

Clean Cities 2011 EV Community Readiness

**South Coast Air Quality Management
District (SCAQMD):**

**California Plug-In Electric Vehicle
Readiness Project**

PI: Patricia Kwon, SCAQMD



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

Project ID: TI029

Brett Aristegui
U.S. Department of Energy
National Energy Technology Laboratory
May 15, 2013

OVERVIEW

SCAQMD: Clean Cities 2011 EV Community Readiness



TIMELINE

- Start date: October 1, 2011
- End: June 30, 2013
- 95% Complete

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

BUDGET

- Total Project Funding: **\$1,201,209**
- DOE: \$1,000,000
- Cost Share: \$201,209

PARTNERS

- **Lead:** South Coast Air AQMD
- 13 California Clean Cities Coalitions
- State Government: California Air Resources Board
- Regional / Local Governments: Bay Area AQMD; Sacramento Area Council of Governments; San Joaquin Valley Air Pollution Control District
- Non-profits/Consultants: CA PEV Collaborative; EV Communities Alliance; CA Center for Sustainable Energy; ICF; UCLA Luskin Center; Better World Group

Objective:

- The objective of this project is to create community based electric vehicle infrastructure readiness plans and implement activities in anticipation of larger electric vehicle deployment efforts in the future.

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.

Barriers Addressed

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TASK 1 – Project Management and Administration

TASK 2 – Establish Coordinating Councils

Provide a forum for sharing best practices between regions of varying readiness levels

TASK 3 – Compile PEV Readiness Guides

Solicit input and complete the PEV Readiness Guidelines document

TASK 4 – Develop PEV Readiness Guides

Work with stakeholders in each targeted region to develop individual plans for the deployment of infrastructure

TASK 5 – Education, Outreach and Communications

Conduct outreach workshops for regions, coordinate with existing outreach efforts

MILESTONES

SCAQMD : Clean Cities 2011 EV Community Readiness



Task	Milestone	Date
1 - Project Management	Award all subcontracts	May 2012
2 – Establish councils	Councils established and monthly calls commence	Dec 2011
3 – Develop Guidelines	Online survey of community PEV readiness completed	May 2012
3 – Develop Guidelines	PEV Guidelines developed and disseminated	May 2012
3 – Develop Guidelines	Toolkit released	May 2012
4 – Develop PEV Readiness Guides	All 6 Reports Published	Dec 2012
5 – Education, Outreach & Communications	6 regional workshops completed	Dec 2012
5 - Outreach	Mayors event at EVS-26 completed	May 2012

Task 2 – Coordinating Council Structure

- Tracked project progress
- Assisted regions in development of infrastructure and readiness plans
- Shared best practices between regions of varying readiness levels
- Communicated best practices and lessons learned

SCAQMD

PEV Collaborative

PEV Coordinating Council

Technology Workgroups

San Diego

Los Angeles

San Joaquin

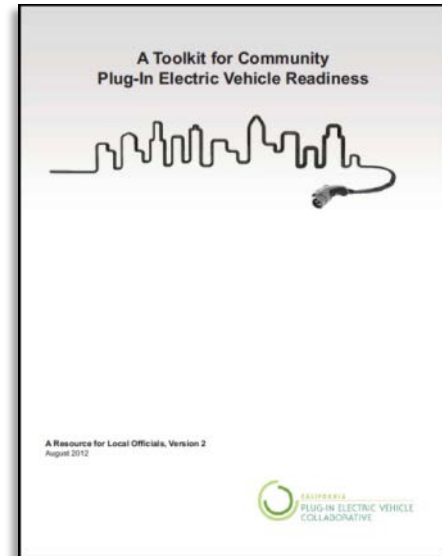
Central Coast

Bay Area

Greater Sacramento

PEV Readiness Toolkit

- Resource for local governments
- Offers best practices, examples, and case studies from communities and stakeholders
- Based around 5 core actions to get PEV ready
 1. Update zoning and parking policies
 2. Update local building codes
 3. Streamline permitting and inspection process
 4. Participate in training and education for public officials
 5. Reach out to local businesses and residents



Issued with 7 support docs (separately funded)

PEV Readiness – Guidelines for plans

- Recognize that regions would be at different stages of PEV readiness
- Identified five required PEV readiness elements
 - as an organizing strategy/framework
- Additional set of seven optional PEV readiness elements
 - agreed upon by the regions
- Document progress
 - on the five required PEV readiness elements
- Select consultants to create the regional plans

PEV Readiness Survey to assess initial PEV readiness

- Administered to local jurisdictions / municipalities in each region
- Informed strategies in regional readiness reports

San Diego survey identified that most agencies in region lack clear zoning and parking policies

Bay Area survey revealed diverse levels of readiness within region

6 Regional EV Readiness Reports



1. **Greater Sacramento**
2. **Bay Area**
3. **Central Coast**
4. **San Joaquin Valley**
5. **Southern California (L.A.)**
6. **San Diego**

Findings:

- Large differences in readiness between regions and within regions
- San Diego is at leading edge
- Need for continued, coordinated regional planning for PEVs and related infrastructure

TECHNICAL ACCOMPLISHMENTS

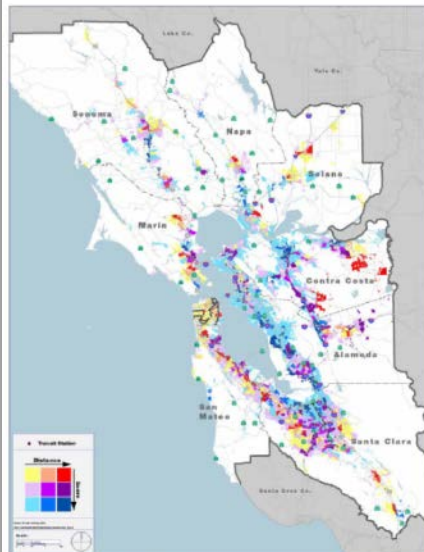
Task 4 - Bay Area EV Readiness Plan Highlights



Plan Includes:

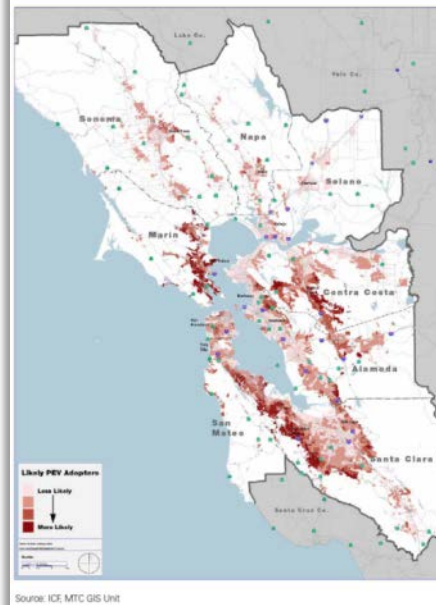
- Assessment of readiness on municipal level
- Siting Plan for EVSE
- Most likely PEV adopters
- Recommendations in each of 5 core areas

Figure 10. Opportunity Charging for Level 2 EVSE



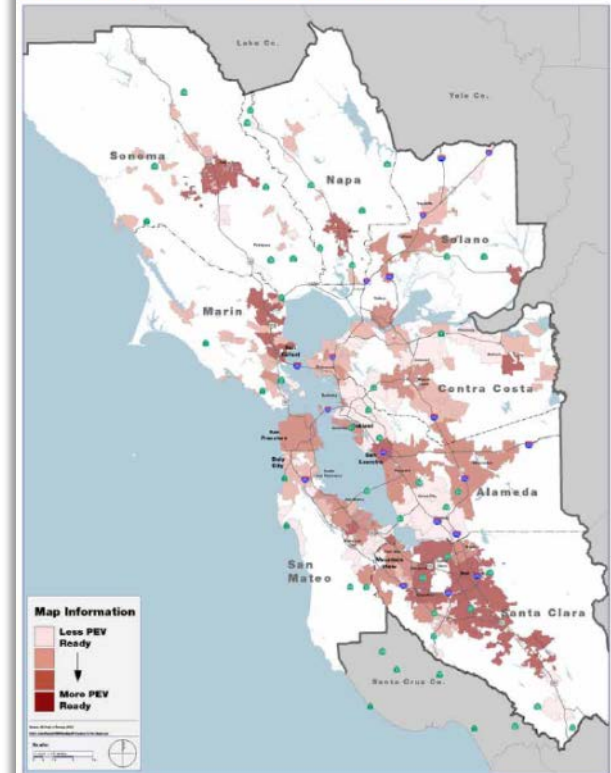
Source: MTC GIS Unit, Fehr&Peers, ICF

Figure 7. Most Likely PEV Adopters in the Bay Area



Source: ICF, MTC GIS Unit

Figure 1. PEV Readiness in the Bay Area, August 2012



Source: ICF, MTC GIS Unit

“Local governments in the Region are in vastly different states of readiness”

TECHNICAL ACCOMPLISHMENTS

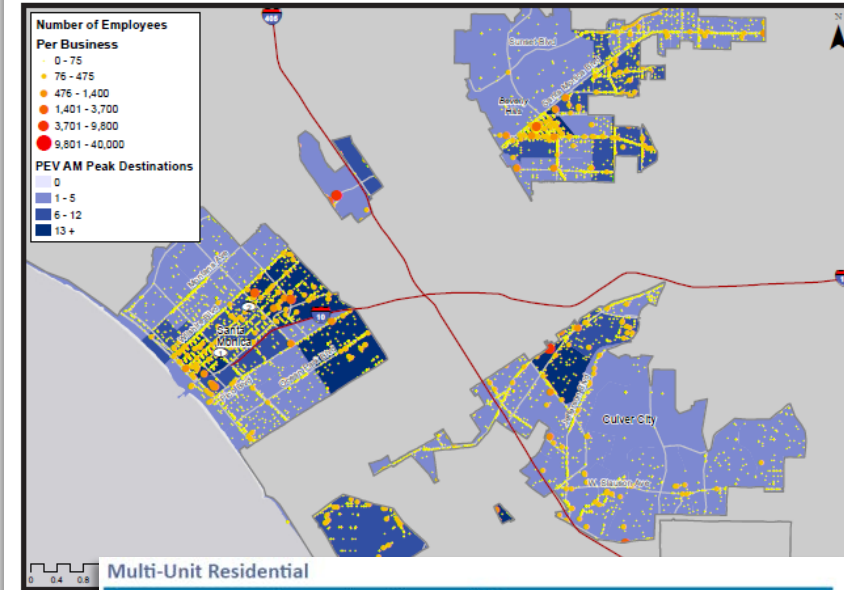
Task 4 - Southern California EV Readiness Plan Highlights



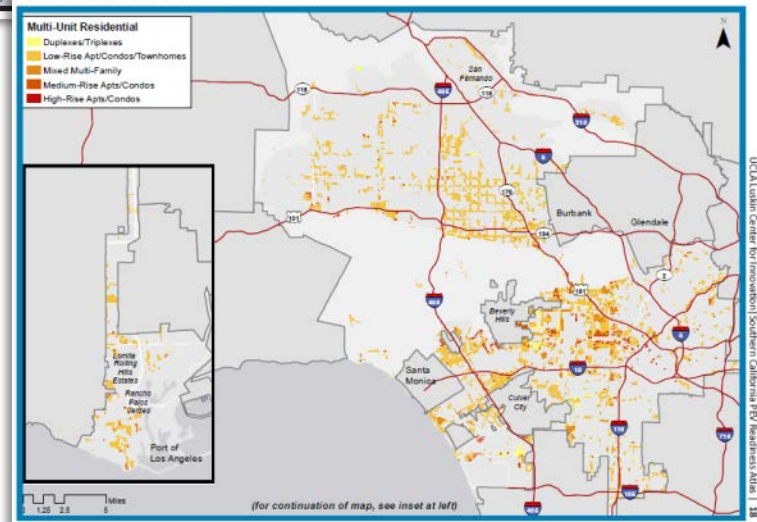
Plan Includes:

- **Planning for Charging in Multi-Unit Dwellings**
 - Recommended planning and policy approaches to reducing MUD charging barriers and costs
- **Planning for Workplace Charging**
 - Prioritize cities /parcels for targeted workplace charging assistance
- **Utility Policies**
 - EV concentration analysis by utility area
 - To understand which utilities need to prioritize PEV readiness
- **PEV Atlas Contains:**
 - Maps for planners to know where PEVs are currently and where growth will occur in the future
 - Helps prioritize municipal planning reforms from PEV Plan
 - Describes where latent PEV demand is constrained

Map 7.3: PEV daytime destinations and workplaces, Westside Cities Council of Governments



Multi-Unit Residential



Education and Outreach

- Six regional workshops with the same format
 - Statewide experts presented at all of the workshops,
 - Local experts presented at each region's workshop
 - Welcome by local advocate (e.g. Mayor)
 - Background information by CA PEV Collaborative and CA Energy Commission (CEC)
 - Panel on top five community actions for PEV featuring local experts





- **Clean Cities Coalitions**
 1. Antelope Valley
 2. Central Coast
 3. Coachella Valley
 4. East Bay
 5. Long Beach
 6. Los Angeles
 7. Sacramento
 8. San Diego
 9. San Francisco
 10. San Joaquin
 11. Silicon Valley
 12. Southern California
 13. Western Riverside
- **Other State Agencies/Institutions**
 - Bay Area Air Quality Management District (BAAQMD)
 - California Air Resources Board (CARB)
- **State Energy Office**
 - California Energy Commission (CEC)
- **Local Governments/Agencies**
 - Sacramento Area Council of Governments
 - San Joaquin Valley Air Pollution Control District
- **Non-profits / Other**
 - PEV Collaborative
 - EV Communities Alliance
 - California Center for Sustainable Energy
 - ICF
 - Better World
 - UCLA Luskin Center
- **Plus Many Unfunded Partners**
 - Utilities, EVSE Suppliers, OEMs

Future Work for Calif. PEV Readiness

- 10 additional regional PEV readiness projects
 - For other regions in California
 - Funded by California Energy Commission (CEC)
- Statewide PEV readiness plan
 - to be funded by CEC
- CA PEV Collaborative and regions to work on PEV challenge areas identified in the plans
 - Multi-Unit Dwellings
 - Workplace Charging
 - Consider funding pilot demonstration projects
- Develop additional planning strategies
 - Distribution of charging with inter-regional corridor plans or sub-regional planning studies
- Follow up with actions identified in Governor's ZEV Action Plan



The EV Community Readiness Project concludes June 2013

Relevance:

- Ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- Provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

Approach:

- Project Management and Administration
- Establish coordinating councils of partners
- Compile PEV Readiness Guidelines
- Develop Regional PEV Infrastructure Plans
- Education, Outreach and Communication

Project Accomplishments/ Progress:

- 6 Regional EV Readiness Plans completed
- Toolkit for EV Readiness planning in other communities is completed and available
- 6 Workshops held and local government event at EVS26

Collaborations:

- SCAQMD
- All 13 California Clean Cities Coalitions
- State and Local governments / agencies / organizations
- Numerous other private & public partners

Future Work:

- Planning and implementation work will proceed post-award with financial support from California Energy Commission, US Dept of Energy

Clean Cities 2011 EV Community Readiness

University of Hawaii Maui College (UHMC):
Multi-Year Plan to Achieve High EV Penetration on an Isolated Grid
Principal Investigator: Clyde Sakamoto, UHMC
Project Director: Anne Ku, UHMC



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BUDGET

Total Project Funding: **\$469,063**
DOE: \$299,693
Cost Share: \$169,370

Funded w/ FY11 funds

PARTNERS

- **Lead:** University of Hawaii, Maui
- Honolulu Clean Cities Coalition
- Hawaii Energy Office (Department of Business, Economic Development and Tourism)
- University of California San Diego

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Task 1: Project Management and Administration

- Manage the project
- Coordinate the efforts of the project partners
- Solicit and gather input from relevant stakeholders

Task 2: Project Assessment

- Choose project assessment metric
- Complete an assessment plan

Task 3: Workforce Training

- Investigate the need for EV related training
- Identify curriculum, vendor and certification options

Task 4: Policy and Planning

- Research EV policies from other localities
- Evaluate existing Hawaii EV policies to determine need for further policies
- Identify key barriers to EV deployment
- Develop EV policies, permitting, plans, incentives and related programs.

Task 5: Information Gathering and Research

- Conduct a sample survey
- Implement information management plan
- Research, evaluate data, and document lessons learned from ongoing EV programs.

Task 6: Consumer Behavior Study Planning

- Design Maui EV consumer behavior study
- Prepare for implementation of the study, post-award

Task 7: Develop PEV Infrastructure Plan

- Develop community based EV infrastructure readiness plan

Task 8: Outreach

- Develop project communications
- Outreach
 - represent project at relevant events
 - identify new stakeholders
 - conduct stakeholder meetings on neighbor islands

MILESTONES

Maui: Clean Cities 2011 EV Community Readiness



Task	Milestone	Date
1 - Project Management	Maui EV Alliance and working group committees established	Dec 2011
2 - Project Assessment	Initial and final assessment plan completed	Mar 2012, N/A
3 - Training	Survey and gap analysis of EV training opportunities in Hawaii completed	Dec 2012
4 – Policy and Planning	Report Published: Driving EVs Forward A Case Study of the Market Introduction and Deployment of the EV in Hawaii	Dec 2012
5 – Info Gathering	Sample survey / interviews with consumers and business completed	April 2012, Sep 2012
5 – Info Gathering	Report Published: Lessons Learned: The Early Adoption of EV Charging Stations from the Perspective of Oahu’s Commercial Properties.	Oct 2012
6 – Behavior Study Plan	Maui EV consumer behavior study design completed	N/A
7 – EV Plan	Report Published: EVs in Paradise: Planning for the Development of EV Infrastructure in Maui County. University of Hawaii Maui College	Dec 2012
8 – Outreach	Launch of Online Presence	Mar 2012
8 – Outreach	Stakeholder Meetings on Neighbor Islands commence	Feb 2013

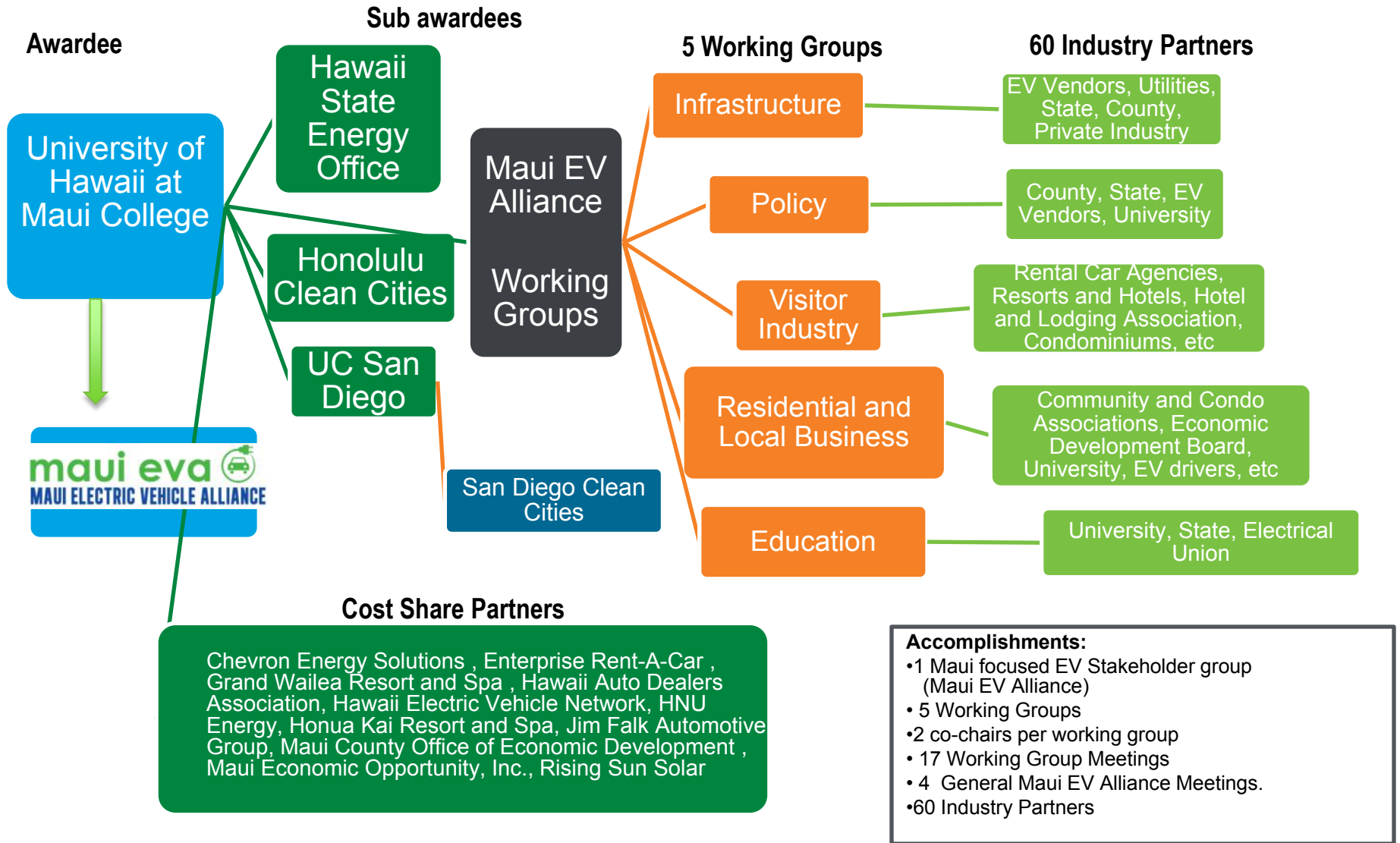
Deliverables/Products

- Reports:
 - EVs in Paradise: Planning for the Development of Electric Vehicle Infrastructure in Maui County
 - Driving EV's Forward: A Case Study of the Market Introduction and Deployment of the EV in Hawaii
 - Lessons Learned: The Early Adoption of Electric Vehicle Charging Stations from the Perspective of Oahu's Commercial Properties
- Surveys/Evaluations
 - Consumer Behavior Study survey design
 - EV awareness surveys
 - Project assessment
- Communications
 - Maui EV Alliance TV
 - Maui Weekly EV in Paradise column
 - Social Media
 - Website: <http://www.mauienva.org/report/>
- Outreach:
 - Events
 - Neighbor Island stakeholder meetings

TECHNICAL ACCOMPLISHMENTS



Task 1: Development of Maui EV Alliance & Stakeholder Engagement Cities



TECHNICAL ACCOMPLISHMENTS

Task 2: Project Assessment



Project Metric	By end 2011	By end June 2012	By end Feb 2013	TOTAL
SWOT analysis	1 Nov 2011 Kick-off meeting: Limited discussion. Lack of knowledge & insight from different stakeholders.	25 June 2012 Meeting: depth and breadth of insight & understanding from all 5 working groups.	Jan 2013 Stakeholder Meeting: over 2 consecutive days: recommendations understood, discussed, and accepted.	
Maui EVA mailing list:				>300
Individuals:	50	200	200+	
Organizations:	30	80	80+	
Surveys				
Number of different surveys	1	2	2	2
Number of survey occasions	1	8	8	8
Number of respondents	41	524	524	524
Media				
Number of outreach events	1	10	10	10
Number of unique broadcasts of Maui EVA TV episodes	0	8	12	12
Reach of media coverage: print paper, online, websites, radio, TV by sources.	9	15		
Number of known media mentions	14	48	Own newspaper column, cable TV program on EVs, monthly EV newsletter, MauiEVA 1 st hand testimonies	
Social media:				1,500+
Twitter followers	Twitter: started 6 Feb 2012	105	207	
Number of tweets	Facebook: started 10 March 2012	783	1,257	
Facebook likes		43	99	

Sub-tasks

- Surveyed available EV training opportunities in Hawaii and identified training needs on Maui
- Identified gaps in EV training in Hawaii (i.e lack of training, locations, need for courses)
- Developed contact list and database containing EV related training information such as:
 - Facilities
 - Instructors
 - Programs

Outcomes

- Results published as part of EV Readiness Plan
- Relationships developed lead to collaboration on future EV related training programs
 - Building Industry Association
 - IBEW
 - EV consultants
- First EV101 workshop (3 hours) course description developed and course advertised in University continuing education catalog Spring 2013

TECHNICAL ACCOMPLISHMENTS

Task 4: Policy and Planning

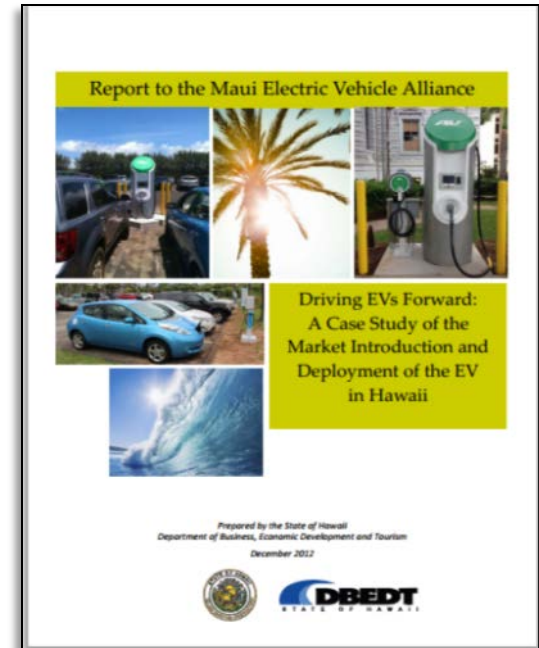


Outreach

- Identified the need for awareness and understanding relating to Hawaii EV laws
- Educated stakeholders on the existence of EV laws
- Facilitated the exchange of information relating to EV policies and planning
 - Zoning permit applications (Special Management Area, flood zone)
 - How EV charging stations installation costs can be reduced through proper planning

Report Published: “Driving EVs Forward: A Case Study of the Market Introduction and Deployment of the EV in Hawaii”

- **Report documented Hawaii’s experience and accomplishments relating to EV deployment including:**
 - Hawaii’s Historical Involvement with EVs
 - Challenges to EV Adoption and Deployment in Hawaii
 - Aligning EV Stakeholder Partnerships and Involvement.
 - Opportunities for EVs in Hawaii, Hawaii’s ideal conditions
 - The Case Study: Creation of an EV market in Hawaii
 - Developing Hawaii’s Public Charging Network and Lessons Learned
 - Recommendations & Best Practices
 - Performance and EV Hawaii Driving Cost Analysis



TECHNICAL ACCOMPLISHMENTS

Task 5: Information Gathering and Research



1. Two surveys conducted

EV Public Awareness Survey

- Designed to gauge public EV awareness and interest.
- Dec 2011, Mar 2012, Apr 2012.
- 71 surveys completed.

EV Readiness Survey

- Developed based on findings from Awareness Survey
- Compares EV readiness indicators: residential accommodation, daily commuting distance, PV ownership, etc.
- Administered Sep, 2012
- 464 surveys completed.

2. Internal information management plan developed to collaborate on project data

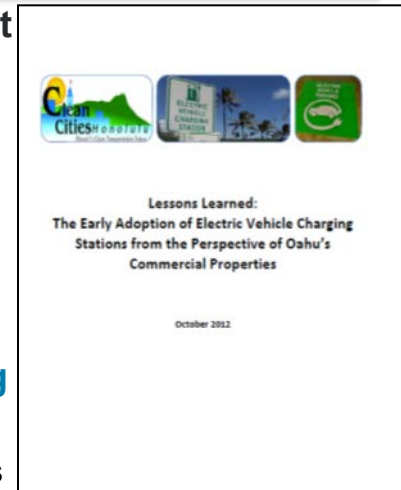
- Web based Informational management tool developed using Google Tools

3. Maui EV charging station location tracking database

- Tracking electrical permits issued in Maui County for commercial charging station installations

4. Report Published: “Lessons Learned: The Early Adoption of EV Charging Stations from the Perspective of Oahu’s Commercial Properties”

- Lessons learned from the installation of 76 chargers among 22 different Oahu properties
- The lessons of early adopters are useful to help glean what's needed elsewhere.
- **Conclusions:** Need education for better decision making of new technology. Will assist in the planning and improvement efforts recognized in the implementation plan for Maui.



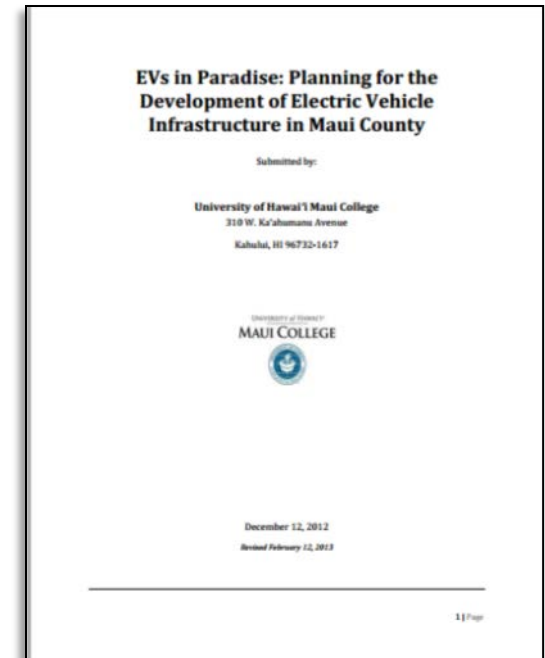
Task 6: Consumer Behavior Study Planning

Task terminated due to lack of applicability, funding will be redirected

Report Published: “EVs in Paradise: Planning for the Development of EV Infrastructure in Maui County”

Highlights

- First island focused EV Readiness Report
- Designed with the non-technical reader in mind
- Highlights EV readiness stakeholders, main barriers, benefits, incentives, permitting, zoning, and impact to utility grid.
- Recommendations serve as starting point for discussions with stakeholders for next phase in EV deployment planning on Maui Island.
- Document could serve as a guide for other island nations looking to deploy EVs on a isolated utility grid with renewable energy potential



Outreach Events

1. Maui Arts & Cultural Center, Dec 2011
 - Maui Premier "Revenge of the Electric Car"
2. Drive Electric Maui & Booth, March 2012
3. 1st UHMC Auto Fest, March 2012
4. Screening "Revenge of ...", April 2012
5. Earth Day, Botanical Gardens, April 2012
6. UHMC Event, April 2012
 - Maui Premier "What is the Electric Car"
7. National Plug-in Day, Sep 2012
 - Declaration and Blessing by the Maui County Mayor,
8. 90th Maui Fair Parade , Sept 2012
 - First time EVs in the parade
9. "Plug-in Maui: Challenges & Opportunities"
 - One day conference



National Plug-in Day, Sept 21, 2012
Blessing of EV Charger
Declaration by the Maui County Mayor

TECHNICAL ACCOMPLISHMENTS



Task 8: Outreach

Education / Media Outreach

- Maui EVA TV – 12 episodes
- Website www.mauieva.org
- Blog, Twitter, Facebook, YouTube channel
- Radio, TV, web, Print Media presence
- Maui Weekly “EV in paradise column”
- Maui EVA newsletter



Neighbor Island Outreach

- Molokai,
- Island of Hawaii (Kona and Hilo)
- Oahu, and Kaua’i

Developed Fact Sheets

- Charging stations (level 1, 2, 3)
- EV FAQ
- Posters for 90th Maui Fair & Plug-in Day
- Fact sheets by stakeholder group





University of Hawaii Maui College- Prime Clean Cities Coalitions

- Honolulu Clean Cities - Subawardee
- San Diego Clean Cities

State Agencies/Institutions

- State Energy Office (DBEDT) -Subawardee

University

- University of California San Diego- Subawardee

Local Government Partners

- Maui County - Office of the Mayor
- Office of Economic Development
 - Transportation
 - Fire and Public Safety
 - Public Works
 - Planning
 - Parks and Recreation

Nonprofit Partners

- Maui Economic Opportunity
- Maui Economic Development Board
- Maui Tomorrow
- Maui YMCA

Industry Partners

- Utilities
 - Hawaiian Electric Companies (HECO, MECO)
- EVSE Suppliers
 - Aerovironment
 - Better Place
 - Hitachi
 - Charge Bliss
- OEMs
 - Nissan North America
 - Mitsubishi North America
- Dealers
 - Hawaiian Association of Auto Dealers
 - Jim Falk Motors
 - Maui Toyota
- Car rental companies
 - Enterprise Rent A Car
 - Bio Beetle ECO Rental Car
 - Hawaiian Electric Vehicle Network (HEVN)
 - Green Car Hawaii



Follow-up activities

1. Continued outreach

- Neighbor island stakeholder follow up- facilitate discussion & information sharing
- Continue monthly EV newsletters to include new stakeholders
- Present on EV deployment progress at local community and sustainability associations i.e. Rotary, Kiwanis
- Encourage local auto dealers and rental car agencies to publicize EV arrivals and lease options via social media

2. Develop directory of vacation accommodations with charging station access

3. Encourage stakeholders to support introduction of local policies

- EV parking ordinances, enforcement of state EV laws, education and outreach regarding state EV laws

4. Research financing mechanisms

- Strategies to lower costs of EV and EVSEs

5. Partner with Visitor Industry to promote Evs

6. Increase user familiarity

- Introduce EV car sharing, EV carpooling

The EV Community Readiness project concludes June 2013

Relevance:

- Ease market introduction of alternative fuels and new electric drive vehicle technologies through voluntary efforts in partnership with local communities
- Provide technical and educational assistance to support local communities and partnerships that promote better understanding of the benefits of these new technologies.

Approach:

- Establish partnerships and working groups
- Engage community through site visits, outreach, media coverage, surveys
- Develop documents to document EV deployment best practices and lessons learned
- Develop plan to establish an EV market on Maui
- Establish Maui EVA as central point of contact, broker of information and contacts, one-stop shop for reliable information.

Project Accomplishments/Progress:

- Established working groups collaborating on EV issues
- Developed communication channels and public awareness
- Report “EVs in Paradise”
- Report “Driving EVs Forward A Case Study of the Market Introduction and Deployment of the EV in Hawaii”
- Report “Lessons Learned: The Early Adoption of Electric Vehicle Charging”

Collaborations:

- Hawaii State Energy Office – DBEDT
- Local Government
- Industry Partners
- Local Stakeholders

Future Work:

- Continued Maui outreach
- Neighbor island outreach and planning
- Implementation of policies and plans