



CALIFORNIA ENERGY COMMISSION

**California Energy Commission
Infrastructure Corridors & Strategic Placement of Charging
Infrastructure for
1 Million Zero-Emission Vehicles and
Medium- and Heavy-Duty Projects
April 29, 2016**



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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, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 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 28, 2013. Title reads:
Secretary of State September 28, 2013.]

LEGISLATIVE COUNCIL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies, funding program.
(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, and 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 not-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 100 publicly available hydrogen-fueling

- Extends ARFVTP funding through January 1, 2024
 - ✓ \$100 million per year
- 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))



ARFVTP Funding Summary: 2009-2015

Investment Areas	Funding Amount (millions)	Percent of Total (%)	Number of Awards
Biofuels	\$158	26	61
Electric Drive	\$199	33	153
Natural Gas	\$95	16	185
Hydrogen	\$113	19	72
Workforce Development	\$28	4	58
Market & Program Develop.	\$13	2	16
Total	\$606	100	545

Through Q4 2015



Funding Allocations for 2016-2017

Category	Funded Activity	Proposed Funding Allocation
Alternative Fuel Production	Biofuel Production and Supply	\$20 million
Alternative Fuel Infrastructure	Electric Charging Infrastructure	\$17 million
	Hydrogen Refueling Infrastructure	\$20 million
	Natural Gas Fueling Infrastructure	\$2.5 million
Alternative Fuel and Advanced Technology Vehicles	Natural Gas Vehicle Incentives	\$10 million
	Medium- and Heavy-Duty Advanced Vehicle Technology Demonstration and Scale-Up	\$23 million
Related Needs and Opportunities	Emerging Opportunities	\$3 million
	Workforce Training and Development	\$2.5 million
	Regional Readiness	\$2 million
	Total Proposed	\$100 million



Fixing America's Surface Transportation (FAST) Act

Federal legislation that authorizes \$305 billion over fiscal years 2016-2020 to:

- Improve surface transportation infrastructure (including roads, bridges, transit systems, and rail transportation network)
- Reform and strengthen transportation programs
- Provide long-term certainty and flexibility for states and local governments
- Streamline project approval processes while maintaining safety.

Currently, 4 notices for funding opportunities.

- Advanced Transportation and Congestion Management Technologies Deployment Initiative
- Letters of Interest for Credit Assistance under the Transportation Infrastructure Finance and Innovation Act Program
- Nationally Significant Freight and Highway Projects
- Surface Transportation System Funding Alternatives



National Electric Vehicle Charging and Hydrogen, Propane, and Natural Gas Fueling Corridors

By December 2016, the U.S. Department of Transportation (DOT) must designate national plug-in electric vehicle charging and hydrogen, propane, and natural gas fueling corridors in strategic locations along major highways to improve the mobility of alternative fuel vehicles.

To designate the corridors, DOT will:

- Solicit nominations from state and local officials
- Work with industry stakeholders
- Incorporate existing fueling infrastructure

Within five years of the establishment of the corridors, and every five years thereafter, DOT will issue a report identifying charging and fueling infrastructure, analyzing standardization needs for fuel providers and purchasers, and reestablishing the goal of achieving strategic deployment of fueling infrastructure in the designated corridors by the end of 2020. (Reference [Public Law 114-94](#))



Energy Commission ARFVTP Alternative Fueling Infrastructure Funding to Date

Alternative Fuel	Awards (in millions of dollars)
Electric Vehicle Charging Infrastructure	\$49.5 for 8,748 charging stations
Hydrogen Refueling Infrastructure	\$96.0 for 49 fueling stations
Natural Gas Fueling Infrastructure	\$21.0 for 65 fueling stations
Upstream Biodiesel Infrastructure (production)	\$4.0 for 4 infrastructure sites
E85 Fueling Infrastructure	\$13.7 for 158 fueling stations



GFO-15-601 Sites

- 41 Sites
 - Interstate-5: 22 sites
 - Highway 99: 11 sites
 - US 101: 8 sites
- 61 DC Fast Chargers
- 42 Level 2 chargers

Source: Energy Commission Staff Analysis, PlugShare.com, US Department of Energy Alternative Fuels Data Center





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Central and Northern California DC Fast Charge Corridors: Grant Funding Opportunity 15-601 and 15-603





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Southern California DC Fast Charger Corridors: Grant Funding Opportunity 15-601 and 15-603





Energy Commission Funded Hydrogen Refueling Stations in Northern California

December 2015

Northern CA Hydrogen Stations

- **Operational**
 Emeryville - AC Transit
 San Jose
 South San Francisco
 West Sacramento
- **In Development**
 Campbell
 Cupertino
 Foster City
 Hayward
 Mill Valley
 Mountain View
 Oakland
 Palo Alto
 Redwood City
 *Robnet Park
 San Ramon
 Saratoga
 *Truckee
 Woodside

 *Not shown on map





Energy Commission Funded Hydrogen Refueling Stations in Southern California

December 2015

Southern CA Hydrogen Stations

Operational

- Burbank
- Coolidge*
- Costa Mesa
- Diamond Bar
- Fontana Valley - OESD
- Fontana - TCEC
- La Canada Flintridge
- Long Beach
- Los Angeles - Cal State CA
- Los Angeles - Burbank City
- Los Angeles - LAX
- Los Angeles - Santa Monica Blvd
- Newport Beach
- Orange
- San Juan Capistrano
- Santa Monica
- Thousand Oaks - Bus Lines Transit
- Torrance

In Development

- Alhambra
- Carroll Canyon
- Costa Mesa
- Fontana - Walrus Ave
- Fontana - Hwy 10
- Lake Forest
- Lakewood
- Los Angeles - Beverly Blvd
- Los Angeles - Lincoln Blvd
- Los Angeles - Hollywood Blvd
- Los Angeles - Woodland Hills
- Mission Viejo
- Orange
- Pacific Palisades
- Redondo Beach
- Riverside
- San Diego
- San Diego - Escondido
- San Jose - Coyote Ave
- San Jose - Elgin Ave

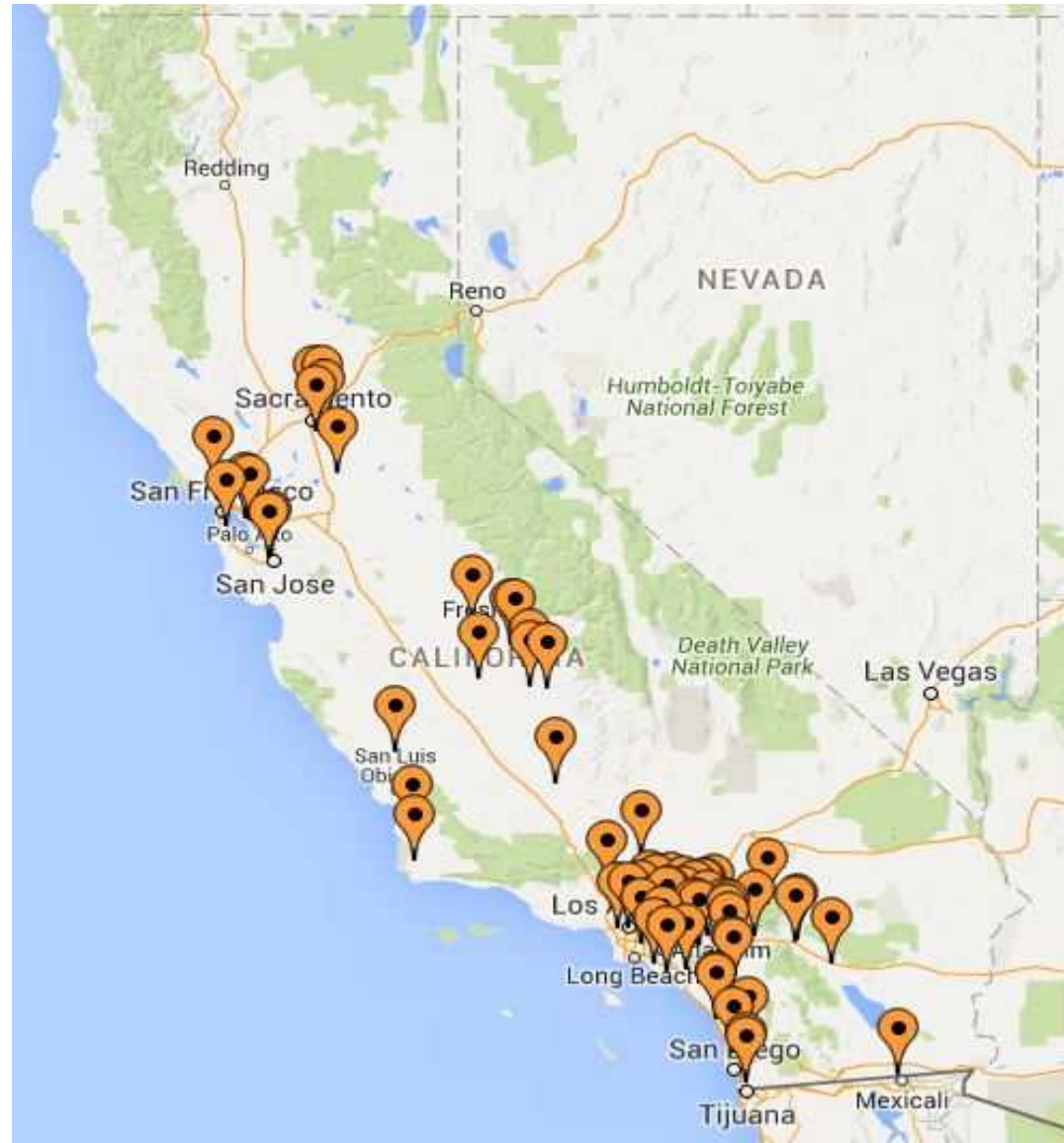
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Energy Commission Funded Natural Gas Fueling Stations in California





Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) Electric Vehicle Support

Charging Connectors	Residential	Multi-unit Dwelling	Commercial	Workplace	Fleet	DC Fast Chargers	Total
Installed	3,937	178	2,039	189	100	43	6,486
Planned	-	167	1,415	236	36	199	2,053
Other				209			209
Total	3,937	345	3,454	634	136	242	8,748

Charging Infrastructure

Grants: \$49.5 M

Plus 34 ZEV Regional Readiness

Planning Grants: \$7.6 M

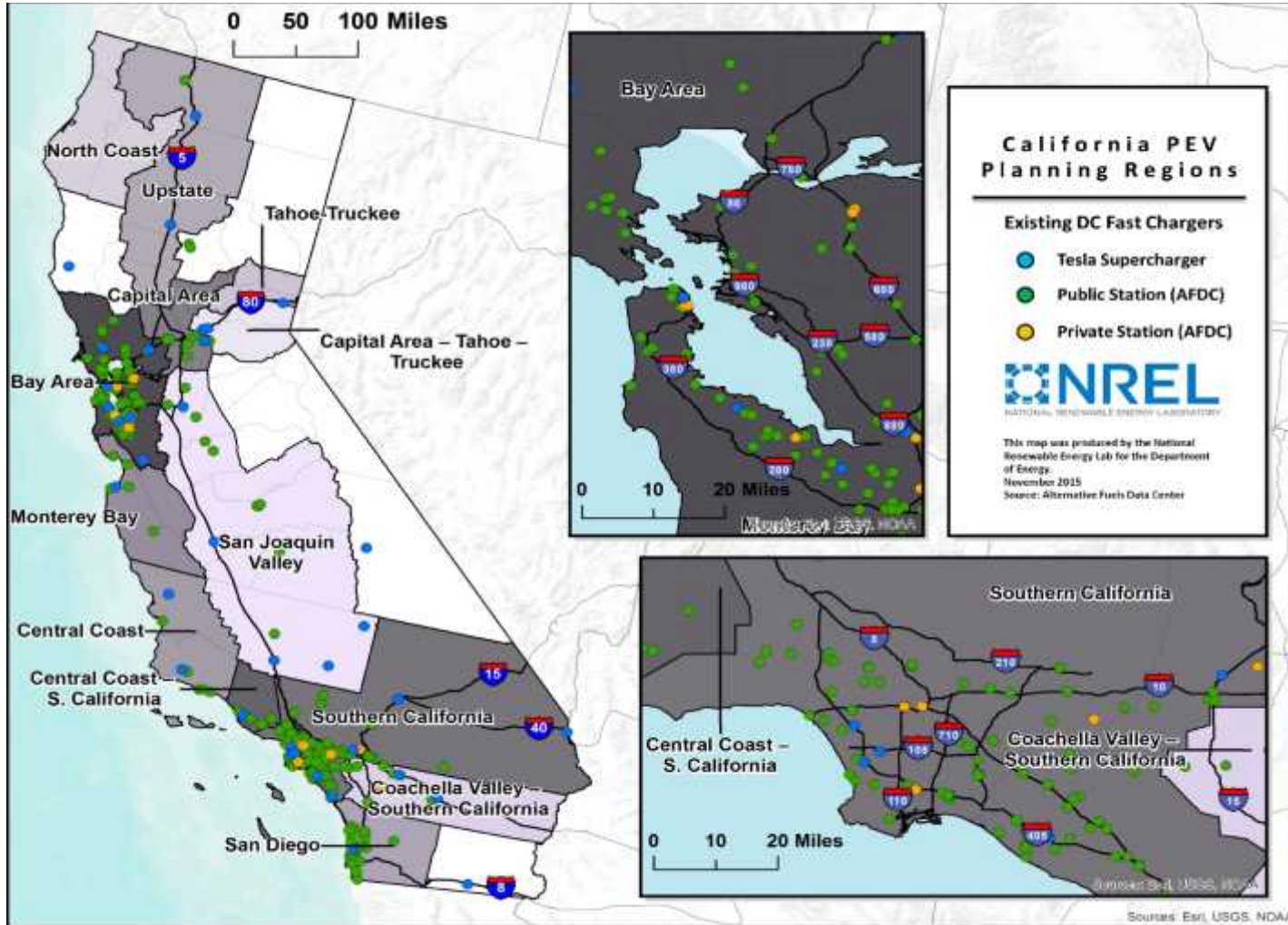
CPCFA Loan-Loss

Reserve Program: \$2 M





Regional PEV Readiness Plans





Energy Commission's EV Charging Infrastructure Focus

- Gather data to inform charging infrastructure deployment and update NREL EV Infrastructure Assessment
- Coordinate with the CPUC and utilities
- Rapidly deploy charging infrastructure to target “fast followers” and meet California’s goals
- Choose strategic locations and sites that will spur EV adoption
- Include reliability and uptime of charging stations in funding opportunities in order to maintain California’s network of chargers



Energy Commission Current and Upcoming ARFVTP Electric Vehicle Infrastructure Funding Opportunities

- 2016 Charging Infrastructure Funding: \$6.8 million
- DC Fast Charging for California's Interregional Corridors
GFO-15-603: \$9.97 million (Applications due June 24, 2016)
- Zero-Emission Vehicle Regional Planning: \$1.9 million
- 2016-2017 ARFVTP Investment Plan:
 - \$17 million for charging infrastructure
 - \$2 million for regional readiness



Accelerating Fleet Turnover – MD/HD Related Funding

About 30 Percent of Total Program Funding

Technology	Funding (\$ Millions)	No. of Vehicles, Fueling Stations or Projects
Commercial Natural Gas Trucks	67.9	2,400 Trucks
Natural Gas Infrastructure	21.0	65 Stations
Commercial Propane Trucks	6.4	514 Trucks
Commercial ZEV Trucks (Class 6 package delivery)	4.0	160 Trucks
Advanced Technology Truck Demonstration or Manufacturing	146.7	64 Projects
Total Funding	\$246 M	18



Cummins Westport ISL G Near Zero Natural Gas Engine

- Production to start Q2 2016
- 8.9 Litre (540 cu. In.)
- In line 6 cylinder
- Spark ignition
- Peak Rating:
 - HP-320 hp Torque -1000 lb-ft
- **Certified to CARB Optional Low NOx 0.02 Standard (Near Zero)**
 - **NOx: 0.02 g/bhp-hr**
 - **PM: 0.01 g/bhp-hr**
- Certified to 2016 EPA / DOT GHG standards
- Three Way Catalyst Aftertreatment
- Manufactured by Cummins in Cummins Engine Plant- Rocky Mount, North Carolina

ISL G NEAR ZERO





Energy Commission Funded Medium- and Heavy-Duty Projects



1. EPRI-Odyne retrofit of 5 work trucks to PHEV drive
2. Transpower Class 8 Electric Truck
3. Wrightspeed Inc. hybrid-electric



Energy Commission Resources

- The Alternative and Renewable Fuel and Vehicle Technology Program Investment Plan:
<http://www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-SD-REV.pdf>
- Energy Commission grant funding opportunities for transportation:
<http://www.energy.ca.gov/contracts/transportation.html#GFO-15-603>
- Energy Commission ZEV Action Plan Implementation Activities:
<http://www.energy.ca.gov/2013-ALT-01/index.html>
- DRIVE website for the Alternative and Renewable Fuel and Vehicle Technology Program: <http://www.energy.ca.gov/drive/index.html>