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October 29, 2013

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: CaFCP comments on draft 2013 IEPR, docket #13-IEP-1A

Dear Commissioner McAlister and CEC staff:

Thank you for the opportunity to review and provide comments on the draft 2013 Integrated Energy Policy Report (IEPR). First, let me commend you and the CEC staff on an excellent, comprehensive report. It was a pleasure to read. I appreciate gaining a broad overview of our energy issues, including the tremendous progress we are making in California as well as the challenges that lay ahead.

To augment the input I provided regarding hydrogen fuel cell electric vehicles at the July 31, 2013 workshop, I offer these comments on the sections of the IEPR that relate to hydrogen:

1. Number of hydrogen stations in California

The Executive Summary, p20, states that six hydrogen stations have been funded under the Alternative and Renewable Fuels and Vehicle Technologies Program (ARFVTP). Table 15 on p180 states ARFVTP has funded 24 hydrogen stations. CaFCP believes 24 is the correct number.

2. FCEV's are electric drive vehicles

Chapter 8, Transportation Energy, uses the term "electric drive" or "electric vehicle" to refer plug-in vehicles. I suggest CEC clearly state that hydrogen fuel cell electric vehicles (FCEVs) are electric drive vehicles and, that for purposes of categorizing funding allocations, CEC separate plug-in electric drive investments from hydrogen fuel cell electric drive investments. For example, on p174 as well as Table 13 on p175 re-name the "electric drive" category to "plug-in vehicles." On p177 paragraph starting "*The Energy Commission's Role*" should state investments in "light-duty *plug-in* vehicles" (emphasis added). I encourage CEC to revisit the "electric vehicle" descriptions in other parts of Chapter 8, including p193 "Electric Transportation."

3. Hydrogen stations must be in place to enable market launch of FCEVs

Chapter 8, Transportation Energy, would benefit from a stronger statement that a minimum network of 68 hydrogen stations is needed to provide coverage and enable market launch of FCEVs (reference [CaFCP roadmap](#)). This could be included in one of several places, e.g. p178 in the discussion of the ZEV regulation or the Governor's Executive Order and Action Plan, p179 in the first bullet describing how CEC helps establish the foundation for ZEVs, or p180 in the discussion of market transformation challenges.

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4. Cost of hydrogen will be reduced over time

Figures 23 and 24 use projections from the U.S. Department of Energy's Energy Information Administration (EIA), which projects the cost of hydrogen based on its use as an industrial gas (e.g. refining gasoline, manufacturing goods). Hydrogen as a vehicle fuel will face different market forces in the future, and significant research and development is underway to meet cost reduction goals set forth by the U.S. DOE (see Fuel Cell Technologies Office Multi-Year Research, Development and Demonstration Plan, [Hydrogen Production chapter](#)). For example, the projected cost of hydrogen produced from distributed steam methane reforming in 2011 is \$4.50/kg but by 2015 is projected to drop to \$3.80/kg¹. Figures 23, 24 and 25 should note that different hydrogen production pathways more applicable to hydrogen as a transportation fuel are expected to reduce hydrogen costs as the market develops.

5. Hydrogen and electricity in California have comparable carbon intensities

Figure 27 provides an excellent visual to demonstrate that hydrogen and electricity in California are comparable in carbon intensity. I appreciate this analysis and clear communication of the result.

6. CaFCP roadmap establishes the need for coverage to enable market launch of FCEVs. I suggest the following edits to the text on p194:

Initial sales of hydrogen fuel cell vehicle are expected to occur in early market cluster areas in the San Francisco Bay Area and Southern California – establishing these as priority areas for fueling infrastructure. The California Fuel Cell Partnership Roadmap, the preeminent study on hydrogen fueling for California, shows that an initial set a network of about 68 stations are is needed by 2015-2017 to support the initial commercial launch of FCEVs and provide customers confidence they can fuel their FCEVs as conveniently as they fuel with gasoline today. provide fueling infrastructure for 20,000-366 hydrogen fuel cell vehicles expected from automakers by this timeframe. To help ensure a successful transformation of the transportation sector to ZEVs, the ARFVTP is providing incentives to help fund this initial set of hydrogen fueling stations.

7. Challenge of scaling up hydrogen station infrastructure

In the discussion on p200 CEC recognizes the challenge of building confidence among all market participants (automakers, station developers, incentive providers). This section would benefit from a deeper exploration of innovative approaches to addressing these challenges. See the recent "Hydrogen Network Investment Plan" published by Energy Independence Now (<http://www.einow.org/resources/reports.html>).

¹ Based on H2A model which assumes 1500 kg/day stations and station equipment produced in volume (500 per year).

Thank you for considering these comments. Please contact me if you have any questions or need further information.

Sincerely,

A handwritten signature in blue ink, appearing to read "C Dunwoody", is positioned above the typed name.

Catherine Dunwoody
Executive Director
California Fuel Cell Partnership