Utility Opportunity to Provide Consumer Benefits Through Smarter Integration of EVs

Columbus Smart City Challenge

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RAP Principal

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RAP provides technical and policy support at the federal, state and regional levels, advising utility and air regulators and their staffs, legislators, governors, other officials, and national organizations.

We help states achieve ambitious energy efficiency and renewable energy targets, and we provide tailored analysis and recommendations on topics such as ratemaking, smart grid, decoupling and clean energy resources. RAP publishes papers on emerging regulatory issues and conducts state-by-state research that tracks policy implementation.
Overview of Presentation

• Benefits to Participating Customers
• Benefits for Low Income Customers
• Societal Benefits that Help All Customers
Benefits to Participating Customers
Electric Vehicles: Not Just for Groceries, Carpools Anymore

- Energy
- Capacity
- Ancillary Services
The Electricity Availability Rate

Utilities pay large industrial customers to curtail usage during peak periods
The Electricity Availability Rate

Why not pay the electric vehicle owners for providing power during peak periods, when the utility needs it most?
Electricity Availability Rate: Voluntary

EV owner gets notice: “Make your car available for five hours on Tuesday, get an adder!”

Example: EV customer gets compensated at approximately 90% of Critical Peak Price (tariffed rate) for each kWh provided.
Electricity Availability Rate: Contract

Customer gets rate discount in exchange for making car available for agreed to number of days and hours with notice based on contract options.

*Example*
Customer receives a discount of $.02 - $.03/kWh on every kWh consumed and billed. Can roughly offset cost of fuel.
Calculation of Contract Obligation Rate

Assumptions:

• Average household usage of 1,000 kWh/mo x $.12/kWh = $120/month
• 4 miles/kWh divided by 40 miles/day = 10 kWh/day = 300/kWh/month
• New total monthly bill = 1,300 kWh x $.12/kWh = $156/month
• Bill increase = $36/month
• Discount of $.03 = $.09 x 1,300 kWh = $117/mo.
• Discount of $.02 = $.10 x 1300 kWh = $130/mo
Summary of Benefits for Participating Customers

- Reduced fuel costs
- Opportunity to sell services back to the grid
Opportunities for Low Income Customers
Mitigation of Rate Increase

• As growth in demand flattens and decreases due to more energy efficiency and distributed energy resources, utilities are concerned about recovering adequate revenues.

• Utilities have proposed straight-fixed variable (SFV) rates in Ohio which consists of a high fixed rate and a low volumetric rate.
  o SFV rates disproportionately increase rates for low-use/low-income rates:
    ▪ A low-income customer living in a studio apartment pays the same fixed rate as a higher income customer in a five-bedroom McMansion
  o SFV sends the wrong price signals regarding conservation.

• Increased source of revenue can decrease utility claims for SFV.
The Sharing Economy

A new way of doing business in which people get products or services directly from each other. (Uber, AirBNB etc.)
Examples of EV Car Sharing Programs

**Autolib:**
- 500,000 subscribers in five years ago
- 1,000 stations crammed into Paris, and the nearly 4,000 EVs around the city.

**BlueIndy**
- Indianapolis car-sharing kicked off late last year.
- City plan is to deploy a fleet of electric cars to be on standby for all of its residents.
- Cost is $20 a month, or $10 a month if you sign up for a year
- Goal is 200 charging stations around Indy, with 500 cars.
- Like Autolib’, it functions with a keycard at a rental kiosk. Then take the car and go.
Societal Benefits that Help All Customers
Comparison of Electric v. Gas Vehicles

<table>
<thead>
<tr>
<th>Electric vs. Gasoline</th>
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<tbody>
<tr>
<td>No Tailpipe Emissions</td>
</tr>
<tr>
<td>Utility Company</td>
</tr>
<tr>
<td>100+/- Mile Range</td>
</tr>
<tr>
<td>Hours to Recharge</td>
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<tr>
<td>2 cents per mile</td>
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</tbody>
</table>

Energy solutions for a changing world
Progress in CO2 reductions in transportation sector are necessary to meet Carbon Reduction Targets in many countries.

Example: Germany to reduce carbon by 40% by 2020
Electric Cars are Better for the Environment

**Better for the climate**

*Electric vehicles cost less to drive and emit less global warming pollution.*

<table>
<thead>
<tr>
<th></th>
<th>Yearly cost to fuel</th>
<th>Yearly global warming pollution (CO₂ eq)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery-electric</strong></td>
<td>$421</td>
<td>2.3 Metric tons</td>
</tr>
<tr>
<td>Runs entirely on electricity</td>
<td></td>
<td>Based off Nissan LEAF</td>
</tr>
<tr>
<td><strong>Plug-in hybrid electric</strong></td>
<td>$764</td>
<td>2.9 Metric tons</td>
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<tr>
<td>Runs on gas and electricity</td>
<td></td>
<td>Based off Ford Fusion PHEV</td>
</tr>
<tr>
<td><strong>Gasoline-only</strong></td>
<td>$1,500</td>
<td>4.7 Metric tons</td>
</tr>
<tr>
<td>Based off average 2012 compact getting 28.8 mpg</td>
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*Source: Union of Concerned Scientists and Consumers Union*  
*The Star-Ledger*
Benefits for Utilities

- Revenue boost selling more electricity for EVs
- Effective, low risk source of grid services to help with integration
About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power sector. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

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