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Air Products SB-423 Report Comments

Please find our comments attached

Additional submitted attachment is included below.

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August 19, 2024

Commissioner Siva Gunda
California Energy Commission
715 P Street
Sacramento, California 95814

RE: Comments on the Draft Senate Bill 423 Emerging Renewable and Firm Zero-Carbon Resources Report (Docket 21-ESR-01)

Dear Commissioner Gunda:

We appreciate the opportunity to provide input on the Draft SB 423 Report and the role of emerging renewable and firm zero-carbon resources in California's clean electricity grid. As a mature, firm zero-carbon resource able to support the state's reliability needs, clean hydrogen will play a critical role in decarbonizing the power sector. The state must ensure that it adopts the policies needed to take full advantage of this versatile resource.

About Air Products

Air Products is a global company providing essential industrial gases, related equipment, and applications expertise to customers in more than 50 countries. As the world's largest supplier of hydrogen, Air Products is committed to driving the energy transition through a $15 billion global investment in clean hydrogen production capacity, including in California, Arizona, Texas, New York and other international sites.

Clean Hydrogen Turbines are Critical Firm Zero-Carbon Resources Able to Decarbonize the Electric Power Sector While Maintaining Reliability

As the state looks to achieve its SB 100 and climate change goals while safeguarding the reliability of the grid during extreme weather events, the use of clean hydrogen for power generation will be a critical tool in making the state's goals a reality. As noted in Table 12 of the Draft SB 423 Report, both hydrogen turbine and fuel cell energy generation technologies are mature and have high Technology Readiness Levels (TRL). This maturity is reflected in the fact that several public utilities are already incorporating hydrogen turbine retrofits into their short-term planning to meet accelerated clean energy goals.

Hydrogen turbines provide a clear pathway for converting existing natural gas plants to produce zero-carbon electricity, especially since leveraging existing assets that are already interconnected to the grid is one of the most expedient paths to decarbonizing power generation. Critically, grid operators and utilities already rely on these plants to follow load and meet system and local reliability needs. Conversion to hydrogen turbines will provide the same reliability characteristics and avoid the need to develop new resources to provide local reliability and/or develop costly and challenging new transmission projects.

Given these complicated and difficult issues, the conversion of existing interconnected generation facilities to utilize clean hydrogen represents a relatively simple pathway to making significant

gains toward the state's energy and environmental goals. While there will be costs associated with the conversion of plants to use hydrogen turbines, the funding and timelines associated with conversions will be a fraction of those associated with new project development, transmission expansion, and reliance on less ready technologies – especially as the cost of turbines comes down due to a ramp up in manufacturing. That said, the buildout of new renewables is essential to meeting the increasing demand for electricity in the state and Air Products supports an "all-of-the-above" approach tackling the energy transition, while also encouraging the state to fully leverage the advantages associated with hydrogen turbine conversions to keep the energy transition on track.

Production of Clean Hydrogen Will Increase in the Near Term

The Draft SB 423 Report notes that "H2 is a less mature fuel than RNG and it requires R&D across the lifecycle, including production and storage of H2, to enable full-scale, cost-effective deployment" (pg. 24). Overall, hydrogen production, transport, and use are mature technologies which have been serving industrial and mobility customers for decades. With California's formal hydrogen hub award via ARCHES, and clean hydrogen becoming a major focus across the globe, we expect that the clean hydrogen supply will increase substantially by 2027. Large low- and zero-carbon hydrogen production projects are under development across the country and the world.

For example, Air Products is investing heavily in the space, with green hydrogen projects under active development in New York, Texas, and Arizona, as well as in California and abroad. Importantly, investments being made by governments across multiple jurisdictions, including through ARCHES, will serve to accelerate these and other projects. The scaling of production enabled by significant investments from both the private and public sectors will serve to drive down the cost of clean hydrogen and accelerate the energy transition.

State Policy Must Accommodate the Global Nature of the Clean Hydrogen Market

The imminent production of clean hydrogen in multiple countries will mean that the market for clean hydrogen will be global in nature like today's energy systems. The state must ensure that its policies related to clean hydrogen reflect and accommodate that reality. Historically, the state's energy policies have recognized the impact that our economy and our energy policies have on the regional, national, and international energy supply—and vice versa. Policies like Cap-and-Trade, the Low Carbon Fuel Standard, and the Renewable Portfolio Standard were designed with a recognition of impacts beyond our borders. Indeed, California Energy Commission (CEC) data shows that California currently imports 75% of its crude oil, more than 90% of its natural gas, and over two-thirds of all energy (including electricity). Replacing these fossil fuels and energy sources will require an all-of-the above strategy, including expanding in-state resources and supporting regional, national, and international hydrogen and hydrogen derivatives supply chains. The state's programs must account for this reality and ensure that imported clean hydrogen will be eligible to contribute to the state's policy goals.

Appropriate Market Signals Are Needed to Drive Demand

To maintain the robust rate of investment that is being poured into clean hydrogen production and distribution infrastructure, policymakers must ensure that the correct market signals are sent and enact policies that will drive growing market demand for clean hydrogen. California has a strong track record of using policy to catalyze demand for new technologies, including hydrogen. The state should double-down on such policies, especially in the power sector. Such measures should include:

- Incentives for **power plant** owners to convert from natural gas to hydrogen and mandates to meet or exceed natural gas power plant nitrogen oxides (NOx) emission standards.
- Highlighting the role for hydrogen solutions in the **power sector** and guide the California Public Utilities Commission (CPUC) **Integrated Resource Planning** (IRP) and **procurement** strategies to enable private sector investment in hydrogen solutions for SB 100 compliance.
    - Examples include clean resource adequacy procurement, strategic reserve investments in hydrogen, directives to load-serving entities to procure hydrogen baseload capacity, procurement directives for hydrogen as long-term storage solutions (e.g. Pacific Gas & Electric (PG&E's) third-party partnership to develop a hydrogen fuel cell project to improve grid resiliency at substations as approved by Commission Resolution E-5261), consideration of distributed generation and grid resiliency in the IRP and procurement orders for electric Load Serving Entities (LSEs) that include hydrogen fueled equipment.
- Updated **CEC Renewable Portfolio Standard (RPS) guidebook** for broad application of hydrogen electric generation beyond fuel-cells, including turbines, and provide clarity around eligibility of clean hydrogen as a zero-carbon fuel pursuant to SB 100.

Enactment of such policies will create a virtuous loop in which clear and predictable demand will incentivize continued investment in production and distribution infrastructure, leading to even more momentum and accelerating the energy transition. We hope that the CEC will incorporate these recommendations into the final version of the SB 423 report.

Additional comments on the Draft SB 423 Report

We appreciate your consideration of the following additional feedback on the Draft SB 423 Report, as well:

- Table 45 describes the Angeles Link project as a "current deployment" and one that seeks to install 10-20 GW of electrolyzers. We note that Angeles Link is a proposed pipeline project that is being studied by the CPUC. It is neither a "current deployment" nor is it a proposal to develop 10-20 GW of electrolysis, which is not something the utility proposing the project has been authorized to do by the CPUC.
- Regarding the statement (Table 48, pg. G-11) that "Repurposing natural gas infrastructure for H2 where technically feasible and safe can result in cost savings and reductions in project lead times in response to the point that building new pipelines is too expensive and time consuming." We question whether there is any data or use cases to substantiate this claim and caution that the state must carefully consider impacts on safety and end-use customers before utilizing natural gas infrastructure for hydrogen. In our experience, dedicated hydrogen pipeline infrastructure is necessary to safely and reliably serve dedicated hydrogen end-uses.
- Table 48 also mentions that "use of traditionally produced hydrogen doesn't result in a zero-carbon firm resource." This counters the guidance in the 2021 Joint Agency SB 100 Report (pg. 7), which states that "the joint agencies interpreted 'zero-carbon resources' to mean energy resources that either qualify as "renewable" in the most recent Renewables Portfolio Standard (RPS) Eligibility Guidebook or generate zero greenhouse gas emissions on site." While we don't take a specific position on either of these statements, it points to the need to clarify the definition and eligibility of zero-carbon resources under SB 100, including hydrogen. This is something CEC should incorporate into the upcoming revision of the RPS Guidebook.

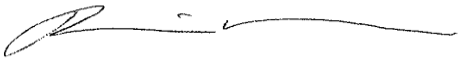
- Table 48 also mentions that "Hydrogen blending with natural gas for combustion may provide some emissions reductions but cannot be a long-term strategy," and that "Gas mixture processes must be emphasized and thoroughly validated before operation is allowed." We agree with this assessment.
- We appreciate the evaluation of barriers to further deployment of firm zero-carbon resources and recommendations to overcome them that are provided in the Draft SB 423 Report. We note that maintaining a competitive private sector marketplace and flexibility to allow for hydrogen imported into to California will be critical to developing a low-cost, reliable supply of clean hydrogen for the power sector as quickly as possible. For further discussion of these topics, we refer you to extensive comments we provided pursuant to the September 8, 2023, Integrated Energy Policy Report (IEPR) Workshop on the Potential Growth of Hydrogen.[1]

Conclusion

California's transition to zero-carbon energy generation is at an inflection point, especially as it endures more frequent and intense extreme heat events that threaten the grid each summer. The state needs to take advantage of every firm, zero-carbon power resource it can muster, especially those that can contribute to its reliability needs in the short-term. Clean hydrogen power generation is well-positioned to fill that role through its ability to convert existing plants to zero-carbon generation. California must ensure that its energy policies fully leverage the unique characteristics of clean hydrogen power generation so that it can reap the benefits of this critical resource.

Thank you again for the opportunity to comment on this important report.

Respectfully,



Miles Heller

Director, Global Greenhouse Gas, Hydrogen, and Utility Regulatory Policy

[1] https://efiling.energy.ca.gov/GetDocument.aspx?tn=252517&DocumentContentId=87593