Investor-owned Utility Electric Vehicle Supply Equipment Programs

Amy Andrews, Policy Director
Brad Cebulko, Senior Policy Advisor
Washington Utilities and Transportation Commission

**UTC Role:** The UTC protects consumers by ensuring that investor-owned utility and transportation services are fairly priced, available, reliable, and safe.

- Electric, natural gas, telecommunications, water, solid waste.
- Railroads, pipelines, moving companies, buses and charters, ferries.
Electric Utilities
Role of the UTC in EV Adoption/Integration

**RCW 80.28.320** – Regulated electric utilities may offer battery charging facilities using ratepayer funds subject to UTC approval.

**RCW 80.28.360** – Allows the Commission to authorize an incentive for electric utilities on capital expenditures for EVSE through 2030.

- 2015 WA legislature “provide(s) a clear policy directive and financial incentive to utilities for electric vehicle infrastructure build-out” (ESHB 1853).
- Utilities “must be fully empowered and incentivized to be engaged in electrification of transportation system.”
- Incentive rate of return.
- Cost cap of no more than 0.25%.
- Must be deployed for benefit of ratepayers; and provide “real and tangible benefits” for all ratepayers.
UTC Policy Statement

In June 2017 the UTC issued its *Policy and Interpretive Statement Concerning Commission Regulation of Electric Vehicle Charging Services.*

Adopted a portfolio approach that prioritizes load management and grid benefits over rate base additions.

<table>
<thead>
<tr>
<th>Service</th>
<th>Ancillary Service / Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Fast Charging</td>
<td>N/A / kWh sales</td>
</tr>
<tr>
<td>Level 2 Workplace / Fleet Charging</td>
<td>N/A / kWh sales</td>
</tr>
<tr>
<td>Residential EVSE Lease</td>
<td>Direct Load Control</td>
</tr>
<tr>
<td>Multi-unit dwelling EVSE “make-ready” installation</td>
<td>Time of Use Rates + Load Data Collection</td>
</tr>
<tr>
<td>Service upgrade for Level 2 Fleet Charging (customer-owned EVSE)</td>
<td>Demand Response</td>
</tr>
<tr>
<td>Grid Integration / Time-of-use rate</td>
<td>Avoided cost of managing EV charging peak</td>
</tr>
<tr>
<td>EV dealer or rideshare incentives</td>
<td>Participant data collection and education / outreach</td>
</tr>
</tbody>
</table>
UTC Policy Statement (continued)

UTC also adopted policies supporting:
- consumer protection,
- direct benefits to low-income customers,
- service quality standards,
- regular and comprehensive reporting,
- education and outreach, and
- interoperability.

Policy statement supports creating a joint stakeholder group of the three IOUs, state agencies, customer advocates, industry experts, and vendors.

Utilities have valuable information that can inform regional transportation planning organizations and WSDOT.
EV Infrastructure and Rate Design

Key issues:

• WA investor-owned utilities are vertically integrated.
• Low electricity rates in the Northwest.
• Limited experience with EV ratemaking to date.
• Rate design options:
  o Cost-based rates.
  o EV specific rates.
  o Time-of-use rates – time shifting.
  o Demand charges.
  o Demand response.
EVSE Pilot Program - Puget Sound Energy

Program Vitals:
✓ Tariffs became effective in December 2018.
✓ PSE will own and maintain all EVSE.
✓ RFP circulating for EVSE acquisition
✓ Estimated $20 million total budget over five years.

Program Components:
• Single family residential.
  • Approx. 550 home chargers.
  • Testing how to shift load.
• Multi-family residential.
• Workplace and fleet.
• Public DC fast charging.
• Education and outreach.
• Low-income EV access.

For more information refer to Docket UE-180877
EVSE Pilot Program - Pacific Power

Program Vitals:
- Tariffs became effective in October 2018
- No ownership of EVSE
- Innovative way to incent private investment in EVSE
- Estimated total budget of $1.6 million

Program Components:
- Demonstration and Development
  - $900k in grants for non-residential customers.
  - Funding for EVSE, make-ready costs and any license costs.
  - Not for EVs.
- Education and Outreach
  - Ride and Drive.
  - Sponsorships and project dedication events.
  - Website resources.

For more information refer to Docket UE-180757
Avista launched a three-year EVSE pilot in 2016 with the following primary learning objectives:

1. Light-duty EV load profiles, grid impacts, costs, and benefits.
2. How the utility may better serve all customers in the electrification of transportation.
3. Begin to support early EV adoption in its service territories.

Report can be found at myavista.com
A total of 439 EVSE charging ports were installed:

- 226 residential.
- 123 workplace.
- 24 fleet.
- 20 multiple-unit dwelling.
- 7 DC fast charging sites.

These EVSE are:

- Owned and maintained by Avista.
- Located on residential and commercial property downstream of the customer’s meter.
  - Exception: DC fast charging sites where the utility owns all equipment from the transformer to the EVSE.
Avista Low Income EVSE Program

Direct Benefits for Disadvantaged Communities

- Nissan LEAF & facility charging
- Transport for critical medical appointments
- 82% reduction in transportation costs

- Mitsubishi Outlander & facility charging
- Transport for job skills training, food deliveries and shelter
- 57% reduction in transportation costs
EVSE Transportation Plans

✓ **SHB 1512** – passed.
  o Revision of RCW 80.28.360 to include DC fast charging.
  o “Electrification of Transportation” plans from utilities must be “approved” by UTC.

✓ **E2SHB 2042** – passed.
  o EV sales tax exemption.
  o EV infrastructure grant program.
  o Electrification of transportation plans.

We expect Avista to file an EVSE Transportation Plan within the next few months.
42,542 Plug In Electric Vehicles Registered in Washington

As of December 31, 2018

Source: http://westcoastgreenhighway.com/pdfs/Map_WAEVRegistrationByCounty.pdf
EVSE Impacts to utility systems

- **Energy:**
  - Could grow to sizeable chunk of load, driving need for more electricity production.
  - Could provide other services such as reliability, resilience, or grid energy storage through vehicle to grid (V2G) capabilities.

Source: Greentech Media
Washington State uses 714 PJ of transportation fuels generating 65 Tg of CO₂ and 420 PJ of electricity generating 10.6 Tg of CO₂

WA State uses 1.7x more transportation fuels than electricity and the transportation sector generates 6x more CO₂

63 - 67 Tg of CO₂

Transport fuels
714 PJ
- ship (91 PJ)
- gasoline (343 PJ)
- diesel (130 PJ)
- jet (134 PJ)
- natural gas (15 PJ)

Electricity
420 PJ
- renewable (327 PJ)
- nuclear (35 PJ)
- natural gas (38 PJ)
- coal (19 PJ)

Data from Energy Information Agency. Additional analysis from GREET
Han et al. Fuel 157 (2016) 292-298 (https://doi.org/10.1016/j.fuel.2015.03.038)
EVSE Impacts on the Grid And Avista’s EVSE Pilot
Avista’s Opportunity for Beneficial Load Growth

Figure ES-3. Historical and projected annual electricity consumption
Avista’s Cost and Benefits Estimates
Energy Usage

• Average WA household uses 12,000 kWh/year.
• EVs use 3,000-4,000 kWh/year, depending on usage and model
  • Estimate based on 15,000 mi driven/yr.
  • Most EVs on the market get 3-4 mi/kWh.
• DOE study showed Nissan Leaf users drove fewer miles in a year (9,697 mi)

*Electric car households defined as enrolled in night-time car charging rate plan.

Graph source: Opower (2014)
Load Shape from Avista and a National Study

Source: Avista EVSE Pilot Report

Source: NREL
Constraints on the Electric Grid – Electric Generation Capacity

Figure 2: Updated Resource Retirements

Planned retirements based on agreements, announcements, IRPs; subject to change

*Colstrip 3, 4 should be considered very tentative

Hardin Generating Station was sold to an out of region cryptocurrency company, therefore no longer "counts" towards the region

California Duck Chart – A Challenge and an Opportunity

Source: California Independent System Operator
Need to Make Electric Vehicle Load “Beneficial Load”

• Electric Vehicles have high demand for short durations.
• This could put stress on the electric grid.
• Must move the peak load into beneficial load.

Rate design options:
• Cost-based rates
• EV specific rates
• Time-of-use rates – time shifting
• Demand charges
• Demand response
What are Time-of-Use Rates?

- Rates vary according to the time of day, season, and day type (weekday or weekend/holiday).
- Higher rates are charged during the peak demand hours and lower rates during off-peak (low) demand hours.
- Rates are also typically higher in summer months than in winter months. This rate structure provides price signals to energy users to shift energy use from peak hours to off-peak hours.

Source: California Public Utilities
Pricing Changes the Shape of the Charge

Figure 53: Comparison of fee-based and free workplace load profiles

Source: Avista EVSE Pilot Report
What is Demand Response?

- Program in which a customer reduces their electricity usage during periods of higher power prices.
- Customers are compensated.
- Examples:
  - Turning up the temperature on the thermostat to reduce air conditioning.
  - Temporarily slowing down or stopping production at an industrial facility.

Source: PJM
Example of Load Management

EV Charging Flexibility – Customer Acceptance

Figure 3: Example DR charging session with 75% peak load reduction
Demand Response Impact

Baseline:
- $n_{days} = 15,715$
- $n_{sessions} = 12,976$
- $n_{ports} = 102$

DR:
- $n_{days} = 3,143$
- $n_{sessions} = 1,876$
- $n_{ports} = 92$

Figure 78. Residential aggregated load profiles before and after DR implementation with load change
Questions?
Thank you!

Amy Andrews
Policy Director
amy.andrews@utc.wa.gov

Brad Cebulko
Senior Policy Advisor
bradley.cebulko@utc.wa.gov