, Empire State Forest Products Association

**Michelle Brown**, The Nature Conservancy

**Tom Gerow**, Wagner Lumber Company

**Suzanne Hunt**, HuntGreen LLC and Hunt Country Vineyards

**Peter Lehner**, EarthJustice

**Samantha Levy**, American Farmland Trust

**Robert Malmshemer**, SUNY College of Environmental Science and Forestry

**Stephanie Morningstar**, Northeast Farmers of Color Land Trust

**John Noble**, Noblehurst Farms

**Julie Suarez**, Cornell University

**Ned Sullivan**, Scenic Hudson

**Donna Wadsworth**, International Paper

**Elizabeth Wolters**, New York Farm Bureau

**Peter Woodbury**, Cornell University

**Nelson Villarrubia**, Trees New York

# Waste

# Waste Advisory Panel

## Recommendations



**Climate Action  
Council**

# Waste Advisory Panel Objectives

## Recommendations target these key areas:

- Reduce methane generating wastes from disposal in landfills and combustors
- Identify and reduce fugitive methane emissions at waste and water resource facilities
- Reduce need for new consumer products
- Ensure proper end-of-life materials management
  - *Focus on Solid Waste Management Hierarchy*
- Support domestic recycling facilities and markets for recovered resources
  - *Highest and best uses for recycling end products*
- No promotion of new fossil fuel energy infrastructure

## Social Impacts:

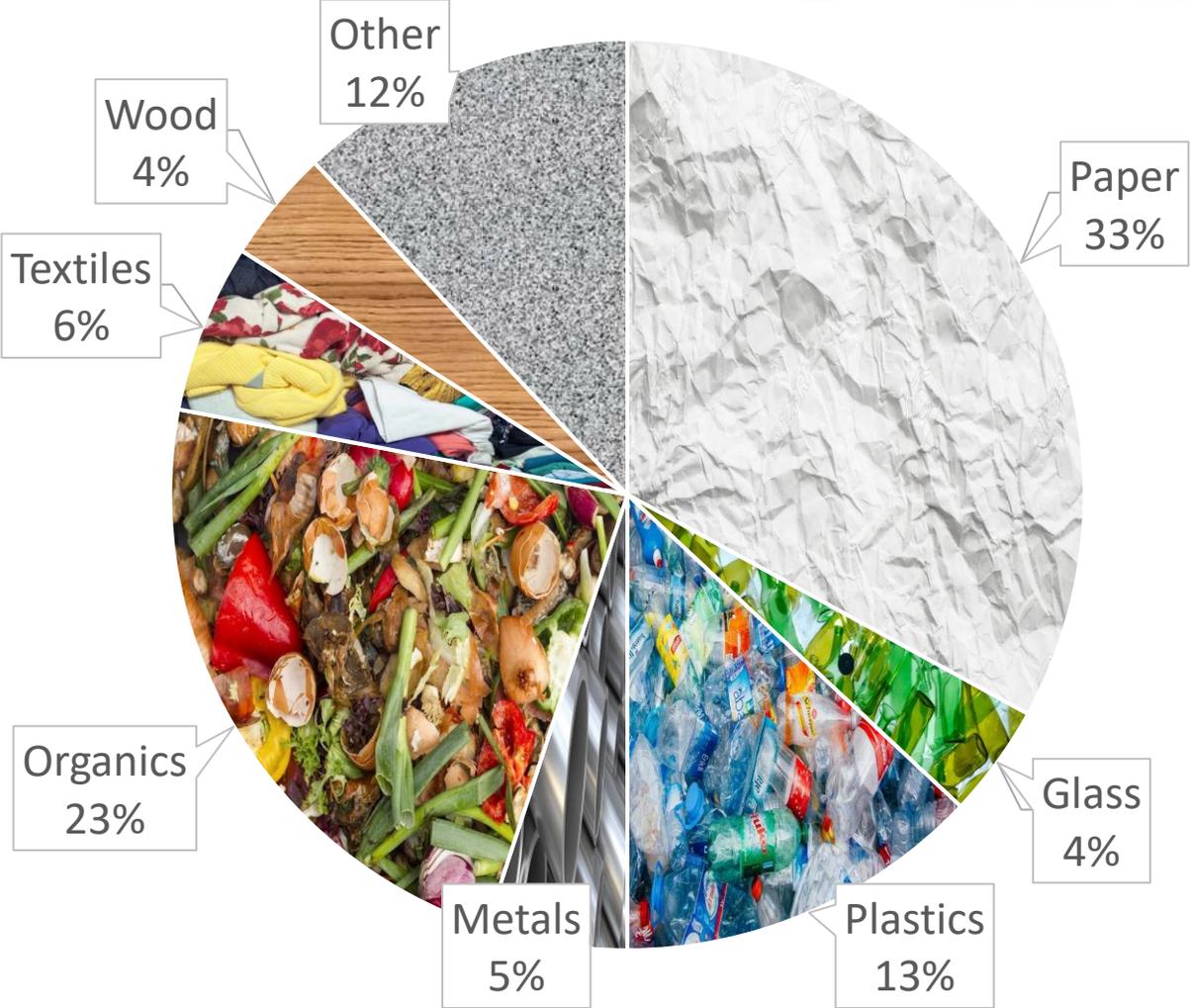
- Green job opportunities in disadvantaged communities
- Feed hungry New Yorkers; address food insecurity
- Reduction in truck traffic and the need for additional solid waste infrastructure
- Reduce emissions, ambient noise, odors, and co-pollutants; improve local air quality

# Waste Advisory Panel – Process

- **Hosted eight (8) full panel public meetings**
  - One meeting focused specifically on public engagement
- **Developed subgroups (each met 5-10 times):**
  - Landfills and Organics Diversion
  - Materials Management
  - Water Resource Recovery Facilities
  - Local-Scale Diversion and Climate Justice
- **Cross-panel engagement**
  - Agriculture and Forestry
  - Land Use and Local Government; Adaption and Resilience
  - Energy Efficiency and Housing
  - Transportation
  - Power Generation
  - Climate Justice and Just Transition Working Groups



# NYS Municipal Solid Waste Composition

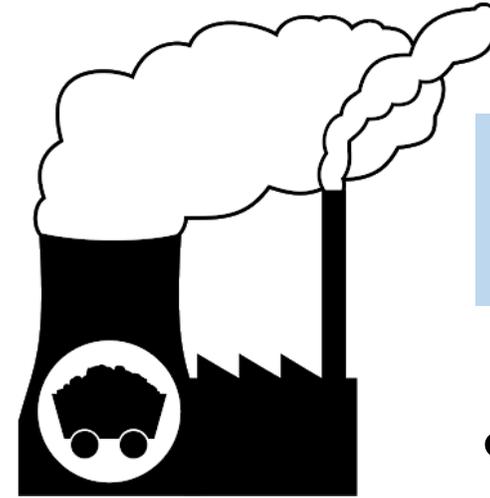


# How does the solid waste stream emit GHGs?

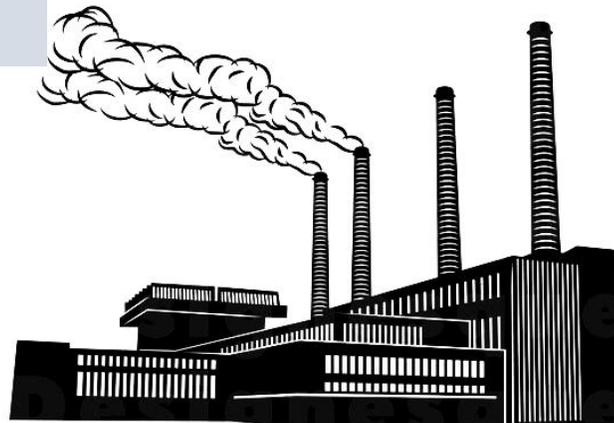


## Developing new products

- Harvesting resources
- Extracting energy sources
- Transporting raw materials



Disposal at a landfill or combustor releases GHGs as waste decays or is burned.

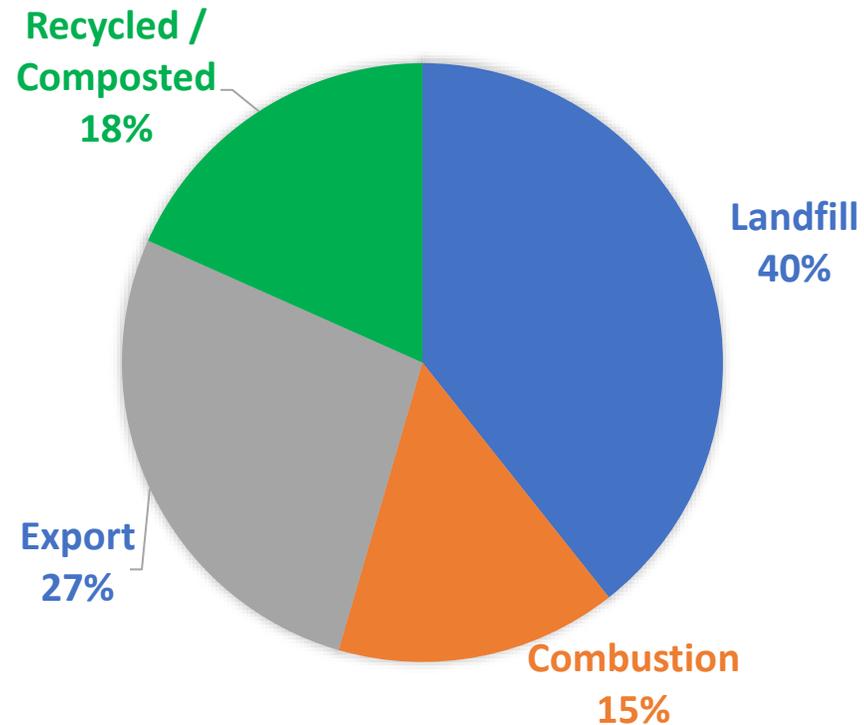


## Manufacturing products

- Energy expended during processing
- Byproducts wasted

# Waste Management in New York State

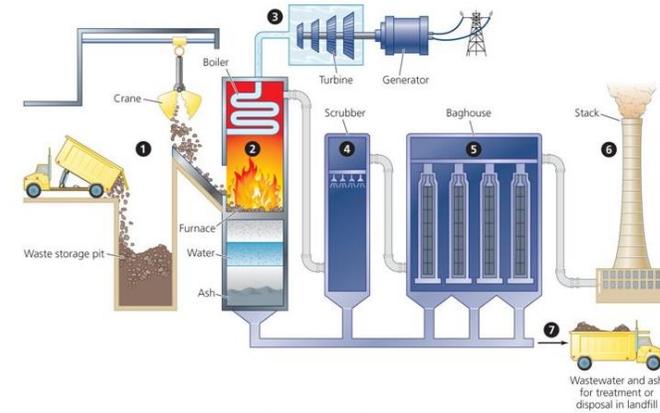
## END USE OF MSW GENERATED IN NYS (2018)



MSW Destination	Tons (2018)
Landfill	7,174,868
Combustion	2,764,004
Export	4,954,487
Recycled / Composted	3,341,051
<b>Total MSW Generated in NYS</b>	<b>18,234,411</b>

# How is NYS managing all this waste?

By disposal  
at landfills...



...disposal at  
MSW Combustors...

...by managing  
biosolids...



# How is NYS managing all this waste?

...and recycling!



Solid Waste Management Facilities in NYS (2018)

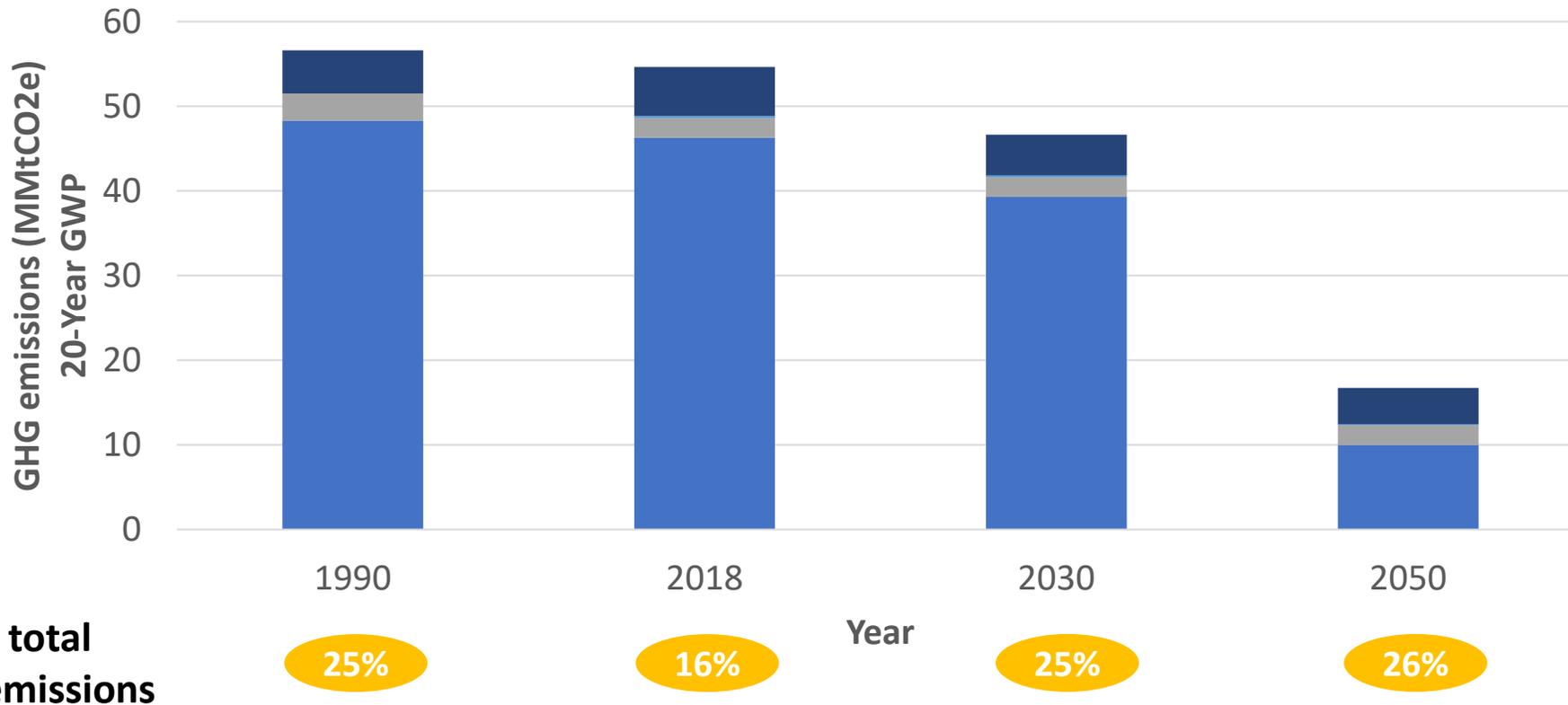
SWM Facility Type	No. Facilities in NYS	Waste Quantity Processed Annually (tons, 2018)
Landfills		
Active	48	12,449,736
Inactive		N/A
Combustors	10	4,102,558
Recycling		
Organics*	256	-
MRFs	342	2,802,699
CDDHRFs	488	15,693,857
Transfer Facilities	529	13,812,364

\*Biosolids, septage, and mulch operations were not included in the organics facilities figures.

# Aggregate GHG emissions impact of Waste panel recommendations

*Draft material*

Estimated GHG emissions - Waste



Reductions require aggressive initiatives to divert organics from landfills and reduce methane leaks.

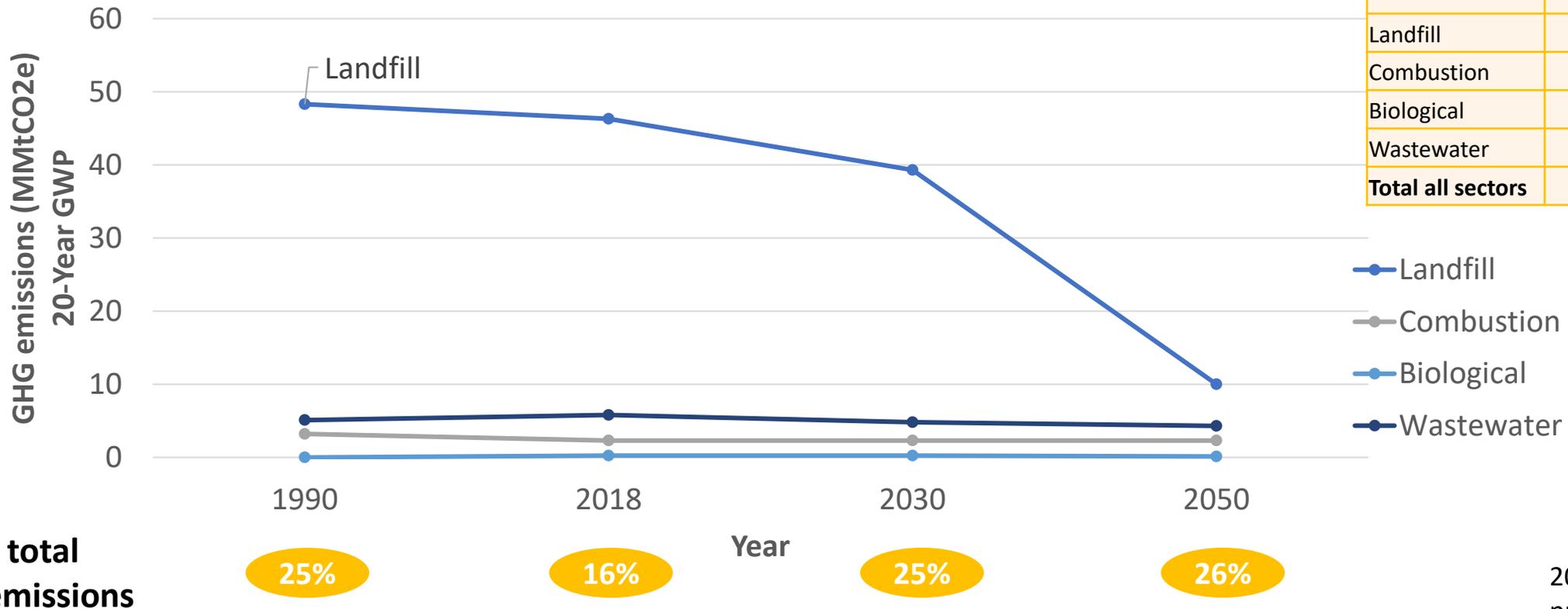
- Wastewater
- Biological
- Combustion
- Landfill

2018 emissions data are preliminary draft

# Aggregate GHG emissions impact of Waste panel recommendations

*Draft material*

Estimated GHG emissions - Waste



Total reductions in GHG emissions from 1990		
	2030	2050
Landfill	18.6%	79.3%
Combustion	28.1%	28.1%
Biological	(increase)	(increase)
Wastewater	5.9%	15.7%
<b>Total all sectors</b>	<b>17.6%</b>	<b>70.5%</b>

2018 emissions data are preliminary draft

# Guiding assumptions to achieve GHG emissions reductions

## > Landfills

- Achieve aggressive goals of *Beyond Waste*, the NYS Solid Waste Management Plan
  - (e.g., 90% paper recycling and 65% food waste diversion by 2030)
- Delay in achieving GHG emissions reductions due to typical slow rate of degradation of waste placed in landfills

## > Combustion

- No reduction projected from 2018-2050: existing combustor facilities will be needed to handle MSW remaining after reduction, reuse, and recycling strategies

## > Biological (composting, regional anaerobic digesters)

- 50% of current leaks eliminated by 2030; 75% by 2050

## > Wastewater

- 50% of current anaerobic digester leaks eliminated by 2030; 75% by 2050
- 1/3 of fugitive emissions from WRRFs eliminated by 2030; 2/3 by 2050
- 1% increase in municipal sewer system utilization (conversion from septic) by 2030; 2% by 2050

# Key Themes – Waste Management

- > Organics Reduction and Recycling
- > Extended Producer Responsibility (EPR) / Product Stewardship for methane generating wastes
- > Identify and reduce fugitive emissions of methane from landfills and anaerobic digesters
- > Support domestic recycling facilities and markets for recovered resources
  - compost, digestate, and recycled aggregate/building deconstruction materials
- > Identify appropriate uses and financial mechanisms for fuels, electricity, or other strategic energy produced from biogas/RNG derived from organic wastes
  - Direct this funding to organics recycling infrastructure
- > Waste Reduction, Reuse, and Recycling initiatives
- > End-of-life management of appliances that contain high-global warming potential refrigerants
- > Further research
- > Green jobs development

# Key Themes – Water Resource Recovery

- > Transform Wastewater Treatment Plants from waste disposal priority to Water Resource Recovery Facilities (WRRFs) that emphasize capture of beneficial products.
- > Address fugitive emissions from WRRFs, septic and sewer systems.
  - Where density and local conditions allow, eliminate septic tanks and convert to municipal sewer system collections or advanced onsite treatments.

# Waste Management

# Organics Reduction and Recycling

- > Reduce methane and carbon dioxide emissions by reducing the combustion and landfilling of organics and other methane/GHG producing wastes.



# Organics Reduction and Recycling - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Expand and Amend existing Food Donation and Food Scraps Recycling Law.	Legislative	High	Easy	\$
Phase in full organics source separation requirements and eventual ban on disposal.	Legislative	High	Easy	\$
Require a surcharge (fee per ton) on all waste disposed to provide financial support for reduction, reuse, and recycling projects.	Legislative	High	Easy	\$
Provide financial assistance for emergency food relief organizations and organics recycling facility infrastructure.	Financial	Medium	Easy	\$
Financial assistance to expand food scraps drop-off and local-scale processing opportunities.	Financial	Medium	Easy	\$

# Organics Reduction and Recycling - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Financial assistance, education, and outreach to schools for food waste reduction, food donation, and on-site food scraps recycling programs.	Financial	Low	Easy	\$
Provide incentive for public-private partnership for organics recycling facility development.	Financial	Medium	Easy	\$
Encourage co-location of solid waste infrastructure investments and operation by simplifying regulatory requirements and incorporate into local planning.	Regulatory	Medium	Easy	\$
Require local solid waste management planning units to emphasize food scraps recovery programs.	Regulatory	Medium	Easy	\$

# Organics Reduction and Recycling - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Implement “best by” food label standardization and educate businesses and residents on food waste reduction.	Legislative; Financial	Low	Medium	\$
Support reducing food waste in stores via inventory controls and other digital tracking methodologies.	Financial	Low	Easy	\$
Evaluate the co-location of food donation and compost sites for streamlined waste diversion. Support renewable energy projects at donation sites.	Legislative; Financial	Low	Easy	\$
Expand successful models for organics collection programs inclusive of multi-family buildings and public housing (e.g., NYCHA, etc.).	Financial	Low	Easy	\$
Fund digital platforms for donation logistics and operation.	Financial	Low	Easy	\$

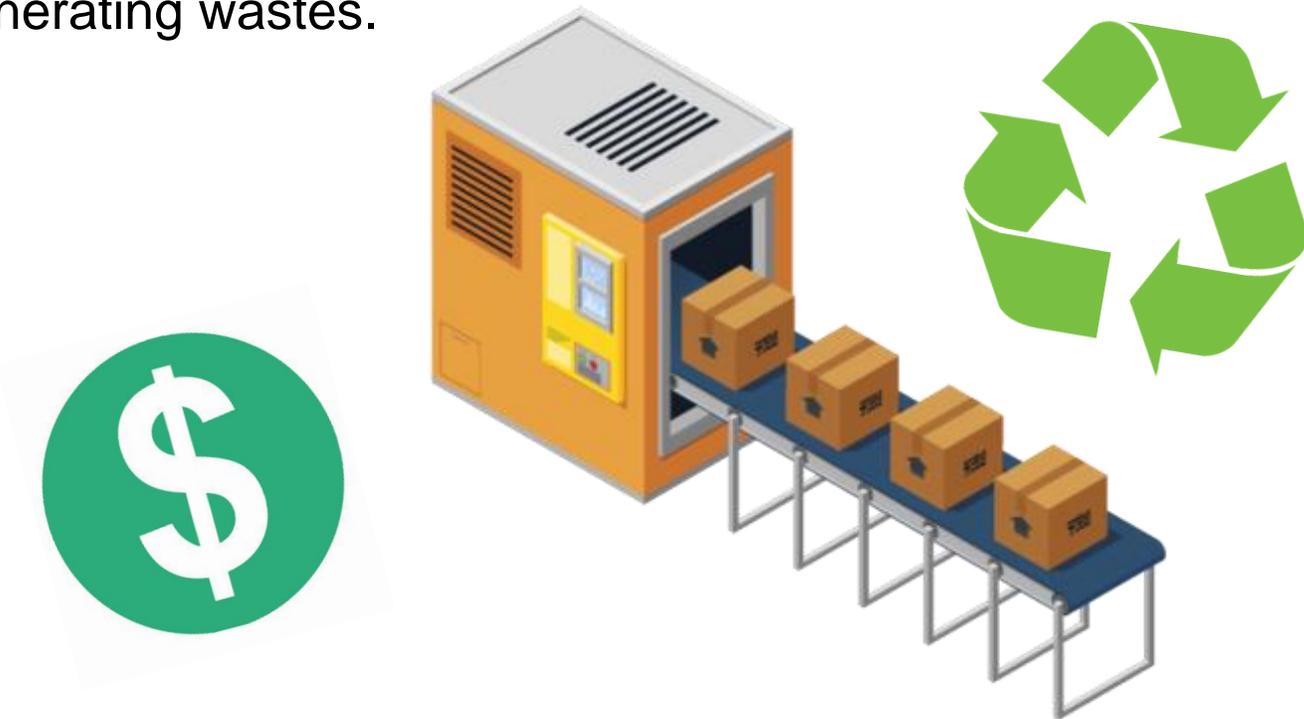
# Organics Reduction and Recycling - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Require food waste reduction and education strategies in school meals, including considerations of GHG impacts in purchasing of food.	Legislative; Financial	Low	Medium	\$
Support technology-enabled waste tracking in restaurants.	Financial	Low	Easy	\$
Allow and encourage composting on municipal park lands.	Legislative	Low	Easy	\$
Establish local compost receiving partners with food growers, street tree, stormwater resiliency projects, individuals, etc.	Financial	Low	Easy	\$

# Extended Producer Responsibility/Product Stewardship

- > Reduce methane and carbon dioxide emissions from waste disposal facilities by enacting broad Extended Producer Responsibility (EPR)/Product Stewardship requirements to cover the recycling of packaging and printed paper, carpet, tires, textiles, solar panels, wind turbines, all batteries, appliances (especially those containing refrigerants), mattresses, and other methane generating wastes.



# EPR/Product Stewardship - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Legislation to create a framework for extended producer responsibility/product stewardship, or individual legislation targeting products with the greatest greenhouse gas impact (e.g., packaging and printed paper, carpet, tires, textiles, solar panels, wind turbines, all batteries, appliances (especially those containing refrigerants), mattresses, etc.)	Legislative	Medium to High	Easy	\$\$

# Reduce Fugitive Emissions

- > Identify and reduce fugitive emissions of methane from landfills and anaerobic digesters through baseline measurement, increased monitoring, and engineering and regulatory programs to reduce leaks.



# Reduce Fugitive Emissions - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Incorporate improved monitoring technologies (e.g., drones) into facility operations and existing monitoring programs.	Regulatory	Low	Easy	\$
Implement best practices for further emissions reduction. <ul style="list-style-type: none"> <li>Landfill examples: enhanced landfill covers to increase oxidation of methane, specialty landfill gas collectors for difficult to access areas, dewatering to increase collection.</li> <li>AD examples: improve maintenance on methane collection systems.</li> </ul>	Regulatory	High	Easy	\$
DEC regulation changes for landfills to require installation of landfill gas collection systems sooner after waste placement; expansion of monitoring requirements for fugitive emissions beyond existing criteria.	Regulatory	High	Easy	\$

# Enhance Recycling Markets

- > Reduce methane and carbon dioxide emissions from landfills and combustors by supporting domestic recycling facilities and markets for recovered resources, including compost, digestate, and recycled aggregate/building deconstruction materials.



# Enhance Recycling Markets - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Require a surcharge (fee per ton) on all waste disposed to provide financial support for reduction, reuse, and recycling projects.	Legislative	High	Easy	\$
Financial assistance to develop recycling markets.	Financial	Low to Medium	Easy	\$
Financial assistance to research and increase the capture and use of building deconstruction materials and recovered aggregate for a variety of applications. Change government requirements (e.g., procurement standards, bid specifications, etc.) to include recycled or reused deconstruction materials.	Financial; Regulatory	Low to Medium	Easy	\$

# Enhance Recycling Markets - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Provide incentive for public-private partnership for recycling facility development.	Financial	Low	Easy	\$
Legislation to require a minimum level of recycled content in certain products and packaging to support end markets.	Legislative	Low to Medium	Medium	\$
Legislation and green procurement programs to require the use of recyclables (compost, construction aggregate, etc.) by State and local entities and those contracting with the government.	Legislative; Regulatory	Low	Easy	\$

# Reduce, Reuse, Recycle

- > Reduce methane and carbon dioxide emissions from waste disposal facilities by supporting robust waste reduction, reuse, and recycling initiatives.



# Reduce, Reuse, Recycle - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Require a surcharge (fee per ton) on all waste disposed to provide financial support for reduction, reuse, and recycling projects.	Legislative	High	Easy	\$
Financial assistance to support waste reduction and reuse education and program implementation.	Financial	Low	Easy	\$
Financial support for local reuse centers, materials exchanges/sharing hubs, certain repair shops, and innovative businesses incorporating recovered or waste reducing materials and technologies.	Financial	Low	Easy	\$
Legislation to require “By Request Only” policies for single-use (e.g., cutlery, straws, etc.) products at businesses.	Legislative	Low	Easy	\$

# Reduce, Reuse, Recycle - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Support innovative zero-waste product development and business projects. Support digital demand software & technologies to monitor and reduce over-production.	Financial	Low	Easy	\$
Require textile origination/content labeling and optimize and reduce sales of GHG intensive textiles.	Legislative	Low	Medium	\$
Support and expand successful recyclables collection programs inclusive of multi-family buildings and public housing (e.g., NYCHA, etc.).	Financial	Low	Easy	\$
Require reusable/refillable options for consumer goods in retail stores and support the reduction and eventual elimination of single-use packaged items. Expand to all personal care products.	Legislative	Low	Easy	\$

# Reduce, Reuse, Recycle - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Fund infrastructure development (i.e., eco-hubs) to increase access to reuse and recycling opportunities for multi-family housing and campuses (e.g., NYCHA, business parks, etc.).	Financial	Low	Medium	\$
Implement new and expand existing statewide campaigns for reduction, reuse, and recycling (e.g., tv, hulu, spotify, radio and podcasts, billboards, subways, social media, other forms of media).	Financial	Low	Easy	\$
Support peer-to-peer education and outreach campaigns in underperforming and BIPOC communities around reduction, reuse, and recycling.	Financial	Low	Easy	\$
Evaluate the feasibility of requiring reusable shipping containers and padding to replace packaging material from online retailers.	Legislative; Financial	Low	Easy	\$

# Reduce, Reuse, Recycle - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Support local/regional recycling coordination and hiring of local enforcement officers for municipal recycling programs.	Financial	Low	Easy	\$
Require government procurement standards for low GHG-emitting products (e.g., textiles, paper, packaged products, etc.).	Legislative	Low	Easy	\$
Evaluate the feasibility of requiring universal restaurant reusables (unbranded) which can be used across establishments, with a deposit for use and drop off locations.	Legislative; Financial	Low	Easy	\$
Support workforce development, job training and trades skills in repair, refurbishment, remanufacturing, recycling, and innovative materials reuse.	Financial	Low	Easy	\$

# End-of-life refrigerants management

Reduce GHG emissions associated with end-of-life management of appliances that contain High-Global Warming Potential refrigerants. Benefits are highest in the near-term while these refrigerants are still in widespread usage.



# End-of-life refrigerants management - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Require reclamation or destruction of refrigerants from appliances at end of life and institute requirements for verification and reporting.	Legislative; Regulatory	High	Easy	\$
Imposing a ban on sale of virgin high-global warming potential (GWP) refrigerants for servicing with an exception for reclaimed refrigerants.	Legislative	High	Easy	\$
Extended Producer Responsibility program (see Initiative #2)	Legislative	High	Easy	\$
Create registry and reporting requirements (to track sales, stockpiles, and leaks) for large refrigeration and HVAC systems and refrigerant wholesalers and distributors.	Regulatory; Financial	Medium	Easy	\$

# Biogas Use

Recognizing that some waste generation will continue, determine limited and strategic best uses for energy produced from biogas/RNG derived from organic waste. Assess use in the waste transportation sector, electric co-location or cogeneration opportunities for energy/heat intensive industries and hard to electrify users.

Utilize market value of the energy to support organics diversion and waste reduction initiatives. Align energy price analysis with funding needs for build-out of organics recycling infrastructure.



# Biogas Use - Emissions Reductions Recommendations

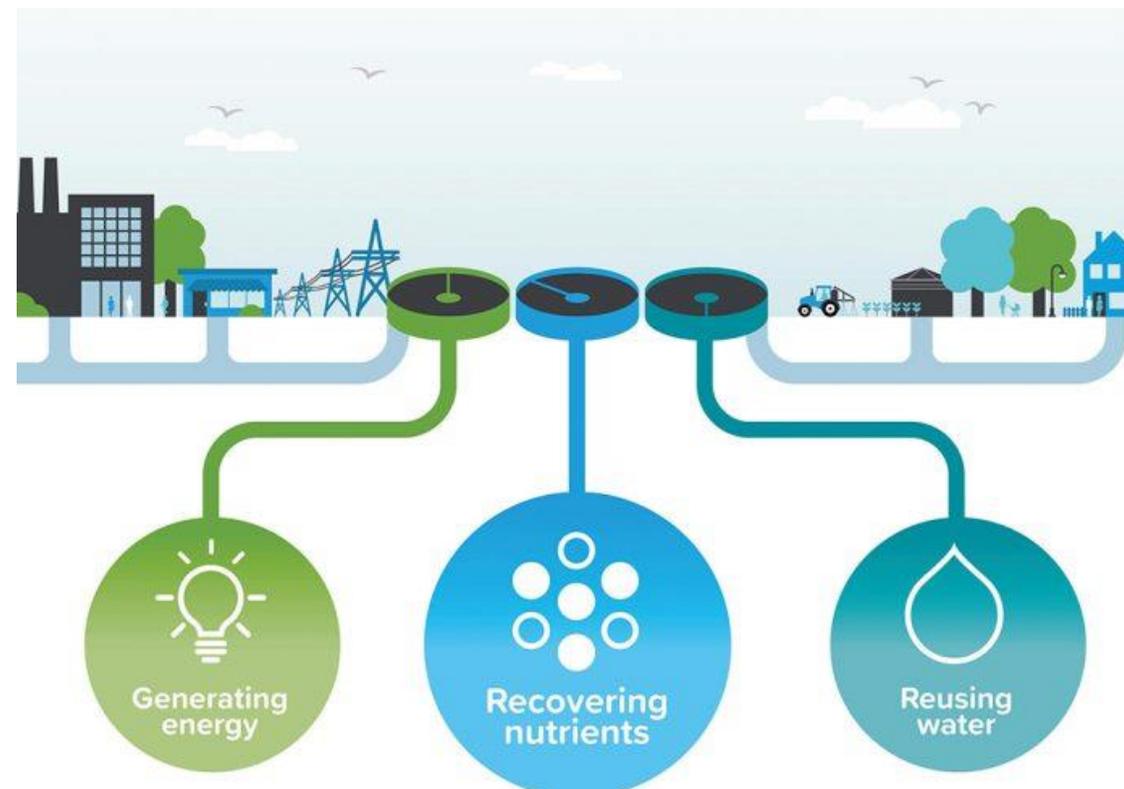
## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Identify energy pricing model and conduct market-based study for waste-generated biogas. Provide funding mechanism to support organics recycling infrastructure.	Legislative; Financial	Medium to High	Medium	\$\$
Evaluate strategic and local uses of generated fuels, electricity, or other energy produced from biogas/RNG for essential needs during transition to electrification and other low-emissions energy sources. Stress fuel uses in the waste transportation sector, electric co-location or cogeneration opportunities for energy/heat intensive industries, and hard to electrify users. Example: resilient microgrid capacity.	Legislative; Financial	Medium	Easy	\$

# Wastewater Management

# Water Resource Recovery Facilities (WRRFs)

- > Transform Wastewater Treatment Plants from waste disposal priority to Water Resource Recovery Facilities (WRRFs) that emphasize capture of beneficial products



# WRRFs - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Support beneficial use of biosolids.	Regulatory; Financial	Medium	Easy	\$
Support beneficial use of renewable biogas, recognizing that water treatment process waste generation is unavoidable.	Financial	Medium	Easy	\$
Operate co-digestion programs with existing capacity and increased pre-processing and depackaging capacity throughout the state.	Financial	High	Easy	\$

# Reduce fugitive emissions at WRRFs

- > Measure and reduce fugitive emissions from WRRFs, septic and sewer systems. Where density and local conditions allow, eliminate septic tanks and convert to municipal sewer system collections or advanced onsite treatments.



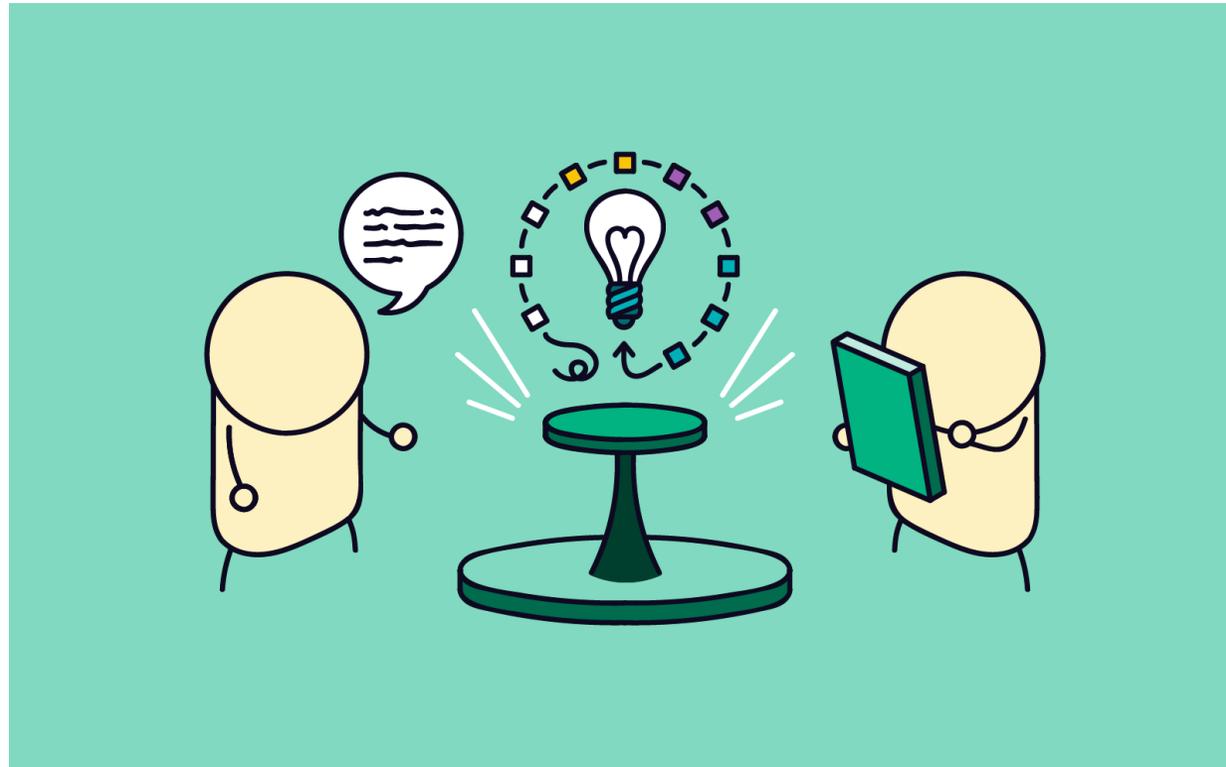
# Reduce fugitive emissions at WRRFs - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Capture, evaluate, and beneficially reuse fugitive biogas.	Financial	High	Easy	\$ to \$\$
Enhance regulations to require monitoring and mitigation of GHG emissions at WRRFs. Provide financial assistance and job training as needed.	Regulatory; Financial	Medium	Easy	\$
Perform emissions monitoring and updated at WRRFs and septic systems.	Regulatory; Financial	Medium	Easy	\$
Support proper maintenance of septic systems at the municipal level.	Legislation; Financial	Medium	Medium	\$
Repurpose septic sewer assistance programs: Existing programs could be extended to include sewer hookups to defray high up-front costs of sewerage.	Financial	Medium	Easy	\$\$

# Research

- > Continue to research and obtain more accurate data on climate impacts from solid waste



# Research - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Study co-pollutants from solid waste management and recycling facilities, including emerging contaminants.	Financial	Low	Easy	\$
Develop lifecycle analysis model and solid waste management decision making tool.	Financial	Low	Easy	\$
Research end of life management for difficult to manage materials (e.g., refrigerants, green energy infrastructure like solar panels, etc.).	Financial	Low	Easy	\$
Comprehensive landfill gas and water resource recovery facility emissions research study.	Financial	Low	Easy	\$
Market study of quantity and characteristics of organics produced in state as well as possible end uses.	Financial	Low	Easy	\$

# Green job development

- > Green, equitable jobs and workforce development. Institute coordination around workforce recruitment and employment frameworks. Develop strategies that result in a living wage green-collar labor system for residents and communities that are economically disadvantaged. Sustainable funding for environmental justice, resident-led initiatives with proven, shovel-ready (local and regional) solutions that reduce and divert recyclables and organics with a focus on multi-family buildings, disadvantaged, BIPOC, and underperforming communities.



# Green job development - Emissions Reductions Recommendations

## Mitigation and Enabling strategies summary

Description	Action type	Emissions impact	Ease of implementation	Cost
Institute a job program aimed at recruiting recycling and sustainability champions and residents from multi-family buildings, disadvantaged communities, BIPOC, and underperforming communities.	Financial	Low	Easy	\$
Strengthen partnerships with local workforce development and staffing programs.	Financial	Low	Easy	\$
Ensure funding consistent for program success.	Financial	Low	Easy	\$

# Benefits and impacts - Disadvantaged communities

- > Solid waste combustion and landfill facilities may be located in EJ and disadvantaged communities. Food waste in these facilities leads to odors that significantly impact quality of life for those communities and potential health impacts. Removing food waste will reduce truck traffic to the landfill and odors.
- > Reduction in landfilling will also reduce the need for transfer facilities and will reduce truck traffic that can impact EJ and disadvantaged communities. These facilities can significantly impact quality of life for those communities and potential health impacts.
- > Developing local recycling markets supports the businesses that provide job opportunities and reduce pollution in disadvantaged communities (see other recommendations).
- > Reduction and control of methane and other gases by the creation of new organics recycling infrastructure will reduce the potential impact on disadvantaged communities where disposal facilities are located.
- > Better research on co-pollutants and other impacts from solid waste management facilities (SWMFs) that may be located in EJ communities and means to potentially mitigate issues affecting these communities.

# Benefits and impacts - Health and co-benefits

- > Odors from landfills and transfer facilities have an impact on neighboring communities, and exposure to odors could result in health impacts. Reducing these odors will improve air quality and may reduce health impacts in these communities.
- > Reduction in truck traffic and transfer facilities can reduce emissions and will improve air quality in these communities.
- > Building local markets for materials reduces long distance truck traffic and associated health effects.
- > Specific infrastructure improvements will also provide enforceable emission controls of other pollutants to improve local air quality.
- > Beneficial reuse of biosolids has potential to offset synthetic, GHG intensive fertilizers, re-green space (tree plantings), and restore disturbed land.

# Benefits and impacts - Just transition: businesses and industries, workers

- > Increasing food donation will assist those in need and increasing food waste recycling will increase job opportunities, including local jobs for recycling facilities located close to the source.
- > Fugitive emission reduction projects produce energy, jobs, co-located facilities, and opportunities for partnerships with industries needing energy and/or heat.
- > Market development is critical to support the potential jobs in recycling and composting and will help support a just transition.
- > Jobs will follow the construction and operation of new biogas facilities. Organics management has potential to develop into a national industry of its own.
- > WRRFs will function as job creation hubs in the circular economy. Capturing non-renewable resources contained in wastewater (e.g., nitrogen, phosphorous) from treatment processes will require workforce training and permanent job creation. Local engineering, construction, and operation employment will be positively impacted by improving operations at these treatment facilities.

# Thanks!

## Waste Advisory Panel Members

**Martin Brand, Chair**, NYS Department of Environmental Conservation

**Dan Egan**, Feeding New York State

**Brigitte Vicenty**, Inner City Green Team

**Dr. Tok Michelle Oyewole**, NYC Environmental Justice Alliance

**Jane Atkinson Gajwani**, NYC Department of Environmental Protection

**Dereth Glance**, Onondaga County Resource Recovery Agency

**Steve Changaris**, National Waste & Recycling Association

**Eric Goldstein**, Natural Resources Defense Council

**Resa Dimino**, Resource Recycling Systems

**Michael Cahill**, Germano & Cahill, P.C.

**Allen Hershkowitz**, Green Sports Alliance

**Paul Gilman**, Covanta

**John W. Casella**, Casella Waste Systems

**Lauren Toretta**, CH4 Biogas

**George Bevington**, Barton & Loguidice

**Bernadette Kelly**, Teamsters Local 210, NYC



# Break

12-1pm

# **Energy- Intensive and Trade-Exposed Industries**

# Energy-Intensive and Trade-Exposed Industries Advisory Panel

## Recommended Strategies



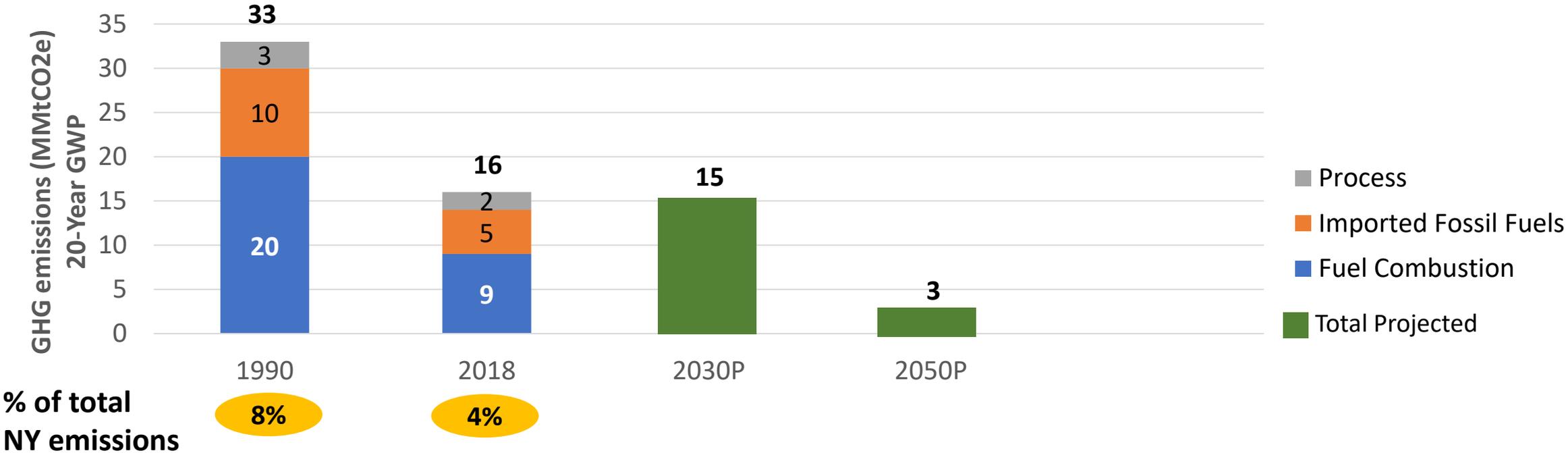
**Climate Action  
Council**

# Public and Stakeholder Input Process

- All EITE Advisory Panel meetings have been open for viewing by the public; all meeting presentations and notes have been posted to [climate.ny.gov](https://climate.ny.gov).
- December – input from Climate Action Council, Climate Justice Working Group
- January – input from public in virtual forum (verbal and written)
- Written comments were accepted at:
  - E-mail (preferred): [climate@esd.ny.gov](mailto:climate@esd.ny.gov)
  - Letter:
    - EITE Advisory Panel
    - c/o Empire State Development
    - 633 Third Avenue
    - New York, NY 10017
- February – input from EITE advisory panel on draft strategies
- March – finalized consensus on EITE advisory panel strategies for Climate Action Council

# Industrial sector GHG emission estimates with EITE panel strategies

Estimated GHG emissions by source type  
Industrial Sector



Source: Draft DEC/NYSERDA analysis subject to public review, 2018 emissions data are preliminary draft  
 Notes: Excludes indirect emissions from electricity consumption and product use emissions; "Imported Fossil Fuels" includes estimates of upstream GHG emissions associated with fuel combustion; "Fuel Combustion" GHG emissions include combustion of all fuel types at industrial facilities; "Process" GHG emissions include all non-combustion emissions related to industrial production; 2030P and 2050P values shown are based on E3 Pathways report under pre-CLCPA accounting and should be considered illustrative only.

# Key themes - EITE considerations for Industrial emission mitigation strategies

- Industrial sectors within EITE panel scope (Manufacturing, Mining) total a small share (~4%) of State emissions
- "Heterogeneous" nature may result in higher cost per tons of emissions reduced.
- "EITE" industries are likely to represent a high share of Industry sector emissions; non-incentive-oriented approaches may cause leakage.
- Emissions will decline with decarbonization of Power Generation sector; near-term opportunities likely focused on energy efficiency, while most deep decarbonization (carbon capture, low-carbon fuels, etc.) is est. to occur further into the future as new technologies scale, mature and become more viable.

# Key themes - Recommended EITE strategies

**Mitigation strategies:** Directly reduce emissions and contribute to the achievement of the GHG emission limits or carbon seq. needed to achieve net zero, where applicable:

1. Provide financial incentives and technical assistance for the decarbonization of EITE sectors
2. Create procurement incentives for business to capitalize on low-carbon economic opportunities

**Enabling initiatives:** No direct emissions benefit, but enable or magnify the mitigation strategies, enhance climate justice, or just transition. (*Examples: outreach, education, and awareness; capacity building; workforce development; and research and development.*)

3. Identify and support technological innovation to enable deep industrial decarbonization
4. Workforce development training to support Energy-Intensive and Trade Exposed (EITE) industries
5. Increase the available data on industrial GHG emissions to help prioritize efforts and monitor progress
6. Provide economic incentives to grow the green economy

# Mitigation strategy – Initiative #1: Financial and Technical Assistance

<b>Description:</b>	Provide technical assistance to help identify economically viable decarbonization projects and provide comprehensive energy management planning. Provide financial assistance for decarbonization projects and leverage low-cost hydropower to support industry.		
<b>Action type:</b>	Engineering support and financial incentives		
<b>GHG reduction by 2030:</b>	Low	<b>GHG reduction by 2050:</b>	High
<b>Cost and funding considerations:</b>	Costs to support industry can be through utility collections of a System Benefits Charge, agency funding or federal grants and support.		
<b>Ease of implementation:</b>	Easy		
<b>Example case studies:</b>	NYSERDA's Clean Energy Fund, NYPA's Low-Cost Power Program, Investor-Owned Utility Energy Efficiency Programs.		

<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>
Industries' internal competition for resources may prohibit investment in implementation of GHG reduction strategies.	Provide clear market signals of long-term resource commitments and benefits to industry

# Mitigation strategy – Initiative #2: Low-Carbon Procurement Policies

<b>Description:</b>	Develop preferential procurement standards for low-carbon building materials and remove impediments to the State's purchase of low-carbon materials. Low-carbon materials will be required to reduce emissions in the built environment. Providing a value proposition for manufacturers to produce low-carbon products will help reduce process related emissions.		
<b>Action type:</b>	Legislative/Regulatory		
<b>GHG reduction by 2030:</b>	Low	<b>GHG reduction by 2050:</b>	Medium
<b>Cost and funding considerations:</b>	Low-carbon products available in the near-term have comparable cost characteristics to legacy materials. Long-term costs can be controlled by capping preferential standards (e.g., a maximum % discount on bid price when a proposal contains low-carbon products)		
<b>Ease of implementation:</b>	Medium		
<b>Example case studies:</b>	Buy Clean California; EU 2014 Public Procurement Directives		
<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>		
<ul style="list-style-type: none"> <li>• Availability of different types of low-carbon products</li> <li>• Life Cycle Analyses (LCAs) of products require standardized accounting frameworks to ensure accurate accounting of emission reduction.</li> </ul>	<ul style="list-style-type: none"> <li>• RD&amp;D funding for product development</li> <li>• Work with federal government as well as other states and municipalities on LCA best practices to ensure that compliance is favorable to business interests.</li> </ul>		

# Enabling initiative – Initiative #3: Research Development & Demonstration (RD&D)

<b>Description:</b>	Develop a comprehensive Innovation Roadmap to determine priorities for deep decarbonization RD&D investment. Meeting the CLCPA goals for industry is not technically and/or economically feasible with currently available technologies alone. This research effort should analyze the social, financial, and technological characteristics of solutions that will enable industry to meet CLCPA goals. The research should consider the intersection of the industrial/manufacturing, agriculture, transportation, and power generation sectors when determining investment priorities.	
<b>Action type:</b>	Research initiative	
<b>Cost and funding considerations:</b>	<ul style="list-style-type: none"> <li>• Funding required for initial roadmap analysis with additional funding for further research and early-stage pilots to be determined pending the outcome of analysis.</li> <li>• Potential to leverage federal spending in these areas given developments with the new administration</li> </ul>	
<b>Ease of implementation:</b>	Easy	
<b>Example case studies:</b>	<i>Electrifying U.S. Industry (Renewable Thermal Collective); Getting to Neutral (Lawrence Livermore National Lab); Low-Carbon Heat Solutions for Heavy Industry (Columbia University)</i>	
<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>	
<ul style="list-style-type: none"> <li>• Research scope will need to be tightly defined to ensure meaningful recommendations can be ascertained</li> </ul>	<ul style="list-style-type: none"> <li>• Form collaborative stakeholder group to provide input on research scope</li> </ul>	

# Enabling initiative – Initiative #4: Workforce Development

<b>Description:</b>	Provide workforce development training on existing and new innovative emission reduction technologies
<b>Action type:</b>	Regulatory (Clean Energy Fund)-- NYS Labor
<b>Cost and funding considerations:</b>	Costs for training are mitigated by expanding job opportunities for clean energy workforce in addition to cost savings at facilities as GHG strategies are implemented.
<b>Ease of implementation:</b>	Easy
<b>Example case studies:</b>	NYSERDA Workforce Development Programs , NYS Dept of Labor Programs

<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>
<ul style="list-style-type: none"> <li>• Training programs not aligned with business needs</li> <li>• Risk aversion for businesses to invest in training</li> <li>• Long lead time to find skilled workers</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and or expand training to meet the needs and capacity</li> <li>• Offset cost of training</li> </ul>

# Enabling initiative – Initiative #5: GHG Reporting

<b>Description:</b>	Expand the universe of facilities that are required to report on their GHG emissions.
<b>Action type:</b>	Regulatory
<b>Cost and funding considerations:</b>	Reporting facilities would be the bearer of cost. DEC would be the bearer of cost for data collection and review.
<b>Ease of implementation:</b>	Medium – regulation adoption takes 12-24 months typically, but process is well established.
<b>Example case studies:</b>	Existing regulations (6 NYCRR Part 202-2) that require GHG reporting for major sources of criteria pollutants.

<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>
<ul style="list-style-type: none"> <li>- Establishing a GHG emissions threshold at which reporting will be required. There will likely be disagreement between state and regulated community as to what the threshold should be.</li> <li>- Concern about placing additional regulatory requirements on facilities already highly regulated by DEC.</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate whether to align this requirement with reporting already done to meet EPA GHG Reporting Program.</li> <li>- To the extent possible the new regulatory requirement should make clear that EITE industries already reporting GHG emissions to DEC would not be required to also report under any new reporting requirement.</li> </ul>

# Enabling initiative – Initiative #6: Economic incentives

<b>Description:</b>	Leverage the State's climate policies to develop an in-state supply chain of green economy companies by engaging in business development discussions and offering loans, grants, tax credits, and other economic incentives.
<b>Action type:</b>	Economic Incentives
<b>Cost and funding considerations:</b>	Costs are offset by attracting additional spending, which produces State and local tax revenues; State programs already in existence: Excelsior Jobs Program, NY Ventures, NYSERDA, etc.
<b>Ease of implementation:</b>	Easy / Operational
<b>Example case studies:</b>	<p>In April 2020, New York State created special "Green Economy Tax Credits" as economic incentives under the Excelsior Jobs Program, which have helped to attract several projects, including:</p> <ul style="list-style-type: none"> <li>• Li-cycle: Will recycle lithium-ion batteries, resulting in 100 jobs, \$175M investment. NYS committed \$5M.</li> <li>• Plug Power: Will produce green hydrogen from renewable electricity, resulting in \$298M in investment and 68 new jobs. NYS committed \$2M in tax credits, \$1.5M/10MW of power from NYPA.</li> </ul>

<b>Risks / Barriers to success</b>	<b>Possible mitigants</b>
<ul style="list-style-type: none"> <li>• Many green industries will require additional conditions to grow in NYS; greater market demand, workforce and suppliers.</li> <li>• Many jurisdictions are competing for green economy jobs.</li> </ul>	<ul style="list-style-type: none"> <li>• To be effective, economic incentives may need to be supported by workforce planning and other efforts to stimulate demand (e.g., clean energy and low-carbon procurements).</li> </ul>

# Key themes – Disadvantaged Communities

- > Industrial facilities are often located in or near Disadvantaged Communities.
- > Disadvantaged Communities should be both included in new green industry opportunities and targeted for decarbonization activities:
  - Air quality and health outcomes in Disadvantaged Communities will benefit from lower GHG emissions due to mitigation strategies.
  - Residents of Disadvantaged Communities will benefit from nearby jobs created by lowering GHG emissions and any new green economy industrial jobs.

# Key themes – Just Transition

- > Emission and business leakage risks to EITE industries and their workers should be mitigated.
- > Where possible, opportunities to repurpose fossil fuel infrastructure and/or create jobs to offset economic losses should be pursued (e.g., using decommissioned fossil fuel power plants as interconnection points for offshore wind energy).
- > Government support for GHG reduction activities and economic opportunities that support good jobs should be targeted to residents of Disadvantaged Communities.



# Thanks to the Energy-Intensive and Trade-Exposed Industries Panel

**Eric Gertler, Chair**  
President & CEO:  
Empire State  
Development

**Keith Hayes,  
Co-Chair**  
Senior Vice President  
of Clean Energy  
Solutions: NYPA

**Heather Briccetti**  
President & CEO: The  
Business Council of  
New York State

**Tristan Brown**  
Associate Professor of  
Energy Resource  
Economics: SUNY ESF

**Jason Curtis**  
Vice President &  
General Manager:  
Nucor Steel

**Carlos García**  
Energy Policy Planner:  
New York City  
Environmental Justice  
Alliance

**Leah George  
VanScott**  
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Development: Greater  
Rochester Enterprise

**Doug Grose**  
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CREATES

**Michael LeMonds**  
Vice President of  
Environment, Land  
and Government  
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**Melanie Littlejohn**  
Vice President and  
Regional Executive  
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**Elisa Miller-Out**  
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**Stephen Tucker**  
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Northland  
Workforce Training Ctr

**David Wasiura**  
Assistant to the  
Director: United  
Steelworkers District 4

**Lourdes Zapata**  
President & CEO:  
South Bronx Overall  
Econ. Devt. Corp.

# Summary:

- Mitigation Strategies
- Enabling Initiatives

Initiative #	Description	Action type	Emissions Impact	Ease of Implementation	Cost
1. Mitigation Strategy	Provide financial incentives and technical assistance for the decarbonization of EITE sectors	Financial and technical assistance	High	Easy	\$\$\$
2. Mitigation Strategy	Create procurement incentives for business to capitalize on low-carbon economy opportunities	Low-carbon procurement policies	Low	Medium	\$\$
3. Enabling Initiative	Identify and support technological innovation to enable deep industrial decarbonization	Research, Dev. & Demonstration	N/A	Medium/Hard	\$\$
4. Enabling Initiative	Workforce development training to support Energy-Intensive and Trade-Exposed (EITE) industries	Workforce development	N/A	Easy	\$\$
5. Enabling Initiative	Increase the available data on industrial GHG emissions to help prioritize efforts and monitor progress	Reporting requirement	N/A	Medium	\$
6. Enabling Initiative	Provide economic incentives to grow the green economy	Economic incentives	N/A	Easy	\$

# **Just Transition Working Group**

# Just Transition Working Group

JTWG Tasks and Deliverables		
Just Transition Principles	Not a statutory requirement	Draft research-based, New York-specific principles of a just transition for purposes of guiding working groups and advisory panel recommendations to the CAC
Workforce Development & Training	Statutory requirement	Make recommendations on how to build talent pipelines that focus on the trades, disadvantaged communities and underrepresented segments of the population, transitioning power plant workers, and public sector employees, including with respect to the transferability of skills
Business Impacts	Statutory requirement	Subgroup formed to identify energy-intensive industries and related trades; advise on the potential impacts of carbon leakage risk; develop recommendations on issues and opportunities
Power Plant Inventory & Site Reuse	Statutory requirement	Subgroup formed to lead development of 1) power plant inventory and 2) Issues and Opportunities – identifying issues and opportunities presented by site reuse
Jobs Study	Statutory requirement	Analyze a broad set of employment impact questions related to achieving the statute's goals

# Just Transition Principles

# Just Transition Principles (1 of 2)

## Principle Language

Engage a diverse range of stakeholders via early, inclusive engagement in communities' transitions to local low-carbon economies, including New York's workforce and the State's disadvantaged communities.

Encourage collaborative state and community-based long-term planning, capacity building, and robust social dialogue in order to ensure a gradual and supported transition.

Ensure that transition plans, policies, and programs reflect and respect local wisdoms, cultures, and traditions, including recognition of indigenous sovereignty.

Seek to lift up New Yorkers in the transition to a low-carbon economy by implementing transition policies and programs that promote cross-generational prosperity and gender and racial equity, in recognition of the disproportionate burden of environmental pollution and climate change on disadvantaged communities.

Promote the creation of high-quality, family-sustaining jobs, including union jobs, and ensure that new jobs are created in transitioning and disadvantaged communities, connecting workers to employment opportunities through career services, skills training, and infrastructure investments.

# Just Transition Principles (2 of 2)

## Principle Language

Promote diversified, strengthened economies in the transition to a low-carbon economy, examine opportunities for community-centered ownership structures, and promote industry recovery, retention, and growth for regions and sectors in transition.

Develop a robust in-state low-carbon supply chain, spanning full product lifecycles, to increase focus on exporting low- and no-carbon products and to ensure that jobs in these emerging sectors become more accessible to the local workforce and to disadvantaged communities.

Integrate climate adaptation into transition planning, including through promotion of community resilience and investment in sustainable infrastructure.

Promote the restoration, conservation, and resiliency of the State's agricultural and natural systems, improving local food security and supply and fostering healthy ecosystems, particularly in disadvantaged communities through sustainable land and natural resource use.

Implement decarbonization policies that simultaneously bolster industry retention and sustainable economic development and growth, and ensure that economy-wide programs and policies address the social, environmental, and economic challenges of workers and communities in transition.

# Initial Workforce Recommendations

# Enabling Initiatives

Initiatives and components required for delivery	Implementation Lead	Time to Develop/Launch	Other key stakeholders
<p><b>1) Direct Displaced Worker Support:</b></p> <ul style="list-style-type: none"> <li>• Training fund, On-the-Job Training (OJT), job fairs</li> <li>• More advanced support where facility closures are known ahead of time</li> <li>• 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"> <li>• Retention: need to <i>retain</i> workers at plants where continued operation needed, as well as <i>retrain</i> workers</li> <li>• Leverage opportunities at dual-commodity utilities</li> </ul> </li> <li>• 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"> <li>• Survey of conventional power plant workforce to identify career status, future interests, timing needs, and other considerations</li> </ul> </li> </ul>	<p>NYS DOL</p>	<p>6-18 months</p>	<p>NYSERDA, DPS, NYPA, unions, Workforce Dev. Institute, developers, training organizations</p>

# Enabling initiatives

Initiatives and components required for delivery	Implementation lead	Time to Develop/Launch	Other key stakeholders
<p>2. <b>Further Evaluate Labor Standards</b> (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:  <b>Project Labor Agreements, and Community Benefits/Workforce Agreements</b></p>	NYS DOL	6-12 months	NYSERDA, labor unions, clean energy developers and contractors, Workforce Dev. Institute
<p>3. <b>Targeted Financial Support for Businesses</b> to address Diversity, Equity, and Inclusion (DEI) and build an inclusive clean energy economy (On the Job Training, support for recruitment, training, hiring, job retention, etc., for Disadvantaged Communities and MWBEs, design and installation firms, community-based organizations, start-ups, worker cooperatives</p>	NYSERDA	4-6 months	NYS DOL, MWBEs, Start-ups, ESD, Chambers of Commerce
<p>4. Develop Climate Justice and Clean Energy <b>Training Curriculum and Programs</b> 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><b>5. Comprehensive Career Pathway Programs</b></p> <p><b><i>Future Workers (primarily entry-level):</i></b>            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"> <li>• Career awareness and supportive services for job placement</li> <li>• Climate Justice Job Corp Fellowships (entry-level and transitioning workers) and OJT</li> </ul> <p><b><i>Existing Workers (transitioning fossil fuel workers, manufacturers, clean energy workers, CBOs, MWBEs, SDVOBs, state/local public workforce, worker cooperatives, etc.):</i></b></p> <ul style="list-style-type: none"> <li>• Technical Upskilling (curriculum and training equipment)</li> <li>• Career Advancement and management/leadership training</li> </ul>	<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>

CBO: Community-Based Organizations  
 MWBE: Minority and Women Owned Business Enterprise  
 SDVOB: Service-Disabled Veteran-Owned Business

# Enabling Initiatives

Initiatives and components required for delivery	Implementation lead	Time to Develop/Launch	Other key stakeholders
<p><b>6. Community Engagement, Stakeholder Input, Market Assessments</b></p> <p>Complete Jobs Study</p> <p>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</p> <p>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</p>	<p>NYSERDA</p> <p>NYSERDA and NYS DOL</p> <p>NYS DOL, NYSERDA, DPS</p>	<p>Ongoing</p> <p>3-24 months</p> <p>3-18 months</p>	<p>CAC, Advisory Panels and Working Groups</p> <p>Unions, developers, manufacturers, building owners training orgs, trades associations, K-12</p> <p>Unions, trade associations, large project developers, clean energy design and install firms</p>

# 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: Energy-Intensive Industries and Related Trades Identification**

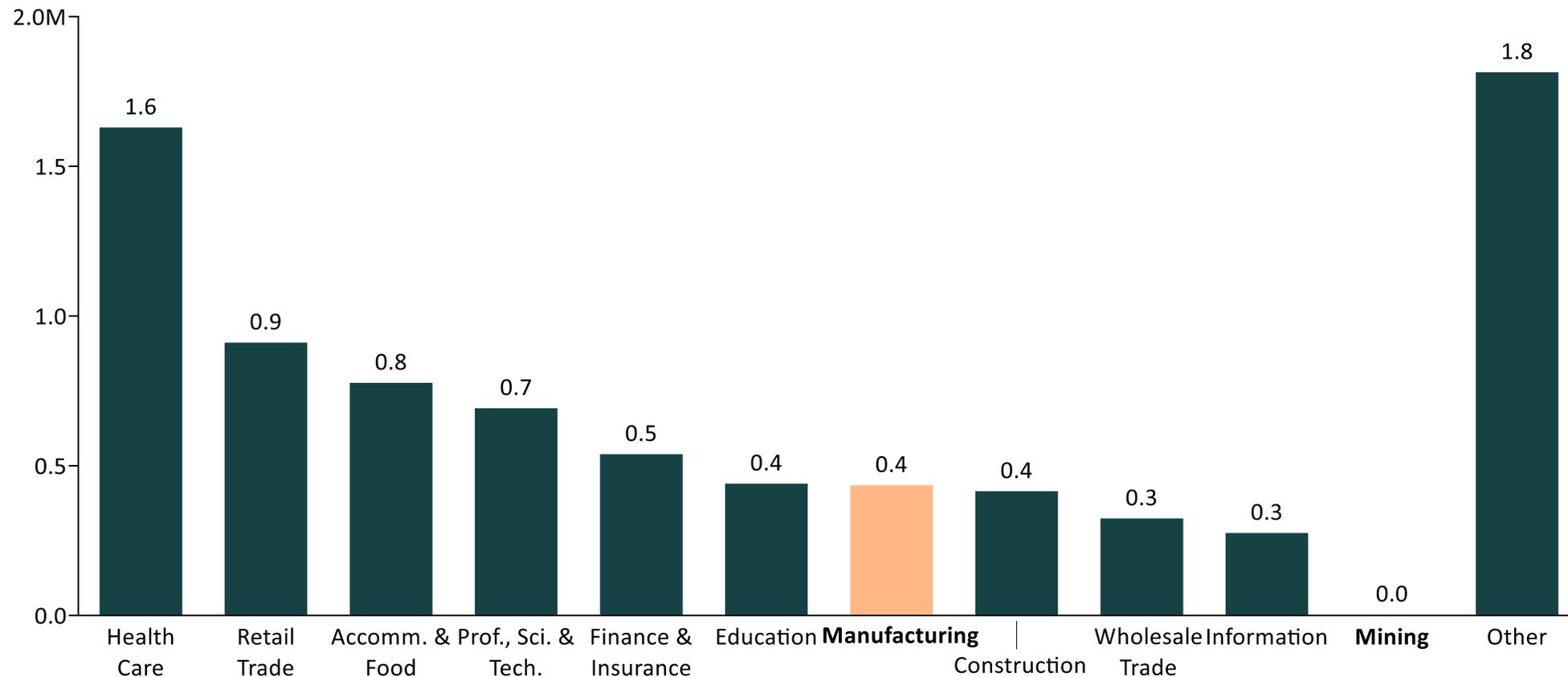
# Objective

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

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

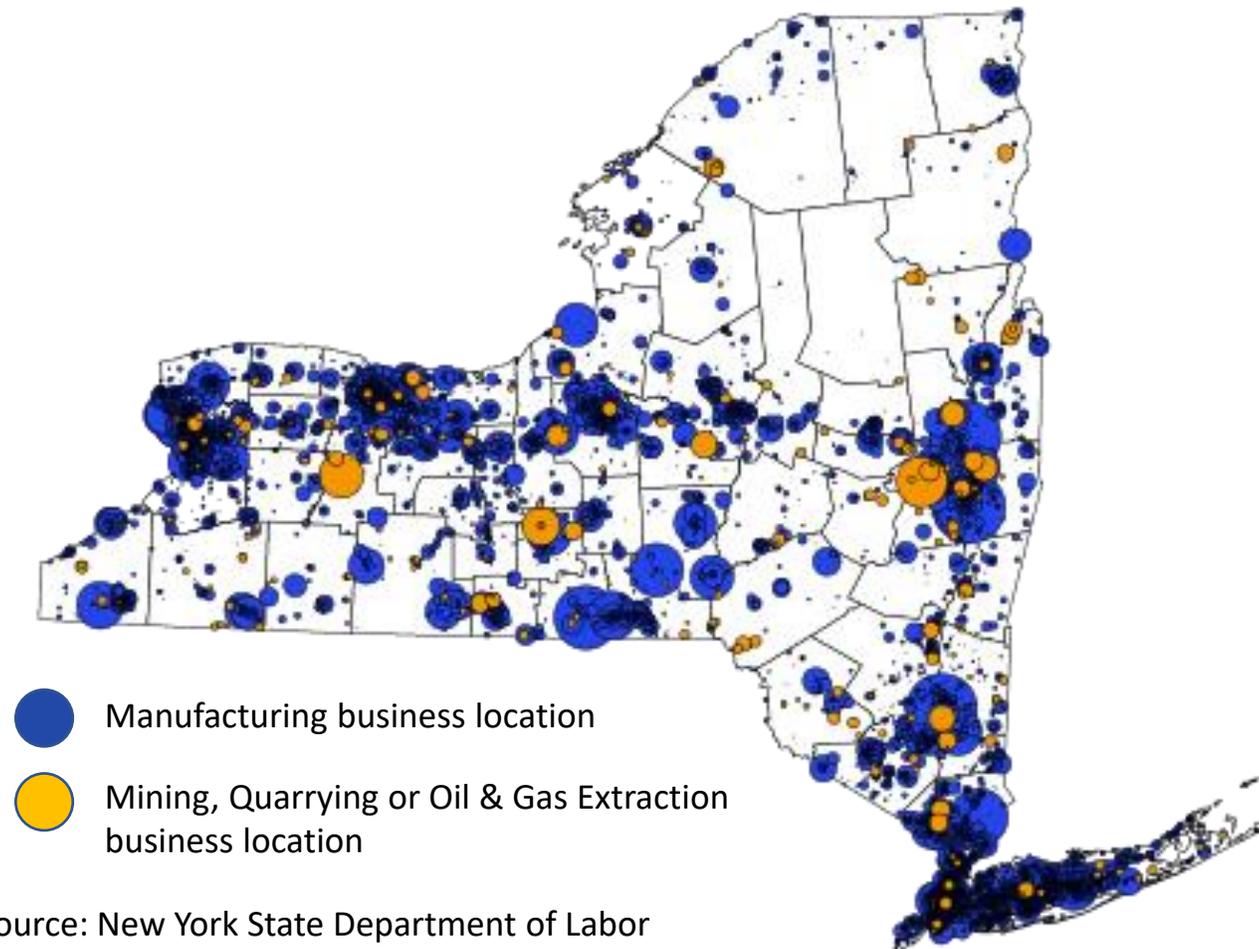
# Energy-intensive industries are concentrated in the Manufacturing and Mining sectors

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.

# Manufacturing and Mining Locations Span New York State

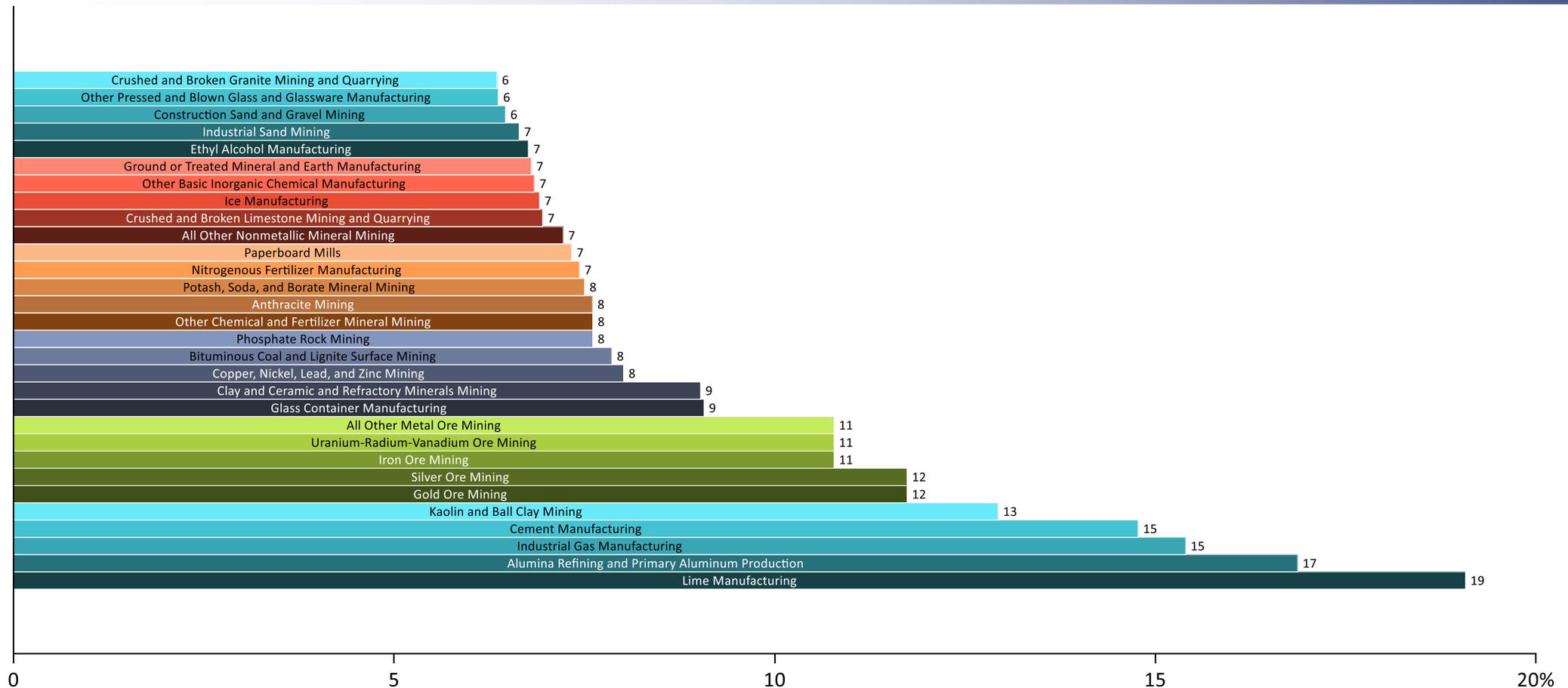


Source: New York State Department of Labor

## 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

# Preliminary Estimates: 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*

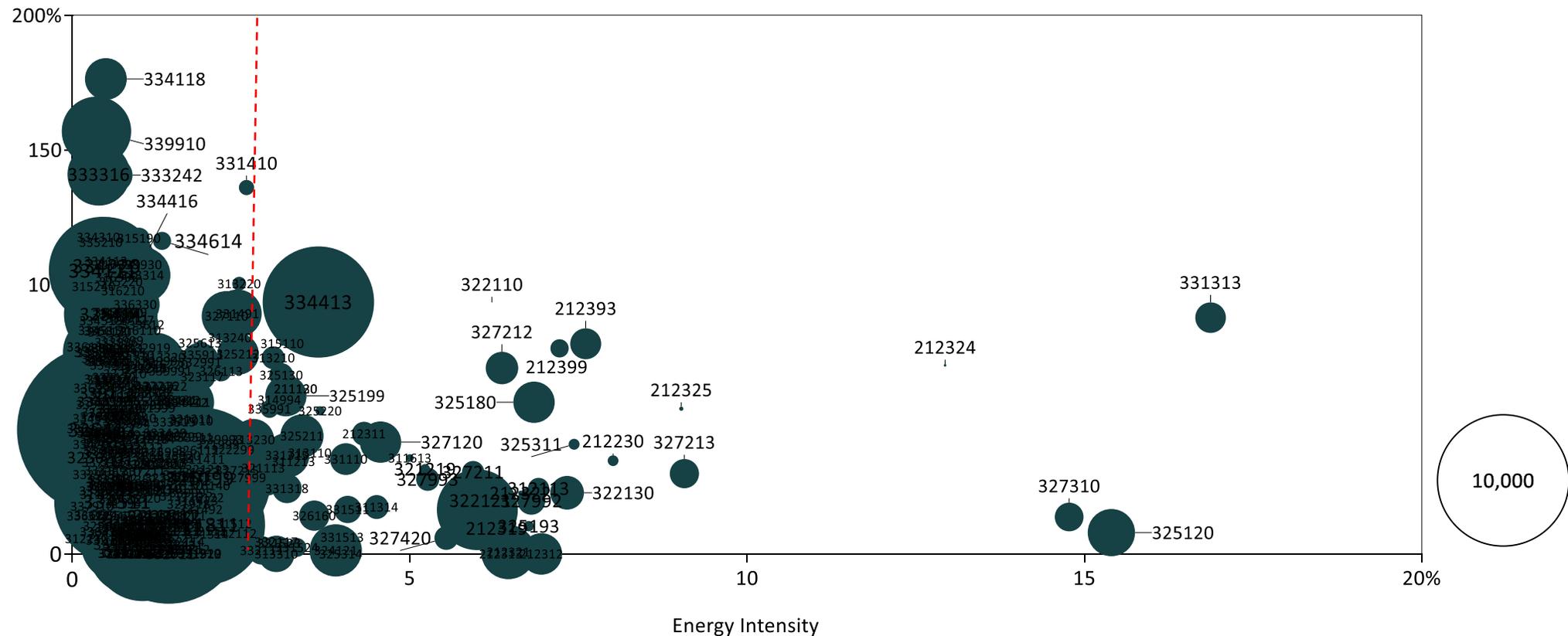
Occupational Title	Employment	% of Industry Employment
Total all occupations	9,391	100.00%
Heavy and Tractor-Trailer Truck Drivers	586	6.24%
Chemical Equipment Operators and Tenders	444	4.73%
Industrial Machinery Mechanics	415	4.42%
Operating Engineers and Other Construction Equipment Operators	407	4.34%
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.

# Most Manufacturing and Mining jobs in New York State are in industries with <2.5% energy intensity

Trade Intensity

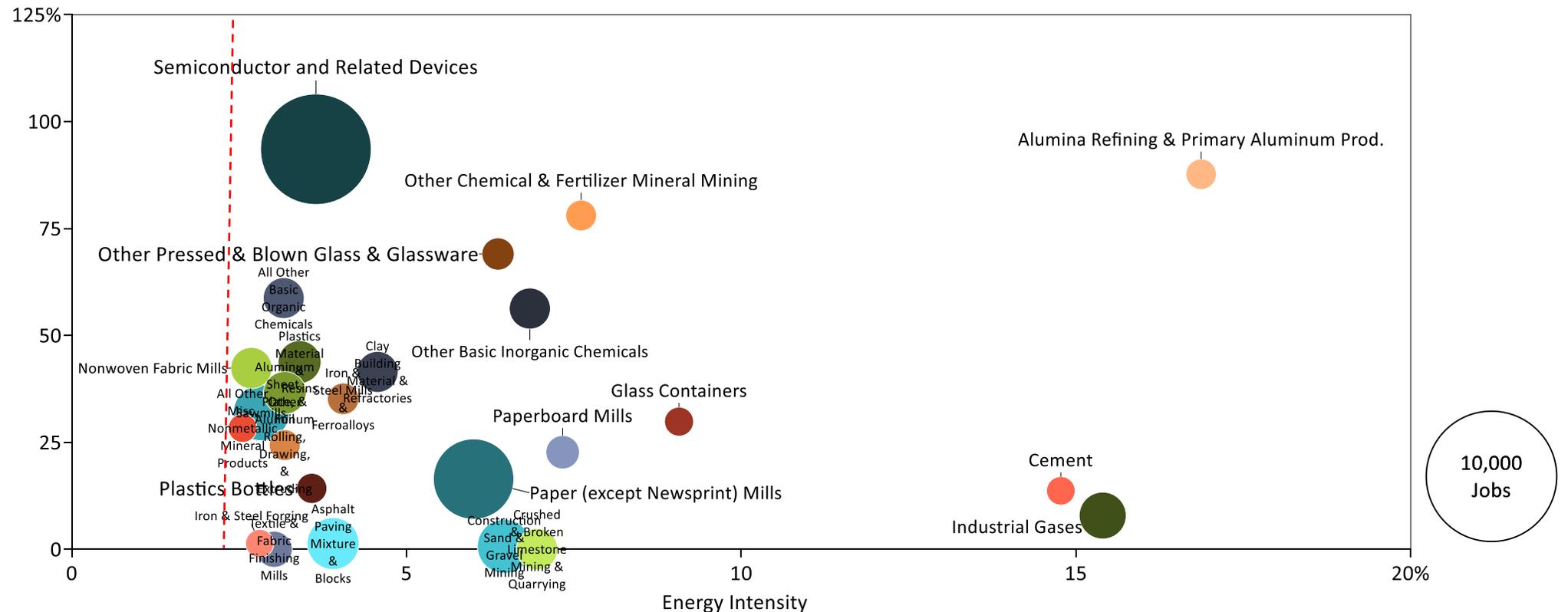


Source: Business Impacts Subgroup Staff Working Group Analysis

Note: X-axis represents energy intensity of U.S. industry, Y-axis represents trade intensity of U.S. industry, and size of bubble represents number of jobs in NYS (relative to 10,000 reference bubble); Energy vs. Trade Intensity by NYS Employment: Manufacturing and Mining; Industries are denoted by six-digit NAICS code.

# For industries with >2.5% energy intensity, NYS jobs are concentrated in semiconductors, paper, metal, cement, gas, glass and chemical manufacturing

Trade Intensity



Source: Business Impacts Subgroup Staff Working Group Analysis.

Note: Energy vs. Trade Intensity: NYS Industries >2.5% Energy Intensity, >450 Jobs; Energy intensity and jobs thresholds used only for data visualization and do not represent formal criteria.

# **Business Impacts: Challenges and Opportunities**

# Just Transition Workstream: Business Challenges and Opportunities

## Scope workstream: Business Impacts

<b>Context:</b>	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.
<b>Statutory objectives:</b>	Recommendations on how to address: <ul style="list-style-type: none"><li>• Issues and opportunities related to the energy intensive and trade exposed entities</li><li>• Measures to minimize the carbon leakage risk and minimize anti-competitiveness impacts of any potential carbon policies and energy sector mandates</li></ul>
<b>Deliverable:</b>	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

<p><b>Challenges</b></p> <ol style="list-style-type: none"> <li>1. Business and emissions leakage</li> <li>2. Electricity/fuel costs, system reliability</li> </ol>	<p><b>Potential Strategies</b></p> <ol style="list-style-type: none"> <li>1a. Incentives for early action, benchmarks</li> <li>1b. Cap and invest*, output-based rebates*</li> <li>2. Low cost, clean power programs, energy efficiency, on-site renewable electricity and energy storage</li> </ol>
<p><b>Opportunities</b></p> <ol style="list-style-type: none"> <li>1. Build and foster strategic partnerships</li> <li>2. Promote low carbon products</li> </ol>	<p><b>Potential Strategies</b></p> <ol style="list-style-type: none"> <li>1. Consortia, economic development groups, partnerships with K-12, technical schools, and colleges, business outreach and awareness</li> <li>2. Recognition, procurement policies, regional/national cooperation to expand markets for low carbon products</li> </ol>

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

# **Power Plant Inventory and Site Reuse Opportunities**

# Overview of Power Plant Work-Products

## Two power-plant deliverables for Just Transition Working Group

- > Language from CLCPA:
  - “[the Just Transition Working Group shall] ... identify sites of electric generating facilities that may be closed as a result of a transition to a clean energy sector and the issues and opportunities presented by reuse of those sites”
- > Two main deliverables:
  - **Power Plant Inventory**
  - **Identification of Issues and Opportunities Presented by Site Reuse**

# Issues Presented by Power Plant Site Reuse

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

**> Issues presented by site reuse:**

- Displaced workforce, and local economic impacts
- Reduced local property tax revenues (County, Municipality, School District)
- Parcel ownership, transfer, and associated factors
- Local planning capacity and community engagement
- Impacts caused by a dormant site being left unattended/unmanaged
- Environmental remediation
- Reliability impacts (current reliability role/contribution)
- Stranded assets and infrastructure impacts

> *Appendix slides present these issues in more detail*

# Opportunities Presented by Power Plant Site Reuse

## JTWG to identify issues and opportunities presented by site reuse

### > Opportunities presented by site reuse:

- Repurposing with onsite clean energy resources
- Interconnection points and infrastructure for offsite renewables
- Commercial redevelopment – residential, commercial, mixed-use, etc.
- Port/marine infrastructure
- Industrial reuse, Information Technology/data centers, manufacturing
- Green-space, park infrastructure – including for climate resilience
- Diversify/extend property tax revenues

> *Appendix slides present these opportunities in greater detail*

# Power Plant Inventory: Objectives and Approach

**CLCPA: “identify facilities that may be closed as a result of a transition to a clean energy sector”**

## > Important notes and reminders

- Inventory is informational only, rather than predictive or decisional: it does not opine in any way on the State or Working Group’s view of which plants *will* close, the cause(s) of any future closures, or the specific timing/order of any future closures
- Just Transition Working Group is not a decision-making body, and this inventory is not binding in any way
- Inventory focuses on objective plant metrics and data-points most salient in future transitions: plant age, capacity factor, fuel type, environmental/emission compliance, etc. Many data points will change over time, and this inventory is just a snapshot.
- Planning decisions will be result of multiple considerations: commercial, operational, regulatory, market factors, among others
- Plant deactivations follow very prescriptive process through New York Independent System Operator (NYISO), *see appendix*. Inclusion of a plant on this list does not suggest such deactivation planning or other NYISO processes are imminent or should be initiated.
- In referencing inventory, please be respectful of and sensitive to the community and human stories contained in and behind the numbers on the page: the jobs, reliability, emissions, and health impacts alike
- All in the context of major CLCPA requirements: 70% renewable by 2030, 100% zero-emission by 2040 (see appendix for other major policy drivers)

# Power Plant Inventory: Summary of Facilities Identified

**CLCPA: “identify facilities that may be closed as a result of a transition to a clean energy sector”**

## > **Private facilities (IPPs, IOUs)**

- 32 facilities, roughly 16,000 MW of capacity
  - Inclusive of 3 GW of previous/known retirements, plus multiple facilities that will be out of service pursuant to DEC regs
- Represent roughly \$140M local property tax contributions per year (excl. indirect local economic impacts)
- Employment: at least approximately 1,685 jobs
  - Approx. 1,429 confirmed site-specific jobs; 256 additional aggregated jobs from NYSDOL QCEW data

## > **Public facilities (owned by/serving NYPA, LIPA, municipal utilities)**

- 29 facilities, roughly 6,500 MW of capacity
  - Inclusive of multiple facilities with units going out of service pursuant to DEC NOx regulations
  - Generation facilities serving LIPA are private facilities committed under contracts that expire primarily in 2027 and beyond
- Represent roughly \$180M local property tax contributions per year (excl. indirect local economic impacts)
- Employment: at least approximately 421 jobs
  - Approx. 91 confirmed site-specific jobs; 330 additional aggregated jobs from NYSDOL QCEW data

## > **Context for overall statewide generation fleet and power sector:**

- ~150 emitting facilities, total of 38+ GW of total capacity (26+ GW of which are fossil-based resources)
- Roughly 24,000\* employed in full traditional electric power generation sector, as of 2019 (pre-COVID)
  - \*Not employed directly at power plants, but rather across full supply chain (O&M, manufacturing, etc.), including partial time

# Power Plant Inventory: Employment

## Summary of power plant employment via JTWG subgroup and NYSDOL data sources

- > **Subgroup Input:** site-specific employment figures contributed via subgroup members and agencies total approximately **1,520** workers across 22 plants (out of 61 facilities on inventory)
- > **NYSDOL QCEW\* Data:** provides ability to look at de-identified/aggregated employment numbers for the plants in question on our inventory
  - Confidentiality rules prevent data to be shared at a firm- or employee-specific level
  - QCEW data identifies approximately **586** additional employees at other facilities on our inventory
  - Data remains unavailable or unverifiable for the remaining small number of facilities
- > 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

\*QCEW, Quarterly Census of Employment and Wages, 2020 Data

# Power Plant Inventory

## Non-Gov't Plants – IPPs, IOUs, etc. (1 of 5)

Simple Power Plant Name	Owner/ Operator	City/town	NYISO Zone	GIS Coordinates	Plant Vintage (Oldest Unit)	Primary Fuel	Nameplate Rating (MW)	2018 Capacity Factor (Aggregate)	2019 Capacity Factor (Aggregate)	Jobs	Local Property Taxes (\$ per year)	Located in Potential EJ Area?	Grid Infrastructure	Potential Clean Energy Associated w/ Site	Active Repowering Proposal	Site Information
East River (note: cogen, electricity and steam)	ConEd	Manhattan	J	40.72719, -73.9725	1951-11-01	NG	726.2	46.5%	44.3%	290	\$23,800,000	Y	CRIS (S/W): 653.9 MW / 731.4 MW Voltage at substation: East River 69kV Local TO substation: East River			Acreage: 3.2 Parcel zoning: M3-2 Assets (Buildings, Rail, Roads, Water): East River, FDR Drive, ConEd (building)
Danskammer	Danskammer Energy, LLC	Newburgh	G	41.57304527 022974, -73.96472865 969712	1951-12-01	NG	532	0.7%	0.2%		\$1,500,000	N	CRIS (S/W): 511.1 MW / 511.1 MW Voltage at substation: 115kV Local TO substation: Danskammer		Q#791 Danskammer Energy Center is a repowering project that would include retiring Danskammer units# 1, 2, 3, and 4. Currently in Article 10 proceeding.	Acreage: 180 Assets (Buildings, Rail, Roads, Water): Hudson River, Roseton Generating Facility
Greenidge 4	Emera	Torrey	C	42.6789, -76.9483	1953-12-01	NG	112.5	20.5%	5.7%		\$60,000	N	CRIS (S/W): 106.3 MW / 106.3 MW Voltage at substation: 115 kV Local TO substation: Greenidge			Acreage: 300 Parcel zoning: I-Industrial Assets (Buildings, Rail, Roads, Water): Seneca Lake, NY-14 (hwy)
Astoria (Steam - ConEd)	Eastern Generation Co. (ArcLight Capital)	Queens	J	40.78767, -73.91256	1954-03-01	NG	959	12.8%	7.9%	90 (union only)	\$575,000	Y	CRIS (S/W): 938.9 MW / 943.7 MW Voltage at substation: Local TO substation:	Storage		Acreage: 300 Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): East River
Cayuga	Cayuga Operating Company, LLC	Lansing	C	42.603333, -76.63555	1955-09-01	BIT	322.5	3.5%	5.9%	2	\$2,200,000	N	CRIS (S/W): 154.1 MW / 154.1 MW Voltage at substation: 115 kV Local TO substation: Cayuga	Large-scale solar		Acreage: 400 Parcel zoning: IR Assets (Buildings, Rail, Roads, Water): Road access, water
Arthur Kill	NRG	Staten Island	J	40.59171, -74.20011	1959-08-01	NG	931.7	12.1%	11.1%		\$8,600,000	Y - near	CRIS (S/W): 903.3 MW / 908.4 MW Voltage at substation: 138/345 Local TO substation: Freshkill 138 kV	Storage		Parcel zoning: M3-1 Assets (Buildings, Rail, Roads, Water): Water, Pratt Industries Paper Mills (nearby)

# Jobs Study

# Just Transition Workstream: Jobs Study

## Scope workstream: Jobs Study

<b>Statutory Objective:</b>	<ul style="list-style-type: none"><li>• CLCPA requires the JTWG to execute a study to analyze a broad set of employment impact questions related to achieving the statute's goals</li><li>• Particular attention to employment in the state's disadvantaged communities</li></ul>
<b>Status</b>	<ul style="list-style-type: none"><li>• Contractor selected from Request for Proposal</li><li>• Scope of work was initiated in December 2020</li><li>• Workstream will be conducted through 2021 (concluding December 31, 2021)</li></ul>
<b>Objectives &amp; Order of Operations</b>	<p><b><u>Project Objectives &amp; Order of Operations</u></b></p> <ol style="list-style-type: none"><li>1. Develop structure &amp; framework of the employment impact model (January – April)</li><li>2. Produce the initial employment model outputs by industry and occupation (March – October)</li><li>3. Examine the workforce implications associated with model outputs &amp; scenarios (September – December)</li></ol>

# Thank you to the JTWG Members!

**Roberta Reardon,  
Co-Chair**  
Commissioner:  
Department of Labor

**Doreen Harris,  
Co-Chair**  
Acting President &  
CEO: NYSERDA

**RuthAnne  
Visnauskas**  
Commissioner: Homes  
& Community  
Renewal

**Sarah Osgood**  
Representing the  
Chair, Public Service  
Commission

**Gary LaBarbera**  
President: Building  
and Construction  
Trades Council of  
Greater New York

**Vincent Albanese**  
Director of Policy and  
Public Affairs: LIUNA

**Omar Freilla**  
Founder &  
Coordinator: Green  
Worker Cooperatives

**Henry Garrido**  
Executive Director: DC  
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**Patrick Jackson**  
Director of Global  
Energy Management:  
Corning, Inc.

**Michael Padgett**  
Vice President of  
Energy: Alcoa

**Brian Raley**  
Principal Staff  
Engineer: Global  
Foundries

**James Shillitto**  
President: Utilities  
Workers Union of  
America Local 1-2

**Maritza Silva-  
Farrell**  
Executive Director:  
ALIGN

**Ted Skerpon**  
Chair: IBEW Local 97  
& Utility Labor Council

**Lara Skinner**  
Executive Director:  
The Worker Institute  
at Cornell University

**Candis Tolliver**  
Political Director: 32BJ  
SEIU

**Randy Wolken**  
President: MACNY &  
Manufacturers  
Alliance

# Next Steps