

EMAIL QUESTION #1

From: Dave Edwards
Air Liquide Director of Technology Partnerships 200 GBC Drive,
Newark, DE 19702

To: Paul Farrell
Attn: Department of Energy and Environmental Protections, Air Bureau 79 Elm Street,
Hartford, CT 06106-5127

Re: Questions regarding the CT PON: Hydrogen Fueling Infrastructure Development Program Initiatives

Dear Paul,

Thank you for providing the opportunity for applicants to ask questions and offer feedback on the recently issued PON. The following questions are for your consideration:

Questions regarding the overall scope and intent of the Program:

1. It is unclear if the onsite production of H₂ is required or preferred. H₂ generation is only mentioned in two places: Section III the Grant Program identifies “hydrogen production and/or dispensing equipment” and Section VII.C..2.b.iii calls for a description of “technology to be used to generate...”. Does CT expect winning proposals to include onsite hydrogen production?
2. In Air Liquide’s experience, critical transportation infrastructure needs to be safe, efficient, and highly reliable. The PON request includes detailed specifications on dispense but does not include any requirements related to overall station reliability, uptime, or design for service and maintainability. In addition, the performance requirements (such as the 200 kg/day average station capacity) differ significantly from existing station requirements (*ie.* 100kg/day per California Specifications or 168kg/day per the German H₂ Mobility Requirements¹). As a result, the specifications call for a custom designed station as opposed to an industry standard design. How will CT value reliability/serviceability in the selection process? If we offer an industry standard design that has proven performance, reliability, safety, and costs, will we be penalized if we do not meet all of the detailed performance specifications in the PON? Is there any desire for CT stations having design consistency with other regions in the US?

Questions regarding the details in Appendix A specifications:

3. **Section 1** - Requires CSA HGV 4.9 and NFPA2 code compliance. CSA HGV 4.9 is not yet published. How will applicants meet this requirement? Which version of NFPA 2 code compliance is required?
4. **Section 2** - What reference should be used to determine the historical temperature data? Is this average the historical average lowest/highest temperature or the maximum/minimum high and low over 20 years?
5. **Section 3** - The state of CA is using 2 vehicle OEMs or potentially a device (called HySTEP) for station validation. How will CT validate that stations meet the requirements for SAE J2601?
6. **Section 4 and Section 5** - What is meant by “H35 if applicable”?
7. **Section 6** - Does the state anticipate vehicles of other sizes?
8. **Section 7** - There is a concern regarding non-communication fueling at H70 as there is no means to validate the acceptability of the receiving system. Must the non-communication fueling also meet the 98% SOC - full fill to maximum pressure?

¹ http://www.now-gmbh.de/fileadmin/user_upload/RE_Publikationen_NEU_2013/Publikationen_NIP/H2Mobility_HRS_Functional_Description.pdf

RESPONSE TO EMAIL QUESTION #1

- 1) There is no requirement for on-site production. Please refer to section **VIII. Grant Application Process, Evaluation Criteria and Review**, subsection **B. Mandatory Proposal Requirements** for the minimum operational parameters, which include the following:
 - 200 kg/day average daily station capacity at 700 bar (10,000 psi) pressure;
 - Hydrogen purity consistent with SAE J2719: Hydrogen Fuel Quality for Fuel Cell Vehicles;
 - Capacity determined as the total kg of hydrogen that can be delivered to a 7 kg-capacity fuel cell vehicles according to the SAE J2601, over a 12 hour period;
 - The ability to deliver the rated daily capacity over a 12 hour period from 6 a.m. to 6 p.m. with a preference for automated operation to extend service to 24 hours/day 7 days/week;
 - The ability to dispense back-to-back refills.
- 2) The proposed facility must be safe, efficient, and highly reliable. Applicants will not be penalized for proposing industry standard designs with proven performance. The use of standard designs should ensure compliance with applicable codes and standards; however, there is no requirement for design consistency with other stations in the US other than compliance with the Hydrogen Refueling Station Interface Specifications in Appendix A.
- 3) CSA HGV 4.9 is expected to be available by December 2015 prior to construction of a proposed facility and will be used to guide the supply, compression, storage and dispensing of hydrogen at outdoor public and non-public fueling stations. The specifications from CSA HGV 4.9 will be taken into consideration with successful applicants through the process by which CCAT enters into an agreement with the selected applicant(s). The CSA HGV 4.9 will be available at: <http://shop.csa.ca/>. NFPA2 (2011) is currently available and NFPA2 (2016) will be available on or about August 28, 2015.
- 4) The station must be capable of operating across the historical ambient temperature range for the last 20 years. Temperature data (maximum and minimum) for Hartford/Bradley is available at: www.ncdc.noaa.gov.
- 5) The station will be validated by individual OEM vehicle fills and/or HySTEP will be used when/if available as a vehicle surrogate to validate compliance with SAE J2601 and CSA HGV 4.3 [as revised].
- 6) H35 is an applicable option that can be provided in addition to H70 if the station intends to fuel buses, specialty vehicles, and other applications that require H35.
- 7) It is anticipated that the primary vehicles applicable for refueling will be light duty passenger vehicles, but the applicant has the option to serve buses, specialty vehicles, and other applications.
- 8) Fuelings at H70 shall have a final SOC target of 98.0% +2.0/-0.0% and have communications to transmit vehicle tank parameters through a wireless interface.

EMAIL QUESTION #2

From: Nick-Verde [<mailto:nick@verdellc.com>]
Sent: Tuesday, July 21, 2015 2:53 PM
To: Farrell, Paul
Subject: About this Public Notice Dear Mr.

Farrell,

We have a question about this **Public Notice: Hydrogen Fueling Infrastructure Development Program Incentives**

About the capacity, your note says we need to be able to deliver the 200 Kg H₂ to the FCV within 12 hours. That means you DO NOT have a min limit for the on-site production capacity, right?

As for the refueling speed, if we fuel 200 Kg within 12 hours, then we just need to fuel each 7 Kg FCV within 20 minutes. Is this your requirement?

Nick Ni



Verde LLC.
6 Brooks Drive
Braintree, MA 02184
www.verdellc.com
Tel: 781.519.4765
Mob: 617.955.2402

This email/fax message is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution of this email/fax is prohibited. If you are not the intended recipient, please destroy all paper and electronic copies of the original message.

RESPONSE TO EMAIL QUESTION #2

- 1) There is no requirement for on-site production. Please refer to section **VIII. Grant Application Process, Evaluation Criteria and Review**, subsection **B. Mandatory Proposal Requirements** for the minimum operational parameters, which includes the following:
 - 200 kg/day average daily station capacity at 700 bar (10,000 psi) pressure;
 - Hydrogen purity consistent with SAE J2719: Hydrogen Fuel Quality for Fuel Cell Vehicles;
 - Capacity determined as the total kg of hydrogen that can be delivered to a 7 kg-capacity fuel cell vehicles according to the SAE J2601, over a 12 hour period;
 - The ability to deliver the rated daily capacity over a 12 hour period from 6 a.m. to 6 p.m. with a preference for automated operation to extend service to 24 hours/day 7 days/week;
 - The ability to dispense back-to-back refills.

- 2) There is no specific requirement to fuel vehicles with 7 Kg within 20 minutes. Please refer to section **VIII. Grant Application Process, Evaluation Criteria and Review**, subsection **B. Mandatory Proposal Requirements** for the minimum operational parameters, which includes the following:
- 200 kg/day average daily station capacity at 700 bar (10,000 psi) pressure;
 - Hydrogen purity consistent with SAE J2719: Hydrogen Fuel Quality for Fuel Cell Vehicles;
 - Capacity determined as the total kg of hydrogen that can be delivered to a 7 kg-capacity fuel cell vehicles according to the SAE J2601, over a 12 hour period;
 - The ability to deliver the rated daily capacity over a 12 hour period from 6 a.m. to 6 p.m. with a preference for automated operation to extend service to 24 hours/day 7 days/week;
 - The ability to dispense back-to-back refills.
- 3) The **Evaluation Criteria** noted in **Appendix B**, which will be used to competitively judge the proposals, include but are not limited to, the following:
- Technology to be used to generate, store, and dispense 200 kg of hydrogen per day at day 700 bar (10,000 psi) pressure,
 - Method to ensure that the hydrogen dispensed complies with SAE J2719,
 - Technology that will be used to ensure that hydrogen that can be delivered to 7 kg-capacity fuel cell vehicles according to the SAE J2601, over a 12 hour period,
 - Technology that will be used to ensure the proposed station can, at a minimum, deliver the rated daily capacity over a 12 hour period from 6 a.m. to 6 p.m., weekdays, with a preference for automated operation to extend service to 24 hours/day 7 days/week, and
 - Technology that will be used to ensure the proposed station is reliable, includes planned redundancy, and can dispense back-to-back refills.
- 4) There are **Hydrogen Refueling Station Interface Specifications** in **Appendix A** that specify the following:
- The station will be capable to fuel, at least, 200 kg in a 12 hour period for category H70-T40. The station will be able to repeat this requirement after a time period not to exceed twelve (12) hours of no fueling. The original system design shall be scalable to allow future expansion of the ground storage capacity to be capable to fuel, at least, 400 kg in a 12 hour period for category H70-T40, and where allowable by site layout constraints.
 - The station will be capable to complete, at least, 7 consecutive fills for a dispensed mass of 4 kg for each fueling, and with a 3 minute interval between each fueling. The time between fueling is defined as removing the nozzle from the previous fueling to starting the fueling sequence of the next fueling. Each fueling shall achieve a state of charge (SOC) of not less than 98.0% +2%/-0%, as measured by the station. The station shall be able to perform the next sequence of 7 consecutive fills, as defined above, after a duration period with no fuelings -in excess of 30 minutes.
 - All fuelings at H70 shall have a final SOC target of 98.0% +2.0/-0.0%.

EMAIL QUESTION #3

From: Edwards, David [<mailto:david.edwards@airliquide.com>]
Sent: Tuesday, September 08, 2015 1:25 PM
To: Farrell, Paul
Subject: Submittal Information

Dear Paul

On behalf of Air Liquide, I will be submitting a proposal for the Hydrogen Fueling infrastructure Development Program. We will be submitting later this week and I have a question: Is there an online submittal site/process? I have only seen a mailing address for the Pitkin Street Address in East Hartford which looks like you want a hardcopy delivered. If you are only interested in hardcopies, can you confirm the number of copies to be sent?

Thanks in advance for your assistance.

Dave Edwards

David P. Edwards | Director of Technology Partnerships | Air Liquide

Delaware Research and Technology Center | 200 GBC Drive, Newark, DE 19702

302 286 5491 | 612 747 7636(cell) | david.edwards@airliquide.com

RESPONSE TO EMAIL QUESTION #3

There is no online submittal process. The Department requests the submission of four hard copies and one electronic copy of each proposal. The materials should be addressed to the Connecticut Center for Advanced Technology c/o Mr. Paul Aresta, 222 Pitkin Street, Suite 101, East Hartford, Connecticut 06108.