Opportunities for utilities in the new mobility ecosystem

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Electric Vehicles (EVs) are coming and will also impact the utility business, however charging infrastructure is a bottleneck

**EVs become economically viable**

- The prices of EVs will decrease, the range will increase and the charging time will be shorter
  
  *Matthias Müller (CEO of VW AG)*, 11/2016

- “Battery costs have been cut by a factor four since 2008”
  

**No. of EVs is rising**

- There are forecasts according to which every second new car will have an electric powertrain in less than 10 years
  
  *Dieter Zetsche (CEO of Daimler AG)*, 9/2016

- “EV sales are growing worldwide at a rapid pace: They jumped 49 percent in the first half of 2016 compared with the year-earlier period”
  

**Utilities start to get involved in EVs**

- “Ten utilities are announcing commitments to increase deployment of EVs and charging infrastructure”
  
  *The White House*, 07/2016

- “52 percent of power companies are pursuing EV charging as a revenue stream”
  
  *Greentech Media*, 02/2016

**SOURCE:** SAC
EV sales are expected to grow with a CAGR of 24% in the US until 2025, which would mean roughly 1.4 million new EVs being sold in 2025.

Forecast of new EV sales in the US 2016 – 25
in k units

SOURCE: SAC, Navigant Research
Utilities are strongly impacted by EVs for 3 major reasons

- Apart from road vehicles, electricity consumption in the US has been stagnating over the last 10 years and there is no major growth expected in the future
- Growing EV penetration makes charging an attractive and increasingly relevant field for utilities

### EV Charging

- If timing is not centrally controlled, charging of most EVs will be focused on a time window of a few hours, adding considerable load to the grid
- At marginal grid upgrade cost of $~230 / kW investments of $~1,600 per home charger and $~11,500 per fast charger are required, leading to a utility investment opportunity
- Controlling charging times via time of use tariffs, smart charging, etc. could optimize investments
- Smart charging also provides the opportunity for utilities to use EV charging as demand response, increasing grid reliability and enabling new services to ratepayers

### Publicly Regulated Utilities

- For example, the State of Michigan is striving to provide its citizens with a wide choice of affordable, environmentally friendly energy (compare Senate Bills 437-438)
- EVs can contribute to these goals by
  - Giving consumers an alternative to fossil fuels
  - Producing no / low local emissions
  - Preserving the environment, esp. if electricity is generated from renewable sources
- Additionally, electric motors reduce the noise level in cities tremendously
When defining its position in the EV ecosystem, utilities have to choose from a variety of roles.

Utilities have a “once in an industry lifetime” chance to define their role and be at the heart of the EV ecosystem.

1 EVSE (Electric Vehicle Supply Equipment) = charging infrastructure
Managing EV charging via location planning and demand response (DR) has been identified to have substantial impact on the ratepayer’s bill

**Average impact of EV charging on residential ratepayer bills in 50% EV penetration scenario**
in $ p.a. per ratepayer

<table>
<thead>
<tr>
<th>Expected scenario without optimization (no location planning and DR)</th>
<th>Expected optimized scenario (with location planning and DR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average residential rate payer bill</strong></td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Impact of increased consumption from EVs</strong></td>
<td>-15.9%</td>
</tr>
<tr>
<td><strong>Impact of increased infra. investment to support EVs¹</strong></td>
<td>+17.4%</td>
</tr>
<tr>
<td><strong>Effect of EVs on average residential rate payer bill</strong></td>
<td>+1.5%</td>
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<td>+6.1%</td>
</tr>
</tbody>
</table>

Under current assumptions **negative effect** on ratepayers

Under current assumptions **strong positive effect** on ratepayers

**SOURCE:** SAC

DISGUISED CLIENT EXAMPLE
Let us inspire you!

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