Efficiency First: Strategies to Improve Municipal Buildings

October 31, 2022

ENERGY EFFICIENCY FORUM

Efficiency First

Joanne Bissetta, *Massachusetts Dept. of Energy Resources*

Ann Livingston, *Southeast Sustainability Directors Network*

Kristel Riddervold, *City of Charlottesville, Virginia*

Chris Russell, *Maryland Energy Administration*

COMMONWEALTH OF MASSACHUSETTS

Charles Baker, Governor
Beth Card, Secretary
Patrick Woodcock, Commissioner

Clean Energy Opportunities for Municipalities

VA Energy Efficiency Council

October 31, 2022

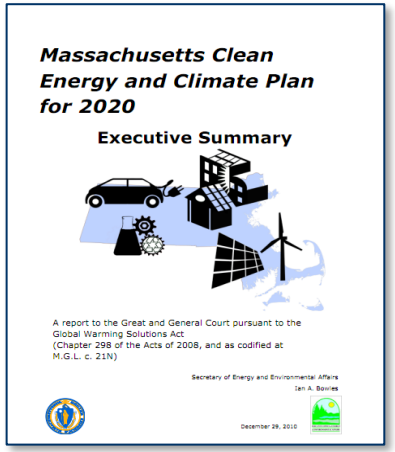
Joanne Bissetta, MA DOER

Clean Energy in MA Cities and Towns

- Authorizing legislation
- Evolution of policies to net zero goals
- Tools and Resources for MA municipalities
- Results
- Looking to 2050

The MA Framework – 2008 Legislation

- Global Warming Solutions Act
  - Established goals to reduce ghg emissions by 25% by 2020
  - 80% by 2050
- Green Communities Act
  - Authorized membership in RGGI,
  - Expanded efficiency programs via Mass Save
  - Supported renewable energy generation via RPS
  - Created Green Communities Program



mass save®
Savings through energy efficiency

Massachusetts Global Warming Solutions
www.mass.gov/eea/gwsa

GREEN COMMUNITY
Massachusetts DEPARTMENT OF ENERGY RESOURCES
Commonwealth of Massachusetts
Charles D. Baker, Governor · Karyn E. Polito, Lt. Governor · Matthew A. Beaton, EOEEA Secretary · Judith F. Judson, DOER Commissioner
DESIGNATED 2015

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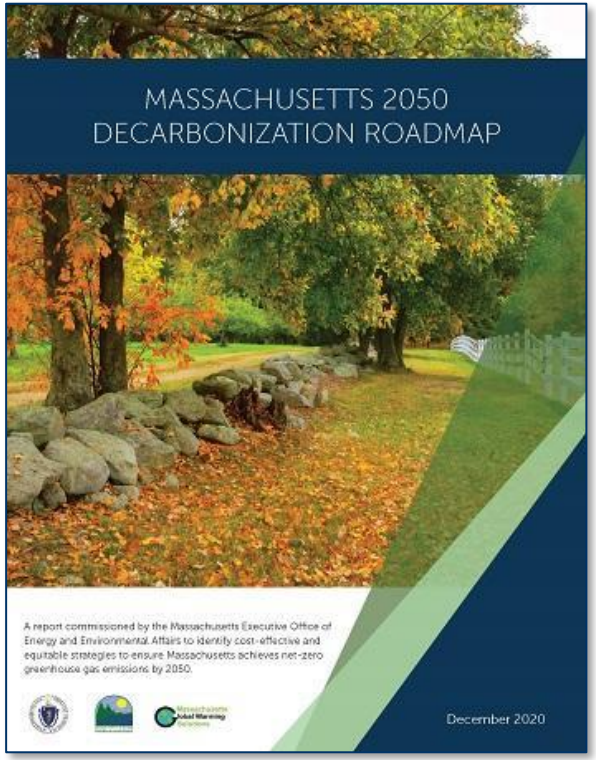
An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy – March 2021

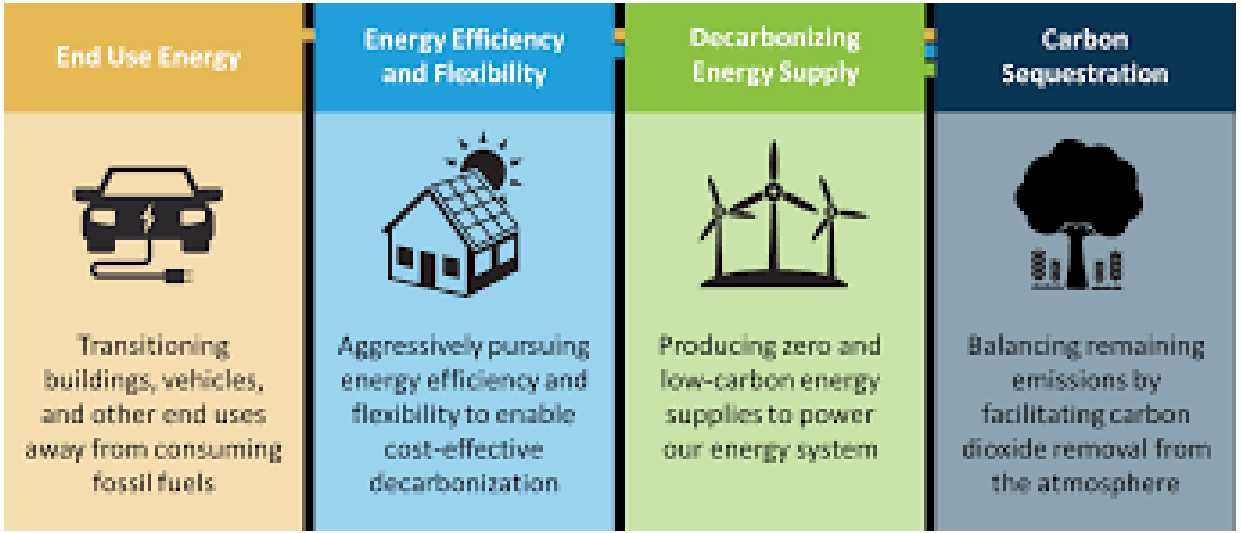
- Updates ghg emissions limits set by 2008 Global Warming Solutions Act
- Commits Massachusetts to achieve **Net Zero emissions in 2050**
- Authorizes the Secretary of Energy and Environmental Affairs (EEA) to establish an emissions limit of no less than **50% for 2030**, and no less than **75% for 2040**

2050 Decarbonization Roadmap

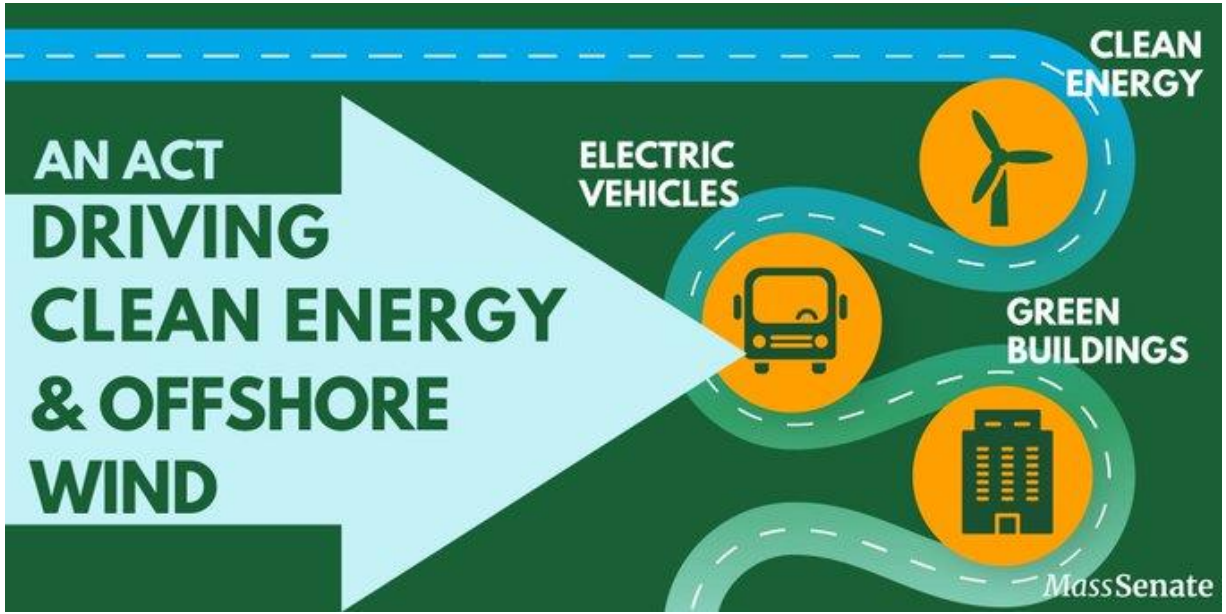


- Two-year research effort
- Comprehensive understanding of 30-year transition to net zero
- Focused on implementation
- Inform near-term decision-making

4-Pronged Approach

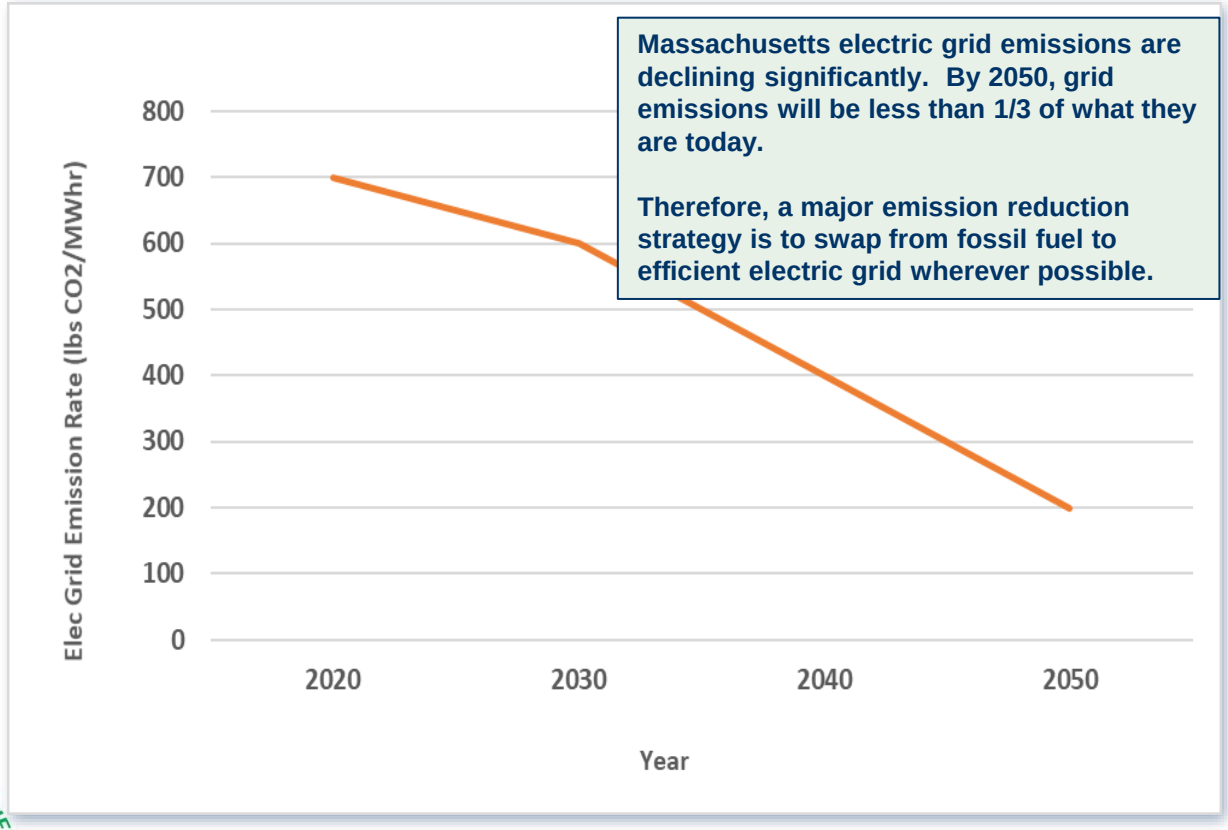


An Act Driving Clean Energy and Offshore Wind – August 2022



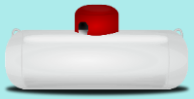
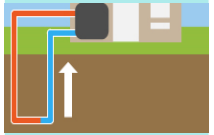
Helping Massachusetts Municipalities Create A Greener Energy Future

How We'll Get There



Massachusetts electric grid emissions are declining significantly. By 2050, grid emissions will be less than 1/3 of what they are today.

Therefore, a major emission reduction strategy is to swap from fossil fuel to efficient electric grid wherever possible.

OIL	PROPANE	GAS	ELECTRIC RESISTANCE	ELECTRIC COLD CLIMATE AIR SOURCE HEAT PUMP	ELECTRIC GROUND SOURCE HEAT PUMP
					

Pounds of emissions to deliver 1 MMBtu of heat into a space (in 2020)

170	145	120	205	65	45

45% Less

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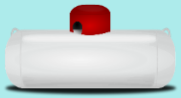
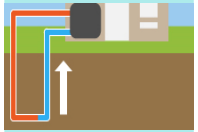
					

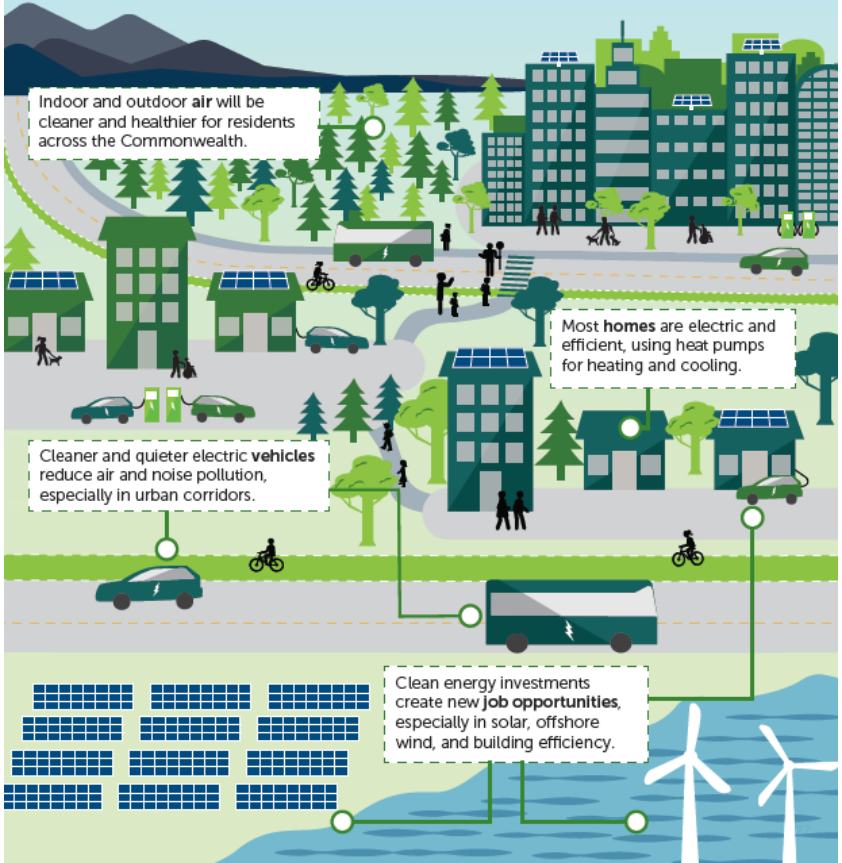
Pounds of emissions to deliver 1 MMBtu of heat into a space (in 2050)

170	145	120	~~205~~ 59	~~65~~ 18	~~45~~ 13

85% Less

SEE YOURSELF IN 2050

The transition to Net Zero has benefits across all aspects of society.
Massachusetts will become cleaner, healthier, and more resilient.



Programs & Resources for Municipalities

- MassEnergyInsight energy tracking and analysis tool
- Municipal Energy Technical Assistance
- Regional Energy Planning Assistance
- ESPC model documents and templates
- Green Communities Designation and Grant Program
- Opportunities offered by other state agencies
- Website filled with tools & resources
  www.mass.gov/orgs/green-communities-division

Green Communities Division

The energy hub for ***all*** Massachusetts cities and towns,
not just designated Green Communities.

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Green Communities Regional Coordinators

- Regional Coordinators act as direct liaisons with cities and towns on energy efficiency and renewable energy activities
- Located at each of the DEP Regional Offices:

WERO – SPRINGFIELD: Mark Rabinsky
Mark.Rabinsky@mass.gov
617-823-4588 - cell

NERO – WILMINGTON: Neal Duffy
Neal.Duffy@mass.gov
857-276-8654 - cell

CERO – WORCESTER: Kelly Brown
Kelly.Brown@mass.gov
617-780-8144 - cell

SERO – LAKEVILLE: Lisa Sullivan
Lisa.M.Sullivan@mass.gov
617-312-4018 - cell

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MassEnergyInsight

POWERING EFFICIENCY

MassEnergyInsight is a robust, easy-to-use, energy information system with customized electricity, natural gas and oil usage details for cities and towns across Massachusetts. This web-based tool, provided by the Department of Energy Resources (DOER) at *no cost*, offers a wealth of information that provides the foundation for critical decision making, and for your participation in the Green Communities Program.

MassEnergyInsight

POWERING EFFICIENCY

- **FREE** online tool for MA cities, towns, RSD & WTP

- **Benchmark**: track energy use by town, department or build
- **Identify**: least efficient buildings for efficiency action
- **Measure and verify**: energy use trends by building over time

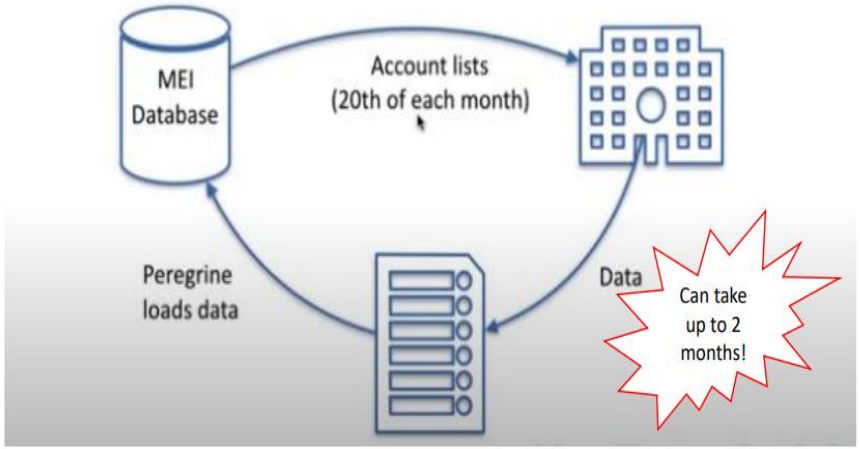
Helping Massachusetts Municipalities Create A Cleaner Energy Future

DOER Massachusetts Department of Energy Resources

MassEnergyInsight

How Data Gets Into the System

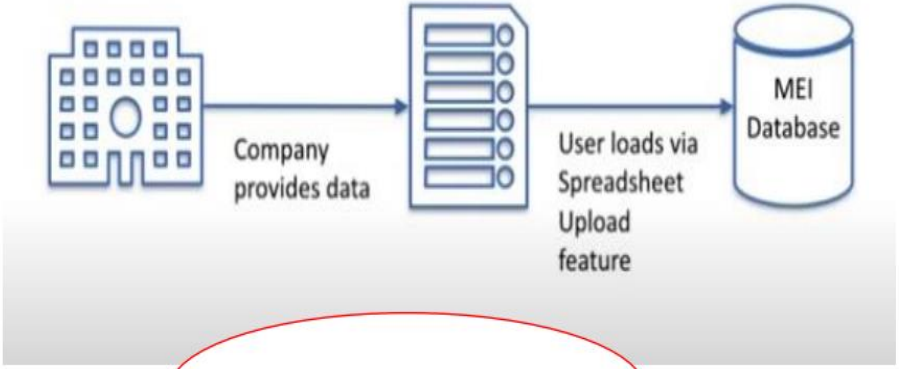
Investor Owned Utilities - monthly data updates



MassEnergyInsight

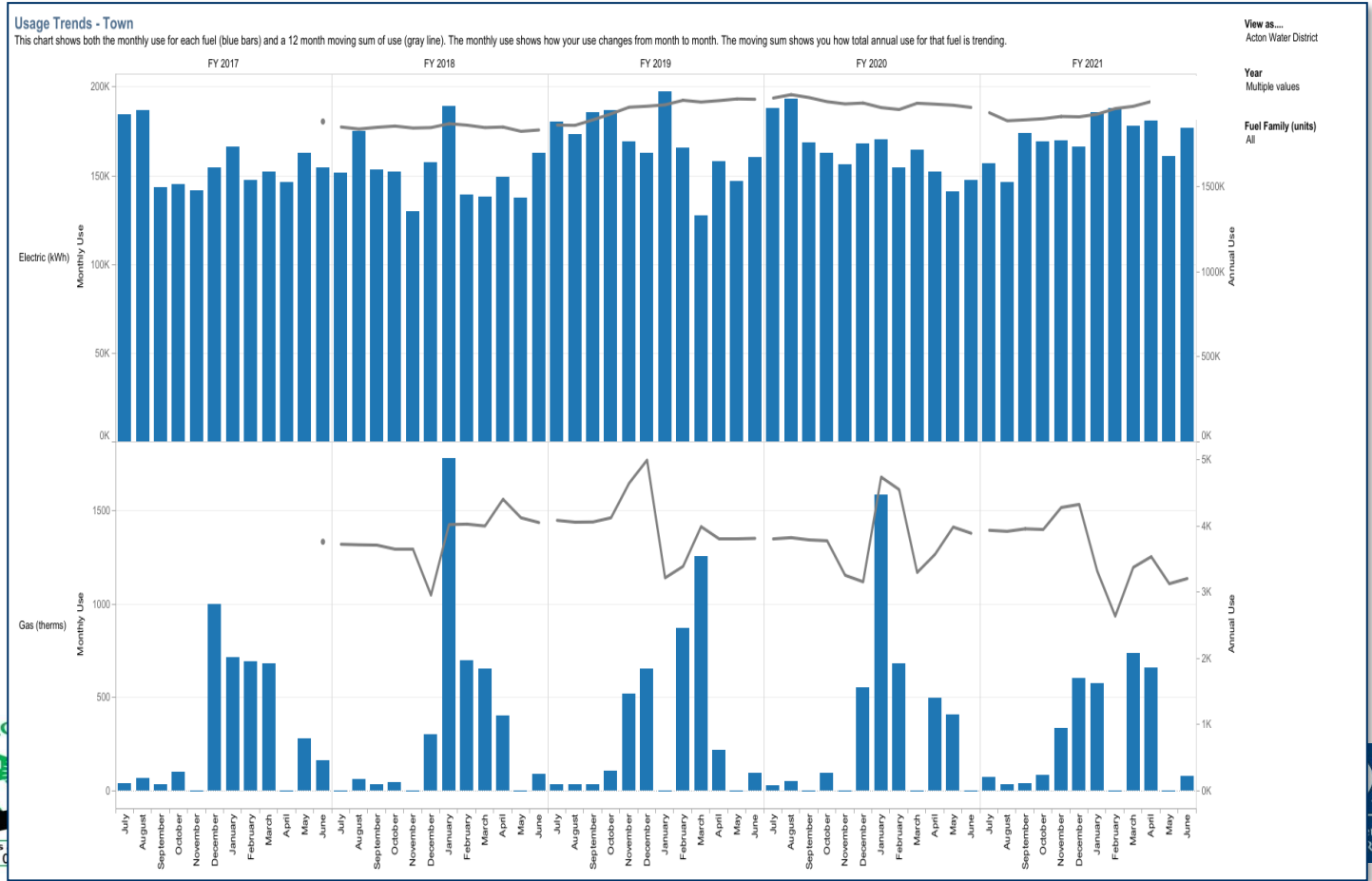
How Data Gets Into the System

Delivered Fuels and Competitive Supply Data

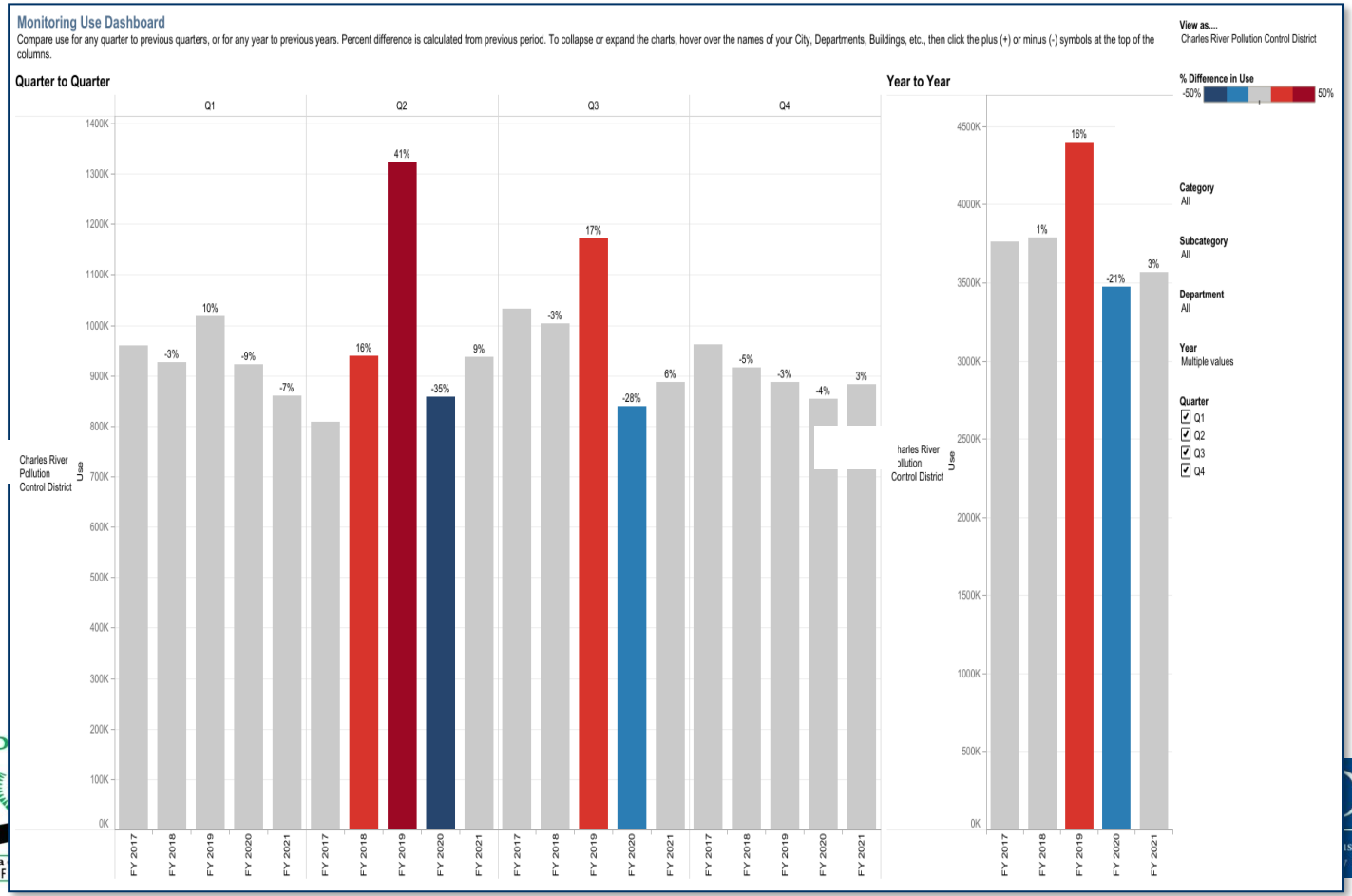


Timing: Reports refresh overnight

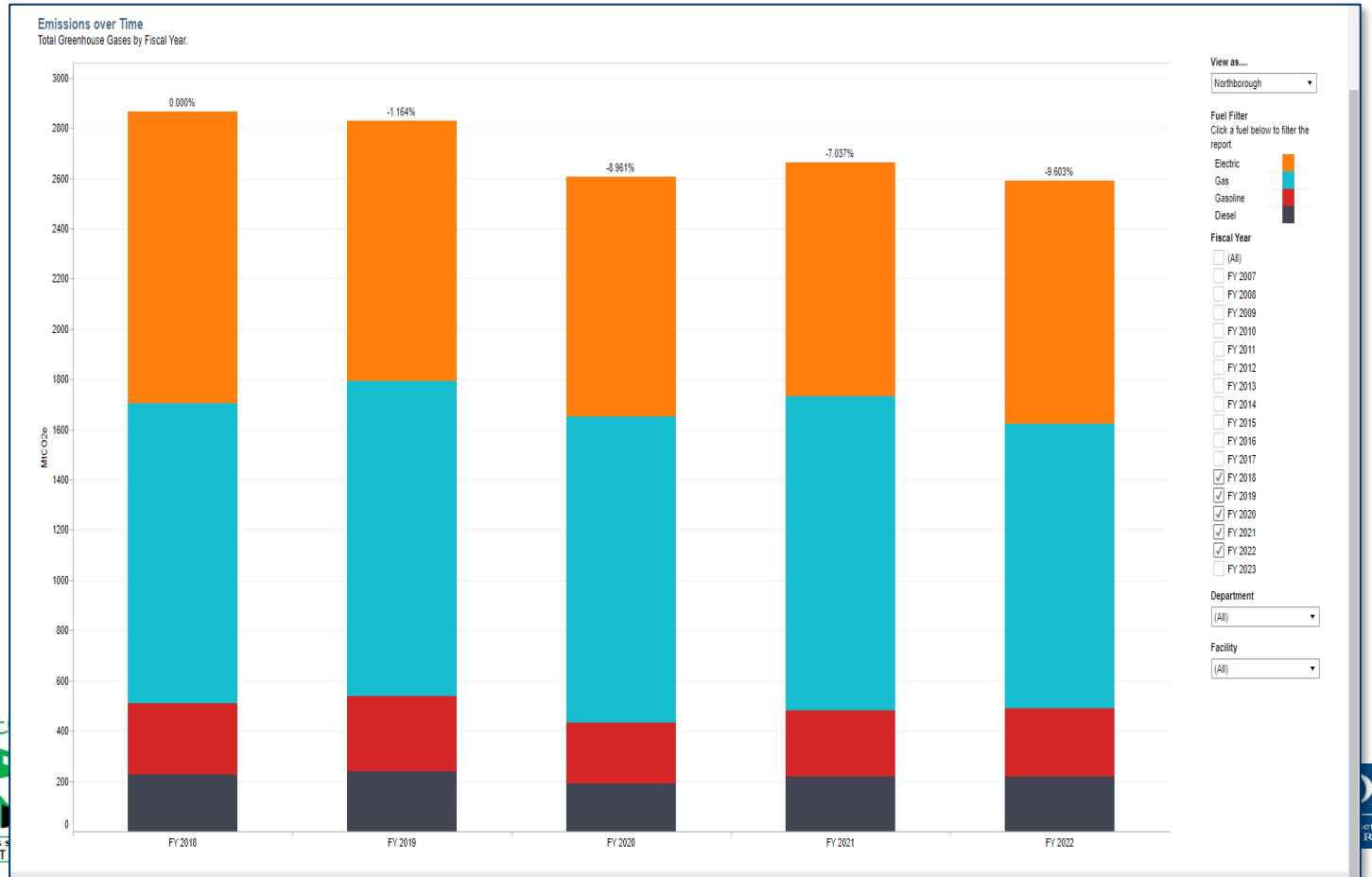
Monthly Gas and Electric data



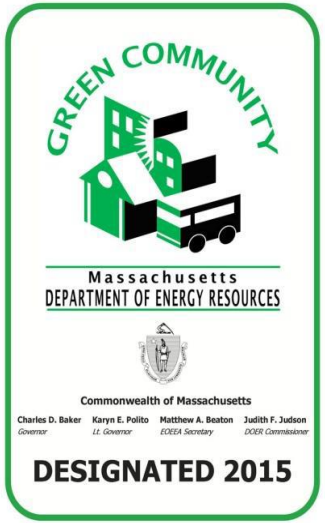
Identifying Change in Use



Emissions by Fuel



Designation and Grant Program



Designation Criteria

1. Adopt as-of-right siting for RE/AE generation, R&D, or manufacturing
2. Adopt expedited permitting process
3. Create an Energy Reduction Plan to reduce energy use by 20% in 5 years
4. Adopt Fuel Efficient Vehicle Purchase Policy
5. Minimize life cycle cost in new construction → adopt the Stretch Code

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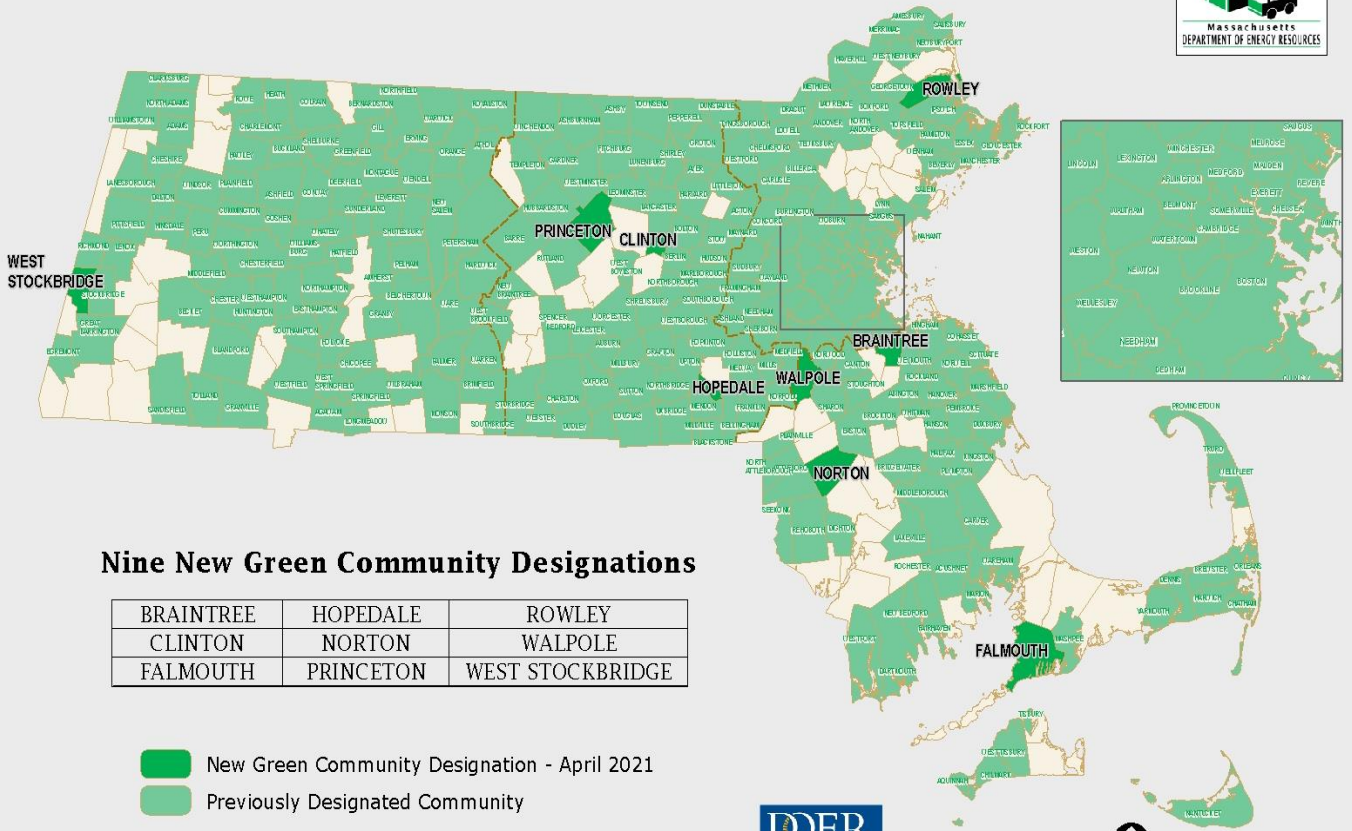
GREEN COMMUNITY DESIGNATIONS REACH TWO HUNDRED EIGHTY



Nine New Green Community Designations

BRAINTREE	HOPEDALE	ROWLEY
CLINTON	NORTON	WALPOLE
FALMOUTH	PRINCETON	WEST STOCKBRIDGE

New Green Community Designation - April 2021

Previously Designated Community

Green Community Grants

- Designation grant awards based on a $125K base plus a population/per capita income formula maximum $1M
- Competitive grants capped at $200K
- Decarbonization grants capped at $500K

Eligible Projects

- Energy conservation measures and projects at municipal facilities
- Hybrid, electric or plug-in hybrid-electric vehicles
- Vehicular efficiency measures, such as idle reduction equipment and after-market hybrid retrofit kits
- Financing the siting and construction of renewable and alternative energy projects on municipally owned property
- Energy storage to address peak demand

Some Results

- Nearly $160M clean energy grant awards since 2010
- Leveraging $36M Mass Save efficiency incentives
- Estimated $26M annual cost savings
- Estimated ghg reduction 66,000 metric tonnes
- Spurred other clean energy activities in communities

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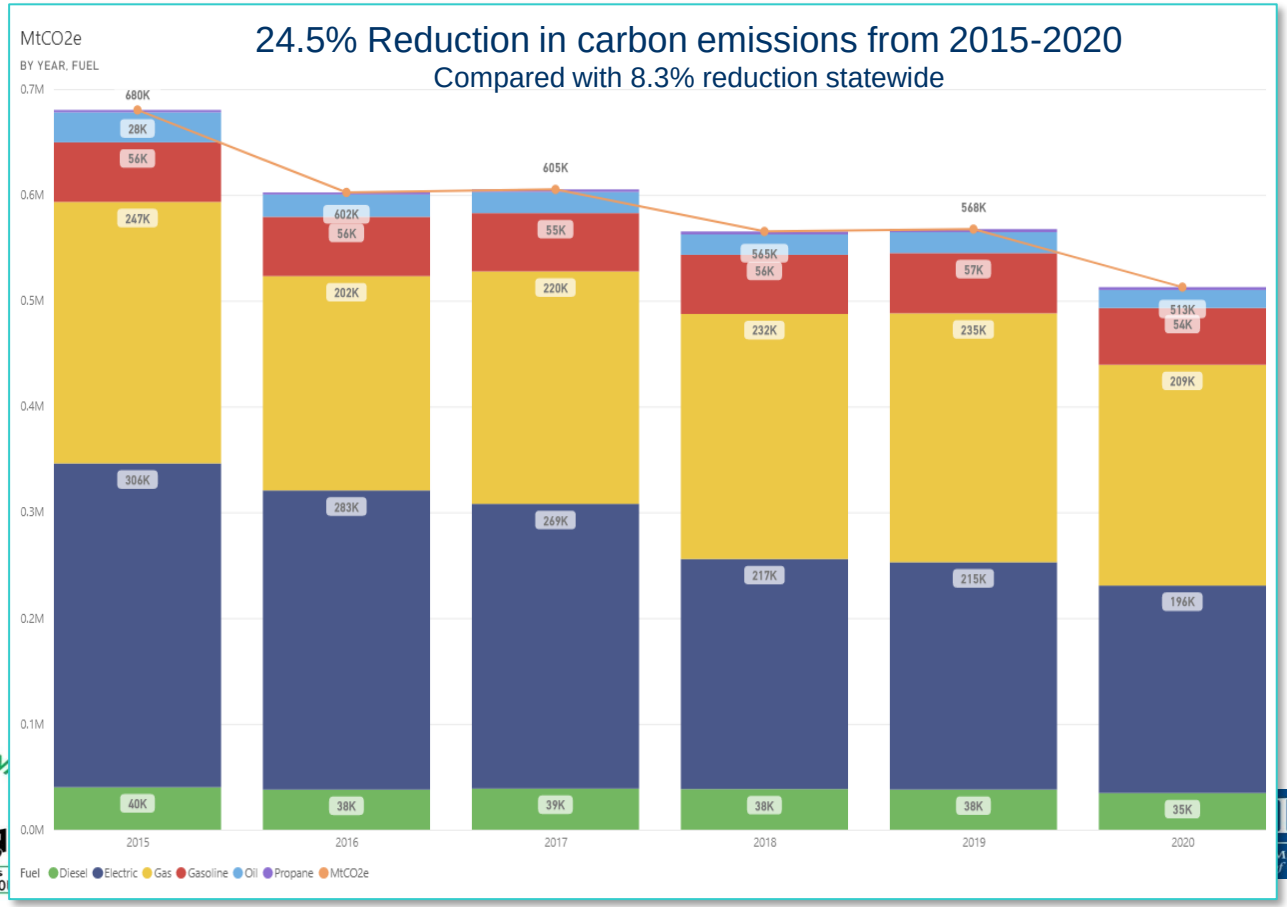
Green Community Stats and Impact



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LED Streetlight Accelerator Grant

- $11.4 million committed to bring down cost to towns
- LEDs use @60% less energy
- Save $$ on energy and maintenance

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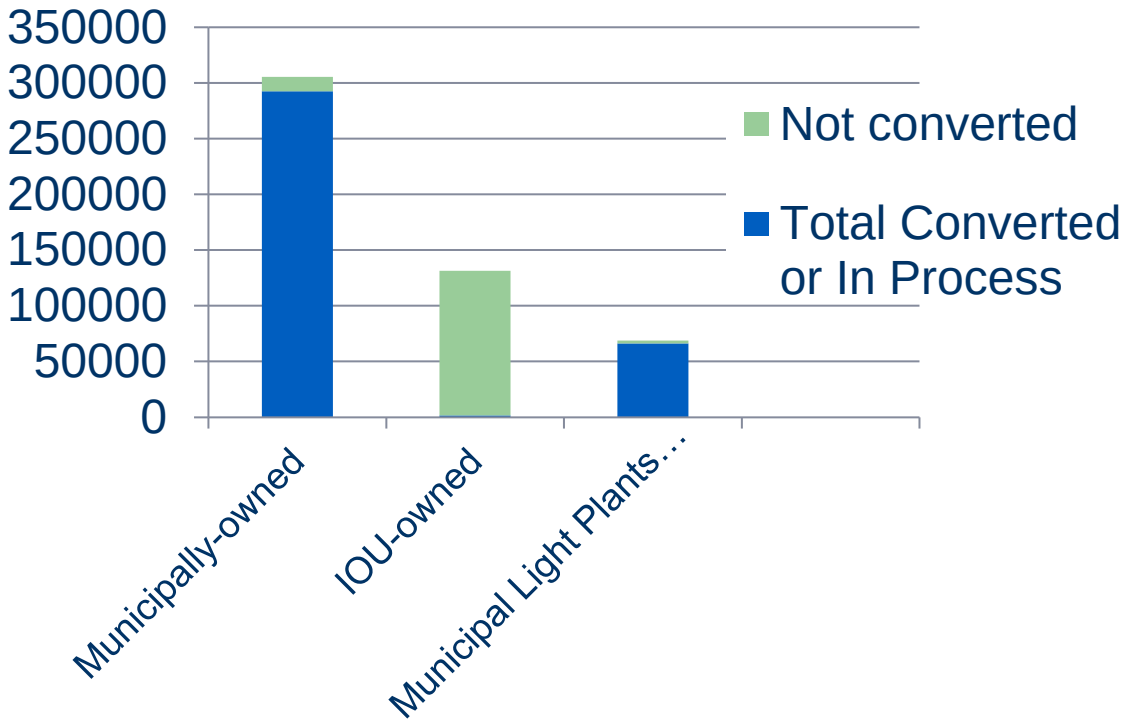
LED Streetlight Retrofits



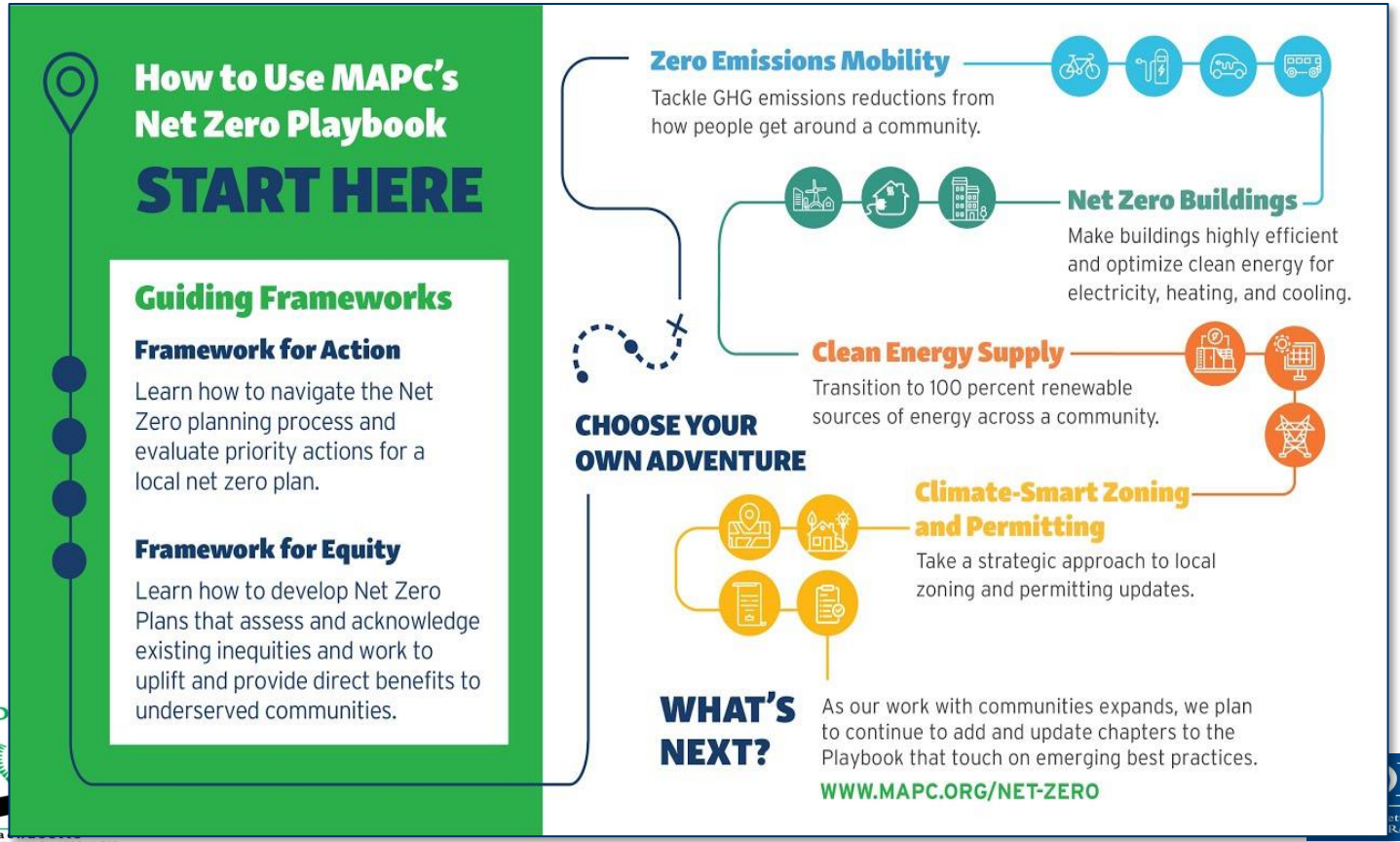
Municipal Energy Technical Assistance (META)

- Engineering/feasibility studies for clean energy technologies
- Investigation of resiliency opportunities at critical municipal facilities
- Evaluation of storage opportunities for public facilities
- Process audits at public water supply and wastewater treatment facilities
- Municipal vehicle fleet assessments
- Up to $15,000 award available
- Available to any municipality, regional school district, water/wastewater district

Regional Energy Planning Assistance

- Funding to regional planning agencies
- Assistance to *attain and maintain* Green Community Designation
- Assistance with Net Zero planning
- Assistance with Clean Energy Planning and Project Support
- $1 million over two years

Hands-On Approach

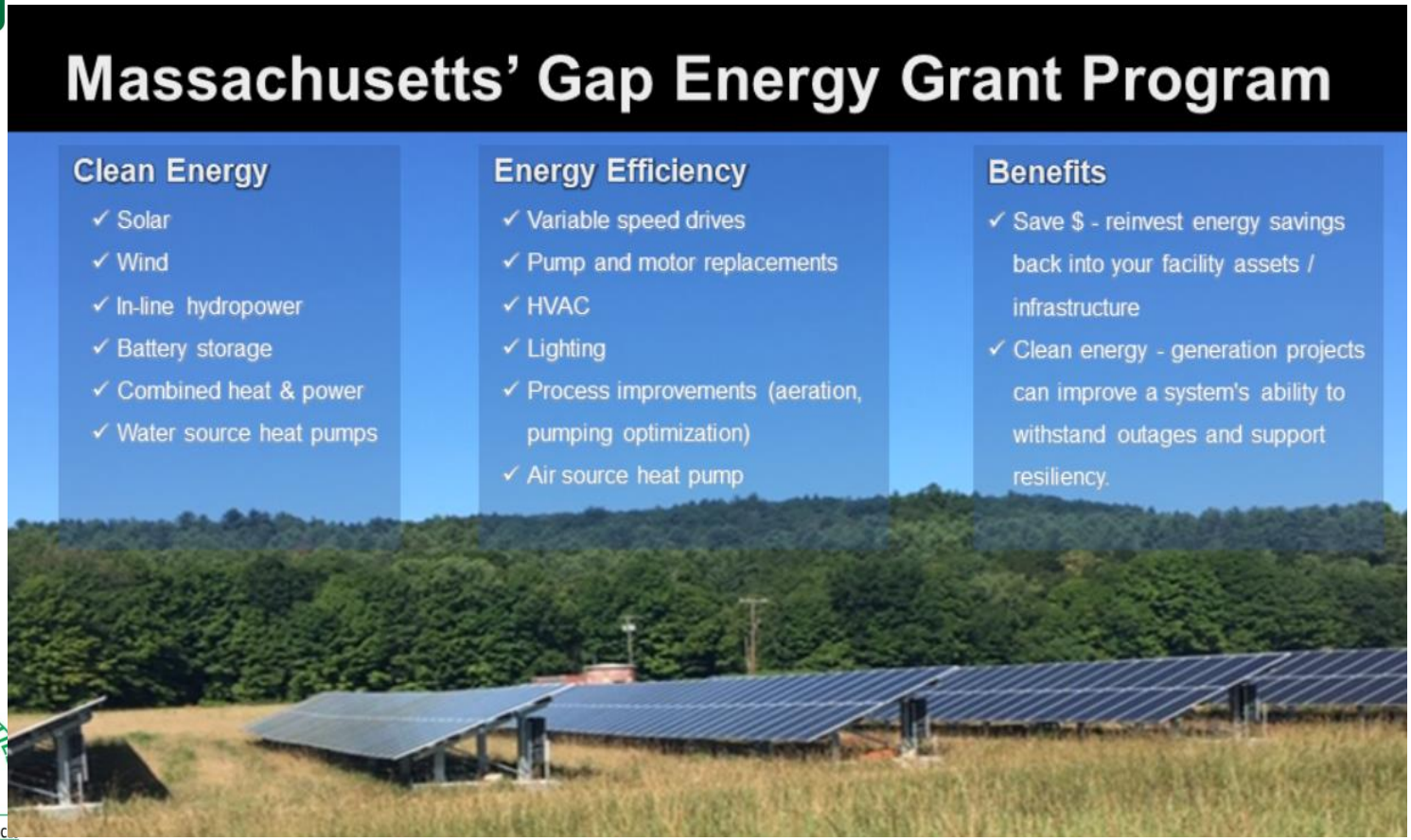


Regional Clean Energy Planning/Project Support

Maximum award $50,000 for this group of activities

- **Capacity building** – convening **training events or workshops** that facilitate peer-to-peer learning and exchanges
- This may also include **preparing and disseminating case studies and other outreach materials** showcasing municipal clean energy best practices
- **Coordinate multi-town efforts** (e.g., alternative-fuel fleet deployment, HeatSmart/Solarize type campaigns, etc.)
  - Projects that prioritize working with partners to engage with difficult to reach disadvantaged populations are highly encouraged

MassDEP Gap Grants



Earth Day 2019 Event
Robert L. Moylan Jr. Water Treatment Facility

- Replacement of the 20-year old ozone generation system with a new Liquid Oxygen System
- Higher ozone concentrations, using less electricity
- Save $161,000 / year
- Reduce electric demand by 50% (1,776,194 kWh) / year

Bernardston Fire & Water District: Drinking Water

Project: The District achieved Net-Zero energy status through the installation of a 150-kilowatt (kW) solar photovoltaic system at the Pratt Field Wellhead area.

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MassEVIP Program Overview

Direct Current Fast Charging Program (DCFC)

- $1.5M allocated
- Competitive program, up to $50,000 per charger

Workplace & Fleet Charging (WPF)

- $2.5M allocated
- Rolling program, up to $50,000 per address

Multi-Unit Dwelling & Educational Campus Charging (MUDC)

- $1.5M allocated
- Rolling program, up to $50,000 per address

Public Access Charging (PAC)

- $1.5M allocated, in addition to the prior $2M
- Rolling program, up to $50,000 per address

Fleets

- ~$1.0M allocated
- Rolling Program, up to 25 vehicles

MassEVIP Charging Programs

DCFC

- Direct Current Fast Charging stations
- Must be publicly accessible
- Up to 100% of eligible costs on government property
- Up to 80% of eligible costs on non-government property
- Up to 60% of eligible costs for chargers at educational sites

WPF

- Level 1 & 2 charging stations
- Up to 60% of eligible costs
- Public, private and non-profit non-residential workplaces with 15+ employees on-site
- Public, private and non-profit employers with 15+ employees in MA at fleet garage location

MUDC

- Level 1 & 2 charging stations
- Up to 60% of eligible costs
- Multi-unit dwellings with 5+ units
- Campuses with at least 15 students on-site

PAC

- Level 1 & 2 charging stations
- Up to 100% of eligible costs on government property
- Up to 80% of eligible costs on non-government property

MassEVIP Fleets Program

- Open to public entities only
- Funding to purchase or lease electric vehicles
  - Up to $7,500 for Battery Electric Vehicles (BEVs)
  - Up to $5,000 for Plug-in Hybrid Electric Vehicles (PHEVs)
  - $750 for Zero emission Electric Motorcycles (ZEMs)

Climate Leader Program

Align resources for municipalities with EEA climate and energy goals

Provide framework for municipalities seeking higher climate ambition

Enhance engagement and forward progress with municipalities

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DRAFT

Program Evolution: From Green Community to Climate Leader

Green Communities Criteria	Climate Leaders Criteria
Adopt as-of-right siting for RE/AE generation, R&D, or manufacturing	Establish/maintain local committee to advise, coordinate, and/or lead clean energy and climate activities
Adopt expedited permitting process	MVP Community status
Create an Energy Reduction Plan to reduce energy use by 20% in 5 years	Commit to decarbonizing municipal operations PLUS implementation plan
Purchase only fuel-efficient vehicles	ZEV-First vehicle policy
Minimize life cycle cost in new construction – a.k.a adopt the Stretch Code	Specialized Stretch Code Adoption

DRAFT

Money Matters

- Estimated $200,000 Year 1 Roadmap assistance
  - Includes online portal and in-person TA *($10k per town x 20 towns)*
- Estimated $250,000 Year 1 Deep Energy Retrofit Studies match *($25k per study x 10)*
- Climate Leader Grants
  - Efficiency & renewable projects and EV support capped at $200k; building electrification capped at $500k
  - Funding for Climate Leader Best practices eligible

Funding source: potentially RGGI and/or BIL funds from DOE (SEP or EECBG)

DRAFT

Proposed Climate Leaders– Best Practices

Clean energy and climate policy/planning	Community Engagement – Equity Consideration Required	Clean transportation & mobility
Commercial Property Assessed Clean Energy (C-PACE)	Community Climate Action/Net Zero Plan *	Incorporate EV charging stations in parking and/or zoning regulations
Tree City USA Certification	Community Choice Aggregation with 100% Class 1 renewable option *	Deploy and/or actively promote the use of publicly accessible EV charging stations within community.
Building benchmarking/performance ordinance	Community Clean Energy Campaign (Solarize, HeatSmart, EV promotion, etc.) *	Tier 3 Complete Streets certification **PLUS** implementation one policy/plan addressing bike/pedestrian safety and access
Streamline permitting for renewables	Youth outreach/education	Fleet electrification plan
Additional "Green Zoning" to promote smart growth, including walkability, reduce heat island effect, and reduction in water runoff	Targeted clean energy for historically marginalized and over-burdened populations. Can be in conjunction with MassSave Community First Partnership	Deploy and/or actively promote EV/E-Bike or "regular" bike share *
Land Policies promoting carbon sequestration	Climate/clean energy event	School bus electrification plan
Electricity for municipal use purchased via competitive supply at least double the minimum RPS Class 1 requirements		Development and promotion of local mobility hub OR micro-mobility

Local Actions

HEATSMART
MELROSE
COOLSMART

ENERGIZE
Framingham

GREENFIELD LIGHT&POWER PROGRAM

STANDARD (default)	LOCAL GREEN (option)	BUDGET (option)
100% renewable electricity, including 5% additional from New England	100% renewable electricity from New England	only the minimum amount of renewable electricity required by law
9.879 ¢/kWh	13.281 ¢/kWh	9.629 ¢/kWh

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In Conclusion

- State policies and commitments provide effective framework for implementation
- Roles of RGGI and mandatory efficiency programs managed by utilities are key for funding stability
- Municipalities need technical and administrative support
- Provide tools, resources, and information to meet communities “where they are”
- Include community engagement

Thanks to all the Green Communities!

Contact Information

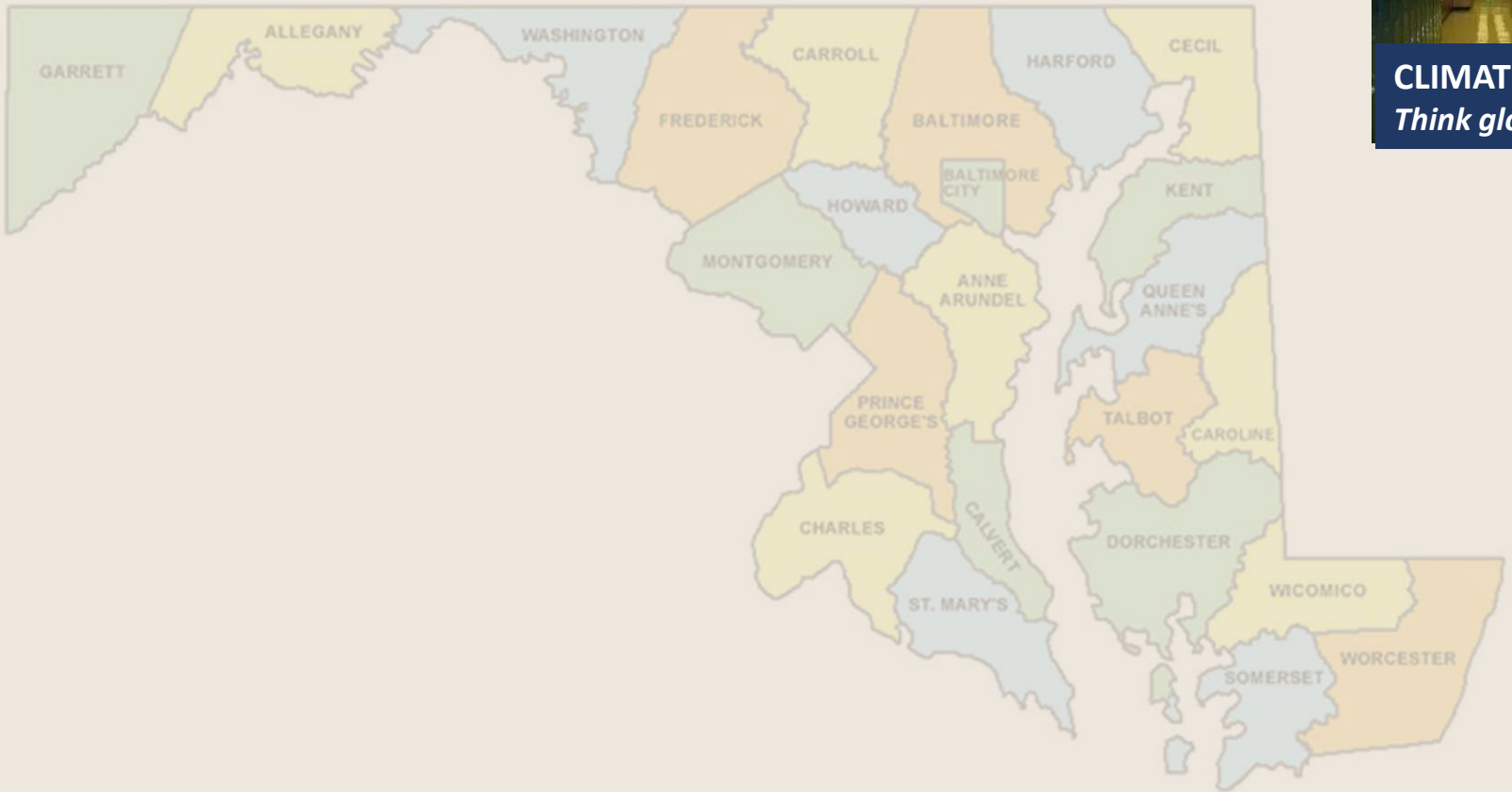
Joanne Bissetta,Director

Joanne.Bissetta@mass,gov

www.mass.gov/orgs/green-communities-division

CLIMATE CHANGE

Think globally, act locally



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Think globally, act locally

DECARBONIZING PUBLIC SCHOOLS

LEAD BY EXAMPLE!

1,377 K-12 school facilities (2021)

CLIMATE CHANGE
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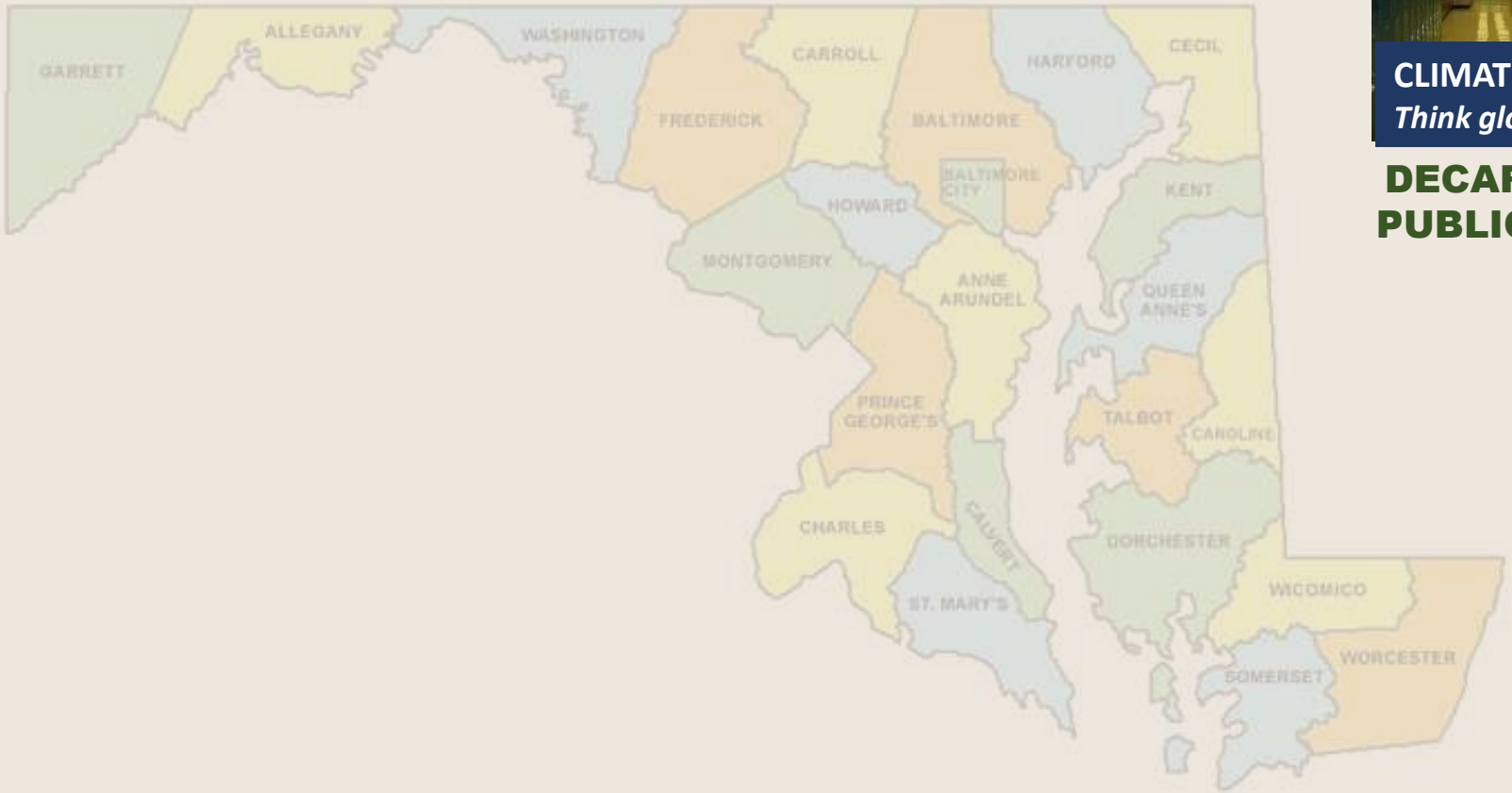

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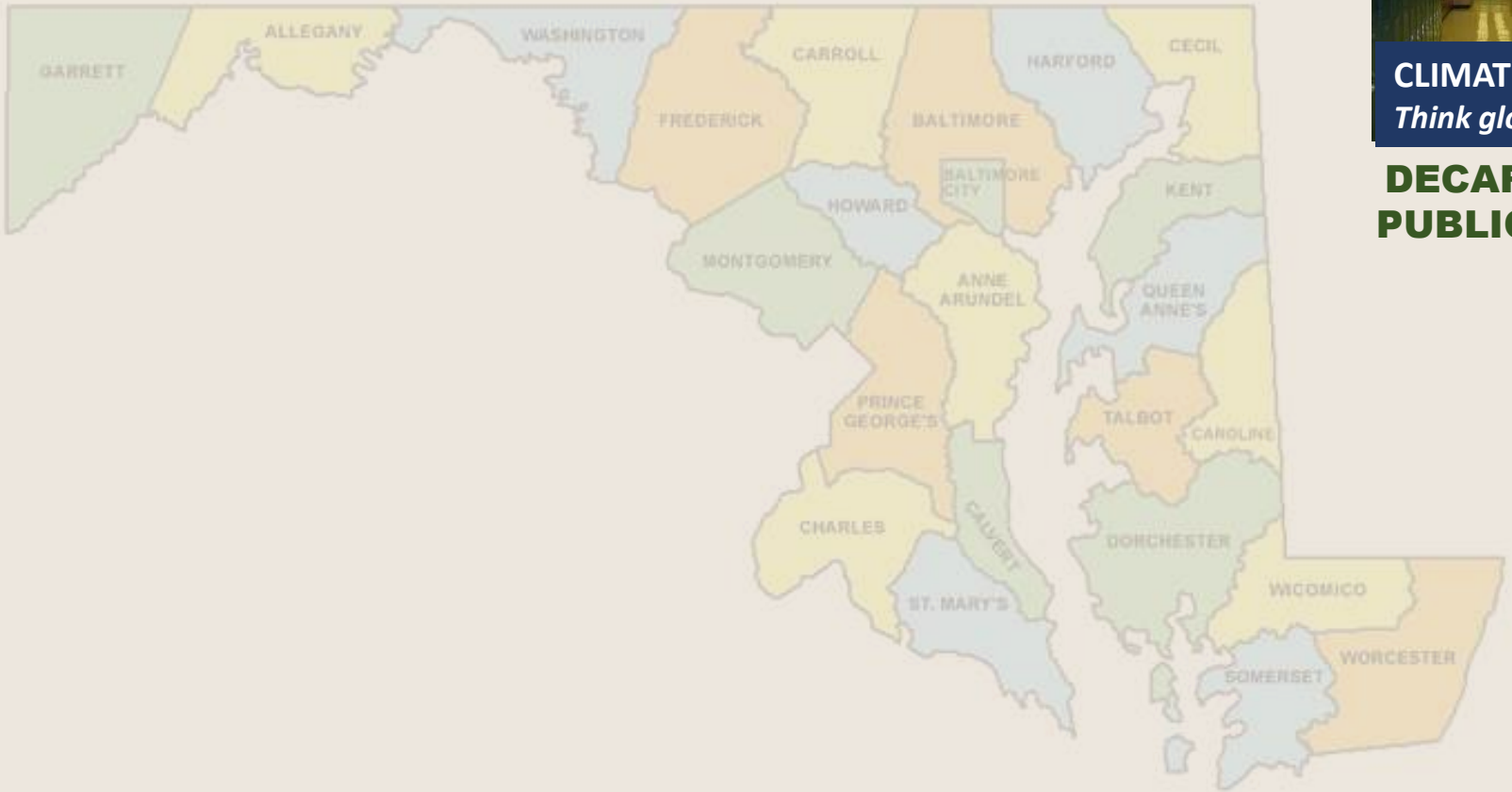
24 Local Education Agencies (LEAs)



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- **By 7/1/2022, each LEA:**
  - Online energy policy
  - Energy data management
    a “pulse” on energy intensity

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- **Well received?** *Yes and no…*
  - LEAs: overworked, underfunded
  - Competing priorities
  - Integration of program agendas
  - Different "flavors of money"

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- **Program solution:**
  MEA's FY22 School Decarb Pilot 1/
  - AOI.1: data management capacity
  - AOI.2: portfolio planning for NZE criteria
  - 7 applications, 8 AOI activities

1/ https://energy.maryland.gov/Pages/SchoolDecarbonization.aspx

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CLIMATE CHANGE
Think globally, act locally

DECARBONIZING PUBLIC SCHOOLS

- VISION
- STATUTE
- STAKEHOLDER ENGAGEMENT
- PROGRAM
- IMPLEMENTATION
- EVALUATION

LEAD BY EXAMPLE!

1,377 K-12 school facilities (2021)

24 Local Education Agencies (LEAs)

- **Unfunded Mandate**

  2021 LEGISLATION → **2022 STATE LAW**

- **By 7/1/2022, each LEA:**
  - Online energy policy
  - Energy data management
    a "pulse" on energy intensity

- **Well received?** *Yes and no…*
  - LEAs: overworked, underfunded
  - Competing priorities
  - Integration of program agendas
  - Different "flavors of money"

- **Program solution:**
  MEA's FY22 School Decarb Pilot 1/
  - AOI.1: data management capacity
  - AOI.2: portfolio planning for NZE criteria
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SCHOOL BOARD FACILITY PLANNING:
Reality of Competing Agendas

- Capacity to match growth
- Reduce deferred maintenance
- Minimize obsolescence
- Attain educational sufficiency
- Optimize funding utilization from multiple sources

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Portfolio approach: harmonize investment agendas
Diversified facility data → unifying investment logic

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Local Government Energy Efficiency Efforts

October 31, 2022

SSDN

SOUTHEAST SUSTAINABILITY DIRECTORS NETWORK

Where does SSDN work?

SSDN's 10 State Region

Alabama
Arkansas
Georgia
Florida
Louisiana
Mississippi
North Carolina
South Carolina
Tennessee
Virginia*

**New state in 2021*

SSDN Core Programs

Peer Learning

(network-wide, includes topic-based workgroups, start-ups group, and small communities; plus one Annual Meeting in person)

State Policy Program

Promotes collective action on state policy from local government (working actively in 6 states: FL, GA, NC, SC, TN, VA)

Southeast Sustainable Recovery Center

To support members' in their access to federal funding

Equity-focused Grant programs

(ex. SE Sustainable Communities Fund, Community Collaboration Catalyst Microgrant)

Local Government Facilities/Operations

- Large users
  - Mix of commercial, industrial, and other use cases
- Many have adopted ambitious energy and climate goals
  - Energy efficiency
  - Clean energy
  - DERs
- However, municipalities and counties are often budget constrained, have deferred maintenance needs, and face other challenges

Local Government Climate Goals

GHG and Clean Energy Goals of Select VA Communities

	GHG Goals		Clean or Renewable Energy	
Community	**Local government**	**Community**	**Local Government**	**Community**
Alexandria	100% by 2030	50% by 2030, 80-100% by 2050	100% by 2030	
Arlington County	Carbon Neutral by 2050	Carbon Neutral by 2050	100% renewable by 2025	100% renewable by 2035
Charlottesville		45% by 2030, carbon neutral by 2050	100% carbon neutrality for all electricity used in City buildings and facilities by 2030 (proposed)	
Fairfax	80% reduction from 2005 levels by 2050	80% reduction from 2005 levels by 2050	100% renewable by 2035	100% renewable by 2050
Fredericksburg			100% renewable by 2035	100% renewable by 2050
Richmond	45% reduction by 2030 and net zero by 2050	45% reduction by 2030 and net zero by 2050	100% renewable by 2025	
Roanoke	50% of 2005 levels by 2030	50% of 2005 levels by 2032		

Alexandria

- “Energy not used is the cleanest and cheapest energy source.”
- US DOE Better Buildings Challenge: improve EUI by 25% by 2027 (2018 baseline)
- LEDs:
  - Facilities
  - Streetlights
  - Traffic lights
- Mechanical Systems:
  - HVAC
  - BMS
  - Water heating
  - Pumps
  - Fans
  - Appliances

Arlington County

- DOE Better Buildings: 1.9 M SF—goal of 20% improvement in EUI
- County Operations Energy Plan
    - Implementation strategies and EM&V
- Partnering with EnergyCap

Town of Blacksburg

- LEED policy
  - All new construction or renovation
  - 5k SF or greater
- Blacksburg Motor Company Building Renovation
  - Historic building
  - LEED Platinum
    - Geothermal heat pump
    - Optimized energy performance

City of Charlottesville

- Energy & Water Management Program
  - Interdepartmental collaboration to optimize energy and water use
  - Robust tracking and reporting efforts
- Performance contracting (2022)
  - Assessed over 40 buildings in the government and school portfolio, seeking opportunities to drastically reduce energy and water use, achieve high levels of utility bill savings, and add renewable energy systems
  - Spring 2022, started the first phase of the Energy Saving Performance Contract (ESPC) with Technical Energy Audits

Henrico County

- Government, public schools, and public utility operations (since 2003)
- Including:
  - Tracking energy use and costs
  - Completing EE and RE projects
  - Green building design and construction
  - Education on energy issues

Constraints and Opportunities

- Constraints:
  - Funding and other resource constraints
  - Limited incentives available, utility and other

- Opportunities:
  - Collaboration: VESPN, SSDN, USDN, other
  - Bonding
  - ARPA, IRA, direct pay ITC, etc.
  - Private sector implementation partners

Contact Information

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Q&A

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Ann Livingston, *Southeast Sustainability Directors Network*

Kristel Riddervold, *City of Charlottesville, Virginia*

Chris Russell, *Maryland Energy Administration*