

Clean Cities 2011 EV Community Readiness

Project FEVER: Fostering Electric Vehicle Expansion in the Rockies

Awarded to: American Lung Association of the Southwest

PI: Natalia Swalnick, Director of Environmental Health, ALA Denver

Energizing Oregon: A Plug-In Electric Vehicle Market and Community Plan

Awarded to: Oregon Business Development Department

PI: Mark Brady, Clean Tech Strategist, Business Oregon

Kay Kelly

U.S. Department of Energy

May 15, 2013

This presentation does not contain any proprietary,
confidential or otherwise restricted information.

Project ID: TI027



The screenshot displays the 'the Electric ride' website. At the top, a blue navigation bar contains the 'Clean Cities' logo. Below this, a yellow banner features the 'the Electric ride' logo in a stylized, bubbly font. A blue line with three circular icons (a question mark, a stopwatch, and a group of people) connects the banner to the main content area. The icons are labeled 'Are You Ready?', 'Get Set', and 'Let's Go!'. On the right side, a vertical menu titled 'How to prepare...' lists three options: 'my Home Individuals' (with a left arrow), 'my Business Fleet Managers' (with a right arrow), and 'my Property Owners & Managers' (with a left arrow). The main content area is divided into two sections. The left section, titled 'Choose a Ride.', features a large image of a black Mitsubishi i MiEV. Below the image, text reads 'Mitsubishi i MiEV Late 2011' and 'The i MiEV is a zero-emissions vehicle.' A blue button labeled 'Learn More' is positioned below the text. The right section features a large, stylized 'the Electric ride' logo. At the bottom of the page, a horizontal row of five small car icons is displayed, each with a different color and design.

the Electric ride

Are You Ready? Get Set Let's Go!

Choose a Ride.

Mitsubishi i MiEV
Late 2011

The i MiEV is a zero-emissions vehicle.

Learn More

How to prepare...

- my Home Individuals
- my Business Fleet Managers
- my Property Owners & Managers

the Electric ride

American Lung Association of the Southwest

PI: Natalia Swalnick
nswalnick@lungcolorado.org

- **TIMELINE**

- Start: October 2011
- End: June 2013
- 98% Complete

- **BUDGET**

- Total Project Funding:
\$500,000
 - DOE: \$500,000
 - Cost Share: \$0
- Funded w/ FY11 & FY12 funds
- \$498,997 spent as of 2/1/13

- **BARRIERS ADDRESSED**

- Availability of Alternative Fuel Vehicles & Electric Drive Vehicles
- Availability of Alternative Fuels and Electric Charging Infrastructure
- Consumer Reluctance to Purchase New Technologies
- Lack of Technical Experience with New Fuels and Vehicle Technologies

- **PARTNERS**

- Clean Cities Coalitions (3)
- State Agencies (6)
- Local Governments (27)
- Utilities (6)
- EV/EVSE manufacturers/retailers
- Fleets

Objectives:

- This project outlines a collaborative approach to successfully prepare the state of Colorado for electric vehicle (EV) and electric vehicle supply equipment (EVSE) readiness and implementation. The project includes a strong consortium of partners from each sector of the industry that will work together through the stakeholder process to develop consensus strategies that will mitigate the barriers to EV/EVSE implementation. Once adequate information has been gathered and analyzed, the project team will develop a publicly releasable written EV readiness plan. A comprehensive marketing, education and outreach plan will accompany the project to raise awareness of EVs in Colorado.

Project Supports VTP Deployment Goals:

- By 2020, to achieve a petroleum reduction of over 2.5 billion gallons per year through voluntary adoption of alternative fuel vehicles and infrastructure.
- To ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- To provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

APPROACH

Project FEVER, American Lung Association of the Southwest



PHASE 1 – Project Administration



PHASE 2 – Subject Area Assessments



PHASE 3 – Barrier Mitigation and Development of EV/EVSE Readiness Plan Elements



PHASE 4 – Development of Final EV/EVSE Readiness Plan



PHASE 5 – Marketing, Education and Outreach

PHASE 2 – Subject Area Assessments



Task 2: Electric Vehicle Grid Impact Assessment

- Gather and share data regarding EV impacts to the grid, develop scenarios that allow for resale of electricity at opportunity charge stations, assess costs associated with upgrading the grid to accommodate a high penetration of EVs

Task 3: Assessment of Electrical Permitting and Inspection for EV/EVSE

- Investigate current approaches and EVSE vendor preferred methods to permitting and inspecting charging stations and identify the strengths and weaknesses of individual approaches.

Task 4.0 – Assessment of Local Ordinances Pertaining to Installation of Publicly Available EVSE

- Investigate current approaches to zoning and parking rules and other local ordinances to support installation of EVSE infrastructure along with EVSE vendor preferred methods to approaching local ordinances and identify the strengths and weaknesses of individual approaches.

Task 5.0 – Assessment of Building Codes for EVSE

- Investigate current approaches to building codes that include EVSE infrastructure or dedicated circuits for EVSE infrastructure in new construction and major renovations along with EVSE vendor preferred methods to approaching building codes and identify the strengths and weaknesses of individual approaches.

Task 6.0 – EV Demand and Energy/Air Quality Impacts Assessment

- Inventory the volume/type of vehicles in fleets, usage patterns, annual replacement schedules and budgets and identify candidate conventional vehicles that can be replaced by EVs for the purpose of aggregating total EV demand in CO.

Task 7.0 – State and Local Policy Assessment

- host a series of forums to consider policy ideas at both the state and local level which will support the development of local/regional EVSE infrastructure and vehicle deployment including fiscal structures and various incentives. The merits and challenges of each policy area will be communicated and discussed through a collaborative process

PHASE 3 – Barrier Mitigation and Development of EV/EVSE Readiness Plan Elements



Task 8.0 – Electric Vehicle Grid Impact Minimization Efforts

- Develop and pilot Smart Grid enabled strategies based on considerations of Task 2.0 with early EV adopters, determine a preferred strategy for resale of electricity to opportunity charging stations and evaluate ratepayer impacts associated with including EVSE related investment in the utility rate base.

Task 9.0 – Unification and Streamlining of the EV/EVSE Permitting and Inspection Process

- Develop a single streamlined permit process for private residential charging infrastructure based on considerations of Task 3.0 that provide for a shortened turnaround time and develop best management practices for permitting and inspection of commercial and multi-unit residential charging infrastructure based on considerations of Task 3.0.

Task 10.0 – Development of Best Management Practices for Local EVSE Ordinances

- Develop best management practices for zoning, parking rules and other local ordinances to support charging infrastructure and other EVSE based on considerations of Task 4.0.

Task 11.0 – Development of Best Management Practices for Building Codes Pertaining to EVSE

- Develop best management practices for updating building codes to support EVSE infrastructure based on the considerations of Task 5.0

Task 12.0 – Development of Colorado-Specific Assessment of EV/EVSE Air Quality & Energy Impacts

- Refine the dispatch model for Colorado for baseline and projected EV scenarios based on considerations of Task 6.0 and compare emissions, energy and air quality impacts along with upstream fuel and vehicle manufacturing/disposal emissions and develop a tool to allow exploration of penetration rates and other assumptions.

Task 13.0 – Development of State and Local Policy Best Practices

- Develop best practices for state and local policies based on the considerations of Task 7.0.

PHASE 4 –Development of Final EV/EVSE Readiness Plan



Task 14.0 – Create final EV/EVSE Readiness Plan

- Consolidate study group elements and developed best management practices into a completed publicly releasable written EV/EVSE readiness plan

PHASE 5 –Marketing, Education and Outreach



Task 15.0 – Develop Project Marketing and Communication Elements

- Develop an electronic newsletter and a dedicated project website.

Task 16.0 – Plan and Schedule In-Person Education and Outreach Opportunities

- Schedule and host informational meetings and attend community forums throughout the state to advance the goals of the project. The recipient will also work with partners to assess the need for and schedule technical training events as appropriate.

- **Year 1**

- Data gathering
 - Two working group meetings each were held for stakeholders on the topics of policy, planning, permitting, regulator/utilities and data/assessments.
- Feedback
 - A thorough review of the final plan was completed by a team of writers during the conception phase, and the entire report was made available to all partners prior to publication
- Completion of Products
 - The Electric Ride (www.ElectricRideColorado.com) website was launched in March 2012
 - The Colorado Electric Vehicle and Charging Readiness Plan was released in December 2012
- Outreach of project
 - The Electric Ride website educates 1,500 users per month
 - 83 first responders were educated at local universities through Project FEVER

- **Year 2**

- TN presentations/lesson learned/info sharing

TECHNICAL ACCOMPLISHMENTS

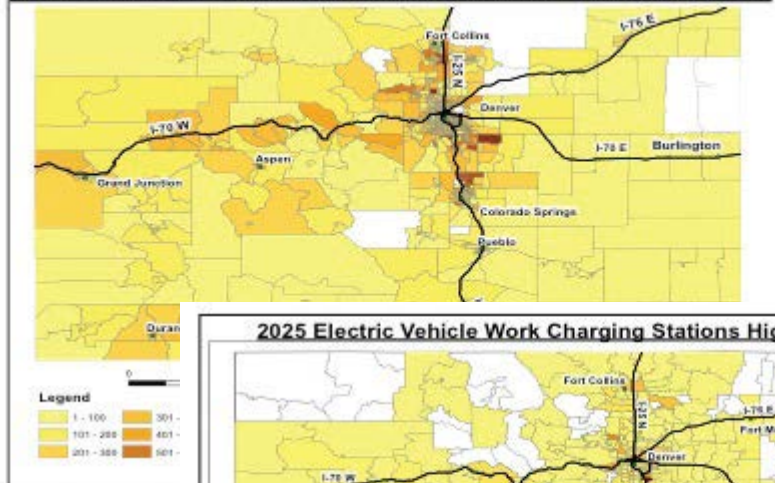
Project FEVER, American Lung Association of the Southwest



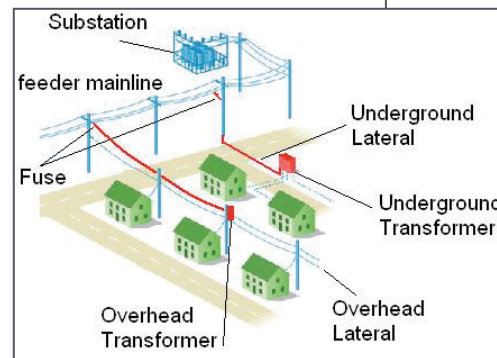
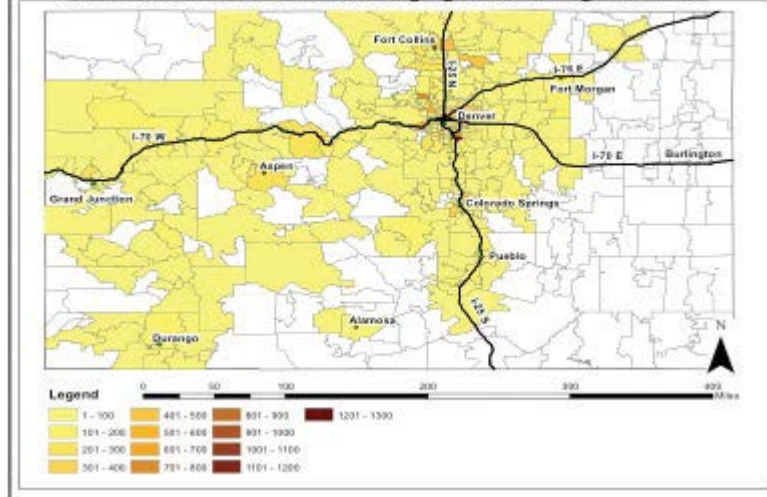
Deliverables/Products completed:

- A publicly releasable written EV/EVSE readiness plan with prioritized action items and suggested resources for implementation

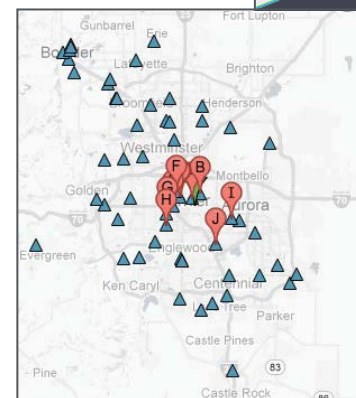
2025 EV Household Stations Medium Scenario



2025 Electric Vehicle Work Charging Stations High Scenario



Colorado Electric Vehicle and Infrastructure Readiness Plan

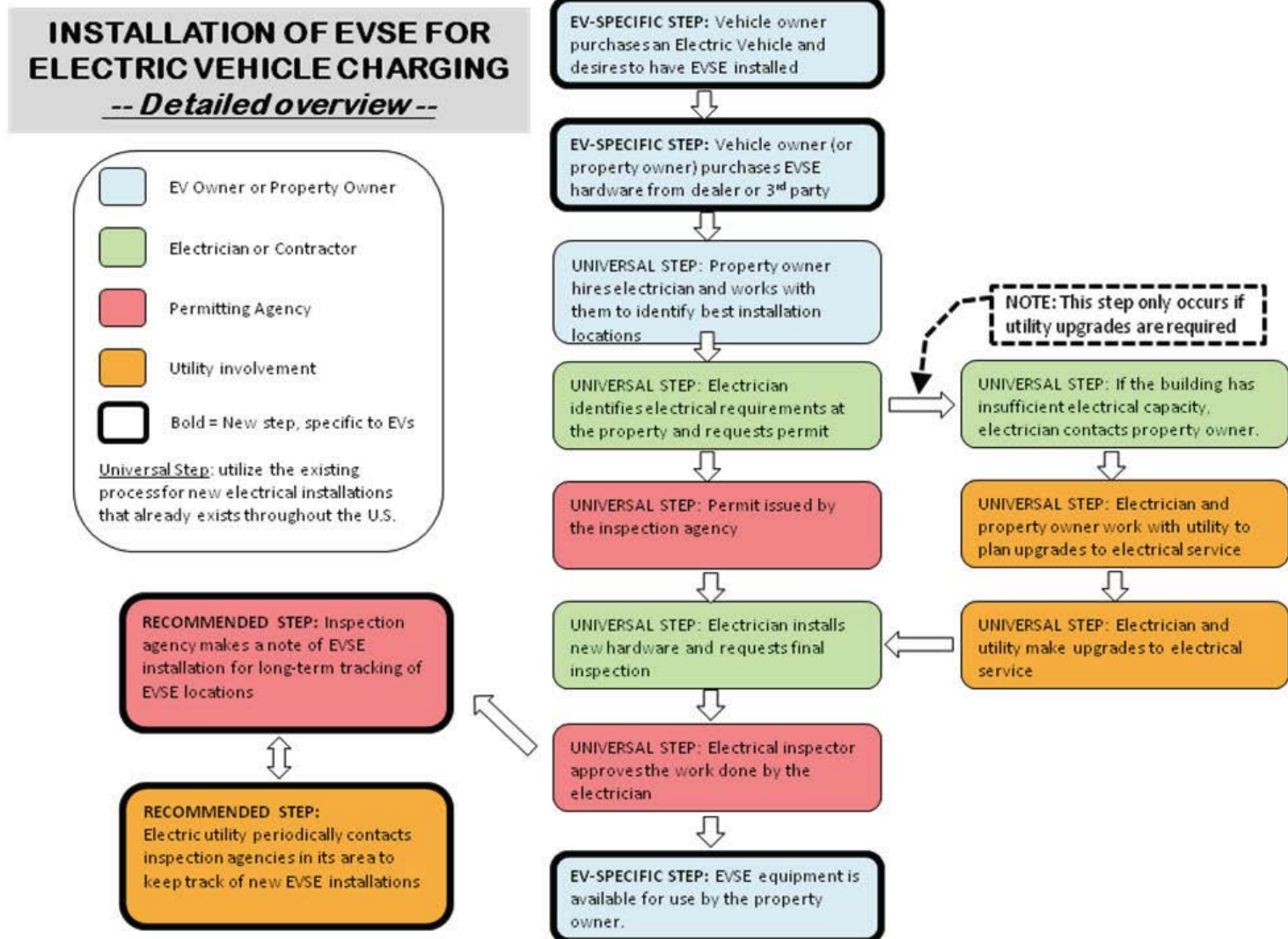


ACCOMPLISHMENTS (cont.)

Project FEVER, American Lung Association of the Southwest



- Model permit for private residential charging



ACCOMPLISHMENTS (cont.)

Project FEVER, American Lung Association of the Southwest



- Report on energy and air quality impacts of EV deployment in CO

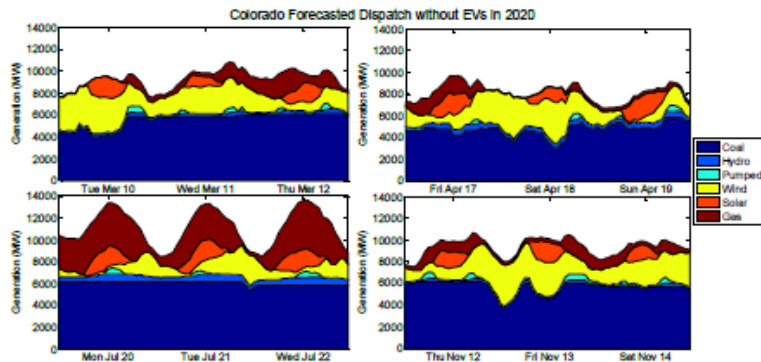


Figure 3: Hourly generation breakdown for PSC/WACM in 2020 without EV penetration.

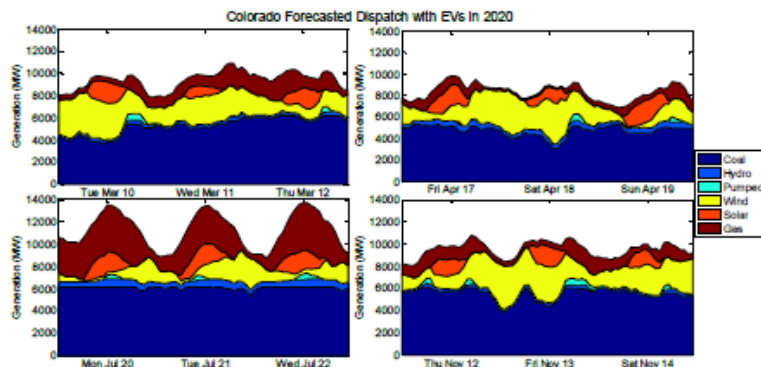


Figure 4: Hourly generation breakdown for PSC/WACM in 2020 with aggressive EV penetration.

Figure 3: ES-1. Well-to-wheels energy consumption for electric vehicles in the high PEV penetration case, compared to that for average light duty gasoline vehicles.

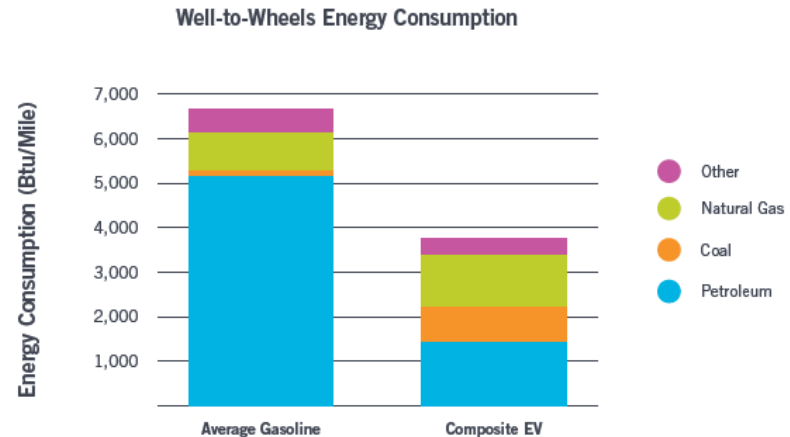
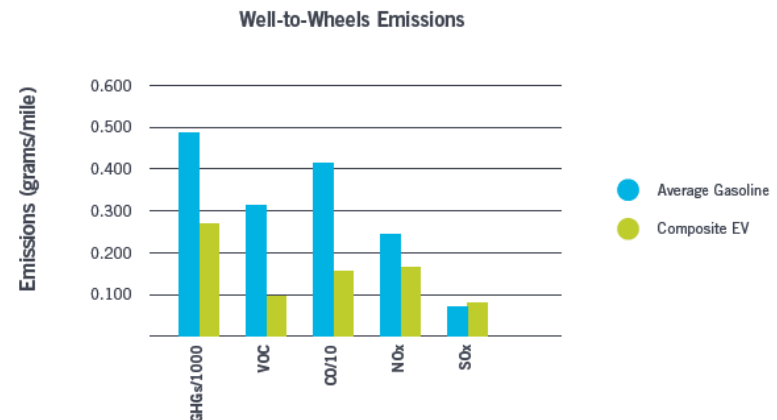


Figure 4: ES-2. Well-to-wheels emissions for electric vehicles in the high PEV penetration case, compared to those for average light duty gasoline vehicles.

For display purposes emissions rates for GHG are divided by 1000; those for CO are divided by 10.



ACCOMPLISHMENTS (cont.)

Project FEVER, American Lung Association of the Southwest



- An online resource for the general public and consumers through www.ElectricRideColorado.com



COLLABORATIONS

Project FEVER, American Lung Association of the Southwest



- **Clean Cities Coalitions**
 - Denver Metro Clean Cities
 - Northern Colorado Clean Cities
 - Southern Colorado Clean Cities
- **State Agencies / Institutions**
 - Colorado Department of Transportation (CDOT)
 - Colorado Department of Public Health and Environment (CDPHE)
 - Governor's Energy Office (GEO)
 - State Fleet Management (SFM)
 - Colorado Public Utilities Commission (PUC)
 - University of Colorado (CU)
 - Colorado School of Mines
- **Utilities / Energy Providers**
 - Public Service Company of CO (Xcel Energy)
 - Colorado Springs Utilities (CSU)
 - Black Hills Corporation
 - Glenwood Springs Power and Light
 - Longmont Power and Communications
 - Morgan County Rural Electric Association
- **Local Governments**
 - Denver Regional Council of Governments (DRCOG)
 - Grand Valley MPO
 - North Front Range MPO (NFRMPO)
 - Pikes Peak Associated Council of Government (PPACG)
 - Regional Air Quality Council (RAQC)
 - City of Aurora, Boulder County, City of Boulder, Colorado Springs, Commerce City, City and County of Denver, El Paso County, City of Englewood, City of Ft. Collins, City of Grand Junction, City of Lakewood, Town of Longmont, Town of Superior, Town of Telluride
- **EV / EVSE Providers**
 - Boulder Electric Vehicle
 - Eetrex
 - Kum and Go
 - OpConnect
 - Phil Long Ford
 - Go Smart Solutions
- **Others**
 - Rocky Mountain Institute (RMI)
 - Environment Colorado (EC)
 - International Center for Appropriate and Sustainable Technology (iCAST)
 - Southwest Energy Efficiency Project (SWEET)
 - MOVE Colorado

- Remaining Project Activities
 - Attend EV Planning Project Workshop (5/1/13, Knoxville, TN)
 - Continue to promote The Electric Ride as a community resource
 - Work with stakeholders to implement policy recommendations from report
 - Measure successes against the goals of partners that they included in this report

- Independent Implementation Efforts (NOT Project Funded)
 - Funding instruments released by Colorado Energy Office and Regional Air Quality Commission to support EV/EVSE purchases
 - Electrification Coalition working with Fort Collins/Loveland to develop an EV Community

- Project FEVER has produced an EV/EVSE Readiness Plan
 - **Relevance:**
 - By 2020, to **achieve a petroleum reduction of over 2.5 billion gallons per year** through voluntary adoption of alternative fuel vehicles and infrastructure.
 - To **ease market introduction of alternative fuels and new electric drive vehicle technologies** through voluntary efforts in partnership with local communities
 - To **provide technical and educational assistance** to support local communities and partnerships that promote better understanding of the benefits of these new technologies.
 - **Approach:** Project Administration, Subject Area Assessments, Barrier Mitigation and Development of EV/EVSE Readiness Plan Elements, Development of Final EV/EVSE Readiness Plan and Marketing, Education and Outreach per the approved Statement of Project Objectives
 - **Project Accomplishments/Progress:**
 - Community Achievement and Leadership Award for a Clean Environment presented to Project FEVER at the World Renewable Energy Forum
 - Final report presented to the Regional Air Quality Council board, Pollution Prevention Advisory Board, Colorado Cleantech Industry Association, Xcel Energy Efficiency Conference, and report was distributed to key state legislators at the Colorado State Capitol
 - **Collaborations:** More than 105 Colorado-based entities including Clean Cities Coalitions, State Agencies, Local Governments, Utilities, EV/EVSE manufacturers/retailers, Fleets,
- Award-funded efforts will continue through May 2014
- Outside groups are currently using Project FEVER to guide implementation efforts in Colorado

Energizing Oregon: A Plug-In Electric Vehicle Market and Community Plan



**Oregon Business Development
Department**

PI: Mark Brady

Mark.Brady@state.or.us

- **TIMELINE**

- Start: October 2011
- End: June 2013
- 95% Complete

- **BUDGET**

- Total Project Funding:
\$573,923
 - DOE: \$485,000
 - Cost Share: \$88,923
- Funded w/ FY11 & FY12 funds
- \$326,990 spent as of 2/1/2013

- **BARRIERS ADDRESSED**

- Availability of Alternative Fuel Vehicles & Electric Drive Vehicles
- Availability of Alternative Fuels and Electric Charging Infrastructure
- Consumer Reluctance to Purchase New Technologies
- Lack of Technical Experience with New Fuels and Vehicle Technologies

- **PARTNERS**

- Clean Cities Coalitions (2)
- Governor's Office
- State Agencies (5)
- Local Governments (6)
- Public Utilities Commission
- Utilities (5) & private partners (15)
- DOT Research Consortium
- Oregon Auto Dealers Association

Objectives:

- This project will engage current and future stakeholders to develop an integrated statewide PEV readiness work plan that leverages and accelerates current PEV efforts in the State of Oregon. This effort will seek to integrate and optimize Oregon's existing PEV readiness efforts, partnerships and stakeholders to have all PEV-related groups, activities, and communications under one umbrella and operating from a uniform platform of policies and messaging. This plan will also identify and address key barriers which must be addressed to achieve broad, fast and successful deployment of PEVs. In addition, this project will create momentum for Oregon PEV deployments to exceed its share of the national goal of 1,000,000 PEVs on the road by 2015 through high visibility use of PEVs, outreach and education to engage future adopters of PEV and installers of EVSE, and targeted training to key early audiences.

Project Supports VTP Deployment Goals:

- By 2020, to achieve a petroleum reduction of over 2.5 billion gallons per year through voluntary adoption of alternative fuel vehicles and infrastructure.
- To ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- To provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

PHASE 1 – Achieving Project Momentum



PHASE 2 – Developing Key Elements of Plan



PHASE 3 – Collectively Defining a Roadmap Forward



PHASE 4 – Sharing Progress and Lessons Learned

PHASE 1 - Achieving Project Momentum



Task 1.0 – Project Management/Administration

- Manage the cost, schedule and scope of the project and provide status and progress in accordance with the deliverables section of this document

Task 2.0 – Define Roles and Responsibilities

- establish work groups and define directives, methodologies, and chairs and members of each work group along with completing an inventory of existing PEV efforts and stakeholders.

PHASE 2 –Developing Key Elements of Plan



Task 3.0 – Develop Content for the PEV Readiness Plan

- Conduct ongoing research to inventory current activities, identify and address barriers, determine opportunities to reduce/remove barriers, and develop strategies/recommendations to achieve broad-based PEV adoption.

Task 4.0 – Initial Implementation of Selected PEV Readiness Plan Elements

- Develop and conduct training on PEVs, develop brochures and/or other information-sharing mechanisms on PEVs for use at auto dealerships, conduct outreach on PEVs, develop and/or procure training on PEVs, develop and/or deploy training for electricians and others on EVSE, conduct PEV outreach in the two participating Clean Cities Coalitions' territories and establish a statewide PEV readiness website

PHASE 3 – Collectively Defining a Roadmap Forward



Task 5.0 – Create Final PEV with Prioritized Action Items

- Consolidate study group elements into a completed publicly releasable written PEV readiness plan with prioritized action items and suggested resources for implementation and will develop a continuing engagement plan to ensure that participants in the process stay engaged and are ready to implement some or the entire plan as resources becomes available

PHASE 4 –Sharing Progress and Lessons Learned



Task 6.0 – Project Information Sharing

- Track project costs, activities, hurdles and creative solutions to inform the development of EV readiness plans by other communities. Prepare and publish reports, finalize website, prepare presentations, and participate in merit reviews as necessary. This shall include the public release and presentation of the Energizing Oregon PEV market and community plan and accompanying website.

MLESTONES

Energizing Oregon, Oregon Business Development



- **Year 1**

- Data gathering
 - Four work groups (deployment, outreach, policy & utilities) held dozens of meetings total over the first year to inform plan development. Public surveys and focus groups were also conducted to gather details on public understanding of EVs
- Feedback
 - The Steering Committee (Governor's Office and Transportation Electrification Executive Council) reviewed work products throughout the process and did a final review of the draft plan from all the work groups.
- Completion of Products
 - Energizing Oregon plan was released in December 2012 and project website went live soon after.
- Outreach of project (events, webinars, training, etc..)
 - Utility work group held a series of four webinars in summer/fall 2012.
 - EV Pavilion set up at 2012 Portland International Auto Show
 - Outreach at various other community meetings, fairs, science museum events and at the State Capitol.

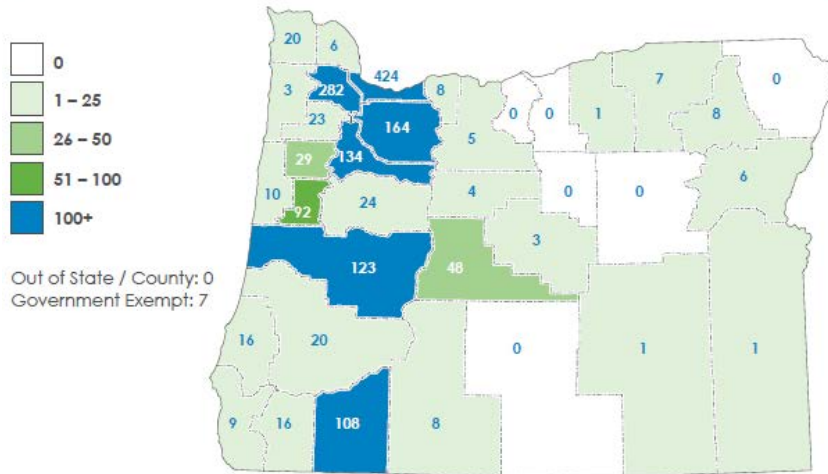
- **Year 2**

- TN presentations/lesson learned/info sharing.
- EV Pavilion at 2013 Portland International Auto Show and Better Living Show.
- Potential development of fleet financing proposal or workplace charging initiative.

Deliverables/Products completed:

- Written PEV readiness plan with prioritized recommendations for implementation steps and initial identification of organizations to be on point for each implementation step.

EV REGISTRATIONS IN OREGON BY COUNTY



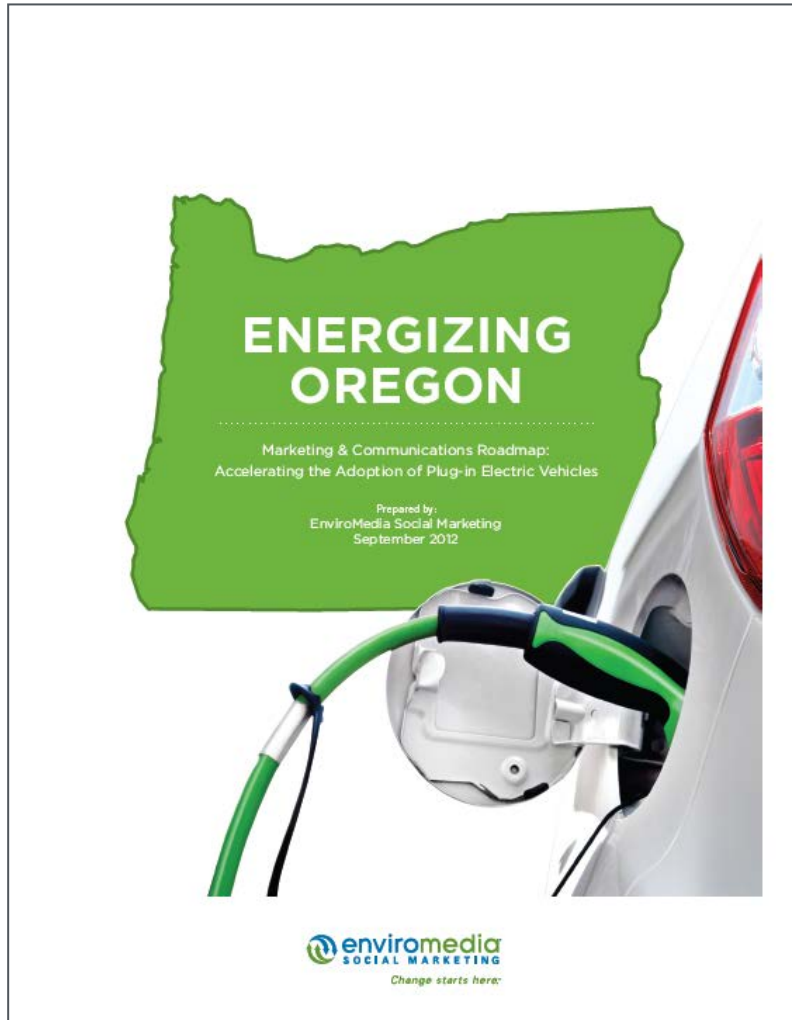
ENERGIZING OREGON

business
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ACCOMPLISHMENTS

Energizing Oregon, Oregon Business Development



- Fully developed outreach and education plan as an appendix to overall plan. Implementation of plan is dependent upon new resources.

ACCOMPLISHMENTS (cont.)

Energizing Oregon, Oregon Business Development



- Online hub for regionally-appropriate information on PEVs and the plan itself: <http://www.evroadmap.us/>

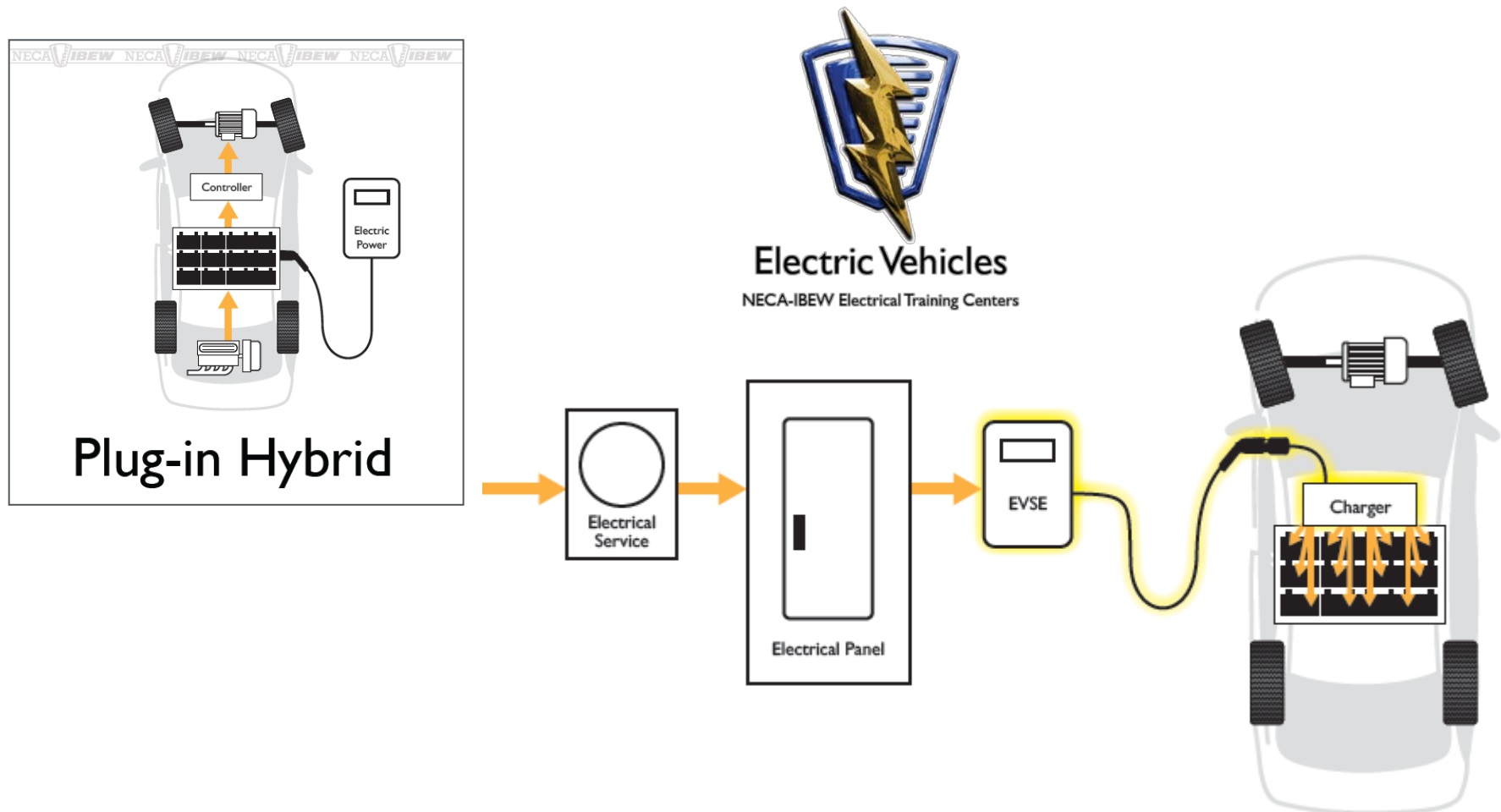


ACCOMPLISHMENTS (cont.)

Energizing Oregon, Oregon Business Development



- Developed and/or delivered training to electricians and auto dealers to help them understand how to sell and support PEVs and EVSE.

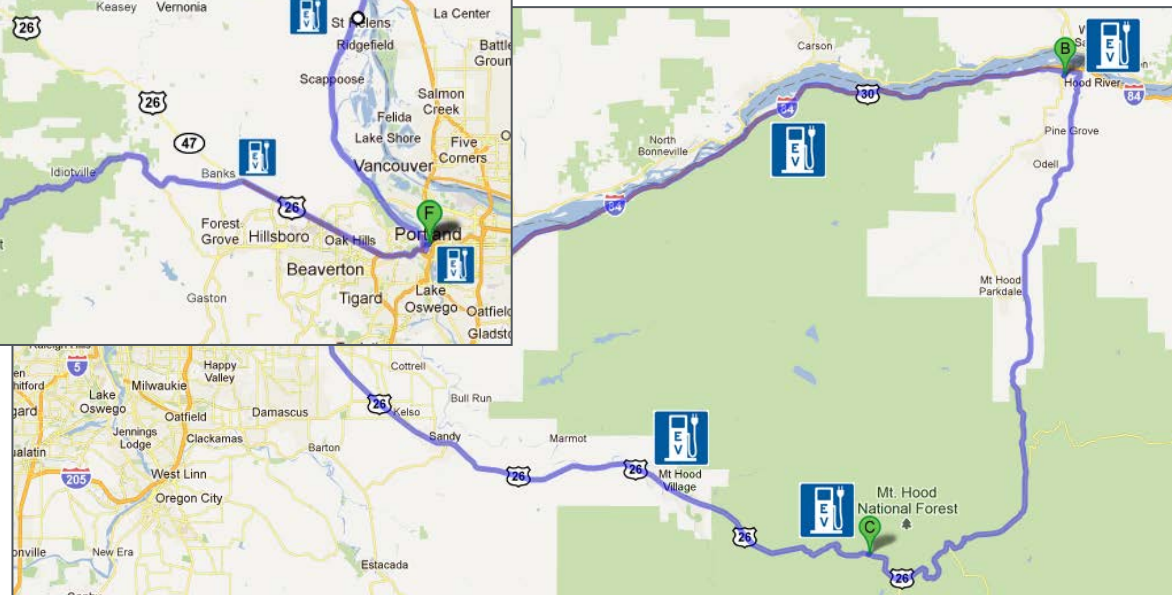
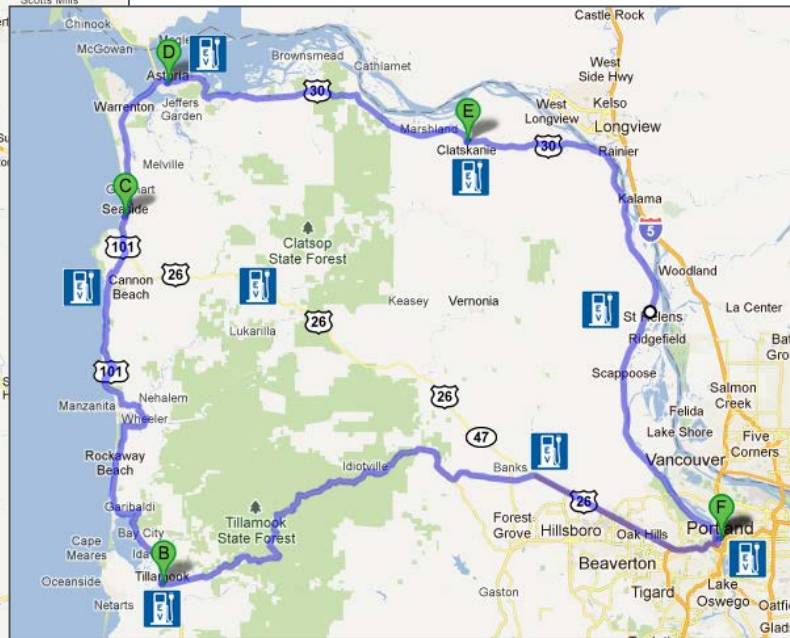
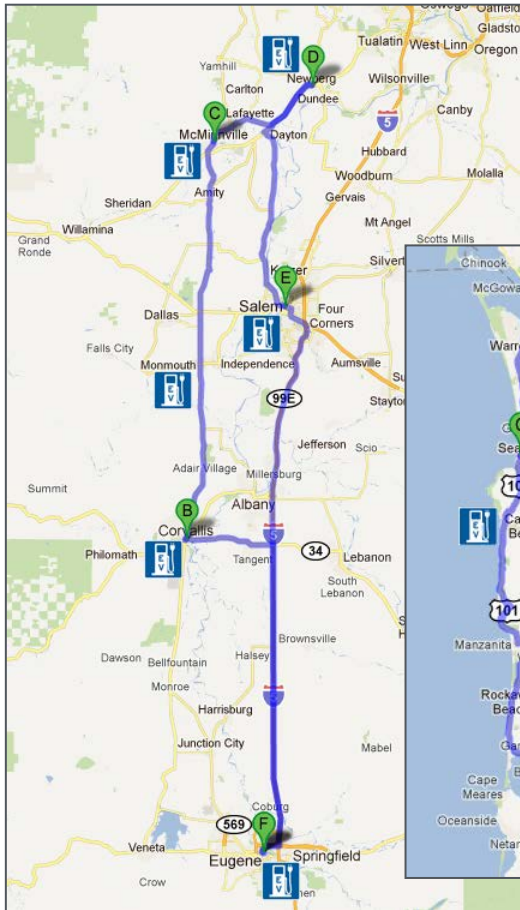


ACCOMPLISHMENTS (cont.)

Energizing Oregon, Oregon Business Development



- Developed PEV itineraries to be promoted by the state's tourism promotion agency to expose more people to PEVs and expand their usable radius.



ACCOMPLISHMENTS (cont.)

Energizing Oregon, Oregon Business Development



- Took initial steps toward developing a program around workplace charging and the creation of a new fleet PEV financing program.
- Creating a template outreach program that can be used by numerous partners at different events around the community.



COLLABORATIONS

Energizing Oregon, Oregon Business Development



- **Clean Cities Coalitions**

- Columbia-Willamette Clean Cities
- Rogue Valley Clean Cities

- **State Agencies**

- Governor's Office
- Oregon Business Development Department
- Oregon Department of Energy (ODOE)
- Oregon Department of Transportation (ODOT)
- Oregon Building Codes Division
- Oregon Department of Environmental Quality

- **Local Governments**

- City of Portland, OR
- City of Eugene, OR
- City of Springfield, OR
- City of Salem, OR
- City of The Dalles, OR
- Multnomah County, OR
- City of Vancouver, WA

- **Others**

- Oregon Public Utilities Commission
- Oregon Transportation Research Consortium
- Oregon Auto Dealers Association
- Drive Oregon
- Bonneville Power Administration
- PacifiCorp
- Oregon Municipal Electric Utilities Association
- Northern Wasco Public Utility District
- Clark County Public Utility District
- Salem Electric
- Portland General Electric
- Citizens Utility Board
- Climate Solutions
- Northwest Energy Coalition
- OEMs
- EVSE Manufacturers
- Travel Portland and Travel Oregon
- Association Oregon Counties
- League of Oregon Cities
- and more...

- Remaining Project Activities
 - Attend EV Planning Project Workshop (5/1/13, Knoxville, TN)
 - Promote PEVs and educate the public through a variety of events, such as the Better Living Show, community events and at the science museum.
 - Spread the word on PEV tourism itineraries developed in partnership with Travel Oregon.
 - Pursue implementation of policy recommendations with appropriate partners.

- Energize Oregon has produced a PEV Readiness Plan...
 - **Relevance:**
 - By 2020, to **achieve a petroleum reduction of over 2.5 billion gallons per year** through voluntary adoption of alternative fuel vehicles and infrastructure.
 - To **ease market introduction of alternative fuels and new electric drive vehicle technologies** through voluntary efforts in partnership with local communities
 - To **provide technical and educational assistance** to support local communities and partnerships that promote better understanding of the benefits of these new technologies.
 - **Approach:** Achieving Project Momentum, Developing Key Elements of Plan, Collectively Defining a Roadmap Forward, Sharing Progress and Lessons Learned
 - **Project Accomplishments/Progress:**
 - Plan adopted by Governor's Office and Transportation Electrification Executive Council
 - Development of PEV-specific travel itineraries to be promoted with other sustainable tourism promotions
 - Training provided to auto dealers and electricians on PEVs
 - **Collaborations:** Clean Cities Coalitions, State Agencies, Local Governments, Public Utilities Commission, Utilities, Colleges and Others
- Award-funded efforts will continue through May 2014
- Governor's Office created an MOU with ODOT, ODOE and Drive Oregon to guide continuing PEV promotional efforts in the state in a coherent manner.