Benefits and Impacts of Electric Vehicles on Grid Stabilization

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ICC: Nexus Between Electric Vehicles and Grid Stabilization

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Who is ChargePoint?

Largest Community of EV drivers
+ 70% of new EV drivers join us
+ A driver plugs into our network every 2 seconds

Charging Everywhere
+ 47,000+ charging spots
+ 600+ ports added every month
+ 270 GWh electricity dispensed

Market & Technology Leader
+ Best in class solutions to support the best driver experience
+ Commitment to open standards

Our Mission:
Get everyone behind the wheel of an EV and provide them convenient, connected charging wherever they go
The Rise of Electric Vehicles

Cumulative U.S. EV Sales:
- December 2015: 408,000
- December 2016: 567,000
- December 2017: 763,000

Increase in U.S. EV Sales:
- December 2015 to December 2016: +159,000
- December 2016 to December 2017: +196,000

Source: Baum & Associates and InsideEVs.com data through December 2017

Sally Saver: For the Savings
Eco Eric: For the Environment
Fiona Future: For the Fun Stuff
Carl Commuter: For the Time Savings
The EV Charging Market is Also Growing Quickly

+ 2017: ~156,000 stations sold in North America with an installed base of 500,000*
+ Solution providers are continuing to innovate new and value added features to make EV charging simple for drivers and productive for site hosts

*Source: Market Data: EV Charging Equipment, Navigant Research, 2Q 2017
A Day in the Life of an EV Driver

- EV drivers charge when and where it's convenient
- EV drivers seek connectivity, convenience and control of their charging experience – both inside and outside the home
A New Fueling Paradigm – Charging While Parking

+ Fueling outside the home takes place at where people work and visit
+ Site hosts are best positioned to manage the EV driver experience and optimize station utilization
+ Site hosts currently choose from a variety of hardware and charging service providers to meet their needs
+ Networked solutions optimize usage: Access control, pricing, reports, remote station services, customer support
EVs Can Provide a Beneficial Load for the Grid

+ Smart EV load growth can provide many Utility benefits including:
  • Increased system utilization
  • Flexible load
  • Smart-grid/micro-grid enabler
  • Support renewables integration
  • New customer touch point
  • Downward pressure on rates

+ As well as societal benefits:
  • Improved air quality
  • Reduced GHG emissions
  • Local economic development
  • Improved energy security and resiliency

Utility Engagement is Vitally Important

- Utility initiatives usually evolve through three approaches:
  - System Impact Planning & Customer Support
  - Load Management Programs/Rates & Customer Education
  - Investment/Incentives in Charging Infrastructure
Various Models Exist for Utility Investment

A) Business As Usual
   - Utility/CIAC: Site Host Investment

B) Make-Ready
   - Utility Investment: Site Host Investment

C) Utility Owner/Custodian
   - Utility Investment (site host still has choice of solution and control of driver experience): Site Host Investment

D) Utility Rebate
   - Utility Investment: Site Host Investment
      - Utility Rebate: Site Host Investment

- Promote a competitive and diverse market
- Support ongoing innovation
- Maintain local site host choice of solution and driver pricing
- Encourage smart charging
Utility Infrastructure Programs and Best Practices

- Provide forums for **robust dialogue** between all stakeholders and **regulatory clarity**
- Maintain **site host choice** of charging solution and their ability to set **pricing to the driver**
- Ensure **data collection** and **demand response** capabilities are part of EVSE qualification criteria
- **Balance rate payer costs with benefits** (e.g. ensuring participant “skin in the game”)
- Seek **efficient designs** that can deploy quickly, allow for **innovation**, and **minimize market distortions**
- Evaluate **smart home charging programs** and tailored commercial rates to supply DC fast chargers

**Utility Program Examples**

<table>
<thead>
<tr>
<th>Utility owned model</th>
<th>Make-ready plus EVSE rebates</th>
<th>Rebates with portion utility owned</th>
<th>Make-ready</th>
<th>Rebates towards EVSE + make-ready</th>
<th>Rebates, make-ready, and utility owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego Gas &amp; Electric</td>
<td>3,500 Ports</td>
<td>Pacific Gas &amp; Electric</td>
<td>7,500 Ports</td>
<td>Eversource (MA)</td>
<td>4,167 Ports</td>
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<tr>
<td>Southern California Edison</td>
<td>1,500 Ports</td>
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<td>National Grid (MA)*</td>
<td>1,278 Ports</td>
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<td>~6,000 Ports</td>
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<td>* Filed, but not yet approved</td>
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Thank You!

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for more information, visit:
www.chargepoint.com