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September 27, 2011

Ms. Mary Nichols – Chair, California Air Resources Board
1001 I Street
PO Box 2815
Sacramento, CA 95812

RE: Comments Regarding 2nd 15-Day Cap and Trade Rule Proposed Amendments and
2nd 15-Day Mandatory GHG Reporting Rule Proposed Amendments

Dear Ms. Nichols:

Air Products is a global, Fortune 250 company that supplies atmospheric, process, medical and specialty gases, specialty chemicals and process equipment serving a diverse range of industries, including primary metals, refining, electronics, food and glass sectors, as well as healthcare and many other general manufacturing industries. Air Products has over 400 employees and 30 locations in California, including numerous atmospheric gases (oxygen/nitrogen/argon) and hydrogen production facilities, electronic specialty gases and materials production and electricity generating facilities. In addition, Air Products serves a fleet of hydrogen fueling stations across the state, facilitating the transition to carbon-free transportation.

Air Products welcomes the opportunity to submit comments regarding the Second 15-Day Amendments to the Cap and Trade Program issued September 12, 2011. Air Products supports the state's efforts to develop a fair, effective and economically efficient means by which to meet the requirements of AB32. Air Products submitted comments in January and December of 2010, and August of 2011 to the previous proposed versions of the regulation and the first 15-day amendment proposed in July 2011. We have continued to work closely with CARB staff over the past nine months to further inform their regulatory development efforts. While these discussions have produced several areas of alignment on certain aspects of the program, there are still some specific aspects of the proposed regulation which significantly impact our existing operations and our business growth opportunities in the state, as well as impact the state's ability to effectively meet the mandates of AB32. The following comments will reinforce those areas of alignment and express our concerns and potential solutions to those areas we believe are uniquely impactful to our business.

The critical, overarching aspect of the majority of our concerns is the need to ensure equitable treatment of independent hydrogen producers serving the refinery sector. Development of an equitable benchmark is important for both CARB and Air Products in that:

- It is imperative to our business that a level competitive playing field be maintained between outsourced and in-house refinery hydrogen supply;
- The outsourced refinery hydrogen supply option can provide a material increment of CO₂ reduction beyond what is feasible from refiners producing their own hydrogen; and
- The outsourced hydrogen supply model is a key enabler for the hydrogen economy vision crafted by California.

The challenges of insuring an equitable allocation method and the potential benefits available through maintaining a viable outsourced hydrogen supply model are not new or unique to California. Air Products is very encouraged that CARB has chosen to incorporate the approach developed by the European Union to preserve equitable treatment between various hydrogen producers. That said, there remain aspects of the specific approach taken by CARB which we believe puts an unfair burden on hydrogen producers that can easily be remedied through CARB's rulemaking process.

Air Products is also jointly submitting comments on the second 15-day proposed amendments to the Regulation for Mandatory Reporting of Greenhouse Gas Emissions (MRR).

EXECUTIVE SUMMARY:

1. ***The Allocation Benchmark for Hydrogen Produced by Industrial Gas Manufacturers Must be Equitable*** – CARB's selection of the hydrogen benchmark derived under the European Union's Emission Trading Scheme – Phase III (ETS) rulemaking better represents the cross-section of hydrogen production facilities in the state relative to the biased benchmark value proposed under the First 15-day Amendments. This ETS hydrogen benchmark selection, coupled with CARB's commitment (beginning with the Second Compliance Period) to apply the refinery benchmark derived under the ETS program, provides greater assurance that the allowances allocated under the program will be the same, regardless of whether the production is undertaken by a refinery or an associated independent industrial gas facility. Air Products supports these two complementary actions.
2. ***The Allocation Benchmark for Hydrogen Must be Based on a Consistent Performance Challenge with All Other Product-Based Benchmarks*** – While acknowledging the ETS hydrogen benchmark value CARB proposes reduces the bias underlying the First 15-day Amendments dataset, using the ETS benchmark value "as is" introduces a serious fairness issue. CARB has failed to recognize that the "performance challenge" inherent in the ETS benchmark (the ratio of the benchmark value to the sector's average emission intensity) is stricter than that which CARB is employing for the other product-based benchmarks under the California program. This difference results from fundamental differences between the

benchmark setting criteria of the California and the ETS programs. This fairness issue can, however, be easily remedied by making an adjustment to the benchmark value to reflect a performance challenge consistent with the state's standard approach. Air Products requests CARB make the appropriate adjustment resulting in a hydrogen benchmark of 9.99 tonnes CO₂-e/tonne hydrogen.

3. ***Liquid Hydrogen Product Should be Designated as Having a High Leakage Risk***
4. ***Hydrogen Produced for Use as a Transportation Fuel Must be Exempted from a Compliance Obligation until the Second Compliance Period*** – Hydrogen produced and used as a transportation fuel should not incur a compliance obligation until other transportation fuels are subject to the cap and trade program in the second compliance period.
5. ***Electricity Consumers Supplied by Industrial CHP Facilities Should Qualify Equally for Benefits/Rebates from the Value of Allowances Allocated to Electric Distribution Utilities*** – The current cap and trade rules do not provide allowance allocations to industrial Combined Heat and Power (CHP) electricity generators that distribute their power directly, bypassing the Electric Distribution Utilities (EDUs). CARB proposes to only allocate allowances for electricity production to the EDUs – where the EDUs are obligated to return the value of such allocations to their rate-payers. As such, electricity consumers will have an incentive to switch their supply of electricity from those CHP suppliers not receiving allowance allocations (hence no “allowance value” to share) to supply by EDUs where allowances will be allocated and subsequently monetized. This creates a disincentive for industrial CHP facilities, contrary to policies mandated under AB32 to promote expanded CHP electricity production.

While given verbal assurances from CARB staff that the intent of the allocation of allowances to EDUs for the protection of electricity ratepayers is for all electricity consumers to receive comparable benefit, regardless of their supply source. That intent notwithstanding, there is conflicting language in the proposed rules that would appear to preclude distribution of EDU allowance value to those electricity consumers supplied directly by an industrial CHP facility.

6. ***Proposed Changes in the Mandatory Reporting Program Create Uncertainty in Reporting Responsibility and GHG Emission Compliance Obligation for Co-located Hydrogen Plants*** – Proposed changes in the state MRR create uncertainty as to which entity is responsible for submitting annual emissions reports and hence bears the compliance obligation under the cap and trade program.

DETAILED COMMENTS:

1. ***The Allocation Benchmark for Hydrogen Produced by Industrial Gas Manufacturers Must be Equitable*** – Air Products submitted comments to the First 15-Day Amendments to the cap and trade rule indicating the inequitable treatment that would result from a hydrogen benchmark derived from a small and biased subset (6 of 26) of the hydrogen production facilities operating in the state. CARB staff has indicated it was not able to assemble the necessary data from all these production facilities with which to derive a representative benchmark. As such, Air Products endorses CARB's decision to instead

apply the EU ETS hydrogen benchmark, one that was derived from a more representative cross-section of production facility sizes, ages and efficiencies.

This decision, coupled with CARB's commitment (beginning with the Second Compliance Period) to apply the refinery benchmark derived under the ETS program, provides greater assurance that the allowances allocated to hydrogen production under the program will be the same, regardless of whether the production is undertaken by a refinery or an associated independent industrial gas facility. Since the ETS hydrogen benchmark was derived from within the ETS refinery benchmark, it shares the same large (98 facilities) database from which to obtain emission intensity data and derive the performance curves which define the benchmark performance challenge.

Further, adoption of the ETS refinery benchmark ensures proper treatment for refinery steam consumption, regardless of whether the steam is self-produced or imported from an independent supplier. This facilitates fair treatment when the cost of carbon is imposed on the production of imported steam.

In these ways, equitable treatment is preserved, regardless of the ownership structure for the production activities (hydrogen and steam) supporting refineries. Air Products supports the joint application of the two ETS-derived benchmarks.

2. ***The Allocation Benchmark for Hydrogen Must be Based on a Consistent Performance Challenge with All Other Product-Based Benchmarks*** – CARB describes the benchmark stringency criteria used for deriving product-based benchmarks from actual facility performance data in Appendix B of the First 15-Day Amendment package issued in July 2011. On page 3 of that document, CARB described a targeted level of stringency created by evaluating each industrial sector's production-weighted average emissions intensity during a historical base period and targeting the benchmark to allocate 90% of this level per unit product. CARB further refined this approach for sectors where the 90% performance challenge (the ratio of the benchmark value to the sector's average emission intensity) would set the benchmark at a level that was more stringent than the current emissions intensity of any existing Californian facility. For the sectors for which this occurs, the benchmark would be based on the "best-in-class" value (i.e., the emissions intensity of the most GHG-efficient California facility).

In contrast, the EU ETS benchmark process employs a benchmark stringency defined as "the average of the top 10%" emission intensity for production facilities in that sector. Depending on the shape of the performance curve for a particular sector (characterizing the range and distribution of emission intensity in that sector), this stringency can represent various degrees of performance challenge (as opposed to CARB's "default" 90% value).

It is this fundamental difference in benchmark stringency criteria between the California and EU ETS programs that leads to a fairness issue in the application of the ETS hydrogen benchmark "as is" under the California program – in this instance, the "performance challenge" inherent in the ETS hydrogen benchmark is stricter than that which CARB is employing for the other product-based benchmarks under the California program. This fairness issue can, however, be easily remedied by making an adjustment to the

benchmark value to reflect a performance challenge consistent with the state's default 90% standard approach.

Recall that the ETS hydrogen benchmark is derived from the ETS refinery benchmark. This is illustrated by reference to two EU ETS documents (submitted with these comments in support of our position) – the first is a presentation by Laurent Bourgeois, Chairman of the CONCAWE¹ CO₂ Benchmarking Task Force made at the 9th CONCAWR Symposium, 14-15th March 2011, and the second is the European Commission's Guidance Document No. 9 on Harmonized Free Allocation Methodology for the EU ETS Post 2012 – Sector-Specific Guidelines.

Establishing the relationship between the ETS hydrogen and refinery benchmarks

Section 36 of EU Guidance Document No. 9 (page 115) indicates the refinery product benchmark value of 0.0295 allowances/CO₂ weighted tonne (note this is the same value CARB has proposed beginning the Second Compliance Period). Further, Table 4 of this document indicates a CWT factor of 300 assigned to hydrogen production – or 300 CWT per tonne of hydrogen produced. When you multiply the hydrogen CWT factor by the overall refinery benchmark (300 CWT/tonne hydrogen produced times 0.0295 tonnes of CO₂-e/CWT) you obtain the hydrogen benchmark of 8.85 tonnes CO₂-e/tonne hydrogen produced.

Calculation of the refinery/hydrogen performance challenge

Slide #7 of Mr. Bourgeois presentation illustrates the performance curve of the 98 EU refineries. It indicates the sector's average emission intensity as 37.0 kg CO₂-e/CWT (or 0.037 tonnes CO₂-e/CWT) and the benchmark value representing the average of the top 10% most efficient facilities (e.g. lowest emission intensity) of 29.5 kg CO₂-e/CWT (or 0.0295 tonne CO₂-e/CWT).

Where the performance challenge is defined as the ratio of the benchmark to the sector average emission performance, the performance challenge resulting from the refinery performance curve is 0.0295/0.037, or 79.7%. In contrast, the performance challenge under the California program cannot be lower than 90%. Given this, an upward adjustment to the ETS benchmark is necessary to align its stringency with that being applied by CARB with respect to other product-based benchmarks for other industrial sectors.

Correction of the ETS hydrogen benchmark to reflect a consistent 90% performance challenge is straightforward. The adjustment factor is just the ratio of the two alternative performance challenges, in this case, 0.9/0.797, or a factor of 1.13. By multiplying the proposed ETS hydrogen benchmark value of 8.85 tonnes CO₂-e/tonne hydrogen by the adjustment factor, a hydrogen benchmark reflecting the states default 90% standard would be 9.99 tonnes CO₂-e/tonne of hydrogen.

Air Products strongly recommends CARB adjust the proposed hydrogen benchmark to the 9.99 tonne CO₂-e/tonne hydrogen produced in order to provide fairness with respect to the economic impact of the cap and trade program across all California industrial sectors.

¹ CONCAWE is the European trade association which represented the refining industry in the development of the EU ETS refinery benchmark under the auspices of the European Commission.

Omitting such an adjustment will serve to reduce the sectors competitiveness, contrary to the intent of the industry assistance recommended under the ISOR.

3. ***Liquid Hydrogen is a Distinctly Different Product from Gaseous Hydrogen and Should be Designated as Having a High Leakage Risk*** – Liquid hydrogen is a different product from the gaseous hydrogen used in refining applications. While both liquid and gaseous hydrogen are very energy (and emission) intensive, liquid hydrogen serves different end-markets, is easily transported and is subject to trade (currently, primarily exports) between California and other non-WCI states and provinces not subject to a comparable cost of carbon. If CARB were to apply the energy/emissions intensity and trade exposure analysis intended under Appendix K of the December 2010 Proposed Rule, we believe the analysis will yield a leakage risk aligned with those industry sectors currently designated as HIGH risk, rather than the MEDIUM risk CARB has proposed for liquid hydrogen.
4. ***Hydrogen Produced for Use as a Transportation Fuel Should be Exempted from a Compliance Obligation until the Second Compliance Period*** – Air Products has been an active partner with CARB in development of hydrogen fueling stations across the state and fulfillment of the vision of the “Hydrogen Highway” from Sacramento to Los Angeles. The build-out of the hydrogen transportation infrastructure should not be burdened by an early penalty imposed on the hydrogen produced for use as a transportation fuel.

Transportation fuels are not covered under the cap and trade program until the second compliance period. Since hydrogen is a low-carbon fuel, the carbon footprint of its production is equivalent to a conventional fossil fuel’s carbon footprint during use. As such, hydrogen used as a transportation fuel during the first compliance period should be exempt from a compliance obligation, consistent with the absence of a compliance obligation imposed on fossil-fuel based transportation fuels during the first compliance period. The hydrogen fuel exemption would also be consistent with the lack of a compliance obligation for natural gas used as a transportation fuel during the first compliance period. This temporary exemption can be realized by CARB allowing a reduction in a hydrogen producer’s overall compliance obligation proportional to the fraction of total production which is sold as a transportation fuel.

Alternatively, CARB could make an allowance allocation equal to the emissions associated with the amount of such hydrogen produced and sold as transportation fuel.

5. ***Consumers Supplied by Industrial CHP Facilities Should Qualify Equally for Benefits/Rebates from the Value of Allowances Allocated to Electric Distribution Utilities*** – Most electricity consumed in the state is distributed through EDUs. A small portion of the state’s electricity consumption occurs by ratepayers who obtain their electricity directly from a producer without going through an EDU – this is often an industrial electricity consumer obtaining power from a co-located but independent industrial cogeneration facility.

CARB proposes to allocate allowances to EDUs based on the electricity consumption through their respective service franchises and then require these allowances to be auctioned with the proceeds being used for the benefit of the EDUs’ ratepayers. Since no allocations will be made to the “industrial cogeneration/distribution” entities delivering

electricity directly to their rate-paying customers, there is an unequal (one-sided) opportunity to offer benefits to the ratepayer which favors the EDU. This will provide an incentive for current (and future) consumers of industrial cogenerated power to switch to grid-delivered power – a result contrary to CARB’s policy objective of incentivizing cogeneration power.

To prevent this unequal treatment, CARB must either allocate allowances to industrial cogeneration/distribution entities in a manner consistent with the proposed allocation to EDUs under §95892, or revise the proposed regulations to explicitly require that cogeneration power customers receive the same benefits under §95892(d)(3) as other EDU retail ratepayers.

CARB staff has stated that the intent of the allocations to EDUs is to mitigate the anticipated added “cost of carbon” imposed upon all electricity consumers, regardless of where the electricity consumer sources their power supply. In CARB’s words, EDUs would be required to share the benefit of their monetized allowance allocations with all consumers connected to the EDU’s system, even if the power consumer is not purchasing power through the EDU. That intent notwithstanding, there is conflicting language in the proposed rules that would appear, at a minimum, to not require, and at worst, to preclude the distribution of EDU allowance value to those electricity consumers supplied directly by an industrial CHP facility. Air Products requests CARB add clear language to the rule to explicitly require sharing of allowance value with CHP customers.

Air Products has provided suggested language to CARB staff to achieve this outcome. Specifically (in conventional underline/strikeout revision format):

§95892(d)(4) revised as:

~~Investor-owned~~ Electrical distribution utilities shall ensure equal treatment of their own customers and customers of cogeneration facilities, electricity service providers and community choice aggregators such that the distribution of auction proceeds does not create an incentive for customers to change electricity suppliers.

Alternately, CARB could clarify intent by adding a definition of “electricity service provider” to explicitly include industrial cogeneration facilities supplying power directly to a ratepayer. Currently, there is no definition of “electricity service provider” under the cap and trade rule, relying instead on definitions within California Public Utility Commission (CPUC). Within the CPUC Code, there are confusing and potentially conflicting definitions which appear to exclude cogeneration facilities, highlighting the need for clarifying language to be added directly to the cap and trade rule. Examples of the relevant CPUC Code follow:

CPUC §218.3 states, in relevant part, the following:

(a) "Electric service provider" means an entity that offers electrical service to customers within the service territory of an electrical corporation

(b) "Electric service provider" does not include an entity that offers electrical service solely to service customer load consistent with subdivision (b) of Section 218

CPUC §218(a) and (b) read as follows:

(a) "Electrical corporation" includes every corporation or person owning, controlling, operating, or managing any electric plant for compensation within this state

(b) "Electrical corporation" does not include a corporation or person employing cogeneration technology . . . for the generation of electricity solely for any one or more of the following purposes:

(1) Its own use or the use of its tenants.

(2) The use of or sale to not more than two other corporations or persons solely for use on the real property on which the electricity is generated or on real property immediately adjacent thereto

Therefore, whether a directly supplying industrial cogeneration facility is considered an “electric service provider,” and thus protected by 95892(d)(4), is dependent on whether it 1) “offers electrical service . . . within the service territory of an electrical corporation” and 2) “offers electrical service solely to service customer load.”

To eliminate the confusion associated with a CHP being designated an electric service provider under CPUC rules, Air Products recommends CARB add the necessary definitions directly into the cap and trade rule to clarify that all CHP electricity customers are eligible for the distribution of auction proceeds.

6. *Proposed Changes in the Mandatory Reporting Program Create Uncertainty in Reporting Responsibility and GHG Emission Compliance Obligation for Co-Located Hydrogen Plants* – CARB has endeavored to mimic the mandatory reporting applicability and calculation methodology of the U.S. EPA Mandatory Reporting Rule in many ways. However, in one aspect of the reporting rule relevant to our operations in the state there appears to be a critical difference – when operational control is shared between entities, CARB’s assignment of reporting (and hence compliance allowance retirement) obligation shifts to the entity holding the permit to operate from the relevant air pollution control authority. The EPA MRR does not have such a provision, making the obligation to report rest solely on the owner/operator of a facility. With the modifications proposed to the state MRR, particularly under §95114(a) which now is identical to the EPA MRR language [Subpart P of 40 CFR Part 98 §98.160(c)], some uncertainty as to the states’ intent has been created.

We continue to seek clarifying language (or an explicit CARB applicability determination) that, notwithstanding the different interpretation by U.S. EPA, the responsibility for developing, submitting and certifying the GHG emissions data report under Article 2, §95104 of Title 17 and, subsequently, the obligation to satisfy an emission compliance obligation under Article 5, §95811(a), rests with the entity holding the permit to operate under the conditions described within the specific definitions of “Operational Control” under §95102 and “Operator” under §95802; and the regulatory primacy stated under §95000.5(d)(4).

Air Products hopes this detailed analysis of the proposed cap and trade 15-Day Amendments illustrates our critical interest and technical familiarity with the proper derivation of hydrogen benchmarks, liquid hydrogen leakage risk, and fair benefit sharing to all electricity consumers, regardless of the generating source.

We stand ready to provide further support to CARB staff in ensuring the allowance allocation treatment is both equitable and fair. If you have any questions or need additional information to support Air Products position on these matters, please contact me by phone (610-909-7313) or email adamskb@airproducts.com.

Respectfully,

A handwritten signature in black ink that reads "Keith Adams, P.E.".

Keith Adams, P.E.
Environmental Manager – Climate Change Programs

c: Jeff Lockett, Eric Guter, Stephen Losby, Peter Snyder, Stephen Crowley – Air Products
Stephen Cliff, Sam Wade, Mihoyo Fuji – California Air Resources Board
Jim Lyons, Jeff Adkins, Alexandra Marcucci – Sierra Research