California
FUEL CELL PARTNERSHIP
DRIVING FOR THE FUTURE
California Fuel Cell Partnership
3300 Industrial Blvd., Suite 1000
West Sacramento, CA 95691
(916) 371-2870
www.cafcp.org
info@cafcp.org

March 30, 2020

Patrick Brecht
California Energy Commission
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket No. 19-ALT-01, Feedback on 2020-2023 CTP Investment Plan and March 3 Advisory Committee meeting

Dear Mr. Brecht,

The California Fuel Cell Partnership (CaFCP) respectfully submits this comment letter to the California Energy Commission (CEC) in response to 19-ALT-01, the Clean Transportation Program's 2020-2023 Investment Plan. The comments and feedback provided are intended as broad comments, based on learnings from our more than 20 years of collective global experience in the fuel cell electric vehicle market.

Based upon the CEC staff presentation and direction for the 2020-2023 Investment Plan, the questions posed by the Commissioner, and the discussion held by the Advisory Committee, we present the following summarized comments.

- **California needs every ZEV it can get**
- **CEC has the responsibility to aim all of California's ZEV programs towards success**
- **Acceleration of ZEVs now is critical to primary state objectives and overall success**

As a national and global leader, CEC has advanced alternative fuels and vehicles for years, including hydrogen and fuel cell technologies, through objective leadership and focused programs. Through this leadership, in coordination with other agencies and industry, CEC and California continue to make progress towards state goals and drive us all towards a clean, sustainable energy system. Collectively, great progress was made, yet our goals still lay in front of us, and now is the time to aggressively push forward. CaFCP offers the following detailed feedback and is committed to continue working closely with CEC.

California needs every ZEV it can get, and fuel cell electric vehicles (FCEVs) are critical to the state achieving its ZEV and environmental targets.

California's carbon reduction goals require successful creation of a healthy ZEV economy, across light-, medium- and heavy-duty applications, as evidenced by the state's five million ZEV goal by 2030. As the staff presentation illustrates (page 13, below), however, the state is behind on all of its ZEV and supporting infrastructure goals. With great diversity in geography, population and lifestyles, California needs a variety of ZEV choices – battery and fuel cell electric – to meet these varied customer needs and achieve state clean air and climate goals.

The fastest and most durable approach to developing a sustainable ZEV market is to encourage its creation and the success of all available technologies across all applications. Fuel cell electric vehicles are a necessary component and choice in a healthy ZEV economy, and provide the market two distinct benefits, critical to reaching state objectives.

The first is light-duty FCEVs offer high energy output, fast fueling and long range, which fill consumer market gaps in high-density housing, extreme temperature environments, super-commuters and those who prefer a conventional automotive experience. Succinctly put, FCEVs offer the performance and experience drivers expect from their vehicles with zero emission and little to no changes in behavior, creating fewer obstacles to widespread consumer ZEV adoption.

The second benefit is FCEVs afford the ZEV market a mechanism to reach economies of scale, synergistically across light- and heavy-duty applications, within the 2030 timescale that California has targeted. The success of fuel cell drivetrains, as an ecosystem, rely on a simultaneous launch of the light- and heavy-duty vehicle markets. These classes of vehicles leverage one another's economies, where heavy-duty vehicle manufacturing will only reach fuel-cell stack production economies of scale by 2030 by sharing the light-duty manufacturing base, and conversely, the retail hydrogen marketplace will achieve gasoline-like pump prices, faster, if the heavy-duty trucking sector demands hydrogen volume. The current Investment Plan properly addresses these opportunities and synergy by keeping separate light- and heavy-duty funding allocations yet recognizing and encouraging synergies when they occur.

CEC has the responsibility to aim all of California's ZEV programs towards successfully meeting California's primary objective of 5 million ZEVs by 2030, and FCEVs are critical to this success. The Clean Transportation Program provides the methodology, and now is the time for CEC to exercise best approaches across all ZEV technologies, including achieving the 200 hydrogen refueling stations target.

CEC and its Clean Transportation Program appropriately focus on ZEVs and target the achievement of the five million ZEVs, as fast and effectively as possible, to support state environmental goals. CEC's approach for BEVs and charging infrastructure reflect that approach towards achieving success; directly referencing and targeting the ZEV five million vehicle objective, developing new analysis tools (EVI-Pro), and focusing all efforts on filling the gaps identified in reaching the overarching objective. In addition, CEC recently released an RFI (20-FINANCE-01) seeking comments regarding strategies to attract private investment in ZEV infrastructure, seeking feedback on how government policies and support mechanisms can develop in tandem with private investment to scale up ZEV infrastructure rapidly and effectively[1]. These approaches are well suited to lead to success, for both the Clean Transportation Program and the state's overall environmental goals. Furthermore, the signals CEC sends to industry, investors and the public with these "aim to succeed" activities cannot be understated and have demonstrated CEC's leadership and ability in ZEV deployments.

However, it is essential CEC apply these methodologies and approaches *objectively across all ZEV technologies*, replicating BEV and charging infrastructure approaches and activities to FCEV and hydrogen infrastructure deployment. This is necessary to fulfill the mandate of the Clean Transportation Program and to meet the state's environmental goals. Creating similar gap analysis tools, such as EVI-Pro, should be relatively straightforward, and can be done with the existing contracts CEC has with NREL and its work with Air Resources Board and other resources already working on BEV and charging applications. These tools are known and identifiable within the Clean Transportation Program and will set CEC up for program and ZEV success.

In addition to the state objective of deploying five million ZEVs, the standing hydrogen infrastructure target is 200 hydrogen stations by 2025, per Executive Order B-48-18 and depicted in slide 13 of the CEC presentation. Although the Clean Transportation Program specifically cites the achievement of 100 hydrogen stations this does not preclude or negate the greater state target of 200 stations by 2025 mandated and re-affirmed by our previous and current governors, or the necessary ZEV infrastructure to support five million ZEVs by 2030 (including both charging AND hydrogen stations). As part of the CaFCP, CEC also helped identify the 1000 hydrogen station target by 2030 in support of the five million ZEVs, which should also be integrated into the Clean Transportation Program's objectives. Overall, the program needs to pivot towards these larger state objectives in terms of hydrogen and FCEV actions and commitments, quickly. CEC has the tools, experience and methodology, needing now to adjust its approach to achieving similar success for FCEV and hydrogen station deployment. Now is *not* the time to ask if the state should stop halfway to its goals. Nor is it proper to send negative signals to industry, investors and consumers about the state's ZEV commitments and future.

[1] https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=20-FINANCE-01

ZEV technologies are prioritized because of their ability to be both zero emission at the point of use and the ability to develop fully decarbonized resource pathways. FCEVs and the associated hydrogen infrastructure are true reflections of that goal and opportunity, as evident by Table 7 in the previous 2018-2019 Investment Plan's *Table 7: Expected Annual Petroleum Fuel and GHG Emission Reduction Benefits*[2]. In this analysis, CEC reported that the expected GHG emission reduction benefits from the current hydrogen station network (at the time) was already vastly greater than that of any other ZEV or near ZEV technology – despite being the last technology to enter the commercial marketplace. Similar benefits were presented in Table 9 of the same report, demonstrating the greatest NOX and PM2.5 reductions from either ZEV fueling infrastructure. This analysis highlights the environmental impact and value of FCEVs in the light-duty market today and which portends even greater for the future. The CEC analysis also demonstrated that the early hydrogen progress has significant positive impact on petroleum displacement.

Table 7: Expected Annual Petroleum Fuel and GHG Emission Reduction Benefits

Project Type	Petroleum Displacement (Million Gallons)			Greenhouse Gas Emission Reductions (Thousand Tonnes CO_2e)		
	2020	2025	2030	2020	2025	2030
Fueling Infrastructure						
Biodiesel	8.5	8.5	8.5	73.8	73.8	73.8
E85	11.1	11.2	11.2	33.7	33.8	33.8
Electric Vehicle Charging	2.8	2.6	2.6	20.9	20.0	20.0
Hydrogen	13.6	14.3	15.5	107.7	113.8	123.2
Natural Gas	35.3	35.3	35.6	87.1	87.8	87.8
Fueling Infrastructure Subtotal	*71.3*	*71.9*	*73.4*	*323.2*	*329.2*	*338.6*

Table 9: Expected Annual Air Pollution Emission Reduction Benefits

Project Type		NO_X Reductions (Tonnes/Year)			$PM_{2.5}$ Reductions (Tonnes/Year)		
		2020	**2025**	**2030**	**2020**	**2025**	**2030**
Fuel Infrastructure	Electric Chargers	1.89	1.57	1.57	0.19	0.19	0.07
	Hydrogen	9.31	8.51	9.25	0.94	1.05	0.43
Vehicles	CVRP & HVIP Support	7.06	6.44	1.83	0.11	0.09	0.05
	Medium- & Heavy-Duty	7.52	12.43	11.52	0.23	0.25	0.22
	Manufacturing	537.17	1,126.14	1,201.45	7.55	19.68	28.13
Total		**562.95**	**1,155.09**	**1,225.62**	**9.02**	**21.26**	**28.90**

[2] ARFTP 2018-2019 Investment Plan https://efiling.energy.ca.gov/getdocument.aspx?tn=223420

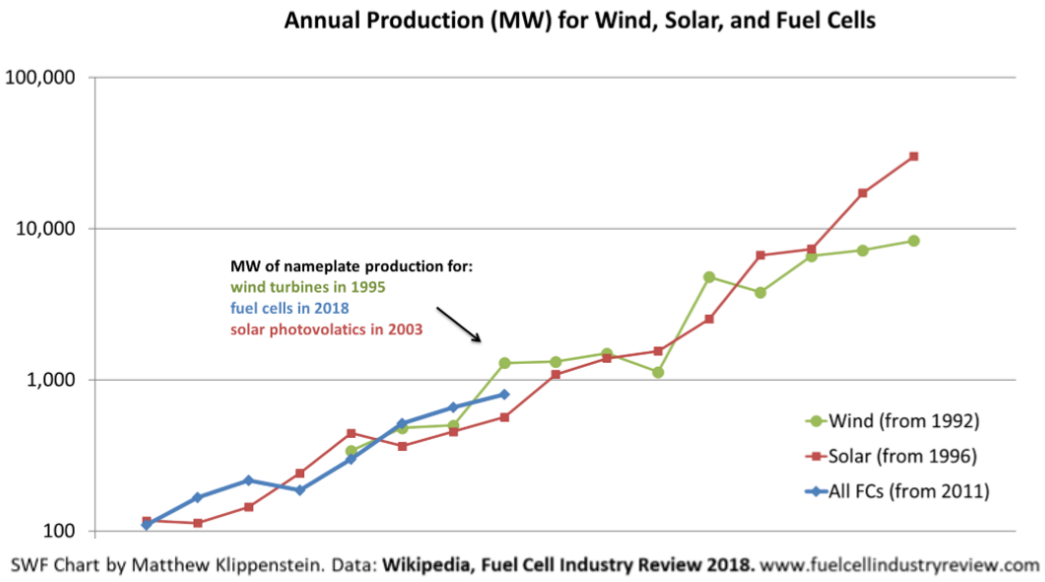
Acceleration of ZEVs, now, is critical to primary state objectives and overall success. Aggressive moves now by government (policies and signals) create faster acceleration and encourages greater private investment and public adoption overall, achieving California's environmental objectives earlier and with greater impact.

California and the Clean Transportation Program should rapidly accelerate the development of light-duty hydrogen stations. This acceleration is critical, as the FCEV market is ramping up, to achieve the economies of scale and market self-sufficiency earlier rather than later. Light-duty success will also pave the way for success in heavy-duty fuel cell transit and truck applications, leveraging supply chain and other synergies. California funding is the catalyst to achieve this market self-sufficiency. Acceleration of funding will send positive signals to industry and the public that the state is committed to achieving economies of scale, and positively encourage private investment and public adoption of FCEVs and hydrogen refueling infrastructure to achieve common goals. The recent BloombergNEF report "*Hydrogen Economy Outlook*[3]" highlighted strong public policy and support as the key element to spurring increased private investment, scaled deployments and reduced renewable hydrogen costs

The current GFO-19-602 responds to this need for accelerated light-duty hydrogen station deployments to accommodate California's projected light-duty FCEV rollout in 2021-2024, providing an immediate $45.7M and "up to $115.7M" in grant funds through new "tranches and batches" concepts. This funding approach creates greater certainty and directly encourages industry to scale up deployments, resulting in lower cost stations and hydrogen by enabling industry to make longer term contracts for larger volume purchases (and production) of equipment. It is also important to clearly articulate these funds are to be directed towards light-duty infrastructure, as originally intended because heavy-duty applications have their own Clean Transportation Program allocation for separate needs consideration. These actions would send the right signals to private industry, creating a cascade of longer-term investment commitments in the production of light-duty ZEVs, fueling infrastructure and hydrogen production, yielding further price reductions.

The Executive Order B-48-18 target of 200 hydrogen fueling stations provides the critical mass to launch a self-sufficient light-duty FCEV ZEV commercial marketplace and potentially represents one of several offramps from State of California investment. Just as early and strong support by government for solar and wind technologies led to cost-competitive market solutions today, CEC's committed support of FCEVs and hydrogen infrastructure now will lead to a sustainable, carbon-free transportation system in California. Should support wane in these early years and funding not materialize, California is at risk of missing its environmental goals and economic opportunities.

[3] https://www.bnef.com/core/insights/22567



We compliment CEC on its forethought and appreciate the opportunity to provide this feedback. We strongly encourage CEC to accelerate the funding of retail hydrogen fueling infrastructure, which will catalyze a global economic transition to a carbon-free transportation. Our door is always open to providing any additional insights, guidance and support to CEC.

Sincerely,

Bill Elrick
Executive Director