

The Honorable John Barrasso, Chairman
The Honorable Thomas Carper, Ranking Member
Committee on Environment and Public Works
US Senate
410 Dirksen Senate Office Building
Washington, DC 20510

Apr 8, 2020

Topic / Ref. : S.2754, The American Innovation and Manufacturing Act of 2019

We are writing in support of the goals and principles of S.2754, the American Innovation and Manufacturing Act of 2019. The Act begins a phasedown of hydrofluorocarbons (HFCs) for the purposes of transitioning to new refrigerants used in heating, ventilation, air conditioning, and refrigeration (HVACR). Aside from their use as refrigerants in HVACR, certain HFCs have critical niche uses. Some of these niche uses do not lend themselves to ready substitution. We would like to draw your attention to the use of HFCs as materials used to manufacture semiconductors.

As of 2015 the semiconductor industry in the US represents \$166 billion of economic activity out of \$335 billion globally. Air Liquide is a leading manufacturer of chemicals and gases used in semiconductor manufacturing. We manufacture and sell certain ultra-high purity HFCs for use as semiconductor etchants. We manufacture these compounds within the US for use domestically and for export. HFC usage as etchants represents around 0.01% of the overall HFC volume.

These etchants are used in tools and processes that have long development timelines and high capital costs. The physics and chemistry that occur within these tools means that substitution of different fluorinated compounds cannot readily be accomplished without significant R&D, and even then, can be limited. All silicon etchants, including the HFCs listed in S.2754, have fluorine as their active element. For some of these processes the need to have a stable, saturated, and partially fluorinated compound leaves few options.

We hope that this is seen as an essential use for HFCs for which no substitutes exist. We look forward to the opportunity to discuss these issues. Thank you for your consideration on this matter.

Sincerely,

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