

September 17, 2012

California Energy Commission  
Dockets Office, MS-4  
Docket No: 12-HYD-1 Hydrogen and Transportation  
1516 Ninth Street  
Sacramento, CA 95814-5512

Subject: Submittal by CaFCP OEM Working Group – Input for docket number **12-HYD-1, Hydrogen and Transportation-DRAFT Solicitation Comment**

Dear Commissioner Peterman:

Thank you for the opportunity to provide feedback on the Energy Commission's Draft Program Opportunity Notice (PON) for Hydrogen Fuel Infrastructure. The upcoming PON and subsequent awards for operating hydrogen stations in key markets in California has been widely anticipated since the adoption of both the 2010-2011 and the 2011-2012 Investment Plans. These hydrogen stations will be critical towards meeting the goals laid out in the California Fuel Cell Partnership's (CaFCP) "*A California Road Map: The Commercialization of Hydrogen Fuel Cell Vehicles*"<sup>1</sup>.

The auto manufacturer members of the CaFCP, which include Chrysler, Daimler, General Motors, Honda, Hyundai, Nissan, and Toyota, strongly supported the development of CaFCP's letter, "*Input for Developing a New Solicitation for a Hydrogen Infrastructure Network*" (August 10, 2012) to the Energy Commission<sup>2</sup>. Furthermore, several automakers participated in each of the three workshops intended to bring forth a transparent dialogue on designing this Draft PON. In each of these forums, the issues facing the development of hydrogen infrastructure in California were closely evaluated and the responses were carefully crafted by industry leaders to ensure the successful use of public funding.

Upon our review of both the intent of the language and anticipated outcomes of the NOPA, the automakers believe the Draft PON does not adequately reflect the majority of comments made in each of the workshops nor the specifics identified in the CaFCP Letter. We respectfully ask the Energy Commission to revisit the specific criteria outlined in Appendix A of the letter in order to more accurately reflect the necessary targets for hydrogen fueling infrastructure in California. Specifically, the Energy Commission should address the following details:

1. Avoid vague language associated with the SAE TIR J2601 Fueling Protocol which is open to interpretation.
2. Identify fill performance targets in Station Performance evaluation, notably Type A for 70 MPa and Type B for 35 MPa.
3. Increase minimum station capacity metrics (kilogram (kg) per day and kg per hour) to ensure early commercialization targets and customer needs are met.
4. Clarify station location criteria and reconsider direct automaker involvement in the final determination of the station awards.
5. Bolster Station Performance scoring metrics, which are currently underrepresented.

<sup>1</sup> CaFCP, *A California Road Map: The Commercialization of Hydrogen Fuel Cell Vehicles*, <http://cafcg.org/roadmap> (June 2012)

<sup>2</sup> CaFCP, *Input for Developing a New Solicitation for a Hydrogen Infrastructure Network*, [www.energy.ca.gov/contracts/notices/2012-07-10\\_workshop/comments/2012-08-10\\_California\\_Fuel\\_Cell\\_Partnerships\\_Comments\\_TN-66581.pdf](http://www.energy.ca.gov/contracts/notices/2012-07-10_workshop/comments/2012-08-10_California_Fuel_Cell_Partnerships_Comments_TN-66581.pdf) (Aug 10, 2012)

Without adjustments to the solicitation, the resulting stations will be undersized and will not be capable of supporting a necessary portion of the vehicle population in the 2015-2017 timeframe. If this were to occur, fuel cell vehicle commercialization may be delayed until customers believe the network is sufficiently mature. Therefore, the automakers believe the Energy Commission should reevaluate the following key criteria:

1. **Avoid vague language associated with the SAE J2601 Fueling Protocol which is open to interpretation; and**
2. **Identify fill performance targets in Station Performance evaluation, notably Type A for 70 MPa and Type B for 35 MPa.**

Draft PON: According to the Section III's *Minimum Technical Requirements*, the Energy Commission has stated the "*Station(s) / dispenser(s) shall meet the intent of SAE TIR J2601, or equivalent.*"

CaFCP: Appendix A, Section A and Section B, provide the following Fuel Protocol and Fill Performance targets<sup>3</sup>:

***Minimum Requirements (Screening Criteria)***

- ***Stations must meet the limits, tolerances, and operating conditions of the vehicle fuel systems listed in SAE J2601 Technical Information Report (TIR).***

***Minimum Requirements (Screening Criteria)***

- ***All stations must dispense hydrogen at 70 MPa and 35 MPa and must be designed to provide the appropriate SAE TIR J2601 fill protocols (Type A for 70 MPa and Type B for 35 MPa fills).***

**Discussion – Fuel Protocol and Fill Performance**

The automakers believe "...meet the intent of SAE TIR J2601..." may be open to interpretation and deviate from the necessary goal of rigorously meeting SAE J2601 protocol and performance standards.

Furthermore, the Draft PON does not identify the type of fill performance required. As noted above, it is critical for customer acceptance that station providers meet Type A fills for 70 MPa and Type B fills for 35 MPa, as recommended by SAE International.<sup>4</sup> Without this requirement, a fill may take significantly longer than five minutes and, therefore, impact customer acceptance of hydrogen fuel as a comparable alternative to gasoline. The Energy Commission should clarify or remove "intent" in the current language and identify the minimum requirements for Fill Performance per CaFCP letter.

It is extremely important that the 12 priority areas in Table 2 meet the needs and expectations of early FCEV customers. Given the current minimum capacity and performance criteria identified in the Draft PON, the Energy Commission risks deploying under-sized, under-performing stations during early commercialization at a time when customers must experience the full value and benefit of these technologies.

3. **Increase minimum station capacity metrics (kilogram (kg) per day and kg per hour) to ensure early commercialization targets are met.**

Draft PON: According to the Section III's *Minimum Technical Requirements*, the Energy Commission has chosen 50 kilogram per day nominal station capacity. Furthermore, the Energy Commission has chosen 20 kilogram per hour peak fueling capacity.

<sup>3</sup> Ibid. A-2

<sup>4</sup> Ibid. attached cc letter from SAE International

CaFCP: Appendix A, Section C provides the following station capacity targets<sup>5</sup>:

***Minimum Requirements (Screening Criteria)***

- *Per the CaFCP Road Map document, all of the stations combined, funded by CEC through the 2012 PON should average a daily capacity of 210 kg per day*
- *Each individual station must have a **minimum daily throughput capacity of 140 kg per day.***
- *Stations must be capable of delivering **five H70 fills per peak hour, at the SAE-defined 7 kilograms (kg) of hydrogen per fill.***
- *Station proposals should outline a clear pathway to manage a potential peak load of 10 fills per hour (H70) at the SAE-defined 7 kilograms (kg) of hydrogen per fill.*
- *Stations must be able to manage two periods of peak demand during each 24-hour period (rush hour).*

**Discussion – Station Capacity**

There is a clear and dramatic difference between the Draft PON and industry input for the minimum criteria established for “per day” and “per hour” capacity for a hydrogen station. CaFCP members identified these minimum requirements to ensure stations available during the early commercialization phase of the *Roadmap* were capable of meeting customer expectations. A 50 kg per day station would not be capable of delivering more than 7 fills in a day (at the SAE-defined 7 kg per fill) nor could it deliver more than 2 fills per hour. Provided the low-scoring criteria for station performance in the current Draft PON, it is not only conceivable, but likely, that stations awarded in the 12 priority areas in Table 2 in California would be grossly-undersized to meet the goals established in the *Roadmap*. The Energy Commission should update the Draft PON to include the minimum requirements established above to ensure adequate station capacity in these critical markets.

The 2012-2013 Investment Plan further supports the need for higher performing stations in high demand areas such as those targeted in this Draft PON;

“In addition to station coverage, station capacity in high-demand areas will be a critical part of hydrogen station deployment. To date, the Energy Commission has funded stations with nominal capacities ranging from 180 kilograms per day to 240 kilograms per day (though functional capacity may vary). As increasing numbers of FCVs are deployed into early adopter clusters, these clusters may require new stations with larger capacities and accelerated dispensing rates.”<sup>6</sup>

Previously CEC included the requirement that all stations meet SAE J2719 fuel quality standards, as this is a critical component of ensuring stations meet both applicable codes and standards and customer expectations. The automakers strongly suggest CEC reinstate this requirement.

**4. Clarify station location criteria and reconsider direct automaker involvement in the final determination of the station award.**

Draft PON: Station location criteria are established by Section XIII-7 Location According to STREET Maps and Section XIII-8 Location According to Intersection.

OEM Working Group: The CaFCP OEM Working Group, in conjunction with UC Irvine, provided Location According to STREET Maps.<sup>7</sup>

<sup>5</sup> Ibid. Page A-3

<sup>6</sup> C. Smith & J. McKinney. 2012-2013 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program Commission Report. California Energy Commission, Fuels & Transportation Division. Publication Number: CEC-600-2012-001-CMF. Page 31

<sup>7</sup> CaFCP OEM Working Group. Comments from CaFCP OEM Working Group. [http://www.energy.ca.gov/contracts/notices/2012-07-10\\_workshop/comments/2012-08-10\\_Comments\\_from\\_CaFCP\\_OEM\\_Working\\_Group\\_Members\\_TN-66587.pdf](http://www.energy.ca.gov/contracts/notices/2012-07-10_workshop/comments/2012-08-10_Comments_from_CaFCP_OEM_Working_Group_Members_TN-66587.pdf) (Aug 10, 2012)

### Discussion – Station Location

The automakers believe the use of two different scoring criteria (a) may lead to confusion in determining eligibility, (b) may place stations in undesired locations, and (c) highlights the need for automaker input during the review process. The use of an alternate location criterion, described in the Draft PON “*Location According to Intersection*”, is not necessary and should be removed, as it becomes inconsistent with process performed with the UC Irvine STREET model.

However, if this criterion is included, then it is recommend to publish an alternate set of spatial polygons to define the various drive time. As currently proposed, the bidder is required to calculate a “drive time” in order to estimate their potential scoring. A common tool to make this calculation has not been identified or made available publicly in the Draft PON. Therefore, this criterion is not transparent to bidders and key stakeholders. The *Location According to Intersection* criteria should be defined made public.

In addition, providing multiple “polygons and gradients” to assess between the *Location According to STREET Maps* and *Location According to Intersection* could lead to further confusion and questions of scoring for a specific location. This may cause improper assessments or misinterpretation and result in further delays when issuing the NOPA. It is recommended that the scoring of the “*Location According to Intersection*” shall always be made less than the scoring based on the *Location According to STREET Maps*.

The process to determine specifics sites in the *Location According to STREET Maps* was deliberate and precise. In some cases, a location outside the polygon was deemed unsuitable for early commercialization for various considerations, including OEM market assessments. Introducing the *Location According to Intersection* may mean a station could be awarded in an undesired location, thereby reducing, or possibly eliminating, the stations ability to be successful. In the same spirit, it is conceivable the highest scoring station in an area identified in Table 2 (pg 17) would be outside the STREET boundary and immediately adjacent an existing hydrogen fueling station.

As shown above and repeated throughout each of the workshops by automaker and non-automaker stakeholders, the importance of automaker feedback in the PON review process is critical<sup>8, 9, 10</sup>. Involving automakers through a “blind-to-vendor” and “blind-to-technology” assessment is viable and preferred for the successful identification of final locations. It is during these review discussions where automakers can support decision making by balancing multiple station location criteria and inputs. Fully depending on modeling through maps and/or drive times cannot adequately represent automaker experience and knowledge of these regional markets<sup>11</sup>.

### **5. Bolster Station Performance scoring metrics, which are currently underrepresented.**

Draft PON: Scoring for station location criteria include *Location According to STREET Maps* (80 points) and *Location According to Intersection* (40 points) for a sub-total of 120 points. Scoring for station performance criteria include *Proposed Hydrogen Fueling Station Performance* (20 points). Total points are 430 points.

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<sup>8</sup> Dr. M. Miyasato, SCAQMD. June 22, 2012 hydrogen workshop [www.energy.ca.gov/contracts/notices/2012-06-22\\_workshop/2012-06-22\\_transcript.pdf](http://www.energy.ca.gov/contracts/notices/2012-06-22_workshop/2012-06-22_transcript.pdf) (pages 36-46) and *Selecting Locations for Hydrogen Infrastructure* presentation. [www.energy.ca.gov/contracts/notices/2012-06-22\\_workshop/presentations/South\\_Coast\\_Air\\_Quality\\_Management\\_District\\_Slide\\_Presentation\\_2012-06-22\\_TN-66128.pdf](http://www.energy.ca.gov/contracts/notices/2012-06-22_workshop/presentations/South_Coast_Air_Quality_Management_District_Slide_Presentation_2012-06-22_TN-66128.pdf) (page 6)

<sup>9</sup> D. Breen, BAAQMD. June 22, 2012 hydrogen workshop. [www.energy.ca.gov/contracts/notices/2012-06-22\\_workshop/2012-06-22\\_transcript.pdf](http://www.energy.ca.gov/contracts/notices/2012-06-22_workshop/2012-06-22_transcript.pdf) (pages 31-32)

<sup>10</sup> G. Achtelek, ARB. June 22, 2012 hydrogen workshop. [www.energy.ca.gov/contracts/notices/2012-06-22\\_workshop/2012-06-22\\_transcript.pdf](http://www.energy.ca.gov/contracts/notices/2012-06-22_workshop/2012-06-22_transcript.pdf)

<sup>11</sup> Dr. M. Nicholas, UC Davis. June 22, 2012 hydrogen workshop. [www.energy.ca.gov/contracts/notices/2012-06-22\\_workshop/2012-06-22\\_transcript.pdf](http://www.energy.ca.gov/contracts/notices/2012-06-22_workshop/2012-06-22_transcript.pdf) (page 113)

CaFCP: No recommendation provided

### Discussion – Relative Scoring

The market viability of a hydrogen fueling stations will be determined by many factors, but none more important than station location and station performance. The Draft PON recognizes this by highlighting that the purpose of the recent Energy Commission workshops were to provide input on both station locations and performance.<sup>12</sup> As noted previously, an under-sized and/or under-performing station will have limited functionality by real-world customers.

Our review suggests that location scoring represents 27.9% ((40+80 points) / 430 points) and station performance scoring represents 4.7% (20 points / 430 points) of the total available points. Therefore, the Draft PON is proposing that station location is nearly six times the relative importance of station performance. Furthermore, the current scoring metrics place station performance comparable to market viability, economic benefits, and innovation. In many respects, station performance will be a driver for those criteria.

The automakers believe the scoring criteria should highlight both station location and station performance across each of the eleven scoring criteria. While the automakers do believe station location should be provided a slight edge over performance in the final calculations, the automakers recommend a more appropriate location to performance ratio of 3:2 or 5:4. For example, the Energy Commission might consider scoring station performance at 80 points and keeping all other scoring criteria the same. In this scenario, total points are 490 points and would result in station performance representing about 16.3% (80 points / 490 total points) and location representing 24.5% (120 points / 490 total points).<sup>13</sup> This will not only ensure station performance and locations are appropriately represented in the proposal, but will also better align the importance of these criteria with the other nine criteria, such as market viability, innovation, and sustainability.

On behalf of current and future fuel cell electric vehicle customers the automakers wish to thank the CEC for the considerable effort in developing what we all hope will be a successful hydrogen station solicitation. We appreciate the opportunity to provide feedback and look forward to working with the CEC and other stakeholders in the future. Please do not hesitate to contact us with any questions or clarifications.

*Provided by the CaFCP OEM Working Group Members:*

American Honda Motor Company, Inc.  
Chrysler Group LLC  
General Motors Company  
Hyundai-Kia America Technical Center, Inc.  
Mercedes-Benz Research & Development North America, Inc.  
Nissan Technical Center North America  
Toyota Motor Engineering & Manufacturing North America, Inc.

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<sup>12</sup> Energy Commission. *DRAFT Solicitation, Subject Area – Hydrogen Fuel Infrastructure*. [www.energy.ca.gov/altfuels/notices/draft\\_hydrogen\\_pon/2012-09-07\\_PON\\_Draft.pdf](http://www.energy.ca.gov/altfuels/notices/draft_hydrogen_pon/2012-09-07_PON_Draft.pdf) Sep 7, 2012. (Section I-C, page 6).

<sup>13</sup> Per Section 4 above, this would imply the 40 points allocated to *Location According to Intersection* (Section 8) was allocated to *Location According to STREET Maps* (Section 7). Another alternative might be to allocate the 40 points from *Location According to Intersection* (Section 8) to *Station Performance* (Section 9) without a change in the total number of points. In this scenario, Location would represent 18.6% (80 points / 430 total points) and Performance would represent 13.9% (60 points / 430 points).