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Re: Comments on Chapter 173-424 WAC, Clean Fuels Program Rule

Dear Ms. Assink,

Shell USA, Inc. appreciates the opportunity to comment on Washington Department of Ecology's "Draft Rule Language" for the Clean Fuels Program ("CFP") rulemaking. Shell Hydrogen has been a leader in Hydrogen Fuel for over 20 years, and operating Hydrogen refueling stations in California for greater than 10 years. We have been actively engaged in the California LCFS market and rulemakings, including work with the California Air Resources Board (CARB) to design the Hydrogen Refueling Infrastructure (HRI) pathway.

It is against this background, and in an effort to ensure that Washington develops a workable clean fuels program, that we offer the below comments on the draft language as it pertains to Hydrogen.

Specific Reporting Requirements: *Specific reporting parameters for hydrogen used as a transportation fuel.*

> We encourage adoption of simple reporting aligned to industry technology standards. *Section 4's Hydrogen reporting* requirement to report hydrogen fuel dispensed by quantity (in kg) and vehicle weight category (LD/MD/HD) is not aligned with hydrogen industry standard SAE J2601 and are not data captured at current refueling stations. Implementation of the requirement to differentiate vehicle types fueled would require significant technology development and/or implementation of inaccurate manual tracking, both of which could add significant cost and delay to effective development of hydrogen fueling for fuel cell electric vehicles in Washington.
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> In order to obtain increased granularity on vehicles filled, we suggest aligning to California's LCFS program and reporting to include, (a) Hydrogen Pressure (H35 or H70), (b) Total Hydrogen Dispensed per Station, and (c) Station uptime.

Generating and Calculating Credits for ZEV Fueling Infrastructure Pathway: *The station nameplate refueling capacity for the permitted hours of operation calculated using the HySCapE 1.0 model or an equivalent model or capacity estimation methodology approved by Ecology.*

> We encourage the adoption of an update to HySCapE 1.0 in a version 2.0 of this tool, as HySCapE 1.0 is limited to 700 bar pressure stations and does not account for recent technology developments. An update to the model may include improving accuracy and accommodating a wider range of station designs, including consideration of: (a)

fueling at 350 bar or 500 bar pressure; (b) fueling for light-duty, medium-duty, and heavy-duty vehicles including an approach to allocating station capacity for "multi-modal" stations that provide fuel to several vehicle classes; (c) liquid hydrogen stations that do not maintain constant head pressure; and (d) gaseous hydrogen stations that do maintain constant compressor inlet pressure.

We understand the CARB may be engaging with the National Renewable Energy Laboratory (NREL) for the purpose of updating the HySCapE model as part of the current LCFS rulemaking in California, and encourage the Department of Ecology to contact CARB on this topic.

Generating and Calculating Credits for ZEV Fueling Infrastructure Pathway: *HRI refueling capacity for the station is the nameplate refueling capacity determined in (b)(v) of this subsection or 500 kg/day.*

Shell supports capacity-based crediting pathways. California's HRI pathway has proven effective in attracting significant investment, improving refueling infrastructure buildout, and decarbonizing hydrogen fuel from the start. Since enacting the HRI pathway, the average hydrogen station capacity has increased 2.5 times, station development programs now underway are 5 times larger than all prior developments, and hydrogen supply has become over 90% renewable and decarbonized.

CARB's approach to defining capacity limits for the existing HRI pathway that applies to Hydrogen Light Duty stations, and the proposed HRI pathway in their current rulemaking that would apply to Heavy Duty stations, ensures that stations are built to deliver a user experience that encourages adoption of zero emission vehicles. The capacity limits at 1,200 kg/day for Light Duty stations and proposed at 4,800 kg/d de-rated by half to 2,400 kg/d crediting basis for Heavy Duty stations balances the goals of fueling network coverage and individual station capacity.

Extending this logic to Washington, we recommend adoption of station capacity limits by Class of Vehicle served, and more specifically the following capacity caps: (a) 800 kg/day cap on Open Retail stations serving Light Duty, (b) 2,400 kg/day cap on the crediting basis for Open Retail stations serving Heavy Duty after de-rating by half (i.e., a station with 4,800 kg/d capacity would certify for 2,400 kg/d capacity crediting), and (c) an allocation approach for multi-modal stations that is additive for the capacity cap (i.e., up to 800 kg/day LD + 2,400 kg/day HD).

Generating and Calculating Credits for ZEV Fueling Infrastructure Pathway: *The estimated cumulative value of HRI credits generated for the FSE in the prior quarter must be less than the difference between the total capital expenditure reported pursuant to (f)(ii)(A) of this subsection and the total grant revenue or other funding reported pursuant to (f)(ii)(E) of this subsection in the prior quarter.*

We encourage not limiting the developing of hydrogen fueling infrastructure with this provision, as the CARB in California decided, because it is unnecessary and could have unintended consequences.

Unlike charging infrastructure for which a similar provision does exist in the California LCFS pathway for Fast Charging Infrastructure (FCI), hydrogen refueling stations are (a) decreasing rapidly in capital cost, (b) require new infrastructure capacity for introduction of the first fuel cell electric vehicles, and may therefore experience (c) increasing utilization and decreasing retail pricing over time. In this context, a provision limiting the cumulative HRI credit revenue to be less than the total capital expenditure net of grant funds is:

1.) Unnecessary: the HRI pathway in California has proven effective in motivating hydrogen station development by de-risking the station utilization from the rate of fuel cell electric vehicle introduction. The natural balance and off-ramp of the pathway – via decreasing HRI crediting as utilization increases – along with the station capacity caps ensure business models remain focused on selling hydrogen fuel through serving customers with competitive pricing and services rather than maximizing HRI crediting.

    Furthermore, in a competitive market, the HRI credit revenue helps hydrogen station operators reduce hydrogen fuel pricing, which can accelerate adoption of fuel cell electric vehicles, thereby increasing station utilization and decreasing HRI crediting. The HRI credit revenue is, in fact, part of the feedback look that makes this pathway naturally balancing.

2.) Unintended Consequences: a cap on HRI credit revenue could inhibit the natural balance in the developing supply of station capacity and demand from fuel cell electric vehicle owners that the HRI pathway is intended to de-risk and enable. Specific unintended consequences could include: (a) diminished motivation to reduce capital costs if this reduces the HRI crediting potential, resulting in structurally higher hydrogen fuel prices in Washington; and (b) the premature closure of hydrogen stations that reach a cap on HRI credit revenue, for example through good success in low capital costs and/or low carbon intensity supply and/or high grant funding, with the combined effects of discouraging these good outcomes and diminishing rather than growing the nascent hydrogen fueling network supporting fuel cell electric vehicle owners.

In conclusion, a similar provision does not apply to hydrogen refueling infrastructure in the HRI pathway of the California LCFS for good reasons that are proving out in practice; we encourage Washington to follow suit in not adopting this provision as it could be detrimental to the intended outcomes of the HRI pathway.

Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways: *(A) CI of 85 gCO2e/MJ or less[DD106], and (B) Renewable content of 65 percent or greater[DD107].*

We encourage the Department of Ecology to adopt California's HRI pathway requirements of a CI less than 150 gCO2e/MJ less and a renewable content of 40 percent or greater.

Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways: *If the applicant fails to demonstrate the operability within 24 months of approval then the application will be canceled. The applicant can reapply for the same station eligible only for 8 years of crediting.*

We encourage the Department of Ecology to adopt California's HRI pathway requirement, which allows for 10 years of crediting in the event an applicant reapplies for the same station. In California, this has proven to be a good balance between encouraging early announcement of station development to bring market confidence for the introduction and adoption of hydrogen fuel cell electric vehicles, while effectively discouraging speculative applications to the HRI pathway if they are unlikely to be completed in a timely manner.

Primary alternative fuel pathway classifications: *Ecology will start accepting Tier 2 applications on July 1st, 2025.*

> We encourage the Department of Ecology to consider provisional pathways starting January 1, 2023 prior to the implementation of the Tier 2 Applications. More specifically we encourage the adoption of pathways that are already approved in California and Oregon to be approved and in effect January 1,2023.

Draft CI Tables for Washington Clean Fuels Standards: *WAC 173-424 Table 4 Washington Carbon Intensity Lookup Pathways Table*

> We understand that the initial table is a draft, and would encourage the following clarifications in regards to Hydrogen.
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> a. Hydrogen pathways details and clarity:
> i. Encourage details on the hydrogen pathways to include distribution and dispensing (compression and pre-cooling).
> ii. Encourage further clarity on eligibility criteria for each pathway (e.g. transportation distance within [100 miles] of the production facility.)
> b. Encourage the inclusion of liquid hydrogen pathway in the look up tables, similar to California LCFS.
> c. Comprehensive pathways for electrolysis generated using renewable electricity, to include geothermal, hydropower, and ocean power renewable electricity.

Please feel free to contact Neil Bhagia at neil.bhagia@shell.com or 608-213-6056 for any additional information or questions regarding our submission.

We appreciate your time and consideration of our comments.

Sincerely,

Wayne Leighty

Commercial Head, North America
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