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New York State Energy Research and Development
Authority (NYSERDA)
17 Columbia Circle,
Albany, NY 12203-6399

Comments submitted electronically via
scopingplan@nyserda.ny.gov

RE: Comments Related to the New York State Climate Action Council Draft Scoping Plan

Air Products is pleased to provide comments related to the New York State Climate Action Council Draft Scoping Plan. We support New York State's climate goals and believe that Air Products can help New York decarbonize and successfully implement the energy transition needed to meet these goals. We are also very supportive of efforts in New York State to develop green hydrogen opportunities in alignment with the Climate Leadership and Community Protection Act and supplied by available green energy resources.

Air Products, the only U.S.-based global industrial gas company, has been in operation for over 80 years and has operations in more than 50 countries around the globe, including a large oxygen and nitrogen production business in the State of New York. The company's core industrial gases business provides atmospheric and process gases and related equipment to manufacturing markets, including refining and petrochemical, metals, electronics, food and beverage and healthcare (including oxygen for COVID response). Approximately 20,000 employees globally work to make Air Products the world's safest and best performing industrial gases company, providing sustainable offerings and excellent service to our customers.

Worldwide, Air Products is the largest hydrogen producer with over 8,000 metric tons per day of production capacity. Air Products is committed to meeting the world's carbon reduction and energy transition challenges at scale. As an example, we have announced the world's largest green hydrogen project – a $5 billion project that will deploy nearly five times more electrolyzer capacity than had been installed globally at the time the project was announced. Air Products recently signed a contract with thyssenkrupp Uhde Chlorine Engineers to supply a more than two-gigawatt (2 GW) electrolysis plant for the project. Our company has committed an additional $2 billion to develop the distribution and refueling infrastructure to bring this fuel to mobility markets around the world. In fact, Air Products has announced over $12 billion in low carbon hydrogen projects, in various stages of execution, including the opportunity detailed above. Air Products' hydrogen supply and distribution capabilities stand ready to contribute to achieving New York's air quality and greenhouse gas reduction goals.

The Final Scoping Plan Should Signal a Strong Role for Hydrogen as a Clean Energy Resource

Air Products believes that hydrogen is the most viable energy source that can decarbonize a significant portion of the economy; especially the hard-to-abate emissions sectors such as heavy-duty transportation (i.e. transit buses, trucks, shipping, aviation), chemicals, cement, power, and metals (steel, aluminum, and iron) production. When used as a fuel or energy carrier in these sectors, it produces very low or no direct emissions, improving local air quality in contrast to some of the other fuels used today. In a complement to renewable electricity, hydrogen also provides important grid reliability, resilience and energy storage as renewable generation grows.

We encourage the State to set emissions-based, performance standards and avoid artificially classifying hydrogen projects by resource type or production technology, which will limit opportunities to achieve deep decarbonization at scale, including decarbonizing existing facilities. While "green" hydrogen, produced with only renewables, might be the ultimate technology goal, even today's hydrogen used in zero emission vehicles or other end uses can provide immediate greenhouse gas (GHG) and localized pollutant reductions. Enabling a variety of hydrogen production technologies will help ensure that supply is not a limiting factor while the necessary infrastructure and end-use markets are built out at scale.

With strong policies combined with its large market, New York can incent the kind of global scale projects that are needed to achieve cost-effective scale for low and zero-carbon hydrogen. **All mitigation scenarios New York considers in the integration analysis should provide for this future and include hydrogen as a zero-emission fuel and clean energy resource.**

Zero-Emission Vehicle Policies are Paramount to Decarbonizing Transportation

Air Products fully supports, at a minimum, the proposed advisory panel recommended "Scenario 3 Accelerated Transition Away from Combustion" (pp. 70-73), requiring new sales of all light duty, medium-duty, and heavy-duty vehicles to be zero-emission vehicles (ZEV) by 2035, which include both battery electric (BEV) and hydrogen fuel cell electric vehicles (FCEV). The decarbonization of the transportation sector needs bold, concrete timelines to make this important switch as the reduction of emissions from conventional vehicles has been limited by ever increasing vehicle miles traveled.

However, regulations requiring the production and sale of all classes of ZEVs, implementing bill A.4302/S.2758 signed into law in September 2021, and setting a goal for all new passenger cars and trucks sold in New York to be zero-emissions by 2035 and new medium-duty and heavy-duty vehicles by 2045, are only part of the equation. In New York's modeled ZEV scenarios, it is important to make sure policies are in place to support deployment on an accelerated scale, including appropriate incentives for use and infrastructure. This includes adoption of a Low Carbon Fuel Standard (LCFS)/Clean Fuel Standard (CFS) program (discussed below) as successfully adopted in other states as well as grant funding support to incentivize the private sector to establish refueling infrastructure to support consumer and commercial ZEV adoption. With respect to hydrogen FCEVs, policies should support both hydrogen fuel production for the transportation market as well as hydrogen refueling station coverage and capacity.

Invest in and Remove Barriers for ZEV Charging and Refueling Infrastructure

Air Products agrees that New York should fund investment in hydrogen refueling stations throughout the state to support its existing light-duty ZEV regulation as well as its newly adopted ACT rule (p. 104). Based on our experience in the California mobility market, such funding should be linked to station operational performance and should incentivize commercial scale investment to ensure the market is on the path towards economies of scale from the start. However, a key roadblock to hydrogen FCEV adoption and deployment exists and must be removed to enable auto makers to sell FCEVs into the state – the Port Authority of New York and New Jersey prohibition of hydrogen FCEVs using tunnels and bridges in the New York City metropolitan area. This prohibition has significantly delayed auto manufacturers from introducing light-duty FCEVs in many northeast states. Massachusetts DOT recently amended its 700 CMR 7.00: Use Of The Massachusetts Turnpike And The Metropolitan Highway System regulation to allow light-duty FCEVs to use certain tunnels in the Boston metropolitan area. The Port Authority is strongly encouraged to follow suit and the Scoping Plan should commit the state to progress this needed change.

Advanced Clean Fleets

Air Products applauds New York for its adoption of California's Advanced Clean Truck regulation in December 2021 which will help establish the deployment of medium and heavy-duty ZEVs. We also encourage and support New York's further adoption of California's Advanced Clean Fleets regulation once that is promulgated by the state. This companion regulation will help create demand for medium and heavy-duty ZEVs and further accelerate the air quality and greenhouse gas benefits to be gained in this sector. This Scoping Plan should strengthen New York's commitment to transition medium and heavy-duty fleets to ZEVs.

Transit Electrification

Electrification of transit buses must include hydrogen fuel cell electric buses. Such buses are currently in revenue service with several California transit agencies including Orange County Transportation Authority (OCTA), Sunline Transit and AC Transit. In fact, as part of Governor Hochul's recently announced 17 Projects Eligible to Compete for $85 Million New York Clean Transportation Prizes Program, the New York Metropolitan Transportation Authority is proposing to put two fuel-cell electric buses (FCEB) in service in the Bronx, demonstrating that hydrogen is a feasible, efficient, and cost-effective zero-emissions solution and thereby accelerating zero-emission vehicle adoption. FCEBs provide two major advantages compared to the primary alternative, battery-electric buses: longer range and faster fueling. New York State support of public transportation services transitioning to ZEVs should include both hydrogen fuel cell and battery electric buses.

Clean Fuel Standard

As mentioned above, Air Products strongly supports the concept of a LCFS/CFS in New York as we have seen the success of this policy in both California and Oregon. Currently, the program is targeting an 8.75% reduction in carbon intensity relative to the 2010 baseline year and will target a 20% reduction in carbon intensity by 2030. This type of program is technologically agnostic and performance-based providing an effective market signal for lowering the carbon intensity of transportation fuels. The California program has been successfully operating since 2011 and the use of a variety of lower carbon fuels including renewable diesel, electricity, renewable natural gas, and hydrogen have all developed as a result of this program. There is also flexibility in the design of the program to provide additional credit generating opportunities for other fuels like jet fuel, reductions in fossil fuel production emissions (including low carbon hydrogen), and zero-emission vehicle fueling infrastructure. The program can be designed to meet aggressive decarbonization targets as cost containment mechanisms can be included in the regulation to protect the public should credit generating opportunities not materialize as quickly as projected. Air Products agrees that utilizing market forces will help minimize emissions leakage and will result in more effective carbon reductions (p. 48). Technology neutral, performance-based programs like the Low Carbon Fuel Standard (LCFS)/Clean Fuel Standard (CFS) adopted by California and other states should play a central role in New York's approaches to decarbonize.

Power Generation

New York has important electricity decarbonization goals including 70% renewable electricity by 2030 and a zero-emissions electricity system by 2040. Hydrogen should play an important role in reducing emissions from firm and dispatchable power plants needed to balance the grid. Hydrogen can both replace fossil natural gas in direct power generation and provide longer-duration, multi-day and seasonal energy storage as more renewable resources are placed on the grid. Both roles improve grid reliability which makes hydrogen an essential energy resource for the state's electrical grid.

The Scoping Plan acknowledges this option but suggests additional study is needed. However, we note that combustion turbine vendors like GE[1] offers turbines that are already equipped to utilize hydrogen and research is advancing, including at U.S. Department of Energy DOE, on this topic[2].

Power generating plants can be retrofit to utilize hydrogen as a fuel providing firm power generation capacity to balance renewables in the portfolio and reduce carbon dioxide and methane emissions from the plant. Such retrofits will help ensure grid reliability. Providing firm, zero carbon power with decarbonized hydrogen will help to avoid overbuild of under-utilized grid resources. One concern expressed with this approach is that hydrogen combustion can increase nitrogen oxides (NOx) emissions from these plants, but deployment of best available control technology for NOx can mitigate these increases. It will be important to ensure that the deployment of hydrogen in this capacity is coupled with robust air quality impact review and permitting.

[1] Hydrogen Fueled Gas Turbines | GE Gas Power

[2] University Turbine Systems Research (UTSR) | netl.doe.gov

Industrial Emission Mitigations Vision for 2050

Air Products strongly supports the use of green hydrogen as a source of heat to decarbonize the industrial sector as identified in the Draft Scoping Plan. Hydrogen should play a role in decarbonizing those industries that require very high heat, for which direct electrification would be prohibitively expensive (e.g., cement, steel, glass, tile) and that currently use natural gas as their fuel.

Residential Heating

While not expressly recommended in any scenarios, we urge caution if New York decides to look at blending hydrogen into natural gas or using pure hydrogen in any legacy commercial or residential heating systems. Any application of hydrogen in these sectors needs to be carefully reviewed to ensure safety, continued system reliability, and that the blend of hydrogen in small quantities into natural gas is an effective emission reduction approach. Limitations to blending exist in terms of pipeline materials, component materials and function (i.e., meters) and impacts on end user equipment and appliances (different flame patterns, flame temperature with associated NOx increases, heat transfer requirements, etc.). Additionally, because of the lower energy density of hydrogen, more volume is needed which may create constraints in the system that require expensive retrofit.

Detailed comments

p. 178 – "Advanced Green Hydrogen"

The Scoping Plan refers to "advanced green hydrogen" in respect to hydrogen used as a resource for the electricity grid. The plan would benefit from a definition of what is intended by advanced green hydrogen.

P. 252 – Economy-Wide Strategies

The Scoping Plan requests input on preferred carbon pricing mechanisms. Air Products believes that carbon pricing is needed to accurately assess the external costs associated with fuels and products of varying carbon footprints. The carbon emission impact on society from these fuels and products need to be addressed by aligning incentives and policies in a way that achieves the desired environmental outcomes. Such pricing will incent demand for lower carbon solutions and this demand will drive future production. This is a more effective and efficient way to incent the transition compared to direct government support of low carbon fuel production.

The Scoping Plan suggests a third option in terms of a clean energy supply standard. We view this as similar to a low carbon fuel standard and as stated above, we believe that this is a very beneficial and effective policy. We want to highlight also that New York should not consider a clean energy supply standard as mutually exclusive with broader economic carbon pricing policies. California maintains both a cap-and-trade program and a low carbon fuel standard as complementary policies. The low carbon fuel standard helps specifically drive the necessary reductions in the harder to abate

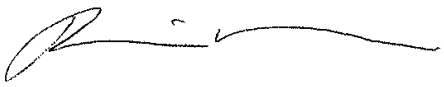
transportation sector earlier than they would otherwise occur under the cap-and-trade program relative to other emitting sectors like electricity where the cost to abate emissions is lower.

Another benefit of maintaining a clean energy supply standard as complementary to a carbon pricing program is to ensure that reductions occur in certain sectors that disproportionately impact disadvantaged communities. A clean energy supply standard, like a low carbon fuel standard, will incent reductions in the heavy-duty transportation sector which burdens local communities based on the health impact associated with diesel pollution.

Lastly, the Scoping Plan asserts that there is no price certainty associated with a clean energy supply standard. While it is true that the market sets the pricing, the program can be designed with price floors and/or ceilings that would provide more certainty to the market while the regulation creates the demand for credits.

Air Products appreciates the opportunity to provide this feedback and would be happy to meet with the Climate Action Council, its staff, the Executive Chamber and impacted agencies to provide additional details related to our comments. Please feel free to contact me by phone (916-860-9378) or email - hellermt@airproducts.com.

Respectfully,



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