

**DOCKETED**

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*Comment Received From: Mikhael Skvarla*  
*Submitted On: 4/3/2020*  
*Docket Number: 19-ALT-01*

**California Hydrogen Coalition Comments on CTP 2020-2023  
Investment Plan and March 3rd Advisory Committee Meeting**

*Additional submitted attachment is included below.*



April 3, 2020

California Energy Commission  
Re: Docket No. 19-ALT-01  
1516 Ninth Street  
Sacramento, CA 95814-5512

Re: Comments on the Clean Transportation Program 2020-2023 Investment Plan and March 3<sup>rd</sup> Advisory Committee Meeting

The California Hydrogen Coalition (CHC) appreciates the opportunity to provide comments on the 2020-2023 Clean Transportation Program (CTP) Investment Plan and March 3<sup>rd</sup> Advisory Committee (AC) meeting. We appreciate the work that the California Energy Commission (CEC) Staff and the AC put into presenting this information to the public.

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 fuel cell electric vehicles (FCEVs) will play a critical role in California's transition to a zero-emission transportation sector because of the advantages this technology already provides with respect to range, size, 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 supporting opportunities to decarbonize locally owned fueling stations throughout California. FCEVs and hydrogen closely emulate existing consumer behavior for the gasoline-vehicle experience which eliminates the pressure to change consumer behavior. We are excited and prepared to deliver accelerated adoption of this ZEV technology over the next several years.

The purpose of the CTP is to develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change goals. It is through this lens that we support the CEC's focus primarily on ZEVs. However, we are concerned with the CEC's direction as it relates to the build-out of hydrogen infrastructure. At the March 3<sup>rd</sup> AC Meeting, discussion of the CTP as it pertains to ZEVs was framed as (1) whether and how to front-load and otherwise increase the effectiveness of support for charging infrastructure, and (2) whether to end support for hydrogen refueling infrastructure at 100 publicly available stations. This framing creates a false choice; for the CTP to be most effective and efficient in the use of public funds, the question for how to increase the effectiveness of support for infrastructure that enables acceleration and scale in ZEV adoption should apply equally to charging and hydrogen fueling, without limitation. The CHC encourages the CEC and AC to



frame the emphasis on “finishing the launch” of ZEV in California – both BEV and FCEV – with sustained and evolving mechanisms for public support of infrastructure investments that enable widespread vehicle adoption. It is ultimately through the vehicle adoption and charging/fueling with low-carbon energy that California’s emission reduction and climate goals can be achieved.

### **Confidence in Sustained Public Support is Essential**

Today, 30 years after the ZEV Mandate was established and with 30 years remaining until our 2050 goals, California is only 14% of the way to its intermediate goal of 5-million ZEVs by 2030 ([B-48-18](#)). Acceleration and scale in widespread adoption of ZEVs will be needed, which can be accomplished through an increasing range of options that provide compelling propositions to broader market segments.

For example, the range and fast refueling of FCEVs will be important for ZEV adoption amongst super-commuters driving from the Central Valley and Inland Empire, the millions living without access to home or workplace charging, and commercial fleet vehicles with high utilization ranging from light-duty vehicles using a retail network of fueling stations to heavy-duty trucks and transit buses. The evidence already shows this selection of service in ZEV adoption, with light-duty FCEV in California averaging 10,000 to 14,000 miles per year while light-duty BEV average 6,000 to 9,000 miles per year. It also means the emission reduction benefit per light-duty vehicle today is approximately 1.5 times greater with FCEVs than with BEVs.

In order to meet the critical 2030 milestone for ZEV adoption, we encourage the CEC to allocate the full \$20 million per year as intended to light-duty hydrogen refueling infrastructure through 2023 for a total of \$80 million instead of the \$65 million proposed in the CTP. This will fund the innovative structure the CEC created in GFO-19-602 that is poised to support the next halving of cost and doubling of performance and continue the off-ramp in direct public funding for hydrogen refueling capacity.

As direct public funding off-ramps, there is a need for continued innovation to pivot public policies toward market-based mechanisms. This policy design for transition is imperative to enabling the scale and pace of expansion to achieve and derive benefits from California’s policy goals. The Air Resources Board’s own analysis shows the potential for leveraging approximately 6% public funding for 94% private sector investment in what could amount to a major hydrogen infrastructure economic stimulus for California.

Clearly a “bare minimum” approach of asking about the minimum possible amount of public support to hydrogen infrastructure will not be effective for the state’s goals for increasing ZEV



adoption, improving air quality, mitigating climate change, and increasing employment and economic development in California through private investment.

Notwithstanding new transit fleet requirements, we would caution against directing any of the \$80M towards heavy-duty. The innovative structure in GFO-19-602 is poised to deliver the next step in progress for the retail hydrogen fueling network, and must be funded with the entire \$80M for the multi-year structure to be effective in supporting the efficient programmatic development of hydrogen stations and expansion of FCEV that underpins significant private investments in dedicated hydrogen production. The appearance of calling this funding into question at the CTP workshop on March 3<sup>rd</sup> may already have had negative impact on industry confidence and results of the GFO-19-602 solicitation. Furthermore, the light-duty sector is poised to accelerate in FCEV sales but has been limited by the slow rollout of stations after five years without a Grant Funding Opportunity, and struggled with fuel supply disruptions caused by this lack of sustained rollout and expansion in demand. A number of automakers have delayed bringing cars to market due to the uncertainty of consistent and full state support, specifically citing the lack of infrastructure to support drivers. It is essential to the state's objectives to signal with confidence the intent to fully fund GFO-19-602 for light-duty retail fueling infrastructure.

The CHC also supports greater investment in the FCEV and hydrogen fueling infrastructure for commercial fleet, medium-duty, heavy-duty, and transit segments. The use-case for hydrogen FCEVs and opportunities for emission reduction in these segments are both strong. However, the solutions in technology, infrastructure, and customer value proposition are different for these segments than for retail light-duty vehicles in important ways. To be most effective, public support and policies therefore need to be tailored to these segments. We would encourage the CEC to work with the Air Resources Board (ARB) and with industry and fleet operators through workshops to grow and maximize the efficiency of the CTP and programs like Carl Moyer (\$60M annually) and the Hybrid and Zero Emission Truck and Bus Voucher Incentive Program (HVIP) (\$150M FY 2020-2021) to achieve the new zero-emission requirements being develop in ARB rulemakings.

The consistency and certainty of California policy and support for ZEVs is as important for private investment as the specific approaches. The CTP needs to provide the unquestionable confidence to the market that California will continue a path toward both ZEV technologies. For hydrogen FCEVs, this needs to include the confidence that California will support as appropriate the objective for 200 retail hydrogen refueling stations in 2025 as per Executive Order (B-48-18) and 1,000 retail hydrogen refueling stations by 2030 as per the California Fuel Cell Partnership Vision document.



## In Conclusion

Hydrogen FCEVs are emerging as an important part of achieving California’s emission reduction goals, with a rapid pace of progress in cost and carbon reductions combined with performance improvements that create an off-ramp to direct public funding, and important innovations in sustained public support and market-mechanisms that enable expansion. Consistency and confidence in public support are key to the major private sector infrastructure investment opportunity at hand. The CHC encourages continued innovation together – in policy and industry actions – toward our strongly shared objectives.

In addition to this letter, CHC has attached an addendum with specific answers to the questions in the CEC staff presentation. We appreciate the opportunity to comment and look forward to supporting the future of zero-emission vehicles and transportation infrastructure in California. If there are any questions, please contact Mikhael “Mik” Skvarla at [Mikhael\\_Skvarla@gualcogroup.com](mailto:Mikhael_Skvarla@gualcogroup.com).

Sincerely,

/s/

Joe Fawell  
President, California Hydrogen Coalition  
Vice President of Government Affairs, Air  
Liquide

/s/

Shane Stephens  
Secretary & Treasurer, California Hydrogen  
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/s/

Michael Lord  
Board Member, California Hydrogen  
Coalition  
Executive Engineer, Toyota Motor  
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Enclosure: Addendum to CHC Comments – Responses to CTP AC 03.03.2020 CEC Staff Questions

cc: The Honorable Patricia Monahan  
Advisory Committee Members  
Drew Bohan, Executive Director, California Energy Commission  
Kevin Barker, Deputy Director, Fuels and Transportation Division



**Addendum**  
**Responses to CTP AC 03.03.2020 CEC Staff Questions**

**Background and Context for Hydrogen FCEV and Refueling Infrastructure**

From a global perspective, activity in hydrogen mobility is increasing and rapid progress is occurring. In Germany and across Europe there are 177 hydrogen refueling stations (HRS) open and 45 HRS in development, in Japan 114 HRS are operational with 160 expected by the end of 2020, in Korea 89 HRS open and 310 HRS by 2022. According to H2Stations.org at the end of 2019, there were 432 HRS worldwide, with 330 publicly accessible stations quadrupling the available HRS for FCEVs in just five years. Major FCEV manufacturers have announced their next steps in scale of manufacturing, including Toyota at 30,000 per year and Hyundai at 40,000 per year, and plans for an increasing range of makes and models that will be important for increasing widespread adoption of ZEVs in California. The Hydrogen Council now represents major private capital looking to invest in hydrogen, with 81 members having expressed a combined intent to invest \$280 billion before 2030.

In California, the cost of hydrogen refueling stations have approximately halved while capacity has approximately doubled already twice over two funding cycles from the California Energy Commission (PON-X, GFO-15-605), substantially increasing the cost-effectiveness of public funds per station refueling capacity to serve FCEVs over the past 5 years. An off-ramp from direct public funding of hydrogen infrastructure is already underway through the combined good efforts and success of the CTP through CEC administration and industry.

California policy-makers and agencies have recently taken important steps in policy innovation to increase the effectiveness of public support for charging and hydrogen fueling infrastructure, including the Fast Charging and Hydrogen Refueling Infrastructure pathways in the Low Carbon Fuel Standard, and a multi-year network-based structure in Grant Funding Opportunity (GFO-19-602) to enable a programmatic approach to hydrogen refueling station development. The results of GFO-19-602 with Notice of Proposed Award expected in June this year will provide important insight as to the continued trends in declining cost and improving performance in hydrogen fueling infrastructure.

The CHC encourages full funding through the CTP of GFO-19-602 for retail hydrogen fueling stations and encourages review of these applications to inform CTP investment planning.

In this context, California's leadership in supportive policy is more important than ever because its effects are starting to amplify. The trends of decreasing cost and decreasing direct public support while increasing capacity and performance are moving in the right directions for



effective, responsible and continued public support for hydrogen refueling infrastructure. Now is precisely the time for California to signal confidence in continuing support for hydrogen, and continuing policy innovation, both for critical contribution to California emission reduction goals and increasing impact through actions in other jurisdictions that are following California's lead.

## **Responses to Specific Questions**

During the March 3<sup>rd</sup> AC Meeting, CEC staff asked a series of questions for consideration. CHC appreciates the opportunity to provide responses to the key questions being factored into the CEC and AC discussions on spending priorities.

### ***Key Questions for CTP and Investment Plan – Context and Priorities***

*Is there additional context that we should factor into our decision-making on priorities?*

CEC staff did a good job laying out the statewide goals, vehicle regulations, fuel regulations, and complimentary funding programs as they relate to the CTP. In the spirit of California's foundational climate change policy AB 32 (Núñez, Chapter 488, Statutes of 2006), CHC proposes looking across the Scoping Plan and California's Air Quality Programs to include policies like the Short-lived Climate Pollutant Strategy which requires reductions in methane and black carbon – both can be achieved through renewable hydrogen production pathways like biomethane steam reformation and thermochemical conversion of biomass.

The opportunities with hydrogen for cross-sector benefits in California should be considered and enabled through coordination of the CTP with other policies and programs. For example, increasing the renewable content and decarbonizing the hydrogen supply for use in transportation can be coupled with the power sector to improve reliability and resilience in California energy systems and can be coupled with waste disposal to mitigate challenges and fugitive emissions from agriculture and municipal solid waste sectors. Investment in decarbonized hydrogen production can then decarbonize other hard-to-abate sectors like industrial and commercial applications. The opportunities for California policy objectives with hydrogen are broader than transportation, and therefore need a coherent set of policy signals that are broader than the CTP. The CHC encourages policy-makers to develop broad-based market mechanisms supporting hydrogen that are analogous to prior successes in renewable power and solar PV: an increasing renewable content requirement on par with electricity, an investment tax credit similar to what has worked for Solar PV, and a clean hydrogen blending standard into natural gas similar to what has worked in the Renewable Portfolio Standard for electricity.





Consideration of these co-benefits and creating a positive externality for the mitigation of short-lived climate pollutant emissions through commoditization could provide cost-savings to ratepayers, businesses, and the public sector while encouraging the transition to a lower-carbon content hydrogen fuel. Cross regulation strategies that lower compliance costs and renewable fuel costs fit the intent of AB 32 to “maximize additional environmental and economic co-benefits for California.”

*Do we have the right program funding priorities (ZEVs, ZEV infrastructure, near- and zero-emission fuels, equity)?*

The CHC agrees with the funding priorities. We have seen that infrastructure is critical to achieving California’s climate change and ZEV transportation goals as it provides the essential assurance to consumers in their decision to adopt the ZEV option for their mobility needs.

In hydrogen FCEVs, customers have been impacted by the lack of sustained investment in infrastructure with fewer than expected hydrogen refueling stations open and less than expected reliability in hydrogen supply. The bad news is this has translated to less consumer confidence in adopting a FCEV. The good news is this can be corrected simply by moving forward and continuing existing programs like the GFO-19-602 and LCFS HRI pathway.

*Are we missing any important activities?*

For BEV charging infrastructure, the CEC is seeking to address plateaued BEV sales through prioritizing and increasing investments but may not be adequately considering how direct public funding can off-ramp to market-based mechanisms without socialized costs before the scale becomes unaffordable.

In contrast for FCEV fueling infrastructure, the CEC has established a trend of decreasing direct public funding through grant funding without otherwise socializing costs, but may be seeking to complete this off-ramp in too much haste and may not be adequately considering opportunities for targeted support to accelerate adoption while the scale and affordability are relatively small.

The CEC would do well to take an approach from Venture Capital, to achieve with each action the biggest increments of progress toward de-risking and off-ramping from direct public funding.

*How should we approach the new concept of multi-year funding allocations?*



The multi-year and network-based structure in the GFO-19-602 solicitation for hydrogen refueling stations will be effective in enabling efficient programmatic infrastructure development that gives confidence to customers, enables significant cost reduction, and underpins associated infrastructure development for hydrogen supply. We commend the CEC for the thoughtful series of workshops in late 2017 that led to the development of this innovative structure. The CTP should clearly fully fund this GFO with the full \$80M, for the intended purpose of retail hydrogen refueling stations serving light-duty vehicles and commercial fleets where synergistic.

A similar approach should be created to fund hydrogen refueling infrastructure for commercial fleet, medium-duty, heavy-duty, and transit segments. Differences in technology, use-case, infrastructure, and customer value proposition warrants structuring a separate funding mechanism(s) to be most effective.

Certainty in multi-year funding allocations to these structures is essential for the confidence to invest a growing proportion of match share, and in associated non-funded areas. Authorizing legislation and Executive Orders establishing intent, combined with clarity in plans like CTP, can sufficiently de-risk the political uncertainty to make these multi-year structures investable.

The CHC is also encouraging policymakers to complement such multi-year funding allocations for decreasing direct public funding with broad-based market mechanisms supporting hydrogen. Examples include the Hydrogen Refueling Infrastructure (HRI) pathway in the Low Carbon Fuel Standard that currently applies to retail light-duty refueling stations and could be expanded when appropriate to certain other segments, and analogs to prior successes in renewable power and solar PV: an increasing renewable content requirement on par with electricity, an investment tax credit similar to what has worked for Solar PV, and a clean hydrogen blending standard into natural gas similar to what has worked in the Renewable Portfolio Standard for electricity.

***Key Questions for Medium- and Heavy-Duty Zero Emission Vehicles and Infrastructure***  
*Is the proposed funding approach (decrease in FY 2020-21; increase in the following 2 ½ FYs) the best approach for the MD-HD sector?*

Evolution in the approach to funding in the CTP will be most effective when matched to the status, needs, and readiness of the private sector to deliver on policy objectives. For medium and heavy-duty ZEV, both BEV and FCEV, first-generation products in both vehicles and charging/fueling are starting to come to market; funding support through the CTP has been appropriately directed toward pilot projects that address the gap in Total Cost of Ownership for adoption by fleet operators.



As industry is ready to scale deployment with lower-cost and high-performing second-generation products, which thereby decrease the TCO gap and need for direct public funding, there will be an opportunity as with light-duty vehicles to create an appropriate multi-year and network-based structure for efficient programmatic infrastructure development that gives confidence to customers, enables significant cost reduction, and underpins associated infrastructure developments for energy supply.

In general, the proposed approach to medium- and heavy-duty ZEV infrastructure of increasing funding in 2021 – 2024 is good, with suggestion to provide certainty of continuing through 2030.

*Which of the following concepts should be prioritized? Are there others that should be considered?*

The emphasis should be on infrastructure, with initial pilots and demonstrations intended to make the most rapid progress toward the ability to scale with cost and performance improvements. This enables a pivot toward multi-year structures with decreasing funding per unit while the number of infrastructure units greatly expands.

Early improvements in public health and emission reduction goals can be achieved with focus on freight and marine/rail infrastructure.

Transit bus and school bus infrastructure may require somewhat different approaches in the CTP to be most effective due to the distinct technology and use case combined with existing structures of significant public funding in general.

*How should we account for the impact of current and anticipated MD/HD CARB regulations (e.g. Innovative Clean Transit; Advanced Clean Trucks)?*

California's experience to date has clearly shown that for regulations that require ZEVs – like ICT and ACT – to be successful, the supporting infrastructure must be built somewhat in advance of vehicle adoption. The CTP and CEC hold critical roles for ensuring this successful outcome and must therefore plan effective funding programs now in anticipation and support of the ICT and ACT regulations taking effect.

CEC and AC should fully examine the existing funding, incentive, tax, and market opportunities for heavy-duty and transit including, but not limited to, Carl Moyer, the Hybrid and Zero Emission Truck and Bus Voucher Incentive Program (HVIP), and Proposition 1B. With a comprehensive snapshot, policymakers should consider adapting or tailoring those programs for the current and anticipated MD/HD CARB regulations. As regulations focus on requiring



new zero and near-zero emission technologies, funds for retrofits of existing fleets could be transitioned to purchasing new trucks and buses as well as the necessary fueling infrastructure.

### ***Key Questions for Hydrogen Refueling Infrastructure***

*AB 8 (2013) requires \$20 million annually until there are at least 100 publicly available hydrogen stations. Once 100 retail hydrogen stations are open, should funding continue?*

Yes, funding under AB8 should continue at \$20 million annually through the full period of authorization and for the intended purpose of retail light-duty fueling stations regardless of the number of hydrogen stations open (i.e., potentially going beyond “at least” 100). The confidence in fully funding GFO-19-602 is essential to realizing the private sector investments and improvements in cost and performance. To pull back when on the doorstep of this accomplishment would be foolish.

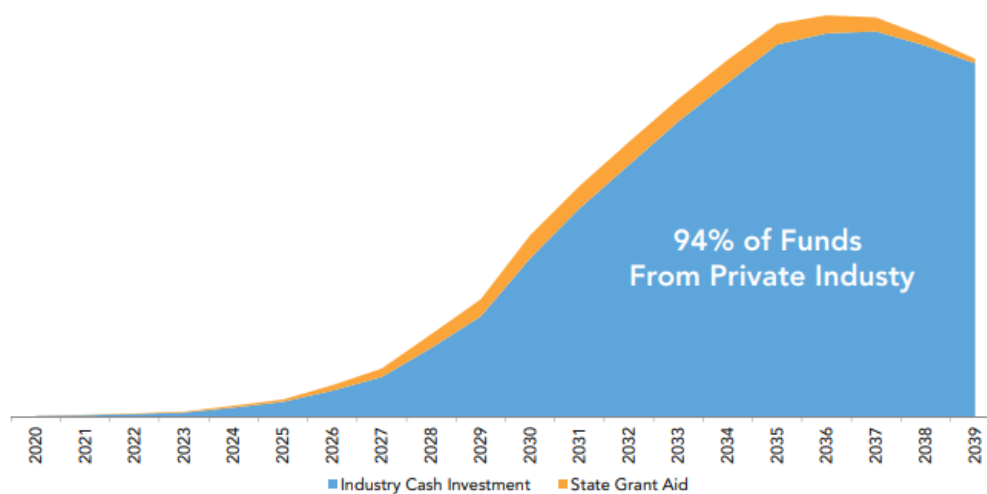
Frankly, CHC is concerned about waning support of light-duty FCEVs prior to finishing the launch of stations to commercial viability and completing the obligations set forth in a series of executive orders. In Governor Brown’s 2018 State of the State, he announced Executive Order B-48-18, an eight-year initiative to continue the state’s clean vehicle rebates and spur more infrastructure investments. This \$2.5 billion initiative included a goal of 5 million ZEVs by 2030, 250,000 charging stations, and **200 hydrogen fueling stations in California by 2025**. AB 8 (Perea, Chapter 401, Statutes of 2013) indicates, “the [CEC] shall allocate twenty million dollars (\$20,000,000) **annually** to fund... **at least 100 publicly** available hydrogen-fueling stations in operation in California.” Contextually, CHC urges CEC to *finish the launch* which, pursuant to B-48-18, includes 200 retail fueling stations supporting light-duty FCEVs.

It is with this foundation that the hydrogen economy can develop, including economies of scale in fuel cell manufacturing that transfer to commercial fleet and medium to heavy-duty applications, economies of scale in hydrogen station equipment manufacturing and operation(s) that transfer to commercial fleet applications, and development of next-generation vehicles and fueling infrastructure for these other segments. While economies of scale in dedicated, renewable, and decarbonized hydrogen production can be accelerated by commercial fleet adoption and medium to heavy-duty FCEVs, the development of these segments cannot occur effectively without first completing the launch of light-duty FCEVs. Also consider the most effective approach to hydrogen fueling and supportive programs will differ between light-duty and heavy-duty applications. To shift emphasis in hydrogen fueling infrastructure from light-duty to heavy-duty prematurely or to merge funding for these purposes would be a mistake.



The opportunities with successful launch of hydrogen FCEVs in California are nothing short of a major infrastructure stimulus to employment and private investment in the state, with cross-sector benefits for a reliable, resilient, and decarbonized energy system and hard-to-abate sectors. A broad range of FCEV makes and models will enable widespread adoption of ZEVs; dedicated new hydrogen production and distribution infrastructure can be decarbonized from 100% renewable resources with the right policy signals; coupling hydrogen production with renewable power generation can improve electric grid reliability and resiliency; producing hydrogen from agricultural and municipal wastes can mitigate waste disposal challenges while producing renewable fuel. Perhaps most importantly, unlike most other emerging technologies, a very large share of total investment can come from private investment, effectively leveraging the relatively small, albeit critical, public support (Figure; source: 2019 AB8 Report).

**FIGURE 45: ILLUSTRATIVE DIVISION OF NETWORK FUNDING SOURCES**



[HTTPS://WW2.ARB.CA.GOV/RESOURCES/DOCUMENTS/ANNUAL-HYDROGEN-EVALUATION](https://ww2.arb.ca.gov/resources/documents/annual-hydrogen-evaluation)

There are only two ZEV technologies, both fill important roles for different consumers across California’s diverse social, economic, and geographic regions. At the end of the day, it is the displacement of millions of metric tons of tailpipe pollution that is needed – this will be unlikely if California waives on its support for either of the ZEV options.

CHC believes that building out 200 publicly available retail hydrogen stations supporting light-duty vehicles with the CTP and LCFS as soon as possible is a critical enabling policy, as well as continuing on to 1,000 hydrogen stations by 2030. This support, set to be accomplished through GFO-19-602, should rightly be complemented by the continuation and further development of programs supporting fleet adoption and fueling infrastructure for medium and heavy-duty FCEV.

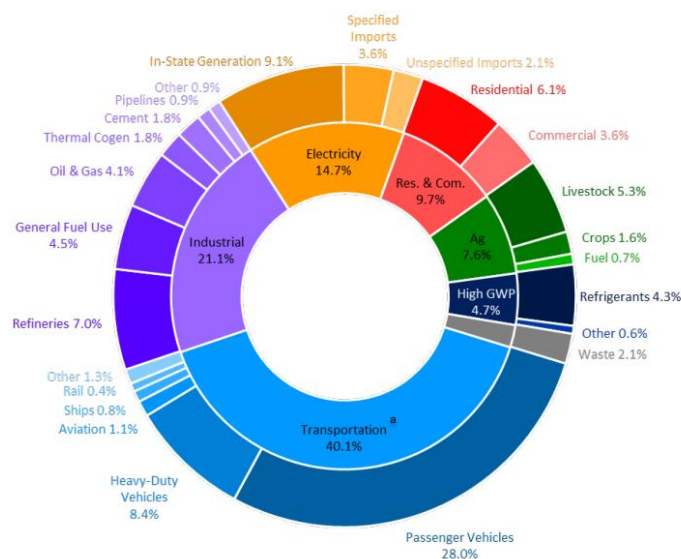


We acknowledge there have been mistakes and lessons learned in the early phases of hydrogen fueling infrastructure, caused in part by a lack of sustained support and infrastructure development to support a successful market launch. Single source supply issues, station capacity, and lack of public funding for five years are all contributing factors to the concerns being raised by the Commissioner, CEC Staff, and some AC members. We must keep in mind the success of renewable energy in California was due to the willingness of the CEC and others to overcome those failings by continuing to support manufacturers, developers, customers and utilities in order to achieve the end goal.

*How much should the program focus on light vs. heavy duty hydrogen infrastructure, especially given new regulations on transit fleets?*

While CHC supports the deployment of fuel cell buses and heavy-duty trucks, we do not support diverting the current \$20M per year allotted to light-duty hydrogen stations for use on transit fleets or heavy-duty infrastructure. We believe there are several dedicated funding and incentive programs for transit and heavy-duty which should be adapted to support deployment of hydrogen in those sectors. CHC will actively work with the Commissioner, CEC staff, and the AC to highlight existing funding which could be adapted over time.

Furthermore, based on ARB data light-duty (passenger) vehicle greenhouse gas emissions are nearly three times greater than those of heavy-duty vehicles and over twelve times greater than aviation, rail, and ships.



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Furthermore, the implication that BEVs will fully satisfy the passenger vehicle market and hydrogen will be relegated to heavy duty is presumptive. CHC believes that both ZEV technologies are needed to meet the goal of 5 million ZEVs. Light-duty consumers are making a different decision than transit agencies, heavy and medium-duty users – different use cases, different mandates, and different financing. The CEC should honor those dynamics as they do with BEV funding and infrastructure in the CTP. While there might be a handful of opportunities where light-duty refueling infrastructure can overlap with medium-duty, heavy-duty, and transit, they are very limited. For example, light-duty FCEVs use 700 bar fueling compared to the 350 bar fueling most common with heavy duty and transit applications. Most urban and suburban fueling locations also currently do not support both heavy duty and light duty applications at the same station.

#### ***Key Questions for Zero- and Near Zero-Carbon Fuel Production and Supply***

*We intend to fund zero and near zero carbon fuel production (includes net negative fuels). These fuels may be used in ZEVs or combustion vehicles. How should we balance GHG emission reductions and technology flexibility?*

The CHC supports funding technology neutral, zero and near-zero hydrogen production pathways. With the right policy signals, the early development of new hydrogen production dedicated for use in transportation can be steered toward renewable and zero-carbon pathways. A technology-neutral approach focused on the intended outcomes – like renewable content and carbon intensity – can support and direct industry in realizing the full potential of hydrogen as a flexible energy carrier with a wide range of production pathways and feedstocks.

Hydrogen fuel production has faced several challenges at small scale that are progressively improving. Funding should balance the emission reduction opportunities with costs, scalability, and resiliency to provide the supply that will support increased vehicle sales.

*We have traditionally funded grants to biofuel production facilities, but we are now considering expanding to address system barriers, like the lack of blending equipment for biodiesel. Is this the right direction?*

A system perspective with focus on addressing barriers can be effective and developing reliable supply chains is important for market success. However, with each grant funding program the CHC would encourage the CEC to consider first how to make the use of public funds most effective, for the second objective which is sunsetting the program to an open market.



*What is the best way to scale up in-state production of renewable fuels? Are there other funding mechanisms besides grants to facilities that can be used to better scale up the market and allow CA businesses to thrive (e.g., loans)?*

The most difficult prerequisite to scale the production of renewable fuels is the firm demand for these fuels that must underpin the investment in scale. This requires market and customer confidence in the adoption of vehicles that use these fuels. The focus in the CTP on providing certainty in sustained state support for vehicle adoption and fueling infrastructure is therefore rightly placed.

An effective evolution in grant funding programs to enable scale has been accomplished and continues in the CEC GFO for hydrogen station development. With emphasis on cost effectiveness, the constant funding authorized under AB8 has stretched to increasing scale as the cost and capacity of hydrogen refueling stations has increased and the grant-funded portion of costs has decreased. The next step in this evolution released by the CEC in GFO-19-602 is the multi-year network-based approach that will enable the efficient programmatic infrastructure development that will give confidence to the market for investments in new dedicated hydrogen production.

Such evolution in grant funding mechanisms can and should be complemented with market-based mechanisms as well to enable further acceleration to scale and provide appropriate policy signals. For example, the HVDC and Hydrogen Refueling Infrastructure pathways created in the Low Carbon Fuel Standard are effective in establishing a naturally sunseting mechanism to partially offset the low initial utilization of these entirely new infrastructures, while also amplifying the policy signal in the LCFS to decarbonize these fuels. Other analogs from past success with renewable power generation and solar PV include investment tax credits and renewable portfolio standards / clean hydrogen blending standards.

These structural approaches will generally be more effective than purely financial tools – like loans with low rates and/or forgiveness or market stabilizing floors and ceilings – that do not address the underlying challenges to risk and return for a viable investment case. There is not a shortage of capital or lack of appetite for risk in renewable fuels, but rather often a lack of viable return or firm demand. These are challenges not easily solved with financing approaches, which may also have unintended consequences for increasing the inherent risks in investments undertaken.