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Ministry of Environment, Conservation, and Parks (MECP) Via e-mail:
Melissa.Ollevier@ontario.ca

Re: Emissions Performance Standards (EPS) Program Update (ERO number 019-5769)

Air Products is a world-leading global industrial gas company, in operation for over 80 years. Air Products is the world's largest supplier of hydrogen and a leader in providing hydrogen related infrastructure. Founded in 1940, the company supplies a diverse portfolio of atmospheric and process gases, equipment, and services. With a $65 billion market capitalization, the company owns and operates over 750 production facilities and employs more than 20,000 people worldwide.

Today, Air Products is Canada's leading supplier of hydrogen. The company operates a hydrogen production facility, a 30-kilometer pipeline network, and a liquefaction facility in Sarnia, Ontario serving customers across eastern Canada and the northeastern US. The company also operates three hydrogen production facilities in Alberta, and a 55-kilometer hydrogen pipeline serving customers across the Alberta Industrial Heartland. Most recently, Air Products announced a $1.6 billion project in Edmonton, Alberta, in conjunction with the Government of Canada and Province of Alberta to create a net-zero hydrogen energy complex that will jump-start an ambitious transition to carbon neutrality across western Canada. The project will also create cascading benefits through additional investments including CO2 infrastructure, fuelling infrastructure and promote end-use in emerging markets.

Air Products appreciates the opportunity to provide input to the Ministry of the Environment, Conservation and Parks (MECP) in response to the proposed EPS updates bulletin (ERO number 019-5769) and the questions posed within. We are supportive of Ontario's climate ambitions and programs like the EPS are important to achieving those goals. Because of the importance hydrogen will play in the energy transition, we want to ensure regulations recognize its emission advantages and promote its use wherever possible.

The questions posed in the MECP bulletin are:

1. Should the changes described in sections 5.1 (Replacing Energy-Based Methods) and 8.4 (Implications of a Revised GHG Report) of this proposal start to apply as of the 2022 compliance period or the 2023 compliance period?
2. How can the future EPS program elements, such as stringency factors, optimize GHG emissions reductions while minimizing carbon leakage?
3. Should different stringency factors continue to apply to fixed process and non-fixed process emissions for the 2023-2030 period?
4. Should the EPS program consider a more stringent performance standard for the electricity sector for the 2023-2030 period?
5. Are there any other sectors that should be considered for a sector-wide performance

standard (e.g., lime production, automobile manufacturing, ethanol production, gold mining and milling)?

Air Products has the following recommendations in response to these questions.

1. ***Should the changes described in sections 5.1 (Replacing Energy-Based Methods) and 8.4 (Implications of a Revised GHG Report) of this proposal start to apply as of the 2022 compliance period or the 2023 compliance period?***

Timeline for implementation of proposed changes:
Air Products recommends that any changes described in MECP's proposal be implemented as of the 2023 compliance period, as operators have planned compliance and reporting efforts for the 2022 period based on the current EPS program. This would also ensure affected parties have the time and the resources in place to properly implement any required changes.

2. ***How can the future EPS program elements, such as stringency factors, optimize GHG emissions reductions while minimizing carbon leakage?***
3. ***Should different stringency factors continue to apply to fixed process and non-fixed process emissions for the 2023-2030 period?***

Treatment of fixed process emissions:
The industrial process emissions associated with hydrogen production are a function of the stoichiometry of the steam-methane reaction and cannot be changed. The chemical reactions underlying certain production processes like hydrogen represent an irreducible minimum emission intensity. For hydrogen production via steam methane reforming, the stoichiometric equations yield process emissions of 5.5 tonne CO2/tonne H2. Given the high percentage of industrial process emissions inherent in the operation of a hydrogen plant, Air Products recommends that the fixed process emissions stringency factor remain at 1.0, and to not subject such emissions to "tightening" reductions.

Should MECP decide to apply a tightening rate to fixed process emissions, Air Products recommends a lower tightening rate for fixed process emissions than for non-fixed process emissions (lower than the blanket 2.4% and 1.5% tightening rates for 2023 and 2024-2030 respectively). This would still result in overall GHG reductions while mitigating the risk of carbon leakage.

Treatment of non-process (non-fixed) emissions:
Beyond the process emissions, hydrogen plants are designed to serve a specific customer demand and are optimized based on requisite hydrogen purity, hydrogen production, thermal (steam) production, and in some cases power or other useful co-products. Virtually all the efficiency of a hydrogen production facility is determined when the facility is designed. We recommend that the non-fixed process emissions stringency factors take these constraints into account in order to not impose costly and burdensome requirements on hydrogen producers that could promote leakage. To this end Air Products recommends a flat 1.5% tightening rate over the 2023-2030 period, rather than applying a 2.4% reduction in 2023 and a 1.5% reduction thereafter.

In addition to the above recommendations, Air Products would like to request that MECP share the credit balance projections and data that led to the determination of 2.4/1.5% as the appropriate tightening

rates. This would ensure transparency in the regulatory process and ensure stakeholders are aware of the data being used to determine program updates. This would also allow stakeholders to make informed recommendations on the proposed changes.

Treatment of hydrogen sector:
MECP states in the proposed updates that the steel sector stringency factors would be subject to a lower reduction rate in order to recognize the significant decarbonization efforts in that sector. Hydrogen will continue to play a key role in the decarbonization of steel and other sectors – a fact recognized by Ontario's Low-Carbon Hydrogen Strategy. Given the importance of ensuring a favourable regulatory environment for the development of Ontario's hydrogen sector, Air Products recommends MECP consider applying lower stringency factor reductions for hydrogen production.

Performance standards for thermal energy:
Air Product's hydrogen facility in Ontario exports useful steam as a product as well as the hydrogen. In principle, under an output-based allocation system, all useful covered products generated and exported from a facility should receive an allocation to account for the emissions involved in their production. Air Products supports the retention of the thermal energy product allocation. Air Products further recommends that any adjustment to the thermal energy performance standard be made based on the current best performing technology commonly used, and that it be a one-time adjustment rather than an annually tightening benchmark. This will ensure that the performance standard is reflective of actual technology and practices, and would allow greater regulatory certainty for investments that rely on the use or production of thermal energy.

Biomass-use adjustment of stringency factors:
MECP is proposing to discontinue the biomass use adjustments to stringency factors starting in 2023. The use of biogenic hydrocarbons as a feedstock and fuel are important decarbonization levers. Removing the biomass-use adjustment of stringency factors would result in a less favourable regulatory environment for the operators investing in the often complex and costly configurations required for biogenic feedstock/fuel use. This is particularly important as Canada and Ontario are looking to prompt significant decarbonization efforts and all viable options should be promoted. Air Products recommends the biomass-use adjustment of stringency factors be retained.

Treatment of Carbon Capture and Sequestration:
Ontario's hydrogen strategy recognizes the importance of carbon capture and sequestration (CCS) in the production of low carbon hydrogen and includes the development of a regulatory framework for CCS involving modifications to the *Oil, Gas and Salt Resources Act* and the *Mining Act*. It is important to ensure facilities employing CCS have their emission reductions recognized in order to ensure Ontario remains a competitive location for CCS investments and to prevent carbon leakage. This measure is also important to ensure the regulatory framework around CCS for the production of low carbon hydrogen in Ontario is complete. Air Products supports the proposed recognition of CO2 captured via CCS through deductions from covered facilities' reported emissions.

Development of an Ontario EPS offset system and protocols:
The EPS does not currently provide a mechanism for the generation of offsets through carbon removals or reductions for credit generation or compliance use. In order to ensure the regulatory framework around CCS for the production of low carbon hydrogen in Ontario is complete, we recommend that the MECP develop and adopt an offset system and protocols for CCS facilities, similar to other jurisdictions in Canada. This would provide regulatory certainty and reduce the risk around investments in CCS in the province.

4. ***Should the EPS program consider a more stringent performance standard for the electricity sector for the 2023-2030 period?***

Performance standards for electricity sector:
MECP is proposing to reduce the electricity performance standard from 370 tCO2e/GWh to 310 tCO2e/GWH as a one-time adjustment excluded from further tightening.
Air Products supports the use of a one-time adjustment as this provides projects and operators using electrical energy with regulatory certainty.

5. ***Are there any other sectors that should be considered for a sector-wide performance standard (e.g., lime production, automobile manufacturing, ethanol production, gold mining and milling)?***

New or adjusted sector-wide performance standards:
Air Products recognizes that the ability to develop new/adjust performance standards is important to ensure the EPS remains effective over the long term. MECP states that sector-wide performance standards will be developed or adjusted based on consultation with applicable sectors. Air Products supports this and strongly recommends that any adjustments to sector-wide performance standards occur only after a rigorous and collaborative consultation with affected operators in the sector.

Air Products would appreciate the opportunity to discuss these recommendations with MECP and to provide further information on our recommendations. Please feel free to contact me by phone (587-985-7705) or email haroonh@airproducts.com.

Respectfully,

Hasin Haroon
Low-Carbon Hydrogen & Regulatory Affairs Manager