



Green Communities Division  
Webinar

May 31, 2016

1

COMMONWEALTH OF MASSACHUSETTS

Charles Baker, Governor  
Karyn Polito, Lieutenant Governor  
Matthew Beaton, Secretary  
Judith Judson, Commissioner

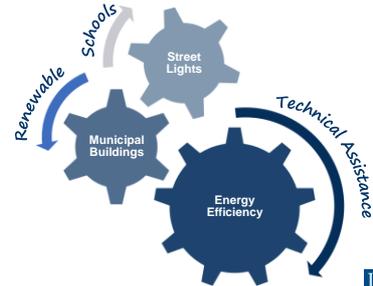
**Electric vehicles and  
Grants for Cities and Towns**

Webinar presenters

Stephen B. Russell  
Alternative Transportation  
Department of Energy Resources  
Sejal Shah  
Environmental Analysis  
Department of Environmental Protection

**Green Communities Division**

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



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2

**Outreach - 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: Jim Barry  
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3

**Green Communities Division -  
Programs & Resources for Municipalities**

- Green Communities Designation and Grant Program
- MassEnergyInsight energy tracking and analysis tool
- Municipal Energy Efficiency Assistance
- Energy Management Services Technical Assistance
- Mass Municipal Energy Group (MMEG)
- Website filled with tools & resources:  
[www.mass.gov/energy/greencommunities](http://www.mass.gov/energy/greencommunities)

Email updates via e-blasts – Sign up by sending an email to:  
[join-ene-greencommunities@listserv.state.ma.us](mailto:join-ene-greencommunities@listserv.state.ma.us)



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4

**Recording & Presentation**

- The webinar is being recorded and will be available on our website in approximately 48 hours at:  
<http://www.mass.gov/eea/energy-utilities-clean-tech/webinars.html>
- Click on the camera icon top right of your screen to save any slides for future reference
- Use the Q & A icon on your screen to type in questions
- The slide presentation will also be posted at:  
<http://www.mass.gov/eea/energy-utilities-clean-tech/webinars.html>



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5

**GREEN COMMUNITIES  
Criteria 4**

- Communities must purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practicable.
- The purpose behind this criterion is to reduce carbon dioxide emissions by municipal vehicles, which has a positive impact on the environment and saves the municipality money.



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6

## Why BEVs (Battery Electric Vehicles)

- Better for the environment
  - Reduce carbon emissions, even when energy is sourced from coal
  - Help the nation transition to renewable energy
  - Reduce use of oil, transmission fluid and other hazardous fluids
  - Cut noise pollution
  - Fun to drive
- Energy independence
  - Keep our energy dollars here
  - Keep and grow jobs here
  - Stabilize transportation costs
- Future benefits
  - Use of "smart grid" during peak demand
  - Used batteries for a second life as an uninterrupted power supply



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7

## Poll Question

- Have you ever driven an electric vehicle?
  - Yes
  - No
  - Not Sure

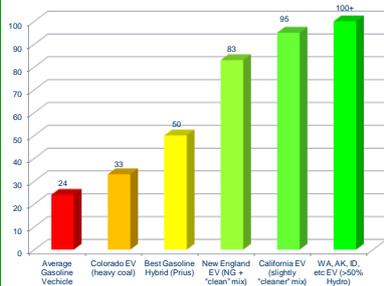


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8

Mile Per Gallon of Gasoline versus Equivalent of Electric Vehicles on a Carbon Emission Basis



Summary: Electric cars will reduce greenhouse gases and other emissions, even if the source of electricity is mostly coal, a 2007 study by the Electric Power Research Institute (EPRI) and NRDC showed. There have been some 30 such studies, analyses and presentations on this topic that all reach similar conclusions.



Source: Union of Concerned Scientists, 2014

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9

## BEVs and PHEVs available today for Sale

BEV= Battery Electric Vehicle



Nissan Leaf  
100 mile range

Ford Focus  
60 mile range

Smart  
60 mile range

PHEV= Plug in Hybrid Electric Vehicle



Ford C-Max Energi  
15 miles range and 100 MPGe

Chevrolet Volt  
50 mile range



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10

## Poll Question

- How many miles do your fleet sedan vehicles drive in a year?
  - 10,000 or less
  - 10,000 – 15,000
  - More than 15,000



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11

## These are the MOR-EV consumer rebate eligible vehicles:



www.morev.org



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12

## Charging the vehicle(fueling)

### Electric Vehicle Supply Equipment (EVSE):

- The conductors, attachment plugs, and all other equipment specifically installed to transfer energy between premises wiring and the electric vehicle, as well as exchange information.

Charging Level	Setting	Supply Power	Representative Example
AC Level 1	Residential/ Parking Lot 5 mi/hour @ 1.7 kW	120vac/20A (15A continuous)	
AC Level 2 (minimum)	Residential/ Commercial 10 mi/hour @ 3.4 kW	208/240vac/20A (15A continuous)	
AC Level 2 (maximum)	Commercial up to 60 mi/hour @ 19.2 kW	208/240vac/100A (80A continuous)	
DC Level 1	Commercial up to 500v @ 80Adc (up to) 120 mi/hour @ 40 kW	208vac/180vac 3-phase (input current proportional to output power; -20A-200A AC)	
DC Level 2	Commercial up to 500v @ 200Adc (up to) 300 mi/hour @ 100 kW	208vac/480vac 3-phase (input current proportional to output power; -20A-400A AC)	



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13

## Insights into Type and placement of EVSEs

EVSE Type	Positives (+)	Negatives (-)
<b>Level 1</b>	<ul style="list-style-type: none"> <li>Cheaper equipment, likely install</li> <li>Lower electricity demand</li> </ul>	<ul style="list-style-type: none"> <li>Up to 5 mi/hr @ 1.7kW 8 to 12 hours to charge a battery electric vehicles</li> </ul>
<b>Level 2</b>	<ul style="list-style-type: none"> <li>10-60 mi/hr @ 3.4-19.2 kW</li> <li>Charge multiple vehicles/day</li> <li>Option of managing load</li> </ul>	<ul style="list-style-type: none"> <li>More costly than L1 2 to 4 hours to charge a BEV 1 hour for PHEV</li> </ul>
<b>DC Fast Charging</b>	<ul style="list-style-type: none"> <li>120-300 mi/hr</li> <li>Flexible, good for emergencies</li> </ul>	<ul style="list-style-type: none"> <li>Expensive equipment and installation</li> <li>Can trip demand charges</li> </ul>

### Recommendations

- Generally, level 2 is preferred, DCFC may be more suitable in travel corridors
- Know your vehicles, charge power varies
- Promote workplace charging
- Identify public Level 2 charging hot spots
  - Workplaces (#1 venue), retail, and parking lots/garages get used the most



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14

## EVSE Unit and Installation cost

EVSE Type	EVSE Unit Cost Range*	Average Installation Cost (per port)	Installation Cost Range (per port)	Source
Level 1	\$300 - \$1,500	not available	\$0- \$600	NREL
Level 2	\$400 - \$7000	~\$4,000	\$650- \$17,000	CO & NY
DCFC	\$10,000 - \$40,000	~\$21,000	\$8,500 - \$48,000	INL (The EV Project)

Installation cost depends greatly on location.

Cost increases as the installation get further from the power source.



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15

## Poll Question

- Does your town/city/agency have EVs already in the fleet?
  - Yes
  - No
  - Not Sure



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16

## Where are all the EVSEs



Cambridge Street Boston



Simon Mall Braintree



Northampton Fire Department



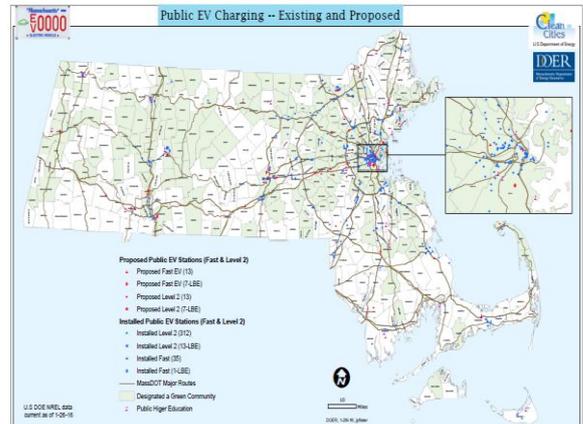
UMASS Amherst



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17



## Mass Electric Vehicle Incentive Program (MasseVIP): Fleets

- Official announcement on Earth Day 2013 in Greenfield and Chelmsford
- Provides incentive funding to Massachusetts entities to acquire:
  - Battery-electric vehicles (BEVs) – no ICE (Internal Combustion Engine)
  - Plug-in hybrid vehicles (PHEVs)
  - Level 2 dual head charging stations



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19

## MasseVIP: Fleets -- Eligible Entities

- Public Entities
  - Municipalities
  - Public Universities & Colleges
  - State Agencies



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20

## MasseVIP: Fleets -- Incentives

### Incentive:

- \*\$7,500 for battery electric vehicles (BEVs)
- \*\$5,000 for plug-in hybrids (PHEVs)
- \*\*Up to \$13,500 to acquire and install a Level 2 Dual Head Charging station



Melrose Charging Station

\* Acquisition = Purchase OR Lease

\*\*Entities must purchase at least one battery electric vehicle to receive incentive for charging station



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21

## MasseVIP: Fleets -- Program Requirements

- Will commit to using the vehicle in the Commonwealth for at least 36 months
- Entities must purchase at least one battery electric vehicle to receive incentive for charging station
- Charging station must be publicly accessible and space used specifically for electric vehicles



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22

## EVs on State Contract VEH98

Chevrolet Volt PHEV



Ford Fusion PHEV



Ford Focus BEV

Ford C-Max Energi PHEV



Nissan Leaf - BEV



Hyundai Sonata PHEV



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23

## EVs NOT on State Contract VEH98 BUT ELIGIBLE



Toyota Plug in Prius  
95 MPGE 12 mile battery



Smart For Two - BEV



Mitsubishi I-MiEV - BEV



VW E-Golf - BEV



Tesla - BEV



BMW i3 - BEV or PHEV



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24

## Where are the charging stations?



Level 2 at Braintree Town Hall



Level 2 New Bedford DPW Yard



Level 2 at Chelmsford Town Hall

To find Electric vehicle charging stations in Mass go to:  
<http://www.afdc.energy.gov/>



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25

## Poll Question

- Would you consider adding EVs to your fleet in the next 6 months?
  - Yes
  - No
  - Not Sure



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26

## MassEVIP: Fleets Application Process

- Application period: **FIRST COME FIRST SERVED**
- Complete and submit to MassDEP an Application Form
- Form and instructions found at:
  - [www.mass.gov/eea/agencies/massdep/air/grants/massevip.html](http://www.mass.gov/eea/agencies/massdep/air/grants/massevip.html)
- Applications are reviewed
- MassDEP will issue a Grant Approval within 30 days of receipt of a complete application
- Entity must sign an End-User Agreement
- Upon receipt of the signed End-User Agreement by MassDEP, entity has 180 days to acquire and install charging station



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27

## MassEVIP: Fleets Incentive Payment

### If Acquired through VEH98

- Incentive paid directly to Dealer
  - Copy of Registration
  - Copy of Invoice

### If **NOT** Acquired through VEH98

- Incentive Reimbursed to Applicant
  - Copy of Registration
  - Copy of Invoice



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28

## MassEVIP: Fleets -- SO FAR

Through April 30, 2016, awarded ~\$1.4 million:

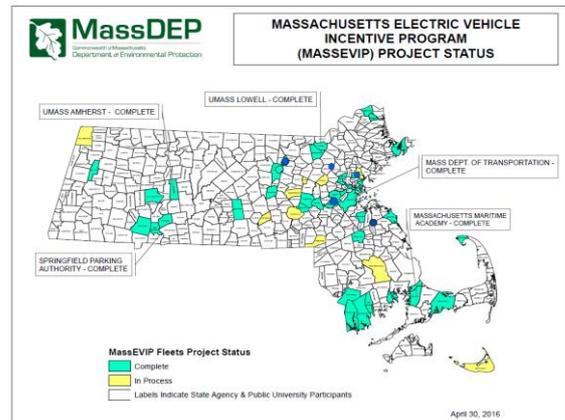
- 45 separate entities
- Vehicles and Charging Stations Awarded
  - 36 Plug-In Hybrid Vehicles (PHEVs)
  - 104 Battery Electric Vehicles (BEVs)
  - 44 Level 2 Dual Head Charging Stations



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29



## Contacts

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- For information on the MassEVIP grant program contact: Ms. Sejal Shah –  
E-Mail: [sejal.shah@state.ma.us](mailto:sejal.shah@state.ma.us)  
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