

## Fuel-Cell-Electric Vehicle Infrastructure

### What is this measure?

Provide funding to build and operate hydrogen stations for fuel cell electric vehicles (FCEVs). It is expected that funding for 85 percent of the station capital costs plus support for the initial three years of operational costs would be necessary. The grant funding costs for the most recent stations proposed in the state have ranged from \$1.7 million to \$2.3 million towards capital costs, plus \$100,000 per year for three years to support operations and maintenance.<sup>1</sup> The Tri-Counties Hydrogen Readiness Plan<sup>2</sup> can be used to help evaluate the suitability of proposed locations.

### Why would someone do this as mitigation?

Infrastructure for FCEVs indirectly reduces GHG emissions by supporting the local adoption and use of the vehicles. The beneficial impacts are equivalent to the difference in well-to-wheels emissions from operating an FCEV, vs. the well-to-wheels emissions from operating a conventional gasoline vehicle. By considering well-to-wheels emissions, the emissions associated with producing, refining, and distributing conventional gasoline and producing and distributing hydrogen are included, in addition to the tailpipe emissions from a conventional gasoline vehicle. Fuel cell electric vehicles do not have tailpipe emissions.

In addition to greenhouse gas benefits, increased local adoption of zero-emission vehicles reduces local and regional emissions of toxic and criteria pollutants. These reductions provide direct health benefits within the region.

Passenger FCEVs are currently available for sale and lease in the state. However, it is still a developing market and the total number of cars on the road today is relatively small. The Energy Commission supports the development of infrastructure for fuel cell electric vehicles and issues annual reports on the deployment of vehicles and infrastructure<sup>3</sup>. These reports document the ongoing need for additional stations throughout the state, and also project potential station capacity shortfalls beginning around 2020. The most recent report shows that Santa Barbara County is a low priority area for more state-funded stations in the near future. Developing additional station capacity can support continued expansion of the fleet of fuel cell electric vehicles in the county. So, this measure would further state goals of reducing petroleum use in vehicles by 50%.

Currently, no local dealers sell or service FCEVs. Local purchasers rely on dealers in the Los Angeles region for sales and support. This is an obstacle for some people who would otherwise consider purchasing an FCEV. Additional local infrastructure could entice local dealers to begin selling and servicing vehicles, which would further support local adoption.

### How would you implement this measure?

#### *Implementing Agency*

The measure could be modeled on the existing program administered by the California Energy Commission (CEC), which is funding an initial network of 100 stations throughout the state. The Air District could be the implementing agency, and would solicit competitive bids from station developers.

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<sup>1</sup> CA Grant Hydrogen Refueling Infrastructure: [www.energy.ca.gov/contracts/transportation.html#GFO-15-605](http://www.energy.ca.gov/contracts/transportation.html#GFO-15-605)

<sup>2</sup> [www.ourair.org/hydrogen-fuel-cells/](http://www.ourair.org/hydrogen-fuel-cells/)

<sup>3</sup> [www.arb.ca.gov/msprog/zevprog/hydrogen/hydrogen.htm](http://www.arb.ca.gov/msprog/zevprog/hydrogen/hydrogen.htm)

There would have to be a scoring system with defined criteria to rank the bids and determine whether any qualify for funding.

#### *Enforceability*

Agreements to fund stations would require a contract between the implementing agency and the station developer. To ensure infrastructure is constructed properly, the contract between the implementing agency and the station developer must specify the minimum design and performance standards to be met. It must also specify the timeline for completing construction and define what constitutes an operational station.

To ensure the infrastructure is maintained and operated properly, the contract must ensure that the station operator has plans in place for appropriate maintenance and monitoring. Furthermore, it must require regular reporting of station throughput.

#### *Interaction with Existing Programs*

This measure would supplement the CEC's existing funding program<sup>4</sup> by funding additional stations. Station developers would not be able to obtain funding from both programs for the same station. Because the region is not considered a "core market," station developers may not be successful in obtaining CEC funding for additional stations in the region during the next few years. So, a local measure would likely lead to faster roll-out of local infrastructure than would otherwise occur.

#### *How would you quantify the benefits?*

To quantify the benefits of this measure, the total amount of hydrogen dispensed should be tracked. The GHG benefits are assumed to be equal to the difference between the GHG impacts related to using hydrogen and an equivalent amount of gasoline, on a well to wheels basis. The CEC's program provides a protocol for quantifying the benefits, which can account for how much hydrogen is produced renewably.<sup>5</sup> The method relies on the carbon intensities specified in the Low Carbon Fuel Standard<sup>6</sup> for gasoline and for each pathway for producing hydrogen.

#### *Questions for Discussion*

- Could this measure identify station developers willing to participate?
- Could this support local dealers beginning to offer and service vehicles locally?
- Should this target only stations that use renewable hydrogen?

#### *Input Received*

##### *Comments Made at Workshops*

##### *Opportunities:*

- Provide incentives for land use projects if they install FCEV infrastructure.
- Require FCEV infrastructure be installed as part of CEQA mitigation.
- Create a mitigation bank from developer fees to use for infrastructure.
- Build a large-scale hydrogen fueling facility for heavy duty vehicles.

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<sup>4</sup> [www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-CMF.pdf](http://www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-CMF.pdf)

<sup>5</sup> [www.energy.ca.gov/contracts/GFO-15-605/Attachment-13\\_GHG\\_Emission\\_Calculation\\_Attachment.docx](http://www.energy.ca.gov/contracts/GFO-15-605/Attachment-13_GHG_Emission_Calculation_Attachment.docx)

<sup>6</sup> [www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf](http://www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf)