Plug-In Electric Vehicles and Charging Infrastructure in Washington State

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Today’s Presentation

1. Overview of Washington State’s PEV Activities
   – Highlights of state, regional and local innovations
2. West Coast Electric Highway
   – Fast Charging Infrastructure Deployment
3. Washington State’s EV Action Plan
West Coast Partnerships:
• to promote petroleum reduction and sustainable transportation solutions on the I-5/Hwy 99 corridor.
• Provides travelers with EV charging and alternative fuel (CNG, Hydrogen, Biodiesel) infrastructure, from British Columbia, Canada to Baja California, Mexico “BC to BC.”
• Supported by Governors in Pacific Coast Collaborative
Plug In Electric Vehicles in Washington

- fuels PEVs with Washington’s clean, renewable, low-cost hydropower:
- saves residents money at the gas pump:
  - $1.14/Egallon vs. $3.54/gallon of gas*
  - 3.5¢ per EV mile vs. 12¢ per gas mile
- provides mobility choices for drivers
- connects communities
- reduces greenhouse gas emissions
- advances energy independence
- creates green jobs, supports a green economy
- helps meets state EV legislation (HB 1481) and GHG reduction goals

* Source: ENERGY.GOV/EGALLON

** Source: U.S. Energy Information Administration
Washington State Law Encourages EV Adoption

**No sales and use tax** on retail purchases of alt fuel and electric vehicles by July 1, 2015. (RCW 82.08.809 and 82.12.809)

State to install charging outlets at state fleet parking and maintenance facilities and at all-state operated highway rest stops, by December 31, 2015.

**“Practicable” Alternative Fuel Use by State Agencies** Requires state governments, to the extent practicable, to satisfy 100% of their fuel usage for operating publicly owned vessels, vehicles, and construction equipment from electricity or biofuel, by June 1, 2015. Local governments by June, 2018. (RCW 43.325.080)

$100 EV Annual Licensing Fee
Washington Citizens are driving PEVs in record numbers

Electric and Plug-in Hybrids
Vehicles Registered Per Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Plug-in Hybrids</th>
<th>Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>148</td>
<td>11</td>
</tr>
<tr>
<td>2011</td>
<td>1,091</td>
<td>29</td>
</tr>
<tr>
<td>2012</td>
<td>2,527</td>
<td>1,036</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td>1,942</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>5,439</td>
</tr>
</tbody>
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States with the Most EV Sales

<table>
<thead>
<tr>
<th>Market Area</th>
<th>*EV Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. San Francisco-Oakland-San Jose</td>
<td>CA</td>
</tr>
<tr>
<td>2. Atlanta</td>
<td>GA</td>
</tr>
<tr>
<td>3. Seattle-Tacoma</td>
<td>WA</td>
</tr>
<tr>
<td>4. Honolulu</td>
<td>HI</td>
</tr>
<tr>
<td>5. Monterey-Salinas</td>
<td>CA</td>
</tr>
<tr>
<td>6. San Diego</td>
<td>CA</td>
</tr>
<tr>
<td>7. Santa Barbara-Santa Maria-San Luis Obispo</td>
<td>CA</td>
</tr>
<tr>
<td>8. Portland</td>
<td>OR</td>
</tr>
<tr>
<td>9. Los Angeles</td>
<td>CA</td>
</tr>
</tbody>
</table>

Sales of new all-electric vehicles in the 12 months that ended March 31, 2014
Source: IHS Automotive, Wall Street Journal

Source: Washington State Department of Licensing
9,000+ PEVs Registered in Washington
Electric Vehicle Charging Locations

422
Level 2 EVSE

42
DC Fast Charging

www.afdc.energy.gov/fuels/electricity_locations.html 8/6/14
Regional Collaboration: EVs and EVSE

The EV Project
U.S. DOE funds to install Blink charging infrastructure in Puget Sound Region Anticipated $20M investment for 1,000 L2 for public and fleet charging, 1,000 L2 for home charging, 20+ DC public fast-chargers. Partially delivered.

ChargePoint America
Awarded $37m to install 5,000 charging stations in 37 regions, including eastern King County (Bellevue/Redmond).

Clean Cities
Western Washington Clean Cities Coalition was awarded $15m to install charging stations & buy fleet vehicles.

Cities and Counties
Energy Efficiency and Conservation Block Grants to purchase charging stations and fleet vehicles.
Regional Collaboration: EVs and EVSE

Sea-Tac Airport Electric Ground Service Equipment
Port of Seattle, Alaska Airlines, USDOE, FAA and partners replaced 45% of the fossil-burning ground support vehicles with electric-powered vehicles. The switch to moving baggage and planes with electric tugs and conveyors will save airlines $2.8 million in fuel and cut 10,000 tons of emissions annually.

SGL/BMW Expand Carbon Fiber Plant in Moses Lake, WA
BMW and SGL Automotive Carbon Fibers are investing $200 million to expand the carbon fiber plant to triple production capabilities to 9,000 tons per year to meet the high demand for carbon fiber in automotive production for BMW's i-series line of cars.

State Agencies
• The state contract offers a variety of alternative fuel and plug-in electric vehicles for government fleet purchases.
• WSDOT installed the state’s first DCQC in 2010, added 6 Nissan LEAFs and 2 Chevy Volts to its fleet, and is the first Washington State Agency to negotiate a lease agreement with Nissan.
• Commerce produced an EV Infrastructure guide for local governments.
Regional Collaboration: EVs and EVSE

Electric Public Transportation
- Sound Transit operates 20 miles of Link Light Rail and voters approved an expansion to add another 30 miles of track.
- Ben Franklin Transit converted a diesel fuel bus to a Zero Emissions Propulsion System (ZEPS) w/ 100-mile range through Complete Coach Works, reducing operating costs from $1.05/mile to $.07 /mile.
- Link Transit operates five 22-foot trolley buses in Wenatchee.

King County MetroPool
King County Metro’s 100% electric vanpool and vanshare commuting program for large employers (Microsoft, Amazon) using 20 2011 Nissan LEAFs. In 2013, saved 232 metric tons of tailpipe emissions and 10,000 gallons of fuel over traditional gas-powered vanpools. Added 5 2013 LEAFs.

West Coast Electric Highway
Multi-state network of highway electric-vehicle, fast-charge stations. Spans 585 miles through Washington and Oregon along Interstate 5 from Canada to California with fast-charging stations every 25 - 45 miles.
West Coast Electric Highway

Unique EV Driving Experience in PNW
WSDOT/ODOT Partnership:
• Equipment Specifications
• Highway Signs
• Branding and Marketing

Fast-Charge Site Criteria:
• Within ½ mile of highway interchange
• Safe and convenient access
• Parking spaces
• Restrooms and drinking water
• Shelter and lighting
• 480V 3-phase electric power supply
• Customer amenities (food, traveler info)
DC Fast Charging Network in Washington

EV Charging: 12 public locations in critical recharge zones, outside The EV Project with DC fast charging available every 35 to 50 miles along major roadways.

Charging Equipment: AeroVironment 50kw DC fast charger (CHAdeMO) and Level 2 EVSE (J1772)

Funding: $1.6 million grant through the Washington State Energy Program, with U.S. Department of Energy Recovery Act funds.

Completion: November 2012
I-5 North-South Corridor

Bellingham, Exit 252
Sehome Village

Tumwater, Exit 102
Shell Station and Deli Mart

Centralia, Exit 82
Wendy’s

Burlington, Exit 229
Outlet Shoppes at Burlington

Castle Rock, Exit 49
Cascade Select Market

Ridgefield, Exit 14
Country Café
US 2, I-90 West-East Corridor

Sultan Visitor Information Center  
Skykomish Sky Deli  
Snoqualmie Pass Chevron

Leavenworth City Hall  
Wenatchee Convention Center  
Cle Elum Suncadia Resort
EVSE and displays at Safety Rest Areas reaching 1.2 million annual visitors

Blaine, WA
Custer SB

Vancouver, WA
Gee Creek NB

Electricity for EV Charging at these sites is provided by Adopt a Charger and the Seattle Electric Vehicle Association. Visit: [www.adoptacharger.org/SEVA](http://www.adoptacharger.org/SEVA)
State Law for Public Charging Signage

Roadway Directional Signs
State Highways, Local Roads, City Streets

D9-11b (alternate) Electric Vehicle Charging Station Symbol

Regulatory Signs & Striping
“No Parking Except Electric Vehicle Charging”

Washington state law “de-ICEing bill” (SB 5849)

www.westcoastgreenhighway.com/evsigns.htm
Electric Highway Usage in Washington

May 2012 – June 2014 Usage

- Total sessions: 19,623 times used
- DCQC sessions: 15,258
- Level 2 sessions: 4,365
- Total energy used: 170,417 kWh used
- Total energy saved: 16,688 gallons of gasoline displaced
Measuring Project Outcomes
West Coast Electric Highway--Washington

Charge Start Time: Frequency

(Duration: Frequency)

(Days of the Week)
Innovative EV Actions on the Horizon

Results Washington Goal: 50,000 PEVs by 2020

- Secure transportation funding to expand the public and workplace charging network.
- Explore new ways to collect road user fees.
- State Legislature's Joint Transportation Committee to study “Business Models for Financially Sustainable EV Charging Networks.”
- In coordination with stakeholders, develop the state’s EV Action Plan and propose policy to advance the use of EVs.

Governor Inslee and business partners congratulate 100,000-mile LEAF driver.

State DOT representatives meet with C2ES to collaborate on advancing the adoption of EVs.
Washington’s EV Action Plan

Key Partners/Stakeholders:

- Federal Partners—FHWA, USDOE, Coalition of 8 ZEV States
- Regional—Regional PEV Working Group, Puget Sound Regional Council
- State Agencies—WSDOT, Commerce, Ecology, DES, WSU-Energy
- Legislators, elected officials, and community leaders
- Clean Air Agencies and Western Washington Clean Cities Coalition
- Advocacy Groups: EDTA, Plug-In America, Seattle EV Association
- Electric utilities—Puget Sound Energy (PSE), Seattle City Light, PUDs
- Auto manufacturers and dealers—Nissan, Tesla, BMW, Mitsubishi, Ford, BYD
- Employers/fleet managers—Microsoft, Amazon, Google, Starbucks, Boeing
- Transit agencies
- Associations—WA Automobile Association, WA Car Dealers
- Tourism Partners—Federal Parks, Economic Development Associations
Washington’s EV Action Plan

Topics for Consideration to advance PEVs:

- Consumer Incentives (financial and non-financial)
  - Extension of sales tax exemption or rebate program
  - HOV/HOT Lane access
- DC Fast Charging Infrastructure
- Business Incentives for public and workplace charging
- State Agency Fleet Vehicles and EVSE
- ZEV Mandate
- Infrastructure Planning and Investment
- Signage
- Building codes
- Public Outreach and Education
- Collaborate with National and State Partners, Utilities
For more information, contact:

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