DOCKETED	
Docket Number:	23-IEPR-01
Project Title:	General Scope
TN #:	249336
Document Title:	Air Products Comments - Air Products Comments 2023 IEPR Scoping Order
Description:	N/A
Filer:	System
Organization:	Air Products
Submitter Role:	Public
Submission Date:	3/17/2023 1:28:09 PM
Docketed Date:	3/17/2023

Comment Received From: Air Products
Submitted On: 3/17/2023
Docket Number: 23-IEPR-01

Air Products Comments 2023 IEPR Scoping Order

Air Products appreciates the opportunity to submit these attached comments

Additional submitted attachment is included below.

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March 17, 2023

Commissioner Patty Monahan
California Energy Commission
715 P Street
Sacramento, California 95814

RE: Air Product's Comments on 23-IEPR-01 – Scoping Order

Dear Commissioner Monahan:

Thank you for the opportunity to comment on the Draft Scoping Order for the 2023 Integrated Energy Policy Report (IEPR) Update. Air Products supports the four proposed major topics, including (1) Accelerated Connection of Clean Energy, (2) Electricity and Natural Gas Forecast, (3) Potential Growth of Hydrogen, and (4) Updates, including those related to decarbonizing gas supplies and end uses and the benefits associated with the transition to clean transportation systems.

Air Products is the only U.S.-based industrial gas company and the world's largest hydrogen producer and supplier for use in numerous markets, including transportation. We are committed to rapidly scaling and decarbonizing global hydrogen supplies, in order to support rapid decarbonization efforts in California and internationally. In just the last two years, Air Products has announced more than $15 billion in clean hydrogen investments.

California Needs a Diversity of Clean Energy Sources and Technologies, Including for Hydrogen

Air Products is fully committed to developing world-scale solutions to address climate change. No individual technology will be able to do so, however, and the world – and California – will need multiple solutions to address this critical challenge. That is why Air Products pursues a diversity of solutions such as green hydrogen and blue hydrogen in locations and circumstances where a specific approach, technology and product makes sense.

In California, blue and green hydrogen both make sense, as does support for both in-state and out-of-state projects. According to CEC data, the state already relies on imported energy to supply nearly one-third of its electricity, more than 70 percent of its crude oil, and 90 percent of its natural gas. Altogether, more than two-thirds of California's overall energy requirements are met from imported resources.

While the state has some world-class renewable energy resources, according to the 2021 Joint Agency SB 100 Report, the state will need to sustain "record breaking" clean energy build rates for 25 years, just to achieve its SB 100 goals. The California Public Utilities Commission has identified a need for new out-of-state renewable energy resources in its recent Integrated Planning Report and the California Independent System Operator is planning for transmission to accommodate several gigawatts of renewable energy imports into the State. If California is likely to have to continue to rely on imported energy to meet its

clean energy goals just in the electricity sector, it very likely will have to in order to achieve clean energy in other sectors, which already rely predominantly on imported energy. The CEC's, and State's, approach to hydrogen should not foreclose opportunities to import low carbon hydrogen into the State, which will likely be required to continue to power California's economy with clean energy.

We hope your review of strategies to accelerate connections of clean energy in California will include an evaluation of the grid and energy resources needed to meet all of California's climate change goals, including grid electricity needed for hydrogen production or other uses like carbon dioxide removal, and the ongoing and growing need to deliver clean molecules, as well as electrons, to California.

Hard to Electrify Sectors Don't Have to be "Hard-to-Abate"

Many sectors that will require clean hydrogen to decarbonize are often referred to as "hard-to-abate" sectors. While we seem to have convinced ourselves of this as a matter of conventional wisdom, they are really no more difficult to decarbonize than other sectors, at least conceptually. We know how to decarbonize industry and heavy-duty and off-road transportation, and the technologies to do so – hydrogen and its derivatives are available today.

We hope the 2023 IEPR, as well as the recently opened and related order instituting informational proceeding on decarbonizing the gas system, will provide forums to more fully evaluate and enable these solutions, and therefore support an accelerated and deeper decarbonization of California's economy.

Surprisingly, according to CARB's Final 2022 Scoping Plan, the hardest to abate sector in California may be the electricity sector. In the Scoping Plan modeling, by 2033, electricity sector emissions overtake industrial sector emissions, and by 2040, they overtake transportation to become the largest source of greenhouse gas emissions in the State. This is due to the ongoing requirement for gas plants to provide for grid reliability, and of course, just like the other sectors, these too can be decarbonized through the use of hydrogen.

We encourage CEC to use the 2023 IEPR to begin a full and complete evaluation of the role that hydrogen can, and should, play to achieve greater greenhouse gas reductions in the electricity sector. This analysis will be timely, as it aligns with implementation of SB 423 (Stern), as well as recent state investments to support clean energy reliability, including the Clean Energy Reliability Investment Plan, Distributed Energy Backup Assets Program, and Strategic Reliability Reserve. It can then feed into the next SB 100 report, which we hope will further evaluate the role that firm zero carbon resources like hydrogen can play in decarbonizing California's electricity grid while maintaining grid reliability.

Finally, we note that SB 423, SB 846 (Dodd) and the other statutes creating the programs listed above are not referenced in the section on "Key Statutory and Executive Order Initiatives." We believe these statutes are critically relevant to the analyses CEC proposes in the 2023 IEPR, and encourage you in the final Scoping Order to include them in the list of statutes that will be emphasized as part of this proceeding.

CEC Should Take a Technology-Neutral Approach to Hydrogen As Part of its Evaluation of the Electricity Sector, Transportation Sector, and Gas System

We are confident that a full and fair evaluation of the complete array of hydrogen technologies, throughout the supply chain, will lead to the conclusion that we can more deeply and quickly decarbonize many sectors of California's economy than we currently assume. An incomplete evaluation, however,

including one that only looks at limited solutions, such as electrolysis or pipeline transport of hydrogen, is more likely to lead to suboptimal outcomes, higher costs, and longer timeframes for achieving California's climate goals.

We urge you to take a technology-neutral and performance-based approach in your evaluation of hydrogen and other technologies throughout the 2023 IEPR, including an evaluation of:

- Current hydrogen supplies and how they can be deployed to support California's energy and climate goals and be further decarbonized themselves.

- End use applications for hydrogen and its derivatives in the transportation, electricity, and other sectors – including methanol, ammonia, and synthetic fuels such as renewable methane or sustainable aviation fuel.

- An array of clean hydrogen solutions and technologies, based on carbon intensity.

- Barriers, and recommendations to overcome them, to deploying hydrogen from all sources and in all relevant sectors to achieve California's energy and climate goals.

Most of all, we strongly urge you to avoid creating any arbitrary and limiting definitions or exclusions for hydrogen based on technology, feedstock, or other categorizations that don't necessarily influence emissions outcomes. This would only serve to limit opportunities to reduce emissions in the State. A comparison and evaluation of decarbonization strategies, including for hydrogen, should be clearly based on lifecycle carbon intensity.

More Cross-Sectoral Analyses Needed than Just Electricity and Electrolysis

As you evaluate hydrogen strategies and technologies, we urge you to consider a wide array of cross-sectoral impacts. Too often, discussions of hydrogen as a cross-sectoral issue have limited focus on electrolysis as an asset for the electricity grid. Electrolyzers are certainly a promising strategy to put excess clean electricity to beneficial use, but overgeneration alone is insufficient to justify in-state electrolyzer projects or drive the market for electrolysis and green hydrogen forward.

Indeed, more promising cross-sectoral assessments may look at the opportunity for blue hydrogen to pair with CCS at industrial facilities, including cement plants, and for biomass gasification (especially if it's paired with CCS and potentially co-located with other industrial decarbonization efforts) to support State priorities related to organic waste, forest management, and avoided agricultural burning in the Central Valley. As illustrated in the Lawrence Livermore National Laboratory Report, *Getting to Neutral,* the cross-sectoral opportunities for waste biomass and hydrogen are vast. The report finds that deploying biomass gasification with CCS to manage existing organic waste streams and developing offtake markets at scale to utilize the resulting hydrogen, can quickly and cost-effectively lead to emissions benefits that would be greater than taking every passenger vehicle off California's roads. Based on this analysis, no other integrated climate strategy may offer such emissions benefits.

This is not to say that the 2023 IEPR evaluation should focus on biomass gasification or CCS, just that it shouldn't exclude those technologies. And it certainly shouldn't limit its focus to just a subset of full range of promising hydrogen production, transportation or storage technologies, or off-take markets and applications.

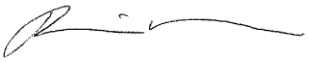
Additionally, as you consider benefits from the transition to clean transportation systems and other issues related to decarbonizing gas supplies and end uses, we strongly encourage you to evaluate the workforce benefits associated with hydrogen as a fuel, and the several different pathways to produce and use hydrogen, as described above. In many cases, transitioning end uses to hydrogen and developing new, clean hydrogen supplies, can provide a just transition for workers in the energy sector to clean energy technologies that align with State goals.

We Look Forward to Working with you on the 2023 IEPR

We hope you will use the 2023 IEPR to start a broad discussion, focused on greenhouse gas emissions outcomes, to help elucidate the wide array of issues teed up in SB 1075 (Skinner) and other hydrogen- and energy-related topics to help California quickly and cost effectively achieve its climate and energy goals.

Thank you again for the opportunity to comment on the Draft 2023 IEPR Scoping Order. We look forward to exploring these topics with you and sharing our expertise and perspective throughout the 2023 IEPR process.

Sincerely,



Miles Heller
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