



### Zero-Emission Vehicles and Infrastructure

In his 2015 inaugural speech, Governor Edmund G. Brown Jr. put forward a goal to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030. This was part of his strategy to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030 as directed in Executive Order B-30-15. On September 8, 2016, Governor Brown signed Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016), putting into law a statewide goal to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030. With transportation accounting for about 37 percent of California's greenhouse gas emissions in 2014,<sup>1</sup> transforming California's transportation system away from gasoline to zero-emission vehicles is a fundamental part of the state's efforts to reduce greenhouse gas emissions.

Each day, an increasing number of zero-emission vehicles (ZEVs) can be seen on California roads.<sup>2</sup> ZEVs include battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCEVs). Between March 2010 and July 2016, more than 223,000 PEVs were sold in California. As of April 2016, 331 hydrogen FCEVs were registered with the California Department of Motor Vehicles (DMV), and California's FCEV population is projected to grow to 13,500 vehicles in 2019 and 43,600 vehicles in 2022.<sup>3</sup> As of July 2016, more than 152,000 PEV and 250 FCEV owners received rebates through the California Air Resources Board's (ARB) Clean Vehicle Rebate Project. California Energy Commission staff monitors vehicle and infrastructure rollout regularly. The availability of new vehicle models; greater driving range provided by FCEVs and improved battery technology; increased availability of electric charging and hydrogen refueling infrastructure; and incentives such as carpool lane access stickers, federal tax credits, and state and air district rebates have all contributed to an expanding ZEV market.

On March 23, 2012, Governor Brown issued Executive Order B-16-2012 to encourage ZEVs in California and set a long-term goal of reaching 1.5 million ZEVs on California's roadways by 2025. The executive order established milestones for three periods:

- By 2015, California's major metropolitan areas will be able to accommodate ZEVs through infrastructure plans.
- By 2020, California's ZEV infrastructure will be able to support up to 1 million vehicles.
- By 2025, 1.5 million ZEVs will be on California's roadways with easy access to infrastructure.

The *2013 ZEV Action Plan*<sup>4</sup> lists the actions to be undertaken by the Energy Commission and other relevant state agencies to meet the Governor's Executive Order B-20-15. The Energy

1 California Air Resources Board, GHG Emission Inventory – 2016 Edition.  
<http://www.arb.ca.gov/cc/inventory/data/data.htm>.

2 <https://cleanvehiclerebate.org/eng> and <http://www.pevcollaborative.org/>

3 [http://www.arb.ca.gov/msprog/zevprog/ab8/ab8\\_report\\_2016.pdf](http://www.arb.ca.gov/msprog/zevprog/ab8/ab8_report_2016.pdf).

4 [http://opr.ca.gov/docs/Governor's\\_Office\\_ZEV\\_Action\\_Plan\\_\(02-13\).pdf](http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf).



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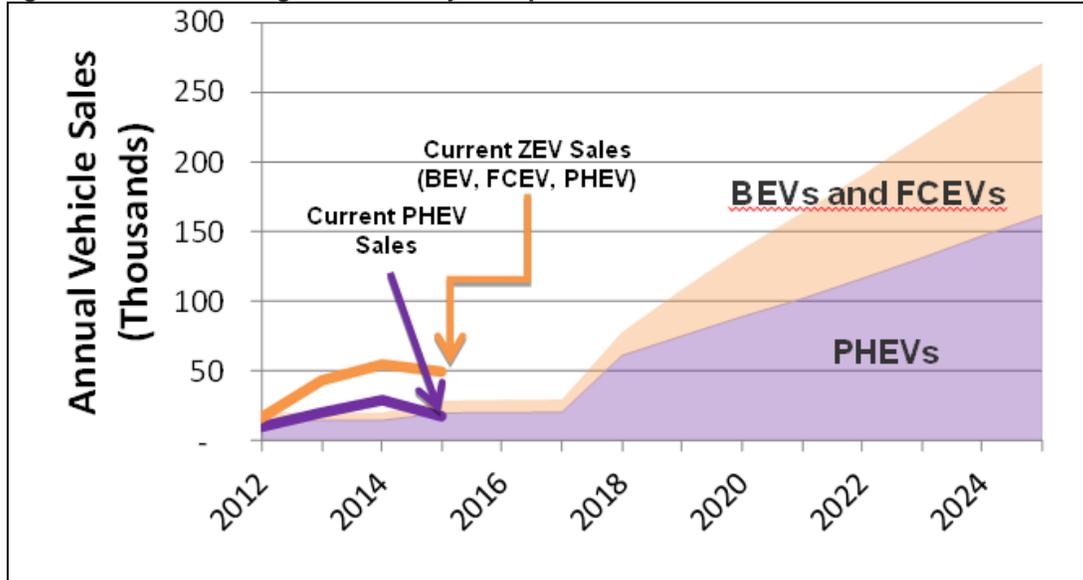
Commission invested in activities identified in the *2013 ZEV Action Plan* and, as part of its work on ZEV infrastructure, provides funding for electric vehicle charging stations (EVCS), hydrogen refueling stations, and guidance on electric and hydrogen vehicle infrastructure deployment.

Additional actions for the *2013 ZEV Action Plan* were developed at the 2015 Governor’s Summit on Zero Emission Vehicles in April 2015. The summit provided a forum to present a strategic assessment of the overall ZEV market in California, collect feedback on areas of improvement and opportunity, highlight progress and accomplishments on the *2013 ZEV Action Plan*, hold detailed discussions on new proposed actions to accelerate the market, showcase new initiatives and projects, and comment on updates to the plan. The *2016 ZEV Action Plan*<sup>5</sup> outlines progress on the *2013 ZEV Action Plan* and identifies new actions state agencies will take to move forward toward the milestones in the Governor’s executive order, as follows:

- Raising consumer awareness and education about ZEVs.
- Ensuring ZEVs are accessible to a broad range of Californians.
- Making ZEV technologies commercially viable in targeted applications the medium-duty, heavy-duty and freight sectors.
- Aiding ZEV market growth beyond California.

The ARB anticipates annual ZEV sales of 200,000 in the next 5-10 years.<sup>6</sup> Once annual sales reach about 16 percent of the light-duty vehicle market, as shown on **Figure 1** in 2025, ARB staff believes that the market will be sustainable.

**Figure 1: ARB ZEV Regulation Likely Compliance Scenario and Current California Sales**



Source: California Air Resources Board

<sup>5</sup> Governor’s Interagency Working Group on Zero-Emission Vehicles, *2016 ZEV Action Plan, An Updated Roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025*, October 2016, [https://www.gov.ca.gov/docs/2016\\_ZEV\\_Action\\_Plan.pdf](https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf).

<sup>6</sup> ARB ZEV Regulation Likely Compliance Scenario, <http://naatbatt.org/wp-content/uploads/2016/03/CA-Air-Resources-Board.pdf>



### *Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)*

The ARFVTP, authorized by Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007) and subsequently amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008), Assembly Bill 1314 (Wieckowski, Chapter 487, Statutes of 2011), and Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013), authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. ARFVTP strategically invests up to \$100 million in public funds each year to promote the development of a clean and secure transportation future. Investments in alternative and renewable fuels, advanced technology cars and trucks, vehicle manufacturing, and fueling infrastructure are intended to reduce greenhouse gas emissions, reduce the state's reliance on petroleum-based fuels, improve air quality, build a strong alternative fuels manufacturing base, and develop a skilled workforce. To date, the Energy Commission has partnered with a variety of public and private organizations to help realize these goals. These partners include alternative vehicle and engine manufacturers, battery manufacturers, alternative fuel producers, fueling infrastructure providers, utilities, universities, other California state agencies, transit districts, air quality management districts, cities, counties, and regional and state governments.

The Energy Commission annually prepares and adopts an *ARFVTP Investment Plan Update* to determine the funding priorities and opportunities and describe how program funding will be used to complement other public and private investments. As the needs for specific activities are identified, the investment plan provides the framework for projects to target. AB 8 specifies that the ARFVTP allocate up to \$20 million per year through January 1, 2024, for hydrogen station development for up to 100 stations.

Program investments for ZEVs began in 2009 and, as of July 2016, include:

- Establishing the foundation for a zero-emission transportation future with \$51.0 million funding of EVCSs, contributing to the largest network of EVCSs in the country. See **Table 1** and **Figure 2**.
- Establishing a nascent retail hydrogen station network to enable the market launch of FCEVs by automakers by investing \$80.3 million for the development of 48 retail stations. Providing \$12.8 million for ongoing operation and maintenance of hydrogen refueling stations until adequate FCEVs are brought to market by automakers to support the stations. See **Figure 3**.
- Providing more than \$10.0 million to support hydrogen refueling for the public transport sector, a hydrogen refueler, and a central hydrogen distribution center. Providing \$7.0 million to California Department of Food and Agriculture/Division of Measurement Standards (CDFA/DMS) for the development of hydrogen purity and dispensing standards for hydrogen and electricity. Also, \$500,000 was provided to CDFA/DMS to operate the United States Department of Energy (U.S. DOE) Hydrogen Station Equipment Performance (HyStEP) device.



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- Creating a \$2.0 million loan loss reserve program with California Pollution Control Financing Authority aimed at providing loans to install EVCS.
- Investing \$109.0 million to help California companies develop manufacturing plants and conduct in-service demonstrations of zero-emission medium- and heavy-duty advanced technologies for trucks, buses, and freight movement. These projects, located in disadvantaged communities, are critical to bring these technologies to market.
- Providing \$57.0 million in seed funding for start-ups and small manufacturers of advanced technology vehicles, components, and batteries to expand their plants and assembly lines and help make California a hub of electric-drive vehicle development, manufacturing, and use.
- Providing \$7.6 million for ZEV regional readiness plans aimed at addressing and reducing barriers to adoption of alternative fuels.
- Providing \$49.0 million to the ARB to support the Clean Vehicle Rebate Project that has accounted for more than 10,000 ZEV rebates.

**Table 1** shows the support provided for EVCS and sited locations. Since 2009, ARFVTP has awarded more than \$51.0 million for the installations listed below.

**Table 1: Number of Charging Connectors Funded by ARFVTP**

Charging Connectors	Residential	MUD	Commercial	Workplace	Fleet	DCFC	Total
Installed	3,937	220	2022	106	100	57	6,663
Planned	0	125	1174	142	36	186	1,867
<b>Total</b>	<b>3,937</b>	<b>345</b>	<b>3,196</b>	<b>248</b>	<b>136</b>	<b>243</b>	<b>8,530</b>

Source: Fuels and Transportation Division, California Energy Commission

On June 6, 2016, the Energy Commission conducted a workshop on strategies for funding electric vehicle infrastructure for the 2016-2017 fiscal year. The Energy Commission will examine funding options that will more efficiently and quickly provide funds for infrastructure installation. Benefits can be provided by strengthening collaborative efforts with public and private partners.

ARFVTP is considering innovative and clean mobility options such as car sharing with battery BEVs and using renewable energy charging systems. An example would be a BEV car-sharing program that could provide short-term use with hourly or per mile fee structures. BEVs could be deployed within or near community areas identified as economically and environmentally disadvantaged as determined by the Office of Environmental Health Hazard Assessment California Communities Environmental Health Screening (CalEnviroScreen) tool. Electric vehicle



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charging would be installed at the base station for the vehicles and may include renewable energy sources for the chargers or technology innovations such as mobile charging systems and battery backup.

Other areas being considered are focused infrastructure projects for sites identified under regional readiness planning activities discussed in the section “Zero-Emission-Vehicle Regional Readiness Planning and Implementation.” Projects may also include apartment complexes and other types of multiunit homes where infrastructure is more difficult to deploy and have been underserved under previous funding opportunities. The ARFVTP continues to coordinate infrastructure deployment with ARB, the California Public Utilities Commission, and various air districts throughout California to provide charging and refueling infrastructure for ZEV deployment.

### *Electric Vehicle Charging Station Infrastructure*

To help ZEV drivers locate charging and refueling stations, the U.S. DOE’s Alternative Fuels Data Center (AFDC) provides data on their locations.<sup>7</sup> As of July 2016, the AFDC site lists 10,073 PEV charging connectors at 3,379 publicly available charging stations throughout California – a more than 50 percent increase since August 2015 (2,248 charging stations).

Except for corridor chargers, the distribution of charging sites is generally aligned with the higher vehicle density areas. Expanding the distribution of EVCS increases the number of electric vehicle miles possible. The types of EVCS, the estimated time of these EVCS to charge a PEV, and the typical locations where they are used are shown in **Table 2**.

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<sup>7</sup> <http://www.afdc.energy.gov>.



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**Table 2: Nonresidential Electric Vehicle Charging Station**

Type of EVCS	Power Level	Estimated Plug-In Electric Vehicle Range per Charging Session	Nonresidential EVCS Locations
Alternating Current (AC) Level 1	110/120 volts, 1.4 to 1.9 kW (12 to 16 amps)	17 hours from 20 percent state of charge (SOC) to full charge.	Commercial office building
AC Level 2	208/240 volts, up to 19.2 kW (80 amps)	10 to 60 miles per hour of charging (3.3 kilowatts [kW] to 20 kW on-board charger).  7 hours (3.3 kW) to 1.2 hours (20 kW) to go from 20 percent SOC to full charge.  Larger on-board chargers can “fill” the battery faster, but larger capacity batteries for 150- to 200-mile vehicles will take longer to fill.	Commercial office building, MUD, public access
Type of EVCS	Power Level	Estimated Plug-In Electric Vehicle Range per Charging Session	Nonresidential EVCS Locations
DCFC	200 to 450 volts, up to 90 kW (200 amps)	Roughly 20 minutes to go from 20 percent SOC to 80 percent SOC.  DC charging requires a separate port on the vehicle, bypassing the on-board charger. Going from 80 percent to 100 percent SOC takes longer than going from 20 percent to 80 percent. As the battery fills beyond 80 percent, it takes more time for each incremental SOC.	Public access, commercial office buildings or parks, hospitalities, and recreation sites

Source: Society of Automotive Engineers Charging Configurations and Ratings

In advance of the development of the Direct Current Fast Charger (DCFC) corridor solicitations issued in July 2015 and January 2016, the Energy Commission analyzed and ranked highway corridors for DCFC deployment. The Energy Commission analyzed the areas with “gaps”<sup>8</sup> in interregional DCFC. These areas include corridors between the San Francisco Bay Area and Sacramento, the north-south corridors from the Oregon border to Baja California, and various east-west corridors including corridors traveling east to Nevada and Arizona. The Energy Commission administered two grant funding opportunities (GFOs) in July 2015 and January 2016 to fund projects within the corridors identified in **Figures 2 and 3** on the next page. Once installed, the funded DCFCs will fill in the existing gaps for electric vehicle drivers. The deployment of a DCFC network will enable interregional and interstate travel by PEVs and support the charging needs of PEV drivers.

<sup>8</sup> Defined as distances without existing or planned fast charger coverage. At a minimum, proposed electric charging infrastructure coverage must be sufficient to allow drivers of a 75-mile-range all-electric vehicle to travel without becoming stranded because of lack of a charging station.



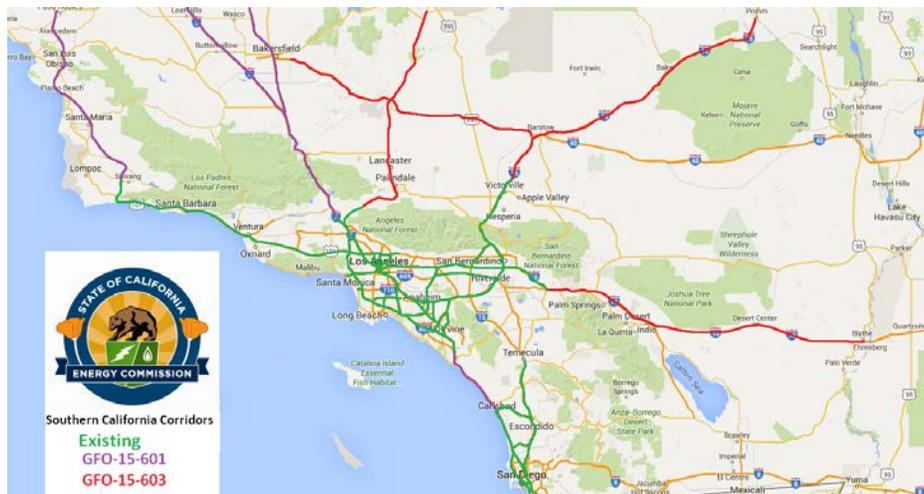
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Figure 2: Central and Northern California DCFC Corridors



Source: Fuels and Transportation Division, California Energy Commission

Figure 3: Southern California DCFC Corridors



Source: Fuels and Transportation Division, California Energy Commission

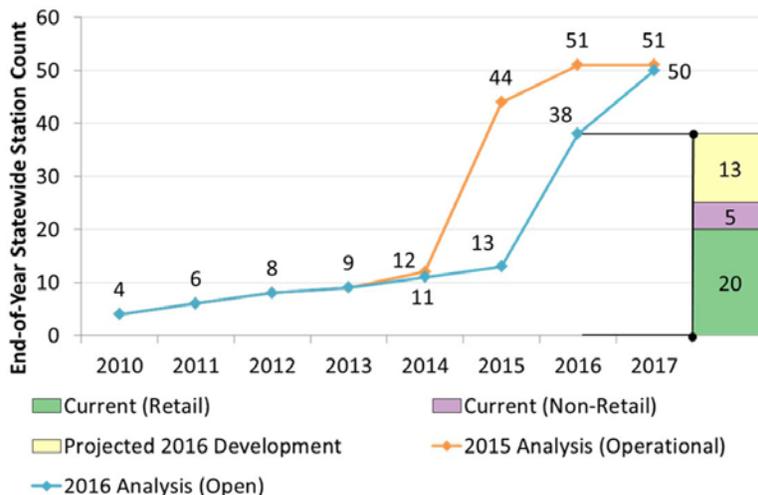


## Hydrogen Refueling Station Infrastructure

In comparison to plug-in electric vehicles (battery electric and plug-in hybrid electric vehicles) that use all-battery=electric power or battery-electric power with a small gasoline engine, FCEVs use an electric motor and an electric drivetrain and are powered by the energy available in hydrogen stored as pressurized hydrogen gas in onboard tanks. The hydrogen gas is mixed with oxygen in a fuel cell, causing an electrochemical reaction and generating electric current, heat, and water. The system produces electricity, which drives the electric motor; the tailpipe emissions are water vapor.

The progression in the development of the hydrogen refueling station infrastructure is shown in **Figure 4**. As of July 2016, there are 20 open-retail hydrogen refueling stations in California capable of supporting up to 5,600 FCEVs.

**Figure 4: Progression on Hydrogen Refueling Station Infrastructure – Statewide Hydrogen Refueling Station Projections Between 2015 and 2016 Annual Evaluations**

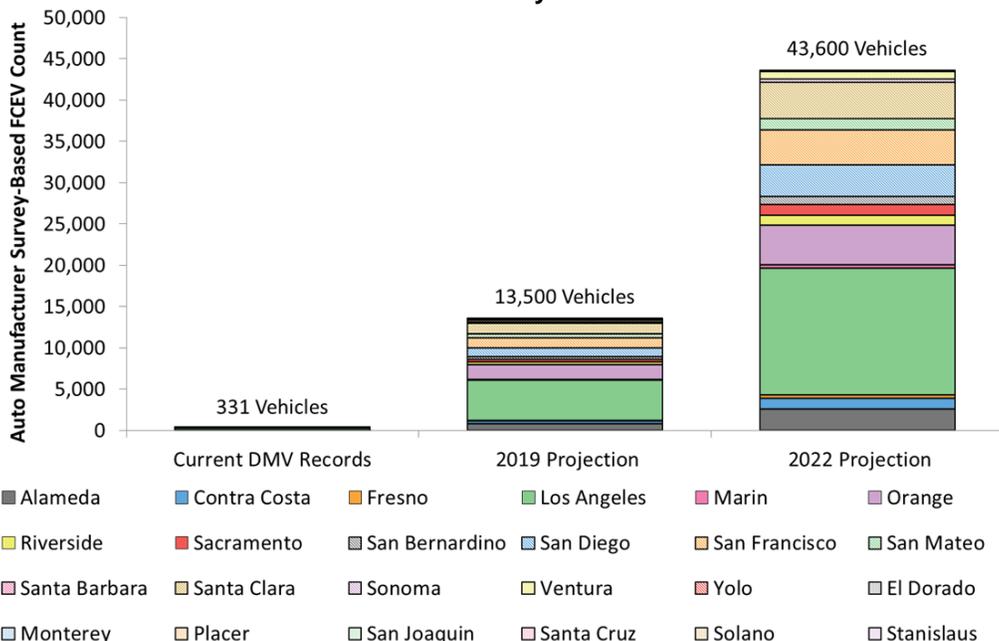


Source: 2016 Annual Evaluation of Hydrogen Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development (Pursuant to AB 8, Statutes of 2013), ARB, June 2016.

**Figure 5** on the next page shows the projected FCEV populations that will require hydrogen refueling station infrastructure.



**Figure 5: Statewide Projected FCEV Population Based on DMV Records and Auto Manufacturer Surveys**

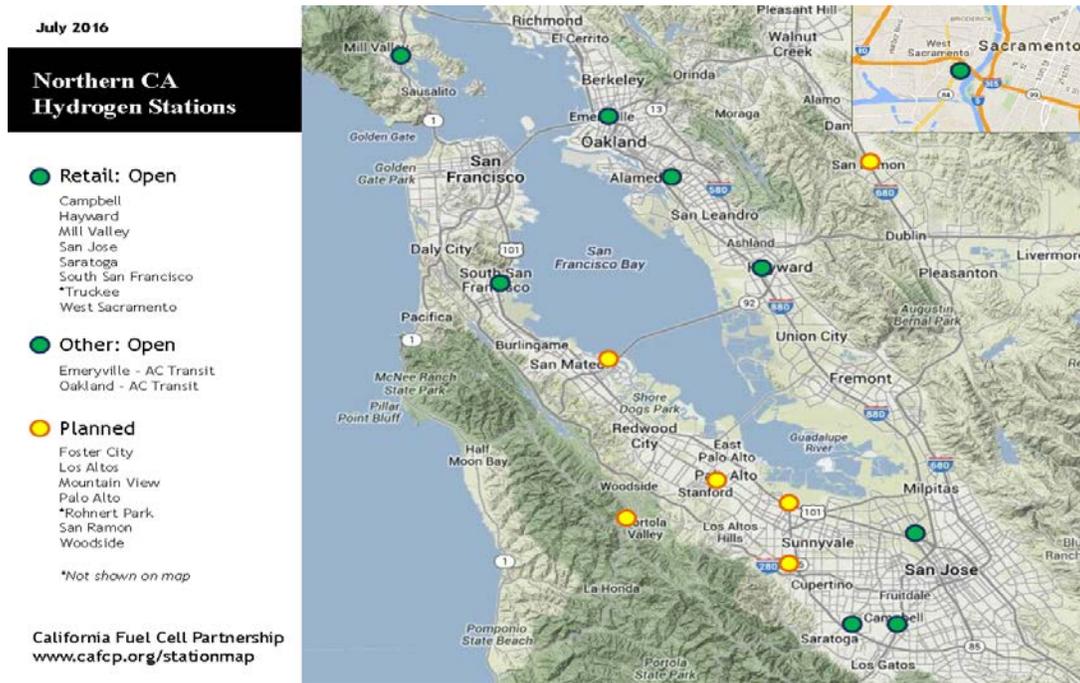


Source: 2016 Annual Evaluation of Hydrogen Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development (Pursuant to AB 8, Statutes of 2013), June 2016.

In California, the automakers’ FCEV deployment is expected soon after the hydrogen refueling stations are constructed. The ARFVTP investments to date total \$80.3 million. There are 20 open retail stations; by the end of 2016, 48 are expected to be operational. The Energy Commission issued a \$33.0 million funding solicitation (GFO-15-605) in April 2016, which is expected to yield up to 12-14 new hydrogen refueling stations. AB 8 provides for an annual allocation of up to \$20.0 million through January 1, 2024.

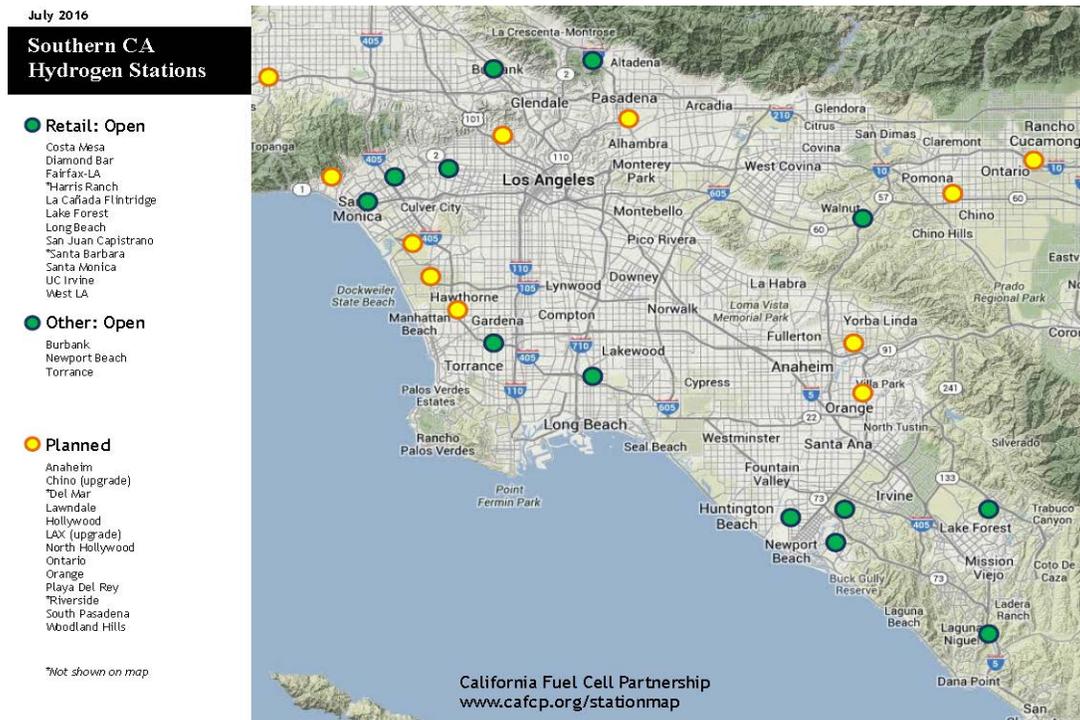
The first 48 stations (**Figures 6 and 7** on the next page) will have a daily refueling capacity of 9,380 kilograms (kg)/day, enough to support 13,400 FCEVs. As of April 2016, 331 FCEVs are registered with the DMV. The ARB’s 2016 Annual Evaluation of Hydrogen FCEV Deployment and Hydrogen Fuel Station Network Development projects 13,500 FCEVs by 2019 and 43,600 by 2022. The report also projects that with continued allocation of \$20.0 million annually, a statewide daily hydrogen fueling capacity deficit will be reached after 2019 and will increase to a projected deficit of 14,300 kg/day by 2022.

Figure 6: Northern California Hydrogen Stations



Source: California Fuel Cell Partnership

Figure 7: Southern California Hydrogen Stations



Source: California Fuel Cell Partnership



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To expand the refueling coverage and capacity, the Energy Commission analyzes the existing hydrogen refueling station network and the automakers’ expected FCEV deployments through ARB’s California Hydrogen Infrastructure Tool (CHIT) and California Hydrogen Assessment Tool (CHAT). These new tools provide higher-level resolution in urban areas of core markets, allowing for more refined analysis in Southern California and the San Francisco Bay Area.

Hydrogen refueling stations funded by the Energy Commission must dispense at least 33 percent of renewable hydrogen. The ARFVTP is exploring technology, resources, and strategies to increase the renewable content and reduce well-to-wheel emissions.

### *Zero-Emission-Vehicle Regional Readiness Planning and Implementation*

The planning for infrastructure for zero-emission vehicle deployment requires coordination at a local and regional level. Since 2011, the Energy Commission funded \$7.6 million for 34 ZEV planning and implementation grants in 12 regions. Six of these 12 regions also received funds from the U.S. DOE to streamline the permitting, installation, and inspection of EVCS, establish best practices for “PEV-ready” building and public works guidelines, and provide consumer PEV education and outreach. **Table 3** and **Figure 8** show the 12 regions, the counties that comprise each region, and the lead organizations associated with each plan.

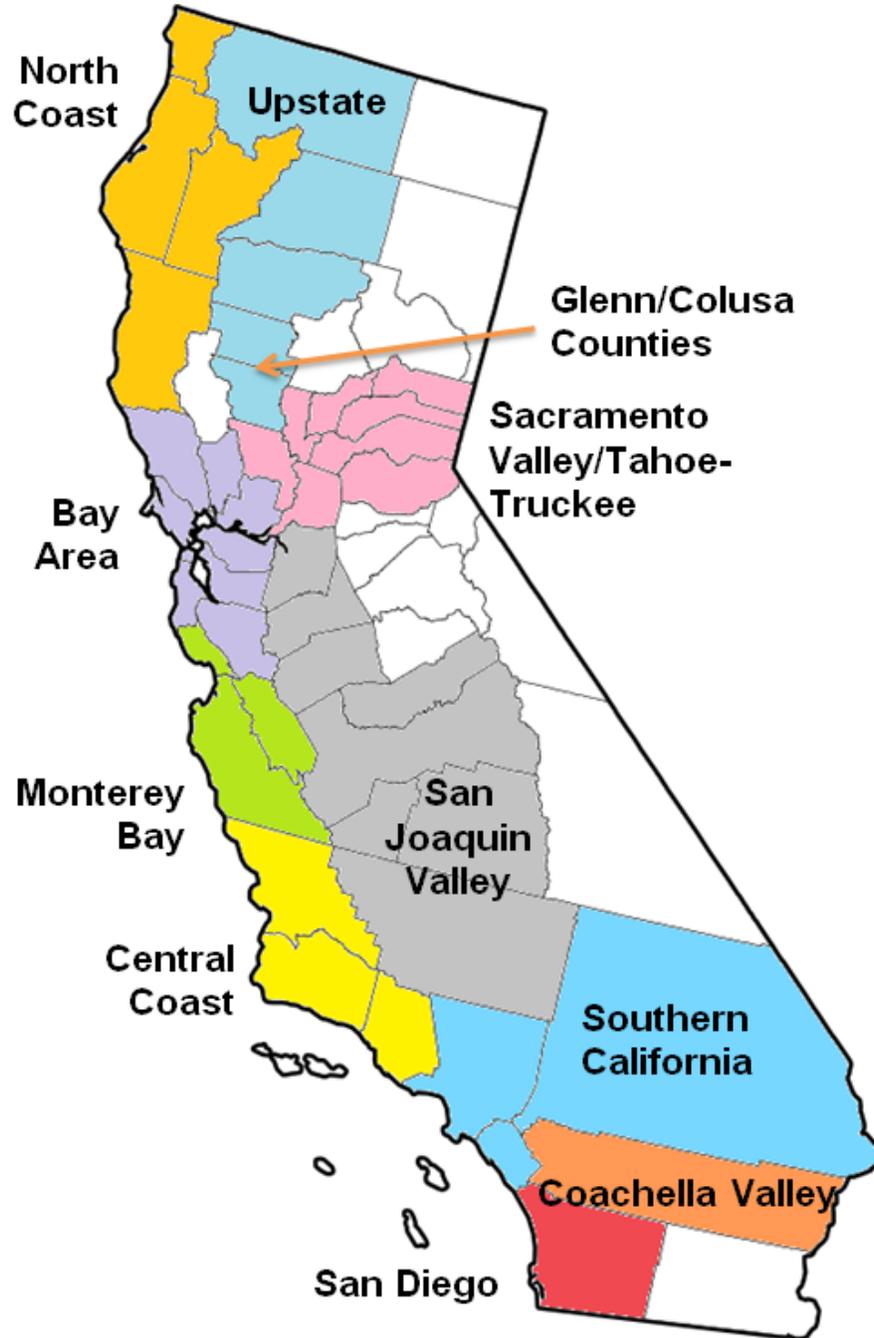
**Table 3: PEV Readiness Regions**

PEV Readiness Region	Counties	Organization
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma	Bay Area Air Quality Management District
Central Coast	San Luis Obispo, Santa Barbara, Ventura	Ventura County Air Pollution Control District
Los Angeles	Los Angeles, Orange, Riverside, San Bernardino, Ventura	Southern California Association of Governments
Monterey	Monterey, San Benito, Santa Cruz	Monterey Bay Unified Air Pollution Control District
North Coast	Del Norte, Humboldt, Trinity	Redwood Coast Energy Authority
Palm Springs	Riverside	Coachella Valley Association of Governments
Sacramento Valley	El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba	Sacramento Area Council of Governments
San Diego	San Diego	San Diego Association of Governments
San Joaquin Valley	Fresno, Kings, portion of Kern, Madera, Merced, San Joaquin, Stanislaus, Tulare	San Joaquin Valley Air Pollution Control District
Tahoe-Truckee	Douglas, El Dorado, Nevada, Placer, Sierra, Washoe	Tahoe Regional Planning Agency
Upstate	Siskiyou, Shasta, Tehama	Siskiyou County Economic Development Council
Glenn/Colusa	Glenn and Colusa	City of Mt. Shasta

Source: Fuels and Transportation Division, California Energy Commission



Figure 8: PEV Readiness Regions



Source: Fuels and Transportation Division, California Energy Commission



### *ZEVs in Diverse and Disadvantaged Communities*

The Energy Commission has a commitment to ensure that all Californians have an opportunity to participate in and benefit from the ARFVTP. This commitment was adopted Commissionwide in April 2015 with a resolution on diversity.<sup>9</sup> ARFVTP grant solicitations have been restructured to encourage projects in disadvantaged communities, which include those with disproportionate environmental pollution or a concentration of low-income households. When feasible, ARFVTP grant solicitations contain either scoring criteria or preference points to encourage project activities within disadvantaged communities according to CalEnviroScreen. One out of every eight charging stations funded through ARFVTP is within a disadvantaged community, and many others provide economic benefits to surrounding communities with adverse economic and environmental conditions identified by CalEnviroScreen. Since 2015, all zero-emission medium- and heavy-duty vehicles are demonstrated within disadvantaged communities, improving local air quality.

Since the designation of disadvantaged communities (Senate Bill 535, De León, Chapter 830, Statutes of 2012), the ARFVTP has issued six solicitations<sup>10</sup> for alternative fuel infrastructure. Each solicitation included a scoring criterion that provided preference to proposals documenting benefits to economically and environmentally disadvantaged communities. These solicitations required applicants to address the potential benefits a proposed project would have on any disadvantaged communities, and these responses are evaluated and scored as part of the overall project selection process.

As of August 2016, the Energy Commission has funded 563 Level 1 and Level 2 chargers, 14 DCFCs, and 10 hydrogen refueling stations within disadvantaged communities scoring in the top 25 percent under CalEnviroScreen.<sup>11</sup> Future ARFVTP funding opportunities for charging infrastructure are expected to focus on workplaces and multiunit dwellings within these communities. These types of charging venues have the potential to broaden the market for plug-in electric vehicles beyond drivers who have a dedicated parking space at home. ARFVTP continues to evaluate the best methods to ensure that disadvantaged communities benefit from funding opportunities. Possible options to include in future funding opportunities that may increase awards to disadvantaged communities include:

- Evaluating the types and locations of infrastructure targeted by ARFVTP to increase the expected participation of disadvantaged communities.
- Restricting participation to projects located within disadvantaged communities.
- Reserving funding for projects located within disadvantaged communities and tailoring the projects to those that could best serve those communities.

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<sup>9</sup> [http://www.energy.ca.gov/business\\_meetings/2015\\_packets/2015-04-08/Item\\_03\\_Diversity\\_Outreach\\_Resolution.pdf](http://www.energy.ca.gov/business_meetings/2015_packets/2015-04-08/Item_03_Diversity_Outreach_Resolution.pdf).

<sup>10</sup> PON-13-606, PON-13-607, PON-13-609, PON-14-608, GFO-15-601, and GFO-15-603.

<sup>11</sup> As determined by the Office of Environmental Health Hazard Assessment California Communities Environmental Health Screening (CalEnviroScreen) tool.



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- Reducing match share requirements or increasing maximum ARFVTP award amounts for projects in disadvantaged communities. This would further encourage local companies to apply and/or encourage larger companies to locate their projects there.

### *Investor-Owned Utility Proposals to the California Public Utilities Commission*

The California Public Utilities Commission (CPUC) has been considering electric vehicle charging infrastructure pilot projects proposed by the three major investor-owned utilities (IOUs) as a result of a decision that set aside the prohibition that prevented them from owning plug-in electric vehicle charging infrastructure. Decision 14-12-079 determined that a case-specific approach would be used to evaluate whether the IOU could own EV charging infrastructure. Furthermore, the California Legislature enacted Senate Bill 350,<sup>12</sup> which added new sections to the Public Utilities Code regarding transportation electrification. The legislation directed the CPUC to consult with the ARB and the Energy Commission to direct the “electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification.” As a result, three IOUs (Southern California Edison, San Diego Gas & Electric Company, and Pacific Gas and Electric Company) submitted applications for PEV charging infrastructure in 2015.

The CPUC approved the pilot programs for San Diego Gas & Electric Company for \$45.0 million and Southern California Edison for \$22.0 million. They are evaluating Pacific Gas and Electric Company’s proposal for \$160.0 million. **Table 4** summarizes these programs. These IOU programs are just beginning, and no infrastructure has been installed under these programs.

**Table 4: Investor-Owned Utility Light-Duty PEV Charging Infrastructure Programs**

	<b>San Diego Gas &amp; Electric’s Pilot (2016-2021)</b>	<b>Southern California Edison’s Pilot (2016-2021)</b>	<b>Pacific Gas and Electric’s Proposal (2017-2022)</b>
<b>Program Name</b>	“Power Your Drive Program”	“Charge-Ready Program”	“EV Infrastructure Program”
<b>Number and Type of Chargers</b>	3,500 L1/L2 chargers.	1,500 L1/L2 chargers.	7,500 L2 chargers.
<b>Number and Type of Eligible Installation Sites</b>	350 MUDs and workplaces.	150 MUDs, workplaces, and public sites.	Nearly 750 MUDs and workplaces, and 100 DCFC public sites.
<b>Disadvantaged Communities</b>	10 percent of expenditures, \$0 participation payment	10 percent of expenditures, 100 percent EVSE rebates	15 percent of expenditures

Source: California Public Utilities Commission

<sup>12</sup> SB 350, De León, Chapter 547, Statutes of 2015



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### *Volkswagen ZEV Infrastructure and Access Fund*

German automaker Volkswagen AG has agreed to provide \$1.18 billion to California to remedy the environmental harm it caused by using devices that altered emissions tests in diesel cars. California will receive \$380.0 million over a three-year period to replace older and dirtier heavy-duty diesel vehicles and equipment with zero- or near-zero technologies in disadvantaged communities. Volkswagen will also invest \$800.0 million over a 10-year period in ZEV infrastructure and projects that will increase access to ZEVs for all consumers in California.<sup>13</sup>

### *Summary*

Californians are driving an increasing number of ZEVs. The ARFVTP has and continues to strategically locate and fund electric vehicle charging and hydrogen refueling stations that enhance California's ZEV refueling network to support increased ZEV adoption statewide.

California is making significant progress in both ZEV infrastructure construction and vehicle deployment. The Energy Commission and other California state agencies continue to implement the actions set forth in the *ZEV Action Plan* to ensure that 1.5 million ZEVs are on California roadways by 2025.

The combined efforts of California state agencies and the wide variety of partners at the local level bolster California's success and ability to transition the transportation sector to zero-emission. This transition will help California meet its greenhouse gas reduction goals, improve air quality, and reduce petroleum dependence.

### **Additional References:**

For information on the data from the Clean Vehicle Rebate Project:

<http://energycenter.org/clean-vehicle-rebate-project/cvrp-project-statistics>

The Governor's California *ZEV Action Plan*:

[http://gov.ca.gov/s\\_zevsummitagenda.php](http://gov.ca.gov/s_zevsummitagenda.php)

[https://www.gov.ca.gov/docs/DRAFT\\_2015\\_ZEV\\_Action\\_Plan\\_042415.pdf](https://www.gov.ca.gov/docs/DRAFT_2015_ZEV_Action_Plan_042415.pdf)

[http://opr.ca.gov/docs/Governor's\\_Office\\_ZEV\\_Action\\_Plan\\_\(02-13\).pdf](http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf)

[https://www.gov.ca.gov/docs/2016\\_ZEV\\_Action\\_Plan.pdf](https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf)

Energy Commission's ZEV Action Plan Implementation Activities, including the Statewide PEV Infrastructure Assessment:

<http://www.energy.ca.gov/2013-ALT-01/documents/index.html>

2016-2017 ARFVTP Investment Plan Update:

<http://www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-CMF.pdf>

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<sup>13</sup> Air Resources Board, News Release #16-33, June 28, 2016, <http://www.arb.ca.gov/newsrel/newsrelease.php?id=834>.



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Energy Commission's Grant Funding Opportunity for DCFCs on California's North-South Corridors:

<http://www.energy.ca.gov/contracts/GFO-15-601/>

2016 awards under ARFVTP for DC Fast Chargers Along California's North-South Corridors:

[http://www.energy.ca.gov/contracts/GFO-15-601\\_NOPA.pdf](http://www.energy.ca.gov/contracts/GFO-15-601_NOPA.pdf)

Energy Commission's Grant Funding Opportunity for DCFCs for California's Interregional Corridors:

<http://www.energy.ca.gov/contracts/GFO-15-603/>

Energy Commission's Grant Funding Opportunity for Light Duty Vehicle Hydrogen Refueling Infrastructure:

<http://www.energy.ca.gov/contracts/GFO-15-605/>

Energy Commission's *2015-2016 Joint Agency Staff Report on Assembly Bill 8: Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California:*

<http://www.energy.ca.gov/2015publications/CEC-600-2015-016/CEC-600-2015-016.pdf>

California Air Resources Board's *2015 Annual Evaluation of Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development:*

[http://www.arb.ca.gov/msprog/zevprog/ab8/ab8\\_report\\_2015.pdf](http://www.arb.ca.gov/msprog/zevprog/ab8/ab8_report_2015.pdf)

California Air Resources Board's *2016 Annual Evaluation of Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development:*

[http://www.arb.ca.gov/msprog/zevprog/ab8/ab8\\_report\\_2016.pdf](http://www.arb.ca.gov/msprog/zevprog/ab8/ab8_report_2016.pdf)

Department of Energy Alternate Fuel Data Center: <http://www.afdc.energy.gov>

*2015 Integrated Energy Policy Report*, [http://www.energy.ca.gov/2015\\_energy policy/](http://www.energy.ca.gov/2015_energy policy/)

For information on clean and efficient vehicles available in California, see the California Air Resources Board buying guide for clean and efficient vehicles:

<http://www.driveclean.ca.gov/>

California Pollution Control Financing Authority's Electric Vehicle Charging Station Financing Program:

<http://www.treasurer.ca.gov/cpcfca/calcap/evcs/>

*TAKING CHARGE: Establishing California Leadership in the Plug-In Electric Vehicle Marketplace* can be found here:

[http://www.pevcollaborative.org/sites/all/themes/pev/files/docs/Taking\\_Charge\\_final2.pdf](http://www.pevcollaborative.org/sites/all/themes/pev/files/docs/Taking_Charge_final2.pdf)

For Information on the Statewide Plug-in Electric Vehicle Collaborative



## California Energy Commission – Tracking Progress

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<http://www.pevcollaborative.org/>

Pacific Coast Collaborative and West Coast Electric Highway

<http://www.pacificcoastcollaborative.org/Pages/Welcome.aspx>

<http://www.westcoastgreenhighway.com/>

For information on The EV Project:

<http://energy.gov/eere/vehicles/avta-ev-project>

Link to “Why Buy and Electric Car?” CEC video

<https://www.youtube.com/watch?v=eXYfuYqDarw>

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**Next Update:** May 2017 and annually