FSEC Advisory Board Meeting
“The Electric Vehicle Market and Drive Electric Florida”
18 April 2014

Britta K. Gross
General Motors
Director, Advanced Vehicle Commercialization Policy
PEV Industry sales of almost 190,000 since late 2010
Electrical

Public Fueling Stations

7,867 electric stations with 18,987 charging outlets in the United States
Excluding private stations
9,404 (incl. private)

PEV Industry sales of almost 190,000 since late 2010, however ...
Recent PEV year-on-year sales are concerning
Market Share of PEV Sales relative to Total New LDV Sales
Dec 2010 through August 2013

PEV Market Share

- >1.4%
- >1.0%
- >0.5%
- >0.4%
- >0.3%
- >0.2%
- >0.1%
- <0.1%
Good correlation between states with PEV sales and those states with strong stakeholder engagement efforts.
A statewide multi-stakeholder coalition:

• Auto Manufacturers and Dealers
• Utilities
• Car Charging Manufacturers and Distributors
• Clean Cities Coalitions Throughout Florida
• Environmental Groups
• Local Government
• FSEC
Drive Electric Florida: Nov/Dec 2013 Kickoff Participants

- FPL
- Duke
- OUC
- TECO
- Jacksonville Electric Authority (JE)
- General Motors
- Nissan
- Ford
- Proterra
- Sutherlin Nissan
- Crown Electric
- NovaCharge
- Car Charging Group
- State of Florida Office of Energy
- Orange County
- Miami-Dade County

- Ft. Lauderdale/Broward County
- Broward County
- City of Orlando
- Clean Cities – Central
- Clean Cities – Southeast
- Clean Cities - Tampa Bay
- Clean Cities - North FL
- Sierra Club
- UCF
- Florida Solar Energy Center (FSEC)
- Electrification Coalition
- Suncoast EV Collaborative
- Tesla Motors Club
- Electric Vehicle Association
- Parquet Group
- RS&H
Drive Electric Florida

Vision:
Drive Electric Florida aims to advance the energy, economic, and environmental security of the State of Florida by promoting the growth of electric vehicle ownership and accompanying infrastructure.

Mission:
To support and accelerate the adoption of plug-in electric vehicles in Florida:
• Engage and educate the public, businesses, and policy-makers
• Facilitate collaboration
• Support EV-friendly policy and programs.
## Initial Working Team

<table>
<thead>
<tr>
<th>Category</th>
<th>Representative</th>
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<tbody>
<tr>
<td>Utilities</td>
<td>Anne-Louise Seabury, FPL</td>
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<tr>
<td>Environmental</td>
<td>Britten Cleveland, Sierra Club</td>
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<tr>
<td>Automakers</td>
<td>Britta Gross, GM</td>
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<tr>
<td>Infrastructure</td>
<td>Helda Rodriguez, NovaCharge</td>
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<tr>
<td>Clean Cities &amp; Academics</td>
<td>Colleen Kettles, CFL Clean Cities &amp; FSEC</td>
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<tr>
<td>Local Government</td>
<td>Maribel Feliciano, Broward Co.</td>
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<tr>
<td>Local Government</td>
<td>John Parker, Orange Co.</td>
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# Current Working Team Leads

<table>
<thead>
<tr>
<th>Category</th>
<th>Lead</th>
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<tbody>
<tr>
<td>Organization</td>
<td>Colleen Kettles, CFL Clean Cities &amp; FSEC</td>
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<tr>
<td>Education</td>
<td>Britta Gross, GM</td>
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<tr>
<td>Policy</td>
<td>Jennifer Szaro</td>
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Why Drive Electric?

• **Energy**
  – Lessen dependence on oil
  – Increase use of domestic/local electricity

• **Economy**
  – 80% less costly to operate a Plug-in Electric Vehicle
  – New technology drives jobs (infrastructure, education, awareness)

• **Environment**
  – 0 tailpipe emissions
  – Lower overall (well-to-wheel) emissions
80% of VMT is less than 40 miles per day

Proximity to a City Center Impacts How We Drive
On Average, the average miles driven by the typical U.S. driver increases the further away from a city center they live.
U.S. Plug-in Electric Vehicles
Market Share by Approx. Price Point
2013 (ignoring trucks, SUV's)

<table>
<thead>
<tr>
<th>Price Point</th>
<th>Market Share</th>
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<tbody>
<tr>
<td>All vehicles</td>
<td>1%</td>
</tr>
<tr>
<td>$20,000+</td>
<td>2%</td>
</tr>
<tr>
<td>$25,000+</td>
<td>4%</td>
</tr>
<tr>
<td>$30,000+</td>
<td>3%</td>
</tr>
<tr>
<td>$35,000+</td>
<td>4%</td>
</tr>
<tr>
<td>$40,000+</td>
<td>6%</td>
</tr>
<tr>
<td>$50,000+</td>
<td>8%</td>
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Entry-level MSRP calculated for 271 vehicles (commercial vehicles excluded). Post-federal rebate prices used for plug-in electric vehicles. Full context provided by accompanying article.

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Education & Awareness

Why and What are the highest impact initiatives to grow the PEV market in Florida?

1. Workplace Charging
   - Provides daily charging for those without a convenient home charging solution
   - Doubles the potential for daily electric miles driven (making PEVs even more attractive)
   - Provides a visible showcase of PEVs available in the market to potential new car buyers (employees, fleet managers, execs)

2. Multi-Dwelling Units
   - New car-buying consumer opportunity in higher end condos/apartments
   - Home charging challenging (complex building ownership, associations, parking restrictions,....)
   - Longer term strategy

3. Awareness
   - Need to promote (and leverage) what is already being done
   - Need to get in front of new faces (especially new-car-buyers)
Awareness

Priorities and Suggested Approach:

1. Prepare formal documentation/brochure for this FL team/effort
2. Plan and prepare press releases for this FL team/effort and major announcements
3. MOU of 15 Mayors to demonstrate PEV leadership and support DEF’s goals
4. MOU of select Corporate Leaders endorsing DEF’s goals and committing to do xyz
5. Identify all Florida event opportunities for EV exposure and ride & drive events
   a) Ride & Drives – track all Florida events (where, when, # drivers, # new drivers), etc...
   b) Strategy to offer Ride & Drives to corporations across Florida (maybe in conjunction with Workplace Charging initiative; reward?)
   c) Website - where to host this data on a website? (user friendly, flexible to changes, professional)
6. Education/Outreach - Consumer awareness – Provide better support and cross-state coordination of all events
   a) National Plug-in Day – September; Earth Day – April; State Fair – East of Tampa in February
The DOE’s EV Project provides a valuable source of electrical infrastructure data.

Source: John Smart, INL, EV Project
Infrastructure Deployment in The EV Project

Blink Charging Units Reporting Data in The EV Project through September 2013

Washington State
- 12 DCFC
- 12 PNL2
- 1,127 RL2
- 376 PAL2

Oregon
- 22 DCFC
- 80 PNL2
- 683 RL2
- 483 PAL2

San Francisco
- 27 DCFC
- 187 RL2
- 173 PAL2

Los Angeles
- 4 DCFC
- 31 PNL2
- 730 RL2
- 373 PAL2

Phoenix
- 18 DCFC
- 440 RL2
- 488 PAL2

Dallas/FW
- 6 DCFC
- 90 PNL2
- 92 RL2
- 104 PAL2

Houston
- 0 DCFC
- 26 PNL2
- 97 RL2
- 130 PAL2

Philadelphia
- 6 DCFC
- 7 PNL2
- 100 RL2
- 22 PAL2

Chicago
- 0 DCFC
- 0 PNL2
- 22 PAL2

Nashville
- 6 DCFC
- 12 PNL2
- 768 RL2
- 298 PAL2

Memphis
- 5 DCFC
- 50 PNL2
- 334 RL2
- 134 PAL2

Knoxville
- 4 DCFC
- 50 PNL2
- 342 RL2
- 36 PAL2

Atlanta
- 0 DCFC
- 22 PNL2
- 248 RL2
- 123 PAL2

Total
- 107 DCFC
- 474 PNL2
- 3,511 RL2
- 8,250 PAL2

Legend
- Yellow: DC Fast Charge (DCFC)
- Blue: Private Nonresidential (PNL2)
- Green: Residential (RL2)
- Red: Publicly Accessible Level 2 (PAL2)

Source: John Smart, INL, EV Project
Home vs. Work vs. Public Charging
Study Period 1/1/2012 – 12/31/2013

• Overall EV drivers:
  o 84% of all charging events are at home
  o 16% not at home

• When workplace charging is available to an EV driver:
  (707 Leafs with access to workplace charging from 1/1/2012 – 12/31/2013)
  o 65% of charging events are at home
  o 32% at work
  o 3% at other locations (e.g. public)

Source: John Smart, INL, EV Project; Link to all reports = http://avt.inel.gov/librarybydate.shtml
Workplace Charging

• Provides daily charging for those without a convenient home charging solution
• Doubles the potential for daily electric miles driven (making PEVs even more attractive)
• Provides a visible showcase of PEVs available in the market to potential new car buyers (employees, execs, fleet managers)

Actions Needed:
1. Need IRS to clearly state EV charging in the workplace is defined as “de minimus” and not a taxable benefit to employees
   ➢ As are $125/mo employee-provided transit passes and $240/mo parking privileges

2. Need Architect of the Capitol to clearly state Government facilities can provide employee/visitor EV charging
   ➢ Define a fee mechanism for employee charger use (credit card, monthly deduction, …) and give project go-ahead

3. Promote the DOE’s Workplace Charging Challenge Initiative

Arguably the most important infrastructure strategy to accelerate adoption of PEVs.
GM Workplace Charging
401 Workplace Charge Stations (incl. 164 at GM Plants)
(approx. 400 add'l private; 2 ADA friendly; 88 Solar; 65% @ 240V, 35% @120V)

**Michigan Sites**
- **Pontiac**
  - 32 Workplace (16@240V)

- **Warren Tech Center**
  - 121 Workplace (76@240V) (28 are Solar)

- **Renaissance Center**
  - 33 Workplace (30@240V) 2 “showcase” @240V

- **Milford Proving Grounds**
  - 22 Workplace (240V) (18 are Solar)

- **Hamtramck**
  - 10 Workplace (240V) (all Solar)

**California Sites**
- **Palo Alto**
  - 1 Workplace (240V)

- **N. Hollywood**
  - 2 Workplace (120V)

- **Thousand Oaks**
  - 4 Workplace (240V)

- **Glendale**
  - 1 Workplace (120V)

- **Torrance**
  - 17 Workplace (13@240V)

- **Santa Fe Springs**
  - 1 Workplace (240V)

**New York Sites**
- **Ardsley**
  - 3 Workplace (2@240V)
GM Workplace Charging – Assembly Plant Efforts

164 Workplace Charge Spots at 20 Assembly Plants (42 Solar)

**Michigan**
- Bay City Powertrain
  - 11 Workplace (120V)
- Brownstown Battery
  - 6 Workplace (3@240V)
- Flint Assembly
  - 2 Workplace (240V)
- Flint Metal Center
  - 6 Workplace (4@240V)
- Grand Rapids (GM Holding)
  - 4 Workplace (240V)
- Hamtramck
  - 10 Workplace (240V) - Solar
- Lake Orion
  - 8 Workplace (2@240V)
- Pontiac Stamping
  - 5 Workplace (1@240V)
- Saginaw Metal Castings
  - 6 Workplace (120V)
- Warren Transmission
  - 3 Workplace (120V)

**Ohio**
- Lordstown
  - 12 Workplace (240V) - East Plant
  - 2 Workplace (240V) - West Plant
- Parma Stamping
  - 12 Workplace (240V) - Solar
- Toledo Transmission
  - 4 Workplace (240V)

**Kentucky**
- Bowling Green
  - 12 Workplace (240V) – Solar

**New York**
- Lockport (GM Holding)
  - 6 Workplace (120V)
- Rochester
  - 6 Workplace (240V)
- Tonawanda
  - 36 Workplace (6 @ 208V)

**Maryland**
- White Marsh
  - 8 Workplace (4@240V) - Solar

**Texas**
- Arlington
  - 3 Workplace (240V)

**Kansas**
- Fairfax Assembly
  - 2 Workplace (120V)
DOE’s Workplace Charging Challenge Partners

Goal is tenfold increase in 5 years!
Multi-Dwelling Units (condos, apartments, …)

According to 2011 US Census data, 92mil residences are single-family detached homes (incl mobile homes) out of 132million total residences – the rest are apartments, condos, townhomes, etc…

- New car-buying consumer opportunity in higher end condos/apartments
- Home charging in MDU’s is challenging (complex building ownership, associations, parking restrictions,….)

Actions Needed

Legislation that:
1. Requires building codes support EV charging in new/modified construction
2. Requires MDU’s/HOA’s to support (do not deny) a resident’s request to find an EV charging solution:
   - CA-AB1092 (passed)
   - CO-SB 126 (passed)
   - CT-SB 357 (proposed)
   - HI-SB 2199 (proposed)

70% of U.S. residences are detached homes, presumably with a 120V outlet solution; 30% are multi-dwelling units needing a supportive charging policy.

Takeaways

• A thriving Florida PEV market requires more alignment and engagement by leading stakeholders, including thought-leading corporations
  o Need to send a signal and make the PEV market more successful today to ensure it can grow to offer more products

• Incentives and Awareness are critical and make the most difference

• Workplace charging is a powerful, direct, enabler that engages employers and employees (and can start with a simple 120V outlet and a sign)

• Organizing state-wide support for Drive Electric Florida ensures we are collectively more effective -- all pulling in the same direction