From: Shane Stephens <shane.stephens@firstelementfuel.com>
Sent: Thursday, July 05, 2018 4:42 PM
To: Duffy, James@ARB <James.Duffy@arb.ca.gov>
Cc: Tim Brown <tim.brown@firstelementfuel.com>; Wade, Samuel@ARB <Samuel.Wade@arb.ca.gov>
Subject: FirstElement's Comments on HRI Pathway

Jim,

Attached are FirstElement's comments submitted to the docket. As always, FirstElement stands ready to provide info that is helpful to the process.

I also want to let you know that although we signed onto the letter by other Hydrogen Stakeholders for the sake of unity, FirstElement believes that the reporting and record keeping requirements that the CARB is contemplating as part of the HRI program are appropriate and feasible from our perspective. In other words, we do not share the view of the other stakeholders on this point.

Thanks,
Shane

Dr. Shane Stephens
Founder and Chief Development Officer
True Zero (a FirstElement Fuel brand)
949-922-3456

FIRSTELEMENT FUEL

FirstElement Fuel Inc. | 5151 California Ave, Suite 220, Irvine, CA 92617 | 949-205-5553

July 5, 2018

Sam Wade
Chief, Transportation Fuels Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95812
Delivered via website

RE: Support for Low Carbon Fuel Standard Proposed Hydrogen Refueling Infrastructure (HRI) Pathway

Dear Mr. Wade:

FirstElement Fuel Inc. is a California company founded to provide retail hydrogen to customers of Zero Emission Fuel Cell Electric Vehicles. On behalf of FirstElement Fuel, I am writing to express support for the ***Hydrogen Refueling Infrastructure*** (HRI) Pathway as proposed by the California Air Resources Board (ARB) in the 15-day Notice of Public Availability of Modified Text and Availability of Additional Documents and Information for Proposed Amendments to the Low Carbon Fuel Standard (LCFS) Regulation and to the Regulation on Commercialization of Alternative Diesel Fuels (ADF) (henceforth "15-day Notice"). The program is well thought-out, and provides a mechanism that will help boost the successful deployment of retail hydrogen stations while also helping to achieve the following critical goals:

- Accelerate build-out of the retail hydrogen network in California
- Entice more private money to invest in hydrogen infrastructure
- Hasten the transition away from grant funding for hydrogen stations
- Help reduce price at the pump
- Incentivize higher percentage of renewable hydrogen

In addition to the comments provided in the joint letter of hydrogen stakeholders dated July 3, 2019, FirstElement wishes to provide input on the following three topics – input which we believe will help improve the overall efficacy of the program:

1. Timeframe on which to base Station Capacity
2. Non-declining vs. declining credits over the 15 year period; and
3. Station uptime multiplier

Timeframe on which to base Station Capacity:
FirstElement recommends that HRI credits be given on the basis of 24-hour capacity that accounts for typical customer fueling profiles. Based on data collected by the California Energy Commission of consumer refueling patterns, retail hydrogen refueling very closely mirrors gasoline refueling behavior based on publicly accessible data provided in a study by Chevron. Based on those data, the capacity of a station can be

based on a 24-hour timeframe, with the following requirements to account for typical refueling profiles:

i. Over a 24 hour period station must be able to dispense 100% of its rated capacity
ii. Over an 18 hour period station must be able to dispense 95% of its rated capacity
iii. Over a 12 hour period station must be able to dispense 75% of its rated capacity
iv. In a single peak hour (typically 6-7 pm), station should be able to dispense 7% of its rated capacity

FirstElement believes that the program should be built around a capacity timeframe that reflects real consumer usage patterns, because it will best serve to incentivize station developers to install hydrogen stations that best meet consumer needs.

Non-declining vs. declining credits over the 15 year period:
FirstElement Fuel generally agrees with the analysis capability and methodology employed by NREL's H2FAST tool, and we also agree that the ARB's desired outcome (returns on investment in the low teens) represent a significant benefit to our business model and will help attract private investment, without being excessively lucrative.

However, once we account for a few additional real costs as well as the realities of a fledgling FCEV market, FirstElement believes that a declining capacity credit that is front-loaded, rather than a constant capacity credit over the program's 15-year per station period will be more effective to address early market challenges and achieve the shared goals of this program. Namely, the declining (vs constant) capacity credit helps address two of the most significant challenges facing retail hydrogen stations:

- Achieving lower price at the pump and funding growth are more difficult during earlier years of fuel cell vehicle market growth. A declining credit is front-loaded to help offset these early stage challenges.
- Station developers will be more motivated to sell hydrogen over time because revenues from capacity credits will decline. This will motivate developers to select locations that reach more consumers, and to provide a better customer experience (including a lower price at the pump).
- A declining capacity credit helps achieve lower price at the pump (even during the initial years of operating a station) and a reasonable IRRs simultaneously.

Station uptime multiplier:
FirstElement Fuel recommends an uptime metric that can push the industry to a higher standard of excellence, and provide a basic degree of customer satisfaction. We believe that the current proposal for an "uptime" multiplier provides too large of a benefit for operators that only achieve 80% or 90% availability at a station. Based on our experience in operating stations, 90% uptime is unacceptable for customer satisfaction, and it requires far less effort and resources than achieving the >97% that we believe provides a basic level of customer satisfaction.

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As an initial proposal, FirstElement Fuel would like CARB staff to consider the following uptime multiplier, and we also gladly offer further discussion and collaboration on this topic:

97-100% availability	Applicant receives 100% of available credits
94-97% availability	Applicant receives 90% of available credits
91-94% availability	Applicant receives 80% of available credits
88-91% availability	Applicant receives 70% of available credits
85-88% availability	Applicant receives 60% of available credits
82-85% availability	Applicant receives 50% of available credits
79-82% availability	Applicant receives 40% of available credits
76-79% availability	Applicant receives 30% of available credits
73-76% availability	Applicant receives 20% of available credits
70-73% availability	Applicant receives 10% of available credits
<70% availability	Applicant receives no credits

Thank you for your consideration of our comments.

Sincerely,

Dr. Shane Stephens
Founder & CDO
FirstElement Fuel Inc.