

DOCKETED

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CEC Workshops on Hydrogen Refueling Infrastructure

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Additional submitted attachment is included below.

December 22, 2017

California Energy Commission
Docket Office, MS-4
1516 Ninth Street
Sacramento, CA 95814

Re: Docket No. 17-HYD-02, CEC Workshops on Hydrogen Refueling Infrastructure

Dear CEC Administrators,

Hydrogen Mobility in California transitioning from a demonstration phase to a market expansion phase. The significant efforts of the State and industry partners has established and validated the use of hydrogen fuel cell vehicles for light duty applications in California. Today, we face the challenges related to growing the market and we have the opportunity to move forward with a shared vision of market growth and acceleration.

The attached comments are in anticipation of the next California Energy Commission (CEC) grant funding opportunity (GFO) and provide feedback on specific proposals made at the CEC Hydrogen Refueling Infrastructure workshops held on November 30, December 4, and December 14. As an active participant in the California hydrogen mobility market, many of our comments have been captured in industry consensus letters submitted separately. The comments in this letter build on this industry consensus but are specific to Air Liquide.

Our comments are consistent with the industry view that priorities and efforts need to drive toward increased scale with a more aggressive schedules which enables the reduction in costs that are available. Air Liquide shares this view at a global level with several other companies whom together have formed the Hydrogen Council. This council outlined this industry viewpoint in November 2017 with the release of "Hydrogen, scaling up; A sustainable pathway for the global energy transition"¹

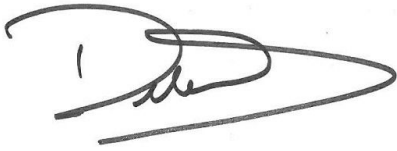
Our recommendations are to make the next phase of the program a multi-year award prioritizing network solutions rather than single station awards, prioritizing grant funds to awardees who leverage scale and schedule to provide the best \$/kg/day network capacities.

Given the importance and possible number of awards affected by the next solicitation, we request the CEC consider developing a draft solicitation and hosting industry feedback workshops for comments to that draft.

We appreciate the opportunity to be involved in the discussions with the CEC and the State of California on these policy priorities and encourage further discussion in early 2018.

Thank you for your consideration.

¹ "Hydrogen, scaling up; A sustainable pathway for the global energy transition" November 2017; available at: http://hydrogencouncil.com/wp-content/uploads/2017/11/Hydrogen-Scaling-up_Hydrogen-Council_2017.compressed.pdf



David Edwards
The Hydrogen Company, Air Liquide
david.edwards@airliquide.com, (612) 747-7636

Section I: Comments from the November 30, 2017 Staff Workshop on Hydrogen Refueling Infrastructure Alternative Funding Mechanisms

Relative to the presentation, “Staff Workshop on Hydrogen Refueling Infrastructure Alternative Funding Mechanisms” we provide the following comments:

Choice between Cap-Ex and O&M Funding (CEC presentation, slides p. 11-15)

It is likely that different applicants will value cap-ex and o&m grants differently as they have different implications related to taxation, project financing, and payment scheduling. If, by shifting a significant portion of funds from cap-ex to O&M grants enabled the state to either build more stations or to build them sooner, Air Liquide would support a flexible approach to enable this.

Under most circumstances and in equal amounts, cap-ex is generally favorable to o&m and, given the choice, we would expect most applicants to make this selection, given a choice. As such, the state could consider offering a premium to o&m funds to offset this effect and provide the state with the desired mix between the two.

In the event that an applicant is awarded o&m funds instead of cap-ex funds, sufficient time must be allowed for cost accruals. In some cases, three years may not be sufficient time for o&m cost accruals and we encourage this be extended to five years.

Regional awards (slides p. 16-25)

Air Liquide strongly supports the shift in priority to a funding process that values a regional capacity of coverage over the selection of individual stations. In this context, we would prefer the awards be based on an applicant’s ability to propose their own network solution. Consider the existing examples. Under the CEC ARFVT Program both First Element Fuel Inc. and Equilon Enterprises LLC (d/b/a Shell Oil Products US) have demonstrated that the award of networks as opposed to individual stations has a much higher likelihood of business viability. In the Northeast, Air Liquide and Toyota collaborated to form a network, not individual stations. In Germany, the H2 Mobility Joint Venture has a planned network which strikes the balance of awarded sites and equipment where each partner shares in the overall success of the network. Similarly Japan has established private-public partnerships to form networks. With approximately 40 stations remaining to award under Assembly Bill 8 funds, the CEC has the opportunity to establish several robust networks.

By offering a network of stations, awardees will better be able to leverage scale for cost reductions and will be able to offer stations in locations that suits both their ability to supply, operate, and maintain their stations, playing to their specific strengths and enable them to optimize their network for the anticipated vehicle market needs.

Because each applicant is likely to have unique regional strengths with regards to hydrogen production and supply, and will have regional strengths with respect to station build-out and operations, we suggest that proposals not be constrained by a predefined region.

A selection process based on networks rather than single stations will allow for applicants to leverage purchasing at scale and to optimize project expenses across the network. This should

enable improved project costs and schedules beyond what has been possible in proposals to date. Providing awardees with more certainty about outcomes in a network proposal is a key enabler for expanded investment in these stations and in the hydrogen supply infrastructure.

In order to award sufficiently large networks to enable these cost reductions, we anticipate that the award process will need to be multi-year. While we recognize the difficulty for the state to make formal commitment to a multi-year program, awards contingent upon future budget approvals could enable awardees sufficient visibility to projects to enable cost reductions. As an example, consider the following scenarios (in this case assuming 15 stations to be awarded per year for the next three years):

Option 1: Single year awards

- Year 1: 15 station network awarded to a single developer
- Year 2: 15 station network awarded to a second developer
- Year 3: 15 station network awarded to a third developer

Option 2: Multiple year awards

- Year 1: 3x15 station networks awarded, one for each developer but only 5 stations funded in Year 1
- Year 2: funding released to each developer for 5 additional stations
- Year 3: funding released to each developer for 5 additional stations

With these options, a station developer would have sufficient scale and commitment to funding to optimize the network for cost reductions.

In order to make awards in this fashion, the network capacity and locations would need to be evaluated (rather than single station evaluations). The CHIT tool scoring could be adapted as an initial screen for this evaluation although the overall valuation of the location and capacity of the network would need to include the added effects of redundancy and flexibility that a network solution can provide.

Similarly, the size and capacity of proposed networks would need to be defined and evaluated (in the range of 5-25 stations for a network), depending upon the state limits for single awards.

In our opinion, it is the combined effects of awarding a network of stations over a multi-year period which enables station developers to leverage scale in reducing costs and providing the best user experiences via robust hydrogen supply and station operation support.

Comments on Slide page 18: We agree with these comments in the context of “network” awards as opposed to “regional” awards. Depending upon the proposal, the regional strengths of a network is likely to be different from proposal to proposal and should be selected based on market strength rather than within a predefined region.

Comments on Slide page 19: The idea of win all-or-nothing regional award wouldn't apply in the event of "network" awards. It is likely that some networks will overlap and this should be taken into consideration in selection and award.

Comments on Slide page 22: In the event of multi-year awards, site control through purchase, lease, etc. could be difficult or could change over the course of a few years. As such, the state needs to enable a degree of flexibility in allowing awardees to make site and address changes within the award.

Comments on Slide page 23: In the context of a "network" rather than "regional" award, we would anticipate the award of multiple networks based on scoring.

Comments on Slide page 24: The multi-year award of networks of stations would enable applicants to optimize the use of state funds in proving the maximum network capacity by leveraging supply chain and project efficiencies. This process will also likely result in applicants being able to take on a larger cost share given the increased certainty, size and duration of awards.

Comments on Slide page 25: As discussed previously, the network approach to awards is feasible, it promotes cost reductions, and is an improvement over the existing status quo. It does, however, require a change to the evaluation criteria for networks and will require careful definitions of networks, network capacities, and coverage.

Loan loss reserve (slides p. 29-33)

In general, we believe that access to capital is not limiting the scale or pace of hydrogen infrastructure in California. While we encourage the state to consider innovative financing tools to enable growth acceleration, we do not believe it should be at the expense of the existing grants program. As such, while the LRR program has some intriguing financial aspects, we do not believe it would materially change our ability to invest.

Renewable fuel sales reimbursement (slides p. 34-50)

We are very encouraged that the state is considering innovative mechanisms to incentivize the market and sales of renewable hydrogen in addition to the station grants program. In particular, this program provides market drivers for applicants to provide renewable hydrogen and to reduce the risk associated with the investments needed to support this goal. It is our understanding, however that implementation of this program would reduce the state's ability to provide direct grants for the build out to 100 hydrogen stations. Today, we recommend continuing with the current grant program.

Regarding the specifics of the Renewable Fuel Reimbursement, we are strong believers that programs such as this are needed as we transition and grow a viable hydrogen market. While we have not done a comprehensive evaluation of this program, we have looked in detail at programs such as the LCFS and other fuel subsidies which can enable further market growth while limiting direct state funding. In our opinion, these types of market incentives are needed to accelerate private investment in the hydrogen mobility market and we commend the state for initiating these topics, even if it is not our highest priority for the next GFO.

Grant amounts (slides p. 51-53)

It is our opinion that the state will get the best return on its investment in hydrogen infrastructure by strengthening the \$/kg incentives in the evaluation criteria. By making awards to networks of stations over a multi-year period, station developers should have sufficient certainty to leverage the economies of scale within their proposals. As such, the state should expect that for similar award amounts, better station capacity and coverage should result.

Section II: Comments from the December 4, 2017 Staff Workshop on Hydrogen Refueling Station Technical Requirements

Industry comments

Most of Air Liquide's responses to the refueling station technical requirements have developed and submitted separately to this docket as part of an industry led document entitled 2017 HRS Proposed General Requirements. Some of the concepts in that document were presented at the session on December 4. Additional comments are below.

Station Nameplate Capacity

It is becoming evident that a station's "nameplate capacity" is an important metric for station performance evaluation, coverage and capacity rating, and in incentives such as the proposed LCFS process changes. We would recommend that the state, academic institutions (such as DOE national laboratories) and industry work together to improve industry consensus standards such as CSA HGV 4.9, which this nameplate capacity may be defined.. While this will require some time to revise such standards, we would expect to see added emphasis in the next GFO submittal requirements for proposals to include sufficient details on how station capacity is determined including modeling, lab, and field data.

Minimum and Target kg/fill

At the December 4 session, there was considerable discussion around how a minimum fill (4kg per fill) and a target fill (6kg per fill) could be valued or required in a proposal. It is our opinion that the minimum fill requirement should remain at 4kg per fill. Recognizing that future vehicles are likely to require 6kg per fill, we believe this can be captured under station scalability. In past GFO's, the station scalability requirements were not defined in detail. For future GFOs, providing specific requirements for scalability should be added to include number of independent fueling positions and ability to meet next generation (6kg per fill) vehicle requirements.

Mobile payment

Regarding the discussion on mobile payment methods. We support the payment method requirements submitted in the industry led response. We support flexibility to include additional payment methods, such as mobile device payment (Apple pay Google wallet, Samsung pay, etc.), at the discretion of the station provider.

Mobile fueler

Air Liquide is opposed to explicitly requiring a mobile fueler for station backup. We suggest each station developer should submit a plan to address station downtime, redundancy, and backup. Depending upon the developer and the network, a mobile fueler may not always be the best option.

Section III: Comments from the December 14, 2017
Staff Workshop on Evaluation Criteria for Hydrogen Refueling Station Applications, Critical
Milestones, and Data Collection

Overall evaluation criteria

Clearly, the overall evaluation criteria should reflect the priorities of the state in selecting the next generation of stations. In order to be consistent with our overall recommendations, we would seek to prioritize those criteria which enable a applicant to provide the best customer serving network of stations at the best expenditure of the state. We believe the following recommendations will better enable this outcome:

Use a screening process with pass- fail criteria to down select bidders initially. All bids should be expected to demonstrate a minimum in the areas of Applicant Qualifications, Safety Planning, Station Performance, Renewable Hydrogen Content, and Sustainability and Environmental Impact. Once these minimum standards are established, the final selection criteria can focus on those that can substantially differentiate the offer. In our opinion, these fall into three, equally balanced categories of criteria:

- Organization/team: Experience and capability above and beyond the minimum requirements. Suggest that station o&m plans and financial/business plans can be included into this category.
- Project-Scope: Including network Coverage, Capacity and Market, station performance, innovation, project budget, project readiness, and hydrogen sourcing all fall into this category.
- Project-Financial Proposal: These criteria would be based on the state's return on investment including the \$/kg/day for the network and any additional private investments that the supplier would leverage upon award.

Simplifying the evaluation criteria into these three categories could better enable the state to select the best partner and the best network while maximizing their return on funds granted.

Proposed Pass/Fail Screening Criteria

Safety planning (slides 21-23)

A continued high standard for safety performance is absolutely critical to the success of this program and should not be considered a scoring differentiator. All viable proposals must meet the safety requirements of the program to be considered. Once this safety threshold is met, we do not believe that it provides a sufficient differentiator for final evaluation and could be considered only as an initial pass/fail screening requirement.

Economic and social benefits, sustainability and environmental impact

These categories should have a minimum threshold in order to be considered a viable project. As such, they should be used as part of the proposal screening but not in final evaluation.

Renewable hydrogen from direct sources

We do not view this as a differentiating category and it should be removed from the evaluation process.

Organization/team (CEC presentation slides 11-14)

Selection of the right organization/team is critical for California to meet the needs of this program. As such, we believe that there is a minimum threshold criterion for applicants that should be used as part of the initial screening. Once a proposal meets this minimum threshold, differentiating criteria including team experience and the proposed financial/business plans should be considered. This section allows for the state to consider past performance on projects and experience in delivering similarly complex programs in the state.

Project Scope (CEC presentation slides 15-19)

Selection criteria need to be advanced to consider networks rather than single stations. While the CHIT tool may be effective in evaluating a single station, it would need to be adapted for networks. In our opinion, the CHIT tool should be used as a preliminary screening tool to evaluate station capacity and coverage but should not be used in the final evaluation. For final evaluations, we would value support of OEMS and market evaluations of locations over a predefined evaluation tool. As such, proposals with OEM supporting specific locations and capacities and proposals that demonstrate in depth market evaluations should score best.

Project Financial Proposal

All of these categories can be combined to consider the overall scope of the proposed network project.