Coachella Valley Plug-in Electric Vehicle Coordinating Council Agenda

Thursday, October 10, 2013
1:00 p.m.
[Immediately following Energy & Environmental Resources Committee]

CVAG Offices
73-710 Fred Waring Drive, Suite 119
Palm Desert, CA 92260
(760) 346-1127

Teleconferencing will be available at:
City of Blythe City Hall
235 N. Broadway, Room A
Blythe, CA 92225
AND
Imperial Irrigation District
1653 W. Main Street
El Centro, CA 92243

THIS MEETING IS HANDICAPPED ACCESSIBLE.
ACTION MAY RESULT ON ANY ITEMS ON THIS AGENDA

1. **CALL TO ORDER** - Chair Michael Wilson, Mayor Pro Tem, City of Indio

2. **ROLL CALL**

A. **Member Roster** P. 3

3. **PUBLIC COMMENTS**

This is the time and place for any person wishing to address the Coachella Valley Plug-in Electric Vehicle Coordinating Council on items not appearing on the agenda to do so.

4. COMMITTEE MEMBER/DIRECTOR COMMENTS

5. CONSENT CALENDAR

A. Approve meeting minutes of the May 9, 2013 Coachella Valley Plug-in Electric Vehicle Coordinating Council (PEVCC). P. 4

B. Receive and File

1) Attendance Roster P. 7

6. DISCUSSION / ACTION

A. CVAG PEV Readiness Plan Task 8: Green House Gas Reductions P. 8
– Michael Shoberg

RECOMMENDATION: Approval of Task 8: Green House Gas Reductions.

7. ANNOUNCEMENTS

Next Scheduled Meeting:

Energy & Environmental Resources Committee, Thursday, November 14, 2013, 12:00 noon at 73-710 Fred Waring Drive, Conference Room 119, Palm Desert. **The Coachella Valley Plug-in Electric Vehicle Coordinating Council will convene immediately following the Energy & Environmental Resources Committee at 1:00 p.m.**

ITEM 2A

Coachella Valley Plug-in Electric Vehicle Coordinating Council

Member Roster[1]

Coachella Valley Plug-in Electric Vehicle Coordinating Council	
City of Blythe	**Mike Evans** Councilmember
City of Cathedral City	**Kathleen DeRosa** Mayor
City of Coachella	**Emmanuel Martinez** Mayor Pro Tem
City of Desert Hot Springs	**Yvonne Parks** Mayor
City of Indian Wells	**Patrick J. Mullany** Councilmember
City of Indio	**Michael Wilson**, **Chair** Mayor Pro Tem
City of La Quinta	**Linda Evans, Vice Chair** Councilmember
City of Palm Desert	**Van Tanner** Councilmember
City of Palm Springs	**Paul Lewin** Councilmember
City of Rancho Mirage	**Scott Hines** Mayor
County of Riverside	**John J. Benoit** 4th District Supervisor
Mission Springs Water District	**Nancy Wright** MSWD Board President
Imperial Irrigation District	**Matt Dessert** Board Member
Agua Caliente Band of Cahuilla Indians	**Jeff L. Grubbe** Tribal Chairman
Cabazon Band of Mission Indians	Unassigned

Non-Voting Members	
Coachella Valley Water District	**Franz W. De Klotz** CVWD Board Member
Desert Water Agency	**Patricia Oygar** Board Member

Staff
Tom Kirk, Executive Director
Katie Barrows, Director of Environmental Resources
Mike Shoberg, Transportation Program Manager
Linda Rogers, Program Assistant II

[1]The CVPEVCC will also include a representative of Southern California Edison (SCE), Imperial Irrigation District (IID), two representatives of the electric car industry and two members of the CVAG Technical Planning Subcommittee, to be identified.

Item 5A

Energy & Environmental Resources Committee
Coachella Valley Plug-in Electric Vehicle Coordinating Council
Meeting Minutes
May 9, 2013

The audio file for this committee can be found at: http://www.cvag.org/minutes.htm

1. CALL TO ORDER

The meeting of the Coachella Valley Plug-in Electric Vehicle Coordinating Council was called to order by Chair Michael Wilson at 12:55 p.m. on May 9, 2013.

2. ROLL CALL

Roll call was taken and it was determined that a quorum was present.

Members Present	**Agency**
Councilmember Mike Evans (via teleconference)	City of Blythe
Mayor Kathleen De Rosa	City of Cathedral City
Mayor Pro Tem Emmanuel Martinez	City of Coachella
Councilmember Russell Betts	City of Desert Hot Springs
Mayor Pro Tem Michael Wilson, **Chair**	City of Indio
Councilmember Linda Evans, **Vice Chair**	City of La Quinta
Councilmember Paul Lewin	City of Palm Springs
Carolyn Syms Luna (by proxy vote for Supervisor Benoit)	County of Riverside 4th District

Non-voting Members Present	
Board Member Franz DeKlotz	Coachella Valley Water District

Members Absent	
Councilmember Patrick Mullany	City of Indian Wells
Councilmember Van Tanner	City of Palm Desert
Councilmember Scott Hines	City of Rancho Mirage
Board Member Matt Dessert	Imperial Irrigation District
Board Member Nancy Wright	Mission Springs Water District
Appointment Pending	Southern California Edison

Others Present	
Lin Juniper	SCE
Britt Wilson	City of Rancho Mirage
Danielle Soto	SCAQMD
Crystal Crawford	Ygrene Energy Fund

CVAG Staff
Tom Kirk
Katie Barrows
Jim Sullivan
Michael Shoberg
Linda Rogers

3. PUBLIC COMMENTS

None.

4. COMMITTEE MEMBER & DIRECTOR COMMENTS

None.

5. CONSENT CALENDAR

IT WAS MOVED BY MAYOR DEROSA, SECONDED BY COUNCILMEMBER EVANS, TO:

A. Approve minutes of the April 11, 2013 Coachella Valley Plug-In Electric Vehicle Coordinating Council (PEVCC).

THE MOTION CARRIED.

B. Receive and File
1) Attendance Roster

Item 5B was received and filed.

6. DISCUSSION / ACTION

A. CVAG PEV Readiness Plan Task 1: PEV Policy Guidelines

IT WAS MOVED BY COUNCILMEMBER EVANS, SECONDED BY MAYOR DEROSA, TO APPROVE TASK 1: PEV POLICY GUIDELINES.

A roll call vote was taken for the City of Blythe:

City of Blythe AYE

THE MOTION CARRIED.

7. ANNOUNCEMENTS

CVAG committees go dark in July and August.

Upcoming Meetings:

Energy & Environmental Resources Committee, September 12, 2013, 12:00 noon, at 73-710 Fred Waring Drive, Room 119, Palm Desert.

Coachella Valley Plug-in Electric Vehicle Coordinating Council, September 12, 2013, 12:00 noon, 2013, at 1:00 p.m., at 73-710 Fred Waring Drive, Room 119, Palm Desert.

The meeting adjourned at 1:04 p.m.

Respectfully submitted,

Linda Rogers

Linda Rogers
Program Assistant II

Coachella Valley Plug-in Electric Vehicle Coordinating Council

Jurisdictions	2013 Attendance Roster				
Voting Members:	**January**	**April**	**June**	**October**	**November**
Blythe	T		T		
Cathedral City	X	X	X		
Coachella	X	X	X		
Desert Hot Springs	X		X		
Indian Wells	X	X			
Indio	X	X	X		
La Quinta	X	X	X		
Palm Desert	X	X			
Palm Springs	X	X	X		
Rancho Mirage	X	X			
Riverside County - 4th District	X	X	X		
Imperial Irrigation District (IID)	X	T			
Mission Springs Water District	X				
Non-Voting Members:					
Coachella Valley Water Dist.	X	X	X		
Desert Water Agency					

T = Elected in attendance via Teleconference (T)

X = Elected member in attendance

= Elected members absent

= Non-voting members absent

Updated on 9/6/2013

Item 6A

Coachella Valley Association of Governments
Coachella Valley PEV Coordinating Council
October 10, 2013

Staff Report

Subject: **CVAG PEV Readiness Plan Task 8: Green House Gas Reductions**

Contact: Michael Shoberg, Transportation Program Manager (mshoberg@cvag.org)

Recommendation: Approval of Task 8: Green House Gas Reductions

Background: The drafting of the PEV Readiness Plan is underway with the second chapter, the Green House Gas (GHG) Reductions, ready for review. Attached you will find the draft chapter.

The goal of the GHG Reduction chapter is to assess the potential for reducing GHG tailpipe emissions for forecasted PEV use in the Coachella Valley. To accomplish that task, the chapter evaluates:

- the number of Plug-in Hybrid Electric Vehicles (PHEVs) and Battery Electric Vehicles (BEVs) on the road now and in the future;
- annual vehicles miles traveled (VMT) for light-duty vehicles and fuel economy;
- percentage of VMT traveled in electric mode or charge depleting mode for PHEVs; and
- GHG emission factors of electricity and gasoline.

In general, the GHG reduction is dependent on the number of vehicles on the road, the overall VMT, fuel economy, and emission factors. With regard to vehicles on the road, especially PHEVs and BEVs, in the Coachella Valley, the estimated number is currently about 150 vehicles based on the assumptions contained in the report. However, that number is expected to increase over the next ten to 15 years as the cost of vehicles declines, the cost of gasoline increases, and charging opportunities becomes more available.

The amount of gasoline a vehicle consumes is a function of both VMT and fuel economy. For PHEVs the amount of gasoline consumed is a function of the VMT in full electric mode which in turn is dependent on the range of the vehicle when using only electricity. That can vary, again depending on the VMT, driving conditions, and driving habits.

GHG emission reductions are the difference between the emissions of a light-duty vehicle with an internal combustion engine (ICE) using gasoline and a PHEV using electricity. This is complicated by the overall miles per gallon of the ICE fleet over the next 15 years.

Electric vehicles have zero tailpipe GHG emissions but electricity generation must be included in the equation in order to get a more complete assessment of actual GHG reductions. A factor has been included in the report to account for that issue.

As can be seen by the results of the study, the introduction of PEVs – with an estimated 2,000 to 3,400 metric tons of GHG reductions – will only have a minor impact on GHG emissions in 2020 because of modest PEV use rates assumed for the Coachella Valley. However, over time, as PEVs become more popular in the Valley, they will play a much larger role in GHG reductions.

Fiscal Analysis: This document is part of the scope of work funded by the California Energy Commission.

CVAG PEV Readiness Plan Task 8: Greenhouse Gas Reductions from Plug-in Electric Vehicle Adoption

July 2013

Submitted to:

Michael Shoberg, Transportation Program Manager
Coachella Valley Association of Governments
73-710 Fred Waring Drive, Suite 200
Palm Desert, CA 92260

Prepared by

ICF International
620 Folsom St, Suite 200
San Francisco, CA 94107

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Introduction

Plug-in electric vehicles have the potential to significantly reduce greenhouse gas (GHG) emissions. The electrification of transportation technologies is a major focus of various regulatory initiatives in California such as the Zero Emission Vehicle (ZEV) Program and the Low Carbon Fuel Standard (LCFS). Furthermore, the federal fuel economy standards and GHG tailpipe emission standards incentivize the deployment of plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). This task highlights the GHG reduction potential of forecasted levels of PEV use in the Coachella Valley.

GHG Reductions from Plug-in Electric Vehicles

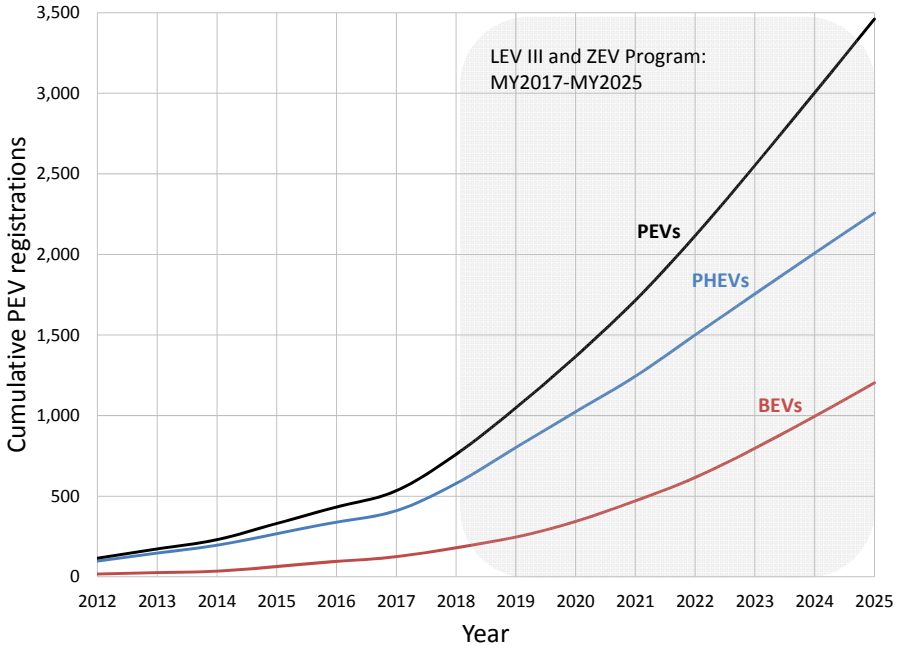
The GHG emission reduction potential of PEVs is dependent on the following parameters:

- number of PHEVs and BEVs on the road;
- annual vehicle miles traveled (VMT) for light-duty vehicles and fuel economy;
- percentage of VMT traveled in so-called electric mode or charge-depleting mode for PHEVs; and
- GHG emission factors of electricity and gasoline.

PEV Deployment: PHEVs and BEVs on the road

ICF used the PEV forecasts for the Coachella Valley from Task 2, as shown in Figure 1 below. The most recent data available from the Clean Vehicle Rebate Program (CVRP) indicate that there are just over 100 PEVs deployed in the Coachella Valley – 44 BEVs and 63 PHEVs. Based on information provided by staff from the California Center for Sustainable Energy (CCSE), who administer the CVRP, these numbers unlikely indicate the entire market for PEVs because a percentage of PEV buyers do not seek a rebate. For instance, as many as 20 percent of Toyota Prius plug-in buyers are not seeking the state rebate. Furthermore, the Chevrolet Volt was available for about 9-10 months before it was eligible for the state rebate, during which time approximately 2,000 Volts were sold in California. Even with these data points, the number of PEVs currently deployed in Coachella Valley is likely less than 150.

Figure 1. Forecasted PEV Deployment in the Coachella Valley



Vehicle miles traveled and Fleet fuel economy

ICF used VMT parameters from EMFAC2011 for light-duty vehicles, as shown in the table below. We assumed an average life of vehicles of 13 years and used the average annual VMT assuming 350 driving days per year.

Table 1. VMT for Light-duty Vehicles in California

Year	VMT/day	VMT/yr
1	58.1	20,325
2	50.3	17,607
3	45.8	16,018
4	42.5	14,890
5	40.0	14,015
6	38.0	13,300
7	36.3	12,696
8	34.8	12,173
9	33.5	11,711
10	32.3	11,298
11	31.2	10,924
12	30.2	10,583
13	29	10,270
Average	38.6	13,524

The other parameter regarding VMT that is necessary to estimate the GHG reduction potential of PHEVs is the number of miles traveled in electric-mode or charge depleting mode, which we refer to here as eVMT. In other words, eVMT is the percentage of miles that a PHEV travels using electricity rather than gasoline. The eVMT for PHEVs is dependent on the range of the vehicle in charge depleting mode, typically ranging from 10 to 40 miles, the VMT in a given day, and the availability of charging infrastructure. The table below shows the range of some of the PHEVs available on the market today.

Table 2. PHEVs and All-Electric Range

Make / Model	all-electric range
Chevrolet Volt	38 miles
Ford Fusion Energi	21 miles
Ford C-MAX Energi	21 miles
Honda Accord Plug-in	13 miles
Toyota Prius Plug-in	11 miles

If we assume no degradation of the battery over the assumed 13-year lifetime, then the lower limit of the percentage of miles that can be fulfilled by a PHEV with equivalent range to the Toyota Prius plug-in is about 30 percent. Using the same assumptions, a PHEV with equivalent range to the Chevrolet Volt, the percent of eVMT is about 93 percent. To date, there is not any reliable research involving a statistically significant number of PHEV drivers to indicate a likely percentage of eVMT. For the purposes of this analysis, ICF reports the GHG reductions from PHEVs in three different percentage eVMT scenarios: 1) 30 percent, 2) 50 percent, and 3) 70 percent.

The GHG emission reductions described in this report are the difference between the emissions of a light-duty vehicle with an internal combustion engine (ICE) using gasoline and a plug-in electric vehicle using electricity (and gasoline in the case of PHEVs). The amount of gasoline that a vehicle consumes is a function of both its VMT (discussed previously) and fuel economy. The table below shows the fuel economy of vehicles used in each year for this analysis: the reported fuel economy is a weighted average of the fuel economy of new vehicles beginning with model year 2012 (MY 2012).

Table 3. Weighted MPG of Light-duty Vehicles

Year	Weighted MPG
2012	29.9
2013	31.0
2014	31.5
2015	31.9
2016	32.2
2017	32.6
2018	32.8
2019	33.1
2020	33.6
2021	34.2
2022	34.7
2023	35.3
2024	35.8
2025	36.3

The increase in fuel economy over time reflects increasingly stringent fuel economy and GHG tailpipe standards.

Emission factors

Electric vehicles have zero tailpipe GHG emissions; however, there are upstream emissions attributable to electricity generation that must be accounted for to conduct a proper GHG reduction analysis. The emission factors for transportation fuels are reported on a lifecycle or well-to-wheels basis and are reported as grams of carbon dioxide equivalents per unit of energy (g CO_2eq/MJ) – also referred to as carbon intensity. ICF used emission factors from the California Air Resources Board's (CARB) LCFS program, as shown in the table below.

Fuel	Carbon intensity (gCO_2eq/MJ)
Electricity	104.71
Reformulated gasoline*	98.95
*Note that reformulated gasoline is comprised of California Reformulated Blendstock for Oxygenate Blending (CARBOB) and ethanol (10 percent by volume).	

As noted previously, the GHG emission reductions are reported as the difference between a light-duty ICE vehicle using reformulated gasoline (RFG) and a PEV using electricity (and gasoline for PHEVs). The carbon intensity of electricity reported in the table above does not account for the fact that electricity used to power a motor is more energy efficient than gasoline. As a result, one must apply a factor referred to as the energy economy ratio (EER). For

electricity, the value reported by CARB is 3.4; in other words, after accounting for the EER of electric vehicles, the effective carbon intensity of electricity is 30.80 gCO_2eq/MJ.

Results and Discussion

The equations below show how the various parameters outlined previously are combined into calculations to yield the GHG emission reductions attributable to vehicles using reformulated gasoline and electricity, or a combination thereof.

$$GHG_{RFG} = PEVs * \left(\frac{VMT}{mpg}\right) * \delta_{RFG} * CI_{RFG},$$

where δ_{RFG} is the energy density of reformulated gasoline, 115.63 MJ/gallon, and CI_{RFG} is the carbon intensity of reformulated gasoline.

$$GHG_{PHEV} = PHEVs * \left[\left(\frac{(1-eVMT)}{mpg}\right) * \delta_{RFG} * \frac{CI_{RFG}}{EER_{Fuel}} + \frac{eVMT}{mpg} * \delta_{RFG} * CI_{electricity}/EER_{electricity}\right]$$

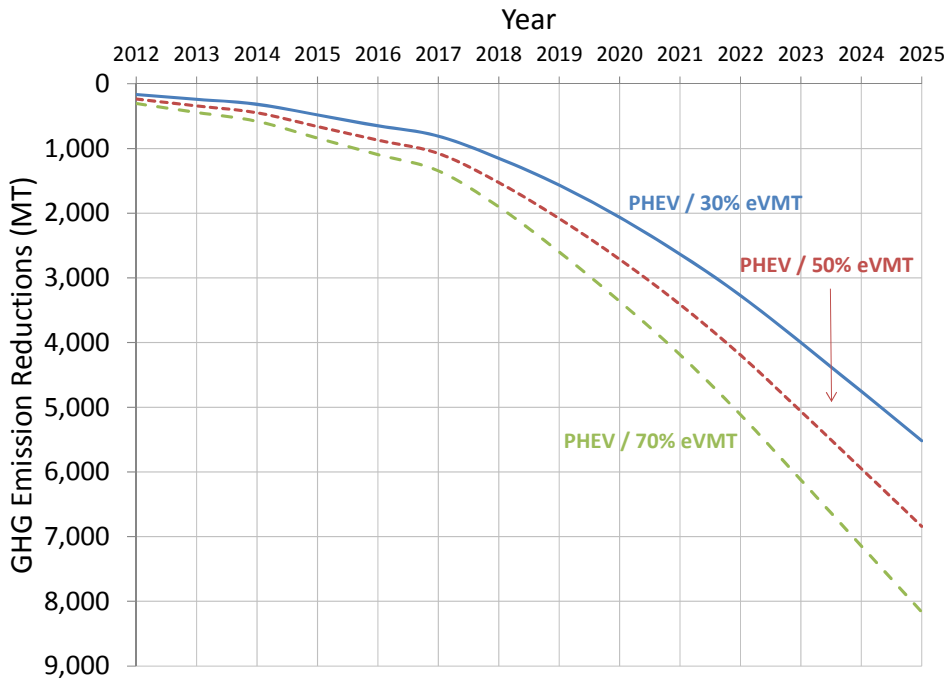
$$GHG_{BEV} = BEVs * \left(\frac{VMT}{mpg}\right) * \delta_{RFG} * CI_{electricity}/EER_{electricity}$$

$GHG\ Emission\ Reductions = \Delta(GHG_{RFG}, GHG_{PHEV} + GHG_{BEV})$, where

$PEVs = PHEVs + BEVs.$

The annual reductions are shown as metric tons in Figure 2 below. As one would expect, the GHG reductions attributable to PEVs increases as the percentage of eVMT for PHEVs increases.

Figure 2. Estimated GHG Reductions from PEVs in the Coachella Valley



Based on these estimates, PEVs will decrease GHG emissions from light-duty vehicles by 5,500 to 8,200 metric tons (MT) by 2025, depending on assumptions regarding the percentage of eVMT for PHEVs.

As of 2005, light-duty vehicles accounted for 41 percent of GHG emissions in the Coachella Valley.[1] The emissions attributable to light-duty passenger cars, light-duty trucks, and medium duty trucks for 2005 and 2020 are shown in the table below.

Table 4. GHG Emissions from Light-Duty Vehicles in the Coachella Valley, 2005 and 2020

Vehicle Category	GHG Emissions (MMT, CO_2e)	
	2005	2020
Light-duty passenger auto	0.80	1.08
Light duty trucks	0.63	0.86
Medium duty trucks	0.33	0.44
Total	1.76	2.38

Source: Regional Greenhouse Gas Inventory for the Coachella Valley, June 2011

As you can see from the table, the introduction of PEVs – with an estimated 2,000–3,400 MT of GHG reductions – will only have a minor impact on GHG emissions in 2020 because of the

[1] Regional Greenhouse Gas Inventory for the Coachella Valley, June 2011.

modest adoption rates assumed for the Coachella Valley. However, over time, as PEVs become more popular in the valley, they will play a much larger role in GHG reductions.