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Large-Scale Centralized Hydrogen Solicitation Concept - Air Liquide

Additional submitted attachment is included below.

June 9, 2023

VIA E-filing portal: https://efiling.energy.ca.gov/
California Energy Commission
715 P Street
Sacramento, CA 95814

Response to: Large-Scale Centralized Hydrogen Solicitation Concept (TN250198)

Dear CEC Representatives,

Air Liquide appreciates the opportunity to provide these comments to the California Energy Commission (CEC) regarding the draft solicitation concept on Large-Scale Centralized Production for clean hydrogen (TN250198).

Air Liquide is an international industrial gases company that entered the US market more than 100 years ago. Today, Air Liquide in the US counts more than 20,000 employees in more than 1,300 locations, offering industrial gases and related services to customers in a range of industries, including oil and gas, chemicals, steel, construction, food and beverage, research and analysis, electronics and healthcare. Hydrogen has been, and continues to be a core growth area for our business in the US.

Attached is our detailed response to the solicitation, supporting the overall form and content of the upcoming funding opportunity. The transportation sector, in particular the heavy-duty goods movement market, will need reliable, diverse, and large scale sources of hydrogen fuel in order to continue to build the baseline infrastructure as it replaces diesel as the primary fuel for goods movement. By introducing additional funding mechanisms to build the supply side, we believe the transition to a low-carbon transportation sector could be accelerated. Such a transition would enable California to continue to lead the country in hydrogen fuel production and decarbonization in general.

We encourage further discussion on this topic and look forward to potential collaboration with the CEC. With our expertise in domestic and global hydrogen markets, our technology offerings in the areas of hydrogen production, liquefaction, and distribution, and our history of establishing strong partnerships with energy market stakeholders, we offer our assistance to the CEC in furthering this program. For more information and follow-up please contact me at alex.augustine@airliquide.com - (610)787-9913.

Sincerely,

Alex Augustine, Ph.D.
Hydrogen Energy and Mobility, NAM, Air Liquide
200 GBC Drive
Newark, DE 19702

1. Summary and General Impressions

A funding opportunity will be announced for the demonstration or scale-up of clean hydrogen production, distribution, and storage. A total of $30MM will be awarded with maximum individual award values of up to $15MM at a 50% cost share. A further caveat is that at least 50% of the CEC funding (25% of overall cost) must be spent in California. US DOE standard terms and conditions apply, however negotiation is allowed.

Funded projects should include production of at least 5.0 MTPD hydrogen from 100% renewable energy sources either on-site or via Renewable Energy Credits (RECs) or Power Purchase Agreements (PPAs). The project also must demonstrate storage and distribution of the hydrogen. There is indication that the electricity generation and hydrogen production additionality (co-located) and temporality (used at the same time as produced) are expected.

Funded projects should have a design, construction, and commissioning time-period up to 3 years and also include a minimum of 1 year 'demonstration' period.

2. Questions for Stakeholders (from Section VIII)

1) Are the Project Elements in Section 4 of this document realistic, reasonable, and feasible?

Response: Yes, the project elements are reasonable with one minor exception. The expectation of both co-location and temporality place a burden on the overall project economics. As solar power is only available for a fraction of the day, the electrolyzer portion of the facility will either have to 'go dark' or produce non-eligible hydrogen for the remainder. This has the potential to significantly increase the levelized cost of the hydrogen produced.

2) What would be the appropriate level of project funding that would leverage private investments associated with the work proposed in this draft concept and why?

Response: We believe the proposed award value is sufficient to spur clean hydrogen demonstration projects.

a) How would limiting the use of grant funds to Eligible Project Costs in Section 3 impact the project? What changes do you recommend, and why?

Response: Assuming that the primary project location is in California, the limits given in Section 3 should not be prohibitive. Tasks such as site preparation, on-site project management, and equipment installation will cumulatively make up a significant fraction of the overall project.

3) Is the requirement for spending in California (50% minimum, preference points for spending over 50% in California) feasible?

Response: The restrictions on the use of the CEC cost share are navigable. Section II.D indicates that 50% of CEC funding must be spent in California and Section III.B.1 indicates that at least 80% of CEC funds must be allocated to equipment (including installation). With respect to Air Liquide as an OEM, we manufacture PEM electrolyzer cells in Germany, cryogenic liquefaction equipment in France, and cryogenic trailer truck components in France and China. So long as the CEC funding can be used for installation at site, Air Liquide may seek to apply.

4) Provide any feedback on the two-phase solicitation approach. Is the 1-month abstract deadline and 3-month full application deadline realistic?

Response: Yes, this submission timeline is realistic and achievable for Air Liquide.

5) Is four years a feasible project timeline?

Response: With the exception of regulatory approval and permitting, the proposed project timeline is suitable for execution of projects at this scale and the demonstration period is reasonable. There is concern that both regulatory approval and execution within the proposed timeline is not feasible.

a) If grant awardees were CEQA-ready (see CEQA in Section 4) but need to obtain regulatory approvals, permitting, and zoning during the project, is a 4-year timeframe feasible for completion? If not, what is the recommended term for a funded project?

Response: A significant hurdle to project execution consists of regulatory approval and permitting, with up to 4 years considered as a potential timeline. While some overlap of project activities with permitting is possible, such as major equipment ordering and fabrication at OEM locations, others such as site installation are much more risky. Assistance/support with the CEQA review process by CEC will certainly help to de-risk and allow for more overlap of project activities, however consideration of an extended project timeline is also recommended.

6) Please provide relevant comments regarding other considerations not explicitly listed above.

6.1) The proposed project scale is at the low end of that which Air Liquide would be interested to participate in. Air Liquide's current market position for clean hydrogen is owning and operating several facilities in North America, all producing 10 or more Metric Tons Per Day (MTPD). If Air Liquide seeks to apply for this funding, it will likely be at a similar scale of 10+ MTPD.

6.2) Can the primary recipient seek funding from other sources at the federal level? For instance, if Air Liquide proposes an overall project cost of $100MM, with a CEC cost share of $15MM, a US DOE cost share of $30MM under a separate application, and an Air Liquide cost share of $55MM, would this be permitted? (Please note that these values are only given as an example and do not represent any investment cost analysis.)

6.3) Section III.B.1 (Page 5 of 12) indicates that at least 80% of CEC funds must be allocated equipment, including installation, and materials. For larger engineering projects a number of additional costs can easily exceed 20% of the overall project budget. Please confirm if each of the following costs can be counted towards the recipient's match share:

a) Engineering design
b) Project management
c) Property acquisition or lease
d) Site preparation including initial survey, foundation, utilities, demolition (if applicable)
e) Legal services such as contracts, intellectual property, zoning (if applicable)

6.4) Section IV (Page 6 of 12) indicates that clean hydrogen is defined as "hydrogen that is produced by water…". Does this indicate that proposals including electrolyzer technologies will be given preference? (as opposed to steam-methane reforming of biogas for instance)

6.5) Section IV (Page 6 of 12) indicates the first objective is to demonstrate production of at least five metric tons of clean hydrogen per day. Will preference be given to projects that intend greater production volumes?