

Leading by Example Council Agenda

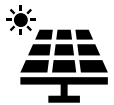
July 13, 2021



Welcome



LBE Updates



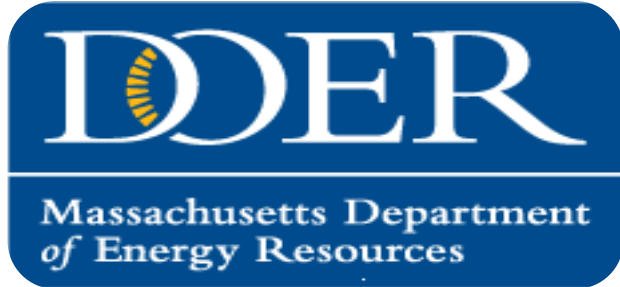
Clean Energy News



LBE Program Priorities and Support



Breakout Discussions



LBE Updates

EO 594 Guidelines

- Provide additional information and clarifications to support implementation of directives



Stakeholder comments through 7/16

New construction

Biofuels

Program administration

Coming soon

ZEV acquisitions

EV charging
infrastructure

Coming this fall

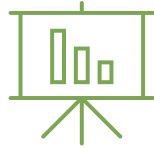
Fleet efficiency

Renewables

Calculating progress

Sustainability initiatives

2021 LBE Grant Wrap-up



Feasibility Study Grant Awards

- ~\$660K funded across 11 studies
 - 4 agencies + 7 campuses

Trend Alert

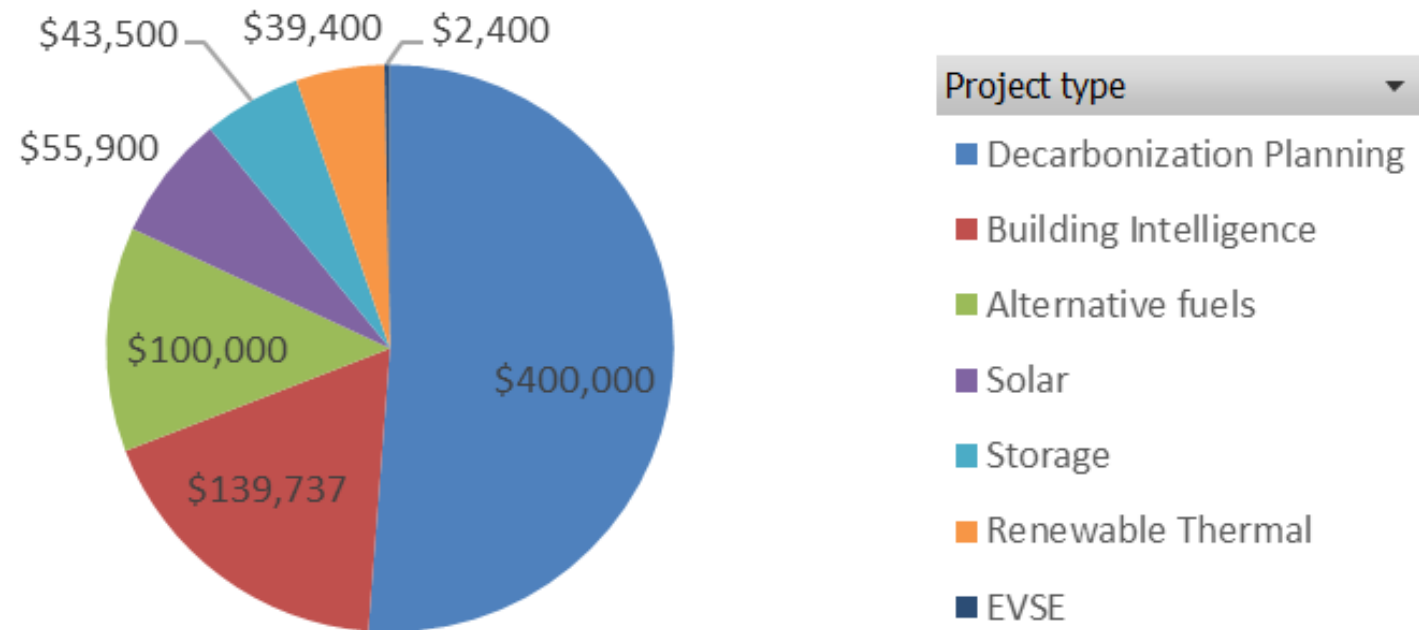
Technology-specific studies



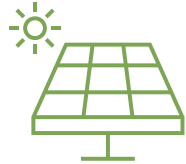
**Holistic long-term
decarbonization
planning**

(4 out of last 6 awarded)

Funding Awarded by Study Type

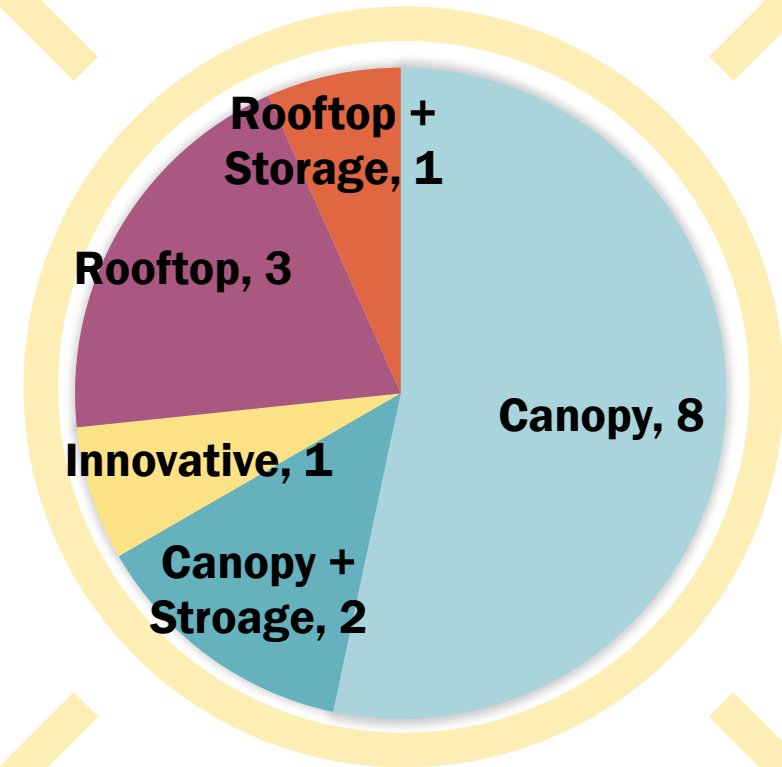


2021 LBE Grant Wrap-up

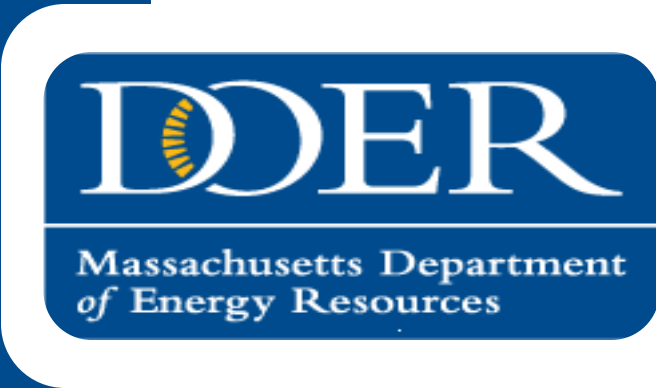


Solar Grant Awards

- \$4.9M committed to 15 projects
- 5 agencies/authorities + 5 campuses
- 10.9 MW solar
- 3.3 MW storage

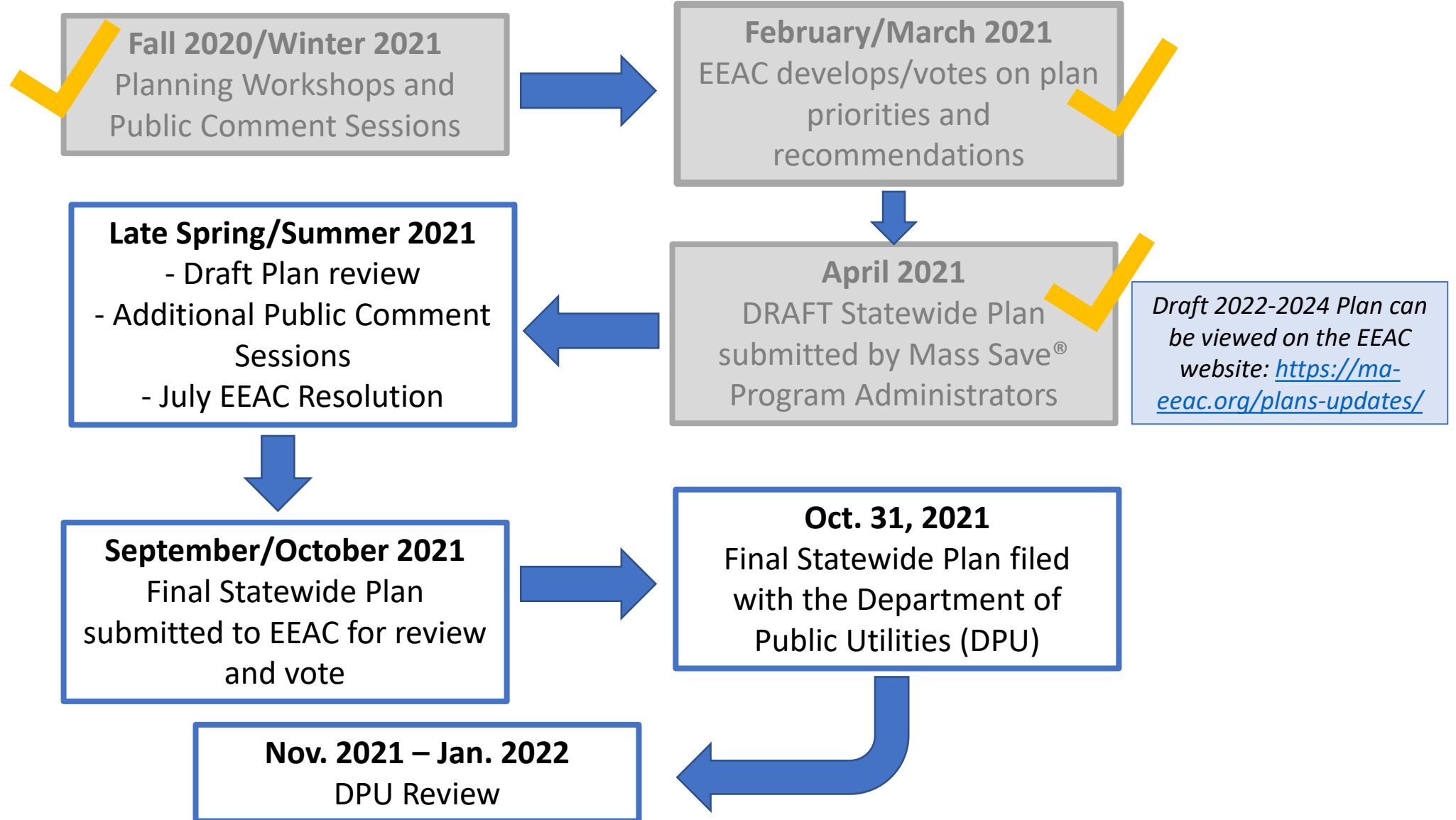


- ❖ Grant investment: ~\$0.46 per watt
- ❖ Estimated annual electricity cost savings: \$1M+
- ❖ Additional demand charge savings (\$ unknown)



MA News

Mass Save Three-Year Planning 2022-2024 Status Update



Three-Year Plan Upcoming July Meetings (Virtual)

- July 14 – EEAC Monthly Meeting
 - Council will discuss a draft Resolution regarding the EEAC Comments on the April 2022-2024 Draft Three-Year Plan
- July 28 – EEAC Special Meeting
 - Council will have final discussion and will vote on the Resolution
- If you would like to provide public comment for consideration for the July Resolution:
 - Verbal comments can be shared during the 7/14 meeting (please pre-register by emailing ma-eeac@mass.gov)
 - Written public comment can be submitted to ma-eeac@mass.gov – please send as soon as possible for consideration for the Resolution

2030 Clean Energy and Climate Plan: Where Are We Now?

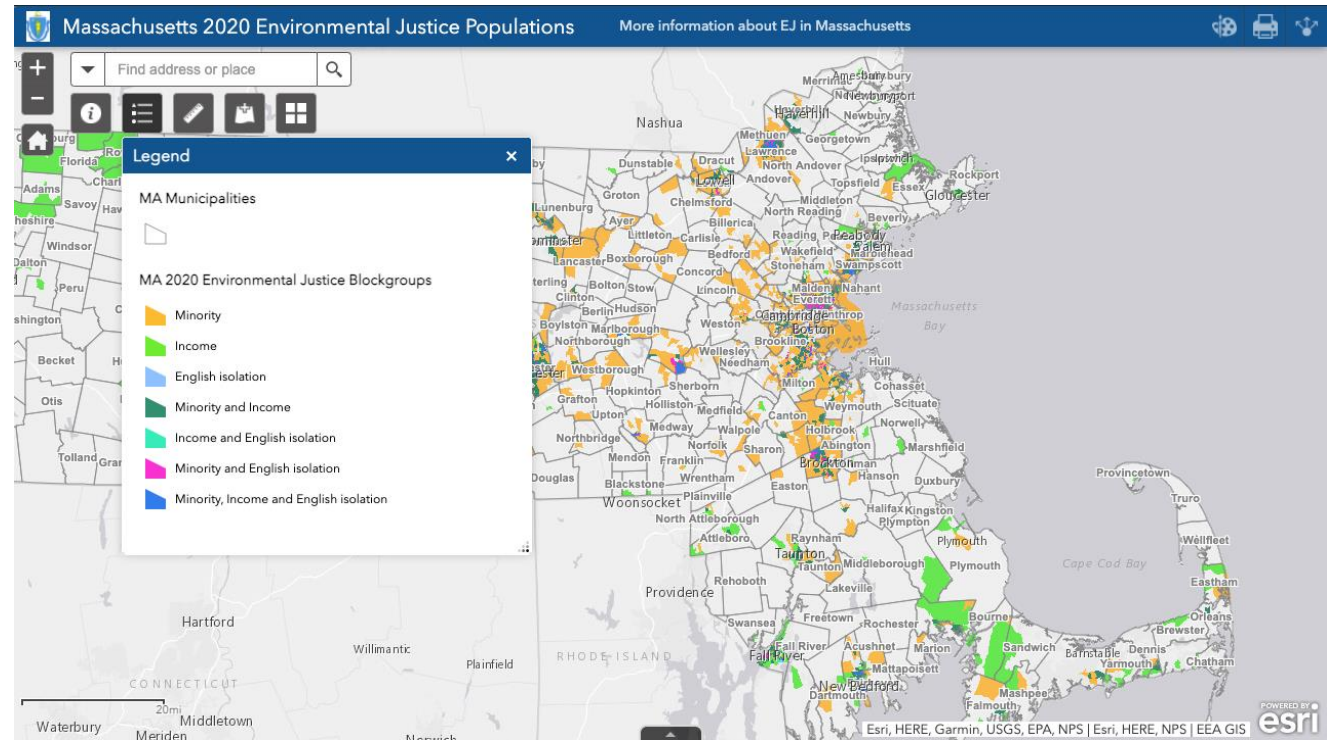


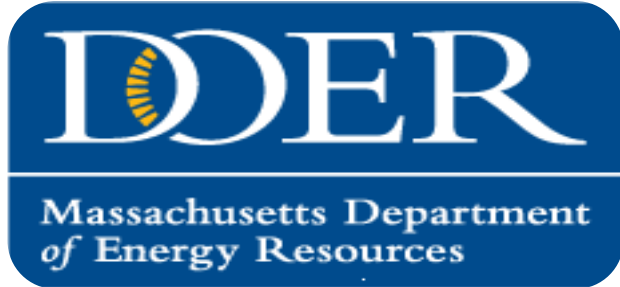
Visit www.mass.gov/2030CECP to see previous meeting recordings, slides, and to sign-up for updates

Update to EJ Viewer Map

A recent update to the Massachusetts Environmental Justice Mapping Tool allows us to more accurately characterize environmental justice populations throughout the Commonwealth

- <https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212>





World News



Weather and Climate



Oceans



Health and Society



Greenhouse Gases



Ecosystems



Snow and Ice

EPA's Climate Change Indicators

- EPA compiles indicators related to causes and effects of climate change
- Indicators provide input to the [National Climate Assessment](#) and other efforts to understand and track the science and impacts of climate change
- Explore indicators, including graphics, storymaps, and data, at www.epa.gov/climate-indicators

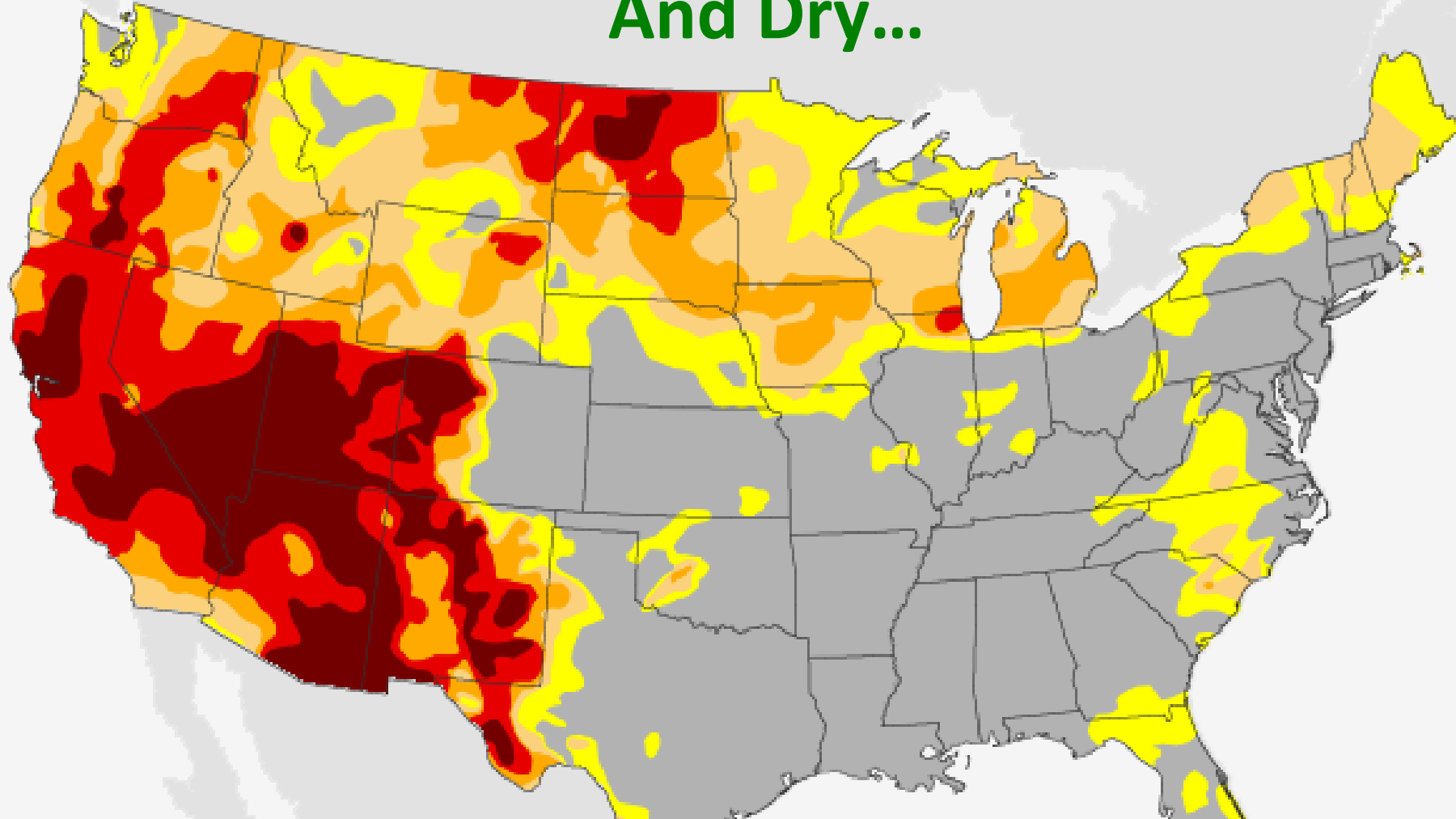
News Flash: It's Hot.

- June 2021 was the warmest June in Boston's history ([WBUR](#))
- From June 15-20, all-time maximum temperature records fell at locations in seven different states (AZ, NM, UT, CO, WY, MT) ([NOAA](#))
- On June 28th, Portland reached 115F, breaking all-time temperature record of 112F...set on 27th
- Seattle, WA hit 104F on June 27th. It has recorded three consecutive triple digit days since 1894 ([NPR](#))

How Hot IS It!?

Location	Avg June High Temp	Avg June High Temp	# of 90 degree days June	# of 90 degree days June 2021
Boston	76	83.6	2	9
Portland, OR	73	82.1	1	9
Vancouver	67	75.4	0	5
Moscow	71.6	78.8	0	6

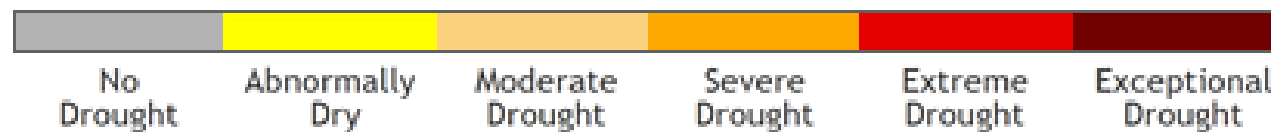
And Dry...



In mid-June, over 20% of the US was in the worst two categories of drought (D3-4: Extreme and Exceptional) ([NOAA](https://www.noaa.gov))

June 15, 2021

Climate.gov
Data: NDMC



"Renewable Gasoline" Around the World

A New Way of Heating Australian Homes

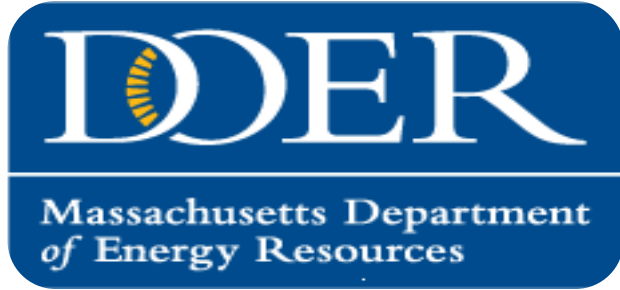


- Australia's largest electrolyser, at just 1.25 MW, switched on in May
- Pilot program providing blend of 5-10% green hydrogen (95% natural gas) to 700 homes
- State has longer-term goal to export green hydrogen; requires 12GW of wind and solar

Sweden Road Tests Renewable Gasoline



- Neste transforms fats into molecules to replace fossil fuels for road, air, marine transport, and chemicals ([BCG.com](https://www.bcg.com))
- Testing began on commercial fleets, in partnership with Powertrain Engineering (supplier of Volvo cars) ([Biomass Magazine](https://www.biomassmagazine.com))
- Emissions from vehicles can be reduced by up to 65% over the fuel's life



EO 594 Implementation Outlook: LBE Efforts and Support



LBE accomplishments are the result of the collective efforts of all state entities, who strive to meet the goals of applicable executive orders while supporting long-term statewide policies and goals

MISSION STATEMENT

The LBE Program aims to substantially reduce GHG emissions and environmental impacts of state owned and managed buildings, facilities, and campuses

LBE Scope

80 million sq. ft. of buildings

- 29 college and university campuses
- 18 prisons, hundreds of armories
- State hospitals, youth detention centers, office buildings, visitor centers, etc.
- 50+ state owned courthouses

State fleet of 6,500+ light duty vehicles

MA State government:

- Over 1 billion kWh of electricity
- 7 million gallons of gasoline & diesel
- Almost 1 million tons of GHGs

Working across state government

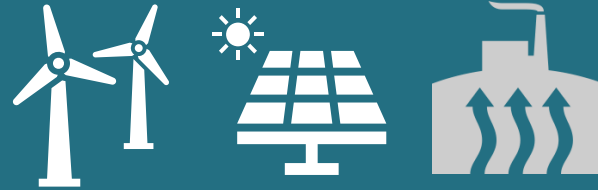
- Close collaboration with DCAMM, OSD, DEP
- Regular inter-agency meetings
- Multiple outreach strategies



LBE Priority Areas



Greenhouse Gas
Emissions



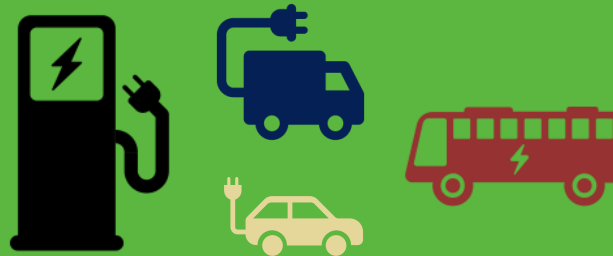
Renewable Energy



Building Energy Use



Green Buildings



Clean Transportation



Sustainability
Initiatives

Data Tracking & Reporting

Annual LBE Tracking Form

Leading by Example Program FY20 Energy Tracking and Reporting Form

Measuring and tracking energy data for Massachusetts state agencies and public higher education is a critical component of the state's Leading by Example Program (LBE). In order to track progress in meeting greenhouse gas, energy reduction targets, and renewable energy goals, collecting & analyzing agency and campus energy data is imperative.

Thank you for working with us to track your energy and sustainability data for your facilities - we appreciate your time and effort!

NEW & UPDATED ELEMENTS OF FY20 TRACKING FORM

The new tracking form for fiscal year 2020 has undergone some minor changes in an effort to make the tracking form more comprehensive and user-friendly. Below is a list of changes that have occurred to the form.

General	Where appropriate, we have automated additional tabs to pre-populate with previously submitted data. As with last year's form, ALL pre-populated fields rely on the selection of your agency/campus from the "Contact Information" tab dropdown. If not selected, no data will pre-populate. Additionally, you will no longer be able to select your agency/campus on individual tabs.
Building Fuel Consumption	For those agencies/campuses reporting bioheat consumption, we have added a question requesting details about your bioheat purchases. Beyond providing the bioheat blend, please provide the additional information requested (including vendor, bioheat source, and associated emissions reduction), where available.
Vehicle Fuel Consumption	For those agencies/campuses reporting biofuel consumption, we have added a question requesting details about your biofuel purchases. Beyond providing the biofuel blend, please provide the additional information requested (including vendor, bioheat source, and associated emissions reduction), where available.
Vehicle Fleet	We have added an "Other" column in the light-duty vehicle section for vehicles that do not fall into the standard class types (e.g. off-road, slow-speed, GEMs, etc.). In addition, we have altered questions around vehicle electrification and efficiency and ask you that you provide any details that are readily available.

Annual LBE Tracking Form

- Contact info
- Square footage/space optimization
- Utility account inventory
- Electricity consumption
- Renewable generation
- RECs/AECs
- Building fuel consumption
- Vehicle & other fuel consumption
- Installed clean power
- Vehicle fleet composition
- EV charging stations
- Energy efficiency projects
- Water use
- Recycling
- Sustainability initiatives

Utility Tracking Platforms

MassEnergyInsight
POWERING EFFICIENCY

view reports organize data upload a spreadsheet

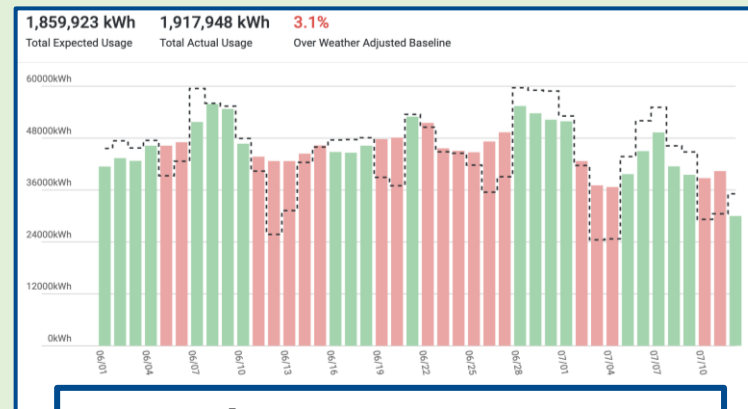
Undo Redo Revert Refresh Pause

Use Table Sites to Target Use Trends Data Loaded - Overview Emissions over Time Usage Variance

Use Table
This table shows use in native units by fiscal year for a chosen fuel or fuels. To expand or collapse the table, hover over the words Agency, Site, Account, (+) or minus (-) symbols. You can do the same for years, quarters and months.

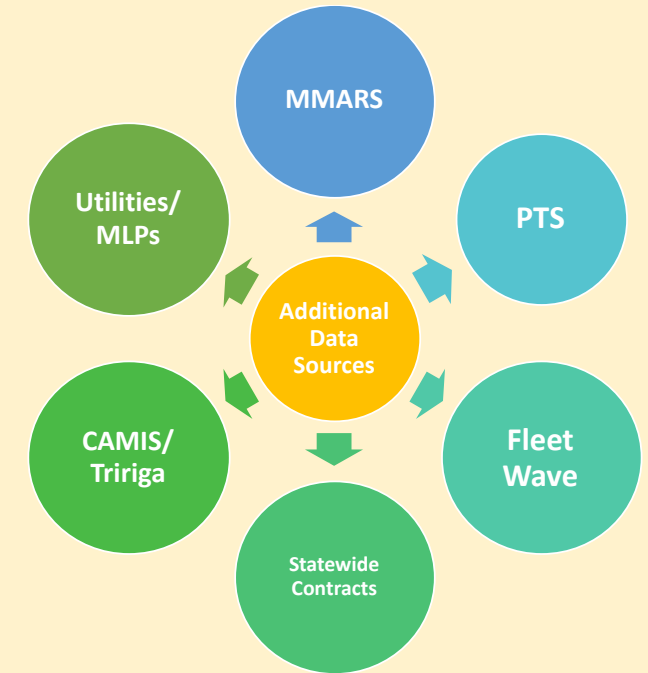
Agency	Fuel	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Auditor	Electric (kWh)	82,640	81,760	89,880	79,360	83,720	85,720	83,520
Berkshire Comm. College	Electric (kWh)	446,681	793,624	1,727,585	1,722,636	929,979	2,011,622	1,973,228
	Gas (Therms)	215,060	232,618	172,896	240,127	205,456	189,049	179,925
Bridgewater State University	Electric (kWh)	2,154,874	507,442	13,708,286	20,698,472	20,435,256	20,368,648	20,094,011
	Gas (Therms)					1,120,081	1,243,530	1,271,131
Bristol Comm. College	Electric (kWh)	5,089,793	5,143,349	3,688,169	4,339,668	2,017,517	2,441,220	2,114,683
	Gas (Therms)	11,146	15,594	17,859	18,372	13,697	14,740	17,586
Bunker Hill Comm. College	Electric (kWh)	5,966,800	5,836,960	5,941,120	5,587,120	5,625,040	5,630,000	5,348,320
	Gas (Therms)	387,146	143,660	976,963	306,638	336,700	344,534	383,710
Burns Building								994,220

MEI → Monthly site & building utility account data



CEI → Real-time energy & utility bill tracking

Databases Galore



- Solar production
- Delivered fuels
- Fleet inventory
- LBE Project Database
- Upcoming EV models

Data Analysis

➤ Portfolio-level

- Progress towards EO 594 goals
- Sector progress
- Target areas

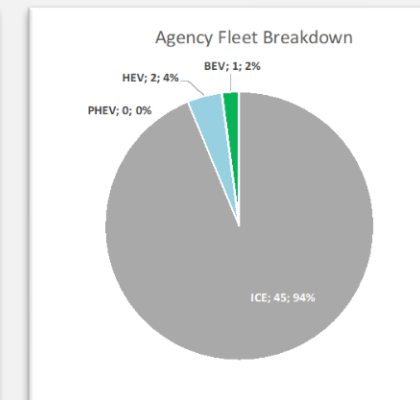
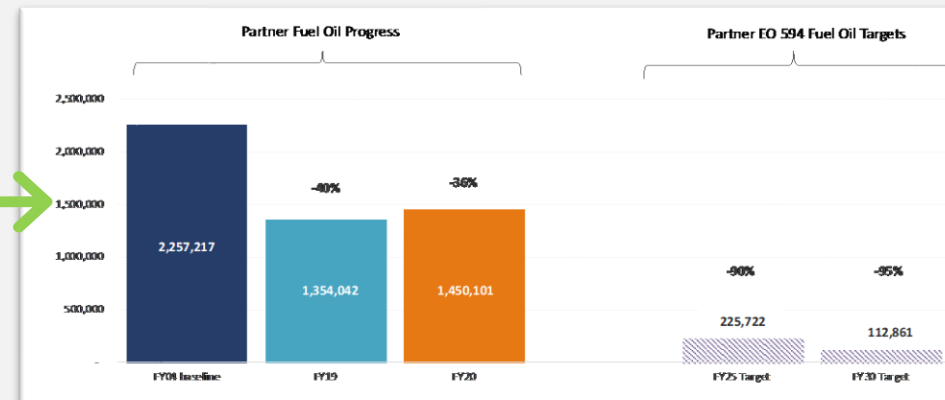
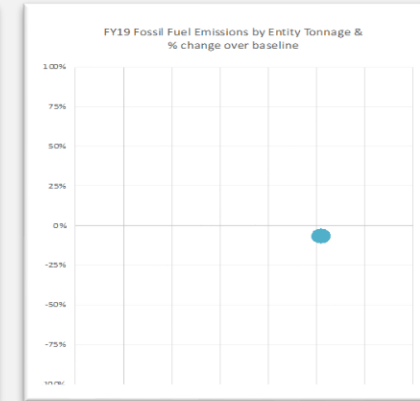
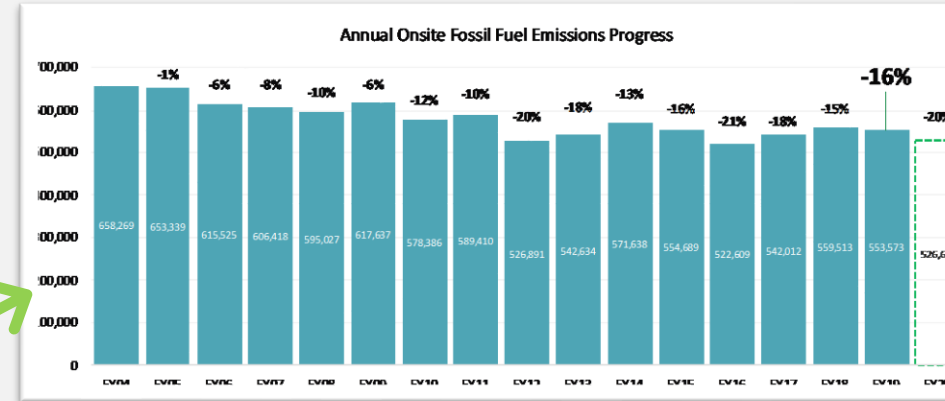
➤ Agency-specific

- Progress towards EO 594 goals
- Sector-specific progress
- Partner comparison

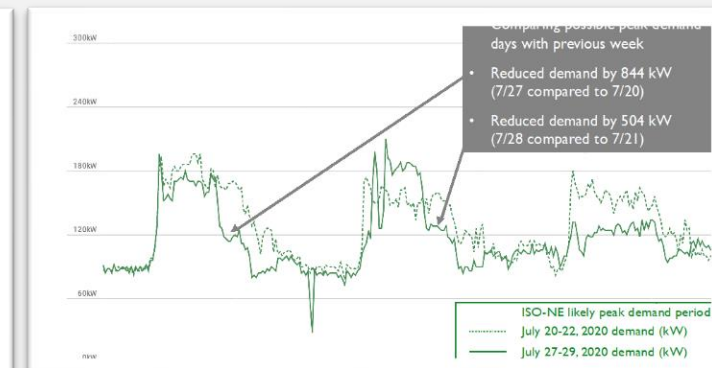
➤ Initiative/project specific

- Fleet replacement analysis
- Vehicle model TCO comparison
- Demand response impacts

Example Analyses



	2021 Honda Civic Hatchback	2021 Chevy Bolt
VEH98 Bid Price	\$22,901	\$28,231 - \$32,895
Bid Price - MassEVIP incentive*	\$22,901	(-\$7,500) = \$20,731 - \$25,395
Range	392 (gas)	259 (electric)
Fuel/100 Miles	3.7 gallons	29 kWh
Est. annual energy costs	\$1,471	\$870
Est. annual maintenance costs**	\$915	\$465
Est. operating costs after 8 years	\$19,086	\$10,680
Est. total cost of ownership after 8 years	\$41,987	\$31,411 - \$36,075



Funding, Financing, and Technical Assistance

LBE facilitates state entity access to funding and technical assistance programs by:

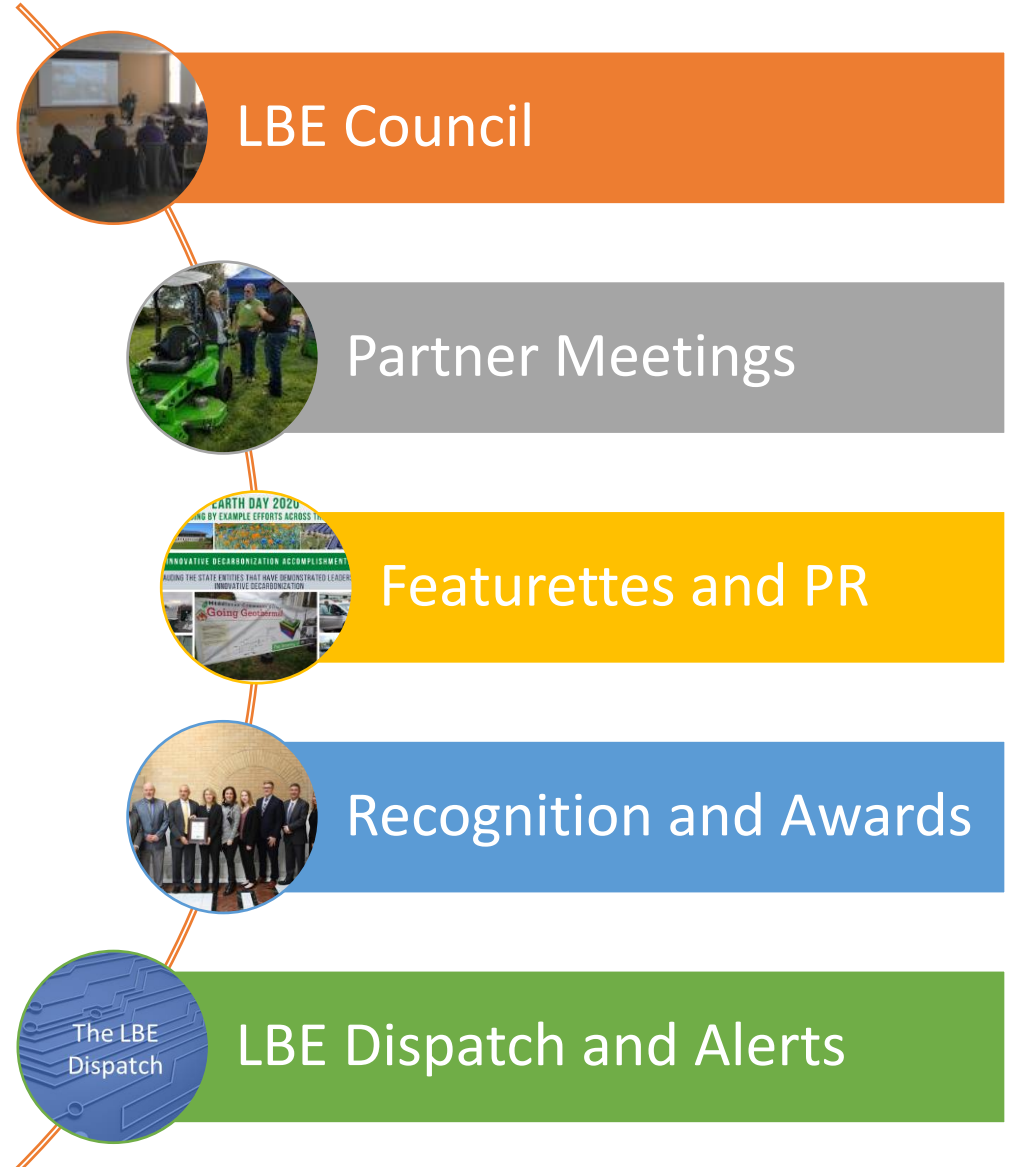
- Staying up-to-date on resources available
- Assisting state entities with navigating the nuance of various programs
- Providing policy and technical expertise to ensure programs are in-line with strategic priorities



LBE Partner Engagement

LBE partner engagement is critical for:

- Sharing technical expertise
- Encouraging peer-to-peer learning
- Disseminating resources and tools
- Celebrating and recognizing success

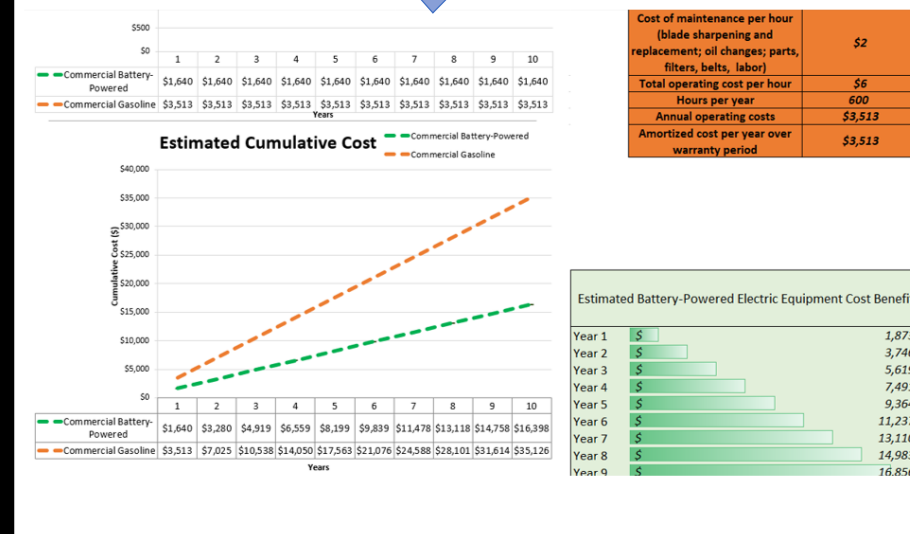




Tools and Guidelines: Calculators

- GHG emissions
- Fuel Efficiency Standard and recommended vehicles
- Lawn to pollinator habitat conversion
- Commercial battery-powered landscaping equipment

Compare battery electric and traditional gas landscaping equipment, including fiscal and environmental impacts





Tools and Guidelines: Internal Guidance Resources

LBE Quick Guide to EV Charging Infrastructure

Technologies, use cases, incentive programs, and procurement

Types of Electric Vehicle Supply Equipment (EVSE) for Charging

EVSE is classified by the speed at which the units can charge vehicle batteries:

		Charging Impacts
Level 1 Charging	Level 1 chargers require a 120V AC supplied by any standard electrical outlet. This type of charging is most convenient for residential and some workplace applications, is relatively easy and inexpensive to install, but provides the slowest charge.	Adds 4-5 miles of range per hour
Level 2 Charging	Level 2 chargers require 240V or 208V AC and may need to be installed by a certified electrician. This type of charging is the most versatile and appropriate for various use cases, provides a faster charge than Level 1 units, but can be more expensive.	Adds 20-60 miles of range per hour

Updated 3/18/2021

LBE Quick Guide to Electric Vehicles

Technologies, incentive programs, and procurement

Types of EVs

Over their useful lifetime, electric vehicles (EVs) may result in total cost of ownership as much as 50% lower than their gasoline-only counterparts. There are three primary types of EVs that use some form of battery power, and each contributes to higher fuel efficiency and lower emissions:

	Battery Electric Vehicles (BEVs)	BEVs, also called fully electric vehicles, have batteries that are charged by plugging the vehicle into appropriate outlets or charging equipment. BEVs always operate in all-electric mode and do not have an internal combustion engine, fuel tank or exhaust pipe. They store electricity onboard with high-capacity battery packs and newer models have typical driving ranges from 150 to 300 miles although some models can add battery capacity to increase range.
	Plug-in Hybrid Vehicles (PHEVs)	PHEVs are powered by an internal combustion engine and an electric motor that uses energy stored in a battery. PHEVs can operate in all-electric (or charge-depleting) mode. To support a driver's typical daily travel needs, most PHEVs can travel between 20 and 40 miles on electricity alone and when the battery has been depleted, the gasoline engine turns on and the vehicle operates as a hybrid electric vehicle instead.
	Hybrid Electric Vehicles (HEVs)	HEVs are powered by an internal combustion engine and a small electric motor that uses energy stored in a battery. Under light load, for instance during initial acceleration, only electricity is consumed. The vehicle is fueled primarily with gasoline to operate the internal combustion engine, and the battery is charged through regenerative braking, not by plugging in.

*BEVs also include fuel-cell electric vehicles, which run on compressed liquid hydrogen. Source: U.S. Department of Energy and EPA

EV Incentive Program Information for State Entities

MassEVIP Fleets Incentive: \$3,000-\$7,500*

First come, first serve incentive for public entities to buy or lease EVs; maximum funding amounts depend on vehicle type and means of acquisition. *Smaller incentive for motorcycles.

Eligible applicants: Municipalities, state agencies, public colleges and universities.

Eligible vehicles: Light-duty battery electric and plug-in hybrid electric vehicles.

Acquisition type: Purchase or lease (minimum 3-year lease).

To note: If purchasing through statewide contract, MassDEP will pay the incentive directly to the vendor; there is a maximum limit of 25 EV incentives per applicant.

MOR-EV Trucks Program: \$7,500-\$90,000

Incentive values will vary by gross vehicle weight rating, and rebates are assigned by blocks with values that will decline over time.

Eligible applicants: Private, commercial, and public fleets.

Eligible vehicles: Medium- and heavy-duty battery electric or fuel-cell electric vehicles (including trucks, vans, and buses) over 8,500 pounds GVWR with a sales price of \$50,000+.

Acquisition type: Purchase or lease (minimum 3-year lease).

To note: Vehicles that operate >50% of the time in Environmental Justice Communities are eligible for an incentive adder.

Procurement Resources

Eligible public entities can work with vendors on the current Massachusetts statewide contract VE98: *Purchase of Vehicles* to procure EVs. The *VE98 contract user guide* includes a link to the list of currently available models (with pricing information) that can be filtered for EVs and other specs. Non-Executive Branch entities may elect to pursue purchase or leasing options outside of statewide contract.

Technology	Make / Model	Vehicle Type	Electric Range	Options
BEV	Nissan Leaf	Passenger Car	150 or 226 miles	Various ranges
	Chevy Bolt	Passenger Car	238 or 259 miles	Cargo vans, various ranges
	Hyundai Kona	SUV	258 miles	Various trims
	Ford Mustang Mach-E	SUV	230 or 300 miles	AWD or RWD; various ranges
PHEV	Toyota Prius Prime	Passenger Car	25 miles	-
	Honda Clarity	Passenger Car	48 miles	Various trims
	Ford Escape	SUV	37 miles	Various trims
	Chrysler Pacifica	Minivan	32 miles	-

Highlight: A Call to Action for State Fleet EV Acquisitions in 2021

MassEVIP and LBE have partnered to issue a special 2021 Electric Vehicle Purchase Challenge; this voluntary initiative spotlights BEV and PHEV acquisitions, offers a unique opportunity to demonstrate leadership, and helps state entities gain additional recognition for their on-the-ground efforts to reduce environmental impacts. Learn more [here!](#)

Commercial Battery-Powered Landscaping Equipment for MA State Facilities

Is your current gardening or landscaping equipment approaching the end of its useful life? Now is the time to look into clean alternatives!

Converting from gasoline and propane to battery-powered landscaping equipment offers an opportunity to reduce the onsite combustion of fossil fuels and associated emissions to staff, the public, and the environment. Battery-powered equipment also provides a quieter, cleaner, and safer alternative to traditional equipment.

What is b

Several types of lawnmowers, blowers, trimmers, and other landscaping equipment are commonly used in state facilities. These tools are often tracked records, often gardening and landscaping equipment.

What

Reduce CO2
Traditional greenhouse gas emissions so eliminate

Lower n
Gasoline maintenance costs. M equipment

Improve
The lack of fumes and using BPL equipment of use and

1: Based on DSD Comments



COMMONWEALTH OF MASSACHUSETTS LEADING BY EXAMPLE PROGRAM

Guiding Framework: Creating Healthy Pollinator Habitat at State Facilities

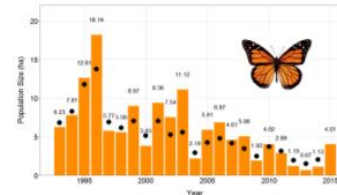


The Leading by Example Program works collaboratively with state agencies and public colleges and universities to advance clean energy and sustainable practices that reduce the environmental impacts of state government operations.

This guiding framework outlines strategies that MA state facilities can implement to support pollinator habitat on state lands. These strategies provide environmental and fiscal benefits and lead to more diverse, resilient, and beautiful landscapes.

A State-Wide Need for Pollinator-Focused Habitats

In Massachusetts, over 45% of agricultural commodities rely on pollinators such as bees, butterflies, beetles, moths, and birds. Pollinators also ensure the regeneration of flowering plants in the wild and are an essential source of food for birds, reptiles, fish, and other wildlife. Despite their importance, insects around the world are experiencing drastic population declines, with some studies estimating that over 40% of insect species are threatened with extinction. In 2019, three native bee species were listed under the Massachusetts Endangered Species Act. Creating and preserving habitat is critical for the continued existence of pollinator species and the benefits they provide.



Decline in the eastern migratory monarch butterfly population as surveyed by the World Wildlife Fund-Mexico. (Source: USGS)



Pollinator habitats support a range of birds, bees, beetles, butterflies, moths, and more.

Loose Lawns, Protect Pollinators

Replacing traditional lawns, or sections of lawns, with native plantings is a cost-effective way to support native pollinators. A diverse, naturalized landscape requires no (or minimal) mowing, will be more drought tolerant, and will not require fertilizers or the broad application of herbicides, resulting in energy and cost savings, more efficient use of staff time, and a healthier environment. In addition to fulfilling the need for critical habitat for pollinators and other wildlife, a more diverse landscape will increase carbon sequestration, better manage and clean stormwater, and help create more climate resilient landscapes.



Environmental / Ecosystem Services Operational Well-being

EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS – DEPARTMENT OF ENERGY RESOURCES

www.mass.gov/eea/leadingbyexample

Other resources

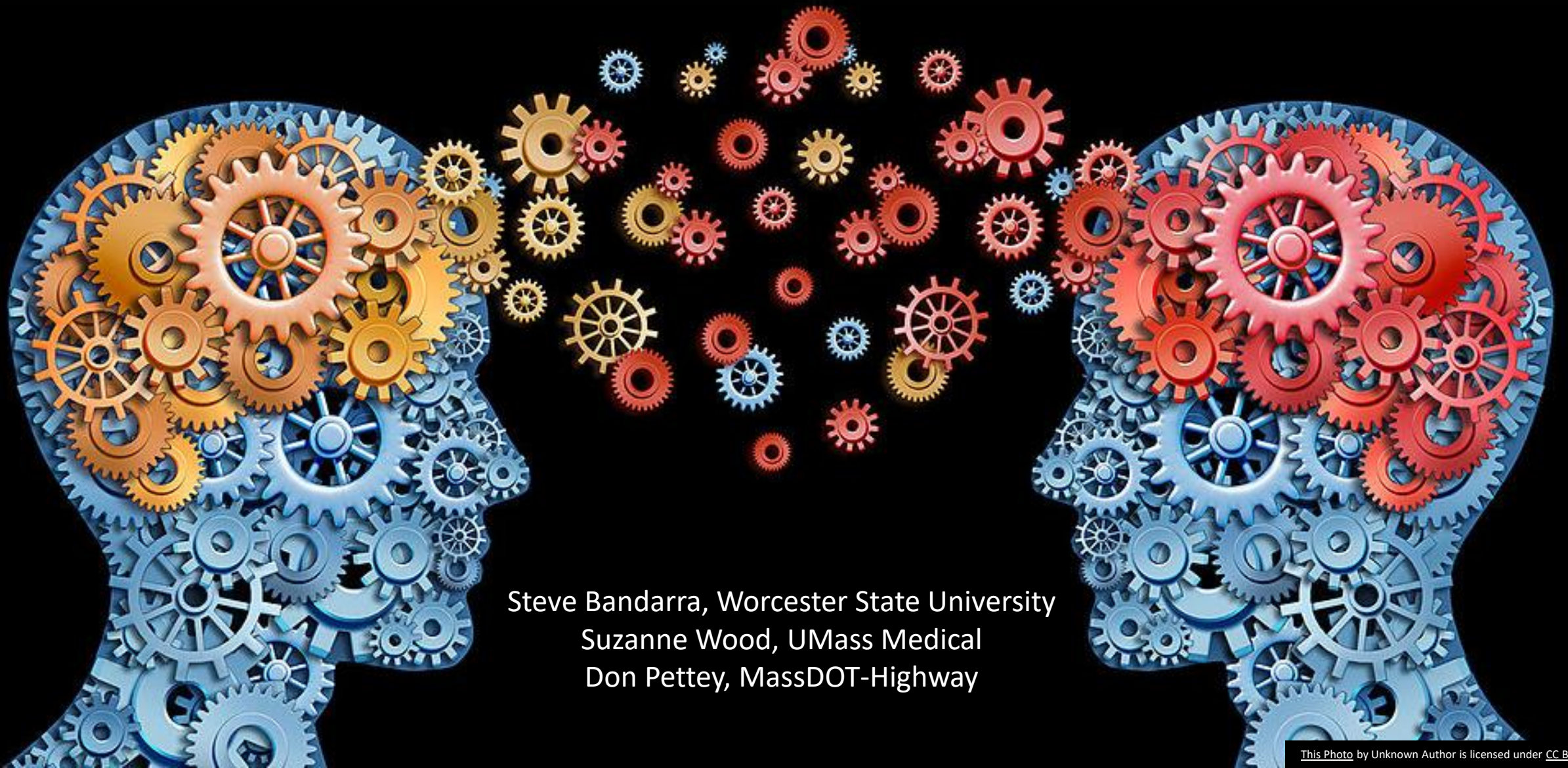
- EV charging scope of services template*
- Guidance for EV charging at state sites*
- EV charging procurement roadmap*
- Biofuels one-pager*
- Water conservation one-pager*

Executive Order 594

- Webinar recordings
- Overview document
- Various guidelines*
- Staff summary/primer*

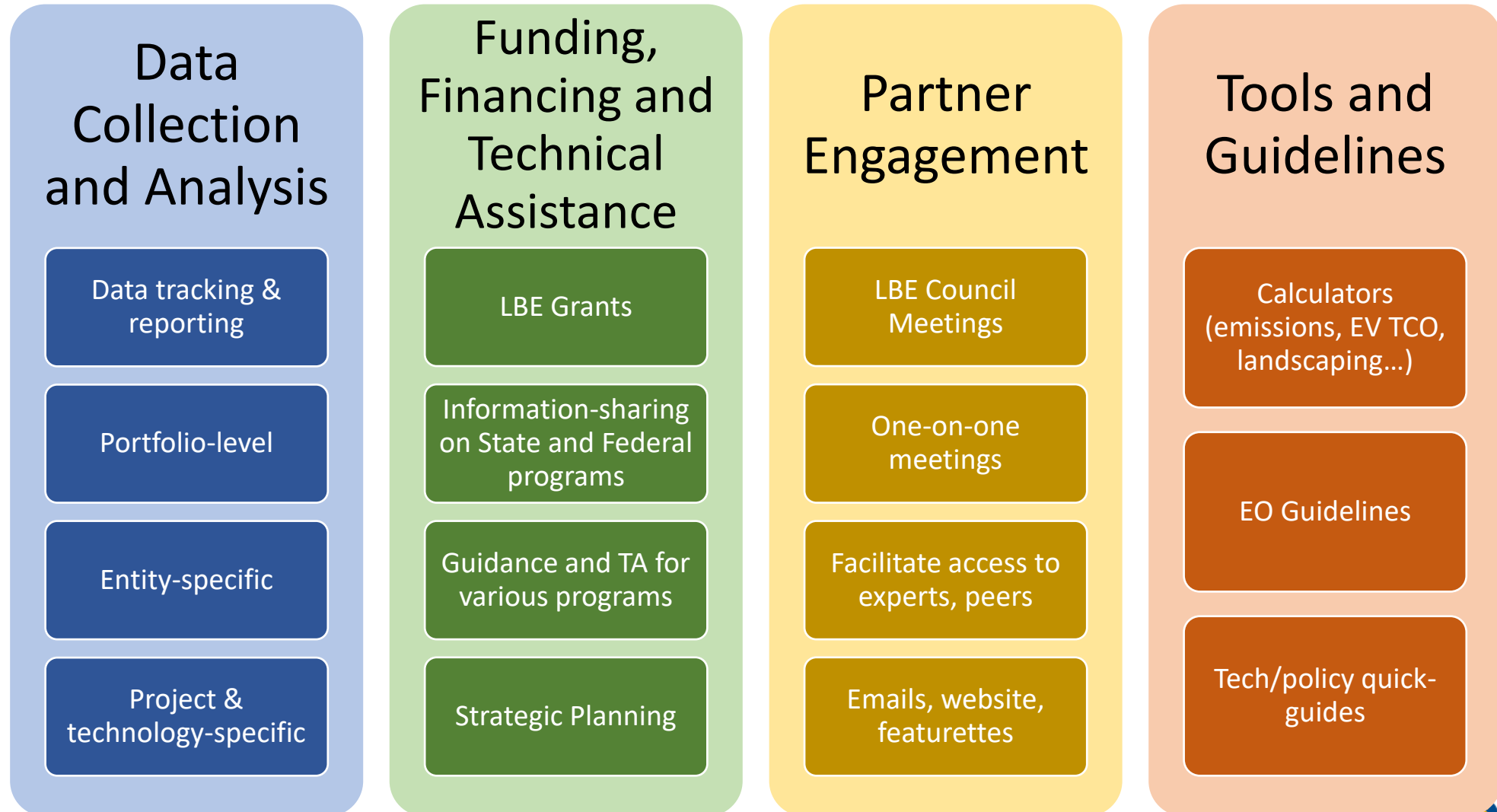
*in development

Partner Perspectives



Steve Bandarra, Worcester State University
Suzanne Wood, UMass Medical
Don Pettey, MassDOT-Highway

Four General LBE Work Areas



Breakout

(Into groups, not into a sweat...)

Breakout Group Objectives

We want to hear from you! Your input will help the LBE program design and provide the kinds of tools, resources, and assistance state entities will need as they work to implement strategies necessary to meet the goals of EO 594.

- We'd like your feedback on previous LBE program efforts, tools, and resources, and on how LBE staff can be most helpful to moving forward
- We want to know:
 - What tools have been the most useful?
 - What additional support should LBE be providing?
 - What type of support should LBE prioritize?
 - And if you're new – how can we be of service?

Breakout Group Format

- Choose your own adventure: Select your own group!
 - We will break out into four groups, each focused on one LBE work area
 - Share your thoughts on how LBE has been helpful in this area, what can be improved, what is missing
- After ~25 minutes, you will have the opportunity to switch to a new room and new topic

SELECT YOUR BREAKOUT ROOM

Data
Collection
and Analysis

Funding and
Technical
Assistance

Partner
Engagement

Tools and
Guidelines



Please turn cameras on while in small groups!

Breakout Discussion Report-Out



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

Next LBE Council Meeting

Save the Date!

Tentative:

Tuesday, Sept 14th
10:00 am–12:00 pm

Upcoming Tentative

Meeting Dates:

November 9th

January 11th

March 8th



"This afternoon we'll have a breakout session ...
but I wouldn't advise breaking out too far."