COLUMBIA | SIPA
School of International and Public Affairs

From Gas to Gold:

Proving the Case for Reconversion of Gas Plants in the United States

Columbia SIPA Capstone (Spring 2025)

Capstone Advisor: Professor Gregory Stoupnitzky
Roland Berger Sponsor: Antoine Pitard

Acknowledgement

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Executive Summary

Redevelopment Plan for Mystic Power Plant

The Mystic Combined Cycle Gas Turbine power plant, located on a 26-acre site in Everett, MA, was retired in May 2024. The landowner, Eversource, plans to repurpose the parcel as **a renewable energy hub**.

From an initial list of 15 redevelopment options, we narrowed the scope down to two feasible scenarios: one focused on **maximizing energy output and accelerating decarbonization**, and another centered on **maximizing job opportunities and supporting the local economy.**

- Scenario A (to maximize energy output):
  Standalone Battery

- Scenario B (to maximize employment opportunities):
  Data Center + Rooftop Solar + Logistics

Federal and State-Level Policy Analysis

Our policy analysis **identified and mapped federal and state-level policies that enable or impede the retirement of gas power plants** and the broader energy transition.

- **At the federal level**, the Trump administration's rollbacks of renewables subsidies and reprioritization of oil and gas will likely shift near-term investment toward fossil fuel and delay the development of certain renewables projects, including wind and solar.

- **At the state level**, the emission reduction and battery storage procurement targets may provide policy incentives to the Mystic's redevelopment; however, state and municipal-level subsidies are scarce for utility-scale renewable energy projects.

Redevelopment considerations must take into account of diverse stakeholder interests – environmental protection, grid stability, tax revenue, and community development

Year | Recent development of state policies toward Net Zero

2021

Bill S.9:
Act Creating A Next-Generation Roadmap for Massachusetts Climate Policy
The Bill S.9 set the statewide emissions reduction target at **net zero by 2050**

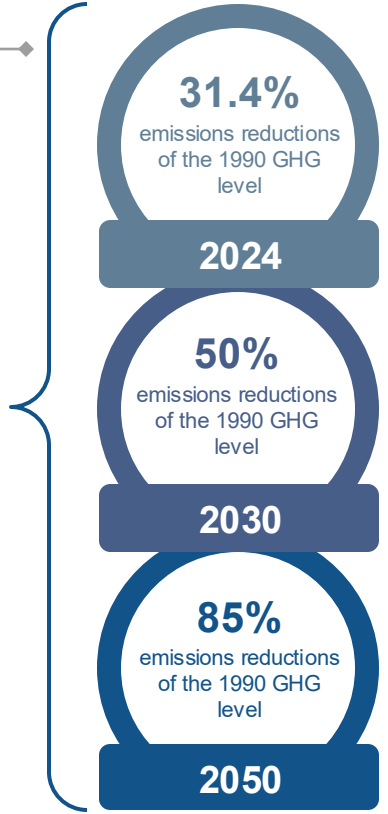
2022

Clean Energy and Climate Plan for 2050 (2050 CECP)
The 2050 CECP set sector-specific emission sublimits adding up to **at least 85% below 1990 level by 2050** through building a future with minimum reliance on fossil fuels

Clean Energy and Climate Plan for 2025 and 2030 (2025/2030 CECP)
The 2025/2030 CECP set the interim statewide greenhouse gas emissions limits at **33% below 1990 level by 2025 and 50% below by 2030** to lead the clean energy transition

2023

Order 20-80
Massachusetts Department of Public Utilities (DPU) issued the Order 20-80, **no longer allowing cost recovery for gas infrastructure** without non-gas alternatives consideration



Redevelopment considerations must take into account of diverse stakeholder interests – environmental protection, grid stability, tax revenue, and community development

	Regulators		Key constituencies of Mystic redevelopment				
	State Government	**Municipal Governments**	**Grid Operator**	**Utilities**	**Current Owner/Operators**	**Shareholders of Eversource**	**Community**
Entities	**Commonwealth of Massachusetts**	**City of Everett** **City of Boston**	**Independent System Operator New England (ISO-NE)**	**National Grid** **Eversource Energy** **Unitil**	**Eversource Energy (26-acre)** **Wynn Resorts (45-acre)**	**Vanguard Fiduciary Trust Co.** **BlackRock Advisors LLC** **State Street Corp** **…etc**	**Local residents** **Local NGOs and NPOs** **Civic activists**
Authorities	State incentive programs, Environment regulations, Energy price	Tax collection, Municipal incentive programs, Environmental regulations, Land permits	Energy market, Energy price	Energy distribution	Land redevelopment	Ownership of company (business)	Community buy-in (e.g., protests)
Interests	Environment, Community development	Environment, Community development, Tax revenue	Grid & Market stability	Supply stability, Energy transition, Grid reliability	Economic benefits, Local demands	Financial returns, Business stability	Economic benefits, Environment, Community development

Mystic Power Plant served as a 1.4GW gas-fired reserve of capacity in the last several years before it retired in May 2024

Basic information on Mystic Power Plant

Location	Everett, Massachusetts
Operation Period	1940s to May 31, 2024
Power plant	**Units 8 & 9 of Combined Cycle Gas Turbine** (CCGT)
Original Owner	**Constellation Energy**
Capacity	Around **1,400MW** capacity At its peak, generated around **800MW (capacity factor ~ 65%), providing electricity to Boston** metropolitan area
Gas Supplier	**Everett Marine LNG Terminal**, owned by Constellation, which will be in operation until 2030
Reason for retirement	**Unprofitable** due to high operational costs and lower dispatch rates.

Source: Constellation, Mystic Generating Station - Retired (2024); Boston Globe, New England's largest fossil fuel-fired plant is shutting down for good (May 31, 2024).

The Mystic Power Plant sits near Boston's industrial-commercial hub, where several redevelopment projects are underway

Explanations of neighboring facilities

1. **26-acre land (scope of this project)**
   Mystic plant site bought by Eversource for $70M.

2. **45-acre land**
   Another parcel of former Mystic Plant acquired by Wynn resort for $25M. Plans to build soccer stadium.

3. **LNG terminal**
   Mystic power plant was fully powered by Everett Marine LNG Terminal, owned by Constellation.

4. **Warehouses and logistics facilities**
   Distribution network for Amazon and other retailers.

5. **Redevelopment area**
   Redevelopment underway by multiple developers, including a Boston-based real estate investment firm. Plans include **700 MW BESS farm**, offices, high-tech manufacturing spaces, residentials, etc.

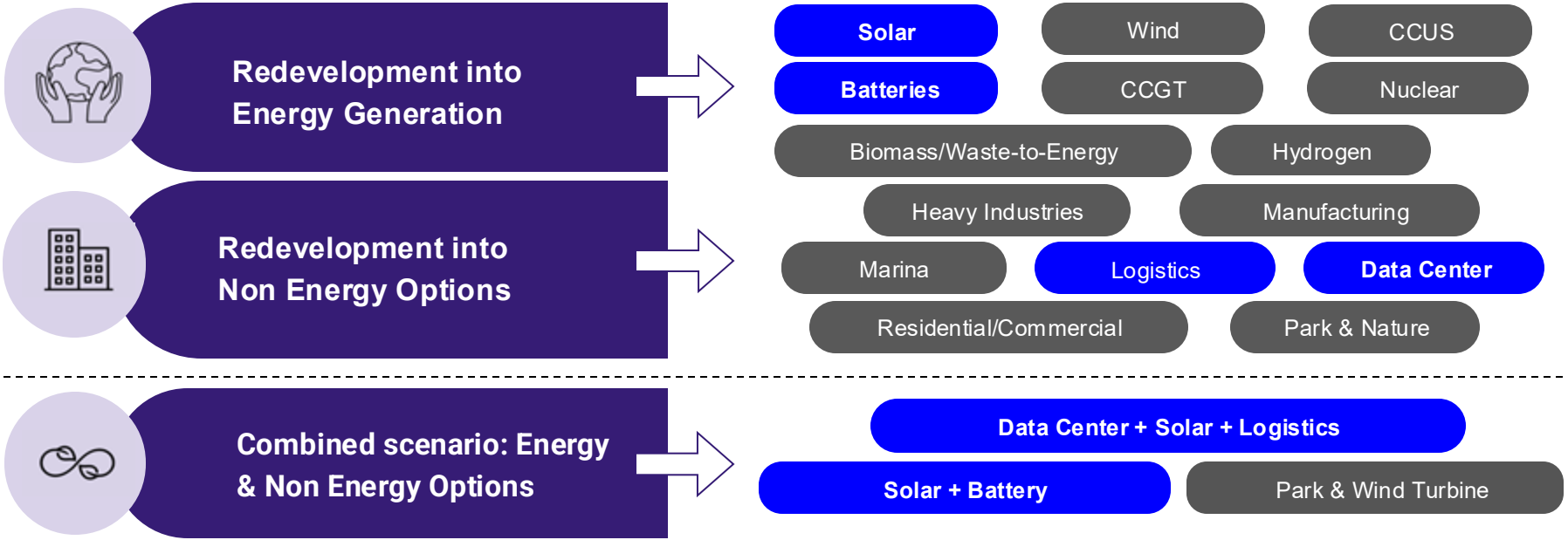
Source: City of Everett, Lower Broadway District Urban Renewal Plan Amendment #2 (2021).

Transformation and Evaluation Framework (TREF) 2.0, developed by previous year's team and enhanced this year, is used to conduct initial screening of options

Criteria	Key Assessment	Example Questions
1. Plant Site Suitability	• Geographical Suitability • Infrastructure Readiness	• Does the site have access to raw materials / natural resources / human resources required? • Are the existing buildings readily adaptable for new industrial uses?
2. Tax Impact	• Tax Revenue Generation • Tax Incentives and Credits	• Will the project create new taxable economic activity (e.g., attracting industries, increasing commercial property value)? • Are there available state tax credits (e.g., ITC for renewables, CCS tax credits, energy efficiency grants)?
3. Resource Adequacy	• Grid Reliability Impact • Capacity Factor and Dispatchability	• Does the redevelopment not have any impact on the grid's ability to maintain stability in terms of frequency regulation, peak demand coverage, and resource adequacy?
4. Job Market	• Skill Alignment • Workforce Development	• Do local workforce skills closely match the needs of the redevelopment? • Is there significant potential for new job creation within the community from the redevelopment?
5. Environmental Protection	• Policy Alignment • Lifecycle & Operational Emission Reduction	• Does the redevelopment contribute significantly to regional and state sustainability targets? • Does the redevelopment reduce total GHG emissions significantly compared to the retired plant?

The possible redevelopment options include transitioning to alternative energy source and diversifying into non-energy sectors

Overview of Selected & Eliminated Options using the TREF 2.0



A comprehensive assessment identifies solar, battery, logistics, and data center options—and combinations of these—as viable plans

Redevelopment options selected from TREF 2.0

	Maximize energy output and accelerate decarbonization		Maximize job opportunities		Combined options	
Options	Solar Farm	Battery Farm	Data Center	Logistics	Solar + Batteries	Data Center + Solar + Logistics
Plant Site Suitability						
Tax Impact						
Resource Adequacy						
Job market						
Environmental Protection						

 = Support redevelopment options

 = Undermine redevelopment options

Other options were eliminated due to their site unsuitability, lower feasibility, and environmental concerns

List of eliminated options

	Energy options					Non-energy options			Combined options	
Options	Wind Turbine	Biomass/ Waste to energy	CCUS	CCGT	Nuclear	Marina	Heavy industries	Other Manufacturing	Park + Wind turbine	Residential/ Commercial + Wind/Solar
Plant Site Suitability										
Tax Impact										
Resource Adequacy										
Job market										
Environmental Protection										

 = Support redevelopment options

 = Undermine redevelopment options

Summary of Final Reconversion Options

= Final scenarios for redevelopment

Option Focus	Option	Impacts	Tax & Energy Costs	Key Advantages
Generation/ Environmental Purposes	Battery Farm Standalone	Supports peak load reduction (1%); 420 job creation	LCOS $183.26/MWh	Strong policy support; strong site suitability; aligns with MA goals
	Solar Farm	Supports MA's 27 GW solar goal; 100 jobs expected	LCOE:$103.5/MWh Tax: 50k/year	High site suitability; delivers both job and environmental benefits
	Solar + Battery	Grid reliability + carbon reduction support	Tax credit: 30–50%	Strong policy alignment and reputational benefits; tax credits
Employment Maximization	Data Center + Solar + Logistics	100+ logistics and 5–30 data center jobs	Tax $5M/year	Land efficiency and employment maximization; addition of solar helps with potential tax credits
	Data Center	30–50 full-time tech jobs	Tax $3M–$5M/year	Aligns with Amazon, Meta, Google capex trends; strong tax incentives
	Logistics	100+ logistics jobs	Tax $500K–$1M/year	Centrally located; compatible zoning; relatively strong tax incentives

Solar Farm: A 5MW solar farm aligns with Eversource's aim, delivering both tax and environmental benefits

Site suitability:

- Connection to the grid is an advantage
- According to the Massachusetts Department of Energy Resources, the parcel is assessed as highly suitable for solar development.

Tax Impact:

- Eligible for state and federal tax incentives, such as IRA
- Expected tax revenue of $50K

Resource Adequacy:

- Calculated LCOE of $103/MWh, which is slightly higher than the utility-scale solar PV LCOE calculated by Lazard

Job Market:

- 100 jobs expected to be created

Environmental Protection:

- Consistent with MA's net zero target. It aims to have 27 GW solar capacity by 2050

Strong site suitability and job opportunities, low electricity price, and high environmental benefits, but concerns on tax revenue to municipality

Source: VHB, Massachusetts' Clean Energy Targets: Roadmap to Net Zero by 2050 (2024); Freeing Energy, Energy Fact – Residential solar installations create the most jobs per megawatt (2020).

Standalone Battery: 506 MWh of battery storage on 12 acres benefits from strong state policy support and site suitability, accelerating energy transition

Site suitability:
- Benefits from the grid connection and existing substations
- Strong suitability for a large-scale BESS project, demonstrated by the Jupiter project of 700 MW/2800 MWh (Trimount Energy Storage Facility) planned nearby

Tax Impact:
- Eligible for federal and state tax credits

Resource Adequacy:
- Calculated LCOS of $183.26/MWh
- MA calculation shows that 126.5 MW can reduce peak load by 1%

Job Market:
- About 420 jobs expected throughout the supply chain

Environmental Protection:
- Consistent with MA's net zero target - 5.8 GW of battery storage by 2050
- Clean Peak Energy Standard program incentivizes standalone batteries

Jupiter's presence confirms BESS viability at Mystic, but grid stability remains a consideration

Source: Energy and Environmental Economics, Inc. (E3), Charging Forward: Energy Storage in a Net Zero Commonwealth (2023); Massachusetts Clean Energy Center, Massachusetts Energy Storage Factsheet (n.d.); Massachusetts State Government, State of Charge: Massachusetts Energy Storage Initiative (n.d.).

Data Center: Strengthening Boston to lead in the era of digital innovation

Power:

- Proposing a data center requiring 5-20 MW **from the grid, using natural gas generators as a backup power source,** creating synergies with the existing LNG terminal.

Tax Impact:

- Potential for tax revenue generation in the +$3M to +$5M range (based on Amazon and Google data centers)
- Qualifies for the Massachusetts Data Center Sales Tax exemption

Job Market:

- Potential to create jobs for 30-50 full time employees

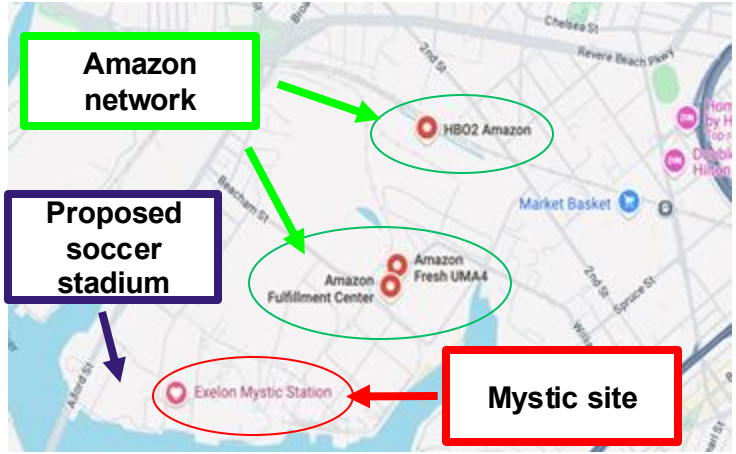
Industry Trends:

- In line with broader capex commitments from Amazon, Meta, and Google

Large tax and job advantages, but concerns of delaying retirement of LNG facility in regards to Massachusetts's Net Zero Targets

Source: Expert interview.

Logistics: Potential to construct warehouse for distribution network or soccer stadium



Site suitability:

- Adjacent to major freight arteries: I-93, Tobin Bridge, port access
- Surrounding uses provides zoning compatibility

Tax Impact:

- Urban industrial property taxes can range $500K–$1M annually, with added multiplier effect from economic activity

Potential Uses:

- Centrally located near existing Amazon distribution network
- Strong potential to be used as warehouse for soccer stadium due to location

Strong site suitability, but low environmental benefits. Presents opportunity to use EV-only delivery fleets

Source: Enel, Carpi Gas Turbine Plant Redevelopment (2019); Mystic Logistics, About Us (2024).

Solar + Battery: Provides clean power, grid reliability, and long-term value; 12 acres of battery storage and 14 acres of solar farm

Reputation & Policy Alignment:

- Positions Mystics as a clean energy leader with visible commitment to decarbonization
- Aligns with IRA and state energy transition goals

Strong Financial Incentives:

- Upfront capital is offset by 30–50% in federal tax credits
- Long-term PPA or capacity market revenues offer stable cash flows and a solid IRR

Reliable Clean Energy Deployment:

- Co-located battery system supports grid stability, mitigating intermittency concerns (particularly important during fossil exit)

Low electricity generation from solar farm due to limited site capacity

Source: Expert Interview; U.S. Department of Agriculture, San Miguel Electric Cooperative Solar + Battery Redevelopment (2024); NV Energy, Reid Gardner Battery Energy Storage System Redevelopment (2024); Vistra Corp, Moss Landing Power Plant Battery Storage Expansion (2023).

Data Center + Rooftop Solar + Logistics: Making the most of 26-acre land while also generating energy

Feasibility:

- 6-9 acres: construction of the data center
- The rest of the land: a logistics facility

Data Center Power Requirement:

- 5-20 MW from the grid, using natural gas generators as a backup power source

Financial Incentives:

- Data center: potential tax revenue ranging from $3M to $5M
- Solar panels on the existing data center and logistics structures has the potential to qualify for IRA tax credits.

Maximization of Employment Opportunities:

- Data center: ~ 30 tech workers
- Logistics facility: > 100
- Solar panel maintenance: ~5 employees

Maximizes employment, but the multi-use redevelopment may cause coordination challenges among multiple stakeholders

Sources: Expert Interview; Prologis, Rooftop Solar and Logistics Facilities (2023); Energy Abundance Development Corp., Data City Texas Project (2025).

Federal policy reprioritizes oil & gas while defunding select renewable projects; state and municipal policy will be critical for fossil fuel phase-out

Policy landscape

* Trump 2.0 (shaded)

Federal level	**Bipartisan Infrastructure Law (2021)** 1.2 trillion funding for infrastructure, including clean energy projects	**Unleashing American Energy (2025)** Oil and gas returned to forefront of American energy strategy
	Clean Air Act & Clean Energy Act (2024) 90% carbon pollution control required for all new gas plants, starting 2035	**Freezing of Remaining IRA/IIJA (2025)** Outstanding IRA/IIJA is frozen and tax incentives are for select clean projects
	Reconsideration of emissions permits (2025) Over 30 Biden-era emissions rules are under reconsideration	**Trump 2.0 Tariffs (2025)** Increased tariffs imposed on key energy trade partners and suppliers
State level	**Clean Energy and Climate Plan (2022)** Sector-specific sublimits of emissions adopted to achieve statewide Net Zero by 2050	**Mass Leads Act (2024)** $400M investment and tax incentives for climate-tech initiatives
	Qualified Data Center Tax Exemption (2024) Sales and use tax exemption applied for qualified data centers	**An Act promoting a clean energy grid, advancing equity, and protecting ratepayers (aka. Clean Energy Act 2024)** Directs MA utilities to procure 5,000 MW energy storage systems by July 31, 2030
Municipal level	**Zoning Ordinance Sections 37 & 38 (2024)** Land permitting process streamlined for the districts near Mystic	**Battery farm buildout in Everett (2024)** 700MW battery farm buildout in Everett objected to by Mayor; yet approved by state

Key implications

1. **Trump administration's rollbacks of federal climate commitment, IRA/IIJA pause, and tariffs** will likely extend the dependence on domestic O&G and **delay the development of select clean energy projects**, including wind power, solar power, and green hydrogen

2. **State-level emission restrictions and policy incentives will be critical drivers** for renewable development; yet **state funds** and tax incentives **are scarce for utility-scale** renewable projects

3. Both **federal and state policymakers have growing interests in** accelerating the **data center buildout and energy storage systems**, providing policy support for the Mystic redevelopment project

Sources: U.S. Department of Energy, Investing in Energy (2025); The White House, Unleashing American Energy (2025); Commonwealth of Massachusetts Website; City of Everett.

Our findings and analysis can be applied to facilitating retirements of other gas plants in the U.S. despite increasing energy demand

Redevelopment Plan for Mystic Power Plant

Our redevelopment plans for the Mystic Power Plant serve as a case study illustrating a holistic assessment approach.

- By applying the five categories of the **Transformation and Evaluation Framework (TREF) 2.0**, we can identify the most suitable redevelopment options for gas plants across the U.S.
- We propose **two scenarios** – one prioritizing environmental impact and the other maximizing job opportunities – that reflect recent trends in building data centers and renewable energy plants **while acknowledging each option's limitations**

Federal and State-Level Policy Analysis

Our federal and state-level policy analysis highlights key implications for the retirement of other gas power plants across the U.S.:

- Trump administration's rollbacks of federal climate policy and incentive programs **will shift near-term investment to oil and gas,** impeding the development of select renewable energy projects
- **State and municipal-level policy** – particularly procurement targets and subsidy programs – **will be key drivers** for the near-term energy transition
- **The combination of clean energy options and data center buildout is a growing avenue for utility companies** to explore due to both federal and state-level incentives and strong industry demands

Future Actions

- Test TREF 2.0 framework with other gas plants in the U.S. to assess its applicability
- Continue updating our policy analysis to ensure up-to-date source

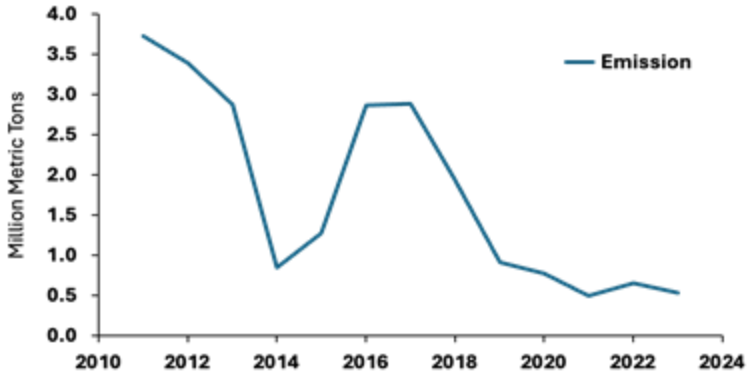
Appendix

As one of the state's largest sources of atmospheric emissions, the long-running gas plant has raised significant environmental and public health concerns

Environmental Concern

- Although GHG emission decreased due to lower operation in recent years, it was **one of the state's most polluting power plants**.
- In 2018 and 2019, the plant emitted **3.1 million metric tons of GHG, which accounted for 21% of the emissions of all the state's power plants.**

GHG Emission of Mystic Power Plant

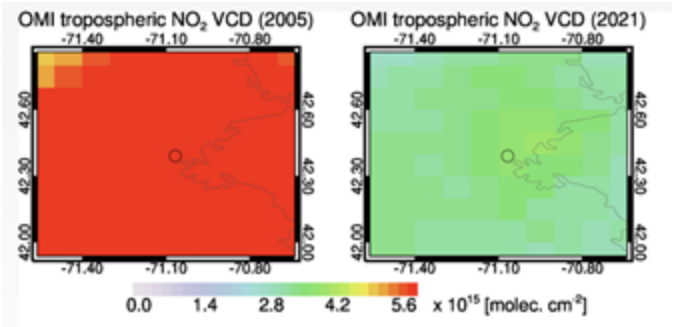


Health Concern

- A disproportionate number of neighbours suffered from **high levels of respiratory and cardiovascular diseases**.
- The surrounding cities, such as Boston, Chelsea, and Revere, has the state's highest asthma rates, although direct causality cannot be drawn.

Nitrogen Dioxide (NO_2) Density in the Air

NO_2 is a major air pollutant known to harm human health. Data show a decrease in NO_2 density from 2005 to 2021, attributed to reduced operations at the Mystic power plant.

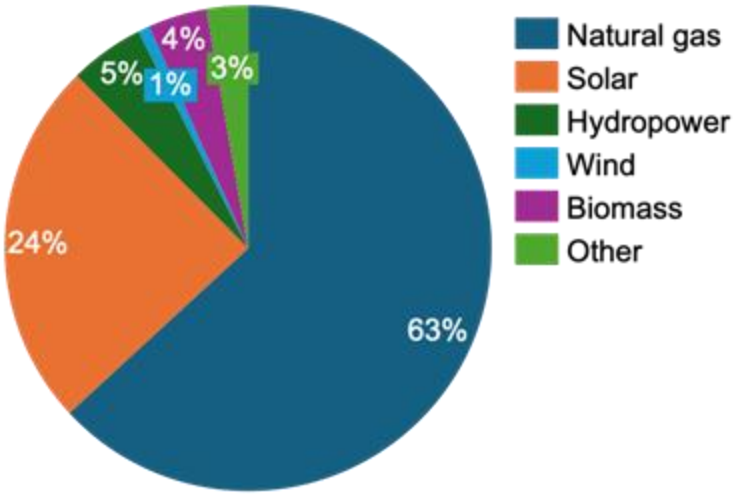


Sources: U.S. Environmental Protection Agency (EPA), 2023 Greenhouse Gas Emissions from Large Facilities (2023); NASA, Air Quality Observations from Space (2021).

In recent years, Mystic served as a backup power generator to metropolitan Boston. The plant generated one-fifth of the total gas-fired capacity in 2023

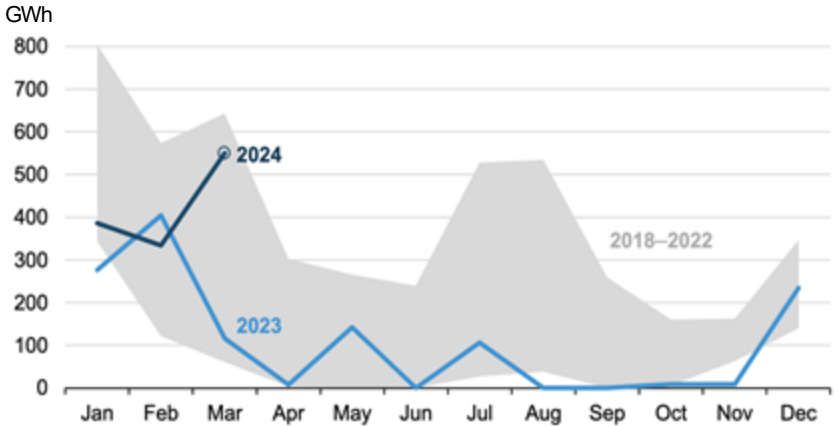
Energy Generation in Massachusetts (2023)

Natural gas is the primary source of in-state electricity generation. The state consumes five times more electricity than it produces locally, getting the balance via the regional grid.



Mystic's Monthly Generation in GWh

The plant accounted for one-fifth of the state's total natural-gas-fired capacity, though its capacity factor was low in recent years.



Grey shade indicate a range of generation from 2018 to 2022.

Sources: U.S. Energy Information Administration, Massachusetts ProfileState Profile and Energy Estimates (2024); U.S. Energy Information Administration, New England utility closes import-dependent gas-fired power plant, keeps LNG import option (2024).

Forty employees on staff at the time of retirement were offered alternative employment opportunities

Employment Statistics

Mystic Power Plant

- **110 full-time workers** maintained Mystic Units 7, 8, and 9
- **40 employees were hired at the time of retirement**. They have agreed with Constellation to take different positions within the company, remain on site to help with Mystic's decommissioning, or have agreed to separation packages.

Everett LNG Marine Terminal

- As of 2024, the terminal employs **60 workers** at the facility
- Supports about **4,300 other jobs related to the natural gas industry** in Massachusetts

Source: Boston Globe, New England's largest fossil fuel-fired plant is shutting down for good (2024).

Mystic was one of the largest taxpayers to the city of Everett but it also incurred additional costs to remain operational

Decreased Tax Revenue for Everett

In 2020, 16.1% of tax revenue came from Mystic.

2001 - 2010	$17.9 million
2011 - 2020	$15 million
2024	$5 million

Mystic Cost of Service Charge

- ISO-NE entered into an cost of service agreement with Constellation to keep the Mystic power plant open to hedge against potential energy shortage.
- The Mystic Cost of Service (COS) Charge was charged by ISO-NE to customers as a supplemental capacity payments.
- The total charges are **$776 million** from June 2022 to May 2024.

Sources: City of Everett, Comprehensive Annual Financial Report (2020); ISO-NE, Monthly Market Operations Report March 2025 (2025).

Solar Farm: Key assumptions are based on the Lazard 2024 report, using the high-end values for Solar PV – Utility Scale

Key assumptions for solar farm

Generation

- Capacity: 5MW
- Capacity factor: 13% (14-year average in MA)

Costs

- Fixed O&M: $14/kw-year
- O&M Escalation Rate: 2.25%
- Total Capex: $7m (EPC costs $1,400/kW)
- **Levelized Cost of Energy (LCOE) : $103.50/MWh**

Tax and Tax Incentives

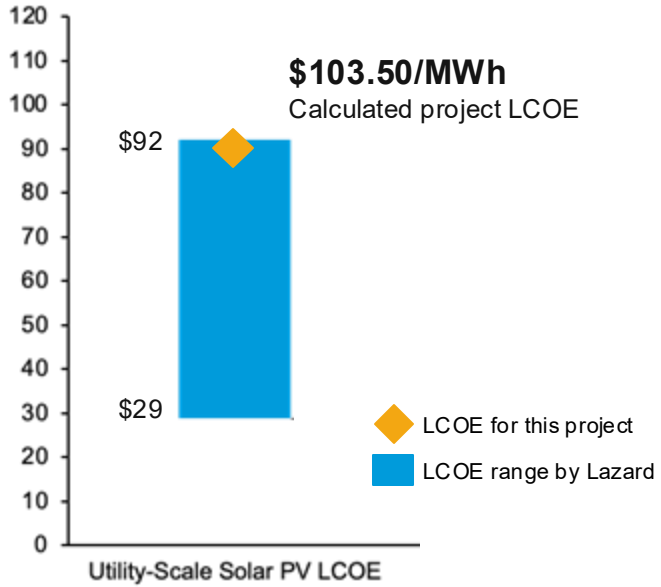
- Tax rate: 40%
- ITC: 30%
- Economic Life: 20 years
- MACRS Depreciation: 5 years

Capital Structure

- Debt: 60% (@8%), Equity: 40% (@12%)

Lazard LCOE vs. Project LCOE

LCOE for this solar farm is higher than the Lazard estimate due to lower capacity and capacity factor for this project.



(*)Assumptions in blue indicate those adjusted for this project from the Lazard assumptions.

Sources: Lazard, Lazard Levelized Cost of Energy+ (2024); Massachusetts Department of Energy Resources, Massachusetts Technical Potential of Solar (2025); Massachusetts Clean Energy Center, Production Tracking System (PTS) (2023).

Standalone Battery: Key assumptions are based on the Lazard 2024 report, using the high-end values for Utility-Scale Standalone (100MW/400MWh)

Key assumptions for battery farm

System Specifications

- Power Rating: 126.5 MW
- Energy Duration: 4 hours
- Usable Energy: 506 MWh
- Depth of discharge: 90%
- Operating Days/Year: 350 days
- Storage Efficiency Factor: 88%

Operating Costs

- Charging Cost: $0.051/kWh
- Charging Cost Escalator: 1.97%
- O&M Escalator: 2.5%

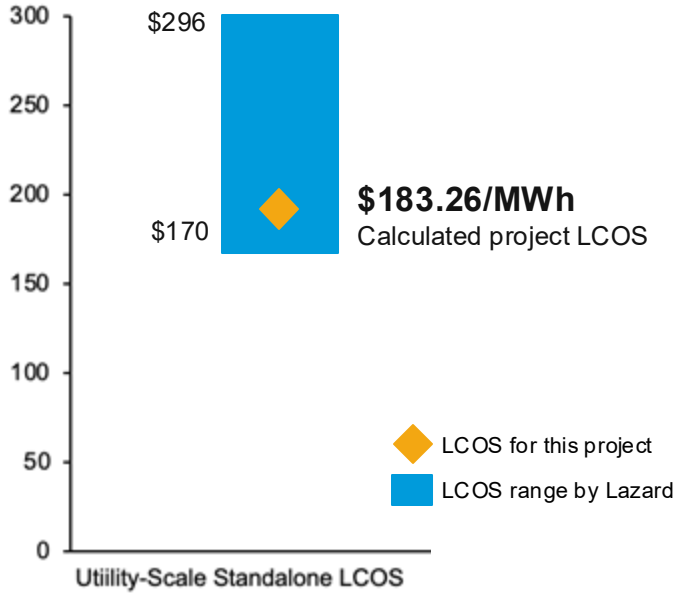
Financial Summary

- Total CapEx: $199M
- Capital Structure: 20% Debt (@ 8%) + 80% Equity (@ 12%)
- Contract Term: 20 years
- Federal ITC (BESS): 30%
- MACRS Depreciation: 5-Year Schedule
- **Levelized Cost of Storage (LCOS): $183.26/MWh**

(*) Assumptions in blue indicate those adjusted for this project from the Lazard assumptions.

Lazard LCOS vs. Project LCOS

LCOS for the battery farm is within the range of Lazard estimate.



Sources: Expert interview; Lazard, Lazard Levelized Cost of Energy+ (2024).

Data Center: 5-20MW data center will be powered from the grid, using natural gas from the existing LNG terminal as a backup

Site Requirements (6-9 acres in total)

- Data Center Building: ~1–2 acres
- Support Infrastructure: ~5–7 acres (warehousing, turbines/generators etc.)

Cabinet & Rack Layout

- Cabinet Width Allocation: 2 ft per cabinet
- Total Cabinets (allocated): ~2,500
- Servers per Cabinet: 10–15
- GPUs per Server: 4–8
- Compute Density: Up to 60 kW per cabinet (range: 20–40 kW baseline)

Power Requirement

- Cabinet Draw: 20–40 kW (up to 60 kW in some configurations)
- Estimated Load: ~5-20 MW
- Natural gas generators as backup power

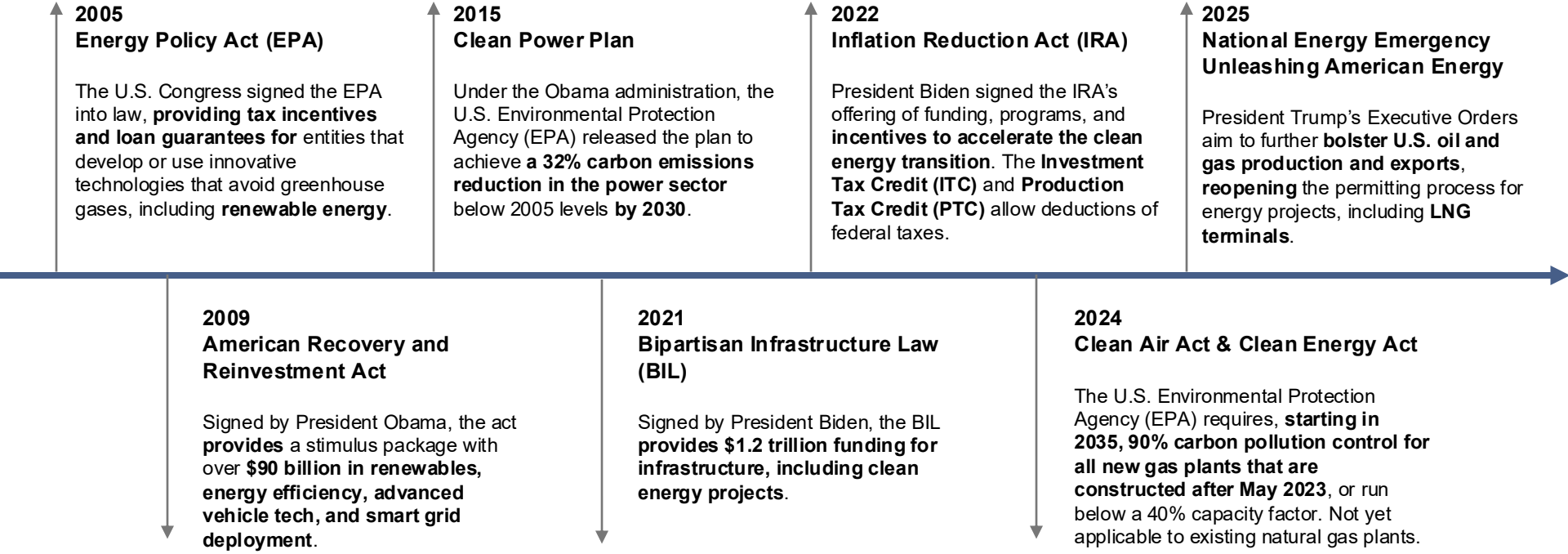
Financials (CapEx Estimates)

- Per Cabinet CapEx: $200K – $1M
- Total Hardware Value (10K sq ft): ~$500M–$1.5B for ~2,500 cabinets

Source: Expert interview.

Trajectory of key federal energy policies highlights continued federal efforts at decarbonization and energy transition and Trump administration's rollbacks

Timeline of Federal Policy Development



Sources: U.S. Department of Energy, Investing in Energy (2025); IRS, Inflation Reduction Act of 2022 (2025); The White House, Unleashing American Energy (2025).

Trump administration focuses on oil & gas production and export as key assets of American energy policy; freezes funds for select renewable energy projects

Categories		Impact	Comments
1 Reprioritization	I Focus on fossil fuel	↘	Federal policies returned oil & gas production and LNG export to the forefront of American energy strategy, redirecting near-term investments in oil & gas infrastructure
	II Energy demand growth	→	Powering data centers and AI buildout will accelerate, significantly increasing U.S. energy demand and accelerating clean energy considerations such as small modular reactors (SMRs)
2 Economic policy	I Defunding of clean energy technology	↘	Subsidies and tax credits re-allocated from wind power, green hydrogen and EV to LNG, CCUS, nuclear power, and blue hydrogen, likely delaying near-term energy transition
	II Tariffs	↘	Tariffs on key energy trading partners and disruption of global supply chains constraints supply sourcing further, potentially rising renewable energy prices and shifting demands for domestic O&G
3 Emissions standard	I Withdrawal from Paris Agreement	↘	Withdrawal from the Paris Agreement undermines U.S. leadership in a global fight against climate change, possibly leading to revision of state-level emissions reduction targets in some states
	II Deregulation	→	Reconsideration of more than 30 Biden-era rules on GHG emissions may speed up the development of energy infrastructure, particularly fossil fuel facilities

→ Impact on fossil fuel plant retirement and grid decarbonization

Source: The White House, Unleashing American Energy (2025); Roland Berger, Trump 2.0 – Outlook on potential impacts on Energy and Sustainability (2025).

Trump administration will likely shift investment into natural gas, yet solar and battery technologies continue to develop due to existing ecosystems and demands

Technology	Solar (utility)	Battery / LDES	Natural Gas
Impact*			
LCOE (USD/MWh)	29 - 92 (standalone) 60 - 210 (PV + storage)	--	110 - 228, 85 (peaking) 45 - 108, 30 (CCGT)
Policy landscape	• Trump administration froze the remaining funds for 30% ITC or 2.75 ¢/kWh5 PTC • Trump's tariffs against China, the world's largest solar panel manufacturer, leads to higher costs of supply sourcing and solar power generation	• U.S. Department of Energy (DOE) defines LDES as 10+ hours duration storage system. Issued in September 2024, DOE announced $100 million in funding pilot-scale non-lithium technologies, LDES, and stationary storage applications • Applicants requested $1.5+ billion of federal funding	• Trump administration reversed Biden-era LNG export ban, paving the way for 100 million metric tons per annum of additional LNG by 2031 • Three LNG projects in Louisiana and Texas announced to move full speed ahead with their development plans.
Comments	• Despite subsidy uncertainties, growing demand and cost-competitiveness continue to push renewables development • Solar expected to continue business as usual where economically feasible	• Storage development likely to continue with the growing renewables and evolving grid needs • More states are implementing policies and targets for energy storage and LDES; this trend is expected to continue	• Advocacy for the fossil fuel industry returns, but midstream infrastructure constraints likely to be exacerbated • LNG export may increase domestic gas prices, potentially raising natural gas bills for U.S. households by $100+ a year

(*) Impact on development and scaling of each energy technology

Sources: Lazard, Lazard Levelized Cost of Energy+ Report (2024); Department of Energy, Long-Duration Energy Storage (2025); Roland Berger, Trump 2.0 – Outlook on potential impacts on Energy and Sustainability (2025).

Trump's rollbacks of nation-wide energy transition efforts including the freezing of IRA/IIJA will delay gas plant retirements and clean energy transition

Supportive Policy Driver

Clean Air Act & Clean Energy Act
Starting in 2035, all gas power plants constructed after May 2023 must control 90% of carbon pollution or run below a 40% capacity factor. However, the Act is not applicable to existing gas plants

- Encourage alternative energy options like renewables

Contingent Policy Driver

Freezing of IRA/IIJA
Outstanding IRA and IIJA funds are frozen; subsidies will be only provided for select clean energy technologies such as CCUS, nuclear, and blue hydrogen

- States dependent on federal funding will shift to preferred clean energy technologies

Deregulation of emissions permits
Biden-era emissions permits and standards are under reconsideration, likely leading to more relaxed permitting measures

- Accelerate O&G infrastructure
- Upgrade of grid and transmission may be beneficial for renewables

Challenging Policy Driver

Unleashing American Energy
O&G production and export will be enhanced as energy security assets

- Shift investment into fossil fuels
- Delay clean energy transition

Tariffs on key trading partners
Increased tariffs are imposed against key energy trading partners

- Increase cost of renewables
- Perpetuating O&G dependence

$20B investment to data centers
Trump announced the Damac Properties' $20+ billion investment in US data centers

- Surge in energy demand
- Delay fossil fuel retirement

Sources: The White House, Unleashing American Energy (2025); US Environmental Protection Agency (2024).

State-level policies promote renewable energy via mandates, R&D efforts, investments in data centers, and mandates for environmental-friendly projects

Categories		Impact	Comments
1 Reprioritization	Battery Storage Mandate Increases Penetration of Renewable Energy	↗	**Bill S.2967: An Act Promoting a Clean Energy Grid**: Directs Massachusetts utilities to procure 5,000 MW of energy storage systems by 2030, significantly increasing the penetration of battery storage, and by extension solar energy, reducing intermittency and promoting greater reliability of the grid
2 Economic policy	I Investment in Data Centers Drives Demand for Energy	→	**Bill H.2792: Data Center Tax Incentive Act:** Provides sales-and-use tax exemptions for "qualified data centers" on purchases of critical equipment, software, electricity, and construction materials. This incentive makes siting large data centers more cost-competitive. Depending on whether data center is co-located with solar or batteries, could be positive or negative for renewables
	II Economic Leadership - Promotion of R&D in Renewables	↗	**Bill H.4459: Massachusetts Leads Act:** $200M for the Clean Energy Investments Fund to stimulate research and development, innovation, manufacturing, commercialization, and deployment of climate tech technologies across Massachusetts; $200M for the Wind Industry Investment Trust Fund to support the development of offshore industry
3 Emissions standard	Renewables Mandates Promotes Green Decision-Making	↗	**MA Clean Energy and Climate Plan:** Adopted emissions sub-limits on natural gas distribution & services reduction in 2025 (33%) and 2030 (50%) below 1990 level; the new law changes the state's definition of clean energy to include nuclear fission, battery storage and technologies which remove carbon dioxide from the air

→ Impact on fossil fuel plant retirement and grid decarbonization

Sources: Bills as posted on Congressional Site, Bill S.2967 (2024), Bill H. 2792 (2024), Bill H4459 (2024), Massachusetts Clean Energy and Climate Plan (2022).

State-level policies accelerate solar and storage adoption while phasing out natural gas in energy transition

Technology	Solar (utility)	Battery / LDES	Natural Gas
Impact*			
Policy landscape	• The SMART program (launched in 2018) has increased renewables penetration amount homeowners through contracts with IPPs, rates paid for by utility • SMART provides 20-year incentives for solar farms larger than 25 kW AC, with payment rates that decline over time in different blocks	• Energy storage capacity 5,000 MWh by 2030 (9× current, per law), to be divided into 3,500 MW of mid-duration storage, 750 MW of long-duration storage, and 750 MW of multi-duration storage	• Overall consumption of natural gas has been decreasing in Boston due to shift away from gas to more sustainable sources. Mystic River was used as a peaking plant when older fossil fuels plants are unable to come online
Comments	• While the SMART program caters to homeowners, homeowners can lease their land to developers for a fixed price. Eversource owns the land so it likely will not qualify • Solar energy installations likely to increase, and Massachusetts does have utility-scale solar farms, but most incentives are on the residential scale	• Increasing long-duration battery storage will help promote energy uptake in times of cheap prices and discharge in peak prices • Short duration battery storage promotes robust ancillary service and frequency duration, which promotes grid reliability • Likely battery penetration in Boston will increase substantially	• The increased incentivization for economic development has created a tension between renewable energy development such as battery storage and maintaining grid reliability infrastructure. Part of this is compensated for the fact that MA heavily favors renewables projects for new developments

(*) Impact on the development and scaling of each energy technology

Sources: Roland Berger, Trump 2.0 – Outlook on potential impacts on Energy and Sustainability (2025); Eversource.com

State-level mandates for battery storage and emissions restrictions drive supply of battery storage, but Data Center law may provide headwinds to gas retirement

Supportive Policy Driver

Bill S.2967: The Act Promoting a Clean Energy Grid limits future rate increases; protects consumers from excessive rate increases.

- Permitting timeline: fixed 15-month review via EFSB
- Accelerates renewables development through battery storage mandates and gas infrastructure requirements
  - Requires that all new proposals must prioritize "non-pipe alternatives"
- Battery storage can help promote renewable energy, both as standalone battery storage and when paired with solar, by reducing intermittency, relieving the grid of reliance on fossil fuels

Contingent Policy Driver

Solar Massachusetts Renewable Target (SMART) Program creates incentives and tax credits for residential solar development.

- State-level procurement targets and price caps drive CO_2 emissions reduction targets
  - Incentivizes residential solar and commercial use if homeowners lease their land to developers
- The SMART program benefits utility companies who may collaborate with homeowners and businesses
- For this proposal, it doesn't directly apply, but Eversource may benefit from it in the future

Challenging Policy Driver

Bill H.2792: An Act relative to qualified data centers in the Commonwealth provides sales-and-use tax exemptions for qualified data centers on purchases of critical equipment, software, electricity, and construction materials.

- Increases reliance on O&G
- Delays fossil fuel retirement
- Global power demand expected to increase 50% by 2027 and up to 165% by 2030 (compared with 2023)
- Eric Schmidt Congressional Testimony: AI could eventually consume 99% of electricity (April 2025)

Sources: Goldman Sachs, AI to drive 165% increase in data center power demand by 2030 (2025); Massachusetts state government, SMART program website, Solar Massachusetts Renewable Target (SMART) Program (2024); Eric Schmidt Congressional Testimony (2025).

Municipal-level policies streamline permitting processes and economic innovation districts; Jupiter project demonstrates increased battery storage penetration

Supportive Policy Driver

Section 36 and 37 of the Everett Municipal Code

- The bill mandates a Cumulative Impact Analysis, part of which in a Community Benefit Agreement, to ensure that communities which have historically been affected redevelopment get payment
- **Impact**: Streamlines the siting and permitting process so instead of going to a litany of organizations for permitting approval, developers only need to go to one entity and wait at most 12 months. Because we already have the site permitted, we have a major advantage; in the long-run, this will increase competition for renewable energy sites in Boston

Contingent Policy Driver

Section 38: Everett Docklands Innovation District

- The Master Plan Project, or Everett Docklands Innovation District (EDID), consists of a mixed-use development including around 7.2 sf of industrial, high-tech manufacturing, as well as the Trimount Energy Storage space. It will be constructed in two phases, with the Trimount Energy Storage Facility being constructed first, followed by other commercial elements
- **Impact**: Policies supporting economic growth offer a mixed news for renewables; increased R&D supports renewables but increased load growth demands stable electricity grid, necessitating fossil fuels such as LNG. The cost of the old fossil fuel plants, however, shifts generation towards renewables

Challenging Policy Driver

Debate around Trimount Project from Jupiter Power:

- On Nov. 29, state energy and environmental affairs secretary Rebecca Tapper, signed a final record of decision-making allowing the massive battery energy storage system to advance in permitting. **The Mayor of the City of Everett has fought against the Jupiter Battery Storage plant**; however, because the State has ultimate say over which projects get constructed, the project was approved for construction by the Department of Public Utilities (DPU), so it was allowed to go ahead
- **Impact**: Jupiter Power's battery entry may intensify competition for redevelopment of Mystic. There is also the issue of community fear and anxiety regarding safety and fire issues with regards to batteries

Sources: Section 36 & 37, Everett Municipal Code, Energy-Storage News, "Jupiter Power faces mounting opposition over construction of 800MWh BESS in Massachusetts", by Matthew Bliss (March 11, 2025).

Solar farm benefits from state incentives, facing IRA and import tariff uncertainty

Supportive Policy Driver to Solar Farm

State: Solar Massachusetts Renewable Target Program pays solar energy producers a fixed tariff rate per kWh, supporting development of up to 3,200 MW of new solar capacity. Massachusetts Department of Energy Resources regulation 225 CMR 20.00 establishes the SMART tariff, paid by utilities directly to solar project owners

- Improves profitability of the solar farm by supplementing wholesale power revenues with incentive tariffs, thereby lowering reliance on market prices
- Aligns the project with Massachusetts' net-zero mandate (27 GW solar by 2050), which eases regulatory approvals

Contingent Policy Driver to Solar Farm

Federal: Inflation Reduction Act 30% Investment Tax Credit – IRC §48: The IRA restored the ITC to 30% of project capital costs for qualifying solar energy property

- Improves project economics by offsetting upfront cost and returns
- However, compliance with labor rules is contingent; must meet prevailing wage and apprenticeship to claim the full 30%; otherwise a base 6% rate
- Potential freezing in IRA funding under current political climate uncertainty

Challenging Policy Driver to Solar Farm

Federal: Solar Import Tariffs – Section 201 + AD/CVD announced that the U.S. temporarily suspended certain import tariffs on solar modules from Southeast Asia. These exemptions are set to expire on June 6, 2024, reinstating tariffs that could increase solar module costs

- Potential increase in procurement costs for solar modules post-exemption
- Need to strategize procurement and installation timelines to mitigate cost impacts

Sources: Massachusetts DOER, SMART Program (2024); IRS, Instructions for Form 3468, Investment Credit (2024).

Standalone battery has benefited from strong state procurement targets and funding support but faces challenges in tariff and IRA uncertainty

Supportive Policy Driver to Standalone Battery

State: Act Promoting a Clean Energy Grid (Energy Storage Procurement Mandate) Section 83E of the Act directs that every distribution utility in coordination with the state, “enter into cost-effective long-term contracts” for approximately 5,000 MW of energy storage systems by July 31, 2030 (with at least 3,500 MW mid-duration, 750 MW long-duration)Initial procurements of ~1,500 MW must occur by mid-2025, ensuring a rapid scale-up

- Guarantees potential offtake contracts for large storage installations
- While the mandate doesn’t fund the project, the long-term contracts it spurs can stabilize income

Contingent Policy Driver to Standalone Battery

Federal: Inflation Reduction Act Domestic Content Bonus – IRC §45(b)(9), §48: The IRA incentivizes use of U.S.-made equipment by offering a 10 percentage-point ITC increase for projects meeting domestic content requirements. This might involve U.S.-made battery enclosures, inverters, switchgear, and possibly battery cells or modules

- Raise the credit from 30% to 40%, or even to 50% if combined with the energy community adder
- Contingent on supply chain factor since most of battery manufacturing is overseas (Asia)
- Involve both an iron/steel requirement and a percentage of overall component costs

Challenging Policy Driver to Standalone Battery

Federal: Tariff on Battery Grip imported lithium-ion batteries and related battery storage components with rates reaching up to 145% at peak. Uncertain tariff rate but will have profound effect on BESS marketplace

- These policy uncertainty may incur increased capital expenditure, supply chain disruption risk, additional regulatory challenges

Sources: Massachusetts General Court, An Act Promoting a Clean Energy Grid, Advancing Equity and Protecting Ratepayers, Chapter 239 (2024).

Data center state tax incentives drive financial viability, yet certification and zoning pose constraints

Supportive Policy Driver to Data Center

State: Massachusetts Data Center Sales Tax Exemption Chapter 238, Acts of 2024 (codified at M.G.L. c.64H §6(zz)) exempts owners/operators of Qualified Data Centers from all sales and use tax on: (A) data center equipment, (B) software, (C) electricity used, and (D) building construction or renovation costs for the facility

- Lowers both capital and operating costs by eliminating the 6.25% sales tax on multi-million-dollar server hardware purchases, power bills, and construction inputs
- Immediate reduction in upfront construction costs (servers, electrical gear, etc.), improving ROI

Contingent Policy Driver to Data Center

State: Qualified Data Center Certification designation requires at least 100,000 square foot of facility space, $50+ million in new investment, and 100 permanent jobs on site. Its ability to secure the tax exemption is contingent on achieving the required size and employment, which adds a planning constraint

- To unlock the above tax benefits, the project must be certified by the state as a Qualified Data Center

Challenging Policy Driver to Data Center

State: Port Zoning Restriction required property sits in a state-designated port zone (Designated Port Area) that limits uses to water-dependent industrial operations

- A data center is not a marine or shipping use, currently prohibited at this site
- The site's DPA status would need to be lifted for the project to proceed

Sources: Massachusetts DOR, Qualified Data Center Tax Exemption (2024); Boston Globe, Port designation poses big hurdle for redevelopment of power plant land in Everett (August 28, 2022).

Logistics supported by zero emission vehicle (ZEV) mandates but faces environmental justice regulatory risk

Supportive Policy Driver to Logistics

State: Advanced Clean Trucks requires automakers to ensure that starting Model Year 2025, at least 7% of new Class 2b–3 trucks, 11% of Class 4 - 8 trucks, and 7% of Class 7 - 8 tractors sold in-state are ZEVs, with those percentage requirements rising each model year through 2035. Manufacturers face fines for non-compliance, and credits or trading mechanisms are in place to meet these ZEV sales target

- The ACT rule's ZEV sales mandate is highly pertinent. Logistics facility is operational, a significant share of delivery trucks serving it will be electric

Contingent Policy Driver to Logistics

N/A: There is currently no identified policy contingency impacting the logistics technology option

Challenging Policy Driver to Logistics

State: Environmental Justice Review Massachusetts' new Environmental Justice provisions in the MEPA law mandate heightened environmental impact reviews and public engagement for projects in EJ areas that may cause environmental harm

- Logistics development would face extensive scrutiny, such as air quality analyses, public hearings, mitigation requirements
- Policy regulation may delay the project, adding compliance costs to address community health concerns

Sources: Massachusetts DEP, Low Emission Vehicle Program Amendments (2024); Massachusetts General Court, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy Chapter 8 (2021).

Solar + Battery: Strongly enabled by Massachusetts' mandates and streamlined permitting but relies on uncertain federal support for financing

Supportive Policy Driver to Solar + Battery

State: Massachusetts Clean Energy Grid and Climate Act Streamlines permitting and siting for renewable energy projects. Imposes 12-month deadline for local permits and 15-month for state permit by consolidating reviews under the Energy Facilities Siting Board. It also requires community engagement and environmental mitigation planning

- Benefit from a faster permitting process and clearer path to construction
- The law's focus on community input means the project must work with stakeholders, but these reforms greatly facilitate a large combined energy redevelopment in Massachusetts

Contingent Policy Driver to Solar + Battery

Federal: Inflation Reduction Act 30% Production Tax Credit – IRC §45: The IRA revived and expanded the renewable electricity PTC (Internal Revenue Code §45). A solar facility can elect the PTC, which pays out $0.0275 per kWh (2.75¢, inflation-adjusted) for 10 years for projects meeting labor requirements (one-fifth of that if labor rules aren't met)

- PTC could be more lucrative when power yields or electricity prices exceed expectations than ITC
- However, this option is contingent on long-term performance Credits accrue only as energy is produced and sold and merchant price risk
- Subject to annual inflation adjustments and tax credit phase-downs after 2032

Challenging Policy Driver to Solar + Battery

N/A: There is currently no identified policy challenge impacting the combined option

Source: IRS, Domestic Content Bonus Credit; An Act Promoting a Clean Energy Grid, Advancing Equity and Protecting Ratepayers, Chapter 239 (2024).

Data Center + Solar + Logistics: Benefits from multi-layered state incentives, but regulatory scrutiny on emission may complicate execution

Supportive Policy Driver to Data Center + Solar + Logistics

State: Economic Development Incentives offers sizable tax credits (often ~$10K–$15K per job) to projects that create new full-time jobs in the Massachusetts

State: Brownfields Redevelopment Tax Credit provides a transferable tax credit to incentivize the cleanup and redevelopment of contaminated industrial site. The credit covers 25%–50% of qualified environmental remediation costs

- Reduce tax burden and upfront infrastructure costs

Contingent Policy Driver to Data Center + Solar + Logistics

N/A: There is currently no identified policy contingency impacting the combined technology option

Challenging Policy Driver to Data Center + Solar + Logistics

State: Environmental Justice Approval Given the scale and mix of uses (industrial, energy, and commercial) in a densely populated area, the project must navigate a full MEPA Environmental Impact Report with robust community involvement. New EJ requirements ensure that any disproportionate impacts on local residents are assessed and mitigate

- This lengthy review process can delay construction and may force design changes to satisfy state regulators and community stakeholders, adding to project complexity

Source: Massachusetts General Court, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, Chapter 8 (2021).