



May 8, 2020

Ms. Lisa Vest
Hearing Officer
Division of Air Quality
Department of Natural Resources and Economic Control
State of Delaware
89 Kings Highway
Dover, DE 19901

Submitted via online comment form at <https://dnrec.alpha.delaware.gov/public-hearings/comment-form/>
REGISTER NOTICE SAN # 2019-08

Re: globalFACT Comments on Proposed Prohibitions on Use of Certain Hydrofluorocarbons in Specific End-Uses

Dear Ms. Vest:

On April 30, 2020, the Division of Air Quality issued a proposed regulation establishing prohibitions and requirements for the use and manufacture of hydrofluorocarbons in the State of Delaware according to their specific end usage, including air conditioning and refrigeration equipment, aerosol propellants, and foam end-uses. Pursuant to the Register Notice, the Global Forum on Advanced Climate Technologies (globalFACT) respectfully provides its comments.

globalFACT is a not-for-profit organization that promotes education, awareness, and policies that support the important role of new-generation, low- and reduced-global warming potential (GWP) advanced climate technologies in protecting the environment while meeting the rapidly increasing demand for safe alternatives.

We would like to clarify information and conclusions in the Technical Support Document associated with the proposed regulation. Specifically, on Page 22, the Technical Support Document states:

From a European Parliament commission study⁴⁰, we know that for natural refrigerants (e.g. CO₂, water), the upfront cost of equipment is often higher when natural refrigerants are not yet the standard technology. However, the overall lifecycle cost is lower than conventional technology that relies on HFCs, thanks to improved energy performance, lower maintenance costs and other factors. In sectors where natural refrigerants are a standard technology (domestic refrigeration and some industrial refrigeration in Europe), the upfront cost of equipment is comparable to systems using HFCs and can be even more cost competitive than HFCs when looking at a lifecycle point of view.

There are several inaccuracies in this paragraph that must be addressed. First, we are unclear about the entity described as the "EU Parliament commission," as no such body exists. The report states to be

commissioned by the Greens/European Free alliance, a minority group of MEPs, rather than the full European [Union] Parliament.

Second, we question the reference to reduced life cycle costs when utilizing so-called “natural refrigerants.” The term “natural refrigerant” was created for marketing purposes. These products are actually industrial chemicals that undergo intensive industrial processing to be brought to refrigerant specifications. For example, hydrocarbons such as propane, butane, and pentane are produced in oil refineries by “cracking” fossil fuels and separating out various byproducts through distillation. Carbon dioxide is brought to refrigerant specifications by industrial processing. And while ammonia can be produced naturally by decomposition of animal waste, most of the ammonia used industrially is produced by a chemical process and is, in fact, synthetic.

Third, the statement that the overall lifecycle cost of “natural refrigerants” is lower is not accurate. All energy costs must be included in a proper comparison between CO₂ and low-GWP HFC and HFC/HFO systems. Refrigerant costs include not only the expense of the fluid, but the purchase and maintenance of equipment. New, replacement systems running on CO₂ are expensive and have complex designs that are necessary to overcome their low thermodynamic efficiency. In addition to higher system costs, they also require knowledgeable engineers and trained personnel for design, start-up, and maintenance — of which a limited pool exists. At least one [presentation](#) sponsored by the EPA GreenChill program has concluded that hydrocarbon systems can have higher energy and maintenance costs, which effectively cancel out any lower cost of refrigerants.

Finally, when comparing overall cost of systems running on so-called “naturals” versus those using low-GWP HFCs, HFOs, and blends, one must consider the total impact of a refrigerant. This includes both “direct” emissions from the refrigerant itself, as well as “indirect” emissions from energy use. Importantly, energy usage can represent more than 80% of a system’s impact on the environment. As is detailed in globalFACT’s white paper, [Selecting the Right Refrigerant for Commercial Refrigeration](#), in higher ambient temperatures, the energy efficiency of CO₂ is reduced, which increases the carbon footprint over the long term.

globalFACT greatly appreciates the opportunity to provide these comments on the Technical Support Document associated with the Department of Air Quality’s proposed regulation. We believe that, due to the vastness and complexity of available refrigerant options, there will never be one solution for all situations, but rather preferred solutions for specific applications — all with the aim of lowering the climate impact and providing safe and efficient operation and ease of use. We respectfully request that you take these comments into full consideration when finalizing the regulation for the proposed prohibitions on use of certain hydrofluorocarbons in specific end-uses.

Sincerely,



Jordan A. Smith
Executive Director