



February 19, 2020

The Honorable Gavin Newsom
Governor of California
1303 10th Street, Suite 1173
Sacramento, CA 95814

Re: 2020-2021 Budget Request - CHBC Request to Increase Hydrogen Funding

Dear Governor Newsom:

The California Hydrogen Business Council (CHBC)¹ appreciates the commitment reflected in your 2020-21 Budget to continue efforts to make energy clean and resilient, protect the climate, and clean the air. We are especially encouraged by the inclusion of hydrogen infrastructure development in the areas of focus outlined for the Climate Catalyst Fund.

We also have four requests we hope will be addressed, in order to enable California to successfully meet its resiliency, climate, clean energy and clean air targets:

- **Acceleration of hydrogen solutions to ensure maximum energy resiliency is paired with protecting air quality and eliminating greenhouse gas emissions**, in the face of planned and unplanned power shutoffs due to wildfire other disaster risk.
- **Funding parity for both types of zero emissions electric vehicle technology**, battery and hydrogen.
- **Stable, if not increased, funding for zero emission vehicles (ZEVs) and infrastructure**, rather than a decrease over last year's budget.
- **Support for increasing and transitioning hydrogen production to zero carbon emissions and applying it help decarbonize multiple sectors**, including transportation, energy storage, electricity generation, ancillary services, industry, and buildings.

One application for hydrogen of particular urgency to California is ensuring energy resiliency without sacrificing air quality or greenhouse gas reduction efforts. To cope with power shutdown risks, Californians are turning to fossil fuel generators, and solar and battery storage are not enough to replace this need with clean alternatives because they cannot provide zero emissions power 24/7

¹ The CHBC is comprised of over 100 companies and agencies involved in the business of hydrogen. Our mission is to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems to reduce emissions and dependence on oil. The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies. CHBC Members are listed here:

<https://www.californiahydrogen.org/aboutus/chbc-members/>

under all scenarios. Stationary fuel cells used for backup generation and in microgrids are capable of long-duration storage and generation, even under extreme conditions, and while they have conventionally run on natural gas, they can run on hydrogen, and when this hydrogen is produced using renewable electricity, the result is electricity generation that emits zero criteria or greenhouse gas emissions over its lifecycle. Electrolyzers deployed on microgrids can also vastly increase the amount of intermittent renewable generation that can be utilized. The state ought to recognize the importance of hydrogen solutions to resiliency problems in its funding and policy support.

Also critical to reaching California's clean air and climate goals is supporting broad advancement of ZEVs that includes both battery electric vehicle (BEV) and fuel cell electric vehicle (FCEV) technology and their respective infrastructure. Battery and fuel cell electric transportation technologies have different strengths for various applications and situations - and are also complementary both in the ecosystem of zero emissions transportation and within vehicles that use a combination of plug in and fuel cell electric technologies. Examples of hydrogen fuel cell advantages in the mobility sector include:

- **Easy and fast fueling for all** - While BEVs are a convenient choice for single family home dwellers who can easily charge at home, FCEVs can be a better choice for the large number of consumers who lack dedicated parking at home, which includes most lower income Californians, and need the comparatively fast and centralized fueling option that hydrogen offers. Fast refueling can also be a major benefit in the heavy duty sector, where hydrogen can provide a similar fueling experience to conventional diesel and CNG.
- **Longer range with fewer resource related constraints** - FCEVs additionally offer longer ranges, which is essential for long haul, heavy duty vehicles and also can be more practical for light duty passenger vehicles. Recently the CEO of GM noted their consumer surveys show that range anxiety remains the number one barrier to mainstream adoption of BEVs.² The BEV industry is seeking to overcome this barrier with bigger batteries, but this approach risks being constrained by mineral resource availability, recycling challenges, and environmental and humanitarian impacts of mining. Light duty passenger FCEVs have achieved a 380 mile range, surpassing battery electric options, an advantage that is amplified in adverse weather conditions.³ The Hyundai Nexo is currently the electric vehicle with the farthest range, at a refueling time of less than 5 minutes from empty to full. Press reports indicate that Toyota's goal is to offer FCEV models in 2025 at the same cost as their hybrid vehicles⁴, with ranges of 400-650 miles per fill.⁵ In October 2019, press reports show

² <https://www.cnn.com/2019/11/25/perspectives/gm-electric-cars/index.html>

³ The Hyundai Nexo has an EPA rated range of 380 miles, <https://www.hyundaiusa.com/nexo/index.aspx>. The highest battery electric range listed is in the Tesla S is 335. <https://www.tesla.com/models>

⁴ <https://www.autocar.co.uk/car-news/industry/hydrogen-cars-cost-same-hybrids-2025-say-toyota>

⁵ <https://www.reuters.com/article/us-toyota-hydrogen/toyota-plans-to-expand-production-shrink-cost-of-hydrogen-fuel-cell-vehicles-idUSKBN1KG0Y0>

that Toyota's 2021 Mirai will achieve a 30% increase in range from its prior model, achieving more than 400-mile range by 2020.⁶

- ***An economical choice for the medium and heavy duty classes of vehicles*** – FCEV technology can carry more payload compared to BEVs due to their heavy weight of batteries compared to hydrogen fuel cells that make them more economical than battery electric options and can carry more freight per trip, for longer distances and faster refueling, increasing the time of availability of the vehicle for hauling freight.

In light of the important role FCEV technologies stand to play in the transition to zero emissions transportation, we urge funding parity with battery electric technologies for both vehicle market and infrastructure development. Specifically, we hope that the \$51 million one-time funding allocation in the Climate Catalyst Fund to accelerate deployment of electric vehicle charging infrastructure⁷ will include – or be matched for – fuel cell electric infrastructure. This would be aligned with your predecessor's allocation of \$92 million for FY 2018-2019 for accelerating hydrogen fueling infrastructure expansion, which regrettably did not pass out of the state legislature at that time.

It is essential that California not lose momentum on leading the way to launching the hydrogen fuel cell transportation industry at this critical and nascent time in market development. Not only would this fail to make best use of the California public funds spent thus far to help put several thousand FCEVs on the state's roads and dozens of fueling stations in place, but also would dampen confidence of multiple companies who have invested far greater sums on developing vehicle, fueling station, and fuel production technologies for the California market. With more vehicles due to enter the market over the next few years, including in the heavy duty sector which is going to need far more hydrogen than the light duty sector did when it began, now is the time to maintain investor confidence and market development. The state ought to support FCEVs across vehicle classes, as just supporting one (or neither) will severely limit the ability to scale and thus reduce cost. Increasing the volume of light duty FCEVs will improve power train cost reduction due to economies of scale, whereas bringing more heavy duty vehicles like buses and trucks on the road will create more demand for hydrogen, including renewable hydrogen per SB 1505 mandate and industry commitment,⁸ leading to efficiencies and stronger competition in the fueling supply chain. On the other hand, inadequate funding support at this juncture will stunt the growing hydrogen vehicle market and put a hold on the fuel cell market supply chain, just when the need is rising.

We recognize the consistent failure of several regions of California to meet clean air standards, the urgent necessity to comply by eliminating criteria pollutants from diesel fuel with clean transportation

⁶ <https://www.motor1.com/news/375766/2021-toyota-mirai-fuel-cell/>

⁷ p. 128, Governor's Budget Summary 2020-21


⁸ A consortium of international hydrogen industry leaders, the H2 Council, has [committed](#) to 100% decarbonized hydrogen for transportation by 2030, a goal supported by CHBC.

technologies, especially in the heavy duty sector, and the significant funding shortfall at air quality agencies to realize this goal. We therefore strongly urge that funding for clean cars, trucks and buses be increased rather than decreased over last year. Failure to eliminate diesel emissions is threatening the health of millions of Californians, especially those in disadvantaged communities.

Finally, key to enabling hydrogen to realize its full potential to reduce criteria pollutants and greenhouse gas emissions not only for disaster resiliency and transportation applications, but also for regular electricity generation, buildings, and industry, is accelerating production. This must include supporting pathways to full decarbonization, such as producing hydrogen from bio-waste feedstocks or zero carbon electricity. Numerous experts project the cost of hydrogen to plummet, due to the falling cost of renewable electricity – Bloomberg reports it could be by as much as about 80%⁹ - but also note that policy support is needed to ensure hydrogen is able to achieve the scale needed to become a key to achieving carbon neutrality. Scaling cost effective decarbonized hydrogen will become necessary to achieve SB 100 targets, which experts agree cannot be achieved with solar, wind and batteries alone, but instead will require zero carbon hydrogen gas turbine generation and seasonal, long duration storage that electrolytic hydrogen is uniquely flexible and scalable to supply. Decarbonized hydrogen will also be needed for hard to abate applications, such as freight, aviation and industrial processes. Fully unleashing hydrogen’s potential can be the source of not only environmental and public health protection, but also jobs, as new sustainable industries are created that can last into the future.

We appreciate your consideration and look forward to working with you, the legislators and relevant agencies to realize the full potential of hydrogen technologies as a key enabler of California goals. Please do not hesitate to reach out, or have your staff reach out to me any time with questions or concerns.

Regards,



Emanuel Wagner
Deputy Director
California Hydrogen Business Council

⁹ <https://www.bloomberg.com/news/articles/2019-08-21/cost-of-hydrogen-from-renewables-to-plummet-next-decade-bnef>