Insights for States Preparing for Electric Transportation

Presentation to the Florida Public Service Commission

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Part I – Beneficial Electrification
Isn’t all electrification created equal?

• Brattle: “Utility sales could nearly double by 2050”!

• Isn’t it all about load growth?
Beneficial Electrification (BE) - Three Conditions

1. Saves Customers Money Over Long-Term
2. Reduces Environmental Impacts
3. Enables Better Grid Management
1. Saves Customers Money Long-Term
Efficiency Across Fuel Types

2. Reduces Environmental Impacts
Power sector fuel mix is changing: MISO example

Power sector fuel mix is changing

**Florida electric utility generation (2008-2018)**

- **2008**: Natural gas (47%)
- **2009**: Coal (30%), Natural gas (47%)
- **2010**: Coal (30%), Natural gas (47%), Other (13%)
- **2011**: Coal (30%), Natural gas (47%), Other (13%)
- **2012**: Coal (30%), Natural gas (47%), Other (13%)
- **2013**: Coal (30%), Natural gas (47%), Other (13%)
- **2014**: Coal (30%), Natural gas (47%), Other (13%)
- **2015**: Coal (30%), Natural gas (47%), Other (13%)
- **2016**: Coal (30%), Natural gas (47%), Other (13%)
- **2017**: Coal (30%), Natural gas (47%), Other (13%)
- **2018**: Coal (30%), Natural gas (47%), Other (13%)

Source: U.S. Energy Information Administration, *Electric Power Monthly*

Note: *Other* includes petroleum liquids.
3. Enables Better Grid Management

GTM, How California Can Shape, Shift and Shimmy to Demand Response Nirvana, January 26, 2017.

Managing Load

EVs can be a benefit … or a problem for the electric grid.

Draw high amounts of power for short periods of time.
Managing Load

EV load must be managed effectively, otherwise all ratepayers will share in the expensive costs of upgrading and maintaining the distribution system to accommodate increased load on the system.

Managing Load

Pairing EV adoption and EV charging with intelligent rate design can **improve** electric distribution **system utilization** and create **downward pressure on rates** through load management and system peak reduction.

Rates

At Least, Avoid High-Cost Hours

Source: Rhode Island Power Sector Transformation, Phase One Report to Governor Gina M. Raimondo (November 2017)
Part II – Taking First Steps

Taking First Steps: Insights for States Preparing for Electric Transportation

By David Farnsworth, Jessica Shipley, Joni Sliger, Mark Lelleland Megan O'Reilly
State Processes

- Coordination with other Parts of Government
- Stakeholders Can Help
Managing EV Load

- Understanding EVs means appreciating the flexibility that they possess and can add to the power grid.
- This can
  - Increase reliability,
  - Improve capabilities of other resources on the grid, and
  - Create conditions for lower rates.
Rate Design

- Regardless of the type of charging — residential, fleet or multi-unit dwellings — it is critical for utilities to manage EV load to benefit all ratepayers and the state.
- Effective rate designs can also protect non-EV customers (and EV customers who charge off-peak) from subsidizing the system costs imposed by the EV customer who charges during peak periods.
EV Charging

• Each charging sub-market (residential; multi-unit; workplace and commercial; public; and transit) has its own characteristics including:
  • Power levels, optimal charging times, and degree of market penetration by competitive suppliers.
• Consequently, there are various models for EVSE investment and ownership.
The Importance of Programs

- The Consumer perspective -- programs are what customers see.
  - Are they accessible and helpful?
- There is a difference between implementing a (utility) program and successfully selling a service.
Using Pilots

• Pilot programs are transitional arrangements.
  • They allow experimentation under time and budget limitations.
  • They provide opportunities for learning and gaining experience, a key to scaling up to more permanent programs.
Recommendations

1. Find opportunities and be willing to learn as you go:
   - Coordinate with other parts of state government,
   - Informally convene stakeholders.
Recommendations

2. Consider encouraging pilot programs that provide you with relevant EV-related information regarding costs and benefits, and that would support moving to scale.
Recommendations

Example – for a fixed budget, time frame and number of customers, gather data related to a TOU rate design for managed EV charging, including:

- Avoided utility costs (e.g., supply, dist. system upgrades), and
- Customer response, and savings.
Electrification: Some RAP Resources

- Roadmap for Electric Transportation
- Taking First Steps: Insights for States Preparing for Electric Transportation
- Beneficial Electrification: Ensuring Electrification in the Public Interest
- Beneficial Electrification of Transportation
- Getting From Here to There: Regulatory Considerations for Transportation Electrification
- BLOG: We All Wish We Were More Flexible: Electrification Load as a Grid Flexibility Resource
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org

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Level 2 EV charging is a lot like… an electric water heater!
Really!

Electric Vehicle
• 3.3 – 6.6 kW
• 2,000 – 4,000 kWh/year
• Can avoid morning and early evening peak charging
• Batteries likely equal a full day’s supply

Water Heater
• 4.4 – 5.5 kW
• 2,000 – 4,000 kWh/year
• Can avoid morning and early evening peak charging
• Tank usually covers a full day’s supply