

Advisory Panel on:

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

October 28, 2020
Meeting 3



**Climate Action
Council**

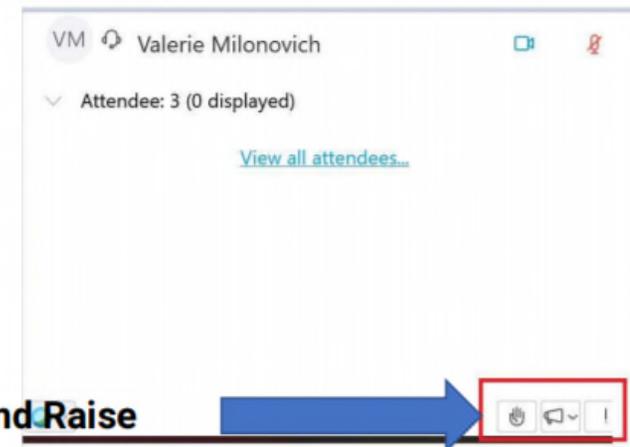
Logistics and Meeting Procedures

Before beginning, a few notes to ensure a smooth discussion:

- > Panel Members should be on mute if not speaking
 - If using phone for audio, please tap the mute button
 - If using computer for audio, please click the mute button on the computer screen (1st visual)
- > Video is encouraged for Panel Members, in particular when speaking
- > In the event of a question or comment, please use the hand raise function (2nd visual). You can get to the hand raise button by clicking the participant panel button (3rd visual). The Chair will call on members individually, at which time please unmute.
- > If technical problems arise, please contact William.Mead@its.ny.gov or (518) 292-5192.



You'll see  when your microphone is muted



Meeting Objectives

- “Deep Dives” to Review Key Panel Topics
 - Industrial Emissions
 - Technology and Process Solutions
 - Preview of Policy Options
- Solicit Panel Ideas, Input on Other Policy Options to Explore

Agenda

- Welcome and Updates
- Deep Dives:
 - Review Industrial Emission Sources
 - Review Technology and Process Solutions to Reduce Emissions
 - Preview of Policy Options
- Next Steps

Energy-Intensive and Trade-Exposed Industries Advisory Panel

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President & CEO:
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Updates

- Work Plan presented to CAC
- Climate Adaptation and Resiliency Group
- Business Impacts JTWG Subgroup

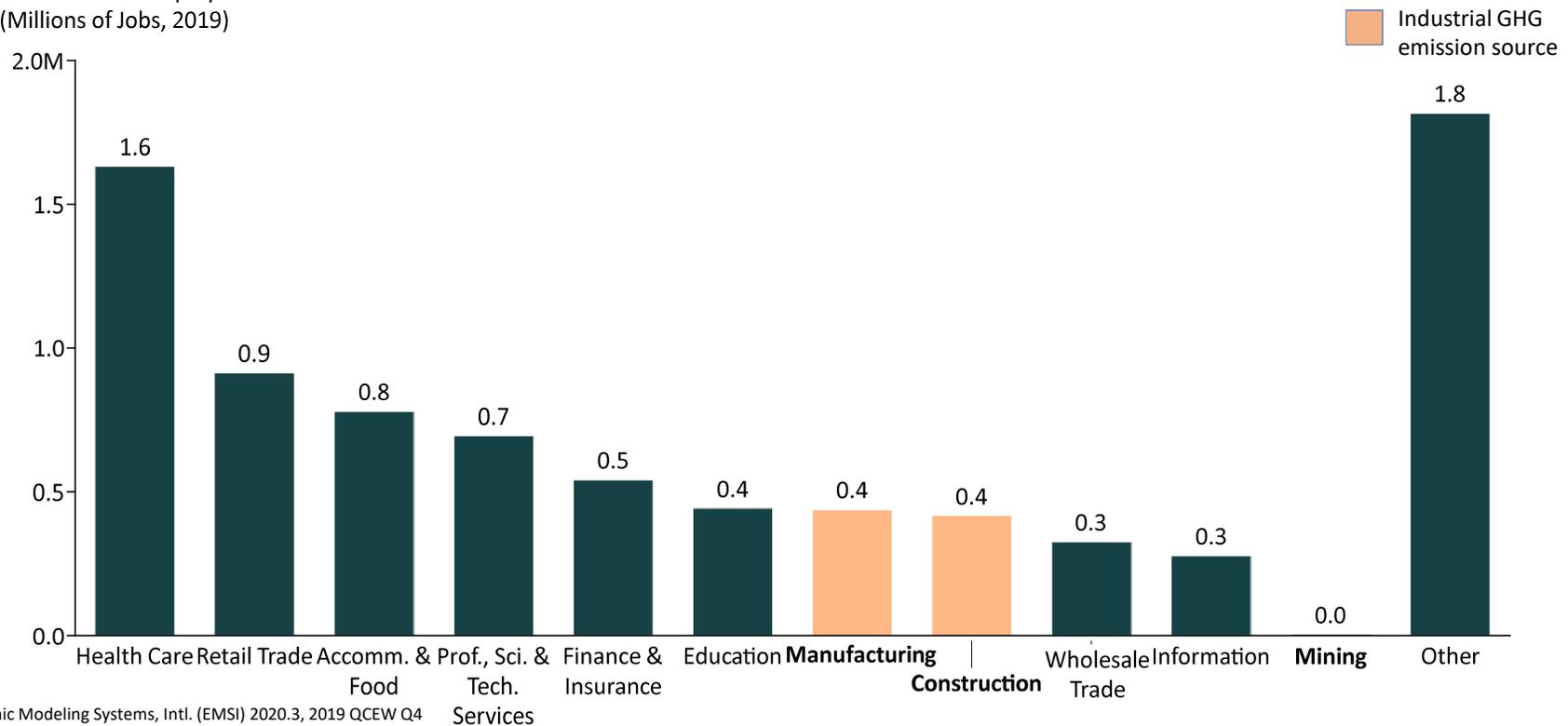
Deep Dives

- Industrial Emission Sources
- Technology and Process Solutions to Reduce Industrial Emissions
- Preview of Policy Options

Industrial Emission Sources

Reminder: Industrial sectors within Panel scope include Manufacturing, Construction, Mining

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



Source: Economic Modeling Systems, Intl. (EMS) 2020.3, 2019 QCEW Q4

Note: Other includes Agriculture, Forestry, Utilities, Transportation, Warehousing, Real Estate, Management of Companies, Admin and Support, Arts, Entertainment and Other Services.

Reminder: Industrial emissions in Scope come from: Combustion, Processes and Electricity

- **Fuel Combustion:** Direct emissions produced by the combustion of fuel
 - *Example: A factory burns fuel on-site as part of a heat treatment process. The burning of the gas releases greenhouse gas emissions.*
- **Non-Combustion Industrial Processes:** Direct emissions released as the result of industrial processes
 - *Example: During cement production, limestone heated in the kiln releases carbon dioxide as it is transformed into clinker.*
- **Electricity Use:** Indirect emissions produced by the generation of power offsite
 - *Example: A factory uses electricity to run its assembly line. A natural gas power plant must generate the electricity, indirectly creating emissions offsite.*

Reminder: Many sources of emissions data

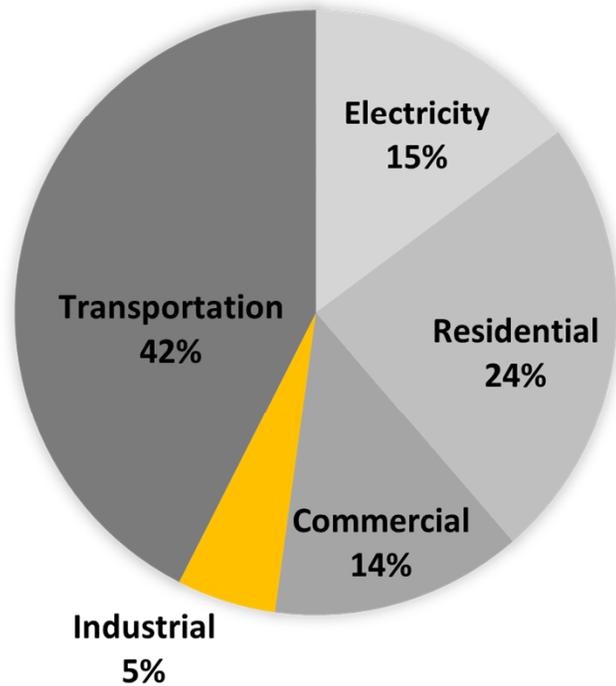
- New York State Greenhouse Gas Inventory: 1990 – 2016 (NYSERDA)
 - Does not utilize accounting requirements mandated by CLCPA
- DEC Division of Air Resources (DAR) Title V Reporting
 - Originally intended to monitor criteria pollutants
 - Facilities below thresholds do not report
- US EPA Greenhouse Gas Reporting Program (GHGRP)
 - Monitors facilities that emit >25,000 MT CO₂e annually
 - >8,000 facilities nationally; roughly 50% of US emissions
- E3 Pathways Analysis
 - Does not utilize accounting requirements of CLCPA. Primarily energy focused.
- Preliminary New York State CLCPA GHG Accounting
 - Draft work product. Revisions are expected. Follows CLCPA requirements

Sources of Industrial Emission

- Combustion
 - On-site
 - Indirect (electricity)
- Industrial Processes
 - Mineral Industry
 - Cement
 - Glass Production
 - Other Uses of Carbonates
 - Aggregate category not captured by DAR/GHGRP
 - Soda Ash
 - Aggregate category not captured by DAR/GHGRP
- Chemical Industry
 - Currently lacking direct emission data
- Metal Industry
 - Aluminum
 - Ferroalloys
 - Iron & Steel
 - Lead
- Electronics Industry
 - Semiconductor Manufacturing

Industry accounted for 5% of 2019 New York State fuel combustion emissions

New York State Emissions from Fuel Combustion by Sector (2018)



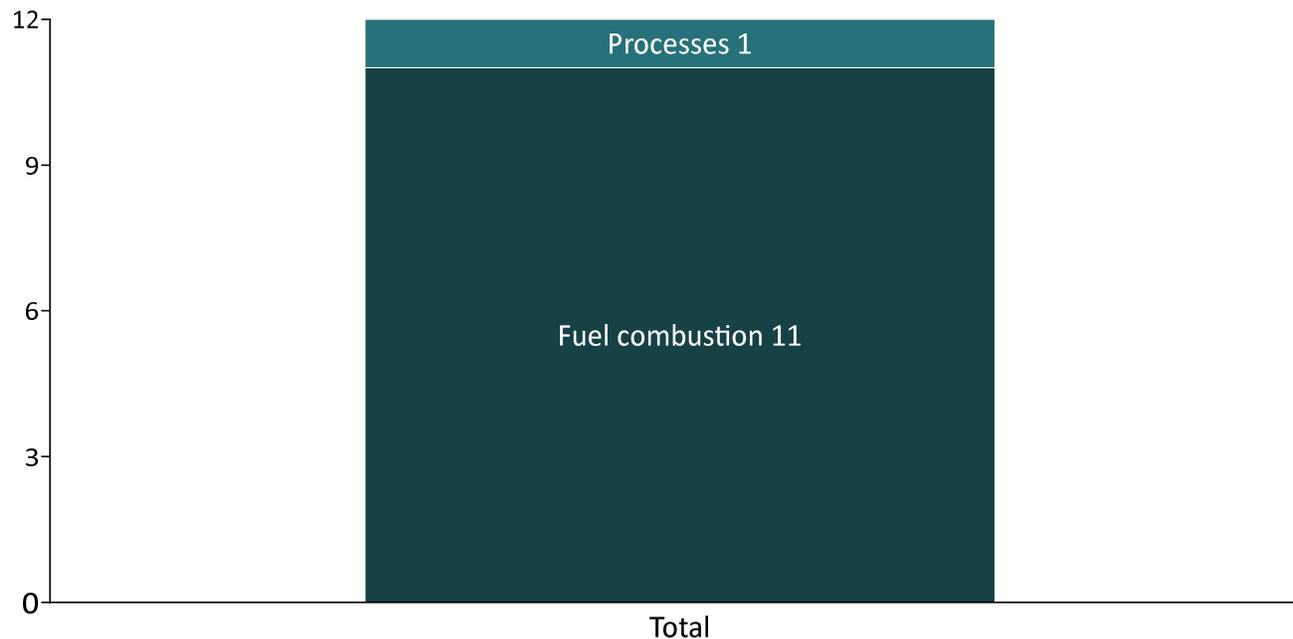
Notes:

- Industrial energy use contributes a portion of indirect “Electricity” emissions
- Chart does not account for upstream emissions

Notes: Emissions associated with electricity consumption are tracked in the electricity generation sector
Source: New York State Department of Environmental Conservation

~90% of Industry's direct emissions are from combustion; ~10% from processes

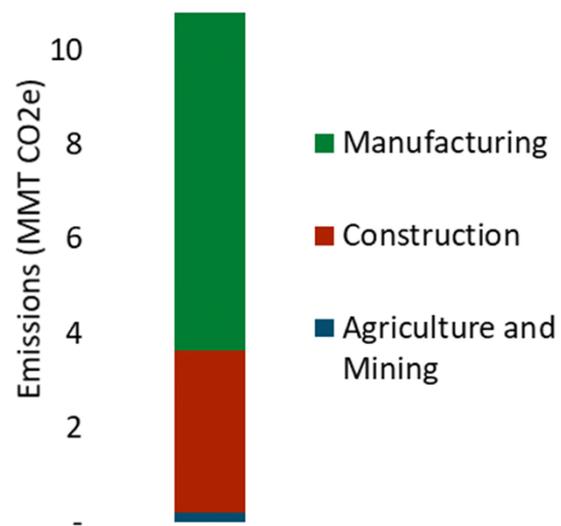
New York State Direct Emissions from Fuel Combustion and Non-Combustion Processes
Million metric tons of CO₂ equivalents (MMTCO₂e), 2016



Notes: Natural gas used in transportation is applied in Industry, emissions associated with electricity consumption are tracked in the electricity generation sector; Emissions benchmarked to the NYSERDA GHG inventory; Energy demand benchmarked Patterns and Trends
Source: E3 Pathways Analysis for fuel combustion; New York State Department of Environmental Conservation for process emissions

Roughly $\sim 2/3$ of Industrial Combustion emissions are in Manufacturing, $1/3$ in Construction; few from Mining

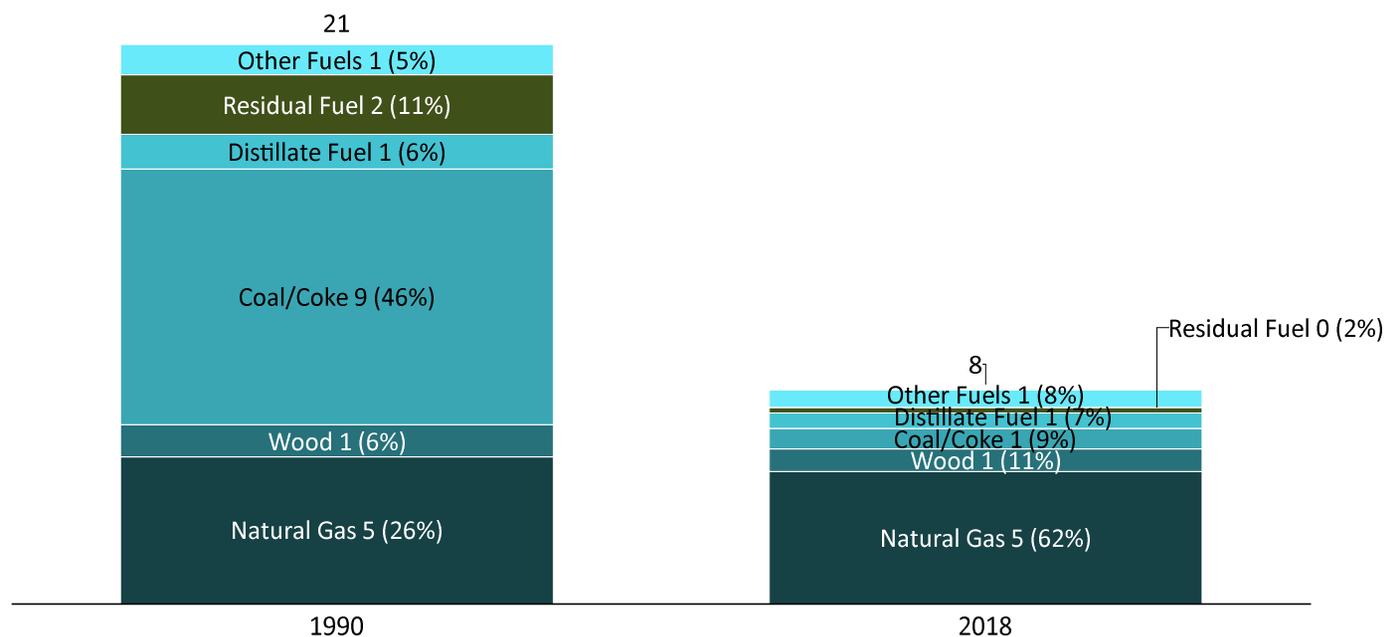
New York State Emissions from Fuel Combustion
by Industry Sector (2016)



Notes: Natural gas used in transportation is applied in Industry, Emissions benchmarked to the NYSERDA GHG inventory ; Energy demand benchmarked Patterns and Trends
Source: E3 Pathways Analysis

Fuel combustion emissions have declined by nearly two-thirds since 1990; 62% are from Natural Gas

New York State Direct Industrial Emissions from Fuel Combustion
Million metric tons of CO2 equivalents (MMTCO2e), 1990-2018



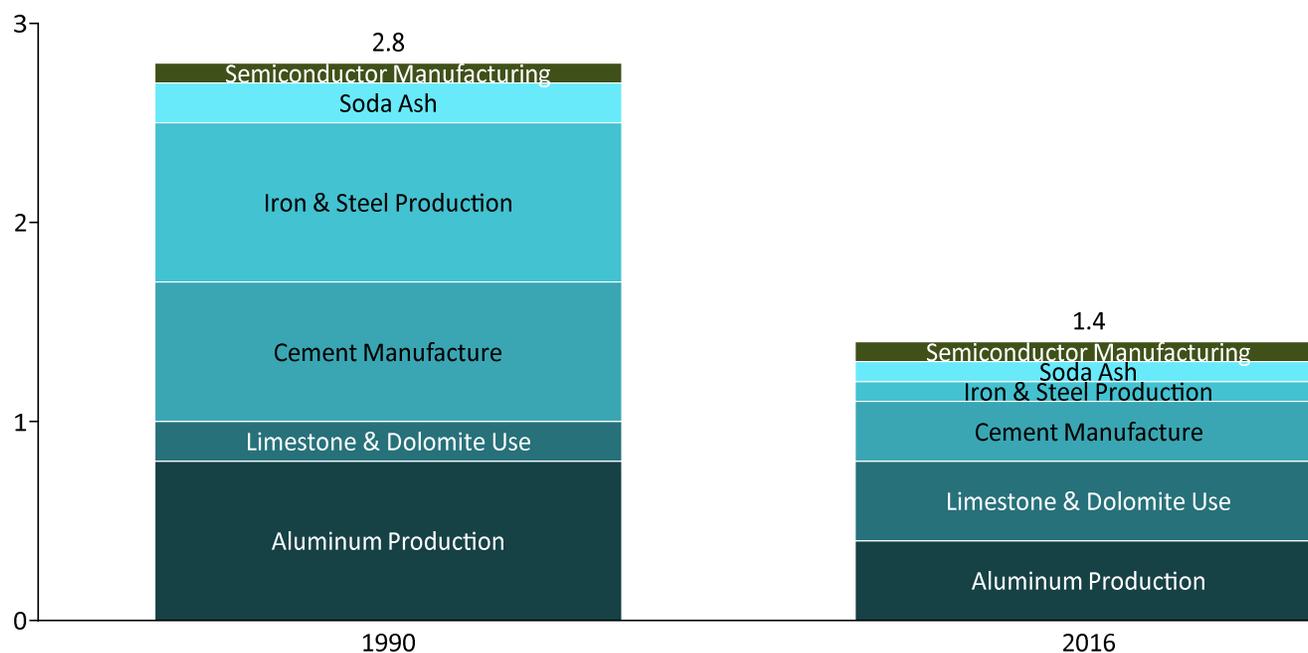
| Fuel | 1990 | 2018 | % |
|-----------------|-------------|------------|-------------|
| Natural Gas | 5.5 | 4.9 | -10% |
| Wood | 1.2 | 0.8 | -28% |
| Coal/Coke | 9.5 | 0.8 | -92% |
| Distillate Fuel | 1.3 | 0.6 | -55% |
| Residual Fuel | 2.2 | 0.2 | -91% |
| Other Fuels | 1.0 | 0.6 | -41% |
| Total | 20.6 | 7.9 | -62% |

Source: New York State Department of Environmental Conservation

Notes: Other Fuels Includes: Asphalt and Road Oil, Lubricants, Miscellaneous Petroleum Products, LPG, Kerosene, Special Naphthas, and Waxes; Coal/Coke Includes: Coal - Coking, Coal - Other, and Petroleum Coke

Process emissions in NYS have also declined by half; most now from Aluminum, Limestone & Dolomite, Cement

New York State Emissions from Non-Combustion Processes by Industry Sector (2016)

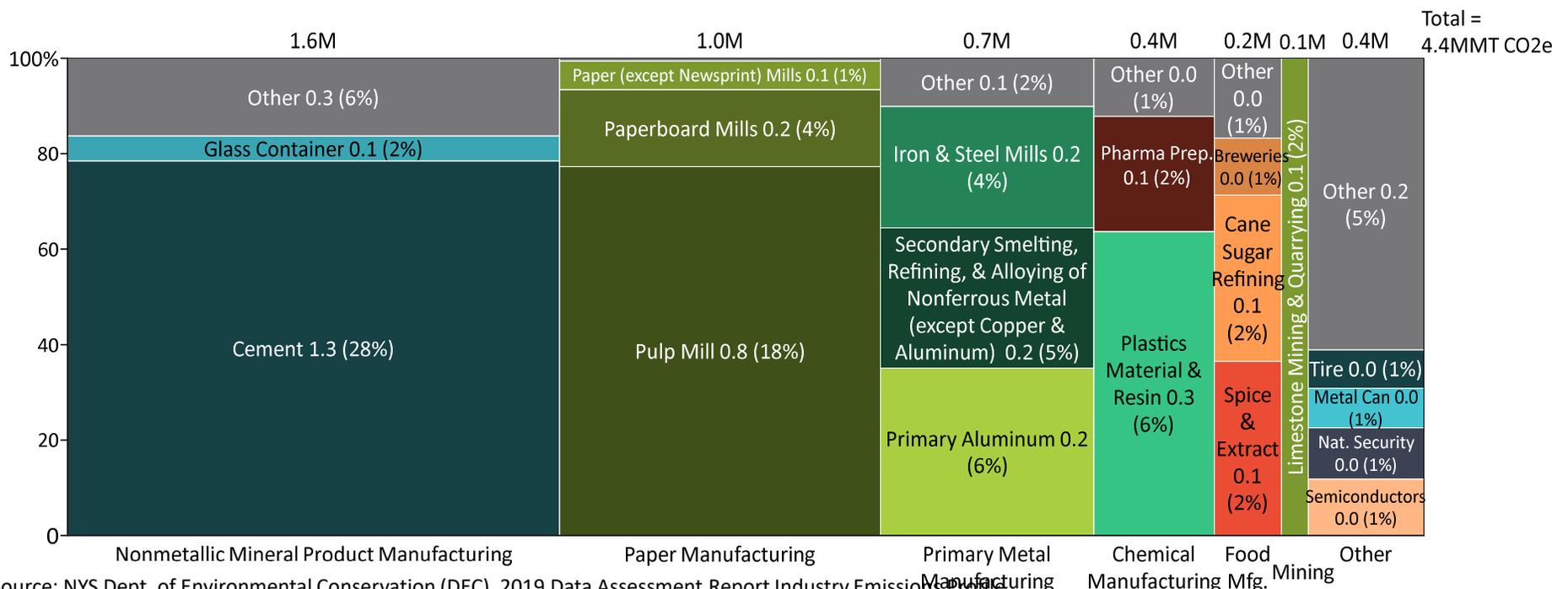


| Sector | 1990 | 2016 |
|-------------------------|------------|------------|
| Semiconductor Mfg. | 0.1 | 0.1 |
| Soda Ash | 0.2 | 0.1 |
| Iron & Steel Production | 0.8 | 0.1 |
| Cement Mfg. | 0.7 | 0.3 |
| Limestone & Dolomite | 0.2 | 0.4 |
| Aluminum | 0.8 | 0.4 |
| Total | 2.8 | 1.4 |

Notes: All values in million metric tons of Carbon-dioxide equivalents (MMTCO2e) AR4 100-yr.
Source: NYSERDA New York State Greenhouse Gas Inventory: 1990–2016

Most emissions from large Industrial sites in NYS are from Cement (28%), Paper (23%) and Primary Metals (17%)

New York State Direct Emissions (Combustion and Process) at DEC-Reporting Industrial Sites (2019)



Source: NYS Dept. of Environmental Conservation (DEC), 2019 Data Assessment Report Industry Emissions Profile
 Notes: Limited to Manufacturing, Mining and related industrial activities only; Only includes sites required to report to NYS DEC.

Key Takeaways:

Industrial Emission Sources

- > Industrial emissions in NYS come from several sources:
 - Emission types: Fuel combustion (direct), Industrial processes (direct), Electricity use (indirect)
 - Industry sectors: Manufacturing, Construction, Mining
 - Top subsectors: DEC data suggest that most direct Industrial emissions come from Cement, Paper, and Primary Metals
- > Fuel combustion produces ~90% of direct emissions:
 - Overall, combustion emissions had declined by 62% from 1990 levels as of 2018; represented 5% of all 2016 New York State emissions
 - Natural gas produces a majority of combustion emissions, followed by coal and distillate
 - Approximately ~2/3 of combustion emissions are from Manufacturing, ~1/3 from Construction
- > Industrial non-combustion processes produce ~10% of direct emissions:
 - Overall, process emissions have declined by 50% from 1990 levels; represent <1% of all 2016 New York State emissions
- > Limited Industry-specific data exists on electricity use emissions
 - Overall electricity use is likely to increase where applying electrification; decrease due to energy efficiency measures
 - Electricity emissions should decline as Power Generation sector is decarbonized in favor of clean power

Technologies and Processes to Reduce Industrial Emissions

- E3 Pathways Revisited
- Energy Efficiency Solutions
- Electrification & Process Emissions

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E3 Pathways Analysis

Pillars of Deep Decarbonization in Industry

Energy Efficiency, Conservation, and Process Improvement

Processes, lighting, and HVAC efficiency gains to reduce electricity usage

Improved device efficiency in boilers and process heat to reduce natural gas demand

Manufacturing process changes

Switching to Low Carbon Fuels

Electrification of low-heat processes

Low Carbon Fuels

- Renewable natural gas
- Hydrogen substitution for some processes (e.g., coal → H₂), as well as pipeline hydrogen (up to pipeline blend limit)

Decarbonizing Electric Supply

Reducing emissions at power plants to avoid emissions associated with industrial electricity use

Flexible industrial operations to reduce electricity use during peak demand periods

Negative Emissions and CCS

Carbon Capture and Storage (CCS) on appropriate industries and fuel demands with concentrated CO₂ streams

Bioenergy with CCS for in-state feedstocks acts as a net negative emissions technology

E3 Pathways Analysis

“2030 goals are met primarily by continued investment in energy efficiency and some replacement of fossil fuels with low-carbon, renewable fuels, allowing more time for innovation to meet the 2050 goals.”

| Metric | 2030** | 2050** |
|---|---------------|---------------|
| Percent GHG emissions reduction* | 6% | 81%-82% |
| Percent reduction in final energy demand* | 4% | 39%-40% |

* Relative to 2016

** Range of values includes limited non-energy pathway

E3 Pathways Analysis

2050 Pillars

Challenges

- RNG & H2
 - More expensive than NG
 - Infrastructure challenges
 - Technical hurdles
- CCS/CCUS/BECCS
 - Expensive: ~\$50-100/ton CO2
 - Infrastructure, geology, and public acceptance
 - Lifecycle analysis
- Optimal mix of technologies
 - Sector specific approaches

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Technologies and Processes to Reduce Industrial Emissions

- E3 Pathways Revisited
- Energy Efficiency Solutions
- Electrification & Process Emissions

Energy Efficiency Overview

Efficiency measures can potentially cut 15% of Industrial emissions through inexpensive modifications*

- Energy efficiency includes both capital and O&M measures
- Some standard systems do exist
- Heterogeneity of industry
 - Custom approaches required in specific subsectors—often down to the plant level
 - Requires precisely scoped and engineered solutions

**Transforming Industry: Industrial Decarbonization in the US, ACEEE 2020*

Energy Efficiency

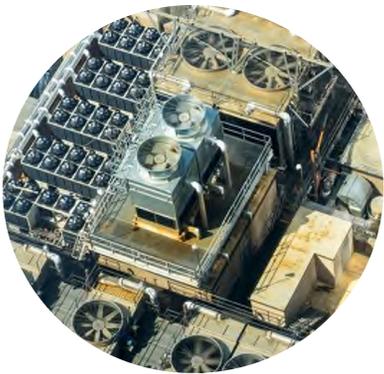
Emission Segment Impacts

| | On-Site Fuel Combustion | Indirect Emissions from Electricity | Process Emissions |
|-------------------|-------------------------|-------------------------------------|-------------------|
| Lighting | | ✓ | |
| HVAC | ✓ | ✓ | |
| Machine Drives | ✓ | ✓ | |
| Compressed Air | ✓ | ✓ | |
| Process Equipment | ✓ | ✓ | ✓ |

Non-Process Building Systems



- > **Lighting and Controls** – 2% total energy consumption*
 - High incidence of low-cost/no-cost project opportunities
 - Multiple methods of reducing electric consumption
 - Bulb replacement
 - Ballast right-sizing
 - Smart control systems programmed for site needs
 - Occupancy sensors

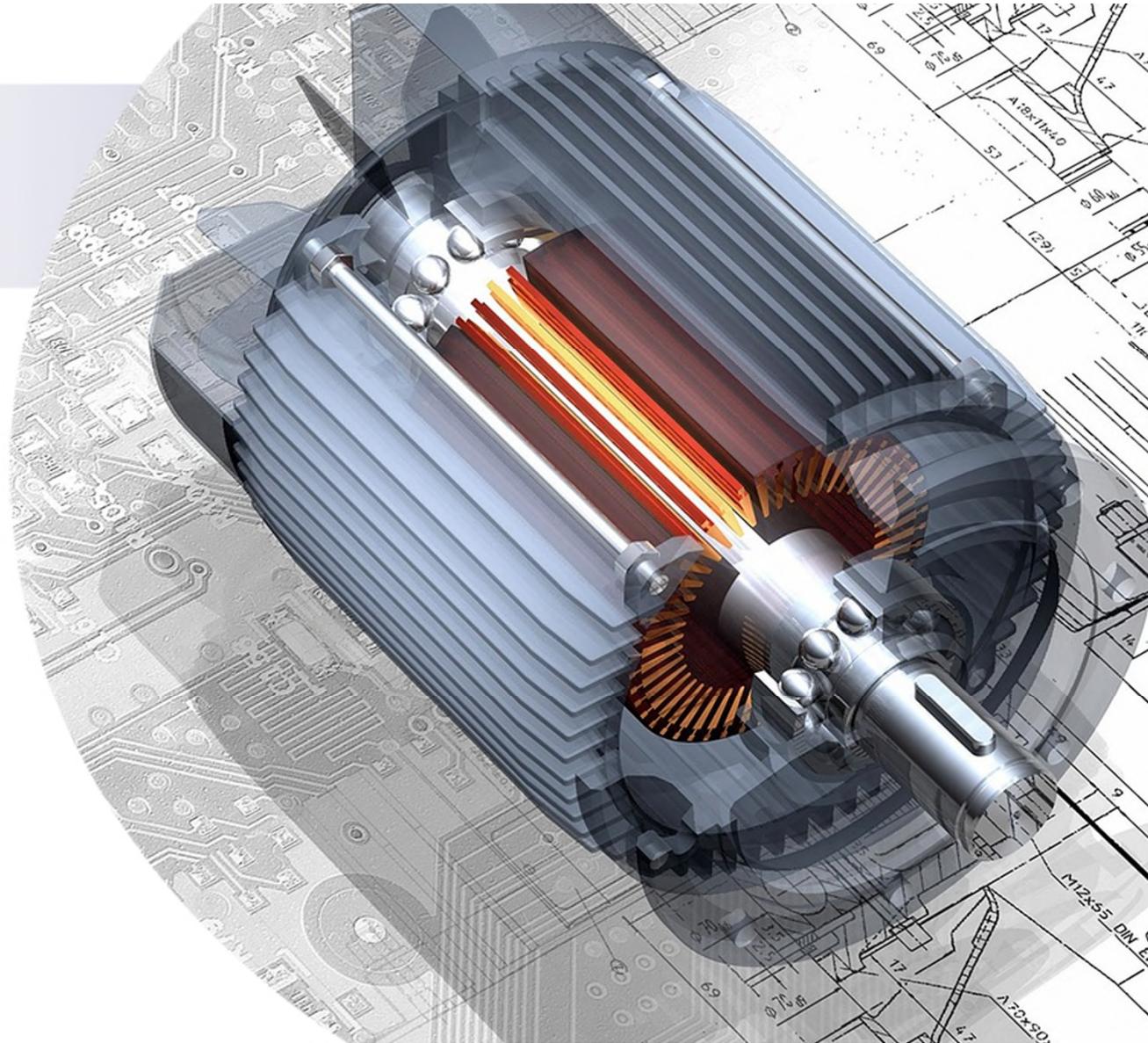


- > **HVAC** – 7% total energy consumption
 - Replacement of low-efficiency equipment
 - Right-sizing
 - Regular maintenance
 - Recycling from process sources: waste heat, chilled water, etc.

* All energy consumption data sourced from *Manufacturing Energy Consumption Survey*, EIA 2014

Machine Drives

- > Motors, pumps, fans, and compressors - 17% of manufacturing energy use
- > Opportunities include
 - Right sizing systems
 - Control systems and system run schedules
 - Variable Frequency Drives (VFD)



Compressed Air

- > Often called the 3rd Utility – 70% of manufacturers use compressed air
- > Standard measures to reduce energy intensity
 - Right sizing systems
 - Control systems and system run schedules
 - Leak detection
 - Right-sizing pressure



Process Efficiency

Processes related to manufacturing account for over 50% of energy consumed on-site

- Equipment used to manufacture or process products
- Heterogeneity of industry
 - Custom approaches required in specific subsectors—often down to the plant level
 - Requires precisely scoped and engineered solutions
- Enabling strategies to help businesses identify opportunities

Process Efficiency Projects



Brewing

- High efficiency centrifuge



Asphalt

- High-efficiency rock crusher



Printing

- Advanced printing quality control to reduce process runtime

Process Efficiency - Enabling Strategy

- > No two plants are identical
- > Key approaches have broad applicability to increase energy efficiency project activity
 - Energy Management
 - Workforce Competency Building
 - Energy Monitoring

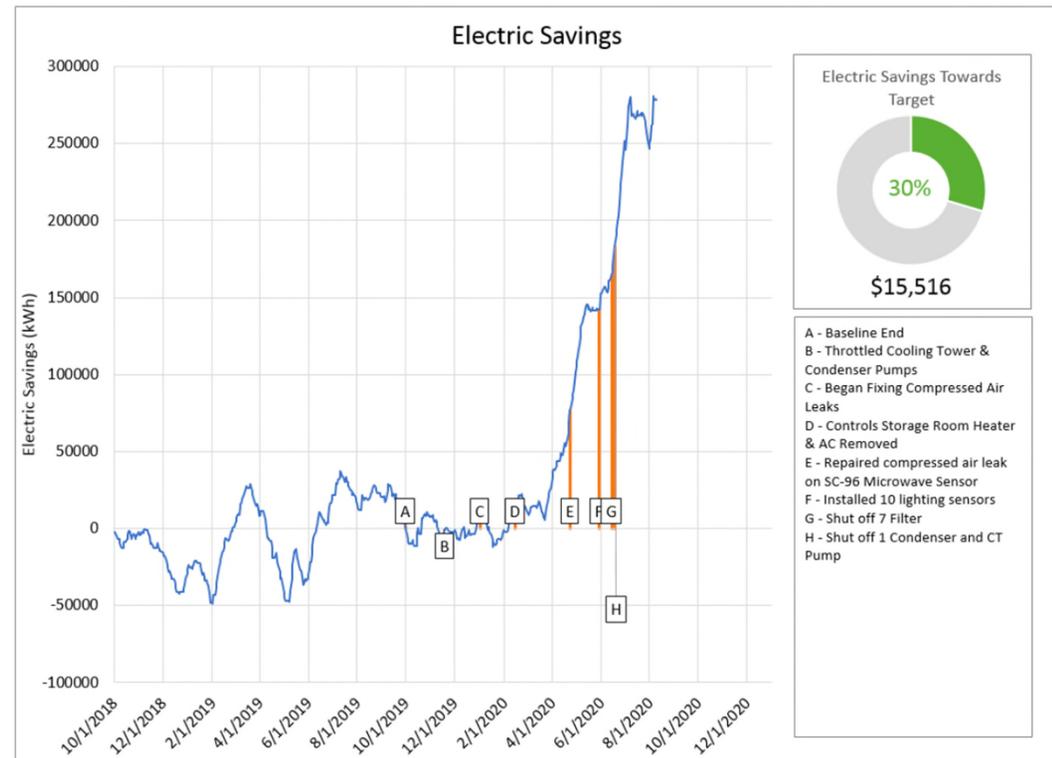
Energy Management

- > Aligning energy efficiency in the flow of essential business processes
- > Provides a framework in which manufacturers recognize energy as a **variable** rather than fixed cost
- > Specific savings potential related exclusively to business changes are difficult to quantify, but data points to significant contribution to O&M and capital related savings

Energy Management – Strategic Energy Management

Case Study: Strategic Energy Management

- > NYSERDA provided cohort training
 - Collect, measure, and track energy use information to help inform strategic business decisions
 - Continuously measure and improve energy performance
 - Empower and motivate workforces to contribute to energy strategy and goals
- > 20 Participants to date
- > Estimated >\$3 million in energy savings



Workforce Capacity & Training

- > Increasing understanding among workforce of how their responsibility areas affect energy consumption
 - On-the-job training
 - Next generation of professionals
- > Dedicating staff resources to focus specifically on energy consumption
- > NYSERDA On-Site Energy Manager
 - Dedicated resource to identify capital and O&M projects



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Energy Monitoring

- > Energy Management Information Systems
 - “You can’t manage what you don’t measure”
 - Systems do not save energy, but lift the curtain to allow gathering of insights
 - Increase confidence in capital expenditures
- > Real Time Energy Management (RTEM) & New York Energy Manager (NYEM)
 - RTEM data is fed into software system that provides plant employees a real time view of energy consumption
 - RTEM & NYEM systems pinpoint operational inefficiencies, identify energy conservation measures, and help justify capital improvements



Technologies and Processes to Reduce Industrial Emissions

- E3 Pathways Revisited
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Electrification and Process Emissions

Emission Segment Impacts

| | On-Site Fuel Combustion | Indirect Emissions from Electricity | Process Emissions |
|-----------------|-------------------------|-------------------------------------|-------------------|
| Process Changes | | | ✓ |
| Electrification | ✓ | | ✓ |

Electrification

- > Electrification has two methods of positively impacting emissions
 - If electricity is generated from renewable sources
 - If electric equipment reduces the energy intensity of the equipment (e.g. a gas powered punch press consumes 2x the equivalent mmBTUs of an electric punch press)
- > Availability and use of electrified equipment varies across sectors



New York Low-Cost Grid Scale Renewables

- > Hydro, wind and solar power current comprise approximately +/-25%* of NYS electrical supply
- > Existing NYS industry focused NYPA hydropower programs
 - **Western New York:** 695 MW of low-cost hydro power available to businesses within 30 miles of NYPA Niagara Plant
 - **North Country:** 490 MW of low-cost hydro power available to businesses in Franklin, Jefferson, and St. Lawrence counties
 - **ReCharge NY:** 910 MW of low-cost hydro and market power available to businesses throughout NYS
- > Wind Generation
 - Currently approximately 3%* of NYS electrical supply
 - NYS goal of 9 GW of offshore wind by 2035
- > Solar and Storage
 - Significant activity across NYS on grid scale solar and storage

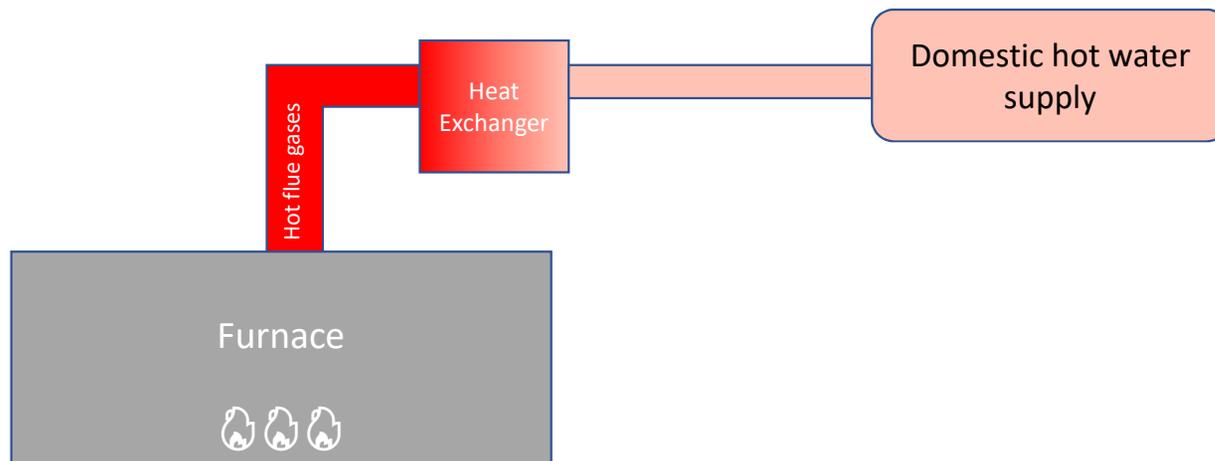
Availability of Solutions

| Subsector | Market readiness | | |
|------------------------------|--|---|--|
| | Today | 2020-2024 | 2025-2034 |
| Food and beverage | <ul style="list-style-type: none"> • UV sterilization • Resistance ovens • RF baking/drying • Electric boilers • Heat pumps | <ul style="list-style-type: none"> • Induction cooking/sterilization | |
| Chemicals/plastics | <ul style="list-style-type: none"> • Electric boilers • Heat pumps | <ul style="list-style-type: none"> • Additive manufacturing | <ul style="list-style-type: none"> • Plasma oxidation carbon fiber |
| Forest products | <ul style="list-style-type: none"> • Resistance drying • IR/RF drying • Electric boilers • Heat pumps | | |
| Metals | <ul style="list-style-type: none"> • EAFs • Induction heating • Infrared curing | <ul style="list-style-type: none"> • Additive manufacturing • Induction melting | <ul style="list-style-type: none"> • Inert anodes • Isothermal melting |
| Petroleum refining | <ul style="list-style-type: none"> • Electric boilers | <ul style="list-style-type: none"> • Indirect induction • Advanced membranes | <ul style="list-style-type: none"> • Plasma arc reforming |
| Cement/glass/minerals | <ul style="list-style-type: none"> • Electric furnaces | <ul style="list-style-type: none"> • IR curing | <ul style="list-style-type: none"> • Hydrogen fuels |

Source: Derived from EPRI (2019), ACEEE (2020), and ENERGY STAR for Industry data (2004-2018)

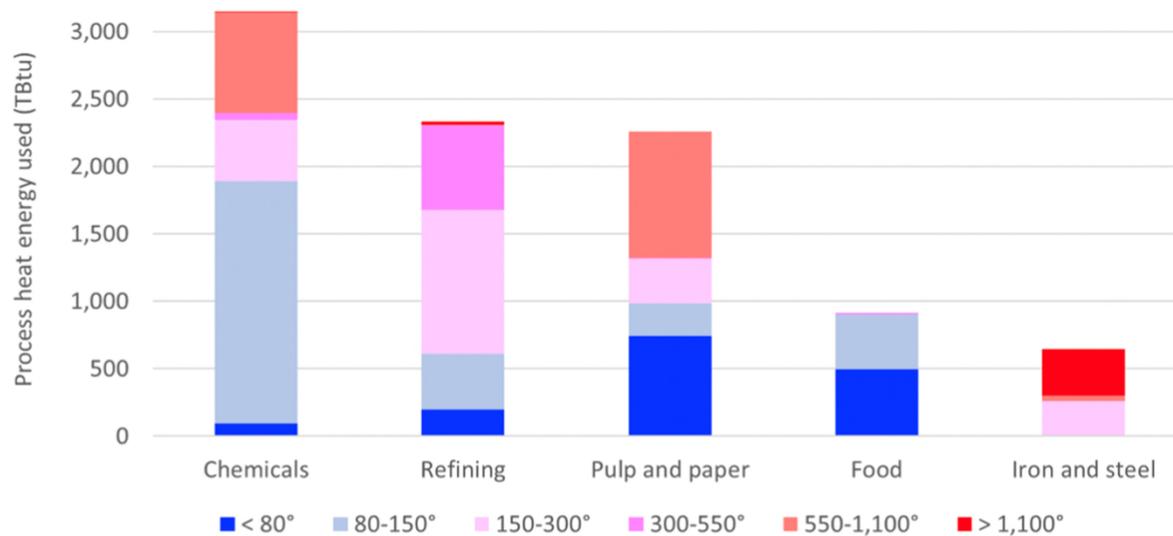
Electrification Challenges

- > Inertia
- > Existing plants have highly integrated processes
 - Example: waste heat generated in one part of manufacturing line or process may repurposed for another process or even for space conditioning
 - Swapping electric equipment can disrupt these dynamics



Electrification Challenges

- > Comprehensive plant overhauls or new builds can take advantage of large-scale electrification, however manufacturing plants have useful lives of several decades
- > Solutions for high-temperature process heat (>350 C) are often not currently economically viable



Process Changes

- > Process Related Emissions
 - Often the result of chemical reactions in the manufacturing process
- > Changes in the process can reduce emissions
 - Similarly heterogenous
 - No "one size fits all" approach
- > There are currently economically viable methods of process emissions reduction



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Example – Portland Limestone Cement

- > Process emissions in cement production are generated while making clinker
 - Mix of minerals heated in a 1400 C kiln
 - Breakdown of minerals releases CO2

| Input | Portland Cement | Portland Limestone Cement |
|-----------|-----------------|---------------------------|
| Clinker | 92% | 82% |
| Limestone | 3% | 13% |
| Gypsum | 5% | 5% |

Result is estimated 10% decrease in CO2 emissions



Key Takeaways: Technology and Process Solutions

- > Long-term emission reduction technologies require significant study and investment
- > Standard emission reduction measures across manufacturing subsectors do exist, but the savings are limited
- > Optimal process efficiency deployment requires increased organizational focus and personnel capacity
- > Deep penetration of electrification suffers from lack of demand

Questions?

Preview of Policy Options

- Reminder: State of the Sector
- Policy Examples

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Reminder: State of New York Programs Applicable to Industry - Overview

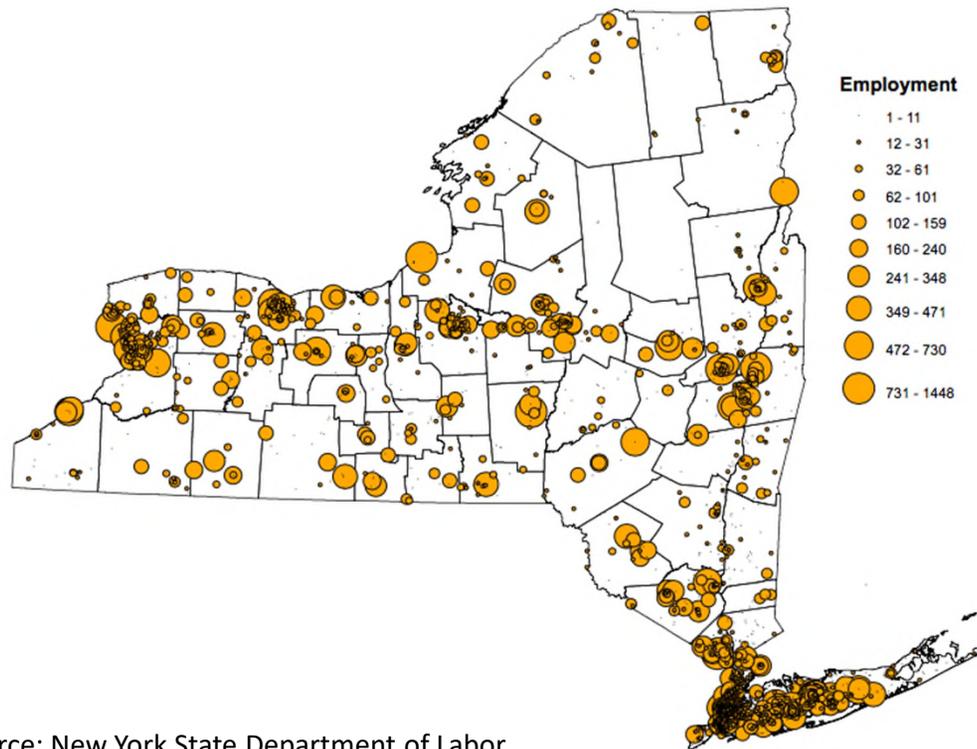
- > The State offers a number of existing programs in *financial assistance, technical assistance, low-cost power and workforce development* to:
 - **lower the emissions produced** by industrial activities in New York State;
 - **support the transition** of energy-intensive and trade-exposed industries throughout the decarbonization of the state's economy; and
 - **mitigate leakage** from energy-intensive and trade-exposed industries by supporting their attraction, retention and expansion.

- > Most relevant programs are offered by: the New York State Energy Research and Development Authority (NYSERDA), the New York Power Authority (NYPA) and Empire State Development (ESD).

Reminder: State of New York Programs Applicable to Industry - Examples

- > **NYPA:** *Financial Assistance* and *Low-Cost Power* (including hydro) programs in exchange for investment or job commitments and *Implementation, Financing and/or Technical Assistance* for energy efficiency, wind, solar, storage and other energy projects.
- > **NYSERDA:** *Technical Assistance* and *Financial Assistance* programs to promote energy efficiency, greenhouse gas emissions reduction, and the deployment of renewable energy in industry.
- > **ESD:** *Financial Assistance* (loans, grants, tax credits, venture investments) to incentivize industry (including EITE sectors) in exchange for investment or job commitments and *Technical Assistance* (e.g. NYSTAR) to conceive and scale disruptive technologies.

EITE Sectors are Likely to Span the State



Source: New York State Department of Labor

Notes: Includes NAICS codes classified as EITE either under U.S. or CA approach

EITE Example:

- Applying the NAICS codes classified as EITE under prior U.S./California definitions produces this map.
- Over 2,400 Business Locations in EITE sectors
- Just under 100,000 Jobs in EITE Sectors
 - Almost 70,000 Upstate
 - Over 30,000 Downstate
- Top EITE Sectors (by employment)
 - Pharmaceutical preparation manufacturing
 - Commercial bakeries
 - Fluid milk manufacturing
 - Paper, except newsprint, mills

DRAFT AND PRELIMINARY - ILLUSTRATIVE ONLY

Preview of Policy Options

- Reminder: State of the Sector

- Policy Examples

Policy Example - Emission Reduction Financial Assistance

- > Description: Financial assistance or incentives to help cover the cost of business investments to reduce their industrial emissions.

- Example: Emission Reduction Alberta, Industrial Efficiency Challenge
 - Provides competitive funding to industrial emitter for demonstration projects
 - Advances new technologies to reduce emissions and operating costs
 - Project types include:
 - Process improvements
 - High efficiency equipment
 - Low carbon industrial heat
 - Electrification

Policy Example - Emission Reduction Technical Assistance

- > Description: Technical assistance programs to help a business take steps to reduce their industrial emissions (e.g., through energy monitoring and efficiency measures, technical guidance, risk reduction on new technology performance)

- > Examples:
 - Industrial Energy Efficiency Programs; Technical assistance provides technical expertise for emission reductions and best practices
 - Technical support for Standards ISO50001, or 50001 Ready
 - DOE Advanced Manufacturing Office Technical Assistance Partnerships: Industrial Assessment Center, Technologist in Residence, Build4Scale

Policy Example - Research, Development & Demonstration

- > Description: Research, Development, and Demonstration to help identify and build future solutions for deep industrial decarbonization. The wide range of technical challenges and variables to be optimized requires a centralized approach to setting research priorities in order to have technology available to meet 2050 goals.

- > Examples:
 - Early stage R&D grants for priority areas (e.g. low carbon fuel generation, product CO2 lifecycle analysis, CCUS capture materials)
 - Pilot support for on-site demonstration projects with high potential for uptake in the market
 - Centralized stakeholder groups—academics, non-profits, businesses, legislators—to establish priorities and required knowledge-building.
 - Current initiatives: Carbon X-Prize; ARPA-E; Offshore Wind Consortium; Emissions Reductions Alberta

Policy Example - Low-Carbon Procurement Policies

- > Description: Green procurement policies to prioritize the deployment of and create markets for low-carbon products.

- > Example: The Buy Clean California Act
 - Establishes maximum allowable Global Warming Potential (GWP) for various products
 - Targets embedded carbon emissions in
 - Structural steel
 - Concrete reinforcing steel
 - Flat glass, and
 - Mineral wool board insulation.
 - Products that exceed their allowable GWP not eligible for procurement by numerous State agencies.

Policy Example - Rate Design: Low-Cost Power Programs

- > Description: Discount power programs for EITE producers to avoid leakage and/or switch to clean energy.

- > Examples:
 - The State of Minnesota provides special discount electric rates for EITE industries.
 - Energy estimated to comprise 25% of production cost.
 - Rate reduction of 5% to enhance global competitiveness.

Policy Example - Economic Incentives

- > Description: Providing loans, grants, tax credits, low-cost renewable power, or other forms of assistance to help improve the competitive advantage and viability of EITE sectors within the State.

- Examples:
 - Programs to support economic growth in historically disadvantaged communities.
 - Australia compensates EITEs for some of the cost of their carbon liabilities.
 - Up to 94.5% of their carbon liability
 - Different levels of assistance depending on the emissions to revenue ratio.

Discussion

- > What input do Advisory Panel members have on examples presented?
- > What other policy ideas should staff present to the Advisory Panel in November to:
 - Reduce industrial greenhouse gas emissions?
 - Mitigate the risk of leakage?
 - Promote climate and environmental justice?

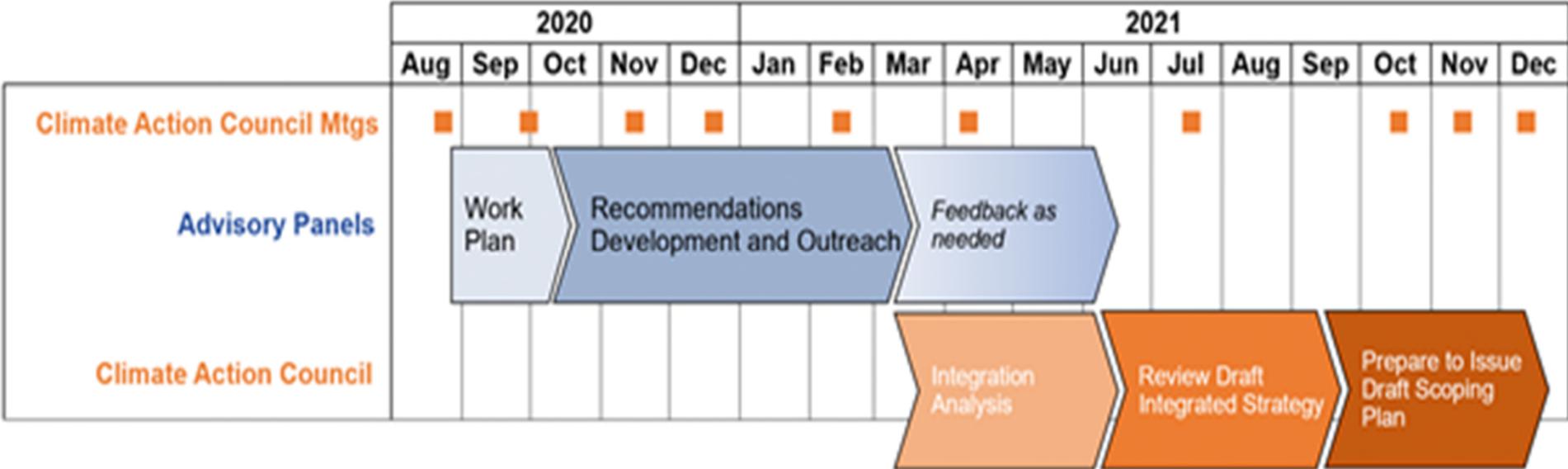
Next Steps

Next Steps

- > Next EITE Panel meeting will be held on Nov. 18 for more detailed discussion of potential policy recommendations.
- > Panel and public should submit comments and potential recommendation options for consideration to climate@esd.ny.gov.
- EITE Panel will meet again on Dec. 9 to select preliminary policy recommendations for further refinement.

Appendix

Reminder: Timeline Overview



Reminder: EITE Advisory Panel Work Plan – Draft Timeline of Meetings, Expertise Provided

| Date | Group | Anticipated Panel-Related Topics | Expertise Provided to Panel for Meeting |
|------------------|----------|--|--|
| Oct 8. | CAC | ➤ EITE Chair to present Work Plan and solicit input from CAC | |
| Late Oct. | EITE | <ul style="list-style-type: none"> • Discuss any CAC input on Work Plan • Review potential technologies and policies | <ul style="list-style-type: none"> • Deep dives on: i) industry emission sources; ii) technologies & policies to reduce emissions. |
| Nov. | CAC | ➤ EITE Chair to present progress and solicit input from CAC | |
| Nov. | EITE | <ul style="list-style-type: none"> • Identify potential recommendation options | <ul style="list-style-type: none"> • Input from JTWG, CJWG and EJAG • List of potential recommendations compiled by Panel, staff, Industry, public, engagement |
| Dec. | CAC | ➤ EITE Chair to present potential recommendation options and solicit input from CAC | |
| Dec. | EITE | <ul style="list-style-type: none"> • Select preliminary recommendations and any input on goals | <ul style="list-style-type: none"> • Initial evaluation of identified recommendations |
| Jan. | EITE | <ul style="list-style-type: none"> • Public, panel/working group, and/or expert input session(s) | |
| Feb. | EITE | <ul style="list-style-type: none"> • Identify potential refinements to recommendations and goals | <ul style="list-style-type: none"> • Summary of input from public, JTWG, CJWG, EJAG • Ongoing evaluation of recommendations |
| Feb. | CAC | EITE Chair to present progress and solicit input from CAC | |
| Mar. | EITE | <ul style="list-style-type: none"> • Finalize panel recommendations and any input on goals | <ul style="list-style-type: none"> • Evaluation of potential refinements |
| Apr.-June | CAC/EITE | <ul style="list-style-type: none"> • Respond to CAC inquiries as necessary. | |

Note: EITE Staff Working Group also expects to hold internal meetings on an approximately weekly basis.

Reminder: Scope of Work

1. Review Industrial emissions and technologies/policies to reduce emissions
2. Develop detailed recommended strategies to reduce industrial emissions
3. Provide input on State Industrial emission reduction goals
4. Develop recommendations to protect competitiveness and mitigate leakage
5. Develop recommendations to support environmental and climate justice

Reminder: Key Scoping Assumptions

1. What types of emissions should the Panel's recommendations address?

- Assumption: On-site fuel combustion, On-site non-combustion process emissions and indirect emissions from electricity use. (Excludes *product use emissions*)

2. What industrial activities fall within Panel's "Industry" designation?

- Assumption: Manufacturing, Construction and Mining. (Excludes *Agriculture*, which is expected to be addressed by Agriculture and Forestry Advisory Panel, and *Waste*)

3. How does the EITE Advisory Panel's responsibility differ from the Just Transition WG?

- Assumption: Panel will recommend Industry emission reduction strategies and goals while considering EITE sectors and leakage; JTWG will lead the definition of EITE sectors and the development of policies to mitigate anti-competitiveness (with EITE Panel providing input).

Reminder: Key Scoping Assumptions (Cont.)

4. What types of **technologies** should the Panel consider for **reducing emissions**?
 - **Assumption**: energy efficiency, low-carbon thermal solutions, cleaner fuels, electrification, carbon capture utilization and storage.

5. What types of **policies** should the Panel consider for **reducing emissions**?
 - **Assumptions**: emission reduction incentives, emission regulations, rate design; market preference for goods produced with minimal greenhouse gas emissions, enabling strategies.

6. What types of **policies** should the Panel consider to **mitigate leakage**?
 - **Assumptions**: rate design; low-cost power programs, market preference for goods produced with minimal emissions, opportunities to support clean technology supply chains.

Reminder: Emission Reduction Goals

- Pathways Analysis currently reflects Industry sector goals of:
 - From 2016 levels: 6% reduction by 2030, 81%-82% reduction by 2050
 - Both goals are for on-site fuel combustion only
- Pathways Analysis contains no reduction goals yet for:
 - Non-combustion industrial process emissions
 - Product use emissions (not part of panel scope)
 - Indirect emissions associated with electricity (in Power Generation panel scope)
- EITE Advisory Panel to advise CAC on goals and should consider goals when making Industry sector recommendations.

Reminder: Public Participation

- Panel meetings will be available for public viewing.
- Meeting notices and materials will be posted on the Advisory Panels web page at <http://climate.ny.gov>.
- Written input will be collected from industry and the public at new email: climate@esd.ny.gov.
- At least one virtual forum to collect public input will be held, anticipated to occur in January.

Empire State Development (ESD) Programs

| Program | Purpose |
|---|--|
| Excelsior Jobs Program, including Green Economy Tax Credits | Provides performance-based refundable tax credits to private businesses in exchange for achieving annual milestones in employment, investment and R&D spending, with enhanced benefits for green economy projects. \$5 million is reserved for the workforce training Employee Tax Incentive Program credit. |
| Centers and Programs – Division of Science, Technology and Innovation (NYSTAR) | <p>NYSTAR annually provides \$55 million to a total of approximately 70 NYSTAR centers, including a number that impact or support the green economy by providing a forum for experts to work with big and small industry partners to conceive, validate and scale disruptive technologies.</p> <p><i>Sample Programs: Centers of Excellence (COE), Centers for Advanced Technology (CAT) and Manufacturing Extension Partnership (MEP) programs.</i></p> |
| Other Economic Assistance – Loans, Grants, Tax Credits and Technical Assistance | ESD administers dozens of general programs devoted to providing loans, grants, tax credits, technical assistance and venture investment; some of these programs may be available to support EITE industries or serve as models for new programs. |

New York Power Authority (NYPA) Programs

| Program | Purpose |
|---|---|
| High Load Factor Power (HLF) | Allocates power from pumped storage facilities to businesses that utilize power at a high rate (~75% load factor or higher) and have an electric demand of 5 MW or higher. |
| Industrial Economic Development Power Program | Allocations of power including hydro and market are granted to the electric systems with new, expanding, or relocating businesses within their service territory, in exchange for a commitment of new jobs at the facility. |
| Northern NY Power Proceeds | Allocates funding for economic development In St. Lawrence County. 15% of the program is dedicated to supporting energy related projects, programs and services. |
| Preservation Power | Allocates hydropower to eligible businesses expanding or businesses looking to locate operations in St. Lawrence, Franklin or Jefferson counties. |
| ReCharge New York (RNY) | Provides low-cost power to businesses and not-for-profit organizations statewide in return for commitments to retain/create jobs and invest capital in their facilities. |
| WNY Hydropower | Allocated hydropower to expanding businesses or businesses seeking to locate within 30 miles of the Niagara Power Plant. |
| Western NY Power Proceeds | Low-cost hydropower is allocated to businesses and others to reduce electricity costs and spur economic development. 15% of the program is dedicated to supporting energy related projects, programs and services. |
| Distributed Energy Resource Program | Advance NYS Clean Energy goals by partnering with our customers to implement distributed solar and storage with NYPA operating as the owner's representative. This work is done at no cost to the customer and is paid by the solar or storage developer if their overall project economics meet the customer's financial requirements. |
| eMobility Program | Installation of electric vehicle charging equipment for multiple purposes: fast charging for highway corridors and urban centers, commuter lot EV charging, transit bus depot charging and charging for workplaces within the ReCharge NY program. Advisory services for fleet electrification. |
| Energy Efficiency Program | Partnering with NYPA customers to implement comprehensive Energy Efficiency projects. This program provides our customers with the expertise to identify and evaluate facility improvements that not only provide solutions to aging equipment, but also produce significant energy and environmental benefits. |
| Smart Street Lighting NY | Advance NYS Clean Energy goals by offering a full turnkey service to assist customers with the acquisition and conversion of street lights to energy efficient LEDs. |
| Street Lighting Maintenance Service | The Maintenance Service begins once municipalities gain ownership and convert their street lights to LED through Smart Street Lighting NY. |

New York State Energy Research and Development Authority (NYSERDA) Programs

| Program | Purpose |
|--|--|
| Buildings of Excellence Competition | Recognizes and rewards the design, construction, and operation of very low or zero carbon emitting multifamily buildings. |
| Clean Energy Workforce Development Programs | Provides clean energy workforce development and training funds. |
| Clean Heating and Cooling Programs | Heat pumps are a more efficient heating and cooling option that eliminate fossil fuels, can provide up to 100 percent of your heating and cooling needs, and help you save on your energy bills. |
| Commercial and Industrial (C&I) Carbon Challenge | Helps large commercial and industrial companies and organizations implement their best energy-saving/carbon-reduction projects. |
| Commercial New Construction Program | Provides technical assistance and support to design teams and building owners involved in building energy-efficient structures. |
| Energy Storage Program | Offers funding and technical support to building owners, municipalities, energy storage developers, contractors, and integrators for installing energy storage technologies. |
| Energy to Lead | Challenged student-supported coalitions across the State to develop and implement plans to advance clean energy on their campuses and in their local communities in new ways. |
| Flexible Technical Assistance (FlexTech) Program | Shares the cost to produce an objective, site-specific, and targeted study on how best to implement clean energy and/or energy efficiency technologies. |
| Ground Source Heat Pump Program | Offers support for the installation of ground source heat pump systems at residential, commercial, institutional, and industrial buildings. |
| NY-SUN | Provides incentives and financing to make solar-generated electricity accessible and affordable for all New York homeowners, renters, and businesses. include training for installers and public officials, standardized permitting processes, and consumer education. |
| Real Time Energy Management Program (RTEM) | RTEM technologies analyze data and recommend actionable insights, resulting in lower operating and utility costs, and a smarter building with greater comfort, appeal and marketability. |
| Strategic Energy Management Program | Offers training to industrial facilities that are interested in optimizing energy use through a continuous improvement approach |