Offering a Plug: The Benefits of Attracting Electric Vehicles

Boston Green Tourism
October 22, 2015

Barry Woods, Director
Electric Mobility NE
bwoods@emne.net
503-504-6492
Overview

• What’s happening to Transportation?
• Why Plug in Electric Vehicles (PEVs) matter to Hospitality
• Technology Choices
• Incentives
• Conclusions
What’s Happening to Transportation?
U.S. cumulative sales of plug-in electric vehicles
by monthly sales of all-electric cars (BEVs) and plug-in hybrids (PHEVs)
(December 2010 - December 2014)
Plug-in electric vehicle sales since introduction: December, 2010
Hybrid vehicles sales since introduction: December, 1999
Prepared by Plug In America based on data from US DOE
© 2014 Plug In America http://www.pluginamerica.org/
Tesla S All-electric Sedan


0-60 in <4 secs

200+ miles of range

Free Supercharger Network

Coming soon:
Tesla X SUV
Tesla 3 Mid-level sedan
Electrification of Transportation

The Cars

• Wide variety of cars and styles (20+)
• Vehicles offer >100 equivalent miles per gallon
• Average range of more than 70 miles
• Virtually every major OEM involved
Why Plug in Electric Vehicles (PEVs) matter to Hospitality?
- Public charging
  - High Visibility
  - Destination
  - Public education and outreach

- Workplace
  - Corporate Parking Lots,
    Municipal Parking Lots

Residential (majority)
- Satisfying consumer-driven
  home installation process
- Permits, electricians,
  inspections, meters, rates
Leveraging Key Markets
Why PEVs Matter to You

• **Rapid growth of PEV consumers in NE region**
  – State & federal policy incentives
  – Current goal of 300,000 PEVs in Mass by 2025
  – Increasing model choices and range from all manufacturers

• **EV Drivers are high value customers**
  – Consumer demographic- young, male, high disposable income

• **Destination venues are perfect host sites**
  – Currently limited public charging infrastructure
  – Long dwell times/Captive (but willing) audience
  – Additional amenity to differentiate your product

• **Cross marketing opportunities galore**
  – Publicly broadcasts your sustainability mission
  – PlugShare.com/USDOE Website
  – Leverages work of State Agencies & Tourism Offices
    • EV Itineraries
Technology Choices
EV Charging

Level 1: 120-Volt/15A

- EV can be plugged straight into a normal 3-prong wall outlet.
- Charges at 1.4 kWh/4-5 miles of range added per hour
- Takes 8-22 hours to fully charge all battery electric vehicles (Nissan Leaf); can be fine for Plug in Hybrid Electric Vehicles (Chevy Volt) with smaller batteries.

- **Pros** - Easy, cheap kWh cost, readily accessible wall outlets, requires little electrical panel space, cars all come with own portable chargers

- **Cons** - SLOW. Drivers like using someone else’s connector. EV batteries keep getting bigger and EV onboard chargers keep getting faster.
EV Charging

Level 2: 240-Volt/32A (or more)

- Can be wall or pedestal mounted or plug versions
- Charges at up to 7.7kWh/adds 20+ miles of range per hour
- Takes up to 3.5 hours for all battery electric vehicles (Nissan LEAF)

**Pros**
- Faster, installation cost similar whether L1/L2, large selection of amperages, future proof charging cluster

**Cons**
- Hardware/connectivity costs vary depending on functionality, risk of demand charges, panel space limitations
State of Electric Vehicle Service Equipment ("EVSE" a/k/a Charger) Technology

Smart Chargers

Basic Chargers

ELECTRIC MOBILITY
Smart Charging

Attributes- Energy Management & Measurement/Billing

- Hardware costs - $4000-6000+
- Monthly/annual connectivity fees
- Hardware Ownership optional
- Charging Session Data Gathering with usage reports & analytics
- Cloud-based/Dashboard monitoring- 24/7 real-time observation of station status, function, and back office support
- LCD Touchscreen/interactive
- Flexible access control options (Credit card/RFID)
- Can have network access across large charging geography
- Billing options for charging sessions

Total costs- single L2 unit-Installation/hardware $6000-$10,000 plus $300 connectivity/network fees per year (approx)
Basic Charging

Attributes - Low Cost & Reliable Performance

- Low cost hardware and installation (Hardware $400-2600)
- High degree of reliability
- Host usually owns the unit
- Limited Interactivity (electricity consumption/trip information)
- Limited Access control options (key)
- No network membership or subscription
- No ongoing communications cost

Total costs single L2 unit - installation/hardware $1,800 to $3000 (approx)

**NOTE:** Evolving a wide range of cost-effective accessories to smarten up and fit a variety of host applications for billing/access/energy management
Hotel Case Studies

- **Hotel Marriott- Portland Commercial Street**
  - One basic level 2 (32A)/single dedicated parking space
  - No cost to guests
  - $10 Valet service fee to non-guests

- **Hyatt/Fore Street Garage- Portland**
  - One basic Level 2 (100A) in gated garage facility- no charge for electricity consumption; everyone pays minimum of $3.00 to park in the garage.

- **Westin Boston Waterfront-**
  - One 120V wall outlet- free (why bother?)

- **W Hotel Boston**
  - 1 Tesla 80A Wall Connector and 1 40A Universal Clipper Creek HCS-40 for guests and patrons.

- **Burlington Marriott Hotel**
  - Dual L2 Connector Chargepoint/typically charge around $1 per hour
  - Credit Card capable/RFID/Networked
Should I charge for electricity

• Generally- No. (At least until there are more cars.)

• Why?
  – Electricity costs are low (one hour of L2 charging = .80 cents of electricity)
  – People appreciate amenities- build brand loyalty
    • Do you bill your guests for coffee?
  – You dissuade driver use if you charge too much (> $1.00/hour)
  – Your hardware costs rise to the point where you spend more collecting $ per kilowatt than the cost of the kW itself!
    • You won’t much revenue anyway if you do.
    • Will it be worth the cost of collecting it?
EVSE Industry Observations

• Pricing pressure on charger costs
  – Hardware costs have dropped 50% in 3 years
• Technology/functionality keeps improving
• Vehicle battery sizes/charge rates keep increasing
• Scale of market is vast and PEVs have only 1% share.
• Incentives fluctuate-impact rate of vehicle adoption
• Electric Utility’s role in charging infrastructure is increasing (smart meters) and regulatory policy is changing.
• Smart EVSE v Smart Car? Who will collect data and control charging?
My Recommendations

• **First Step:**
  • Start with a reliable, low-cost basic level 2 32A charger with universal J1772 connector- not Tesla specific. (ClipperCreek, GE, Leviton)
  • Overbuild installation to anticipate expansion (use larger conduit/additional parking spaces/upgrade electrical panel)
  • Provide dedicated EV parking with signage
  • Provide electricity for free or at low cost to guests

• **Second Step:**
  – Monitor use to determine when to expand and accessorize as needed to recapture electricity costs, control access, manage electricity
Incentives
Federal Incentives

• **Qualified Plug-In Electric Drive Motor Vehicle Tax Credit**
  • A tax credit may be up to $7,500

• **Alternative Fuel Vehicle Property Tax Credit (Expired December 31, 2014)**
  • 30% tax credit for residential and business owners installing EVSE, good for both hardware and installation costs - retroactively.
Massachusetts Incentive Programs

• **Workplace Electric Vehicle Supply Equipment Grants (MA-EVIP)**
  • Grants for 50% of the cost of Level 1 or Level 2 workplace EVSE, up to $25,000. Eligible applicants include employers with 15 or more employees in a non-residential place of business. Funding is available on a first-come, first-served basis.

• **Massachusetts Offers Rebates for Electric Vehicles (MOR-EV)**
  • offers rebates of up to $2,500 to customers purchasing or leasing a PEV or zero-emission motorcycle.
Conclusions

• Global, US & Regional markets actively converting transportation to electricity
• Hospitality Industry can use EVSE to attract new customers, differentiate brand, enhance sustainability mission.
• Rapid changes in vehicle and charging technology means strategic investment is critical. Start simply and expect change.
• Federal/state incentives are available
ClipperCreek

- Since 1993
- Highly reliable product reputation
- Founders: Jason France, Mike Rogers
- Products >15 years, competitors <4 years
- Multiple generations EVSEs: Levels 1 & 2
- >20,000 EVSEs: Auburn, CA facility
- Used for verification of compatibility
- Many UL & CE listed products
  - 20A-100A
Current Products

- CS Line Public infrastructure product $1750-$2650
  - UL Listed
  - 208 V / 240 V
  - 20 to 80 Amps - Tesla charge rate

- HCS Series $565-$899
  - UL Listed - Workhorse unit
  - 208 V / 240 V
  - 30 to 60 Amps

- LCS-25 Line
  - Residential Unit
  - ETL Listed
  - 208 V / 240 V
  - 20 Amps Continuous
  - Comes with plug

- Made in the US
- Reliable and low cost
- All are highest NEMA 4x rating for indoor/outdoor use
- Easy mounting on wall or pedestal, single or dual units
- 25 foot cord set - standard
- 3 Warranty for most products
- Can be accessorized with cable retractors, RFID card readers, keypads, and other access control and energy management options.
Questions/Comments?

- Call me if you have questions on what technology to use and charging policies that work for hotels

- Call me to learn more about ClipperCreek EV Charging products and accessories

Barry Woods, Director
bwoods@emne.net
503-504-6492
@barrytwoods

www.driveevs.com
www.electricmobilityne.com