

October 30, 2023

California Air Resources Board

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Submission via on-line portal

[Public Comment on the Request for Information for California Senate Bill 1206 Assessment Report | California Air Resources Board](#)

RE: CARB Request for Information – Senate Bill (SB) 1206 Assessment Report

Dear California Air Resources Board,

DuPont's Performance Building Solutions (PBS) business appreciates that California Air Resources Board (CARB) has issued a Request for Information (RFI) to assist in completing the report and transition plan away from hydrofluorocarbons (HFCs) as directed by California Senate Bill 1206. This bill would require the state board to post an assessment on its internet website by January 1, 2025, specifying how to transition the state's economy, by sector, away from hydrofluorocarbons and to ultra-low or no global warming potential alternatives no later than 2035.

PBS is a major producer of thermal insulation and air sealing products and technologies that are used extensively in the residential and commercial construction markets, in applications such as roof and wall insulation as well as insulated garage and entry doors. These products improve building energy efficiency, and they are necessary to meet California's energy efficiency and greenhouse gas emission reduction goals. Today PBS foam insulation products include extruded polystyrene boardstock foam insulation (XPS) and low-pressure spray polyurethane foam (LP SPF) insulation and sealants.

As a manufacturer that uses externally sourced foam blowing agents to create products, we are responding to questions in Section 8 and Section 10 of the RFI.

Section 8: Other Non-Refrigerant HFC Sources (Fire Protection, Aerosol Propellants, Foams, Solvents, MDI):

Question 35. Are there emerging technologies for non-refrigerant HFC end-uses (including products with application-specific allowances) that show promise in addressing the transition to ultra-low GWP or no-GWP alternatives?

The US extruded polystyrene foam (XPS) industry is completing transition out of high global warming potential (GWP) blowing agents such as HFC-134a. DuPont, along with two other US XPS manufacturers, which wholly makeup the Extruded Polystyrene Foam Association (XPSA), have moved to a blowing agent blend that mainly consists of ultra-low-GWP and no-GWP alternatives in combination with low-GWP HFC-152a.

It took PBS approximately 7 years to transition out of HFC-134a which took XPS products to GWP <150 and LP SPF products to GWP <10. There is a current lack of alternatives to achieve a GWP <10 in XPS. Each transition of blowing agents takes more time as invention is required. PBS is unaware of any emerging blowing agent technologies under development that are suitable as technically viable, drop-in alternatives to the current offerings. Time will be required to find a new solution of GWP <10 in XPS which will mean transition is not likely by 2030. It is important that CARB ensure sufficient transition time for the US XPS industry until 2035.

Section 10: Overarching Questions

38. What factors around PFAS (per- and polyfluoroalkyl substances) should be considered as California transitions to ultra-low- and/or no-GWP alternatives?

Some US States have or are implementing regulations with overly broad definitions of “PFAS” which incorrectly include the HFO/HCFO blowing agents used as foam blowing agents. As California considers transitions to ultra-low-GWP alternatives, the State must be careful to ensure any definition of “PFAS” does not incorrectly include these fluorinated gases which are non-persistent, non-toxic, and non-bioaccumulative (non-PBT). One example of a responsible definition of “PFAS” is found in the US EPA reporting rule published October 11, 2023ⁱ.

In terms of ultra-low or no-GWP substances, an exhaustive search for alternatives to high-GWP blowing agents in LP SPF and XPS products has been conducted by global technology experts over the last 10+ years, in response to the global HFC phasedown driven by the Montreal Protocol and Kigali Amendment. The result of our **extensive effort has led to HFO/HCFO compounds being identified as the only viable insulating foam blowing agent options, for use in a blowing agent blend, today.** Although the Kigali Amendment defined low global warming potential (GWP) and greenhouse gas (GHG) reduction as the main requirement of successful alternative blowing agent technology, a broad set of well-understood technical requirements (e.g., high insulating performance, air sealing performance, closed cell content and low water absorption) also guided the evaluation and identification of viable blowing agent options for LP SPF and XPS foams.

The research outcome sets LP SPF and XPS technologies apart from some other technologies that can use alternative blowing agent options like CO₂ and H₂O alone without an insulating gas. These blowing agent options alone are not viable for LP SPF and XPS applications in North America. Additionally, foam blowing alternatives with no-GWP such as hydrocarbons are volatile organic compounds (VOCs) and are classified as (extremely) flammable. The United Nations Foam Technical Options Committee under the UN TEAP of the Montreal Protocol has specifically noted that flammables are not appropriate for spray foam applications.ⁱⁱ

There are currently no plans to transition away from HFO/HCFO insulating foam blowing agents used in LP SPF and XPS. Transition plans are currently not possible, because no alternatives to HFO/HCFO used in LP SPF and XPS exist today, as reviewed above. Transition away from HFO/HCFO is wholly dependent upon development of new materials by

blowing agent technology developers and suppliers. New materials must be invented that would expand the technology options beyond the exhaustive set that has already been researched and demonstrated not to meet the product performance requirements.

To our knowledge, blowing agent technology developers and manufacturers do not have research programs currently underway to develop HFO/HCFO alternatives. We suspect that this activity may be unlikely given that HFO/HCFO is a technology that has only recently been commercialized after a lengthy research and development program, with products like LP SPF and XPS that utilize HFO/HCFO having been introduced to the market as recent as the past year. Without the invention and development of new alternatives by the blowing agent technology developers & manufacturers, the LP SPF and XPS industries will be unable to transition away from HFO/HCFO technology.

Considering the timing of potential transition, we note that the most recent transition out of high-GWP HFCs used in LP SPF and XPS products took the entire industry, considering HFO/HCFO producers, regulators, and downstream users, over 15 years. Applying this experience to a future potential transition away from HFO/HCFO, we estimate that transition would require roughly 25+ years, demonstrating the importance of a proper PFAS definition that will ensure the continued use of non-PBT HFO/HCFOs in the future.

Thank you for your thoughtful consideration to enable more flexibility and promote reasonable regulation while accomplishing your state's GHG reduction goals. Protecting human health and the environment are engrained in DuPont's core values. We are committed to continuous improvement of our chemical stewardship process and to upholding the highest standards for the products and innovations we deliver to our customers.

We would be pleased to provide further detailed information at any time.

Sincerely,



Lisa Massaro
Product Stewardship Manager

ⁱ [Federal Register :: Toxic Substances Control Act Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances](#)

ⁱⁱ Rigid and Flexible Foams Technical Options Committee 2018 Assessment Report, UNEP, ISBN: 978-9966-076-57-1 page 11, 24, and 30-31