



2014 Integrated Energy Policy Report Update Workshop on Transportation

Alternative and Renewable Fuel and Vehicle Technology Program March 27, 2014

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California Energy Commission

California Energy Commission

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California Transportation: Nation-State Statistics

- Population: 37.8 million
- GDP: \$2.0 trillion - 8th largest global economy
- GHG Emissions: 448 MMT*
 - 7.2% of U.S. Emissions (Pew Center)
 - 10th largest emitter on global scale
 - **Transportation accounts for nearly 40 % of all GHG emissions**
- Vehicles: 26 million cars, + 1 million trucks
- Annual Fuel Consumption: 17.8 billion gallons
 - 14.5 billion gallons gasoline
 - 3.3 billion gallons diesel

* Source: California Air Resources Board 2011 Inventory



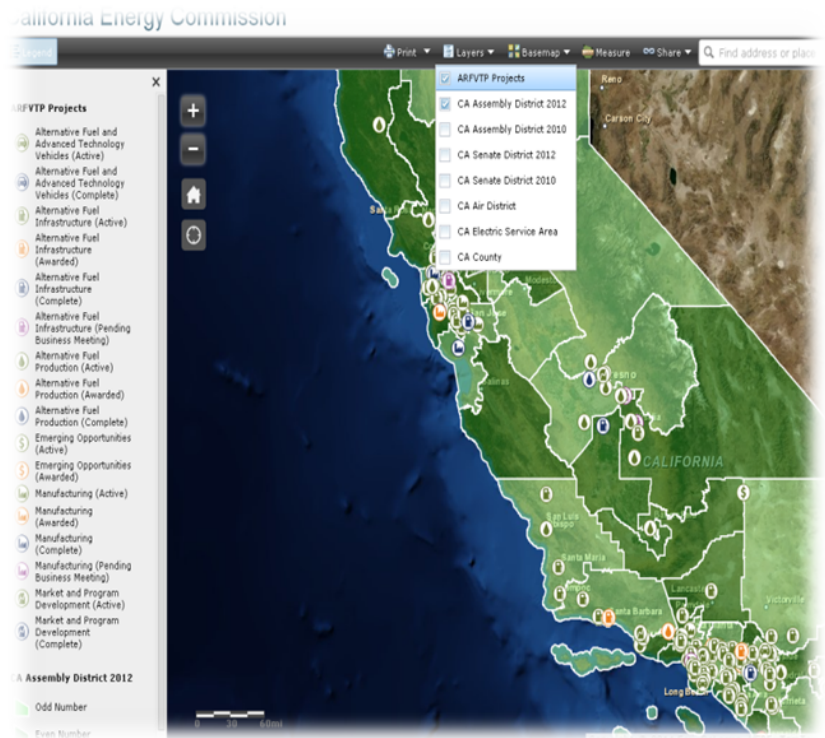
California's Policy Goals and Objectives

Policy Objectives	Goals and Milestones
GHG Reduction	Reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050
Petroleum Reduction	Reduce petroleum fuel use to 15% below 2003 levels by 2020
In-State Biofuels Production	Produce in California 20% of biofuels used in state by 2010, 40% by 2020, and 75% by 2050
Low Carbon Fuel Standard	10% reduction in carbon intensity of transportation fuels in California by 2020
RFS2	36 Billion Gallons of renewable fuel by 2022
Air Quality	80% reduction in NOx by 2023
Governor Brown's ZEV E.O.	Accommodate 1 million EVs by 2020 and 1.5 million by 2025



Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

- Created under AB 118 (2007)
- Amended by AB 109 (2008)
- Extended by AB 8 (2013)
- More than \$400 million invested
- Over 250 projects to date
- Up to \$100 million annually



<http://www.energy.ca.gov/drive/projects/map/index.html>



Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013)

Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44289.1, and 44289.2 of, to add and repeal Section 43618.9 of, and to repeal Section 44289 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately

[Approved by Governor September 22, 2013 Filed with
Secretary of State September 26, 2013.]

LEGISLATIVE COUNSEL'S SUGGEST

AB 8, Perea, Alternative fuel and vehicle technologies, funding programs.
(1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or non-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported to the state board, and the number of hydrogen-fueled vehicles registered with the Department of Motor Vehicles through April 30. The bill would require the commission to allocate \$20 million annually, as specified, until there are at least 160 publicly available hydrogen-fueling

- Extends ARFVTP funding through January 1, 2024
- To transform California's transportation market into a diverse collection of alternative fuels and technologies and reduce California's dependence on petroleum.

“...develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies.” (Health and Safety Code Section 44272(a))



Investing in a portfolio of projects that have the potential to be transformative

Category	Funded Activity	Cumulative Awards to Date (in millions)	Projects
Alternative Fuel Production	Biomethane Production	\$38.9	12
	Gasoline Substitutes Production	\$18.4	8
	Diesel Substitutes Production	\$35.9	14
Alternative Fuel Infrastructure	Electric Vehicle Charging Infrastructure	\$26.8	28
	Hydrogen Fueling Infrastructure	\$36.8	8
	E85 Fueling Infrastructure	\$16.5	4
	Upstream Biodiesel Infrastructure	\$4.0	4
	Natural Gas Fueling Infrastructure	\$17.5	48
Alternative Fuel and Advanced Technology Vehicles	Natural Gas Vehicle Deployment	\$33.5	3
	Propane Vehicle Deployment	\$7.3	1
	Light-Duty Electric Vehicle Deployment	\$20.1	3
	Medium- and Heavy-Duty Electric Vehicle Deployment	\$4.0	1
	Medium- and Heavy-Duty Advanced Vehicle Technology Demonstration	\$54.5	28
Related Needs and Opportunities	Manufacturing	\$48.1	18
	Workforce Training and Development	\$25.2	39
	Fuel Standards and Equipment Certification	\$4.0	1
	Sustainability Studies	\$2.1	2
	Regional Alternative Fuel Readiness and Planning	\$3.7	16
	Technical Assistance and Program Evaluation	\$15.6	26
Total		\$413.0	264



CALIFORNIA ENERGY COMMISSION

ARFVT Program Successes





Deploying EV Charging Infrastructure

Over \$25 million invested

Total EVSE = 7,798 charge points

Commercial = 3,096

Residential = 3,882

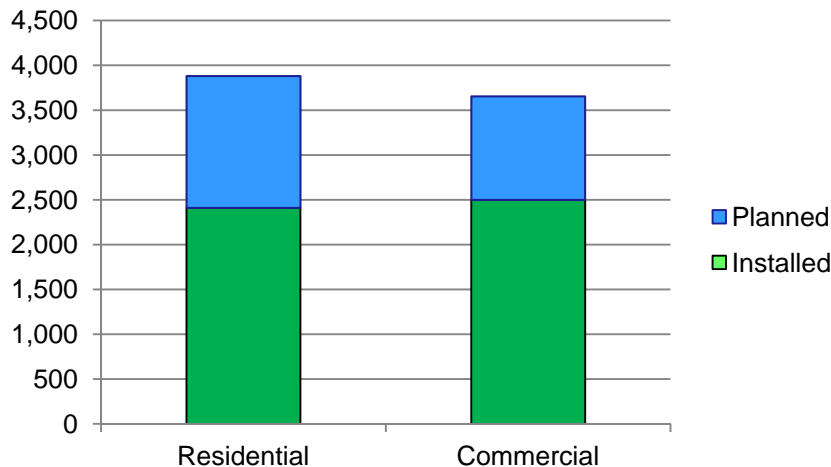
Workplace = 743

DC Fast = 77

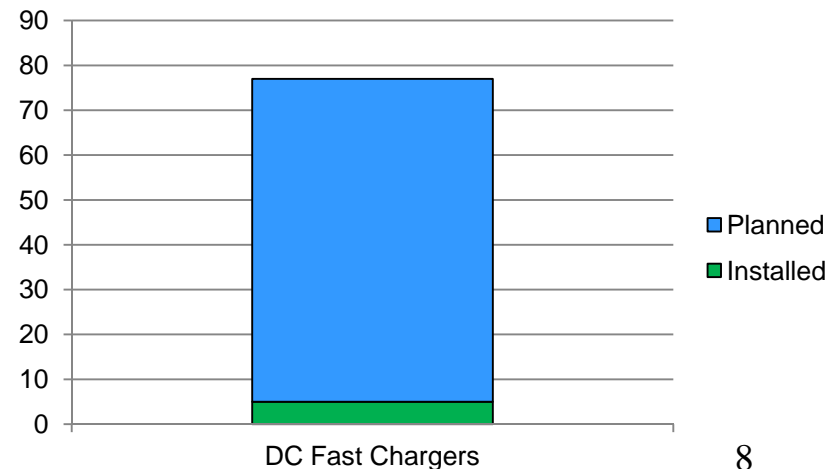
Plus over \$3 million for
Alternative Fuel Regional
Readiness and Planning



Level 1 & 2



77 DC Fast Chargers





Supporting Zero Emission Vehicle Goals



- Nearly \$20 million ARFVTP allocations to fund 9,000 incentives for battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) via the Air Resources Board's Clean Vehicle Rebate Project.
- An additional \$24.5 million transferred from the ARFVT Program fund to the Air Quality Improvement Program fund anticipated to cover an additional 12,400 vehicle incentives.





Building a Foundation for Hydrogen Fueling Stations

Station Funding

17 Stations = \$27.1 million (existing awards)

~5 Station Upgrades = \$6.7 million

AC Transit Bus Station = \$3 million

~ 11-12 New Stations = \$30 million (pending awards)



Other Funding Activities

CDFA Div. of Weights and Measures = \$4 million

Retail Dispensing Fuel Standards

UC Irvine STREET Model = \$1.5 million

SCAQMD Regional Readiness = \$299,360





Advancing Low Carbon Biofuels

- Over \$90 million invested
- 34 projects to expand the production of low-carbon biofuels
- More than 20 projects will use primarily waste-based feedstocks
- Capable of displacing tens of millions gallons of gasoline and diesel per year
- Ability to achieve low carbon intensities
- Potential for more than 36 million gallons per year of biofuel production capacity by 2017.





Escondido Biorefinery – Buster Biofuels Commercial Project Example

- **ARFVTP Grant: \$2,641,723**
- **Purpose:** Local production of over 5 million gallons transportation biodiesel per year from nearly 5.65 million gallons of used cooking oil per year





Accelerating Fleet Turnover with Natural Gas Vehicle Incentives and Infrastructure

- Invested over \$17 million for infrastructure and over \$30 million for vehicle incentives
- 62 fueling stations for compressed and/or liquefied natural gas.
 - At least four of these stations will dispense a mixture of conventional and renewable natural gas, which will significantly reduce carbon intensity.
- Provided incentives to speed the adoption of more than 1,000 natural gas vehicles





Bear Valley Unified School District - Natural Gas Vehicle Project Example

- **ARFVTP Grant: \$300,000**
- **Purpose:** install a new compressed natural gas (CNG) fueling station to service the district's existing natural-gas fueled school buses





Incubating Innovation in Medium and Heavy-Duty Advanced Technology Vehicles

- 28 projects to demonstrate advanced technologies, including electric, hybrid electric, fuel cell, and advanced natural gas engines
- Over \$50 million to design, develop, and deploy medium- and heavy-duty range-extended and all electric drive





Supporting Manufacturing in California

- 18 manufacturing projects, primarily for electric drive-related batteries, components, and vehicles
- **ARFVTP: \$3,000,000 to Boulder Electric Vehicles**
- **Purpose:** Design & construct a manufacturing facility in LA to produce medium-and heavy-duty all electric drive trucks & buses





Aligning Clean Technology Investments with Economic Development

- \$25 million invested in 39 workforce training agreements to help develop skills and knowledge in clean technology
- Training for ~12,000 individuals and more than 100 businesses and municipalities to support all aspects of hybrid, hydrogen, CNG/LNG, and biodiesel technologies
- Awards to Community Colleges in Northern, Central, and Southern California for the development of curriculum, training the trainer instruction programs, training material development, and essential equipment needs





Workforce Training and Development – California Employment Training Panel

- **ARFVTP Grant: \$999,460**
- **Purpose:** Training for nearly 1,200 employees and support for joint labor-management training programs at three regional public transit agencies
 - Los Angeles County Metropolitan Transportation Authority
 - Sacramento Regional Transit District
 - Santa Clara Valley Transportation Authority
- Help California's transit agencies continue as nationwide role models of clean public transportation innovation





Helping Create Jobs

Estimated number of jobs created through program:

2013 IEPR							
	Administrative	Manufacturing	Construction	Engineering	Operation and Maintenance	Other	Total
<i>Short-term</i>	433	541	1,406	371	284	123	3,158
<i>Long-term</i>	356	1,030	277	370	805	378	3,216
Totals:	789	1,571	1,683	741	1,089	501	6,374

Source: California Energy Commission



Engaging A Broad Set of Successful ARFVTP Applicants

- Program oversubscribed, but we continually strive to reach broader audiences
- Pre-application workshops to answer questions and help applicants submit successful proposals
- Post-solicitation debriefing available for all applicants
- Investment Plan meetings open to public
- Workshops for solicitation design
- Apply lessons learned from previous solicitations into new solicitations—continually improving

