



May 10, 2024

Rajinder Sahota
California Air Resources Board
1001 I Street Sacramento, CA 95812

Dear Ms. Sahota,

On behalf of the undersigned organizations and companies, we are pleased to submit the following comments for consideration as the California Air Resources Board (CARB) develops updates to the Low Carbon Fuel Standard (LCFS). California's LCFS has been one of the strongest carbon markets in the world, driving significant private investment in achieving the carbon intensity (CI) target. The strength of this market signal was working; however, changes must be made to buttress credit pricing to drive investments necessary to achieve California's 2045 carbon neutrality goal.

We would like to express our gratitude for the diligent efforts undertaken to shape the LCFS to address the role of hydrogen. This supports the vision in the Scoping Plan and is crucial to recognize the comprehensive strides made in addressing the essential components of this transformative pathway for achieving carbon neutrality. While acknowledging the inclusion of significant policy components, we must underscore the importance of nuanced adjustments to ensure the success of hydrogen – a success that is also vital for achieving the standards set forth in Advanced Clean Fleets (ACF), Advanced Clean Trucks (ACT), Innovative Clean Transit (ICT), and Advanced Clean Cars 2 (ACC2) regulations. Our comments are largely focused on very specific intricacies that improve the operability of the initial proposal and avoid disadvantaging hydrogen to other low-carbon fuels.

Heavy-Duty Hydrogen Refueling Infrastructure Credits

Hydrogen refueling station (HRS) developers assisted CARB in the development of a heavy-duty (HD) capacity credit program that could be built into the Low Carbon Fuel Standard (LCFS). The program, modeled after the light-duty (LD) HRI program, included a capacity cap of 6,000 kg/day with a 50% discount applied to unused capacity. The concept was developed using the current LCFS compliance curve and agreed upon by both CARB and HRS developers as adequate to promote HD HRS development. It has now been included in the proposed LCFS amendments, which industry greatly appreciates.

In addition to the HD HRI program, CARB's proposed amendments include a step down in the compliance curve, a steeper slope for the compliance curve, taking the curve out to 2045 and an automatic adjustment mechanism (AAM) to help the program self-correct for surplus credit inventory as defined. The amendments to the compliance curve when modeled in a 10-year HRI program window result in a significant reduction of HD HRI credits generated than what was originally contemplated. CHC's estimate, using a zero-throughput assumption (baseline), results in a 19-23% reduction in HRI

credits generated over the 10-year term under a 7% stepdown and 25% reduction target by 2030 scenario. A larger stepdown and steeper slope will result in even more lost credits. Regardless of the LCFS credit price, this is a significant reduction in the number of credits for developers.

Every HRS developer uses different assumptions for station capital costs, operating costs, projected throughput and LCFS credit price. Using a zero-throughput scenario, independent of any of these variables, a 23% reduction is significant. While each developer will have their own models that predict the impact on returns, all will show this reduction in credit generation is significant and will negatively affect investment decisions.

While the amendments to the LCFS are aimed at boosting the credit price, it may take years for this to happen if it happens at all. HD HRI developers are wary of LCFS price projections and will not model investments on aggressive LCFS pricing. Rather, they will take a conservative view on the forward price on which to base investment decisions.

Our recommendation is the applied HRI discount be adjusted to 39%, from the proposed 50% to account for this impact.

Assumptions - Single HRS											
3,000 kg/d HRI Credit											
Zero TP											
10 year term ('26 - '35)											
Annual HRI Credits (tonnes of CO2e)											
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Sum
Current Diesel Compliance Std.	19,185	18,903	18,672	18,339	18,056	17,774	17,540	17,210	16,928	16,646	179,252
7% Stepdown, 25% by 2030	17,598	17,097	16,641	16,095	15,594	14,592	13,627	12,587	11,583	10,581	145,994
Impact	(1,587)	(1,806)	(2,030)	(2,244)	(2,463)	(3,183)	(3,913)	(4,623)	(5,345)	(6,065)	(33,258) -23%
7% Stepdown, 25% by 2030											
61% Capacity or 39% Discount	21,470	20,858	20,302	19,636	19,024	17,802	16,625	15,357	14,131	12,909	178,113
7% Stepdown, 25% by 2030											
50%	17,598	17,097	16,641	16,095	15,594	14,592	13,627	12,587	11,583	10,581	145,994
60%	21,118	20,516	19,970	19,314	18,713	17,510	16,352	15,105	13,900	12,697	175,193
62%	21,822	21,200	20,635	19,958	19,336	18,094	16,897	15,608	14,363	13,120	181,033
70%	24,637	23,936	23,298	22,533	21,831	20,428	19,077	17,622	16,216	14,813	204,392
75%	26,397	25,645	24,962	24,142	23,391	21,887	20,440	18,881	17,374	15,871	218,992

Light-Duty Hydrogen Refueling Infrastructure Credits

The (LD) HRI program as originally implemented was working as intended with station providers opening up to eight stations in a single year (2021) when credit prices were healthy. The LCFS program had effectively dealt with the “chicken-or-the-egg” challenge by incentivizing private investment and building stations of adequate size to satisfy drivers’ needs. The effective halt to building more stations is a direct result of credit prices falling to unprecedented low levels.

We are confident that CARB will implement policies to bring the credit prices back to sustainable levels, however, the proposed 600 kg/d capacity cap will disincentivize the building of stations to serve the existing LD population as well as the larger format medium-duty pickup trucks and work trucks being announced and demonstrated by multiple automotive manufacturers. These trucks will fuel at the neighborhood fueling stations, as they do now, and under sizing HRS will exacerbate vehicle queueing, congestion, delivery challenges and economic hurdles experienced with the first generation, low-capacity, and single dispenser HRS. California's regulatory requirements and learned experience with low capacity HRS further necessitates and informs that we should not incentivize stations under 1,200 kg/day of capacity. Therefore, we urge the LD HRI to be maintained in its current, successful form.

Equitable Policy Design

Absent direct access or specific hydrogen tariff's, grid-tied hydrogen production is significantly disadvantaged to charging and other fuels by the proposed requirements in the LCFS draft. Hydrogen production with the appropriate policy signals can help manage and mitigate issues that result from a grid with a high concentration on variable renewable electricity while also reducing the ratepayer impacts that are associated with managing these variable renewable resources by allowing deeper penetration of renewable energy throughout the economy and the recovery of costs from curtailment or over-procurement.

Under the current LCFS regulation at §95488.8(i)(1), electrolytic hydrogen producers that produce hydrogen fuel for direct use as a transportation fuel or hydrogen used to produce a transportation fuel can source low carbon intensity electricity through the use of book-and-claim accounting by acquiring renewable energy certificates (RECs) from electricity produced within the same balancing authority or consistent with CPUC §399.16(b)(1) within the most recent three calendar quarters.

Under CARB's proposed revisions to the LCFS program at §95488.8(i)(1)(C), it will be considerably more difficult for hydrogen producers to source low carbon intensity electricity than under the current LCFS regulation. Only the deliverability requirement would remain the same as in the current regulation. CARB is proposing to impose the following limitations and requirements on the use of low carbon intensity electricity in hydrogen production:

- Contracting method- REC sourcing would no longer be sufficient. Hydrogen producers would need to be the first contracted entity for procuring the electricity via power purchase agreement (PPA).
- Additionality- Existing low-CI power sources would no longer be acceptable, only new or expanded production on or after January 1, 2022, or within three years of the start of the hydrogen production facility whichever is later would be acceptable.
- Temporal period- the temporal period would be narrowed to one calendar quarter.

We understand that these proposed amendments are intended to address concerns of consequential emissions, and some of these might be necessary outside of California, however the culmination of energy and climate policies in California provide sufficient and comprehensive guardrails to avoid these concerns.

California’s policies have long contemplated the impacts of shifting demand from fossil fuels to decarbonized energy resources. Protections have been well established in statute and across regulatory programs to prevent new electric loads from increasing emissions in California. The combination and interaction of the Renewable Portfolio Standard (RPS) and Cap-and-Trade program will prevent emissions from occurring, even without hourly time matching and strict additionality. The hydrogen facilities and the utilities that will serve them are not somehow exempt from California’s climate policies so importing unspecified power to serve electrolyzer loads is not legal or possible.

The California Cap-and-Trade is an enforceable binding and declining cap on greenhouse gas emissions. The RPS is an enforceable binding compliance obligation. Neither RPS or Cap-and-Trade obligations change if load is shifted from fossil fuel to electricity or e-fuels like electrolytic hydrogen production. RPS annual compliance obligations are assumed into Electric Distribution Utility (EDU) load forecasts that inform Cap-and-Trade allocations. EDUs in their Integrated Resource Plans (IRP) balance their obligations with RPS with their obligations to reduce emissions under cap-and-trade. This balance in renewable procurement with declining carbon emissions and the cost of carbon inform modeling that dictates what generation resources are procured.¹ The key concern is that clean capacity expansion on the grid is not keeping pace with demand. However, the requirement to update load forecast and continually plan for that forecast through increasing the capacity expansion order under the IRP directly mitigates these concerns in California.

California’s Electric Planning – A Complex Ecosystem

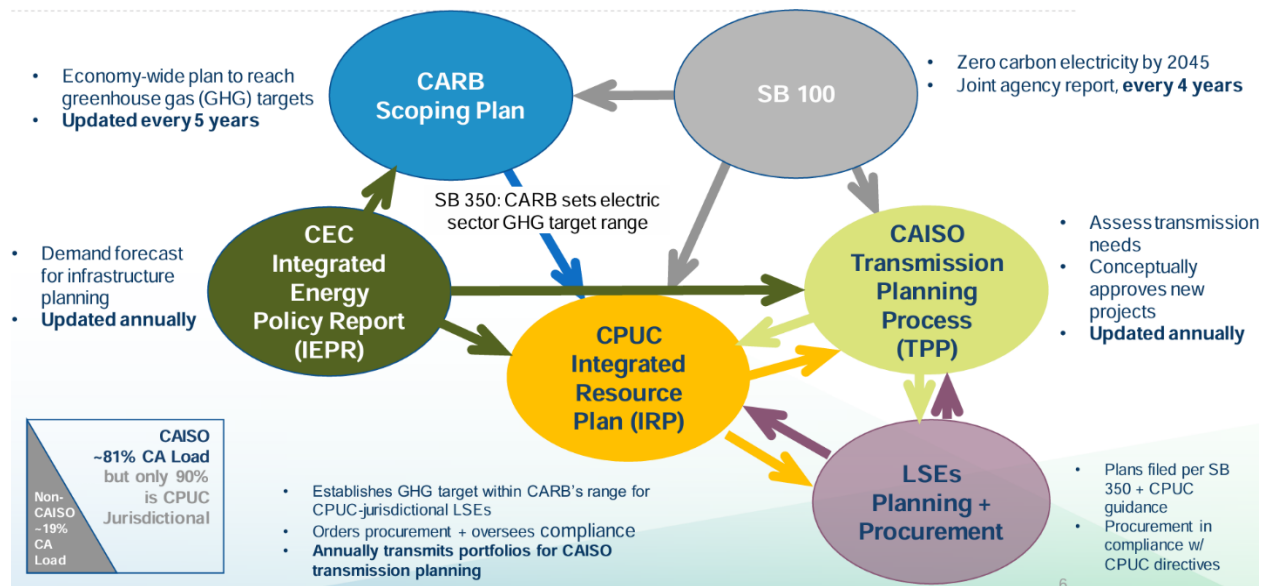


Figure 1: Commissioner Gunda’s Presentation to Assembly Energy and Utilities Committee on February 20, 2024, describing the layered policy interactions that help ensure our renewable energy and climate goals are achieved.

¹ Pub. Util. Code section 454.52 and 9621

In their February 12, 2024, letter to Governor Newsom, a coalition of environmental organizations including California Environmental Voters, NRDC, EDF and the Sierra Club, among others, write “If you redirect existing renewable energy sources from the current users of that power, those households and businesses will still need electricity and in California that means more gas plants will need to be fired up”. The letter goes on to say, “Allowing hydrogen producers to add substantial new electricity demand on the grid and cannibalize existing clean energy to meet that demand will drive increased fossil fuel generation to fill the gap and significantly compromise the achievement of a zero-emission grid by 2045.”

These letters describe resources shuffling, which is expressly prohibited in California law. Simply put California does not allow redirection of existing renewable energy sources that result in increasing carbon emissions within the west as we transition to a zero-carbon electric system. Section 454.53(a) of the Public Utilities Code states,

“It is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. The achievement of this policy for California shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling. The commission and Energy Commission, in consultation with the State Air Resources Board, shall take steps to ensure that a transition to a zero-carbon electric system for the State of California does not cause or contribute to greenhouse gas emissions increases elsewhere in the western grid, and is undertaken in a manner consistent with clause 3 of Section 8 of Article I of the United States Constitution. The commission, the Energy Commission, the State Air Resources Board, and all other state agencies shall incorporate this policy into all relevant planning.”

We agree hydrogen production will increase demand on the energy grid. Building electrification for commercial and residential properties, ports infrastructure, electric vehicles and proposed legislation like AB 841 and AB 2083 (Berman, 2023 and 2024) call for the electrification of industrial processes – none have prompted a discussion around renewable power sufficiency, displacement, or fears around resource shuffling, etc. Energy demand is factored into the utility Integrated Resource Plans, so why is hydrogen production being held to a different standard or being pushed outside the grid? Particularly as hydrogen seeks to replace the energy demand of fossil fuels and fossil fuel production. As it relates to the concerns, we suggest a more comprehensive and non-discriminatory policy actions:

- Develop a comprehensive strategy (utilizing the Scoping Plan, IERP, and IRP) that contemplates the benefits of load management, reliability, resiliency, mitigation of negative climate externalities (specifically biomass and biogas) and systematic integration across time and geography to inform a hydrogen production strategy that allows it to compete and displace gasoline, diesel, and natural gas. Fundamental to this strategy, California should contemplate either:
 - Exemptions from the direct access cap for hydrogen production. This would allow facilities to sign PPAs and more readily control their cost structure.
 - Develop an electric tariff that allows hydrogen to be cost-effectively produced and contemplates how hydrogen production can load follow.

- Appropriate rate design will leverage abundant renewable electricity and reduce the approximately 2.5 TWh of curtailed wind and solar while recovering ratepayer costs that would otherwise be wasted.
- Get renewable energy projects on-line sooner. On average California is building 2GW of new renewable projects per year, at our peak 2.7GW, yet we need to build 7GW annually to meet our 2045 goals.
 - Permitting, interconnection, transmission are all challenges.
- Implement policies that support the transition of existing gas infrastructure to hydrogen.
 - The ability to leverage existing thermal electric generation facilities to provide clean firm dispatchable power will help achieve our RPS and SB 100 goals, as well as better match renewable resources to demand, helping to alleviate transmission constraint.
- Support the adoption of the Joint Utilities Blending Application to evaluate the feasibility and safety of hydrogen blending in existing gas pipelines as a near term strategy to facilitate lower cost transport and in support of establishing a hydrogen injection standard, and ultimately transition of the pipeline system to 100% hydrogen.
- Support the passage of legislation enabling a renewable gas standard in California’s pipelines and ultimately transition of the pipeline system to 100% hydrogen.

Policies that set unnecessary, differential, and higher standards on hydrogen production will hamper and slow progress toward deep economy wide decarbonization as clean and renewable hydrogen is key to decarbonizing our massive use of molecular fossil fuels today. Molecular fuels are also key to ensuring reliability, fuel diversity and resiliency for our power sector in addition to our transportation sector - as such clean and renewable hydrogen is a necessary component of our clean energy portfolio going forward and will serve as a key enabler of electrification. If we do not have a way to decarbonize molecular energy, the ratepayer impacts that are currently coming to the forefront will only be exacerbated and California will ultimately fail to achieve our climate change goals.

We urge CARB to strike the proposed changes to hydrogen production that further burden the development of this clean and renewable energy carrier.

Conclusion

We appreciate CARB staff’s work on the development of the proposed rule and their commitment to improving the LCFS. Successful adoption of battery and fuel cell electric vehicle technologies requires changes in LCFS to reinforce market pricing, parity in policy, and encourage deployment of fueling and charging infrastructure for zero-emission fleets. The undersigned associations and non-profits will continue to support the development of vehicles, infrastructure, low-carbon, zero-carbon, and renewable hydrogen needed to build this market and reduce emissions. We look forward to continuing to work with CARB staff on the necessary details to finalize this rulemaking proceeding.

Thank you,

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