SENATE COMMITTEE ON ENVIRONMENTAL QUALITY
Senator Allen, Chair
2021 - 2022 Regular

Bill No:	SB 643		
Author:	Archuleta		
Version:	3/22/2021	**Hearing Date:**	4/12/2021
Urgency:	No	**Fiscal:**	Yes
Consultant:	Paul Jacobs		

SUBJECT: Fuel cell electric vehicle fueling infrastructure and fuel production: working group: statewide assessment

DIGEST: Requires the California Air Resources Board (ARB) to create a working group to prepare a statewide assessment of the fuel cell electric vehicle (FCEV) fueling infrastructure and fuel production needed to support the adoption of zero-emission trucks, buses, and off-road vehicles.

ANALYSIS:

Existing law:

1) Establishes ARB as the air pollution control agency in California and requires ARB, among other things, to control emissions from a wide array of mobile sources. (Health and Safety Code (HSC) §39500 et seq.)

2) Establishes the Alternative and Renewable Fuels and Vehicle Technology Program (Clean Transportation Program, or CTP), to be administered by the California Energy Resources Conservation and Development Commission (CEC), to develop and deploy technologies and alternative and renewable fuels to help attain the state's climate change policies. (HSC § 44272)

This bill:

1) Requires ARB, in consultation with CEC and the California Public Utilities Commission (CPUC), to create a working group to prepare a statewide assessment of the FCEV fueling infrastructure and fuel production needed to support the adoption of zero-emission trucks, buses, and off-road vehicles at levels necessary for the state to meet specified goals and requirements.

    a) The assessment shall be completed by December 31, 2023 and updated every two years until January 1, 2030.

2) Requires ARB to convene the working group, seek public engagement on the statewide assessment, and appoint the following members to the working group:

    a) Three members from ARB.

    b) Two members from CEC

    c) Two members from CPUC.

    d) Two members from the hydrogen industry.

3) The assessment shall:

    a) Consider all necessary fuel and fueling production and distribution infrastructure, including, but not limited to, the dispensing equipment, distribution equipment, production equipment, storage equipment, and supporting hardware and software, all vehicle categories, road, highway, and off-road electrification, port and airport electrification, and other programs.

    b) Examine existing and future fuel and fueling production and distribution infrastructure needs throughout the state, including in low-income communities.

    c) List synergies and estimate the potential for hydrogen to contribute to emissions reductions across sectors, including an evaluation of the ability of hydrogen to enable a more renewable grid, provide grid services, decarbonize hard-to-electrify industries and remote locations, contribute to microgrids, and improve energy resilience.

Background

1) *Health Impacts of Air Pollution from Trucks and Buses*. Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is known as diesel particulate matter (diesel PM). Diesel PM is typically composed of over 40 known cancer-causing organic substances such as benzene and formaldehyde. In 1998, ARB identified diesel PM as a toxic air contaminant which has been linked to increased cancer risk, respiratory and cardiac illnesses, and premature deaths. ARB estimates that about 70 percent of total known cancer risk related to air toxics in California is attributable to diesel PM. Diesel exhaust also contains

gaseous pollutants, including volatile organic compounds and oxides of nitrogen (NOx) that lead to the formation of fine particulate matter (PM2.5) and ozone.

Studies consistently show that mobile source pollution exposure near major roadways contributes to and exacerbates asthma, impairs lung function, and increases cardiovascular mortality. Unfortunately, these communities are often low-income and communities of color. Individuals living in communities located near ports and freight hubs are also subject to higher cancer risks than surrounding communities due to their increased exposure to high quantities of diesel emission fumes. Sadly, children living in these communities are also unduly burdened by adverse health impacts. Increased exposure to vehicular traffic pollution has been associated with a number of adverse childhood health impacts, including slower lung development, increased symptoms and medication use in asthmatic children, and increases in the development of asthma in children.

2) *Executive Order N-79-20.* On September 23, 2020, Governor Newsom signed Executive Order (EO) N-79-20 which established a goal that 100 percent of California sales of new passenger car and trucks be zero-emission by 2035. In addition, the Governor's order set a goal to transition all drayage trucks to zero-emission by 2035, all off-road equipment to zero-emission where feasible by 2035, and the remainder of medium- and heavy-duty vehicles to zero-emission where feasible by 2045. Under the order, ARB is tasked to work with other state agencies to develop regulations to achieve these goals taking into account technological feasibility and cost effectiveness.

3) *Advanced Clean Trucks Regulation*. On June 26, 2020, ARB adopted the Advanced Clean Truck rule, a first-of-its-kind regulation requiring medium- and heavy-duty truck manufacturers to transition to ZEVs. Beginning in 2024, ARB will require manufacturers' new truck sales in California to be comprised of a certain percentage of ZEVs. For example, 9 percent of the largest classes of trucks in model year 2024 must be zero-emission and that percentage must increase to 75 percent by 2035.

4) *Mobile Source Strategy.* On November 24, 2020, ARB released an updated draft Mobile Source Strategy that demonstrates how California can determine the pathways forward for the various mobile sectors that are necessary in order to achieve California's numerous goals and targets over the next 30 years. The 2020 Strategy intends to maximize the criteria pollutant reductions by going to zero-emission where feasible. Specifically, the 2020 Strategy calls for the

deployment of approximately 1.4 million medium- and heavy-duty ZEVs in California by 2045.

5) *ZEV Market Development Strategy.* Led by the Governor's Office of Business and Economic Development (GO-Biz), the ZEV Market Development Strategy is an ongoing collaborative effort to accelerate large scale, affordable, and equitable ZEV market development to achieve the state's ZEV goals.

6) *AB 2127 Electric Vehicle Charging Infrastructure Assessment.* AB 2127 (Ting, Chapter 365, Statutes of 2018) requires CEC to prepare a biennial statewide assessment of the charging infrastructure needed to achieve the goal of 5 million ZEVs on the road by 2030. EO N-79-20 directed the CEC to expand this assessment to support the new levels of electric vehicle adoption required.

7) *AB 8 Assessment on Hydrogen Refueling Stations.* AB 8 (Perea, Chapter 401, Statutes of 2013) directed CEC to fund at least 100 publicly available hydrogen refueling stations in California. The bill also requires ARB and CEC to jointly report annually on progress toward establishing a hydrogen-fueling network that provides the coverage and capacity to fuel vehicles requiring hydrogen fuel that are being placed into operation in the state. To date, CEC has supported the opening of 45 retail hydrogen refueling stations.

Comments

1) *Purpose of Bill.* According to the author, "To meet our climate goals, California needs to adequately plan and implement hydrogen technologies. This bill tasks the Air Resources Board with creating a working group to be made up of professionals from our State departments and the hydrogen industry to assess, among other things, the hydrogen infrastructure required to meet our air pollution goals."

2) *Fuel Cell Technology.* Fuel cells use an electrochemical process to convert the chemical energy in a fuel (such as hydrogen) to electricity. Fuel cells generate electricity without combusting the fuel and therefore contribute to emissions reductions in greenhouse gases, NOx, and PM2.5. In transportation, fuel cell electric technology is found in the light-, medium-, and heavy-duty vehicle sectors, as well as in ships and airplanes. While FCEVs make up a small proportion of ZEVs in the state (around 1 percent), hydrogen FCEVs have particular promise for the heavy-duty long-haul trucking sector.

3) *Existing Efforts.* As mentioned in the background, recent state goals such as the Governor's EO and ARB's Advanced Clean Trucks Regulation are placing

more emphasis and focus on converting the medium- and heavy-duty fleets into ZEVs. ARB's draft 2020 Mobile Source Strategy recognizes this direction and calls for the deployment of approximately 1.4 million medium- and heavy-duty ZEVs in California by 2045. To complement and support these goals, investment in medium- and heavy-duty ZEV infrastructure will be necessary. The administration estimates that more than $2 billion in additional public funding is needed to deploy heavy-duty vehicle infrastructure at a scale to meet the state's goals. CEC, ARB, and CPUC are all currently supporting ZEV infrastructure through various programs.

What is not entirely currently clear is what proportion of the medium- and heavy-duty ZEV goals should be accomplished through battery electric or FCEV technologies. One thing is certain though, all of the efforts to support light-, medium, and heavy-duty ZEVs should be strategically and holistically planned across programs and technologies. With this in mind, there may be concerns about creating a new assessment regarding a narrow ZEV technology, rather than expanding on current efforts to make the planning process more comprehensive and to avoid any redundancies. At a very high level, GO-Biz's ZEV Market Development Strategy is one example of a statewide effort to comprehensively plan for meeting the state's ZEV goals. Below, the AB 2127 and AB 8 planning efforts are discussed in more detail.

a) *AB 2127.* The AB 2127 biennial assessment examines the electric vehicle charging infrastructure needs to support meeting California's ZEV goals. CEC staff not only assessed the infrastructure needs for light-duty passenger cars, but also examined the expected electrification of the state's medium- and heavy-duty vehicles and equipment in the next decade. The report found that medium- and heavy-duty vehicles often adhere to demanding operation patterns that make infrastructure planning for these vehicles a unique challenge. The Governor's recent EO expanded this assessment to address the state's recent ZEV goals. However, the report currently only includes plug-in electric vehicle infrastructure and does not include FCEV technologies.

b) AB 8. The AB 8 annual report specifically focuses on the hydrogen infrastructure needs for both light- and heavy-duty FCEVs. The current statutory direction for this joint report is to assess the needs to accomplish the required 100 publicly available hydrogen refueling stations. However, the report also discusses planned projects to reach the 2025 goal of 200 hydrogen stations set by Governor Edmund G. Brown Jr.'s Executive Order B-48-18. So far, much of the focus of the assessment has been on light-duty vehicle infrastructure, but recently the assessment is moving

towards including more on the heavy-duty sector. The report discusses the mutually beneficial relationship with light- and heavy-duty FCEVs, highlighting the interdependencies and mutual benefits of investments in both sectors. CEC's most recent CTP Investment Plan will evenly split funding for hydrogen infrastructure between light-duty and medium- and heavy-duty hydrogen infrastructure.

As this bill moves forward, rather than creating a new assessment, the author may consider expanding on existing efforts to either (1) expand the scope of the AB 2127 biennial report to include FCEV technologies or (2) update the scope of the AB 8 annual report to address the new state ZEV goals for medium- and heavy-duty vehicles.

4) *Conflict of Interest?* By assessing the FCEV infrastructure needs throughout the state, this bill could create a significant cost pressure for the Legislature to provide the necessary funding to meet at least part of the needs identified by the task force. Including members of the hydrogen industry on the task force could give the appearance of a conflict of interest as they could steer the findings to directly benefit their companies. As such, it might be best to remove them from the task force to avoid this appearance.

The Committee may wish to amend the bill to remove the two members from the hydrogen industry from the task force.

DOUBLE REFERRAL:

If this measure is approved by the Senate Environmental Quality Committee, the do pass motion must include the action to re-refer the bill to the Senate Transportation Committee.

SOURCE: Western States Hydrogen Alliance

SUPPORT:

Advanced Structural Technologies, INC.
Alaska Applied Sciences INC.
Ballard Fuel Cell Systems INC.
California Hydrogen Business Council
Dash2energy LLC
Engineering Procurement & Construction, LLC
Gta INC.
Longitude 122 West, INC.
Millenium Reign Energy

Natural Hydrogen Energy LLC
Next Hydrogen
Sacramento Metropolitan Air Quality Management District
T2m Global
Tatsuno North America INC.
U.S. Hybrid
Ventura County Air Pollution Control District
Western States Hydrogen Alliance

OPPOSITION:

None received

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