



Technology Advancement Office Advisory Group Meeting

Light and Medium-Duty Electric Vehicle Projects February 2, 2011



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South Coast Air Quality Management District

Federal & CA Current Incentives

- Incentives for vehicles
 - \$2,500 – \$7,500 federal tax credit (IRS Form 8936)
 - Up to \$5,000 buydown through Clean Vehicle Rebate
 - CA HOV lane access*
- Incentives for infrastructure
 - \$1,000 federal tax credit (IRS Form 8911)



ARRA and CEC Match Awards in CA

Contractor	ARRA Awards (\$)	CEC AB 118 (\$)
ETEC ECOtality	\$99.8M in US \$15M in CA	\$ 8.0M in CA \$ 3.2M in AQMD
Coulomb Chargepoint	\$37M in US \$15M in CA	\$ 3.4M in CA \$ 1.4M in AQMD
Clipper Creek		\$ 1.9M in CA \$760K in AQMD
Totals	\$136.8M in US \$30M in CA	\$13.3M in CA \$ 5.4M in AQMD



Projects Completed in 2010

- **Plug-In Fuel Cell Vehicle Technology Study: Phase 1**
 - \$100,000 total; \$50,000 AQMD Clean Fuels & \$50,000 ARB Report Results:
 - First-cut results show potential for PFCVs
 - Proposed scope of work & budget for a full study
- **Clean Air Now: Clean Air Challenge**
 - \$150,000 total; \$60,000 AQMD Clean Fuels Results:
 - Trained 154 local middle & high school teachers in 2009 with lessons & kit containing equipment including a fuel cell model vehicle



Progress Overview

Plug-in Hybrid Electric Vehicles

- EnergyCS – up to 5 Priuses, 3 in operation at AQMD over 190,000 cumulative miles



- Thirty Vehicle Program

- Up to 10 A123 Hymotion Plug-In Priuses
CARB EO issued, then halted – new procedure
EPA approved for US, CARB EO abandoned
2 in operation at AQMD
- 20 Quantum Plug-In Hybrid Escapes
battery supplier changed from ALP to EnerDel
ARB EO approved
18 PHEVs delivered and beginning operation



A123 Hymotion Prius PHEV

GridPoint Data Logging Portal - Windows Internet Explorer provided by South Coast A.Q.M.D

File Edit View Favorites Tools Help


https://mycar.v2green.com/Driver.jsp

GridPoint Data... x

Vehicles

AQMD

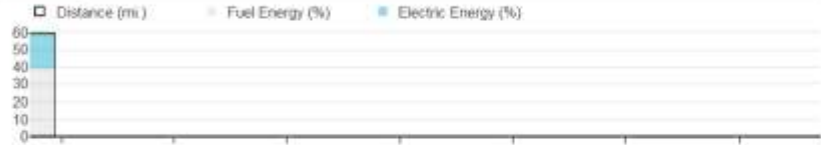
AQMD : Toyota Prius 2004+ with Hymotion kit



State: Plugged In
 Fuel Level: 52%
 Battery Level: 100%
 Location: (34.001633, -117.829189)
 AC Power: 0.0kW


Travel by Fuel Source

Distance (mi.) Fuel Energy (%) Electric Energy (%)



Battery Level

Battery % Driving Plugged In



Sat 1/22 Sun 1/23 Mon 1/24 Tue 1/25 Wed 1/26 Thu 1/27 Fri 1/28

Performance Report | Timeline | Trips | Charge Sessions

Detailed Statistics

	Today	Last 7 Days	Last 30 Days
Driving			
Trips	0	2	12
Time	0 m	2 h 24 m	6 h 14 m
Distance (mi.)	0.0	0.1	113.6
Fuel (gal.)	0.0	0.0	1.7
DC Energy (kWh)	0.0	-0.0	-10.5
Est. Cost (\$)	\$0.00	\$0.00	\$8.67
CO ₂ e (lbs.)	0.0	0.4	40.7

Fleet Comparison

	Today	Last 7 Days	Last 30 Days
MPG			
AQMD	0.0	8.0	85.9
Fleet	42.7	43.8	46.1
National Average	19.9	19.9	19.9
CO ₂ e (lbs.) / mi.			
AQMD	0.0	3.0	0.4
Fleet	0.6	0.5	0.5
National Average	1.2	1.2	1.2

Done

Internet | Protected Mode: Off

160%

Start Telephone call L... Quantum PHEV ... Microsoft ... TAO Advisor mt... Pictures GridPoint Dat... 5:11 PM



A123 Hymotion Prius PHEV

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Performance Report Timeline **Trips** Charge Sessions

Start Time	Duration	Distance (mi.)	Battery Start (%)	Battery End (%)	MPG	Estimated Cost (\$)
Thu 01-27-2011 (2 Trips)						
	2 hours 24 minutes	0.1 mi	100%	99%	7.98 mpg	\$0.06
Fri 01-21-2011 (2 Trips)						
	1 hour 18 minutes	59.4 mi	98%	11%	75.13 mpg	\$2.92
Fri 01-14-2011 (3 Trips)						
	12 minutes	0.3 mi	100%	99%	8.65 mpg	\$0.09

Internet | Protected Mode: Off 160%

Start Telephone call L... Quantum PHEV ... Microsoft ... TAO Advisor mt... Pictures GridPoint Dat... 5:14 PM



Comparing PHEVs to base Prius

<http://avt.inl.gov/>

*INL posted fleet results	A123 Hymotion Li (A123) 2009	EnergyCS Li (Valence) 2009	Prius (base) 2004
Fuel Economy Overall (mpg)	49	51	
Fuel Economy CD (mpg)	63	64	
Fuel Economy CS (mpg)	43	45	44.2 mpg



Quantum PHEV Data Collection

- Initial fuel economy examples
 - Quantum: FTP 75, SOC 74 – 52%, 59.8 mpg weighted ave
 - FTP 75, SOC 68 – 44%, 56.5 mpg weighted ave
 - AQMD: 40 mpg generally,
Ranging from 32 (uncharged) to 102 (parking lot)
- Approx 13k miles accumulated on 18 vehicles to date
- Planning Pomona Loop and other actual driving comparisons
- Evaluating options to equip vehicles with data acquisition systems
- Quantify:
 - In-use fuel and energy consumption
 - Use-profiles



Battery Electric Vehicles

- Light-Duty Vehicle Fleet Demonstrations
 - BMW Mini-E
 - AC Propulsion technology developer
 - 5 vehicles in AQMD fleet; 450 vehicles in U.S.
 - \$600/month vehicle lease
 - Neighborhood Electric Vehicles
 - 5 models: Miles, GEM, Columbia Park Car, Wheego
 - \$178,000 AQMD project cost
- Medium-Duty
 - Class 4 electric Utility Truck
 - Electroride technology developer
 - Zero Truck use in Santa Monica fleet
 - \$87,600 AQMD cost; \$175,200 total project cost





City of Santa Monica

90 Day Report	Daily/Monthly Operating Costs	Daily Average Mileage	Breakdown or Repair Costs	Monthly Mileage Engine ON Time
July	.018 cents per day .53 cents per month	.87 miles	NONE	26.3 miles 62 minutes
Aug	.018 cents per day .54 cents per month	1.09 miles	NONE	32.71 miles 81 minutes
Sept	.026 cents per day .79 cents per month	1.19 miles	NONE	35.96 miles 71 minutes

Direct Operating Metrics Basis:

2 cents per mile and 11 cents per hour

Progress Overview in 2010

- UC Davis Institute of Transportation Studies (ITS)
Sustainable Transportation Energy Pathways (STEPS)
 - \$2M+ total; \$120,000 AQMD Clean Fuels support for four projects
 - Hydrogen Infrastructure Transition Analysis – LA area study
 - Electric Vehicle Energy Loads on the Grid – LA area study
 - Plug-In Hybrid Electric and Alternative Fuel Vehicle Surveys
 - Cross-Comparison of Vehicle-Fuel PathwaysNext STEPs through 2014
- CA PEV Collaborative Report
 - Plan for California to encourage 1 million PEVs in CA by 2020

<http://www.evcollaborative.org/strategic-plan>



August 2010 TAO Advisory Retreat

PEV Infrastructure Potential Projects

- Ready-Set-Charge!
 - Establish streamlined permitting templates
 - Reduce time to install EVSE
 - Deploy throughout basin
- Upgrade key public charge points
- Integration with renewables
- Development of local incentives (Rule 2202)
 - Other workplace incentives?
- Residential incentives?



New Projects Started in 2010

- Charging Infrastructure Support
 - Federal & CEC co-funding
 - \$210K AQMD Clean Fuels co-funding equally to 3 contractors:
 - Clipper Creek (upgrades)
 - Coulomb
 - ECOtality
- Local Government Support & Outreach
 - CEC funding \$841k for www.SoCalEV.org supported by AQMD
 - Clean Fuel Connection EV Ready LOE contract
 - Calstart LOE contract
- Toyota Prius PHV demo
 - 3 PHVs at AQMD for 1 year with data collection



EV 101 Workshop

- Follow-Up action from SoCal EV Ready
- Clean Fuel Connection organized
- Goals
 - Educate & Inform local government
 - Build momentum (elected officials & press)
 - Encourage streamlined EVSE permitting regional implementation
 - Local community issues
- Locations: UCLA, October 22, 2010
Carson with SBCCOG, December 9, 2010
Riverside with WRCOG, February 23, 2011
additional tbd



For More Information....



South Coast
Air Quality Management District

Cleaning the air that we breathe...



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www.aqmd.gov

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