DPU Public Workshop: Solar and Distributed Generation in Massachusetts

Massachusetts Department of Public Utilities
May 3, 2024

DISCLAIMER

THE DEPARTMENT'S INTENT IN HOSTING TODAY'S SOLAR AND DISTRIBUTED GENERATION WORKSHOP IS TO PROVIDE AN EDUCATIONAL OPPORTUNITY FOR MEMBERS OF THE PUBLIC AND PROVIDE A FORUM FOR QUESTIONS IN LINE WITH THE DEPARTMENT'S GOAL TO INCREASE ACCESSIBILITY AND TRANSPARENCY. THE VIEWS EXPRESSED BY SPEAKERS FROM THE DEPARTMENT ARE THOSE OF THE SPEAKERS AND DO NOT NECESSARILY REPRESENT THE POSITION OF THE DEPARTMENT.

CONSISTENT WITH THE DEPARTMENT'S EX PARTE RULES, DEPARTMENT STAFF WILL NOT DISCUSS SUBSTANTIVE DETAILS ABOUT PENDING ADJUDICATIONS.

FURTHER, THIS MEETING IS BEING RECORDED BY THE DEPARTMENT. BY STAYING IN THIS MEETING, YOU CONSENT TO BEING RECORDED.

Agenda

- Welcome
- Opening remarks
- Introduction
- Net Metering
- Solar Massachusetts Renewable Target (SMART) Program
- Q&A Session
- Break
- Interconnection
- Grid Modernization
- Ombudsperson’s Office
- Q&A Session

Who Are We?

The Massachusetts Department of Public Utilities (DPU) is an adjudicatory agency responsible for the oversight of investor-owned electric power, natural gas, and water utilities in the Commonwealth. In addition, the DPU is charged with developing alternatives to traditional regulation, monitoring service quality, regulating safety in the transportation and gas pipeline areas, and the siting of energy facilities.

Commissioners

The DPU is overseen by a three-member Commission appointed by the Secretary of the Executive Office of Energy and Environmental Affairs and approved by the Governor.

Chair
James M. Van Nostrand

Commissioner
Cecile M. Fraser

Commissioner
Staci Rubin

Our Mission

- To ensure that **consumers' rights are protected**, and that utility companies are providing the most reliable service at the lowest possible cost while supporting equity and the Commonwealth's GHG reduction goals.

Safety

Security

Reliability of Service

Affordability

Equity

Greenhouse Gas Reduction

Introduction

MASSACHUSETTS
GREENHOUSE GAS REDUCTION GOALS

from 1990 baseline levels

33%	50%	75%	NET ZERO
BY 2025	BY 2030	BY 2045	BY 2050

DG Proceedings Update

SMART Phase II: D.P.U. 20-145

- Order to be issued in the near term

Net Metering Rulemaking: D.P.U. 21-100

- Implementing An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy
- Order issued February 15, 2024
- Compliance review
- Next substantive milestone: Tariff compliance approvals

CIPs: D.P.U. 22-51 to 22-55, 22-61, 22-170, 23-06, 23-09, 23-12

- Orders to be issued as soon as practicable

Investigation into Statutory Changes to the Single Parcel Rule: D.P.U. 23-20

- Next milestone: reply comment deadline May 24th

Forthcoming Net Metering Rulemaking: D.P.U. 23-140

- To implement An Act Driving Clean Energy and Offshore Wind
- Proceeding to commence as soon as practicable after the conclusion of interagency review

ESS Operational Parameters Proceedings

- Procedural schedule to be established in the very near term

ESMPs

- Hearings have concluded and we are in the briefing phase

Net Metering

Massachusetts Department of Public Utilities
May 3, 2024

Agenda

- What Is Net Metering
- How Net Metering Works
- Eligibility
- Compensation
- Credit Values
- Classifications
- Net Metering Caps
- Private vs. Public Facilities
- Cap Exemptions
- Single Parcel Rule and Subdivision Rule
- Recent Legislation and Rulemakings
- Net Metering vs. Qualifying Facilities

What Is Net Metering

- Net metering is a billing mechanism that allows customers to offset their energy use and transfer energy back to their electric companies in exchange for a credit on their electric bills.
  - E.g., solar panels on a home, wind turbine at a school

How Net Metering Works

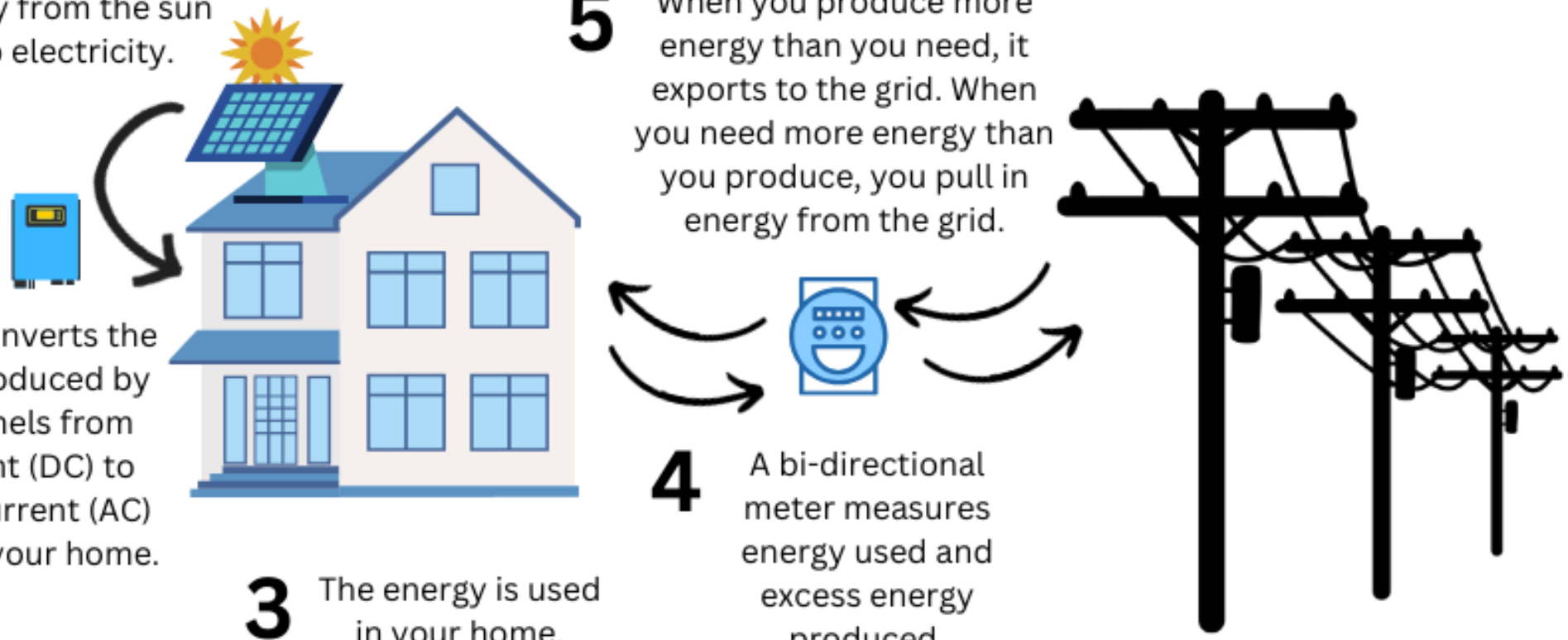
1 Solar panels convert energy from the sun into electricity.

2 An inverter converts the electricity produced by the solar panels from direct current (DC) to alternating current (AC) to be used in your home.

3 The energy is used in your home.

4 A bi-directional meter measures energy used and excess energy produced.

5 When you produce more energy than you need, it exports to the grid. When you need more energy than you produce, you pull in energy from the grid.

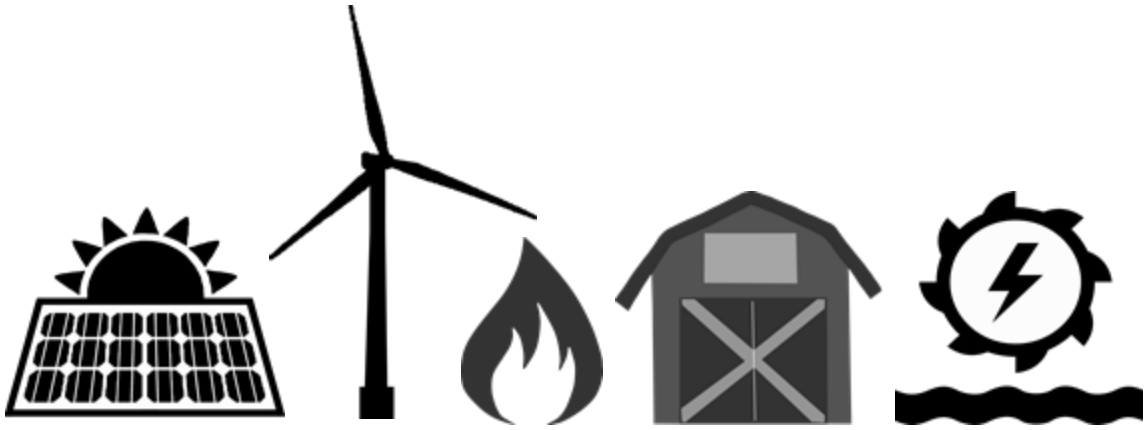


Eligibility

- To net meter, you must be a customer of Eversource, National Grid, or Unitil. In addition, your generating facility:
  - Must be interconnected by your electric company
  - Must meet all of your electric company's requirements before you interconnect
  - Must meet all of the rules and regulations
  - May need to apply for a cap allocation with the Massachusetts System of Assurance of Net Metering Eligibility (MassACA).
- Entities that cannot net meter include electric utilities, generation companies, aggregators, suppliers, energy marketers, energy brokers, or customers of a municipal electric company

Eligibility

- Eligible technologies:
  - Solar
  - Wind
  - Anaerobic digestion
  - Agricultural
  - Hydroelectric



- Other technologies are eligible for net metering as Class I facilities (less than 60 KW)

Net Metering Class

- A facility's net metering class is determined by the nameplate capacity of the facility.

Class Number	Size of Private Facility	Size of Public Facility
Class I	60 kW or less	60 kW or less
Class II	More than 60 kW but less than or equal to 1 MW	More than 60 kW but less than or equal to 1 MW
Class III	More than 1 MW but less than or equal to 2 MW	More than 1 MW but less than or equal to 10 MW

Net Metering Class Examples

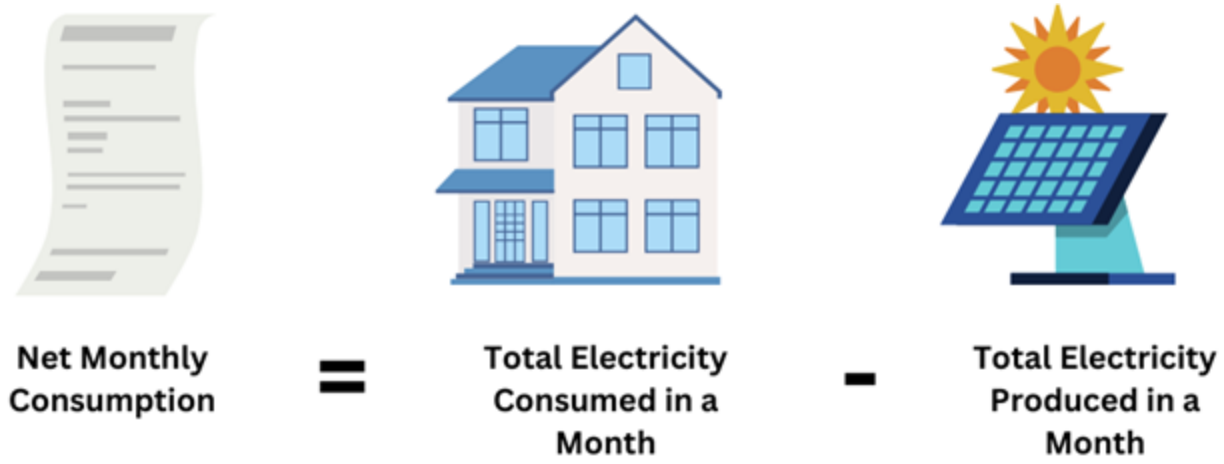
4 kW
Class I Facility

500 kW
Class II Facility

2 MW
Class III Facility

Compensation

- Customers who net meter are billed for their net consumption of energy.



- If your net consumption is **positive**, you must pay an electricity bill to your electric company for the excess consumption at the end of the billing period.
- If your net consumption is **negative**, you will not owe your electric company money during that billing period. You will receive a net metering credit on your electricity bill. These credits never expire and will rollover to the next billing period.

Credit Values

- Credits differ by class size, facility type, cap, and technology:
  - Credits for renewables are based on the sum of the EDC's core kWh charge components
    - Credits for certain solar facilities differ based upon when they applied for and were granted a cap allocation.
  - Credits for non-renewables are based on ISO-NE clearing prices.
  - Credits for small hydroelectric facilities are based on the basic service rate.
  - Cap Exempt Class II and Class III Facilities serving On-site Load will receive an annual cash-out or crediting of accrued Net Metering Credits at the Avoided Cost Rate.

Allocating Credits Via Schedule Z

- Schedule Z of the Interconnection Tariff allows host customers to assign net metering credits to other accounts.
- The host customer assigns a percentage of future credits to the other account(s).
- Host Customers may change Schedule Z up to 4 times per year.
- Previously allocation was only allowed within the same distribution service territory and ISO-NE load zone.
- The 2021 Climate Act, implemented through rulemaking D.P.U. 21-100, enables cross territory and cross load zone transfers for certain facilities.

Net Metering Caps

- Participation in the general net metering program is capped at a total amount of generation specific to each electric company service territory, based on the electric company's highest historical peak load.
- Cap allocations must be applied for and granted by MassACA.
- Small hydro net metering cap is 60 MW statewide.

Distribution Company	Private Cap (7%)	MW interconnected	Public Cap (8%)	MW interconnected
Eversource	408.24 MW	382.823 MW	466.56 MW	304.524 MW
National Grid	359.191 MW	358.724 MW	410.504 MW	405.252 MW
National Grid - Nantucket	4.069 MW	1.714 MW	4.650 MW	0.100 MW
Unitil	7.167 MW	6.998 MW	8.191 MW	8.180 MW

Last updated 5/3/2024

Private vs. Public Facilities

- Projects in the general net metering program default to the private cap.
- Only the DPU can classify participants as public entities. To receive this classification (a public ID number), a participant must electronically file an Application for Municipality or Other Government Entity with the DPU.
- To be in the public cap, facilities must:
  - Have a public entity as the host customer; and
  - Assign 100% of credits generated to itself or other public entities.
- Public entities are
  - Municipalities; or
  - Other Governmental Entities, such as:
    - State and federal agencies;
    - Other entities that demonstrate public character (e.g., housing authorities, regional school districts, water districts).
- Advantages of being in the public cap

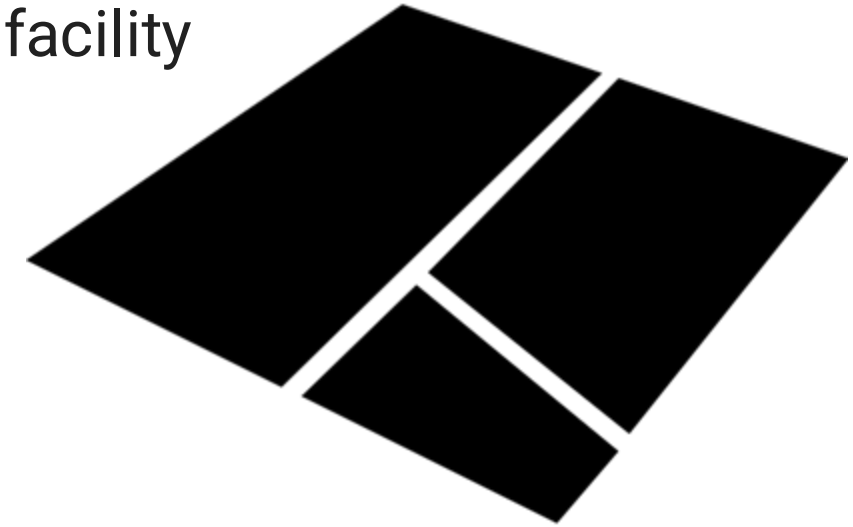
Cap Exemptions

- Cap exempt facilities are able to net meter, even if the relevant cap is full.
- The first type of cap exemption was created by statute in 2012 and was later expanded in 2021 and 2022.

Legislation	DPU Regulation/ Rulemaking	Eligible Facilities
An Act Relative to Competitively Priced Electricity in the Commonwealth (St. 2012, c. 209, § 30)	220 CMR 18.02	Renewable Class I ≤ 10 kW (single-phase) Renewable Class I ≤ 25 kW (3-phase)
An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy (“2021 Climate Act”) (St. 2021, c. 8, §§ 85)	D.P.U. 21-100	Renewable Class II and Class III that serve on-site load
An Act Driving Clean Energy and Offshore Wind (“2022 Clean Energy Act”) (St. 2022, c. 179, § 54)	D.P.U. 23-140	All Renewable Class I ≤ 25 kW Renewable Class I >25 kW that serve on-site load

Single Parcel Rule

- The Single Parcel Rule (SPR) defines a net metering facility as the energy generating equipment associated with:
  - A single parcel of land,
  - Interconnected with the electric distribution system at a single point,
  - Behind a single meter.
- A single parcel may only have one net metering facility



Single Parcel Rule Proceedings

D.P.U. 11-11-C

- Establishes definitions for the Single Parcel Rule.

D.P.U. 11-11-E

- Allows electric companies to grant exceptions to single interconnection points and single meter requirements on the basis of optimal interconnection.

D.P.U. 17-22-A

- Allows blanket exceptions for multiple technologies and rooftop cap exempt facilities.

D.P.U. 23-20

- Will implement exceptions created through the 2022 Clean Energy Act.

Subdivision Rule

- Established by D.P.U. 11-11-C.
- Net metering facilities cannot be installed on a parcel of land subdivided after January 1, 2010.
- To be granted an exception, you must petition the DPU and show that the subdivision was not for the purposes of net metering eligibility.
- In D.P.U. 23-20, the Department proposes to eliminate the Subdivision Rule, which the Department established in connection with the Single Parcel Rule.

Net Metering Rulemaking, D.P.U. 21-100

- Implemented provisions in the 2021 Climate Act.
- Allows Net Metering Facilities with a generating capacity of 60 kW or less (Class I Facilities) that belong to a Municipality or Other Governmental Entity to participate in the System of Assurance's public cap of the general Net Metering Program.
- Allows net metering credits for excess generation to be transferred to other accounts of any distribution company in the Commonwealth, as opposed to accounts only within a particular utility load zone.
- Creates a new type of cap exempt net metering facility by allowing Class II and Class III net metering facilities that serve On-site Load, with Interconnection Service Agreements executed on or after January 1, 2021, to participate in the net metering program without the need to obtain a cap allocation.
- Removes the Net Metering Recovery Surcharge (NMRS) from the calculation of Net Metering Credits.

Single Parcel Rule Investigation, D.P.U. 23-20

- Will implement provisions contained in the 2022 Clean Energy Act.
- Amends applicability of the Single Parcel Rule for solar net metering facilities.
  - 5 exceptions:
    - Government owned parcel
    - Additional facility not less than one year
    - Single rooftop separate customer
    - Separate and distinct rooftop
    - Low and moderate income housing
  - More than one solar net metering facility can be located on the same parcel of land if they meet the requirements and remain within the delineated aggregate capacity limit.
- The Department has issued a process proposal to implement these changes. Under the proposal, net metering customers wanting to utilize any SPR exception would do so through a self-certification process. The Department would have the ability to audit any Self-Certification Form.

Forthcoming Net Metering Rulemaking, D.P.U. 23-140

- Will implement additional provisions in 2022 Clean Energy Act.
- Increases the maximum nameplate capacity for Class I cap exempt facilities from 10 kW to 25 kW.
- Creates a new type of cap exempt net metering facility by allowing Class I net metering facilities greater than 25 kW that generate renewable energy and serve on-site load to participate in the net metering program without the need to obtain a cap allocation.

Qualifying Facilities

- Registering as a Qualifying Facility is an alternative option for metering DG from small power producers and cogenerators when the NM cap is full.

	Net Metering Facilities	Qualifying Facilities
Determining Excess Generation:	The netting of energy imports and exports happens on a monthly basis.	The netting of energy imports and exports happens on an hourly basis.
Compensation:	Any excess generation appears as a credit on the electric bill.	May choose to receive a check from the Distribution Company, or receive credits on their electric bill. - Facilities <1 MW are compensated based on the average monthly clearing price at ISO-NE - Facilities >1 MW are compensated based on the hourly price of electricity at ISO-NE
Primary Regulator:	Department of Public Utilities	Federal Energy Regulatory Commission (FERC)
DPU Regulations:	220 CMR 18.00	220 CMR 8.00 et seq.

Additional Resources

- Net metering guide
- Net metering homepage
- Net metering eligibility
- Net metering glossary
- Net metering laws and regulations
- Apply for a cap allocation with MassACA
- Apply for a public ID number
- Approved public entities
- View net metering filings and tariffs
- File a petition for a net metering exception
- Apply for a net metering blanket exception
- July 24, 2023 letter on DPU implementation of net metering laws

SMART Program

Massachusetts Department of Public Utilities
May 3, 2024

Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

Massachusetts Department of Energy Resources

SMART Program Overview

May 3, 2024

Program History

- Program development occurred 2016-2018 with economic analysis of revenue requirements for solar, stakeholder engagement and listening sessions, and public hearings
- Program began accepting applications in November 2018
- DOER conducted a review of the program in Fall 2019 to evaluate compensation rates, program costs, and any necessary revisions
  - Final revised regulations were filed in July 2020

Program History

- SMART I
  - Over 11,000 applications received – half of all program capacity reserved within first 4 months
  - Application rates of ~55 MW/month
- SMART II
  - Expanded total program capacity from 1600 MW to 3200 MW
  - Additional siting restrictions to discourage projects on undeveloped land with high conservation value
  - Required systems >500 kW AC to pair with energy storage
  - Established capacity set-asides for 25-500 kW, >500 kW, and Low-Income Community Shared Solar/Low-Income Property

Program Structure

- Program is funded by ratepayers of the three investor-owned electric distribution companies (EDCs) - Eversource, National Grid, Unitil

- Incentive payments are distributed by EDCs to system owners
  - Incentive rates are based on system size, system type (behind-the-meter vs. standalone), and system location

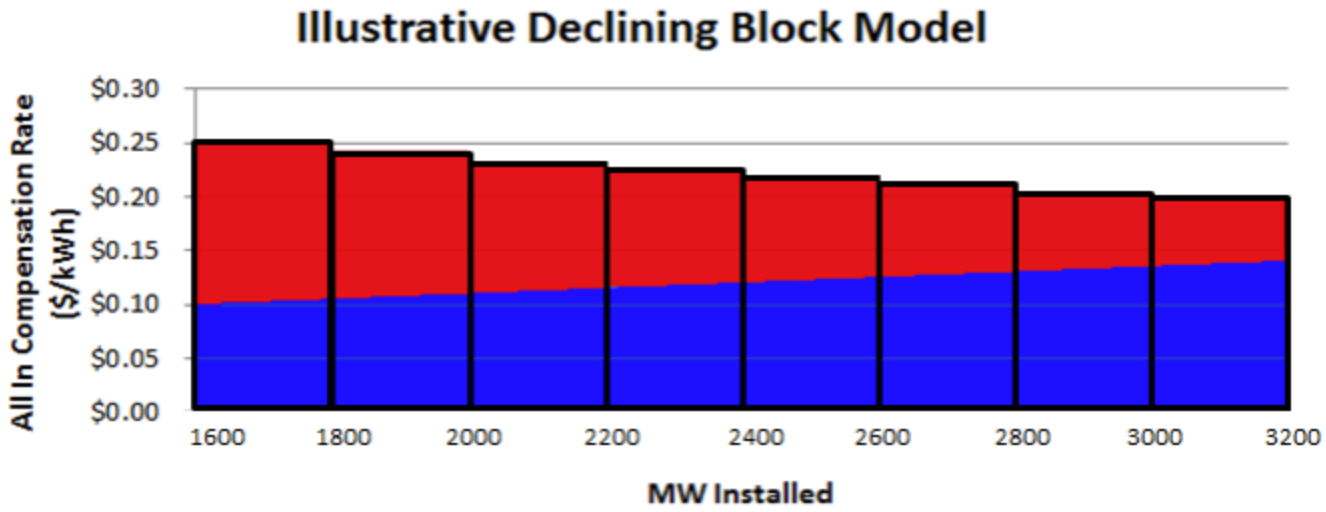
- Projects ≤25 kW are considered "small" and projects 25 kW – 5 MW are considered "large"
  - Small projects have a 10-year incentive term
  - Large projects have a 20-year incentive term

- DOER has established SMART as a 3200 MW program
  - ~1200 MW currently operational

Program Structure

- **DOER**: Enforces SMART regulations and guidelines, provides final project approvals, provides guidance to program participants
- **DPU**: Oversees EDCs and approves changes to SMART tariffs
- **EDCs**: Distribute incentive payments to system owners
- **CLEAResult**: Program Administrator that processes applications, provides guidance to program participants
- **Solar developers**: Submit applications on behalf of customers or projects, build projects, ensure projects comply with regulations

Program Structure



- Provides long-term revenue certainty through the fixed 10- or 20-year tariff term
- Assumes that the costs of developing solar will steadily decline

Program Structure

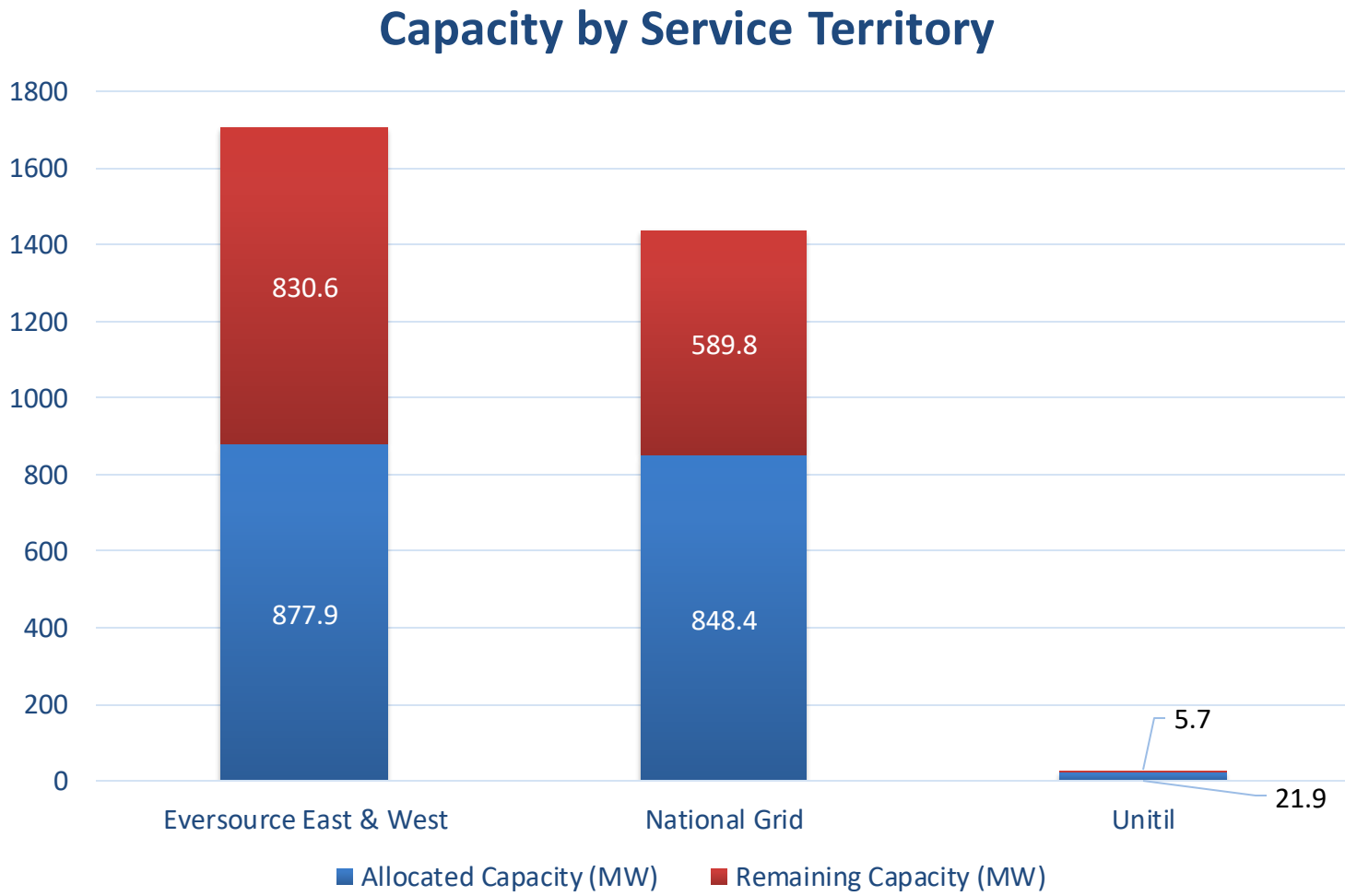
- Interconnection Types
  - Behind the Meter – electricity consumed on-site
  - Standalone – electricity distributed offsite
- Compensation Types
  - Net Metering – on-bill credits for net excess electricity generated by a facility
  - Qualifying Facility – sale of electricity from facility to EDC as governed by 220 CMR 8.00
  - Alternative On-bill Credits – bill credits for generation specific to SMART, an alternative to net metering

Program Structure

- Large projects are eligible to receive “adders” on their compensation rate for meeting additional policy goals

Unit Type	Adder Value ($/kWh)
Building Mounted	$0.02
Floating	$0.03
Brownfield	$0.03
Landfill	$0.04
Canopy	$0.06
Agricultural	$0.06
Community Shared	$0.05
Low Income Community Shared	$0.06
Low Income Property	$0.03
Public Entity	$0.04
Solar Tracking	$0.01
Energy Storage	Variable

Program Statistics



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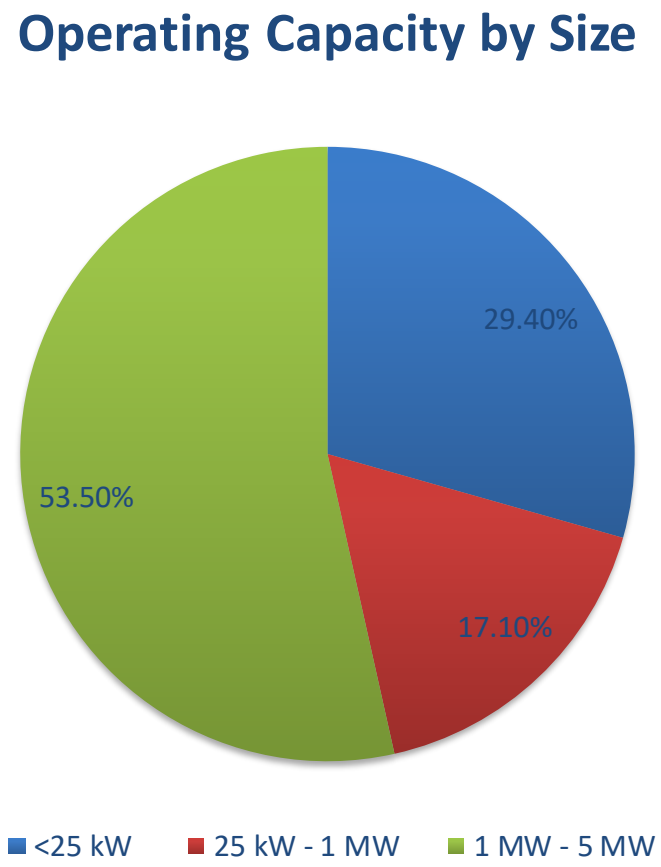

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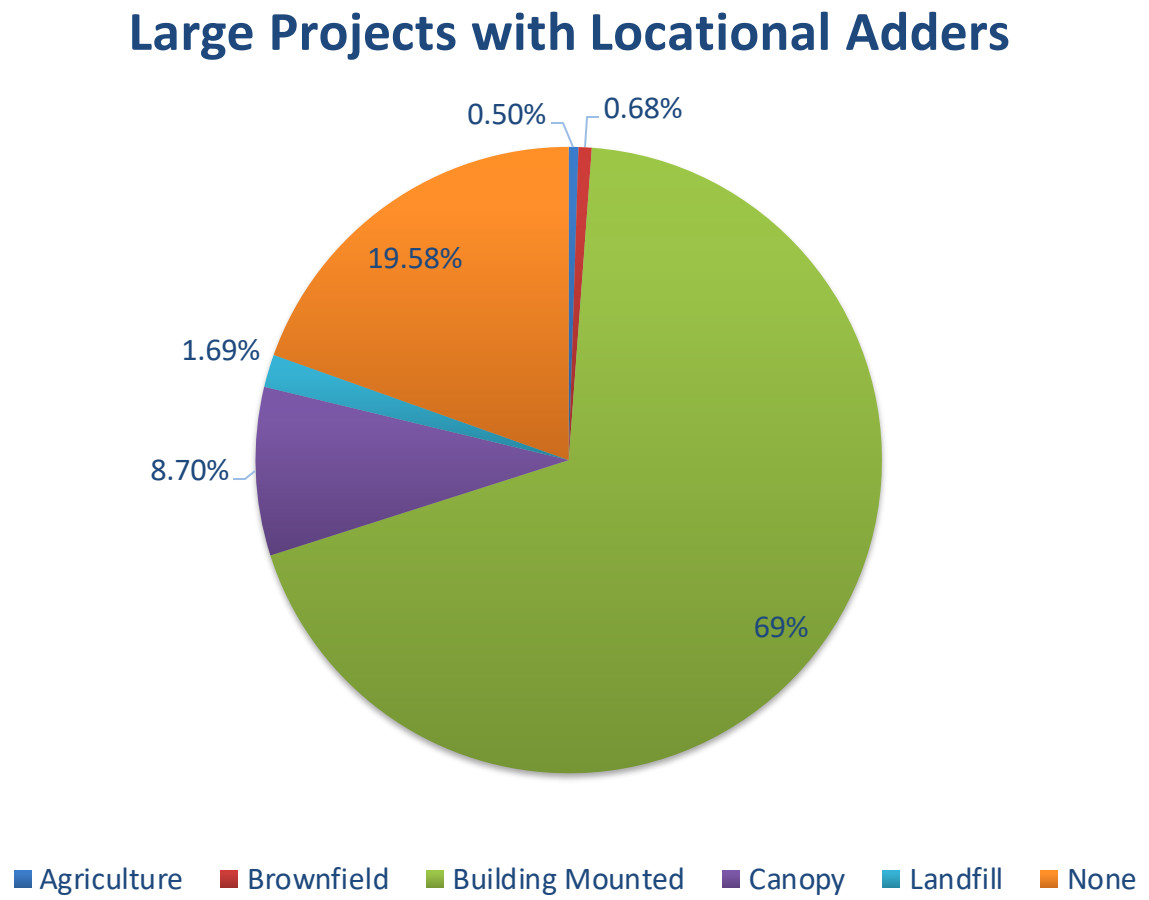

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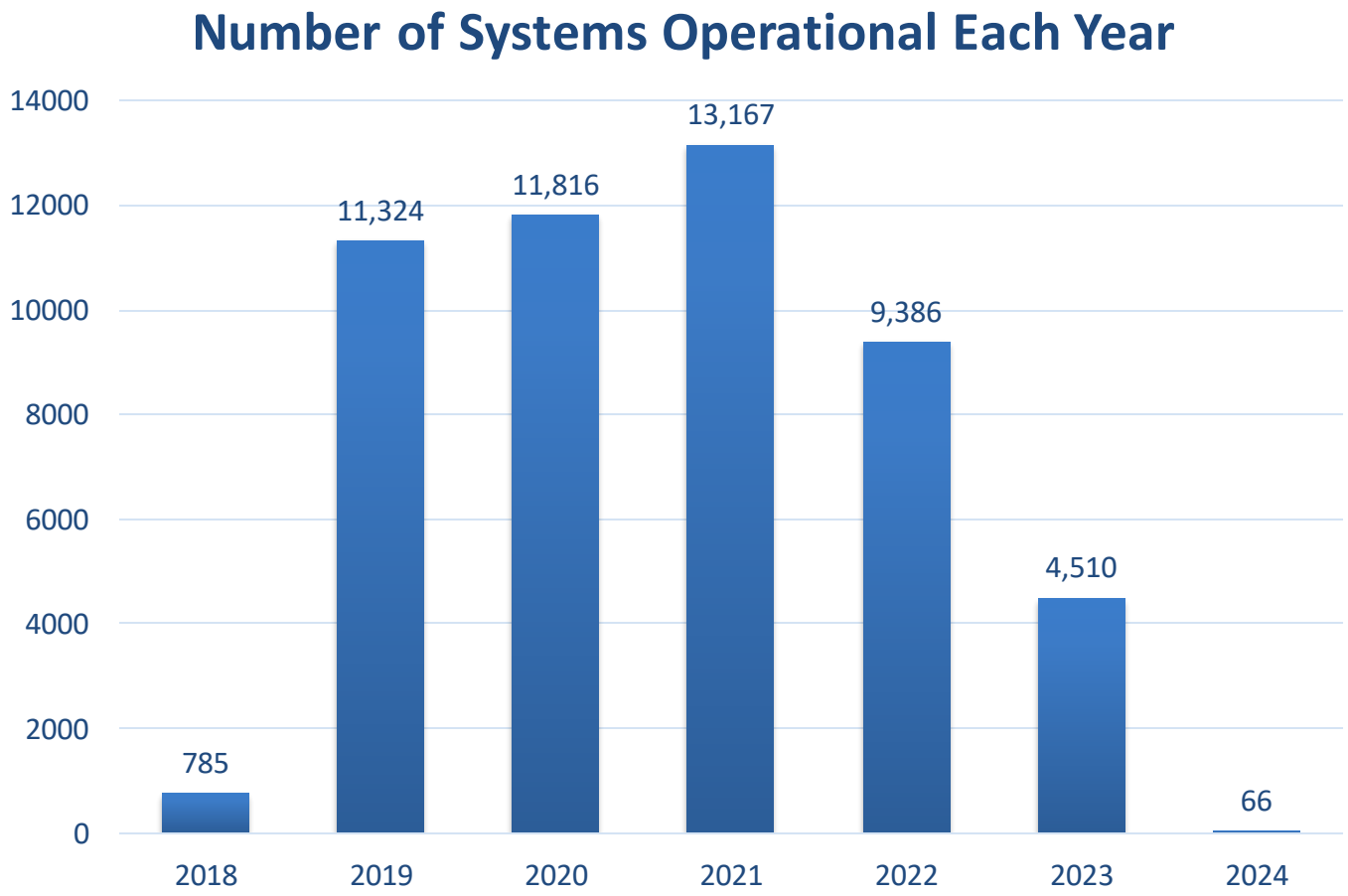


Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

DOER
Massachusetts Department of Energy Resources

Ways for Residents to Participate

- **Direct Ownership**
  - Customer receives SMART incentive on utility bill for 10 years
  - System offsets previous electricity usage
- **Third-party Ownership/Power Purchase Agreement**
  - Third-party system owner receives SMART incentive
  - System offsets previous electricity usage, and customer purchases power from system owner at a reduced rate
- **Community Solar**
  - Project developer receives SMART incentive
  - Customer signs up as an “offtaker” for a percentage of the system’s production
  - Customer purchases bill credits from the community solar provider, which are applied to their utility bill

Recent Developments

- Due to unexpected disruptions to the solar market and the Commonwealth's ambitious policy targets for solar deployment, DOER identified the need to conduct another review of the program to improve outcomes

- DOER engaged Sustainable Energy Advantage, LLC to perform an analysis of solar costs and needed incentive levels across sectors from 2025-2030

- Collected written stakeholder comments in January to a series of questions about program elements and potential improvements

- Hosted a series of stakeholder meetings in March to gather input on current challenges and barriers and desired changes to the program

- On April 22nd, DOER received an award notice of $156 million in federal funding under the Solar For All program
  - These projects are expected to participate in SMART and the additional funds will enable deeper benefits to low-income residents

Guiding Principles

Equity	Prioritizing historically underserved populations and those disproportionally affected by climate change.
Consumer Protection	Ensuring the value and benefits of the SMART program are being passed onto program participants.
Transparency	Creating accessibility to program data to ensure implementation is consistent and just.
Coordination	Ensuring the SMART program is in harmony with existing policy.
Simplicity	Reducing burdensome requirements to participate.

Stakeholder Input

- Incentivize projects on the built environment, limit greenfield development, and align program with other Administration policies and plans on land protection
- Build in more flexibility to the incentive structure so rates can be revised more frequently and stay aligned with market conditions
- Expand eligibility for projects serving low-income customers and increase consumer protection measures
- Provide more educational materials for residents and municipalities

Major Themes for Review

- Program structure
  - Base compensation rates
  - Adder values
  - Block structure and capacity
- Community solar
  - Consumer protection and transparency
  - Customer savings
  - Low-income participation
- Land use and siting
  - Greenfield solar development
  - Solar on the built environment
  - Alignment with Administration policies on land protection
- Low-income participation and equity
  - Customer savings and benefits
  - Consumer education and transparency
  - Reducing barriers to entry

Upcoming Engagement Opportunities

- **Summer 2024**: Feedback on Straw Proposal
- **Fall 2024**: Feedback on revised regulations

Additional Resources

- **SMART Website**: https://www.mass.gov/info-details/solar-massachusetts-renewable-target-smart-program
- **SMART Programmatic Review**: https://www.mass.gov/info-details/smart-programmatic-review
- **MassCEC Solar Resources**: https://goclean.masscec.com/clean-energy-solutions/solar-electricity/
- **DOER Email List Sign-up**: https://www.mass.gov/forms/subscribe-to-doer-email-lists
- **SMART Filings and Tariffs:** https://www.mass.gov/info-details/smart-filings-and-tariffs

Q&A

Break


DEPARTMENT OF PUBLIC UTILITIES
SIGILLUM REIPUBLICÆ
COMMONWEALTH OF MASSACHUSETTS
ENSE PETIT PLACIDAM SVB LIBERTATE QVIETEM

Interconnection

Massachusetts Department of Public Utilities
May 3, 2024

Outline

- Terminology
- Evolution of the Electric Power Grid
- Massachusetts DG Growth
- Interconnection Process
- Interconnection Rulemakings
- Interconnection Challenges
- Cost Allocation
- Provisional Program
- Electric Sector Modernization Plans
- Working Groups

Terminology

Power = Voltage x Current

- Measures the instantaneous draw of electric load, or the output capacity of a generator
  - Watt (W)
  - Kilowatt (kW)
  - Megawatt (MW)
  - Gigawatt (GW)

Energy = Power x Time

- Measures the sustained amount of power delivered over a period of time
  - Kilowatt-hour (kWh)
  - Megawatt-hour (MWh)

Terminology

- **Distributed Generation (DG)**: Any electricity generating technology that is connected a the distribution system level of the electric grid.
- **Distributed Energy Resources (DER)**: Small-scale energy resources, including distributed generation and energy storage systems, that are connected to the distribution system level of the electric grid.
- **Interconnection**: The process for integrating distributed generation into the electric distribution system.
- **Electric Distribution System (EDS)**: The system owned, controlled, or operated by an electric distribution company, used to provide electricity to its customers.
- **Electric Distribution Company (EDC):** An electric utility entity that distributes electricity to customers **(**Eversource, Unitil, National Grid).

Evolution of the Electric Power Grid

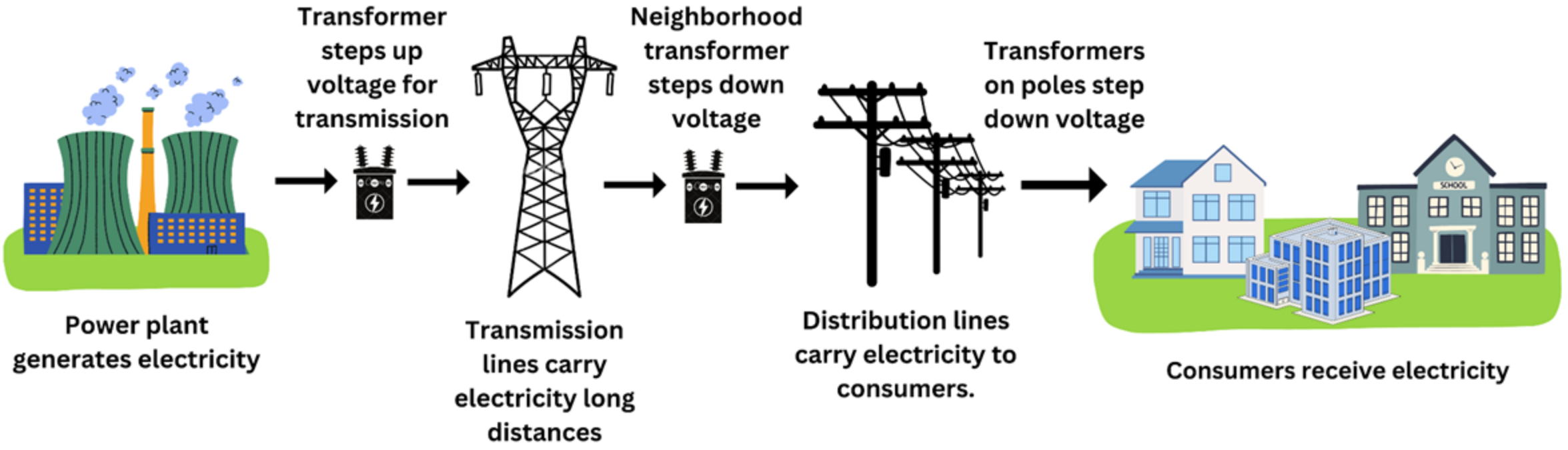
Traditional Power Grid

- Centralized generation from a few large sources
- One-way flow of electricity
- Limited resilience
- Lack of flexibility

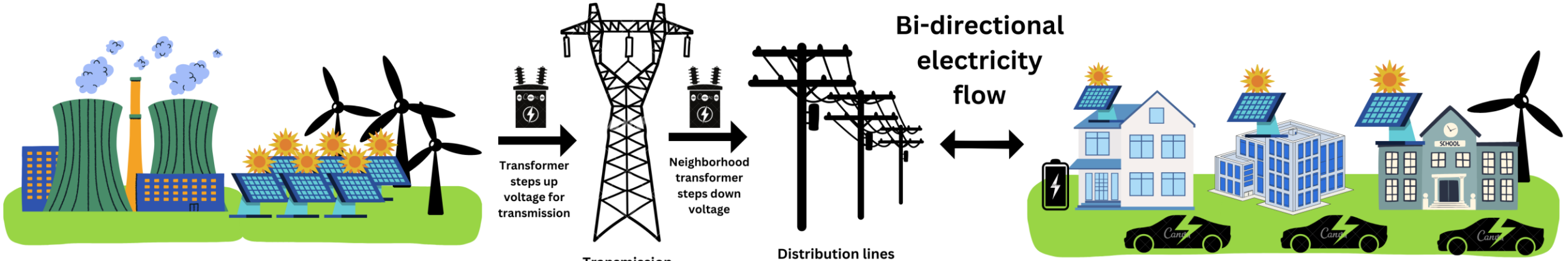
Evolving Power Grid

- Distributed generation from many smaller sources
- Bi-directional flow of electricity
- Enhanced resilience
- Increased flexibility

Traditional Power System



Evolving Power System



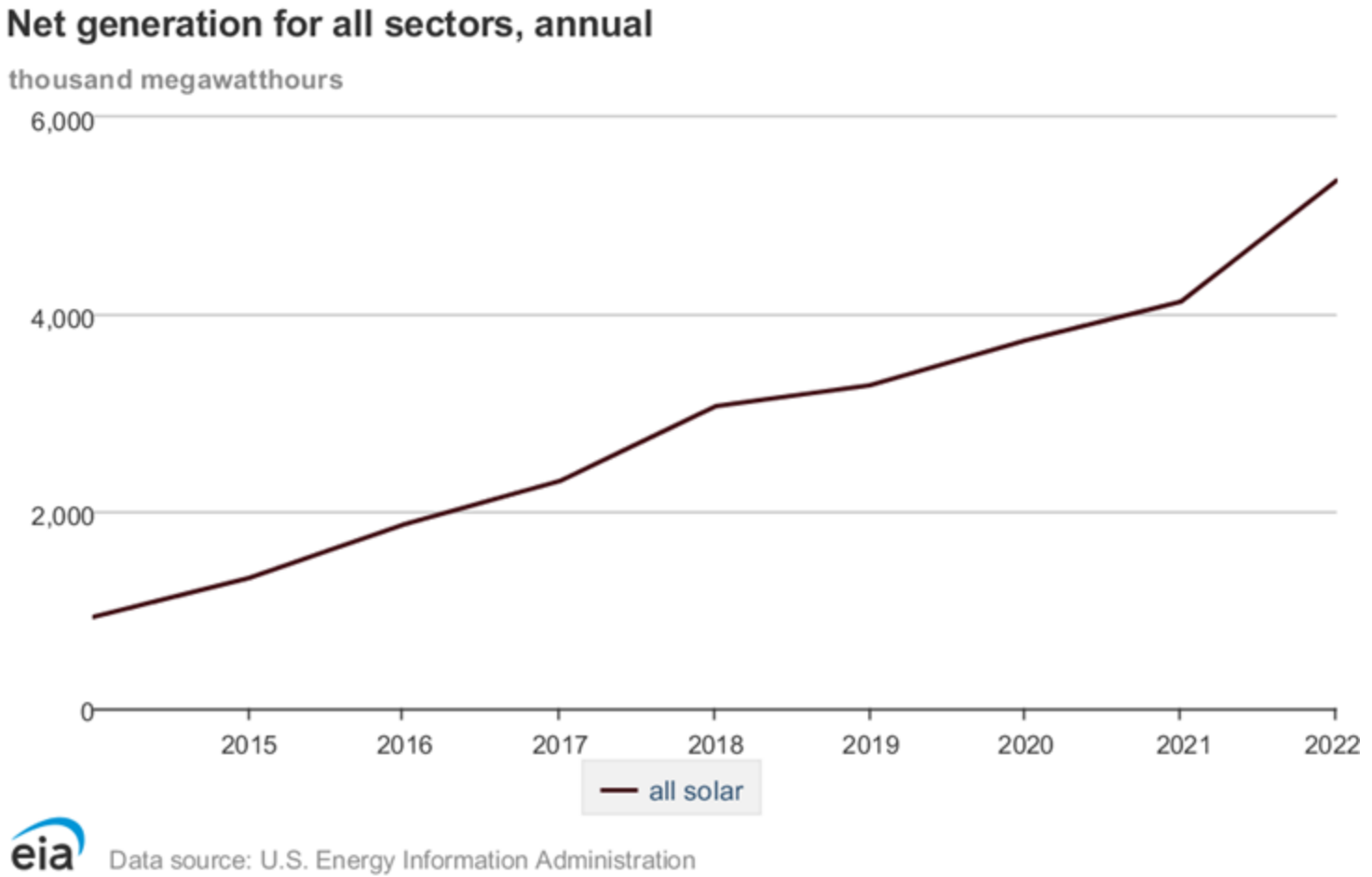
More renewable energy is used for power generation

Transmission lines carry electricity long distances

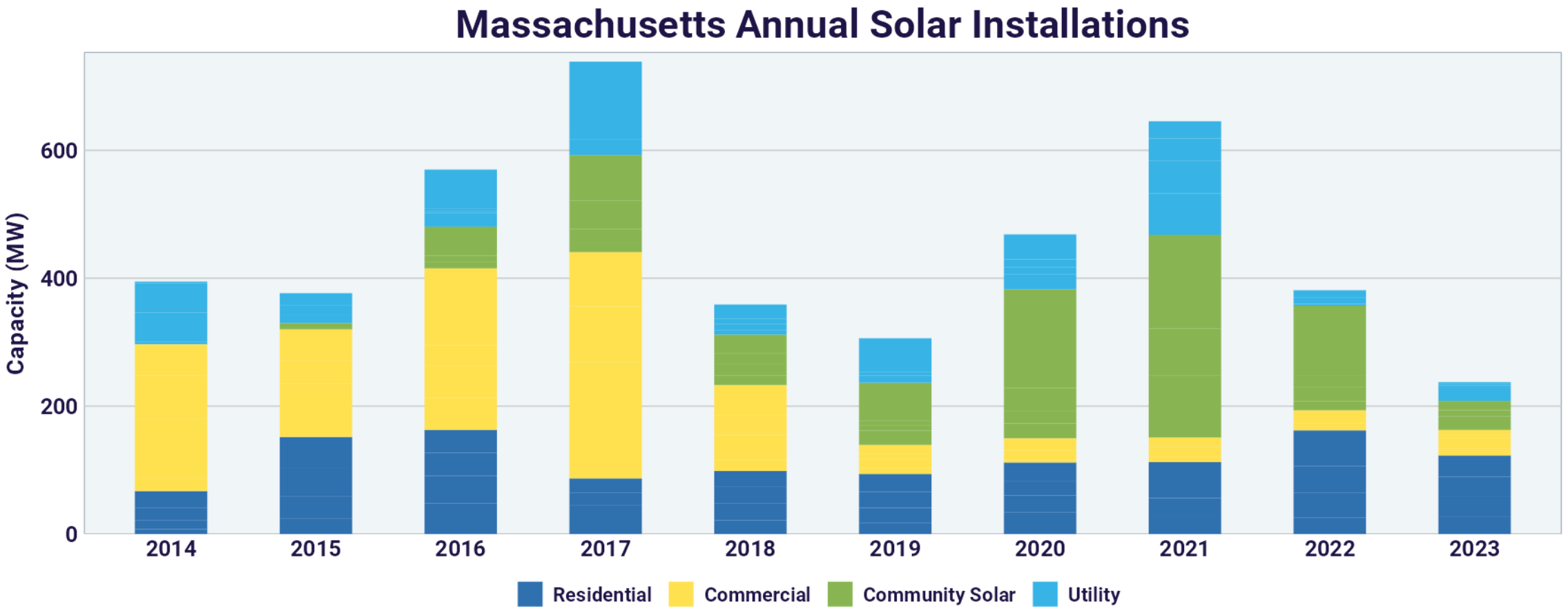
Distribution lines carry electricity to consumers.

DERs (including DG and Energy Storage) generate power at or near their point of consumption

Massachusetts Solar Growth



Massachusetts Solar Growth



Source: Solar Energy Industries Association

Interconnection Process

- Customers proposing to interconnect a DG facility must follow the interconnection process pursuant to that EDC's DG Interconnection Tariff.

Pre-Application

- The interconnecting customer reviews their EDC's interconnection tariff and determines which review process to apply to (simplified, expedited, or standard) based on the project's generation type and size, customer load, and the characteristics of the grid where the facility is located.

Application

- The interconnecting customer submits an application and fee to the local EDC. When an interconnection request is complete, the EDC assigns it a queue position.

Review

- The EDC reviews the application and conducts engineering studies to determine how the facility will affect the EPS, whether distribution system upgrades are necessary for interconnection, and how much they would cost.

Agreement

- The EDC provides the interconnecting customer with an Interconnection Service Agreement (ISA), which includes interconnection cost estimates +/- 25%.

Interconnection History

DPU 11-75

- Reviewed the existing DG interconnection standards and application procedure to determine what changes should be implemented to ensure an efficient and effective interconnection process.
- Established the Model DG Interconnection Tariff.

DPU 17-164

- Approved a group study provision as a permanent provision in the DG Interconnection Tariff.

DPU 19-55

- Opened an investigation into the interconnection of DG, specifying 5 initial topics:
  - Interconnection of energy storage systems
  - Methods to manage high volume queues for DG interconnection
  - Process related to affected system operator studies conducted during interconnection
  - Timeline enforcement mechanism
  - Interconnecting process for DG facilities interconnecting to the transmission system

DPU 20-75

- Opened an investigation into DER planning and assignment and recovery of costs for the interconnection of DG.
- Established the Provisional Program.

Interconnection Challenges

- Interconnection bottleneck
- Expensive interconnection upgrades
- Long interconnection queues
- Interconnection study delays
- Cost allocation

Cost Allocation

Cost Causation

Interconnecting customers are solely responsible for covering the costs of the distribution system upgrades necessitated by their proposed projects, even if those upgrades benefit future interconnecting customers.

Cost Sharing

Ratepayers initially pay the costs of the upgrade. Then, each DG facility that is able to interconnect due to the upgrade pays a pro rata share of the upgrade costs. Those payments are returned to ratepayers through a credit on their electric bills.

Provisional Program

- In D.P.U. 20-75-B, the DPU established a new, provisional framework for planning and funding essential upgrades to the EPS to foster timely and cost-effective development and interconnection of DG.
- Allows the EDCs to file **Capital Investment Projects** (CIPs) with the Department that limit the interconnection costs allocated to each DG facility enabled by a certain CIP. Ratepayers will help fund the initial construction of these EPS upgrades but will be reimbursed over time from fees charged to future DG facilities that are able to interconnect due to the prior upgrades.
- The DPU reviews each CIP on a case-by-case basis for approval, denial, or modification.
  - The DPU has received 11 CIP proposals, and issued its first Order approving a CIP proposal in December 2022.

Electric Sector Modernization Plans

- The 2022 Clean Energy Act requires the EDCs to each submit an Electric Sector Modernization Plan (ESMP) with the DPU once every 5 years.
  - Before the EDCs submit the ESMPs, the Grid Modernization Advisory Council (GMAC) must provide recommendations on the draft plans.
  - The first ESMP filings were filed on January 29, 2024. The DPU must approve, approve with modification, or reject each ESMP within 7 months of submission.

Electric Sector Modernization Plans (cont'd)

- ESMPs outline EDCs' plans to proactively upgrade their electric distribution system in order to:
  - Improve reliability
  - Enable renewable energy adoption
  - Promote energy storage
  - Prepare for climate impacts
  - Accommodate future demands
  - Minimize ratepayer impacts
- ESMPs include:
  - Summaries of proposed and related investments, alternatives, and financing approaches reviewed, under consideration, or approved by the DPU previously
  - Customer benefits for proposed investments and alternative financing approaches
  - 3 planning horizons for electric demand (5 years, 10 years, and through 2050)
  - A list of GMAC recommendations, with explanations on adoption, modification, or rejection.

Working Groups

Technical Standards Review Group (TSRG)

- Established by the DG Interconnection Working Group
- Meets quarterly to discuss the common and utility-specific DG interconnection technical standards and other topics related to DG interconnection
- Composed of 3 utility members, 3 non-utility members, and 1 ex-officio member.
- Interested stakeholders are encouraged to attend meetings.

Energy Storage Interconnection Review Group (ESIRG)

- Established under D.P.U. 19-55-E.
- Meets monthly to discuss energy storage topics related to interconnection and processes overseen by the DPU.
- Composed of utility members, non-utility members, and an Advisory Panel.
- Interested stakeholders are encouraged to attend meetings and join an electronic distribution list as non-members.

Interconnection Implementation Review Group (IIRG)

- Established under D.P.U. 19-55-F.
- Meets monthly to discuss issues related to the implementation of the DG interconnection process.
- Consists of utility members, non-utility members, and an Advisory Panel.
- Interested stakeholders are encouraged to attend meetings and join an electronic distribution list as non-members.

Additional Resources

Interconnection Data

- View interconnection activity
- Renewable energy snapshot

General Resources

- Provisional system planning program guide
- Interconnection dispute resolution guidance
- Distributed generation interconnection workshops
- MA technical standards review group
- Who to contact about my renewable energy question or concern
- Renewable energy incentives

Filings and Tariffs

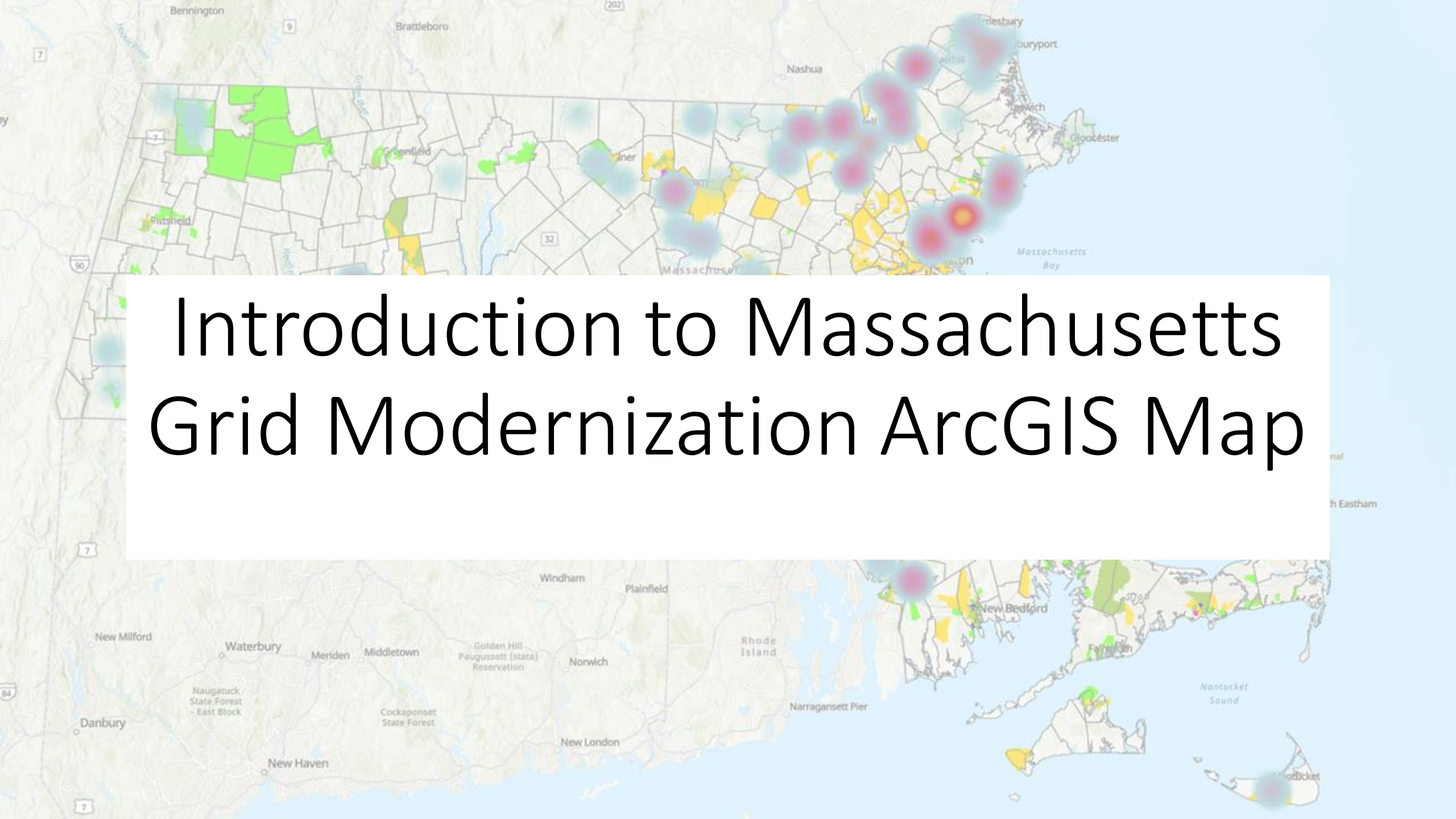
- Interconnection filings and tariffs
- SMART filings and tariffs

Utility Interconnection Webpages

- Eversource interconnection webpage
- National Grid interconnection webpage
- Unitil interconnection webpage

Grid Modernization Map

Massachusetts Department of Public Utilities
May 3, 2024



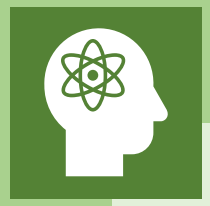
Introduction to Massachusetts Grid Modernization ArcGIS Map

Background

The objective of this project is to create a map that identifies grid modernization progress across the three electric distribution companies (“EDC”) within the state: Eversource, National Grid, and Unitil. The geographic coverage includes all municipalities within the Commonwealth of Massachusetts and the time period of the content spans from 2018 to 2022.

Overview

- Introduction
  - What is Grid Modernization?
  - Why Grid Modernization?
  - Grid Modernization in Massachusetts
  - Grid Modernization Hardware & Software
- Grid Modernization & You
  - Community Benefits
  - Environmental Justice
- Map Navigation and Details
  - Navigation Instructions
  - Base and Grid Modernization Data Layers



Introduction

- What is Grid Modernization?
- Why Grid Modernization?
- Grid Modernization in Massachusetts
- Grid Modernization Hardware & Software

What is Grid Modernization?

Grid modernization involves making necessary upgrades to electric grid infrastructure to meet current and future electricity demand. This effort materializes into a rigorous, interconnected system of controls, sensors, and innovative technology which are essential to enable a clean energy future.

The information above is based on US Department of Energy research related to the organization's Grid Modernization Initiative ("GMI"). For more information, please access https://www.energy.gov/gmi/grid-modernization-initiative.

Why Grid Modernization?

Increasing electricity demands coupled with **aging electric infrastructure** require grid modernization improvements to address the resulting strain on power grids.

In addition to **outage reduction** especially for critical industries, grid modernization provides innovative **energy usage insights**, combats **climate change**, and enables diverse consumer **energy options.**

Grid modernization will help **meet supply demands**, **prevent outages**, meet statewide and federal **clean energy goals**, and revolutionize **consumer participation.**

The information above is based on US Department of Energy research related to the organization's Grid Modernization Initiative ("GMI"). For more information, please access https://www.energy.gov/gmi/grid-modernization-initiative.

Grid Modernization in Massachusetts

D.P.U. 12-76

DPU established policies to encourage the EDCs to adopt grid modernization technologies and practices that:

- Enhance the reliability of electricity service
- Reduce electricity costs
- Empower customers to adopt new electricity technologies and better manage their use of electricity

D.P.U. 15-120/ 121/ 122

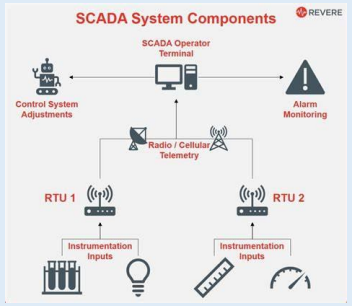
DPU order approving the first grid modernization plans in MA established objectives:

- Optimize system performance (by attaining optimal levels of grid visibility, command and control, and self-healing)
- Optimize system demand (by facilitating consumer price-responsiveness)
- Interconnect and integrate distributed energy resources

Dockets D.P.U. 21-80, D.P.U. 21-81, and D.P.U. 21-82: second grid modernization plans and first advanced metering infrastructure plans were approved in 2022

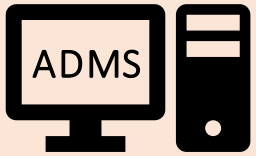
Grid Modernization Hardware & Software

Monitoring & Control ("SCADA")



Description: Supervisory Control and Data Acquisition (SCADA) systems are hardware and software components used for monitoring and controlling utility devices. SCADA enables remote and on-site gathering of data to remotely manage utility asset and processes.
Benefits: Remote monitoring and control, avoided equipment damage, labor cost savings, and reduced outage time

Advanced Distribution Management System ("ADMS")

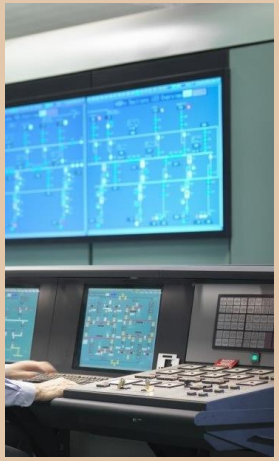


Description: ADMS is a decision support system including SCADA functionality as well as more advanced features for control room and field operators to maintain distribution management and optimization. ADMS provides energy companies and other energy utility providers with the tools to distribute, monitor, and manage their power grids.
Benefits: Demand management, energy loss prevention, operational efficiency, support for regulatory compliance

Volt-VAR Optimization ("VVO")

Description: VVO is a process for managing voltage levels and reactive power by reducing end-use energy consumption, peak demand, and system losses. VVO leverages an advanced function that determines the optimal set of control actions to achieve operations without violating fundamental operating constraints.
Benefits: Reduce costs, energy efficiency, reduced peak demand

Distribution Automation



Description: An integrated solution of field apparatus, devices, communications and software applications that utilities use to improve the operational efficiency of their distribution power system. Designed to optimize power grid efficiency and reliability, often related to fault location, isolation, and service restoration ("FLISR").
Benefits: Minimize customer outages, reduce costs, optimize distributed energy resources, extend asset lifespan

In addition to the grid modernization technology above, other grid modernization investments include advanced metering infrastructure (AMI) and distributed energy resource management system (DERMS)

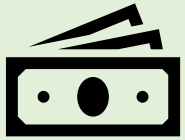
Grid Modernization & You

- Community Benefits
- Environmental Justice in Massachusetts

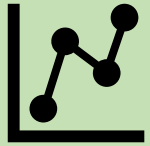
Community Benefits

Grid modernization transforms critical infrastructure, increases reliability, promotes affordability, updates security, and enhances resiliency. This is especially pertinent for critical industries as global energy demand increases.

Lower Energy Costs



Energy Usage Information



Fewer Power Outages

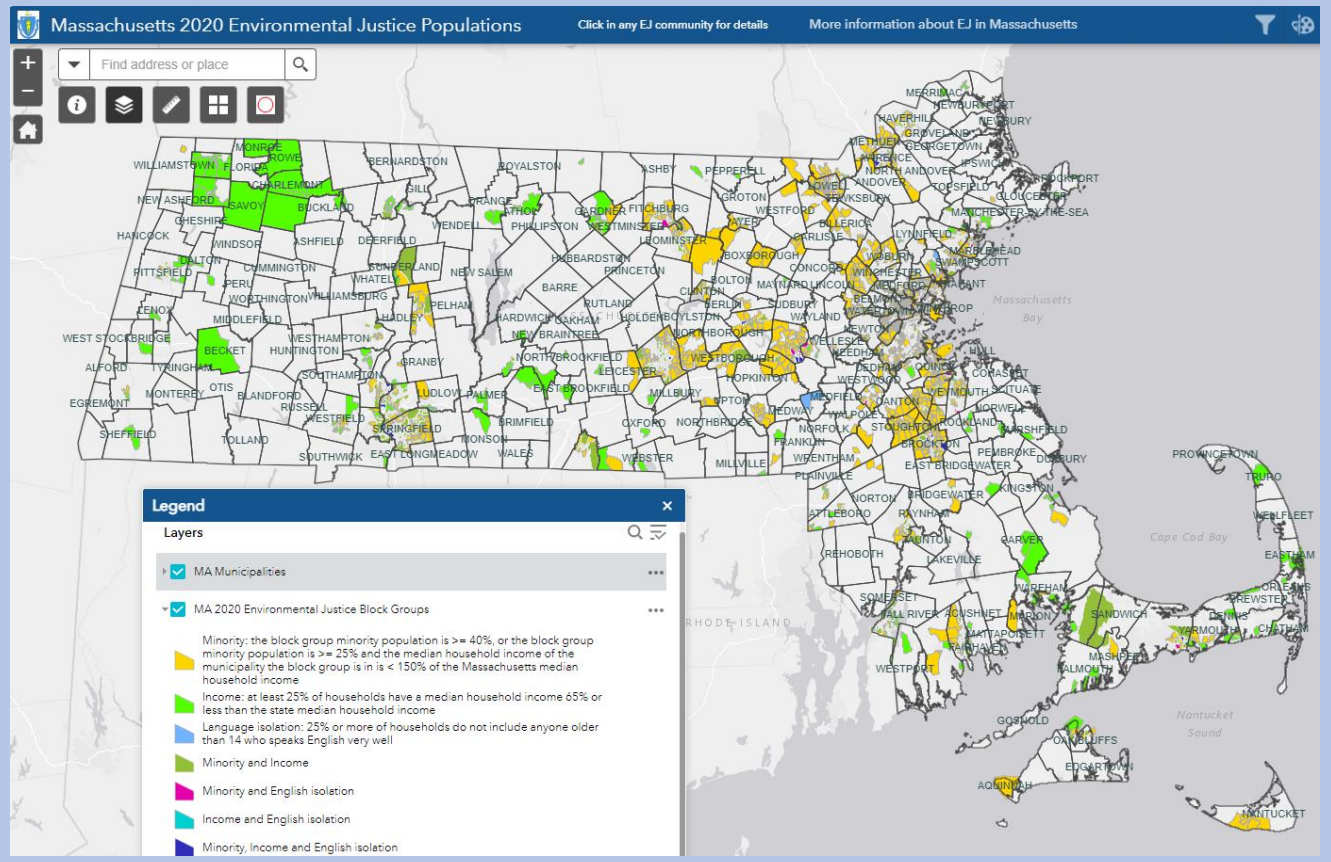
Reduced Outage Response Time

Resilient Cybersecurity

Increased Clean Energy Options

Environmental Justice in Massachusetts

The objective of this map is to show locations where grid modernization investments have been deployed, and how they overlap with environmental justice populations.



Massachusetts environmental justice populations satisfy one or more of the following criteria:

Annual median household income is 65% or less of the statewide annual median household income	Minorities make up 40% or more of the population
25% or more of households identify as speaking English less than "very well"	Minorities make up 25% or more of the population and the municipality's annual median household income does not exceed 150% of statewide annual median household income

This map is based on US Census Bureau data released in October 2021 and March 2022, and was updated on November 12, 2022. These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

Map Navigation and Details

- Navigation Instructions
- Base and Grid Modernization Data Layers

Map Details

The ArcGIS map and associated data layers are comprised of data extracted from the annual reports and term reports submitted by EDCs to Massachusetts Department of Public Utilities. These reports contain information on grid modernization investments for hardware and software technology including monitoring and control (SCADA), distribution automation, volt-var optimization, and advanced distribution management system. In addition to grid modernization investments, this map contains environmental justice populations to promote visibility into energy and environmental equity.

How to navigate this map

This map contains layers falling into two categories: base map data layers and grid modernization data layers. It is recommended to keep the selected default layers of "MA Municipalities" and "MA Environmental Justice" while toggling between the grid modernization data layers.

1 Read initial pop-up containing background information and instructions to navigate the map

Background

The objective of this map is to promote transparency of grid modernization progress across the three electric distribution companies (EDC) within the state: Eversource, National Grid, and Unitil. The geographic coverage includes all municipalities within the Commonwealth of Massachusetts and the time period of the content spans from 2018 to 2022.

Instructions

This map contains layers falling into two categories: base map layers and grid modernization data layers. It is recommended to keep the selected default layers of "MA Municipalities" and "MA Environmental Justice" while toggling between the grid modernization data layers.

Base Map Layers:

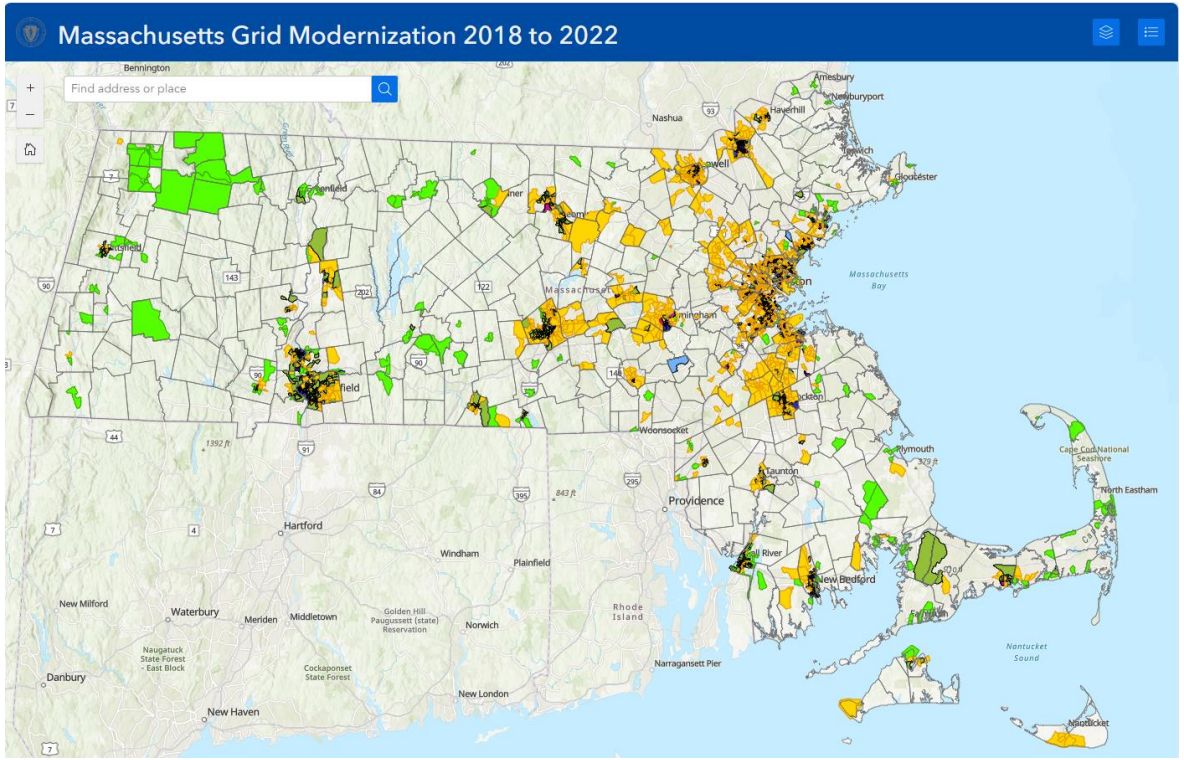
- MA Municipalities
- MA Environmental Justice
- Electricity Providers, by Town

Grid Modernization Layers:

- Substation Energy Savings - Actual VVO On Hours (MWh) 2021 - 2022
- Number of Feeders with Full Volt-VAR Optimization Capability (as of 2022)
- Monitoring & Control (SCADA) Devices (Deployed 2018 - 2022)
- Distribution Automation Devices (Deployed 2018 - 2022)
- Volt-VAR Optimization Devices (Deployed 2018 - 2022)
- Number of Feeders with Advanced Distribution Management System (Deployed 2018 - 2022)

☐ Don't show this again OK

2 Access ArcGIS map with default layers activated (i.e., Massachusetts municipalities, Massachusetts environmental justice populations

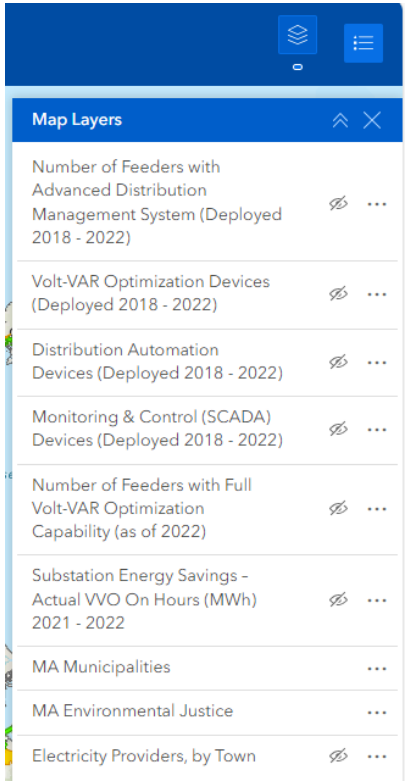


Please note that there is duplicate data from the [grid modernization reports] in this map between the annual and cumulative data layers for the aforementioned hardware and software technology.

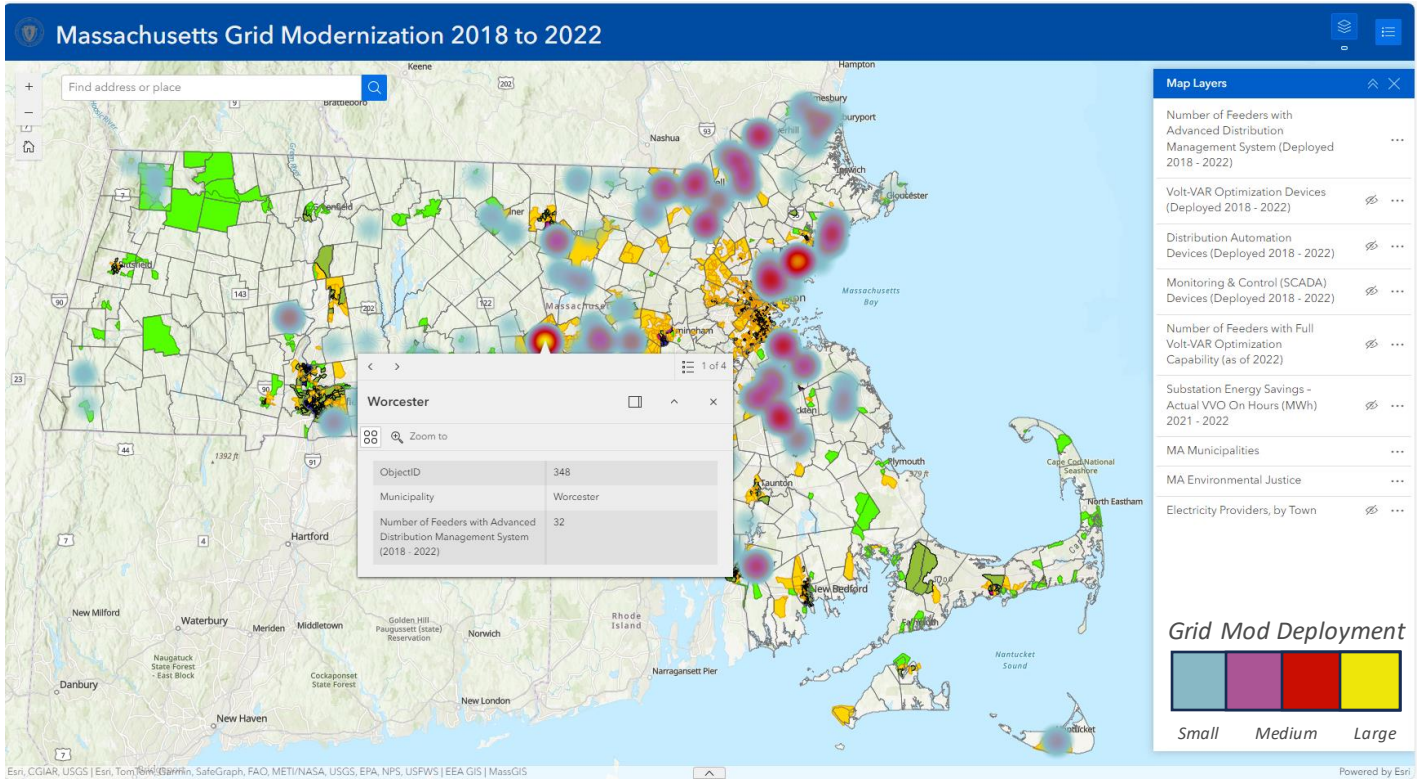
How to navigate this map

This map contains layers falling into two categories: base map data layers and grid modernization data layers. It is recommended to keep the selected default layers of "MA Municipalities" and "MA Environmental Justice" while toggling between the grid modernization data layers.

3 Toggle visibility icon to view deployment of different grid modernization technology



4 Adjust scope to desired granularity and select municipality heat dot to access information for each visible layer



Please note that there is duplicate data in this map between the annual and cumulative data layers for the aforementioned hardware and software technology.

Base Map Data Layers

Massachusetts Municipalities (Updated April 2022)
Linear boundaries of all 351 Massachusetts cities and towns based on the legislatively approved record of municipal boundaries and regularly updated by MassGIS as information becomes available

Massachusetts Environmental Justice (Updated November 2022)
Environmental Justice Population Data, based upon demographic criteria developed by the state's Executive Office of Energy and Environmental Affairs ("EEA")

Electricity Providers by Town (Updated November 2021)
Public electric utility providers for each Massachusetts municipality. The source of data was the Massachusetts Department of Public Utilities, September 2021

Grid Modernization Data Layers

Advanced Distribution Management System ("ADMS")

Data Range: 2018 – 2022
Units: Number of feeders enabled
Description: Number of Feeders with distribution management system enabled from 2018 – 2022
Devices: feeders that are installed with distribution management system

Distribution Automation Devices

Data Range: 2018 – 2022
Units: Number of devices
Description: Number of distribution automation devices deployed from 2018 – 2022
Devices: overhead distribution automation, overhead distribution automation with ties, feeder monitors, 4kV oil switch replacement, 4kV VFI retrofit

Monitoring & Control ("SCADA") Devices

Data Range: 2018 – 2022
Units: Number of devices
Description: Number of monitoring & control (SCADA) devices deployed from 2018 – 2022
Devices: microprocessor relay, 4kV circuit breaker SCADA, recloser SCADA, padmount switch SCADA, network protector SCADA, feeder monitors, power quality monitors

Full Volt-VAR Optimization ("VVO") Capability

Data Range: as of 2022
Units: Number of feeders enabled
Description: Number of Feeders with full volt-VAR optimization capability enabled from 2018 – 2022
Devices: feeders that are VVO-enabled with full remote control capability

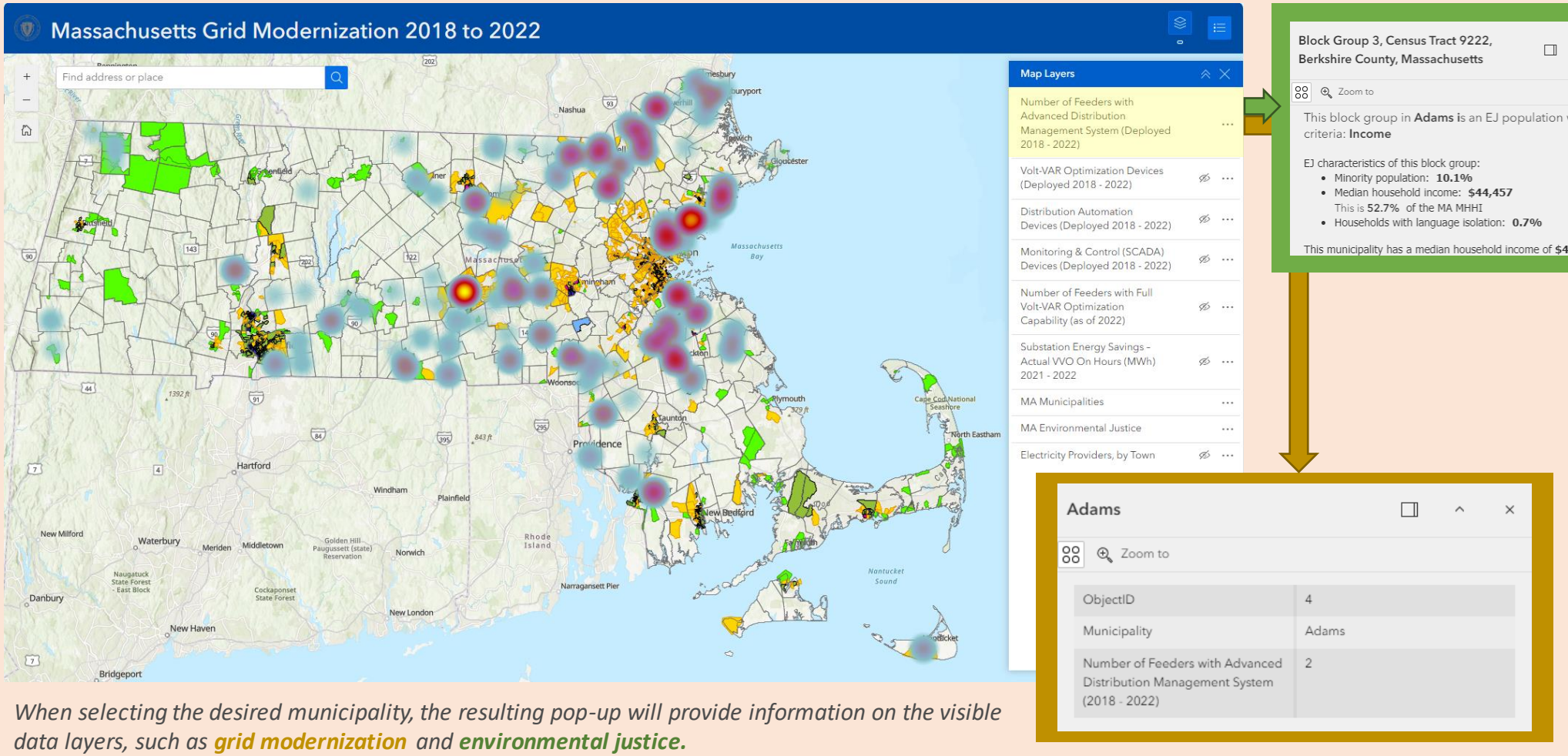
VVO

Data Range: 2018 – 2022
Units: Number of devices
Description: Number of volt-VAR optimization devices deployed from 2018 – 2022
Devices: VVO regulators, VVO capacitor banks, VVO LTC controls, VVO line sensors, micro-capacitors, grid monitoring line sensors

Substation Energy Savings (VVO)

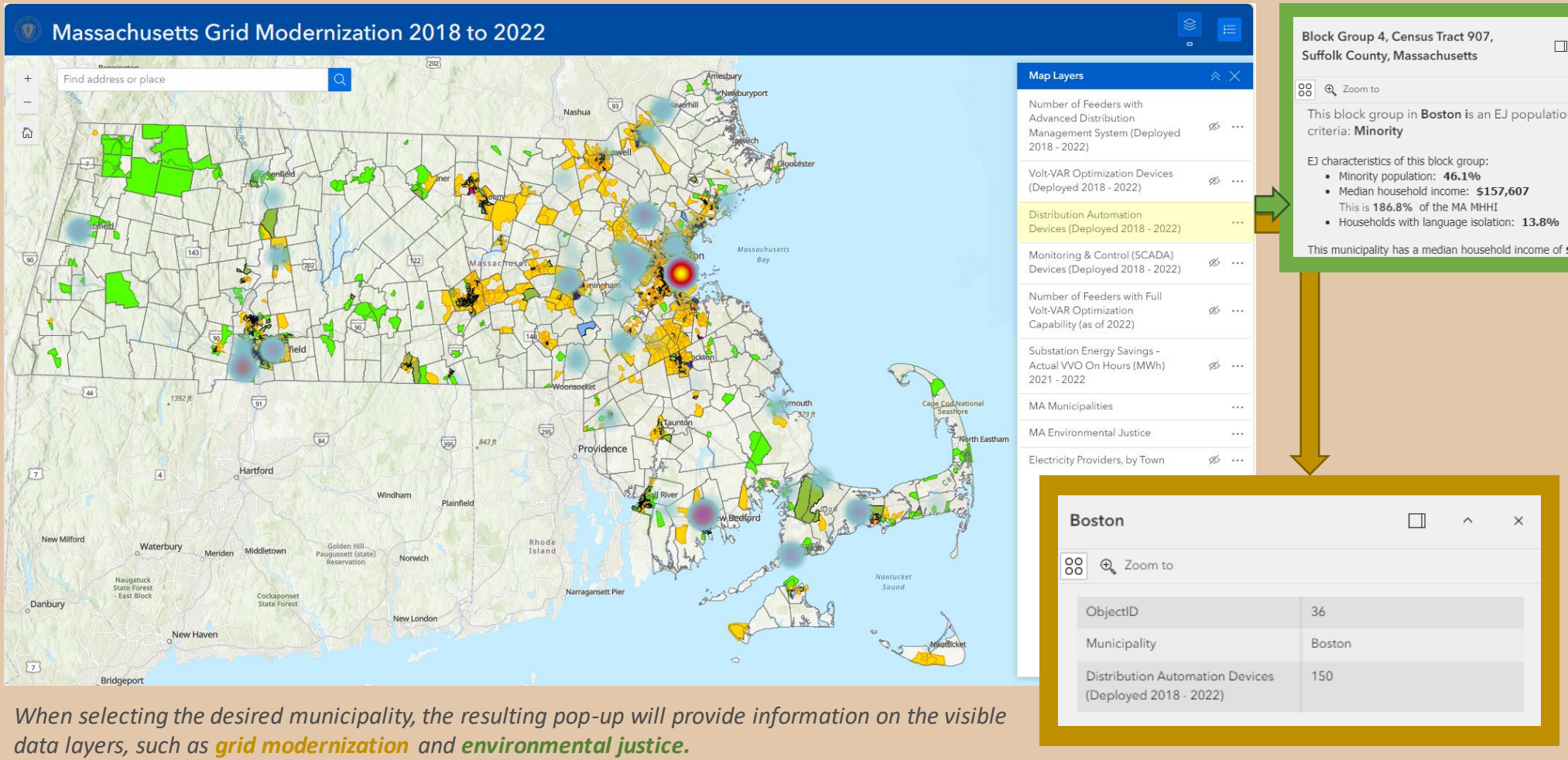
Data Range: 2021 – 2022
Units: Megawatt-Hour (MWh)
Description: Energy savings in MWh during volt-VAR optimization activated hours during winter of 2021 and spring of 2022
Devices: feeders monitored for energy savings data which was collected after 9 months' on-and-off VVO control testing

Data Layers: ADMS



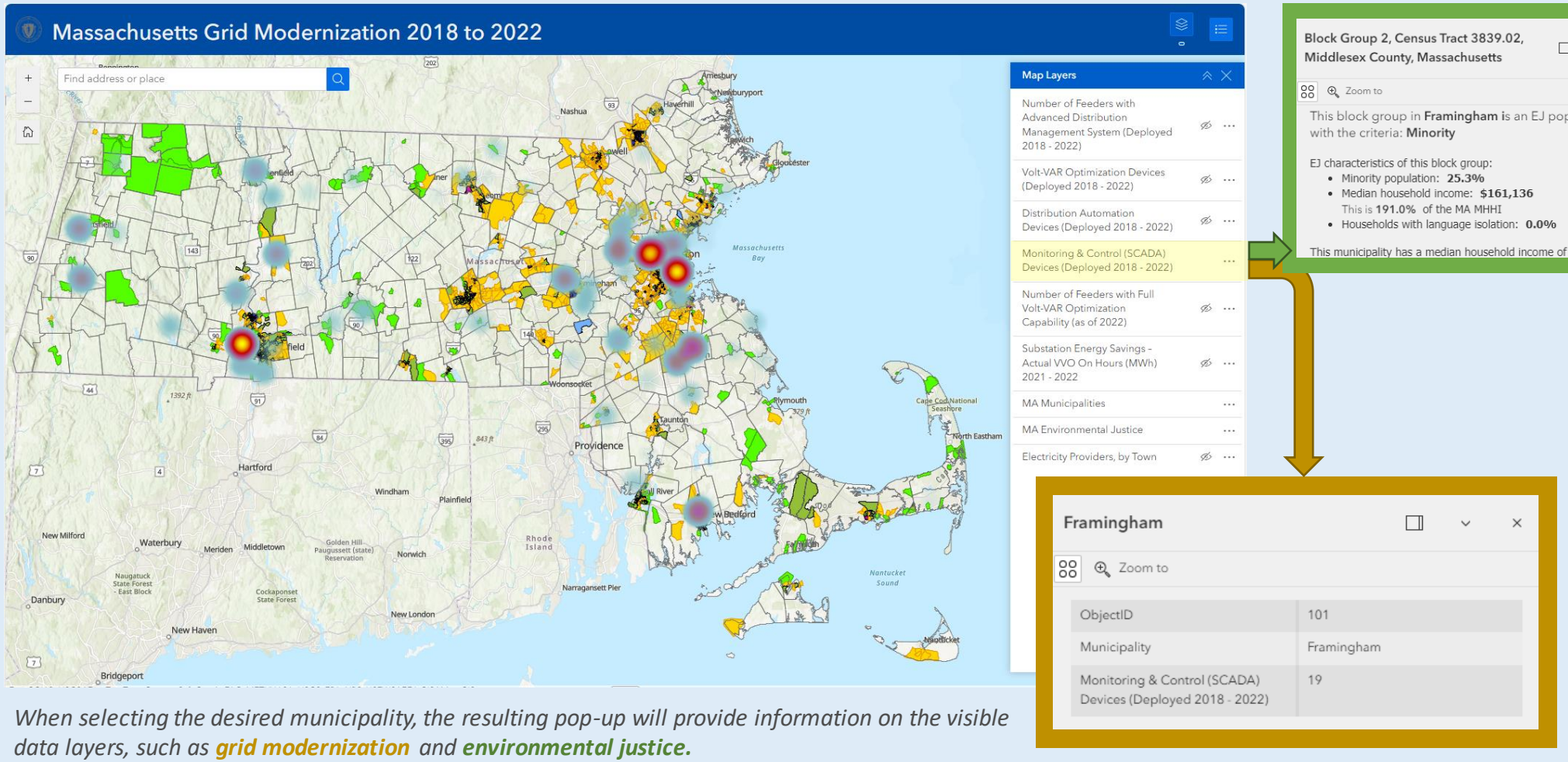
*When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as **grid modernization** and **environmental justice.***

Data Layers: Distribution Automation



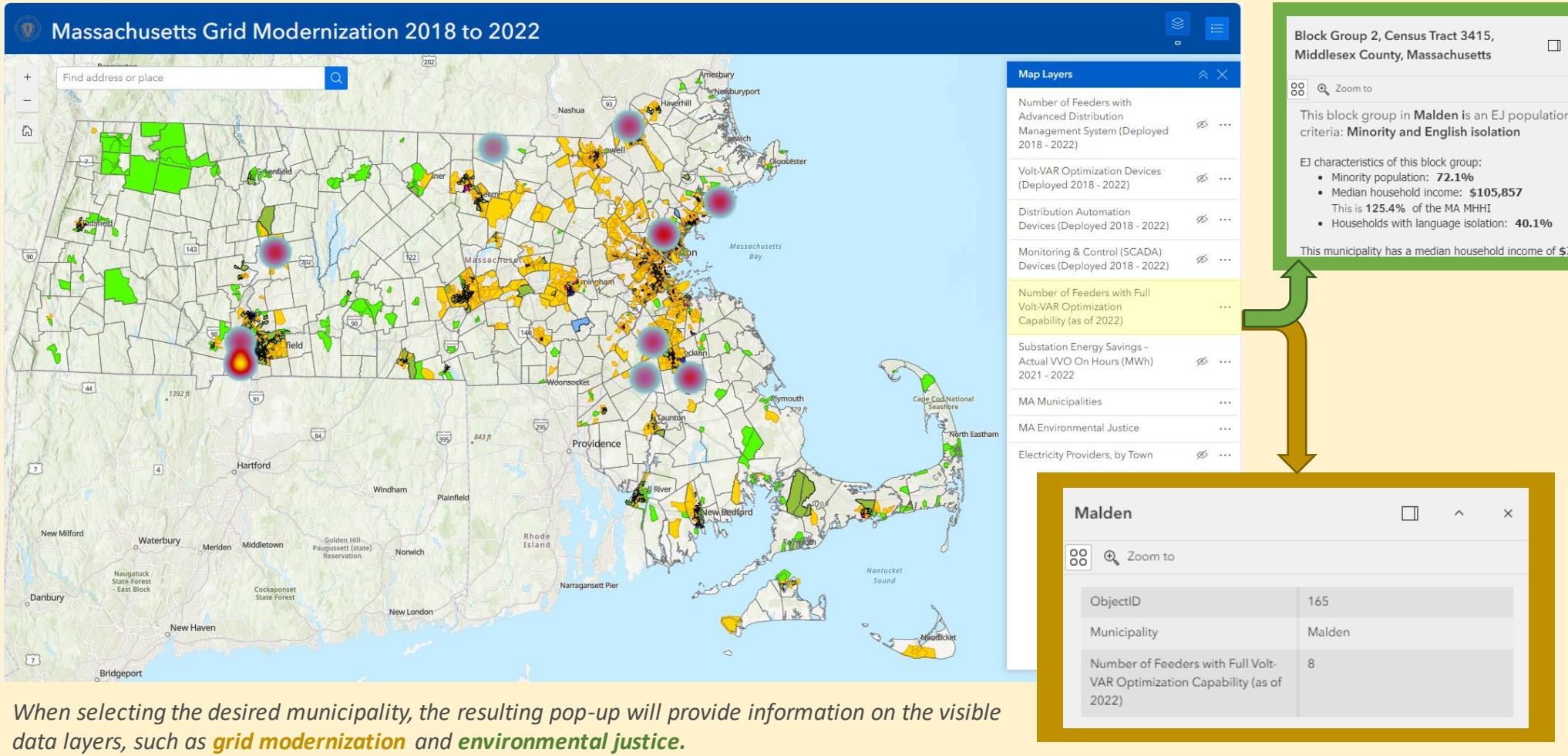
*When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as **grid modernization** and **environmental justice.***

Data Layers: Monitoring & Control (SCADA)



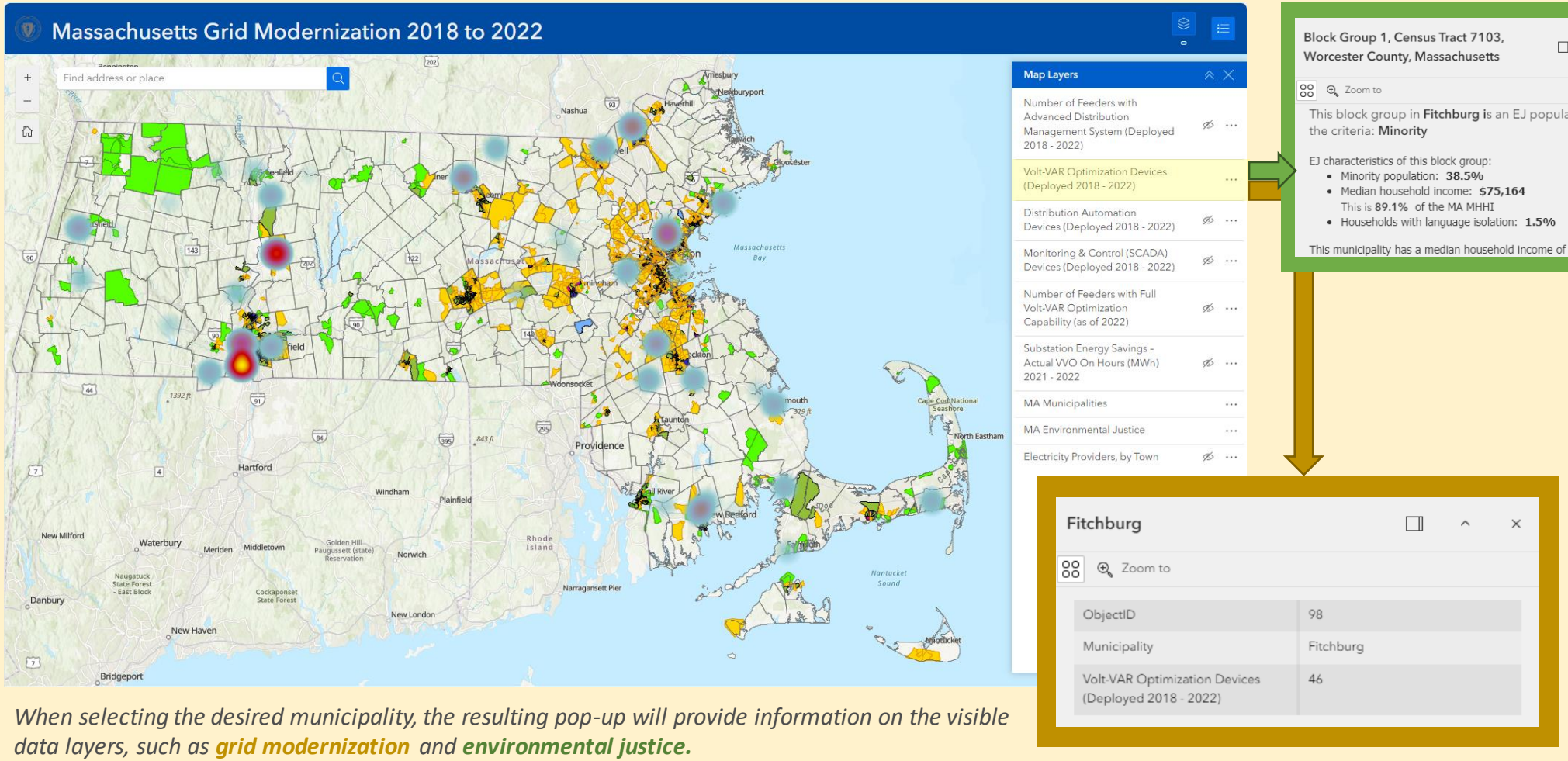
When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as ***grid modernization*** *and* ***environmental justice.***

Data Layers: VVO Capability



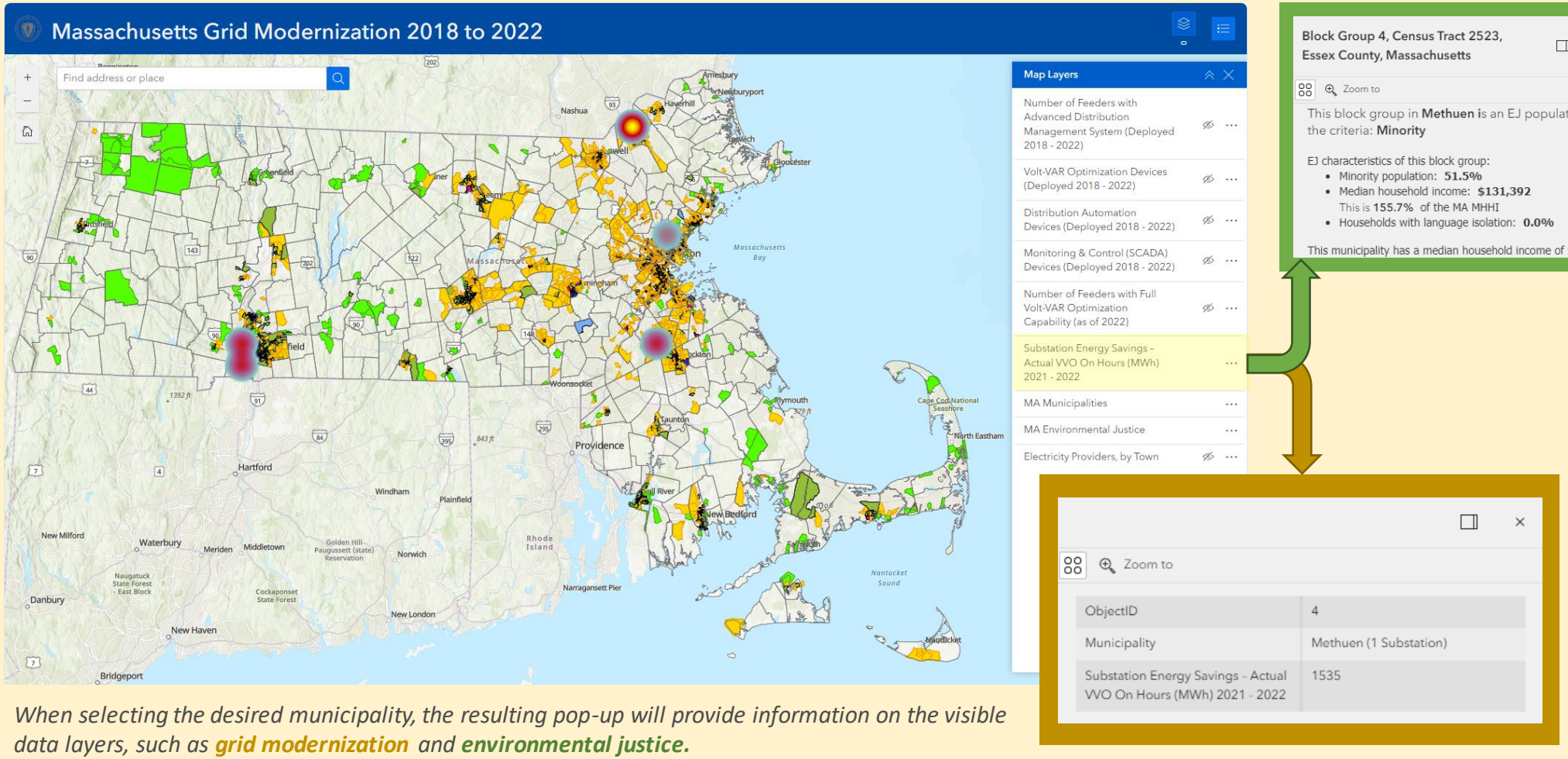
When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as ***grid modernization*** *and* ***environmental justice.***

Data Layers: VVO Devices



When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as ***grid modernization*** *and* ***environmental justice.***

Data Layers: Substation Energy Savings



*When selecting the desired municipality, the resulting pop-up will provide information on the visible data layers, such as **grid modernization** and **environmental justice.***

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Ombudsperson's Office

Massachusetts Department of Public Utilities
May 3, 2024

Agenda

- Who Are We
- History
- Role Overview
- Dispute Resolution Process
- Distributed Generation Group

Who Are We?

- **Katie Zilgme**, Distributed Generation and Clean Energy Ombudsperson
- **Robert Fitzpatrick**, Deputy Distributed Generation and Clean Energy Ombudsperson
- **Eva Stoller**, Department of Energy Clean Energy Innovator Fellow
- Contact: DPU.netmetering@mass.gov

History

2013
DPU 11-75-E

- Approved the creation of an Interconnection Ombudsperson role at the Massachusetts Department of Public Utilities ("DPU") on a trial basis for an interim of one year.

2014
DPU 11-75-F

- Made the Interconnection Ombudsperson a permanent position.

2020
DPU 19-55-A

- Expanded the role to become the Distributed Generation ("DG") and Clean Energy Ombudsperson ("Ombudsperson").

Role Overview

- Be easily accessible;
- Facilitate and review the Good Faith Negotiation process of parties involved in interconnection disputes;
- Conduct independent interviews and investigations as deemed necessary;
- Offer independent problem-solving assistance;
- Manage public inquiries and complaints;
- Maintain open communication with electric companies, stakeholders, and other government agencies, including enabling education and outreach;

Role Overview (cont'd)

- Oversee or advise on dockets, programs, and projects;
- Support the Commission and Division of Regional and Federal Affairs;
- Assist the Chief of Staff and Commission in addressing state consumer energy policies, updating state elected officials, explaining Department policies and practices, and providing information to support development of energy legislation and statutory reforms;
- Assist the Commission in the development of new policies or regulations

Dispute Resolution Process

- The Ombudsperson will assist you if you have a project-specific dispute pursuant to Section 9 of the Standards for Interconnection of Distributed Generation Tariff.
- You can start the dispute by submitting the dispute resolution online form.

Standards for Interconnection of Distributed Generation Tariff

- Interconnection Tariffs describe the process and requirements for an Interconnecting Customer to connect a power-generating facility to an electric companies' Electric Power System.
  - Eversource interconnection tariff
  - National Grid interconnection tariff
  - Unitil interconnection tariff

Dispute Resolution Process

Step 1 - Section 9.1:

Good Faith Negotiation

- Notify your Electric Distribution Company in writing that you are initiating Dispute Resolution. The dispute must then be elevated to a VP or Senior Manager
- File a Dispute Resolution with the Ombudsperson using the online form
- Ombudsperson will request a response from the EDC, due within 10 days
- Ombudsperson may schedule a conference call to gain more information and/or potentially resolve the dispute
- Ombudsperson may issue a proposed resolution

Dispute Resolution Process

Step 2 - Section 9.2:

Mediation/ Non-Binding Arbitration

- Ombudsperson will offer a list of qualified mediation neutrals
- Both parties may agree to use any neutral
- Mediation fee is split 50/50

Step 3 - Section 9.3:

Adjudication

- You may request an adjudicatory hearing
- Prehearing conference will determine:
  - Appropriate exchange of information
  - Procedural schedule
- Outcome is binding and precedential
- Outcome is appealable to the MA Supreme Judicial Court

Distributed Generation Group

- The DPU's DG Group includes legal and technical experts.
- You can submit a form to the DG Group if you have a renewable energy complaint or question relating to the following topics:
  - Net metering
  - SMART Program matters that are *not* related to eligibility
    - e.g. Disagreement about whether an electric company is applying the correct value of energy or per kilowatt hour components of a solar tariff generation unit (STGU), general questions about qualifying facilities.
  - Interconnection
  - Filing a petition seeking an exception to the net metering rules and regulations
  - Initiating dispute resolution

- If your inquiry is complex, a member of the DG team will reach out to you to schedule a call and assist with facilitating any additional process.
- Contact: dpu.netmetering@mass.gov

Additional Resources

- **Interconnection dispute resolution guidance**
- **Start the dispute resolution process with the DPU**
- **Submit an interconnection question to the DPU**

Q&A


DEPARTMENT OF PUBLIC UTILITIES
SIGILLVM REIPVBLICÆ
COMMONWEALTH OF MASSACHVSETTS
ENSE PETIT PLACIDAM SVB LIBERTATE QVIETEM

Thank You!


DEPARTMENT OF PUBLIC UTILITIES
SIGILLVM REIPVBLICÆ MASSACHVSETTENSIS.
COMMONWEALTH OF MASSACHUSETTS
ENSE PETIT PLACIDAM SVB LIBERTATE QVIETEM