CleanENERGY®
MANUFACTURING
in Appalachia

Roadmap to a Greener Factory Webinar 9-12-24

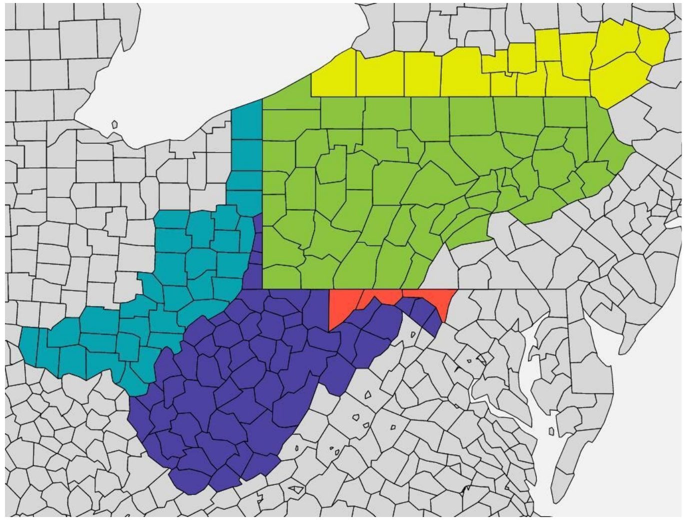
AMT
Alliance for Manufacturing and Technology

Agenda

- Introductions
- Background
- Roadmap to a Greener Factory
  - Assessments
  - Rebates
  - Services
  - Funding
- Wrap-up

Appalachian Regional Initiative for Stronger Economies (ARISE) - ARC

- **Project:** Manufacturing the New Energy Economy in Appalachia
- **Five State Effort:** Pennsylvania, Maryland, New York, Ohio and West Virginia
- **Program Lead:** Catalyst Connection (PA- MEP)
- **New York Lead:** AMT (NY-MEP)
- **NY Locations:** Allegany, Broome, Cattaraugus, Chautauqua, Chemung, Chenango, Cortland, Delaware, Otsego, Schoharie, Schuyler, Steuben, Tioga, Tompkins



Introductions – New York ARISE Team

NY Program Manager

Punit Shetty

Principal Consultant, AMT

Team Members

Carol Miller

Executive Director, AMT

Ben Rand

President, Insyte Consulting

James A. D'Agostino

CEO, TDO

Cory Albrecht

Director, AIM

Jeff Reed

Business Development Manager, AMT

Ryan Case

Business Development Manager, Insyte Consulting

Mike Metzgar

Business Development Manager, TDO

What is Carbon Footprint?

Major Greenhouse Gases (GHG)

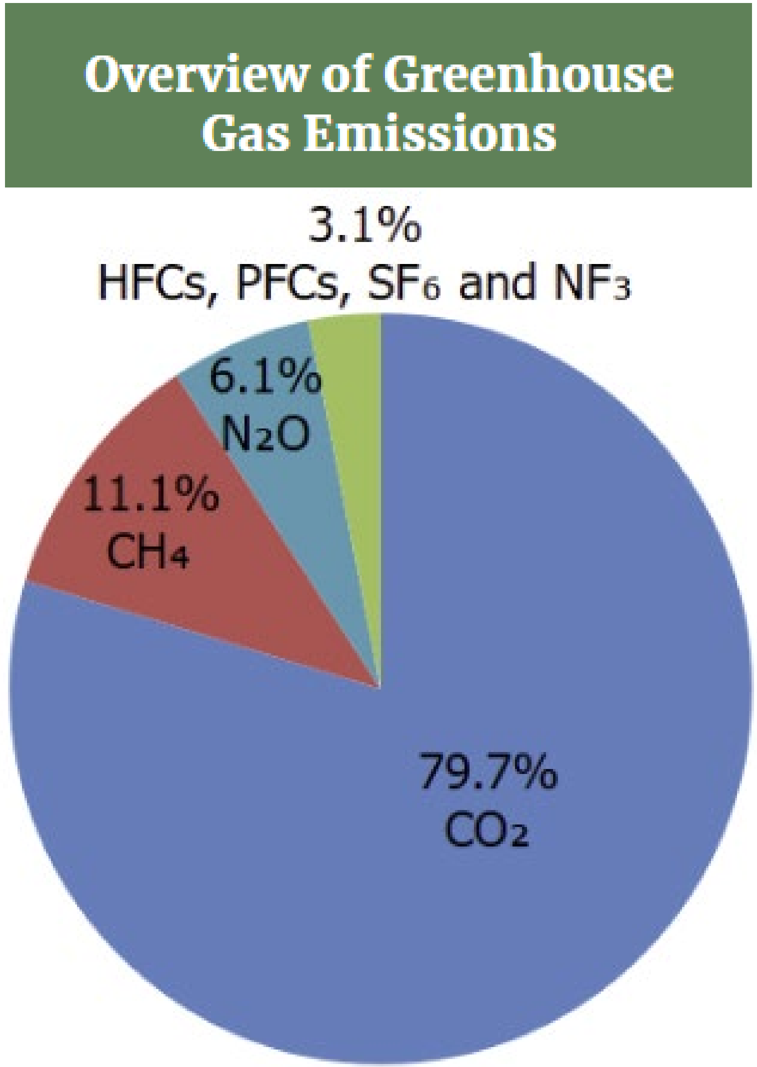
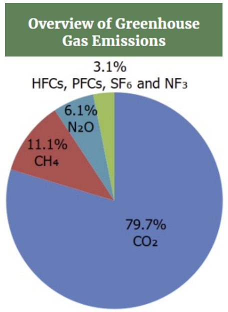


Image courtesy “EPA.gov”

Major Greenhouse Gases (GHG) sources



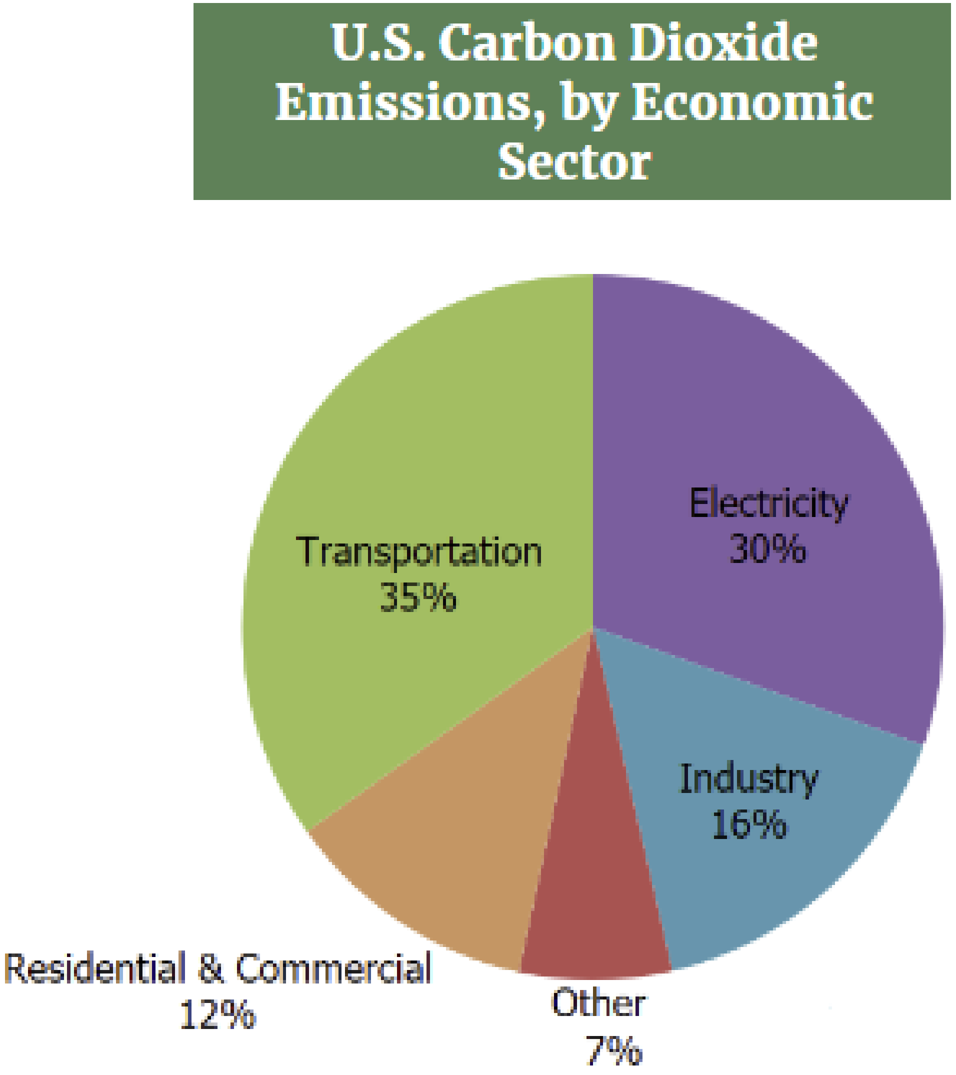
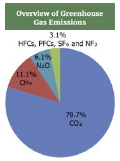


Image courtesy "EPA.gov"

Scope of Carbon Footprint



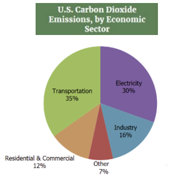
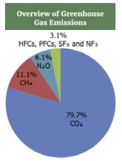


Image courtesy “NYSP2I”

Scope of Carbon Footprint



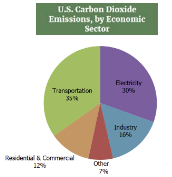
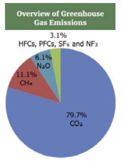
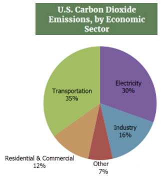


Image courtesy “NYSP2I”

Scope of Carbon Footprint





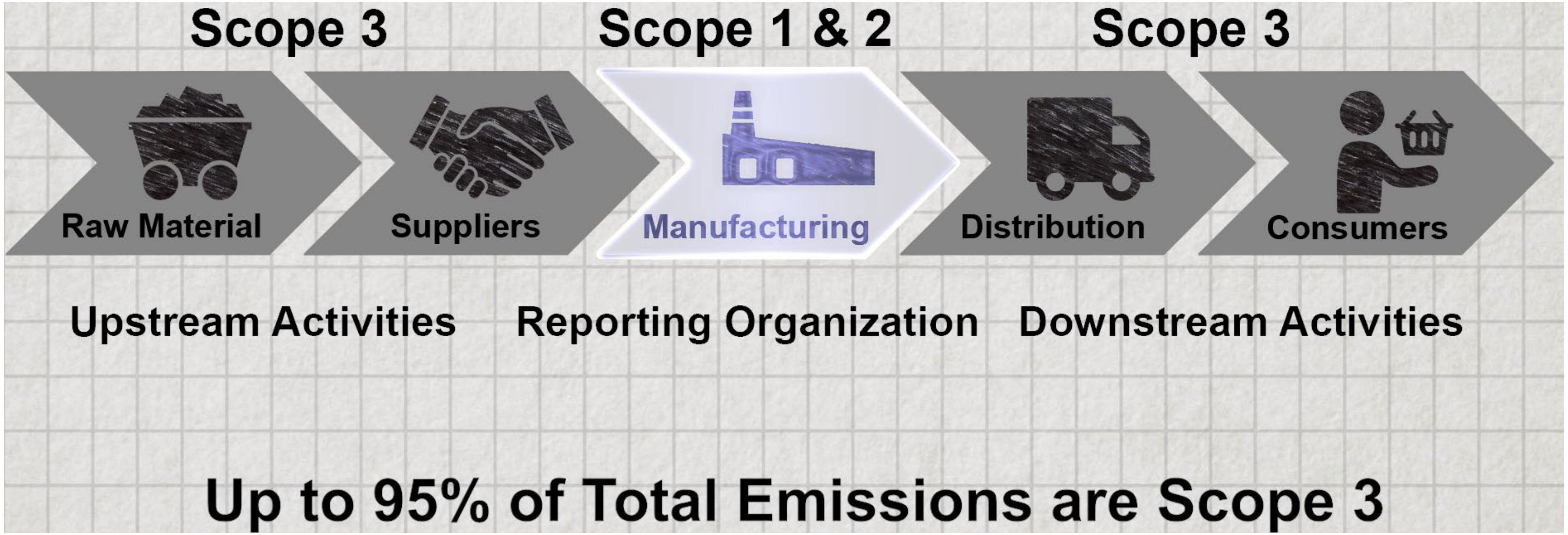


Image courtesy "NYSP2I"

U.S DOE Industrial Decarbonization Roadmap

Image “Courtesy U.S. Department of Energy”

Path to Net-Zero Emissions by 2050

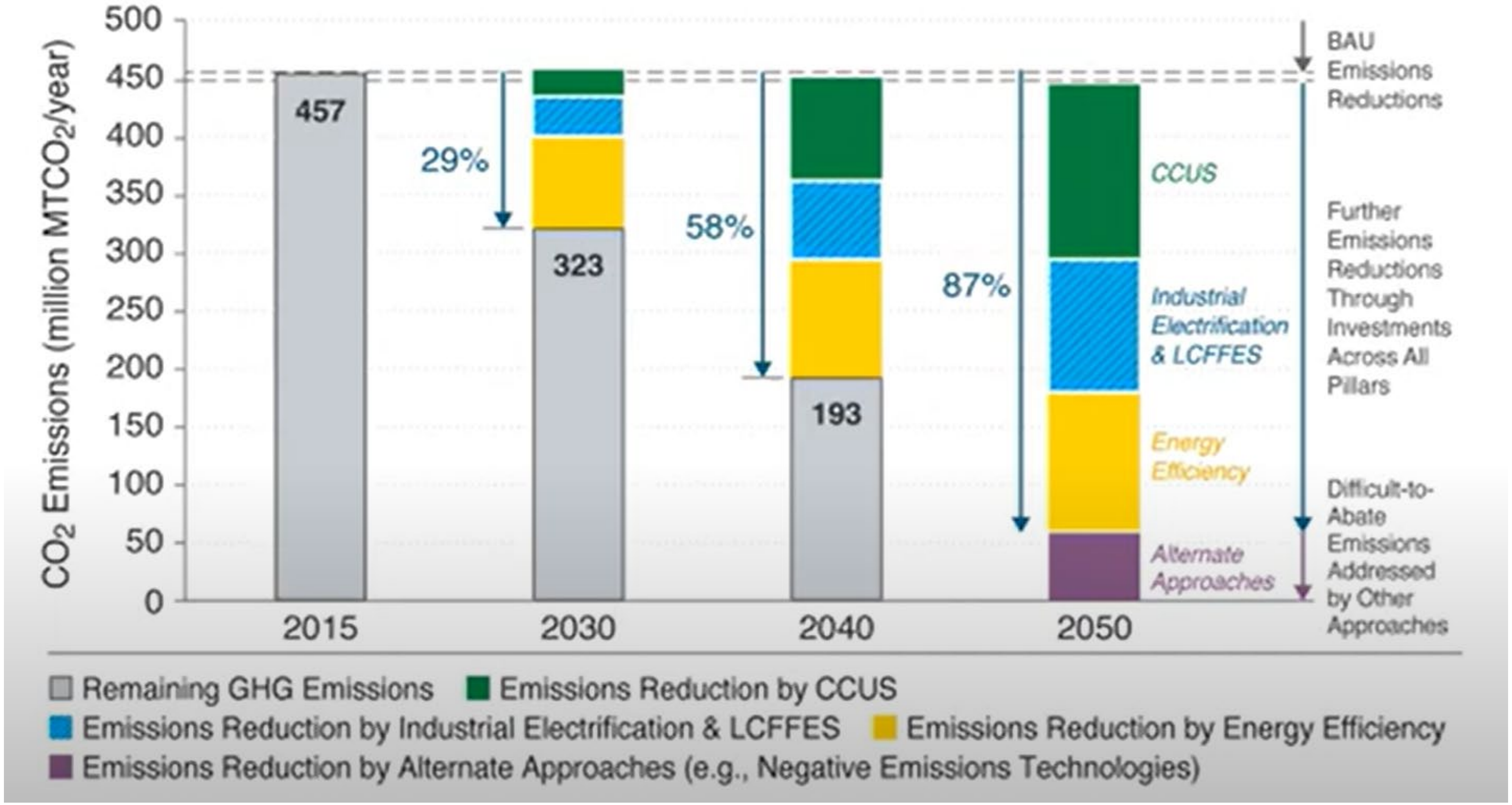


Image “Courtesy U.S. Department of Energy”

Climate Leadership and Community Protection Act (CLCPA / Climate Act) – New York State

2019

Legislation

Effective from 2020

2024

We are Here

2030

Goals

Reduce emissions by 40% from 1990 levels.

Achieve 70% renewable energy

2040

Goals

100% zero-emission electricity

2050

Goals

Reduce emissions by at least 85% from 1990 levels.

Transition to a zero-emission transportation system

Why Energy Reduction Matters for Manufacturers?

United States Environmental Protection Agency (EPA)
Department of Energy (DOE)

Cost Savings

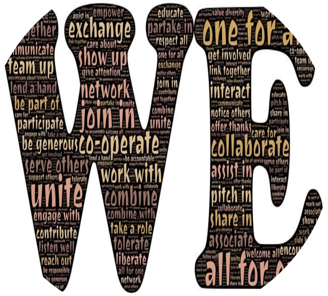
Lower utility bills result in reduced production costs.

Resilience and Reliability

Reduced congestion and stress, preventing power disruptions.

Community Benefits

Enhanced community resilience and energy



Environmental Benefits

Significant reduction in greenhouse gas (GHG) emissions and pollutants.

Health Benefits

Cleaner air, water, and land, directly benefiting human health.

POLL #1

What motivates your organization to reduce energy consumption?

- Cost Savings
- Environmental Impact
- Regulatory Compliance
- Corporate Social Responsibility
- Innovation

Roadmap to a Greener Factory

01
Start Decarbonization Journey

Use the Clean Energy Manufacturing in Appalachia (CEME) Self-Assessment

Reach out to NY ARISE team

02
Conduct Plant Tours

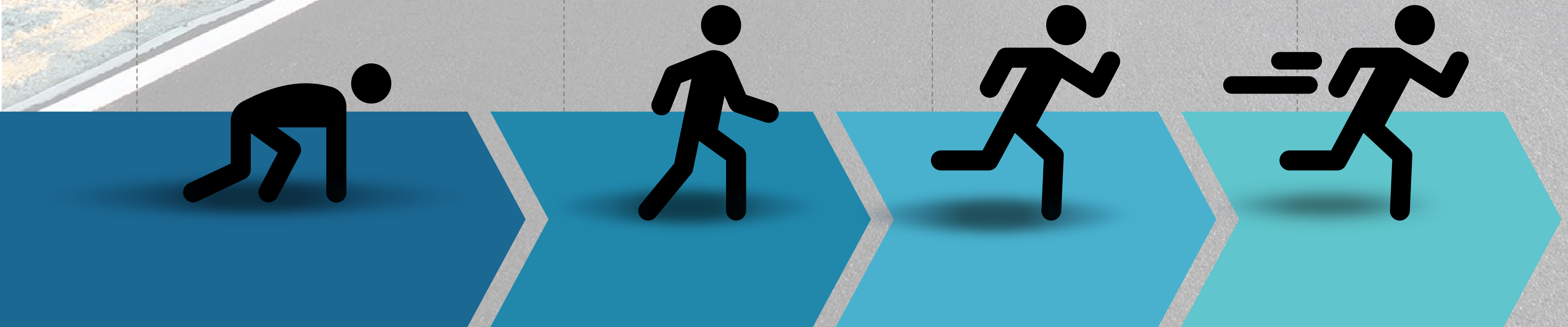
- Introductions
- Company goals
- Interview
- Gather information
- Utility Bill Analysis
- Plant Layout

03
Define Approach

- Identify Opportunities
- List projects
- Prioritize.

04
Take Action

- Assessments
- Rebates
- Services
- Funding



Roadmap to a Greener Factory

01
Start Decarbonization Journey

Use the Clean Energy Manufacturing in Appalachia (CEME) Self-Assessment

Reach out to NY ARISE team

02
Conduct Plant Tours

Introductions
Company goals
Interview
Gather information
Utility Bill Analysis
Plant Layout

03
Define Approach

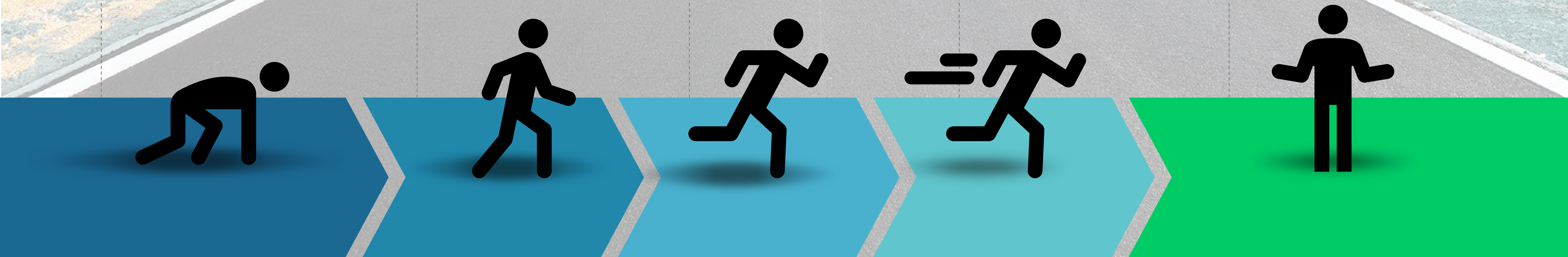
Identify Opportunities
List projects
Prioritize

04
Take Action

Assessments
Rebates
Services
Funding

05
Greener Factory

Project Implementation
Reduced Energy
Cost Savings
Grid Resilience
Environment benefits
Heath Benefits
Climate Justice



What is an Energy Assessment / Audit?

- Building Statistics
- Energy Usage
- Building Structure and Equipment Survey
- Conservation Opportunity Assessment
- Conservation Priority List

Energy Assessment Types

- **ASHRAE Level 1 Energy Audit:**
  - High-level overview of energy performance.
- **ASHRAE Level 2 Energy Audit:**
  - Energy modeling for potential savings.
- **ASHRAE Level 3 Energy Audit:**
  - Detailed energy modeling and life-cycle cost analysis.

ASHRAE = American Society of Heating, Refrigerating and Air-Conditioning Engineers

Energy Assessment Resources

	NYMEP	Virtual IAC	Full IAC	Contractor
Criteria	Any small and medium-sized manufacturer (NAICS 31-33, less than 500 employees)			
	Utility Bill = Any amount	Utility bill = $65K - $100K	Utility bill = $100K – $3.5M	Utility bill = Variable (Prefers larger spends ~ $1M)
Process	Pre-assessment survey Site visit Follow up Report completion	Pre-assessment survey Virtual assessment Site visit (if required) Follow up Report completion Implementation survey	Pre-assessment survey Site visit Follow up Report completion Implementation survey	Pre-assessment survey Site visit Report completion
Cost	No-cost			Variable (typical for SMM ~ $7,000 - $30,000) Partially funded by NYSERDA”””
Status	Immediate	Next availability: October 2024 (5 Assessments a year)	Next availability: October 2024 (20 Assessments a year)	Variable Lead time
ASHRAE Level	Level 1	Level 2	Level 2	Level 1 / 2 / 3

*** 50-75% of the audit cost up to $500,000 or 20% of the energy usage (whichever is less) Industrial customers located in a disadvantaged community and/or industrial customers investigating electrification opportunities are eligible for up to 75% funding, while funds are available
https://www.Nyserda.Ny.Gov/ny/disadvantaged-communities

AMT

Rebates

NYSEG

RG&E

nationalgrid

U.S. DEPARTMENT OF ENERGY

Municipality

Types of Rebates

Prescriptive

Defined rebate amounts.

- Lighting
- HVAC
- Process Systems
- Kitchen Equipment and Refrigeration

Performance-based amounts.

- Non-lighting energy efficiency projects
- Require site-specific analysis and energy savings calculations.

Custom

Rebates - NYSEG/RG&E

Prescriptive

- Lighting
  - Lamps ($6 - $12) and Fixtures ($25 - $360) ***
  - Controls and Sensors ($5 - $30) ***
- Process Systems
  - Compressed Air ($150 per hp per unit)
  - Process Exhaust Filtration ($1.25 per CFM per unit)
- Weatherization
  - Weather Stripping and Air Sealing ($150 per SF of room)
  - Industrial Air Curtain ($20 per SF of doorway)
- HVAC and Plumbing
  - Surveys (up to $10,000)
  - Heating, Cooling ($40 - $150 per ton)
  - EC Motor ($150 - $2,000 per motor)
  - Fans and Pumps ($40 - $60 per hp)
  - Boiler Furnaces and Unit Heaters – ($2 - $4 per MBH per unit) ***
  - Instantaneous heaters ($250 - $400 per unit) ***

*** Higher Rebates available for SBCC and high Runtime SBCC

Custom

- $0.20 per kWh / $1.50 per therm saved
- Up to 90% of the Project Cost – EOL Replacement / New Construction
- Up to 50% of the Project Cost – Early Replacement / Additional Equipment

Rebates - National Grid

Prescriptive

- Lighting
  - Lamps ($4 - $10 per lamp) and Fixtures ($8 - $200 per sensor)
  - Controls and Sensors ($10 - $25 per sensor)
- Heating and Cooling ($800 - $1,500 per 10,000 BTUH)
  - Heat Pump
  - HVAC
  - Water Heaters
- Air Compressor
  - Leak Survey (up to $10,000)
  - Retrofit (up to 50% of cost)
- Chiller
  - Tune up ($5 per ton)
  - Upgrade ($2 for every 0.01kW per ton)

Custom

- 65% of the Project Cost

Processes for Rebates (NYSEG/RG&E, National Grid)

Prescriptive

- Review Requirements
- Install the Equipment and Start Saving
- Apply for Rebate
- Get Reimbursed

Custom

- Apply Online
- Get Approved
- Install the Equipment & Start Saving
- Apply for Rebate
- Get Reimbursed

Rebates - DOE

- Department of Energy – Office of Manufacturing and Energy Supply Chain (MESC)
  - Program: https://www.energy.gov/mesc/extended-product-system-rebates
- Two-step Process – Register and Apply
  - Application Portal: https://doerebates.my.site.com/rebates/s/?language=en_US EPS
- Extended Product System (EPS) Rebate
  - Provide rebates for qualified extended product systems (i.e., electric motor, electronic control, and driven load)

POLL #2

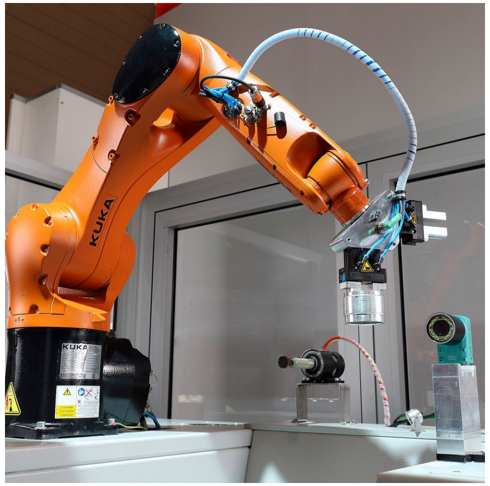
How much has your organization reduced its energy consumption in the past year?

- 0-5%
- 6-10%
- 11-20%
- More than 20%
- No Reduction
- Not Sure

Services

Manufacturers can reduce greenhouse gas (GHG) emissions through several targeted strategies

- Energy Efficiency in Operations
- Transitioning to Alternate Sources
- Sustainable Material Use and Waste Reduction
- Optimizing Supply Chain and Transportation
- Carbon Management and Offsetting



Services - Energy Efficiency in Operations

- Create a plan to increase profitability, help attain environmental goals, and achieve greater resiliency
  - Training to develop an SEM (Strategic Energy Management Program) plan
- Create a Sustainable Energy Management System
  - Become 50001 Ready
- Support with hiring an Onsite Energy Manager

Planning

Services - Energy Efficiency in Operations

- Optimizing Equipment
  - Upgrading machinery and production equipment to more energy-efficient models.
  - Monitoring Energy
    - Reduce Taxes on Energy for Production Activities
    - Reduce Energy Demand
  - Reduce Waste
    - Evaluate and Implement Air Compressor Best Practice

- Facility Upgrades
  - Implementing energy-efficient lighting, HVAC systems, and insulation in factories and warehouses.

Services - Energy Efficiency in Operations

- Process Optimization
  - Streamlining manufacturing processes to reduce energy consumption, such as using advanced automation or lean manufacturing techniques.

Quality and Environmental Services

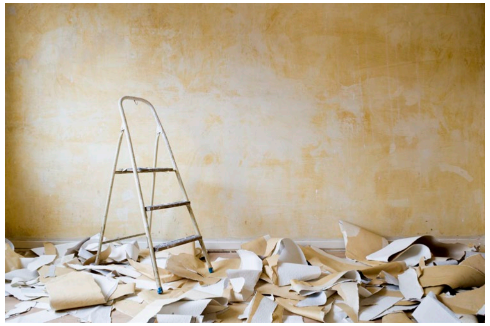
Lean Enterprise and Six Sigma Programs

Cybersecurity Assessments and Remediation

Services - Transitioning to Alternate Sources

- On-Site Renewable Energy
  - Installing solar panels, wind turbines, or other renewable energy systems at manufacturing sites.
    - Low-cost solar for small and medium-sized business
    - Battery and energy storage solutions
- Purchasing Green Energy
  - Sourcing electricity from renewable providers through Power Purchase Agreements (PPAs) or Renewable Energy Certificates (RECs).
- Onsite Combined Heat and Power (CHP).

Services - Sustainable Material Use and Waste Reduction

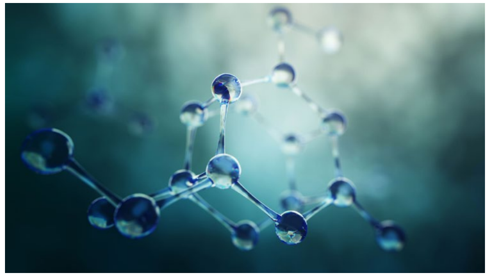


- Material Efficiency
  - Reducing material waste by optimizing design and production processes to use fewer raw materials.

- Recycling and Reuse
  - Implementing closed-loop systems where waste materials are recycled back into the production process.

- Sustainable Sourcing
  - Choosing raw materials that have lower environmental impacts, such as recycled or sustainably sourced materials.

Services - Optimizing Supply Chain and Transportation



- Supply Chain Assessments
  - Identify and prioritize opportunities to improve supply chain management and remove risks.

- Efficient Logistics
  - Reducing emissions through optimized transportation routes, consolidating shipments, and using energy-efficient vehicles.

- Supplier Engagement
  - Collaborating with suppliers to improve the sustainability of their practices, including reducing their energy use and adopting low-carbon technologies.

Services - Carbon Management and Offsetting

- Carbon Capture
  - Integrating carbon capture and storage technologies in production processes, especially in industries with high emissions like cement or steel manufacturing.

- Carbon Offsetting
  - Investing in offset projects, such as reforestation or renewable energy initiatives, to balance out emissions that cannot be eliminated.

POLL #3

What is your biggest challenge in implementing energy reduction strategies?

- Cost
- Lack of Knowledge
- Technology Limitations
- Employee Engagement
- Regulatory Compliance

Funding and Support

- DOE
- NYSERDA
- ARISE Mini-Grant
- Various Sources Depending on Project and Industry

DOE - Funding and Support

Program	Funding and Support	Brief description
ITAC Implementation Grant	Grants of up to $300,000 at 50% cost share	Funding for SMMs in implementing recommendations from DOE recognized assessments.

DOE - Funding and Support

Program	Funding and Support	Brief description
ITAC Implementation Grant	Grants of up to $300,000 at 50% cost share	Funding for SMMs in implementing recommendations from DOE recognized assessments.
Better Plants	Partnership and support	Technical assistance, tools, resources, and national recognition.

DOE - Funding and Support

Program	Funding and Support	Brief description
ITAC Implementation Grant	Grants of up to $300,000 at 50% cost share	Funding for SMMs in implementing recommendations from DOE recognized assessments.
Better Plants	Partnership and support	Technical assistance, tools, resources, and national recognition.
Onsite Energy	Partnership and support	Technical assistance and resources in identifying and implementing technology options for achieving site-specific energy objectives.

DOE - Funding and Support

Program	Funding and Support	Brief description
ITAC Implementation Grant	Grants of up to $300,000 at 50% cost share	Funding for SMMs in implementing recommendations from DOE recognized assessments.
Better Plants	Partnership and support	Technical assistance, tools, resources, and national recognition.
Onsite Energy	Partnership and support	Technical assistance and resources in identifying and implementing technology options for achieving site-specific energy objectives.
50001 Energy Management System	Partnership and support	Technical assistance and resources for a self-paced, no-cost way to build a structured energy improvement that leads to deeper and sustained savings.

NYSERDA – Funding and Support

Program	Funding / Support	Brief Description
C&I Carbon Challenge	Reward ($500,000 – $3.75M per project) depending upon carbon savings	Implementing cost-effective carbon reduction opportunities (25,000 mt CO_2e).

NYSERDA – Funding and Support

Program	Funding / Support	Brief Description
C&I Carbon Challenge	Reward ($500,000 – $3.75M per project) depending upon carbon savings	Implementing cost-effective carbon reduction opportunities (25,000 mt CO2e).
Onsite Energy Manager	Cost-share a percentage of fees	Hiring a dedicated on-site energy manager to assess and reduce energy usage.

NYSERDA – Funding and Support

Program	Funding / Support	Brief Description
C&I Carbon Challenge	Reward ($500,000 – $3.75M per project) depending upon carbon savings	Implementing cost-effective carbon reduction opportunities (25,000 mt CO_2e).
Onsite Energy Manager	Cost-share a percentage of fees	Hiring a dedicated on-site energy manager to assess and reduce energy usage.
FlexTech Program	Cost share 50-75%	Completing an energy study to identify and evaluate opportunities to reduce energy costs and incorporate clean energy into capital planning.

NYSERDA – Funding and Support

Program	Funding / Support	Brief Description
C&I Carbon Challenge	Reward ($500,000 – $3.75M per project) depending upon carbon savings	Implementing cost-effective carbon reduction opportunities (25,000 mt CO2e).
Onsite Energy Manager	Cost-share a percentage of fees	Hiring a dedicated on-site energy manager to assess and reduce energy usage.
FlexTech Program	Cost share 50-75%	Completing an energy study to identify and evaluate opportunities to reduce energy costs and incorporate clean energy into capital planning.
RTEM program	Cost-share up to 30%	Installing a cutting-edge Real-time Energy Management system (RTEM).

NYSERDA – Funding and Support

Program	Funding / Support	Brief Description
C&I Carbon Challenge	Reward ($500,000 – $3.75M per project) depending upon carbon savings	Implementing cost-effective carbon reduction opportunities (25,000 mt CO_2e).
Onsite Energy Manager	Cost-share a percentage of fees	Hiring a dedicated on-site energy manager to assess and reduce energy usage.
FlexTech Program	Cost share 50-75%	Completing an energy study to identify and evaluate opportunities to reduce energy costs and incorporate clean energy into capital planning.
RTEM program	Cost-share up to 30%	Installing a cutting-edge Real-time Energy Management system (RTEM).
SEM program	Fully-funded training programs	Develop an SEM plan that will increase profitability, help attain environmental goals, and achieve greater resiliency.

Other – Funding and Support

Program	Funding / Support	Brief Description
ARISE Mini-Grant	Funding up to $10,000	Services such as consulting, design, development.

Other – Funding and Support

Program	Funding / Support	Brief Description
ARISE Mini-Grant	Funding up to $10,000	Services such as consulting, design, development.
NYSP2I	Funding up to 90% and support	Initial assessment, solution development, implementation and follow-up for projects in: • Technology commercialization • Sustainable manufacturing • Sustainable supply chain • Life cycle assessment (LCA)

Other – Funding and Support

Program	Funding / Support	Brief Description
ARISE Mini-Grant	Funding up to $10,000	Services such as consulting, design, development.
NYSP2I	Funding up to 90% and support	Initial assessment, solution development, implementation and follow-up for projects in: • Technology commercialization • Sustainable manufacturing • Sustainable supply chain • Life cycle assessment (LCA)
National Grid Manufacturing Productivity Program (MPP)	Funding 40-60% up to $15K-$40K depending on the project type	Consulting projects for productivity, growth or both.

Other – Funding and Support

Program	Funding / Support	Brief Description
ARISE Mini-Grant	Funding up to $10,000	Services such as consulting, design, development.
NYSP2I	Funding up to 90% and support	Initial assessment, solution development, implementation and follow-up for projects in: • Technology commercialization • Sustainable manufacturing • Sustainable supply chain • Life cycle assessment (LCA)
National Grid Manufacturing Productivity Program (MPP)	Funding 40-60% up to $15K-$40K depending on the project type	Consulting projects for productivity, growth or both.
Workforce training grants	Funding 50-90%	• SUNY workforce development training grant. • Workforce Development Institute (WDI).

Roadmap to a Greener Factory

01
Start Decarbonization Journey

Use the Clean Energy Manufacturing in Appalachia (CEME) Self-Assessment

Reach out to NY ARISE team

02
Conduct Plant Tours

- Introductions
- Company goals
- Interview
- Gather information
- Utility Bill Analysis
- Plant Layout

03
Define Approach

- Identify Opportunities
- List projects
- Prioritize

04
Take Action

- Assessments
- Rebates
- Services
- Funding

05
Greener Factory

- Project Implementation
- Reduced Energy
- Cost Savings
- Grid Resilience
- Environment benefits
- Heath Benefits
- Climate Justice

For More Information

Punit Shetty

Principal Consultant

Office: 607.743.1823

pshetty@amt-mep.org

amt-mep.org

NEW YORK Manufacturing Extension Partnership

Alliance for Manufacturing and Technology

CleanENERGY MANUFACTURING in Appalachia

Advanced Institute for Manufacturing

Insyte consulting