California's Hydrogen Station Funding Program

In 2006 and 2007, California passed legislation that required the California Energy Commission and Air Resources Board to develop plans to reduce emissions from vehicles. As a direct result, the agencies developed the State Alternative Fuel Plan of 2007 that made recommendations to:

- Reduce GHG emissions to 1990 levels by 2020
- Reduce petroleum fuel use to 15% below 2003 levels by 2020
- Increase the use and production of alternative fuels in the state by 26% by 2022
- Increase in-state biofuels production 40% by 2020

One of the recommendations in the plan was to "support a Clean Alternative and Renewable Fuel, Vehicle and Advanced Technology Initiative, which advances the state's leadership on clean transportation technology. Ongoing funding in the range of $100 million to $200 million per year should be directed at the transportation sector to advance innovative and pioneering technologies."

Assembly Bill 118 created a revenue stream to fund state investment by placing a small fee on vehicle and boat registrations, on vehicle smog checks, and on new tire sales. Of this funding, the Energy Commission's Alternative and Renewable Fuels and Vehicles Technology Program (ARFVFP) provides up to $100 million annually for alternative fuel production (biomethane, and gasoline and diesel substitutes) alternative fuel infrastructure (biofuels, natural gas, hydrogen, and electricity), alternative fuel vehicle deployment, and related needs that include workforce training, sustainability studies, and regional planning. Funding amounts for each category are set in an annual investment plan. (See the draft 2017-2018 investment plan.)

In 2009, when the ARFVTP was making the first grants, biofuel and plug-in vehicles were already commercial products.. Fuel cell electric vehicles were in the demonstration phase and automakers were considering the timing of market entry. The State was committed to supporting the emerging FCEV market. ARFVTP granted $15.7 million for hydrogen stations in the program's first year, but didn't not award hydrogen grants for the next two funding cycles.

Policies that Support the Alternative Fuel Plan

- Assembly Bill 32: Reduce GHG emissions to 1990 levels by 2020
- Senate Bill 32 and Executive Order B-30-15: Reduce GHG emissions to 40% below 1990 levels by 2030
- Executive Order S-3-05: Reduce GHG emissions to 80% below 1990 levels by 2050
- Low-Carbon Fuel Standard: Reduce carbon intensity of fuels by 10% by 2020
- State Alternative Fuels Plan: Reduce petroleum fuel use to 15 %below 2003 levels by 2020
- Energy Policy Act of 2005; Energy Independence and Security Act of 2007: 36 billion gallons of renewable fuel by 2022 nationally
- Clean Air Act; California State Implementation Plans: 80% reduction in NOX by 2031
- California Air Resources Board's Zero-Emission Vehicle Regulations; California Executive Order B-16-2012: Infrastructure to accommodate 1 million electric vehicles by 2020 and 1.5 million electric vehicles by 2025 in California*
- Executive Order B-32-15 on Sustainable Freight: Improve freight efficiency and transition freight movement to zero-emission technologies

Source: California Energy Commission.
**Senate Bill 1275 subsequently established a target of 1 million zero-emission and near-zero-emission vehicles in California by 2023, as well as increased access to such vehicles for disadvantaged, low-income, and moderate-income communities and consumers.*

Automakers needed a commitment to infrastructure in order to start planning vehicle production. To provide that certainty without depending on station regulations, a cross-section of industries and NGOs looked for a source of steady funding. That opportunity came with Assembly Bill 8.

In 2013, Governor Brown signed AB 8 that extended ARFVTP until 2024 and designated up to $20 million a year for hydrogen stations through 2023 with the aim of having 100 hydrogen stations statewide. It also required an annual evaluation to ensure that infrastructure and vehicles keep pace, and provided flexibility to adjust the funding in any given year as recommended in the evaluation. Assured that hydrogen stations would be in place, automakers made announcements about vehicle commercialization plans and, in some instances, formed new R&D partnerships to accelerate product development.

Between 2010 and 2015, the Energy Commission granted more than $64 million to support the building or upgrading of 47 hydrogen fueling stations. Before each of the Program Opportunity Notices (PONs), public workshops helped CEC refine requirements to ensure awards would result in stations that accelerate the FCEV market.

The 2013 PON was the first to cover "retail-like" characteristics and subsequent PONs required "retail" stations and specified that stations use a POS terminal with commonly used payment systems, adhere to SAE standards for dispensing fuel, serve light-duty vehicles, provide capacity to meet projected vehicle demand, and remain open for five years.

CEC also provided awards for upgrading existing "demonstration" stations, some of which were funded by the initial 2009 grants and others by the Calfornia Air Resources Board, South Coast AQMD and/or the U.S. Department of Energy. Upgrades can include new equipment or programming to adhere to SAE standards, addition of a POS to accept payments, and/or addition of equipment to increase capacity. Most stations also apply for operating and maintenance cost grants, which ensure that the station operators do not lose money in the early years. Funds for upgrades and O&M are included with the $20 million designated for hydrogen.

The most recent evaluation report indicates that as many as 43,600 FCEVs will be on the road in 2022. The report also predicts that fuel needs will outstrip station availability by 2021, and that 100 stations will provide sufficient coverage for 20,000 vehicles. CaFCP and its members are investigating other funding mechanism to bridge the early commercial market and a self-sustaining market.