Level 2 EVSE and DC Fast Charger Use by Plug-in Electric Vehicles – NGA/EDTA 2014

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National Governor’s Association Workshop on Advanced Technology Vehicles – EDTA Conference
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Idaho National Laboratory

- U.S. Department of Energy (DOE) laboratory
- 890 square mile site with 4,000 staff
- Support DOE’s strategic goal:
  - Increase U.S. energy security and reduce the nation’s dependence on foreign oil
- Multi-program DOE laboratory
  - Nuclear Energy
  - Fossil, Biomass, Wind, Geothermal and Hydropower Energy
  - Advanced Vehicles and Battery Development
  - Homeland Security and Cyber Security
Charging Units Reporting Data Nationally

- 107 DC Fast Charge
- 443 Private Nonresidential AC Level 2
- 3,555 Publicly Accessible AC Level 2
- 8,251 Residential AC Level 2
- **12,356 Total**
Charging Units* Reporting Data Nationally

- 39 Not specified
- 264 Private Nonresidential
- 2,508 Publicly Accessible
- 1,836 Residential

Total 4,647

* All units are AC Level 2
Dual-port units count as 2 units
Usage Frequency of Residential & Public Level 2 EVSE and DC Fast Chargers

**EVSE = Electric Vehicle Supply Equipment. L2 = SAE’s AC Level 2 EVSE (208 – 220 Volts) definition. DCFC = DC Fast Charger**
Blink DC Fast Chargers - Fee Impacts

DCFC Fee per Session
- $5 Blink members
- $8 non-Blink members

Roll-out of Blink DCFC usage fees during Q3
Average Usage Rate for Public Level 2 EVSE & DC Fast Chargers per Select Regions

Charging Frequency by EVSE Type and Region - SF, LA, WA

Level 2 Fee per hour
- $1 Blink EVSE
- ChargePoint unknown
Usage Frequency of All DC Fast Chargers Nationally

Monthly Average Number of Charging Events per Day for Each DCFC

Usage of most DCFCs dropped when payment started

DCFCs with sustained high usage:
- Workplace
- Small Retail Tacoma - I5
- Workplace
- Parking lot Seattle downtown
- Fred Meyer North Seattle
- Workplace
Public Blink Level 2 EVSE Usage by Venue & Site – Sites May Have Multiple EVSE

Top 10 Most Highly Used Public Level 2 Blink EVSE Sites in Each Venue Category

- Workplace
- Retail
- Public Municipal
- Parking Lots/Garages
- Multi-Family
- Medical
- Leisure Destination
- Hotels
- Education
- Fleet
- Transportation Hub

Average number of charging events per site per week
Public Blink DC Fast Charger Usage by Venue & Site – One DCFC per site

Top 10 Most Highly Used Blink DC Fast Charger Sites in Each Venue Category

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Average number of charging events per site per week

Fred Meyer in Seattle, WA
Photos from plugshare.com
In aggregate, workplace vehicle drivers had little use for public infrastructure on days when they went to work.
Charging Location Preference – Chevy Volt

Group of Chevrolet Volts with Access to Workplace Charging
2013 Only

Days When Vehicles Were
Parked at Work

- Frequency: 50% Work, 48% Home
- Energy: 46% Work, 53% Home

Days When Vehicles Were
Not Parked at Work

- Frequency: 89% Home, 11% Other
- Energy: 89% Home, 11% Other

In aggregate, workplace vehicle drivers had little use for public infrastructure on days when they went to work.
Commercial EVSE Level 2 Installation Costs

- Nationally, commercially sited Level 2 EVSE averaged $4,000 for the installation costs. EVSE hardware cost excluded.
- There is much variability by region and by installation.
- Multiple EVSE at one site drive down per EVSE install cost.
- Tennessee and Arizona have average installation costs of $2,000 to $2,500.
- Costs driven by sitting requests.
  - Example: mayor may want EVSE by front door of city hall, but electric service panel is located at the back of the building.

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DC Fast Charger (DCFC) Infrastructure Installation & Demand Costs

- DCFC installation costs do not include DCFC hardware costs
- DCFC Demand Charges can have significant negative financial impacts
**Additional Information**

- White papers currently being developed
  - Leaf L2 vs. DCFC usage
  - public charging venues
  - More from workplace charging case studies
  - EVSE installation costs
  - And more

- EV Project and ChargePoint America publications and general plug-in electric vehicle performance, visit
  - [http://avt.inl.gov](http://avt.inl.gov)

- For addition charging infrastructure focused presentations

Funding provided by DOE`s Vehicle Technologies Office