



July 9, 2021

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Re: Scoping Plan – Preliminary Comments

The California Hydrogen Coalition (“CHC”) appreciates the opportunity to provide comments on 2022 Scoping Plan update. We appreciate the work that Air Resources Board (“ARB”) Staff has put into the Scoping Plan and Carbon Neutrality to date and the opportunities and investments it generates for the build out of hydrogen fueling infrastructure in the Low Carbon Fuel Standard (“LCFS”) to support the state’s growing fleet of fuel cell electric vehicles. To that end, we have provided four recommendations that could enhance the outcomes of the Scoping Plan, accelerate the transition of California’s fleet to zero-emission hydrogen powered fuel cell electric vehicles and enhance the LCFS and accelerate bringing additional decarbonized hydrogen into the marketplace.

The mission of CHC is to enable California’s transition to zero emission vehicles (“ZEVs”) by expanding the availability of reliable, convenient, and affordable hydrogen fueling to support the state’s emission reduction goals. We are confident light, medium, and heavy-duty FCEVs will play a critical role in California’s transition to a zero-emission transportation sector because of the advantages this technology provides today with respect to range, duty-cycle, and fast refueling, and may soon provide for cost and carbon intensity reductions. CHC is equally confident in the development of a hydrogen fuel market that will continue providing quality jobs and opportunities to decarbonize locally owned fueling stations throughout California. FCEVs and hydrogen closely emulate existing consumer behavior for the gasoline and diesel vehicle experience, eliminating the pressure to change consumer behavior while decarbonizing the jobs associated with the existing distribution and fuel delivery markets. We are excited and prepared to accelerate the adoption of this ZEV technology over the next several years.

Embrace the “Earthshot”

On June 7, 2021, Secretary Granholm announced the federal government’s “Earthshot” initiative to reduce the costs of clean hydrogen to \$1 per kilogram in a decade. This ambitious pricing target reflects the importance of hydrogen as an energy carrier in decarbonization, but also recognizes that California’s climate allies in Asia and Europe are much further ahead in planning and execution of the deployment of hydrogen in their carbon reduction strategies.



Achieving \$1 per kilogram of clean hydrogen far exceeds the cost reductions needed to directly compete with existing fossil fuel resources and in California makes hydrogen more cost-effective than retail electricity.

This initiative is a wakeup call to the country and a market signal to industry; California must similarly send market signals and create a predictable policy environment to encourage investment. The world often looks to California not only for leadership but also partnership when it comes to decarbonized, energy and mobility. Our climate partners are leading the way and it is time for California to embrace our leadership role in this space. The hydrogen economy will not be built by one jurisdiction alone. We can partner in the development of a zero-carbon and domestic energy resource that when paired with zero-carbon end uses can displace 1:1 fossil fuel without an expectation of mass behavioral change from the public and while providing a just transition for thousands of businesses and hundreds of thousands of Californians.

The California Air Resources Board has done substantial work in helping enable markets that will drive the state toward decarbonization. The members of CHC are investing billions into the establishment of a hydrogen economy that will help adoption of hydrogen as an energy carrier. However, there is more work to be done and the LCFS presents some immediate opportunities to send investable signals to the private market and drive capital toward the appropriate investments for California's future.

Now more than thirty countries¹ have recognized there is a large role for hydrogen in achieving national strategies for climate change emissions reductions and in attempts to achieve carbon neutrality have released comprehensive hydrogen strategies. While CHC is currently focused on the development of a hydrogen transportation market, we want to acknowledge the benefits of hydrogen and fuel cells for stationary power (baseload, peak, and backup), longer-duration energy storage, and industry processes (most of the cap-and-trade facilities could benefit from decarbonization of the natural gas pipeline with hydrogen injection). The opportunities hydrogen and fuel cells provide for on-road and off-road mobility does not end with light-duty passenger or medium and heavy-duty trucks and buses, but extends to off-road applications including material handling, aviation, maritime, and rail.

The Role and Benefits of Hydrogen and Fuel Cell Electric Vehicles for Decarbonization

CHC's current focus is to support the build out of some of these early commercialized applications and with that comes the need to update the LCFS in a timely manner to help leverage the immediate infrastructure opportunities to achieve cost-effective and equitable compliance for Advanced Clean Fleets, Advanced Clean Cars, Innovative Clean Transit and Zero

¹ <https://ocean-energyresources.com/2021/02/22/new-hydrogen-council-report-shows-over-30-countries-with-national-h2-strategy/>



Emission Vehicle Program requirements – Californians need choice. Investments and market signals will drive:

- Environmental justice and equity -- The shared infrastructure of FCEV hydrogen fueling provides an option for Californians who live in multi-unit dwellings or older housing stock and have no daily ability to charge at home or work.
- Consumer adoption advantages -- Californians who require rapid refueling or face long daily commutes, including transportation networking companies as well as our construction and agricultural workforce, can access a long range zero-emission vehicle with rapid three to five minute refueling times.
- Heavy-duty and fleet operations – the weight advantage and rapid refueling benefits of hydrogen will serve existing goods movement business models with the same freight efficiency without placing requirements on our warehousing to bring in expensive infrastructure that may not provide the same level of service or uptime.
- More reliable vehicle performance -- Californians can expect good vehicle performance in hot or cold weather since FCEVs are less impacted by weather conditions.
- More zero emission vehicle miles traveled -- On average, FCEVs are driven between 10,000-14,000 miles per year, while plug-in electric vehicles are driven between 6,000-9,000 miles per year.²
- Internal combustion engine replacement -- A 1:1 replacement for gasoline and diesel vehicles which eliminates the growing trend of households rely on both a gasoline/diesel and plug-in electric vehicle to meet driving needs.
- More efficient goods and people movement -- A better option for public transit and goods movement where moving large loads and fleets demands fast refueling and lower unladen weight to maintain operational efficiency.
- Different clean production pathways provide different co-benefits to California's climate and air quality programs.
 - Steam methane reformation of biogas is a high efficiency low-carbon pathway for mitigating methane emissions from anthropogenic sources like landfills and wastewater treatment plants, while also creating favorable economics for the anaerobic digester capacity needed to achieve our statutory organic waste diversion goals and short-lived climate pollutant strategy.

² <https://www.energy.ca.gov/data-reports/surveys/california-vehicle-survey/vehicle-miles-traveled-fuel-type>



- Electrolysis will eventually be the predominant source for hydrogen and paired with dedicated renewable electricity generation, we can see scenarios, where curtailment of electrolyzers will backup grid resources or hydrogen will be used in turbines and fuels cells to provide baseload to the grid.
- Thermochemical conversion of biomass to hydrogen is another way to manage the waste from forestry and agricultural operations. This will also provide favorable economics to mitigating wildfire risks while lowering the emissions by eliminating the open combustion-based practices highlighted by the state procurement of incinerators in recent budgets for CalFire.
- Just transition away from fossil fuels -- Fueling stations, which number in the several thousands and are predominately small, minority-owned businesses, have a viable transition to fueling zero-emission vehicles allowing their businesses to thrive as we transition away from fossil fuels.
 - CHC emphasizes that unionized refinery and pipeline workers' high skill – high wage jobs would be preserved with a transition to a zero-carbon molecular energy carrier like hydrogen. This also transitions the public's multibillion dollar pipeline infrastructure and lowers the reliance on a grid which cannot handle all the demand envisioned.
- Self-Sufficiency within the Decade – According to an ARB draft report the light-duty hydrogen refueling sector can achieve self-sufficiency within the decade for as little as \$300,000,000 additional dollars.
 - This is a small fraction of the funds that have already been spent and allocated to charging infrastructure.

As such, CHC would like to suggest some finite recommendations for action in 2021 to help unlock the benefits and investments that will aid compliance to a number of transportation decarbonization rules ARB is currently pursuing.

Recommendations in Brief

In the 2022 Scoping plan development ARB should push forward these changes for a 2021 LCFS rulemaking that would enable hydrogen providers and vehicle drivers in California to reduce their carbon footprints while simultaneously increasing investments in low-carbon production and supply.



This document outlines two levels of policy recommendations. Firstly, those that affect the scope and impact of the overall policy itself:

Item 1: Extending the station HRI credits to include HD and MD vehicle refueling stations.

Item 2: The LCFS should allow the decoupling of the environmental attributes of RNG so that RNG may be used both to produce renewable hydrogen and to generate RFS credits for natural gas used as a transportation fuel. Decoupling the RFS credits and LCFS credits would overcome the market limitations caused by not having H2 pathways in the current federal RFS programs.

Secondly, we have two additional recommendations that are policy clarifications and improvements that should have more modest policy impacts. These include:

Item 3: Allowing renewable process energy to be used to reduce the carbon intensity of hydrogen, similar to production feedstocks.

Item 4: Allow for book-and-claim processes for hydrogen when it is supplied from mixed supply schemes such as pipeline networks connecting multiple production sources or bulk gaseous/liquid storage.

Background and supporting information are included in the following pages.

Item 1: Extending the station HRI credits to include HD and MD vehicle refueling stations.

We are recommending that MD/HD stations be explicitly included in the HRI provisions of § 95486.2. *Generating and Calculating Credits for ZEV Fueling Infrastructure Pathways.* It is our understanding that, as written, the current regulations were intended for LDV infrastructure only.

Because of the higher capacity of MD/HD stations, we ask that for these applications, the capacity limit for MD/HD stations be scaled to the needs per the ARB's discretion. Crediting should be proportional to capacity to ensure that the business case for the station is hydrogen dispensing and not crediting.

We ask that the program have similar bounds to the LDV stations, using a limit of an additional 2.5 percent of deficits in the prior quarter for pathway approvals to be granted.



CHC would like to discuss with staff any additional provisions that would differ from the current HRI provisions to best suit HD/MD vehicles.

Justification

California has established aggressive regulations for decarbonizing the medium- and heavy-duty transportation sectors. These will require significant infrastructure upgrades for all ZEV platforms and given the even bigger role that FCEVs must play to meet the recent MD/HD mandates in the ACT Regulation – further reinforced by EO N-79-20 – will require urgent HRI buildout for these sectors.

The addition of HRI credits for LDV stations has been very successful in advancing the LDV network, encouraging larger stations to enter the market earlier, and resulting in substantial private investment in stations. This is most easily seen in the results of the most recent station funding announcements (GFO-19-602) where the average proposed station is approximately 200% larger than the average for previous station awards and the state contribution has been reduced from 60-75% to less than 30%. This has resulted in a net improvement in the state's investment (on a per kg dispensed basis).

HRI will lead to larger stations that can lead MD/HD infrastructure to be ahead of the vehicle market. As we have learned from early generation of H2 stations simply building "just the right amount of H2 infrastructure" is a mistake since lead time to develop H2 infrastructure is 18-24 months which stagnates the vehicle adoption. HD/MD fleet are less likely to adopt ZEVs without an adequate statewide network of infrastructure (both stations and capacity).

Leveraging the success of the LDV HRI program to HD/MD applications is expected to have similar results. CA has established very aggressive schedules and policies advancing zero-emission truck and bus adoptions which will require similarly aggressive growth in the refueling networks required to fuel these vehicles. By implementing the recommended MD/HD HRI changes, we anticipate industry's response through further infrastructure investments would help enable this network growth.

Item 2: Decoupling the use of RFS credits and LCFS credits to overcome the market limitations of not having H2 pathways in the current federal RFS programs.

In the current renewable fuels markets, California's LCFS program is complimented by the federal EPA Renewable Fuels Standard ("RFS") Program which enables renewable fuel providers to capture value in supplying renewable fuels along approved pathways. Currently, the EPA has no approved renewable H2 pathways which disincentivizes a fuel provider from supplying into this market. We are recommending CARB decouple the RFS



and LCFS pathways such that hydrogen is given an equal opportunity to generate these credits.

RNG as an example: If an RNG supplier chooses to sell into a CNG application in CA, that seller is eligible to generate RINS through the approved EPA pathway and to generate fuel credits in the LCFS program along the similarly approved LCFS pathway. If that same RNG supplier, however, chooses to sell into a H2 production application in CA, only the fuels credits from the LCFS pathway are generated.

It is our recommendation to decouple these pathways such that if the RNG supplier chooses to sell RNG into a CNG (or similar RFS) pathway, the supplier could choose to generate ONLY the EPA RINS while retaining the LCFS environmental attributes of the RNG to be sold to a H2 application in CA. Effectively, the supplier could then capture the full value of the credits from both programs without the need for EPA H2 pathway approvals. We would anticipate this option to be terminated for any H2 pathways that are approved by the EPA RFS program in the future.

Applying such a process to the supply of renewable fuels in CA would enable H2 to have a market opportunity for renewable energy providers and would incentivize further sales and investments into renewable H2 production and supply pathways for the state.

Item 3: Allowing for process energy used in hydrogen production to use power-purchase agreements for low-carbon energy to be credited within the pathways similar to production feedstocks.

Per the current regulation: § 95488.8. *Fuel Pathway Application Requirements Applying to All Classifications*

(h) Renewable or Low-CI Process Energy. Unless expressly provided elsewhere in this sub article, indirect accounting mechanisms for renewable or low-CI process energy, such as the use of renewable energy certificates, cannot be used to reduce CI. To qualify as a low-CI process energy source, energy from that source must be directly consumed in the production process as described in (1) and (2) below:

To provide equal benefit to fuels, **we recommend that the use of RECs qualify for all fuel pathways in both feedstock and process energy applications.**

By allowing for renewable energy credits ("REC") to be used for feedstocks but not for process energy, the regulation significantly limits the potential to have the lowest



possible CI fuels for consumers. This disproportionately affects hydrogen supply as the contribution to CI of process energy in the forms of compression, refrigeration, liquefaction, pumping, and distribution is significantly higher than for other fuel options.

To address concerns about traceability, tracking, and reporting of these RECs across different regions, we would suggest that a certified third-party validation process be invoked to hold the reporting entities accountable for their pathway compliance.

Item 4: Allow for book-and-claim processes for hydrogen when it is supplied from mixed supply schemes such as networks connecting multiple production sources or bulk gaseous/liquid storage.

ARB staff has advised that the use of book-and-claim or equivalent methods to capture renewable energy credits in a fuel pathway is not allowed as it has not been explicitly indicated in the current regulation.

We are recommending that book-and-claim accounting be allowed under the current regulations.

By not allowing for such accounting methods, hydrogen suppliers are unable to provide the lowest possible CI fuels when the production, storage, or distribution of fuels involves mixed production supply schemes.

Example 1: A likely hydrogen supply scenario can have multiple production sources feeding into a single liquefier and or bulk storage system (vessels, tanks, or caverns). Without allowing for this book-and-claim scenario, when hydrogen from such a facility is distributed to a fuel retailer, the CI content can only be reported as the bulk average of the storage system. As hydrogen production increases for the transportation market, cost reductions through large scale, multi feed supply schemes are expected. Without book-and-claim on the hydrogen, the use of such schemes and in the investment in low-carbon production is disincentivized.

Example 2: In some processes, such as renewable diesel production, the use of low-CI hydrogen from a pipeline system is a feedstock that helps enable the lowest possible CI final product. Such pipelines would typically have multiple H₂ production sources with varying CI scores feeding it and, without being able to use book-and-claim methods to tie renewable diesel production to specific H₂ sources along the pipeline, optimizing these low CI fuels is not possible and the addition of low-CI H₂ sources to pipeline networks is not incentivized.



Enabling Policies and Modeling

In addition to the finite actions for this year in the LCFS programs, CHC would also like to request the scoping plan examine the role various policies included can further enable the demand for renewable and clean hydrogen. This would start with a hydrogen centric scenario for the modelling being performed by the ARB. Hydrogen serves as an energy vector that can utilize existing resources with minimal retrofit costs, minimizes the behavioral changes for end-uses, and can unlock the full potential of 24/7 clean energy we believe a scenario that factors in the Department of Energy Earthshot initiative and widespread end-uses would be appropriate. If we are to unlock the full potential of this energy vector California should model its potential.

CHC would like to engage in a direct dialog with ARB staff and the team developing the models for the 2022 scoping plan to ensure the accuracy of the assumptions, accounting for the rapid advancement of hydrogen and fuel cell technologies, production methodologies, and sectors that hydrogen can serve a key role in decarbonization. In the examination of achieving carbon neutrality, it is our belief that the economics and environmental benefits of widespread hydrogen adoption will prove to be cost-effective. For example, in cursory analysis of existing funding for hydrogen refueling it is apparent that the cost to convert every refueling station in California at current public grant levels is far more cost-effective than converting for charging. This is not to say California should pick one over the other, as we will need both to achieve carbon neutrality and decarbonization of the transportation sector. California in this scoping plan should analyze the economics of scaling our energy and infrastructure to achieve carbon neutrality which far exceeds the goals of AB 32 and SB 32.

In addition to modeling and policy signals CHC would like to explore the role of that state incentives can play in rapidly developing renewable and clean hydrogen incentives. In 2021 Assembly Member Rodriguez introduced AB 1312 that proposes an investment tax credit. CHC sponsored this legislative proposal and hired Capitol Matrix Consulting to perform an economic analysis. This analysis concludes, " Given the rapid progress made to date with respect to cost declines and capacity improvements in hydrogen fueling stations, we believe that a tax credit will be successful in attracting private investment, accelerating development of the infrastructure needed to grow the FCEV market and wean private investors off public subsidies altogether. Such investment will have immediate economic impacts, including thousands of good-paying jobs related to the construction, operations, and maintenance of the hydrogen fuel network. Just as importantly, it will provide the fueling infrastructure needed to give all Californians access to workable options as the state moves toward a zero-emissions transportation market." We have attached the bill and analysis for ARB's review.



In Conclusion

Following announcements for substantial national and international investments in hydrogen production and infrastructure it is important to capitalize on the moment in California. CHC believes the moment to advance policies that California further enables the development of lower-carbon fuels with zero carbon end uses like hydrogen and fuel cell electric vehicles is now. Previous LCFS rulemakings that have encouraged hydrogen have resulted in hundreds of millions of dollars in throughout the State. We are hopeful that ARB is willing to work with CHC to capitalize on the signals sent by the Governor's Executive Order to advance hydrogen production and refueling and further enable zero emission vehicles. CHC is committed to working diligently with ARB staff to further refine our recommendations over the next few months and bring more investment to California's transforming transportation and energy markets.

We appreciate the opportunity to comment and we look forward to working closely with ARB staff to enable hydrogen throughout the economy. If there are any questions, please contact me at TCooke@BHFS.com or our government affairs representative at The Gualco Group Inc., Mikhael Skvarla at Mikhael_Skvarla@gualcogroup.com.

Thank you,

/s/

TERESA COOKE
Executive Director

Attachments:

AB 1312 (Rodriguez, 2021)
Analysis of Proposed Income Tax Credit for Hydrogen Fueling Infrastructure Development

cc: Members of the California Air Resources Board
Mr. Richard Corey
Mr. Matthew Botill