REGIONAL EV STRATEGY
EV Charging Station Fee and Policy Guidance, Vehicle-to-Everything Pilot Projects, and More

April 10, 2025

MAPC
METROPOLITAN AREA PLANNING COUNCIL

Today's Agenda

1:00-1:05 p.m.	**Welcome**	Alison Felix, MAPC
1:05-1:25 p.m.	**Public Level 2 EV Charging Station Fee and Policies Guide**	Mark Scribner, Massachusetts Executive Office of Energy and Environmental Affairs
1:25-1:55 p.m.	**MassCEC Vehicle-to-Everything Demonstration Projects**	Katie Peterson, Mobility House Elijah Sinclair, Massachusetts Clean Energy Center
1:55-2:00 p.m.	**MAPC Electric School Bus Roadmap**	Alison Felix, MAPC
2:00-2:05 p.m.	**E-Cargo Bikes in Greater Boston**	Marah Holland, MAPC
2:05-2:25 p.m.	**Municipal Updates**	Emma Zehner, MAPC
2:25-2:30 p.m.	**Updates and Resources**	Emma Zehner, MAPC

Public Level 2 EV Charging Station Fee and Policies Guide

Electric Vehicle (EV) Charging Station Owner-Operator Resource

Public Level 2 EV Charging Station Fees and Policies Guide

Mark Scribner, Policy Advisor for Transportation Decarbonization
Executive Office of Energy and Environmental Affairs (EEA)

About this guide

This guide, developed by the Electric Vehicle Infrastructure Coordinating Council (EVICC) Technical Committee, provides guidance for owner-operators of public Level 2 charging stations on setting EV charging rates to deliver optimal usage and a positive customer experience.

- Energy-based fee recommendations (vs. time-based) and rate-setting principles
- Idle ("parking") fee guidance to encourage turnover
- Benefits of balanced, reasonable pricing for all users
- Example fee ranges for energy and idle fees
- Best practices for signage and customer communication
- Overview of alternative fee types and considerations

Preview: Public Level 2 EV Charging Station Fees

Electric Vehicle (EV) Charging Station Owner-Operator Resource
Public Level 2 EV Charging Station Fees and Policies Guide

Appropriate usage and additional parking/idle fees at publicly accessible EV charging stations are necessary to ensure optimal usage of EV charging stations and positive customer experiences, both of which are vital to increased EV adoption. Below are typical EV charging structure types and principles for consideration in setting EV charging rates to deliver optimal usage and positive customer experience.[1]

Recommended Fee Types for EV Charging Stations

Energy-Based Charging Fee: A fee based on the total amount of electricity (measured in kilowatt-hours, kWh) used by the vehicle while charging; the fee amount may vary based on time of day. This fee type is preferred for its predictable revenue for station owner-operators and predictable cost to vehicle owners.

Idle Parking Fee: Additional fee charged if the vehicle stays plugged in after it's done charging. This fee type encourages drivers to move their cars once charging is complete and is considered a best practice.

Best Practices for Setting EV Energy-Based Charging Fees

Energy-based fees should be set carefully, balancing affordability for users with the need to cover costs and, as applicable, achieve revenue goals. Multiple factors should be considered when setting an energy-based fee, including local electricity rates, operational expenses, and the competitive landscape.

Benefits of Balanced (i.e., Not Too High or Low) Energy-Based Fees for EV Charging Stations

Benefits if the fee is not too low:
- Encourages drivers with access to home charging to primarily charge at home
- Helps ensure garage orphans (people without home charging) can access stations
- Reduces congestion so that public resources are available for drivers when needed (e.g., long trips, etc.)
- Financially supports the operation and maintenance of the charging station

Benefits if the fee is not too high:
- Increases site utilization percentage when rates are competitive compared with other options
- Enables garage orphans to transition to electric vehicles without being hindered by high charging costs

By setting energy-based fees thoughtfully, station owners can strike the right balance between affordability, utilization and optionally, profitability — ensuring sustainable and successful operation.

How to set an energy-based charging fee:

1. Start with Local Residential Electricity Rates: These rates provide a baseline for users' expectations since they are familiar with what they pay to charge their EVs at home and will likely continue to charge primarily at home if public charging rates are no less than their home charging cost.

2. Incremental Adjustment for Additional Costs: Charging station owners face additional costs beyond electricity, such as equipment maintenance, network fees, and property expenses. To account for these, the energy-based fee should be incrementally higher than residential rates—but not excessively so.

3. Avoid Extreme Pricing: Setting rates too low (e.g., below residential electricity rates) can impact the financial sustainability of charging stations and attract local drivers who would otherwise charge at home. Conversely, rates that are too high (e.g., significantly above residential rates) can deter EV drivers from using the station. High fees reduce station utilization and can lower total revenue despite the higher price.

1 *Signage at publicly accessible EV charging stations is also important to deliver these outcomes. Best practices on station signage design and language will be provided in a separate guidance document.*

Example 2024 EV Energy-Based Fee Range:

A reasonable range for energy-based charging fees in 2024 was **$0.30 to $0.40 per kWh**, depending on local electricity rates and site-specific factors. This range allows for sufficient cost recovery while remaining competitive and appealing to EV drivers. For a specific example calculation, see the supplementary guide *"Determining an Appropriate Energy-Based Charging Fee."*

Best Practices for Setting EV Parking/Idle Fees

Implementing parking or idle fees at EV charging stations encourages efficient use of charging infrastructure while promoting equitable access for all users. These fees are typically applied when vehicles remain parked beyond their charging session.

Benefits of EV Parking/Idle Fees

- Discourages non-charging EVs from parking in the spots
- Reduces congestion and supports quick turnover for better availability
- Increases public understanding of EV charging etiquette and proper use
- Aligns with sustainability goals by ensuring chargers are used more efficiently
- Ensures station owners are compensated for lost opportunity for charging revenue

Ultimately, parking/idle fees can help address issues such as charger congestion and availability, supporting responsible use of EV charging resources and financial sustainability for charging stations.

How to set a parking or idle fee:

A parking/idle fee should start after the vehicle is fully charged or after a preferred amount of charging session time (such as 2 to 6 hours). The fee should be set high enough to cover the lost charging opportunity cost (i.e., the energy-based charging fee converted into a typical per minute or hour amount). It should also be set above any parking fee for non-EV charging spaces, as applicable. This will encourage turnover and discourage drivers from misuse by parking fully charged for extended periods.

Example 2024 EV Parking/Idle Fee Range: $3.00-$12.00 per hour (levied typically as $0.05 to $0.20 per minute)

Best Practice:

Implement a grace period (e.g., 15-30 minutes) after charging is complete before the idle fee starts, so drivers have time to move their vehicles. Communicate fee change through signage / messaging. Consider potential adverse customer experience of high idle fees; use a daily cap of fees above example range.

Alternative Fee Types

There are alternative approaches to charging service fees, each with unique considerations and applications. Three common alternative fee types, their use case scenarios, and potential impacts are outlined below. These fees are not typically recommended unless there is a clear policy rationale, such as enabling novel applications.

- **Parking Time Fee:** How long the vehicle is parked and connected (charging or not) measured in minutes or hours. This fee is not tied to the amount of energy provided, creating potential inequities between charging and equivalent gasoline costs based on an EV's charging capabilities.

- **Connection Fee:** A set fee for connecting to the charger, no matter how much energy you use or how long you charge. This fee type can discourage use.

- **Flat Fee:** A single fixed amount charged per session, regardless of time or the energy used. This fee can result in inconsistent charging revenue and inequities between charging and gasoline costs.

Examples of time-based and flat fees to book charging services are emerging and may be appropriate. Such fees should be clearly communicated and converted into likely or actual, after-the-fact energy-based fees.

Supplementary Document: Calculating Fees

This document provides an example calculation for setting fair and sustainable energy-based fees for EV charging stations.

- Consider local residential electricity rates as a baseline
- Factor in costs for maintenance and operations
- Avoid consumer rates that are too low or too high
- Suggested 2025 fee range: $0.30-$0.40 per kWh*
- Example calculation method provided step-by-step
- Balance financial sustainability with user attraction

*kWh = Kilowatt- hour, the measure of amount of electricity an EV uses

Preview: Determining an Appropriate Energy-Based Charging Fee

Determining an Appropriate Energy-Based Charging Fee

This document provides an example calculation for setting fair and sustainable energy-based fees for electric vehicle (EV) charging stations. An appropriate fee ensures financial sustainability for station owners while remaining attractive to EV drivers. Below are key points explaining the rationale and process for determining these fees.

Key Points

- **Align with User Expectations:** Start with local residential electricity rates to establish a baseline, as EV drivers compare public charging costs to home charging.
- **Account for Operating Costs:** Incrementally increase fees above residential rates to cover additional expenses, including maintenance, network fees, and site costs.
- **Maintain Balance:** Avoid rates that are too low, which could attract home chargers and impact station sustainability, or too high, which could deter users and reduce utilization.
- **Target Range:** A suggested range for 2025 is $0.30 to $0.40 per kWh, balancing cost recovery with competitiveness.

Sample Calculation: Setting an Energy-Based Charging Fee

To determine an appropriate per kWh fee:

1. Start with Local Residential Electricity Rates
Massachusetts average residential electricity rate (2024): $0.29 per kWh

2. Add Incremental Adjustment for Costs
Estimate additional costs (e.g., maintenance, network fees, property expenses)
Incremental adjustment: $0.08 per kWh.*

**How was this estimated?*

1. **Annual Costs:** Include network fees ($1,200) and maintenance ($500) totaling **$1,700 annually.**
2. **Projected Energy Sales:** Assume **12.5% average utilization** for two Level 2 chargers (7.2 kW) operating eight (8) hours/day combined, resulting in **21,024 kWh/year.**
3. **Incremental Adjustment Formula:** Divide total costs by annual energy sales to calculate the adjustment per kWh.

$$\text{Incremental adjustment} = \frac{\text{Total Additional Costs}}{\text{Annual Energy Sales}}$$

Formula:

3. Calculate Total Energy-Based Fee
Add the residential rate to the adjustment:
Charging fee = 0.29 + 0.08 = $0.37 per kWh

4. Confirm Alignment with Recommended Range
The calculated fee of $0.37 per kWh falls within the reasonable 2024 range of $0.30 to $0.40 per kWh.

Summary

Setting an appropriate per kWh charging fee ensures a balance between cost recovery and user appeal. A well-calculated fee, like $0.37 per kWh, enables station owners to cover operational costs, attract EV drivers, and encourage public charging use. By aligning fees with user expectations and site-specific needs, operators can promote EV adoption and maintain financial sustainability.

New EVICC resources links page!

Electric Vehicle (EV) Charging Station Owner-Operator Resources

- **Public Level 2 EV Charging Station Fees and Policies Guide**
  - This guide, developed by the EVICC Technical Committee, provides guidance for owner-operators of public Level 2 charging stations on setting EV charging rates to deliver optimal usage and a positive customer experience.
- **Determining an Appropriate Energy-Based Charging Fee**
  - This document provides an example calculation for setting fair and sustainable energy-based fees for EV charging stations.

Additional EVICC guidance in the works

Additional EVICC guidance documents over the next year, including:

- User / EV driver centric version of EV charging fees guidance
- Publicly owned, public Level 3 (DCFC) fees guidance
- Signage, enforcement, siting and design best practices
- EVSE* hardware, software and maintenance plan selection
- Additional guidance documents based on suggested topics

EVSE = Electric Vehicle Supply Equipment = the “charging unit”

Thank you! – Q&A

Contact: mark.r.scribner@mass.gov

Vehicle-to-Everything Demonstration Projects

MassCEC Vehicle-to-Everything Demonstration Program

General Overview

MASSACHUSETTS CLEAN ENERGY CENTER®

About MassCEC

MassCEC funds climate solution innovation to meet Massachusetts' emission reduction goals while growing the state's clean energy economy.

Upcoming Programming

- The Electric Vehicle Infrastructure Coordinating Council awarded MassCEC $38M of ARPA funding in 2024 to increase access to charging infrastructure for various sectors

ON-STREET CHARGING SOLUTIONS

Can include pole-mounted chargers, street light chargers, and curbside charging

VEHICLES-FOR-HIRE EV CHARGING SOLUTIONS

Deploying DCFC charging stations for Transportation Network Company (TNC) and taxi drivers

MEDIUM- AND HEAVY-DUTY MOBILE CHARGING

Deploying mobile charging stations for medium- and heavy-duty fleets

VEHICLE-TO-EVERYTHING DEMONSTRATIONS

Deploying bidirectional chargers to reduce grid load

MassCEC V2X Demonstration Program

➤Program Overview:

- $6.3M grant awarded to deploy demonstration V2X charging systems across Massachusetts in 2025-2026
- Deployment of V2X charging systems across vehicle classes and use-cases
  - Residential
  - Commercial Fleets
  - School Bus Fleets

➤Program Timeline:

- Participant selection period: Now – Aug 2025
- EVSE installation: Aug – Dec 2025 (expected)
- EVSE Operation and Data Collection: Jan - Dec 2026
- Publication of a public-facing V2X Guidebook: Dec 2026

resource innovations

THE MOBILITY HOUSE

B2Q

VOLTREK
POWERING YOUR JOURNEY

CONVERGE STRATEGIES

What is V2X (Vehicle to Everything)?

V2X takes advantage of the fact that newer Electric Vehicles can both charge and discharge power. Examples are:

- Off-Grid (Islanded, vehicle is not connected to the grid)
  - V2H: Vehicle to Home | V2B: Vehicle to Building: Vehicle provides back up power during a blackout situation (when the home or building is not grid-connected)
  - V2L: Vehicle to Load: Vehicle can be used as a power source when away from a building for small loads
- On-Grid (Grid-parallel, vehicle is connected to the grid through an inverter)
  - V2G: Vehicle to Grid
  - Vehicle can provide back up when the home or building is grid-connected
  - Can be used to reduce load on grid during peak times

How can V2X Be Used?

Use Case Type Examples	V2X	Description
Resilience Hub	V2B	In a solar-integrated set up, using the vehicles batteries to power a community resource such as a cooling center
Backup power during blackouts or power safety shutoffs	V2H	Using the vehicles batteries as backup power for the home
Fleet Demonstrations	V2G	Scheduling charging/discharging for fleets in line with peak electric events, best for fleets with highly predictable loads
Decreasing strain on the grid during peak electric events	V2G	Using the vehicles batteries to power some part of the home or building's load during a peak event, reducing the house's draw on the grid
Reduction in peak demand	V2G	Reducing the peak demand for a house or building by discharging to the home during usual peak periods Most applicable for commercial use cases and would need integration with building energy management systems
Decreasing strain on the grid during peak electric events	V2G	Using the vehicles batteries to feed directly into the grid during a peak event

V2G EV Fleet Deployments

Program includes funding for:

- V2G charging stations & warranties
- Charging management software & services for 5 years
- Design & engineering work
- Construction & installation
- Utility upgrades & interconnection fees

Additional Benefits:

EV fleets will have the option to be enrolled in local utility’s V2G program and earn revenues in exchange for discharging energy from EVs*.

**without disruption to fleet operations*

MASSACHUSETTS CLEAN ENERGY CENTER®

Eligible EVs and Funded Equipment

➤ The list of residential bidirectional chargers that are fully funded for the program include:
- dcbel Home Energy Station
- Sunrun Home Integration System and Ford Charge Station Pro
- DG Matrix Power Router
- Enphase IQ Bi-Directional EV Charger

➤ The list of commercial bidirectional chargers that are fully funded for the program include:
- InCharge ICE-22/44/66 V2X chargers
- Tellus V2G DC Fast Charger
- Heliox 44kW V2G Charger

YOU QUALIFY IF YOU OWN, LEASE, OR OPERATE THE FOLLOWING ELECTRIC VEHICLES:

- 2021+ Thomas Built Electric School Bus
- 2021+ BYD Electric School Bus
- 2021+ IC Bus Electric School Bus
- 2021+ Blue Bird Electric School Bus
- 2021+ Micro Bird Electric School Bus

- 2022+ Ford F-150 Lightning
- 2013+ Nissan Leaf

Don’t see your EV? Check back often - more will be qualified soon!

V2G Compensation Structures

- We will help participants enroll in the utility **Connected Solutions** Program
  - "Participating customers receive an incentive every year based on the performance of their battery system at a rate of $275 per kW performed between June 1 and September 30. On average, customers have received $1,500 per year."
  - Residential V2G pilots in MA have earned as much as $3000/yr through this program
  - A 2023 V2G electric school bus pilot in Beverly, MA participated in 30 events, deploying ~7 MWh of energy between 2 buses.
- We are still exploring other use cases and incentives such as Clean Peak and new Virtual Power Plant programs slated for development in compliance with Massachusetts DPU Order 24-10, 24-11, and 24-12 (ESMPs), and the MMWEC's Connected Homes program.

Program Selection & Participation

Planning & Analysis | **Construction*** | **Operations**

Program recruitment:
Now – Aug 25

Data collection period:
EVSE commissioned – Dec 26

Feb25
Expression of Interest

Apr25
Application Release

B2Q
Site Visit & Feasibility Assessment

Selected for Program
Fleet signs Terms & Conditions

B2Q
Engineering Drawings Completed

B2Q
Charger Procurement & Project Permitting

B2Q
Schedules & Completes Installation

Inspection & Utility Interconnection
By local utility & authority having jurisdiction
nationalgrid
EVERSOURCE
MMWEC
MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY
Public Energy Partners
Unitil
energy for life

Site & Charger Energization
B2Q

Data Validation & Collection
(ends Dec 2026)

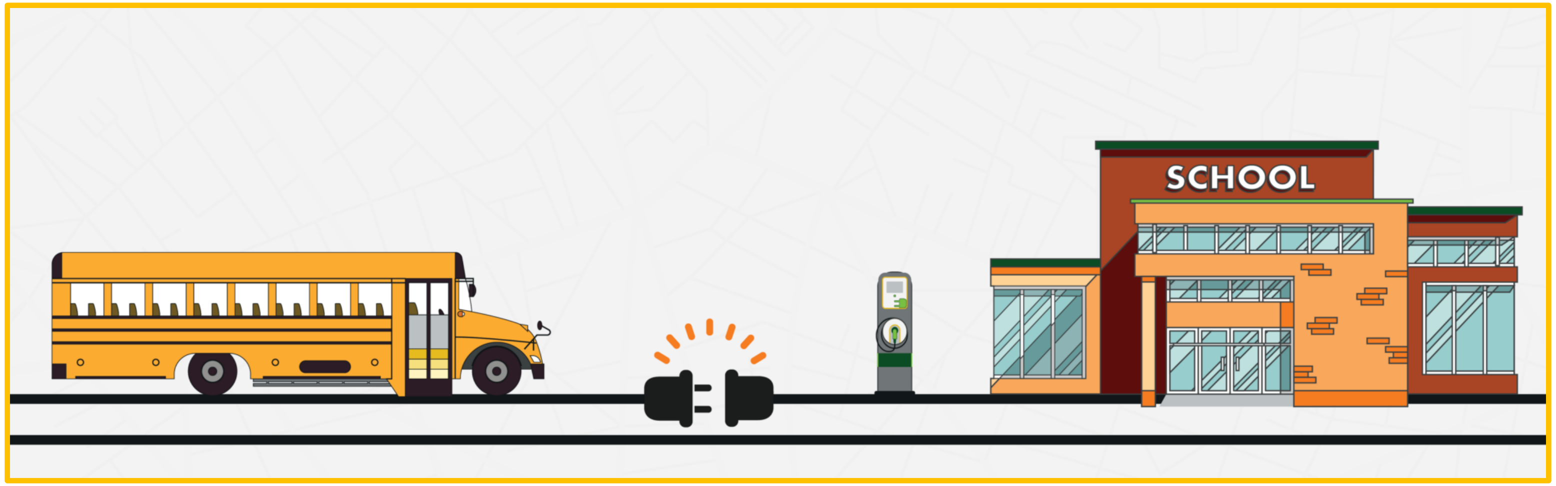
Ongoing Operational Support
5-year subscription to ChargePilot software

Legend
- Mobility House
- B2Q
- Milestone

*Construction timeline dependent upon utility, AHJ, and equipment lead times.

Apply Now!

MAPC Electric School Bus Roadmap



Electric School Buses: A Roadmap

RESOURCE DEVELOPED BY MAPC

MAPC

What is this?

A guide for school districts and municipalities to start planning for an effective and efficient transition to electric school buses.

It highlights the essential steps that school districts and municipalities should take.

Provides many links to resources that decision-makers can use to learn more about making this transition.

What is in this?

- Why Electric School Buses?
- ESB Ownership and Operation Models
- Conducting a Fleet Assessment
- Selecting Charging Infrastructure
- Site Selection and Planning
- Workforce Training
- Operations, Maintenance, and Safety
- Funding and Financing
- Procurement

How could I use this?

- Review Resources and Case Studies
- Work with Utilities
- Total Cost of Ownership (TCO) Calculators
- Connect with Peers and Experts

Check out the new resource here:

https://www.mapc.org/resource-library/electric-school-buses/

MAPC

We would like to express our gratitude and acknowledgment to the following organizations for their contributions to the development of this resource: *Eversource, Green Energy Consumers Alliance, Highland Electric Fleets, Massachusetts Clean Energy Center (MassCEC), National Grid, Operational Services Division (OSD), and the World Resources Institute.*

E-Cargo Bikes in Greater Boston

E-Cargo Bikes: Strategies for Municipal Delivery Transition

Resource developed by MAPC and the City of Boston, funded by the Massachusetts Clean Energy Center (MassCEC)

What is this?

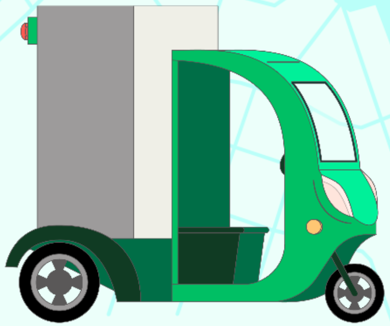
- A summary of the benefits of using e-cargo bikes for local deliveries
- An overview of Boston Delivers, the City of Boston's e-cargo bike delivery pilot program
- A toolkit for municipalities with strategies for how to support and expand the use of e-cargo bikes for local deliveries of food and goods
- Examples of to e-cargo bike delivery initiatives locally, nationally, and internationally

Who could use this?

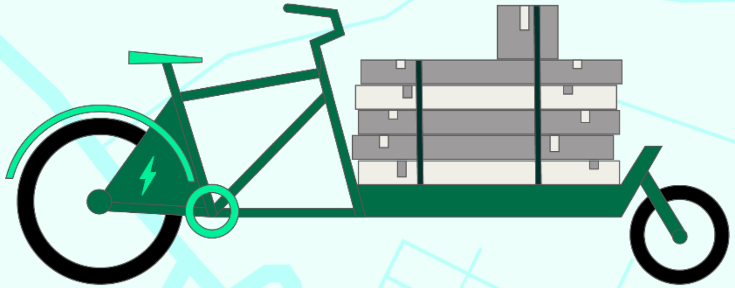
- Municipal staff (target audience)
- Elected Officials
- Advocacy organizations
- Local businesses and business associations
- Anyone who is interested in e-cargo bike deliveries!

How could I use this?

- Review strategies municipalities can adopt to support e-cargo bike deliveries
- Determine which of these strategies align with local sustainability and mobility goals
- Review examples of how other municipalities have implemented these strategies
- Connect with MAPC to learn more and/or create a plan for implementation



Check out the new resource here: mapc.org/resource-library/e-cargo-bikes



Join Us to Learn More!

Join us for a Webinar:

E-Cargo Bikes: Strategies for Municipal Delivery Transition

May 15th, 1:00pm-2:00pm

Register Here:

https://us06web.zoom.us/meeting/register/BrB6FIZbQWyZLMx7NkROcg#/registration

Municipal Updates

Updates and Resources

EV Procurement Strategies Under 30B and Statewide Contracts

Office of the Inspector General's OIG Academy is hosting three free online courses on procurement strategies for Electric Vehicles and Charging Infrastructure under 30B and Statewide Contracts.

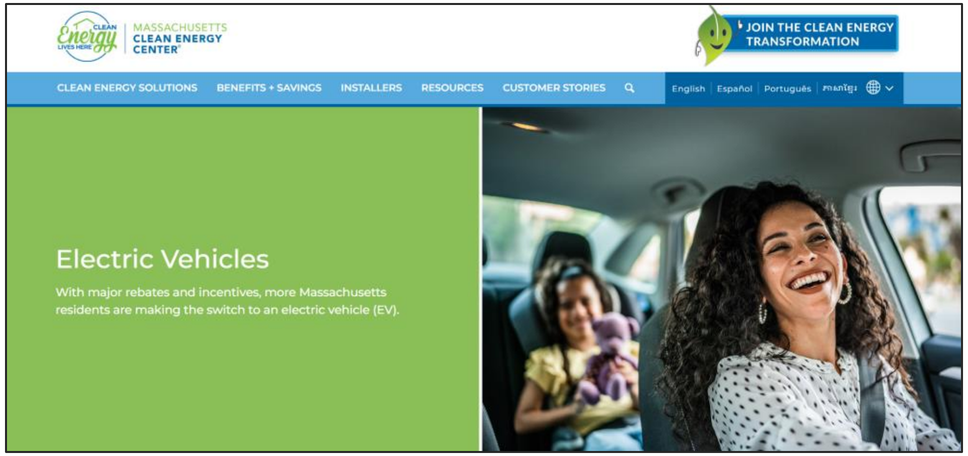
- ~~**Friday, April 4** | 10:00 – 11:30 AM~~ – session passed
- ~~**Thursday, May 15** | 10:00 – 11:30 AM~~ – seats filled
- **Tuesday, June 17** | 10:00 – 11:30 AM

Register: https://maoigacademy.geniussis.com/catalog/course/61/electric-vehicles-electric-vehicle-charging-infrastructure-purchasing-strategies-under-30-b-and-statewide-contracts/sections

New MassCEC Electric Vehicle Information Page

- Dedicated webpage to help Massachusetts residents find relevant information about electric vehicles
- Provides information on operating costs by vehicle type, charging station information, available rebates and incentives
- New call center to answer electric vehicle-related questions and more

https://goclean.masscec.com/clean-energy-solutions/electric-vehicle/



Have questions for our team of EV experts?

Call 888-391-4959 or email EV@masscec.com.
We have translators for **250+ languages**, so all are welcome to call or email.

Our Hours Monday – Friday | 8 A.M. to 5 P.M. EST

Green School Works Implementation Grant

MassCEC is now accepting applications for its Green School Works Implementation Grants

- **Focus:** projects that improve energy efficiency, reduce carbon emissions, or mitigate the impacts of climate change
- **Funding:** $52.5 million, with awards ranging from $50,000 to $5 million
- **Deadline:** April 30
- **Eligibility:** K-12 schools in Massachusetts that serve a student population that is at least 40% low income in at least one of the last three school years are eligible to apply

Source: MassCEC.

Learn more:

- Attend virtual office hours

VEH122 – Advanced Vehicle Technology Equipment, Supplies and Services

The Operational Services Division (OSD) is soliciting bidders for a wide range of vehicle technology equipment and services.

Category 1: Electric Vehicle Supply Equipment (EVSE), Hardware, Software, and Ancillary Services

Category 2: Idle Reduction Technology

Category 3: Alternative Fuel and Technology Conversions

Category 4: Electric Vehicle Supply Equipment (EVSE) Operation and Maintenance

Monday, April 14, 1-2pm – Pre-Bid Conference

Tuesday, June 3 at 2pm – Bid Opening Date

This contract will replace VEH102 – Advanced Vehicle Technology Equipment, Supplies and Services

For more information on the request for responses and contract requirements, please refer to this link here.

What is Charging Smart?

Charging Smart provides no-cost technical assistance and national recognition to local governments to facilitate the adoption of electric vehicles (EVs) and EV charging for their residents and businesses.

CHARGING SMART

NATIONALLY DISTINGUISHED. LOCALLY POWERED.

- **Learn More:** visit energy-ready.org/charging-smart
- **Interest Form:** https://energy-ready.org/join
- **Contact:**

Catelyn Sweeney | Program Manager
catelyns@irecusa.org

Ed Gilliland | Senior Program Director
edg@irecusa.org

IREC

Charging Smart Action Categories

- Planning
- Government Operations
- Regulation
- Education and Incentives
- Utility Engagement
- Shared Mobility

Wrap Up & Next Steps

Next Meeting Thursday, June 26 – 1-2:30pm

Topics Include:

- **EV Fire Safety – National Fire Protection Association**
- **Guide to the Equitable Siting of EV Charging Stations - EEA**

If you aren't already on our invite list, please email **ezehner@mapc.org** to be added for future meetings.

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METROPOLITAN AREA PLANNING COUNCIL