SENATE COMMITTEE ON ENVIRONMENTAL QUALITY
Senator Blakespear, Chair
2025 - 2026 Regular

Bill No:	SCR 180		
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Urgency:		**Fiscal:**	No
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SUBJECT: Hydrogen: decarbonization tool

DIGEST: This resolution would have the Legislature recognize hydrogen as a key decarbonization tool, support carbon-intensity based frameworks, encourage state agencies to prioritize hydrogen deployment, and urge coordination to ensure hydrogen projects advance specified outcomes.

ANALYSIS:

Existing law:

1) Under the California Climate Crisis Act (AB 1279, Muratsuchi, 2022), states that it is the policy of the state to achieve net zero greenhouse gas (GHG) emissions no later than 2045, and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced to at least 85% below the 1990 level. (Health and Safety Code (HSC) § 38562.2)

2) States that is the goal of the state to procure 100% of electricity from eligible renewable energy resources and zero-carbon resources by December 31, 2045. (Public Utilities Code (PUC) § 454.53)

3) Requires the California Air Resources Board CARB, by June 1, 2024, to prepare a hydrogen evaluation, including:
   a) Policy recommendations to accelerate production and use of hydrogen, and specifically green hydrogen, to help achieve climate, clean energy, and clean air objectives;
   b) Strategies supporting hydrogen infrastructure and end uses in difficult to decarbonize sectors;
   c) Potential for other forms of hydrogen, outside of green hydrogen, to achieve emissions reductions;
   d) An analysis of how curtailed electrical generation could be used to meet climate goals, including for the production of green hydrogen; and,

e) An estimate of emissions reductions the state could achieve through deployment of green hydrogen. (HSC § 38561.8)

This resolution:

1) Describes existing California clean energy and climate goals and requirements.

2) Positions hydrogen as one of the solutions to achieving said targets.

3) Advocates for the value of carbon intensity-based frameworks in assessing hydrogen production and use.

4) Describes considerations for hydrogen production, transportation, and end-use.

5) Resolves that the Legislature:
   a) Recognize hydrogen as a key decarbonization tool,
   b) Supports the continued development and refinement of carbon intensity-based frameworks,
   c) Encourages state agencies to deploy and use it, and
   d) Urges coordination among all levels of government and stakeholders to advance hydrogen.

Background

1) *Hydrogen: when, where, and why?* The environmental impacts of hydrogen, including effects on climate and air quality, can range from very favorable to very unfavorable, depending on production, delivery, end use, and the fuel the hydrogen is replacing. For example, hydrogen produced with fossil fuels and used in a combustion application that replaces a renewable energy source is not a good environmental solution. However, hydrogen produced with zero-carbon energy and used in a zero-emission application that replaces diesel combustion has clear climate and air quality benefits.

   The source of the hydrogen and the source of the energy used to split hydrogen plays a significant role in determining the lifecycle emissions associated with hydrogen use. Today, there are several means of hydrogen production and it is likely that these will evolve as technology advances.

   Green hydrogen can result in almost no GHG emissions. Produced by electrolyzing water, green hydrogen is made using 100% renewable electricity to split hydrogen from water molecules. Less than 0.1% of hydrogen production globally comes from water electrolysis.

96% of the hydrogen today is considered to be gray hydrogen. Gray hydrogen is produced by heating natural gas, or methane, with steam to form syngas (a mixture of hydrogen and carbon monoxide and carbon dioxide). The syngas is separated to produce hydrogen. This process results in a relatively high release of GHGs.

Blue hydrogen attempts to mitigate some of the GHG emission release during the production of gray hydrogen by pairing production with carbon capture and storage. However, not all carbon dioxide emissions can be captured, and some carbon dioxide is emitted during the production of blue hydrogen. Carbon capture increases the cost and inefficiency of the production of blue hydrogen.

Currently hydrogen branded "renewable" is produced mainly by steam methane reformation of biomethane from North American landfills. SB 1505 (Lowenthal), Chapter 877, Statutes of 2006, requires 33% of the hydrogen produced for fueling stations that receive state funds be made from eligible renewable energy resources, including biomass, digester gas, landfill gas, solar, and wind. However, compliance is achieved largely on paper, through the use of credits from out of state renewable energy sources, rather than direct production and use of renewable hydrogen in California.

No matter how green it is, where hydrogen is used matters. There have been recent evaluations seeking to identify the "least-regrets" end-uses of hydrogen, especially given the costliness of initial hydrogen production and the varied emissions benefits of hydrogen usage in different sectors.
Earthjustice, an environmental law organization, released a report in 2021 identifying promising applications for green hydrogen and ranking hydrogen use by least-regrets uses, sectors to explore with caution, and sectors where hydrogen is not a solution.[1] The report categorizes the least-regrets use for hydrogen as displacing fossil hydrogen in current industrial feedstocks. The usage of hydrogen in maritime shipping, aviation, and long-haul trucks and trains were categorized as "sectors to explore with caution." While Earthjustice categorized hydrogen usage in combustion in fossil gas power plants, gas-burning appliances in homes and commercial buildings, and cars, buses, and regional trucks as sectors where hydrogen is not a solution.

[1] Reclaiming Hydrogen for a Renewable Future. Earthjustice. November 2021. https://earthjustice.org/wp-content/uploads/hydrogen_2_pager_state_final.pdf

Another such report was released in 2024 by Energy Innovation, titled *Hydrogen Policy's Narrow Path: Delusions and Solutions*.[2] Similarly, the Energy Innovation report stated that, "Hydrogen will be important for achieving our climate goals, but it can do so if and only if it is truly clean and directed to appropriate applications. Straying from this narrow path can reverse, delay, or raise the cost of emission reductions while failing environmental justice goals" The report assessed the use of hydrogen across 12 sectors, and concluded that "The risk is high for hydrogen investments to do more harm than good. But there's still a chance to set a course where hydrogen delivers on its promises if government officials act wisely."

Comments

1) *Purpose of Bill.* According to the author, "SCR 180 recognizes hydrogen as an important decarbonization tool that can help California achieve its ambitious climate, air quality, energy reliability, and economic development goals. California has long been a leader in advancing innovative clean energy technologies, and hydrogen is increasingly being deployed to reduce emissions in sectors that are difficult to electrify, including heavy-duty transportation, industrial processes, ports, rail, aviation, maritime applications, and dispatchable power generation.

   "This resolution acknowledges that hydrogen pathways should be evaluated through transparent lifecycle carbon intensity standards that measure actual environmental performance. SCR 180 does not mandate any specific technology or project. Instead, it affirms the Legislature's support for a technology-neutral framework that encourages innovation, investment, job creation, and emissions reductions while helping California maintain its leadership in clean energy, clean air, and climate policy."

2) *Carbon intensity: not bad, but not the full picture*. Carbon intensity is a helpful measure of the lifecycle emissions associated with a resource, but it is not a silver bullet. In the same way that Diet Coke and water are both zero-calorie liquids that cannot fill all the same roles, two low carbon intensity applications of hydrogen may not be equal in all regards. The so-called "boundaries" of a life cycle assessment to assess a carbon intensity are not always clear, objective facts. According to carbon intensity alone, hydrogen made from the methane captured from dairy manure may be among the "cleanest" hydrogen available. However, that relies on ignoring the other externalities the production process creates, as well as requiring certain assumptions to be made about what would've happened to the methane otherwise.

[2] Esposito, Dan. Hydrogen Policy's Narrow Path: Delusions and Solutions. Energy Innovation. August 2024. https://energyinnovation.org/report/hydrogen-policys-narrow-path-delusions-and-solutions/

Of particular relevance to discussions of hydrogen today is the "Three Pillars" framework. Designed as part of the 2022 Inflation Reduction Act to support the development of a U.S. hydrogen economy, the federal Section 45V clean hydrogen production tax credit offers up to $3.00 per kilogram for the lowest carbon intensity hydrogen. Defining the carbon intensity of that hydrogen has driven significant discussion of how to define and verify clean hydrogen. In a situation where a hydrogen producer simply builds a new renewable energy resource to directly power their operations, this is a simple task. However, when energy attribute certificates (EACs) are used to account for clean electricity generated and used elsewhere, this quickly becomes wickedly complicated.

In a white paper published in December of 2023, the U.S. Department of Energy sought to describe the necessary safeguards to ensure that electricity EACs used for hydrogen production truly contributed to reduced GHG emissions.[3] The framework used in that white paper has been colloquially referred to as the "Three Pillars" and has stood as an example of the robust considerations necessary to ensure nominal GHG emission reductions represent real-world improvements.

After over a year of deliberations and over 30,000 public comments, the U.S. Treasury's final hydrogen 45V guidance established the rules for qualifying electrolytic hydrogen projects.[4] The rules generally maintain the "three pillars" overall structure — requiring producers to build and deliver clean power, at the time of production, to hydrogen projects to qualify for the tax credit.[5] Notably, some provisions of the final 45V guidance work different in California and Washington, due to the presence of certain state laws.

3) *Resolving to keep it in the mix*. As a resolution, SCR 180 does not have force of law, nor does it compel or require any actions or decisions on hydrogen. Undoubtedly, hydrogen will play a role in California's decarbonized future. The scope and shape of that role is yet to be determined. While hydrogen can help the state decarbonize its economy, generally speaking, care should be taken to uphold rigor and nuance in considering each application. Regardless of the encouragement for hydrogen in this resolution, California should continue

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[3] Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit. U.S. DOE. https://www.energy.gov/sites/default/files/2023-12/Assessing_Lifecycle_Greenhouse_Gas_Emissions_Associated_with_Electricity_Use_for_the_Section_45V_Clean_Hydrogen_Production_Tax_Credit.pdf

[4] Credit for Production of Clean Hydrogen and Energy Credit. 1/10/2025. Federal Register. https://www.federalregister.gov/documents/2025/01/10/2024-31513/credit-for-production-of-clean-hydrogen-and-energy-credit

[5] Implementing the 45V Rule: What it Means for Green Hydrogen Projects. Taylor Krause, Evan Brooks, Nathan Iyer for RMI. March 3, 2025

to use the best methodology and evidence available for each given application and decide accordingly when and where hydrogen is the best tool for the job.

Related/Prior Legislation

SB 1420 (Caballero, Chapter 608, Statutes of 2024), as heard by this committee, defined "renewable hydrogen" and "qualified clean hydrogen," and included those classes of hydrogen in a set of transportation fuel content standards; added them to two existing permit streamlining mechanisms created by recent legislation; and made changes to the RPS to enable their inclusion as eligible resources.

AB 2204 (Bennett, 2024) would require all hydrogen produced or used in California by date certain to be green hydrogen that excludes fossil fuels as a feedstock or an energy source in the production process, and that complies with any applicable requirements regarding the three pillars. AB 2204 was not heard in committee.

SB 414 (Allen, 2023) would have required CARB, in consultation with the CEC and CPUC, to develop an assessment of hydrogen use for specified applications including electricity generation. This assessment would include cost, energy efficiency, and health, safety, environmental, and climate risks. This bill died in the Assembly Appropriations Committee.

SB 1075 (Skinner, Chapter 363, Statutes of 2022) directs CARB, in consultation with the CPUC and CEC, to develop an evaluation by June 1, 2024 which, among other things, evaluates the potential use for other forms of hydrogen (not green hydrogen), health and environmental impacts of various forms of hydrogen, and strategies to support hydrogen infrastructure.

SOURCE: California Hydrogen Business Council

SUPPORT:

California Hydrogen Business Council
United States Hydrogen Alliance

OPPOSITION:

None received

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