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Climate Change and the Extruded Polystyrene (XPS) Foam Insulation Industry

The Extruded Polystyrene Foam Association (XPSA) represents the major XPS foam insulation manufacturers in North America and is a valuable resource on the topic of climate change, serving as a source of scientific data supporting the positive environmental impact of XPS insulation.

A History of Technological Advances and Compliance for Sustainability and Climate

XPSA is proud of its long history of working cooperatively with both U.S. and Canadian governments as well as international bodies in order to protect the stratospheric ozone and mitigate the effects of climate change. We support advancing the Montreal Protocol's phase down of HFCs and the Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) Program's transition from HFCs, specifically HFC-134a. This transition is an important accomplishment for the industry's stewardship and sustainability objective and a natural step in the ongoing search for better technologies to serve our customers and protect our environment. XPS manufacturers have always met or exceeded the timelines set forth and will continue to do so based on sound science and environmental stewardship.

The EPA's SNAP program, which periodically evaluates global warming potential (GWP) and the environmental acceptability of blowing agents used in foam insulation, has determined that HFC-134a remains an acceptable blowing agent for XPS until January 1, 2021. With respect to GWP, significant amounts of HFC-134a will remain in the foam at "end of life," and typical in-use emissions rates of HFC-134a will be 0.5% to 1.0% per year, according to [a study by Vo and Paquet](#). The use of HFCs in foam products is relatively low making up just 16% of the total North American HFC production, and the use of HFC-134a in foam products is even lower at 7%.

Making the Transition the Responsible Way

The intricacy of XPS chemistries makes the process of transitioning to an alternative blowing agent complex. Replacing HFC-134a requires a comprehensive reconsideration of the entire chemical makeup of XPS insulation products. The EPA has agreed on the need to provide sufficient time for XPS manufacturers to identify viable alternatives and to ensure adequate production capacity to meet global market demand. For these reasons, the XPS industry cannot halt its use of HFC-134a by 2016 or 2017 by switching to HFO-1234ze(E), carbon dioxide (CO₂), or hydrocarbons.

The XPS industry requires more time to convert foam blowing agents due to several technical challenges not faced by other industries where suitable alternatives have been available for many years. Due to these challenges, the past two blowing agent conversions took 10 years to successfully complete. The industry is intensively exploring all available insulating gases to find a blend which offers customers similar product performance at a competitive price, while minimizing the inherent manufacturing risk associated with processing more combustible materials and retraining employees.

Offsetting the Environmental Costs

The decision to use insulation must not only be taken into consideration for heating and cooling costs, but also for the benefits of emission reductions and net offset of CO₂ enabled through the use of these

products. Contrary to the statement that “it is actually better to have no insulation and crank up the heater and the AC because of the GWP of many types of home insulation,” Environmental Product Declaration (EPD) data reveals that XPS foam delivers energy savings that pay back the embedded CO₂ multiple times over the life of the building.

The XPSA and Canadian Plastics Industry Association (CPIA) form for submission of information, specified in Annex F of the Stockholm Convention pursuant to Article 8 of the Convention, showed that existing buildings account for 40% of world’s total energy consumption and 48% of global CO₂ emissions. This submission also indicated that for every 1 lb. of CO₂ equivalent created to make an XPS foam board, 233 lbs. of CO₂ equivalent are saved because of the energy spared throughout the life of the building.

The Department of Energy (DOE) and EPA both recognize that one of the most effective greenhouse gas (GHG) emissions reduction strategies for buildings is through increased energy efficiency. According to ENERGY STAR, it takes 3.34 units of energy to deliver one (1) unit of electricity to a building site for user consumption. As a result, conservation of energy that lowers demand has a tripling effect. For this simple reason, policies such as energy codes are in many cases increasing the use and application of all types of foam insulation throughout the United States. Due to their high R-value per inch, rigid foam insulation products, including XPS and SPF, are especially effective at mitigating GHG emissions over the 50-plus year life of the building, and therefore play an important role in improving building energy efficiency and reducing carbon-dioxide emissions from power plants.

In the EPA’s proposed CAA 111 (d) rule imposing emission caps on utilities to curb GHG emissions, the EPA noted that increases to cap emission could be offset by energy demand reduction, which is an acknowledgment of the critical role energy efficiency plays in overall GHG reduction efforts.

President Obama’s Climate Action Plan, issued in 2012 and subsequently revised in 2014, solidifies the fundamental link between foam insulation use and energy efficiency improvements within residential and commercial building sectors. Since HFC emissions from foam insulation are disproportionately offset by energy savings over the lifetime of a building, XPS foam insulation helps achieve advanced energy efficiency and GHG emissions reduction goals.

The Climate Action Plan also states that refrigeration and air conditioning are the primary industrial sectors that contribute to GHG emissions derived from HFCs. Foam insulation constitutes a small portion of the overall GHG emission profile for HFCs. In a March 2013 publication, [*Domestic Policies to Reduce the Near Term Risks of Climate Change*](#), the authors noted that while HFCs represent less than 2% of aggregate GHG emissions, HFC-134a from auto air-conditioning is “by far the largest use of HFC emissions.”

Our industry is committed to complying with international and U.S. regulations, while continuously developing technologies that take into consideration climate change, sustainability, quality, and safety, and will implement these alternatives on the timeline determined by the EPA.

The Extruded Polystyrene Foam Association is the leading authority on the XPS foam insulation industry and serves as a valuable resource. Additional information can be found at <http://www.xpsa.com>. For media inquiries please contact Kelsey Dentinger, XPSA Public Affairs Specialist, 202-207-1105, office@xpsa.com.