



**DTE Energy®**

# **MPSC Technical Conference – Charging the Future of Michigan**

**February 20, 2018**



## Benefits of EVs

---

- **EV owner** savings through reduced fuel and maintenance costs
- Load growth and affordability benefits to **utility customers**
- **Social benefits** of:
  - Reduced CO2 emissions
  - Reduced dependency on foreign oil
  - Economic development in Michigan & local development impact



## Our Role

---

- ✓ **Help** bring about the benefits of transportation electrification to the public at large
- ✓ **Mitigate** unnecessary grid investments caused by ad-hoc fast charging station deployment
- ✓ **Improve** our understanding of EV load and its impact on the grid
- ✓ **Provide** opportunity to pilot managed charging programs and integration with new technologies

# DTE EV-Related Activities

	Objective	Implementation	
<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p><b>1</b></p> <p><b>Ramp up and refine our current efforts</b></p> </div>	<p><b>Improve the EV experience</b> for both residential and commercial customers</p>	<p>2018</p>	<p><b>Scope of today's presentation</b></p>
<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p><b>2</b></p> <p><b>Deploy near-term pilots</b></p> </div>	<p><b>Develop and test concepts and gain key insights</b> into both EV-grid integration and consumer preferences</p>	<p>2018</p>	
<div style="border: 1px solid black; padding: 10px;"> <p><b>3</b></p> <p><b>Implement a sustainable program</b></p> </div>	<p><b>Grow EV adoption in Michigan</b> that benefits all customers</p>	<p>2019-2021</p>	

# 1 Ramp up and refine our current efforts

Key Activity	Description	EV Driver Experience	Site Host Experience
<b>Charger Inquiry Experience</b>	Improve the experience for charging station installation inquiries at the call center and beyond	✓	✓
<b>EV Education &amp; Awareness</b>	Redesign the DTE EV website <sup>1</sup> and launch an EV campaign	✓	✓
<b>EV Dealer Partnerships</b>	Facilitate workshops to increase knowledge of sales people and address sale pain points	✓	
<b>Market Intelligence</b>	Conduct information gathering with account managers to gauge charging station interest of potential site hosts <sup>2</sup>		✓
<b>Engineering Standards</b>	Pre-define specifications for charging stations to ease installation process		✓

1. See reference material for examples of new web tools coming soon

2. See reference material for examples of potential site hosts

## 2 Deploy near-term pilots

### Category

### Planned Pilots

### Partners



#### Load Management

- Demand Response
- Battery Storage



#### Downtown Charging Showcases

- Ann Arbor
- Detroit



#### Corridor Fast Charging

- Corridor Station
- Extreme Fast Charging





## Demand Response Demonstration



### Issue

Need to test and understand the value demand response (DR) from an EV can bring to the grid



### Solution

Develop and agree a DR pilot with Ford to shift load and quantify potential peak-shaving value



### Features

- Aggregating software portal created by Ford and other OEMs within the EPRI working group<sup>1</sup>
- Using Ford employees to start



### Partners



## Battery Storage Integration



### Issue

Fast charging draws significant power from the grid and could become an issue during peak hours



### Solution

Test battery storage with one make-ready fast charging station to learn the cost-benefits of storage-EV integration



### Features

- Battery storage integration with a fast charging station in an area of critical capacity



### Partners

TBD - site host and battery storage technology provider

1. BMW, Daimler, FCA, Honda, Nissan, and Toyota

# Downtown Charging Showcases



## Downtown Detroit



### Issue

There is currently no fast charging available anywhere in Detroit



### Solution

A downtown fast charging hub and EV promotional space



### Features

- Make-ready infrastructure
- Multiple fast chargers in one place
- New EV model display
- Community social space



### Partners



## Downtown Ann Arbor



### Issue

Ann Arbor has the highest EV density in DTE territory, but limited fast charging



### Solution

A downtown fast charging showcase with three fast chargers in a high-traffic area



### Features

- Make-ready infrastructure
- Multiple fast chargers in one place
- Co-branded City of Ann Arbor / DTE



### Partners





## Highway Charging Station



### Issue

EV drivers need to be able to quickly refuel their vehicles on long road trips



### Solution

Fast charging station partnership with an existing business near a main highway exit



### Features

- Make-ready infrastructure
- “Gas station” refueling model



### Partners

TBD - private company (i.e., gas station, retail establishment, etc.) through an open solicitation process

## Extreme Fast Charging



### Issue

Extreme fast charging is not yet ready for wide-scale deployment



### Solution

Collaborative effort to test and develop 400 kW charging (pending DOE award)



### Features

- Testing and development for charger, EV battery, and grid impacts
- Multi-phase approach






### Partners





# Pilot Key Objectives & Learnings

	<b>Key Objective</b>	<b>Targeted Learnings</b>
	<b>Test the Market</b>	<ul style="list-style-type: none"><li>• Gauge site hosts' level of interest</li><li>• Refine cost estimates for make-ready infrastructure model</li><li>• Develop process guidelines for future deployments</li><li>• Understand level of customer interest in EVs</li></ul>
	<b>Learn about EV Load and Grid Impact</b>	<ul style="list-style-type: none"><li>• Understand customer charging behavior, especially during peak times</li><li>• Analyze station utilization and impacts on grid during peak times</li><li>• Determine best approach to manage peak impact</li></ul>
	<b>Understand the Costs and Benefits of Managed Charging Programs</b>	<ul style="list-style-type: none"><li>• Evaluate customer responsiveness to demand response parameters</li><li>• Quantify value of battery storage integration as an alternative to infrastructure investment</li></ul>

## Reference Material

# Examples of New Website Tools<sup>1</sup>

**Redesigned EV website is projected to launch by April 1<sup>st</sup>**

### Rate Plan Choices

**EV rate plans: at the intersection of convenience and savings**  
DTE Energy offers different rate plans that can deliver serious benefits to EV owners. Choose the plan that's best for you and your EV.

EV Home Page

- Cost Savings
- Rate Plan Choices**
- Ownership Benefits
- Electric Vehicle Types
- Charging
- Charger Installation
- PlugShare Locator Map
- More Resources
- EV Help
- Dealer Info

Residential  
\$1,894 a year

EV Plan  
\$1,832 a year  
Requires installation of an additional EV-dedicated electric meter.

Rate

\$624

\$1,264

\$572

\$1,264

### Ownership Benefits

**How EVs benefit you and your community.**  
Your decision to go electric can have a big and positive impact on the environment, as well as our local economy.

EV Home Page

- Cost Savings
- Rate Plan Choices
- Ownership Benefits**
- Electric Vehicle Types
- Charging
- Charger Installation
- PlugShare Locator Map
- More Resources
- EV Help
- Dealer Info

**Fewer Emissions**  
Producing few to zero emissions compared to traditional gasoline vehicles.

**Low Life-Cycle Emissions**  
As DTE Energy continues to invest in gas and renewables, you can reduce your carbon footprint by driving an electric vehicle.

**Less Fossil Fuel**  
EVs use far less fossil fuel than a \$1 worth of fuel, gas or diesel.

**Energy Independent**  
The energy you use in your home helps lower our nation's dependence on being pumped into our country.

**Traffic Noise Reduction**

### How to Charge Your EV

**Charging is easy.**  
Charging your EV couldn't be simpler. Just plug it in like you would your mobile phone! EVs can be charged with a standard electric wall socket when you use the charger that came with your EV or you can charge at a faster speed with a level 2 charger.

EV Home Page

- Cost Savings
- Rate Plan Choices
- Ownership Benefits
- Electric Vehicle Types
- Charging**
- Charger Installation
- PlugShare Locator Map
- More Resources
- EV Help
- Dealer Info

**Power/Outlet**

Level 1 (Basic)  
1 hour of charging will fully charge a 60 kWh battery pack. Level 1 chargers come with your EV.

Level 2 (Fast)  
1 hour of charging will fully charge a 60 kWh battery pack. Level 2 chargers are available at many public charging stations.

Standard home charging outlet (120V AC)

Where to Find

Your level 1 charger is portable. Plug it in wherever you have a standard 120V AC outlet.

### Electric Vehicle Types

**Find the EV that's right for you.**  
Drivers today have lots of EVs to choose from, and each offers a wide range of performance and pricing options. Regardless of your driving habits, there's an EV model that fits your lifestyle.

EV Home Page

- Cost Savings
- Rate Plan Choices
- Ownership Benefits
- Electric Vehicle Types**
- Charging
- Charger Installation
- PlugShare Locator Map
- More Resources
- EV Help
- Dealer Info

**Battery Electric Vehicle (BEV)**  
Battery powered electric motor only. Plug in to charge.

**Plug-in Hybrid Electric Vehicle (PHEV)**  
Battery powered electric motor with plug-in charging plus an internal combustion engine.

**Hybrid Electric Vehicle (HEV)**  
Battery powered electric motor plus a gas-powered combustion engine that works.

**Gas-powered Vehicle**  
A traditional internal combustion engine powered by fossil fuels.

Power source	BEV	PHEV	HEV	Gas
Plug-in	✓	✓	-	-
Battery	✓	✓	✓	-
Gasoline	-	✓	✓	✓

**Fuel efficiency**

Measured by miles per gallon equivalent (MPGe)

1. Example DTE webpages are drafts and subject to change prior to website launch

# Partnership Opportunities



**Municipalities**



**Workplaces**



**Business Owners**



**Gas Stations**



**Multi-Unit Dwellings**



**EV/Charging Companies**