Electric Vehicles in Maine

October 25th, 2012

Presenter: Jennifer Puser
Title: Transit & Energy Planner
E-mail: jpuser@gpcog.org
History of Electric Vehicles

• 1830s – first electric automobiles
• 1896 – Jacob Lohner and Ferdinand Porsche began producing an electric vehicle
• Design was used 70 years later for NASA Lunar Rover
• 1910 – gasoline powered vehicles became preferred mode of transportation
• 1920s – availability of cheap oil reduced electric vehicle use
Electric Drive Vehicles

• Three groups of EVs according to U.S. DOE:
  – Hybrid electric vehicles (HEVs)
  – Plug-in hybrid electric vehicles (PHEVs)
  – Battery-powered electric vehicles (BEVs)

• All EVs utilize electric motors and energy storage systems
• Each type offers different advantages
• Obama Administration has a goal Of 1 million EVs on the road by 2015.
Why Consider Electric Drive Vehicles?

- No tailpipe emissions – effects of air pollution and global warming are lessened
- Electricity is produced domestically
- Renewable sources can and are used to generate the electricity needed
- Maine generates about 30% renewable power (wind, hydro, biomass, etc. and is increasing)
- Domestically produced electricity increases energy independence
Advantages of Electric Drive Vehicles

• Best of both electric and conventional systems
• EVs and conventional vehicles are essentially driven in the same manner
• All-electric systems (BEVs) do not produce any local emissions
• Decreased reliance on foreign oil
• Low maintenance costs
• Save on fuel costs over the life of the vehicle (Nearly $13k based on $3.50 gas, and avg electricity prices. Source: UCS)

Annual electricity costs vary from $500-1,100 per year.)
Types of EVs Available in Maine Today

- **Nissan Leaf** (BEV, 99 mpg, $30-35K, 73 mile range)

- **Tesla Roadster** – (BEV, 89 mpg, $100k, 265 mile range)
Types of EVs Available in Maine Today

• **Mitsubishi “i”** (BEV, 112 mpg, $30k, 62 mile range)

• **Chevy Volt Plug-in Hybrid** (94 mpg, $40k, 380 mile range, 35 electricity only)
Types of EVs Available in Maine Today

- **Toyota Prius Plug-in Electric Hybrid** (95 mpg, $32K-40K, 540 mile range, 11 electricity only)

- Up to $7,500 tax Federal tax credit!

Lithium-Ion Batteries

- Used in PHEVs, and BEVs
- High power-to-weight ratio
- Newest technology, show great promise
- U.S. produces around 40% of all lithium batteries
Electric Vehicle Charging Levels

Level 1
• 120 volt “residential” outlets
• Standard three-prong outlet
• Charges at 2-5 miles of range per hour

Level 2
• 220 – 240 volt charging systems
• Fixed location
• Charges between 2 and 6 hours
• 10-20 miles of range per hour
Electric Vehicle Charging Levels

Level 3

- 480 volt DC Fast Charge system
  - Fast-fill
  - Can charge batteries to 50% capacity in 10 minutes or less
  - Utility systems must be upgraded to utilize Level 3 charging
  - 60-80 miles of range in 20 mins.
EV Stakeholder Group

- Convened a Stakeholder Group in 2011
- Developed a Feasibility Study for the Greater Portland Region - Completed in October, 2011
- Looked at barriers to EV adoption, EVSE installation, Permitting and more
- Recommended 5 potential locations for EVSE in Greater Portland Region
  - Idexx Laboratories
  - Westbrook City Hall
  - Maine Mall
  - Portland City Hall
  - Maine Medical Center
EV Survey

- Survey was sent to over 700 existing Hybrid Vehicle owners and additional interested parties in 2011

- Most Important Benefits of PHEV and EVs according to respondents were:
  - “to reduce pollution and personal contribution to climate change” followed by
  - “reduce fossil-fuel consumption and reliance on foreign oil.”
EV Survey

Concerns and barriers associated with PHEV and EVs of respondents included the following (in order of ranking):

- Accessibility of charging infrastructure
- Price
- Vehicle Range
- Cold weather performance
- Lifespan of batteries
- Availability of vehicles
- Safety concerns of having a charging station in their garage
EV Readiness Grant

• Develop and carry out stakeholder engagement
• Complete a literature review including a lengthy data collection process
• Numerous documents focused on siting and design guidelines, model building codes, permitting and zoning rules
• Outreach and education (events & one-on-one mtgs.)
Maine Clean Communities’ EV Work

EV Charging Infrastructure in Maine: 5 Charging Stations Now

– Lee Auto Malls – Auburn and Topsham Dealerships
– Acadia Welcome Center, Trenton
– Auto Museum, Bar Harbor
– Revision Energy, Portland
Jennifer Puser, Transit & Energy Planner
jpuser@gpcog.org
774-9891
http://mainecleancommunities.gpcog.info/