
# Department of Natural Resources and Environmental Control

## Division of Air Quality

## Regulation Proposal
## 7 DE Admin Code 1151 –
## *Prohibitions on Use of Certain Hydrofluorocarbons in Specific End-Uses*

## Technical Support Document

April 2020

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# I. Executive Summary

As a coastal state with over 381 miles of shoreline, Delaware is already experiencing the detrimental effects of climate change, and its associated increased temperatures, sea level rise and intense rainfall events. Delaware is vulnerable to coastal erosion, storm surge, saltwater intrusion, and tidal wetland losses. Intense rainfall and rising sea levels increase the risk of permanent and temporary flooding across the state, which threatens public safety and incurs costly damage to homes and businesses. Rising temperatures, and extreme heat events increase the risk of serious illnesses, especially for vulnerable citizens—the elderly, young children, outdoor workers, and people with pre-existing health conditions. Temperature and rainfall extremes pose serious challenges for our agriculture and tourism economies, as well as imposing increasing costs for maintaining and repairing critical infrastructure. Inundation from sea level rise will occur in all three of Delaware's counties, affecting a wide variety of resources. For all these reasons, Delaware needs to prioritize addressing the effects of climate change and mitigating greenhouse gas emissions. Hydrofluorocarbons (HFCs) are potent greenhouse gases with global warming potential that are hundreds to thousands of times that of carbon dioxide ($CO_2$), and their use is projected to increase through 2050. Currently, HFCs are the fastest growing source of greenhouse gases globally, in sectors where energy-efficient alternatives are readily available for a growing number of applications.

This regulatory development process was initiated as a result of the 2019 Delaware House Concurrent Resolution 60[1] and the Governor's directive[2] to the Department of Natural Resources and Environmental Control to propose regulations for the use and manufacturing of HFCs in the State, by March 30, 2020. The proposed new regulation 7 DE Admin Code 1151 will establish prohibitions and phase down requirements for the manufacture and use of HFCs in Delaware, following an end-use specific schedule beginning as early as January 1, 2021. The proposed new regulation is based on the previously promulgated EPA Significant New Alternatives Policy (SNAP) rules 20 and 21[3], for which the federal agency had built an extensive technical support for the overall costs and the benefits for transitioning to lower global warming potential refrigerants that minimize risks to human health and the environment. According to estimates based on tools developed by the California Air Resources Board, on behalf of the United State Climate Alliance (USCA)[4], the proposed regulation is expected to reduce HFC emissions by 25% by 2030 compared to a Business as Usual scenario. In 10 years, (between 2020 and 2030), the Delaware proposal would avoid a total of 0.832 million metric tons of CO2 equivalent emissions.

This proposal is necessary to continue Delaware's effort to reduce its Greenhouse Gas (GHG) emissions, and to offer Delawareans an increasing quality of life through reduced air pollution, increased economic opportunities, and mitigating the effects of climate change.

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[1] Delaware General Assembly. Passed on June 30, 2019. House Concurrent Resolution 60. Accessible via: http://legis.delaware.gov/BillDetail/47864

[2] Delaware News, June 30, 2019. Governor's Directive on Delaware to Eliminate HFCs to Confront Climate. Accessible via: https://news.delaware.gov/2019/06/30/delaware-to-eliminate-hfcs-to-confront-climate-change/

[3] United States Environmental Protection Agency, Significant New Alternatives Policy, Regulatory website. Accessible via: https://www.epa.gov/snap/snap-regulations,

[4] United States Climate Alliance is a bipartisan coalition of governors committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement. Accessible via: https://www.usclimatealliance.org/

# II. Introduction and Background

## A. What are Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are gaseous compounds used across various economic sectors in applications for air conditioning, refrigeration, foam-blowing, solvents, and aerosols. HFCs were identified in the 2009 GHG Endangerment Finding[5] by the U.S. Environmental Protection Agency (EPA) as one of six GHGs in the atmosphere that "threaten the public health and welfare of current and future generations." As stated above, HFC emissions are GHG that can have a warming effect that is hundreds to thousands times that of carbon dioxide ($CO_2$), as illustrated in Table 1[6]. In the latter, two values are listed for the GWPs of each HFC; they refer to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4)[7] and Fifth Assessment Report (AR5)[8]. While more recent data were used for the AR5, official emission estimates are currently being reported by the U.S. using AR4 GWP values[9]. Blends of HFCs are also commonly used as refrigerant; for example, R-410A is common refrigerant used in air conditioning that is a mixture of difluoromethane (HFC-32) and pentafluoroethane (HFC-125), resulting in a GWP of 2,088 (AR4; 1,924 for AR5).

**Table 1. Examples of global warming potentials of commonly used HFCs**

| | 100-year GWP Values | |
|---|---|---|
| **Gas** | **AR4*** | **AR5**** |
| HFC-23 | 14,800 | 12,400 |
| HFC-32 | 675 | 677 |
| HFC-125 | 3,500 | 3,170 |
| HFC-134a | 1,430 | 1,300 |
| HFC-143a | 4,470 | 4,800 |
| HFC-152a | 124 | 138 |
| HFC-227ea | 3,220 | 3,350 |
| HFC-236fa | 9,810 | 8,060 |
| HFC-4310mee | 1,640 | 1,650 |

* Intergovernmental Panel on Climate Change, Fourth Assessment Report (AR4); official emission estimates are reported by the U.S. using AR4 GWP values

** Intergovernmental Panel on Climate Change, Fifth Assessment Report (AR5)

[5] United States Environmental Protection Agency, December 2009. Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. Regulatory website. Accessible via: https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-clean-air-act.

[6] United States Environmental Protection Agency. April 2019. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2017. Accessible via: https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

[7] The Intergovernmental Panel on Climate Change. September 2017. Fourth Assessment Report on climate Change. Accessible via: https://www.ipcc.ch/assessment-report/ar4/.

[8] The Intergovernmental Panel on Climate Change. September 2014. Fifth Assessment Report on Climate Change. Accessible via: https://www.ipcc.ch/assessment-report/ar5/.

[9] The Intergovernmental Panel on Climate Change. September 2014. Fourth Assessment Report on Climate Change. Accessible via: https://www.ipcc.ch/assessment-report/ar5/.

As discussed in the following section, HFCs were originally introduced as a substitution ozone-depleting substances (ODS), within the same applications, as part of the phase-out established in accordance to the Montreal Protocol[10].

## B. Background to this Initiative

Under the Montreal Protocol[11], chlorofluorocarbons (CFCs) were recognized as ozone depletion substances (ODS), and the EPA defined a phase-out schedule for the different classes of ODS (Class I and Class II). The phase-out targets the ODS that are produced or imported in the country, and the original schedule was amended over time.

The EPA rule for Class I substances (CFCs, halons, carbon tetrachloride, and methyl chloroform) required the producers to gradually reduce production of these chemicals and completely phase them out by January 1, 2000 (was later accelerated). Class II ODS (HCFCs – that were developed as transitional substitutes for class I) are used in a variety of applications, including refrigeration, air conditioning, foam blowing, solvents, aerosols, and fire suppression. Currently, there are 34 HCFCs subject to the EPA phase-out, but only a few are still commonly used (the most common being HCFC-22, HCFC-141b, HCFC-142-b). As a Party of the Montreal Protocol, the U.S.A. must incrementally decrease HCFCs consumption and production, to completion in 2030. HCFCs usage must be reduced to at least 99.5% below the baseline levels, in 2020. Section 605 of the CAA establishes the U.S. strategy and framework.

HFCs were developed to address the phase-out of the HCFCs (same applications), however they were recognized as greenhouse gases (GHGs) with high Global Warming Potentials (GWPs), and because of the increasing urgency of climate action, the Kigali Amendment[12] to the Montreal Protocol requires the participating countries to cut their production and consumption of HFCs by more than 80% by 2050.

The U.S. EPA sought to phase-down the use and manufacturing of these high-GWP pollutants through its Significant New Alternatives Policy (SNAP) program[13]. However, on August 8, 2017, the D.C. Court of Appeals limited the agency's ability to require replacement of HFCs due to a decision resulting from the Mexichem Fluor, Inc. (petitioner) v. EPA (respondent) case[14]. Although legal actions have been initiated to defend the SNAP rules in court, state action is required to maintain HFCs prohibitions schedule, in line with the vacated SNAP rules.

Delaware's Department of Natural Resources and Environmental Control has authority to regulate the use of HFCs upon Del. Code Title 7, Chapter 60 §§ 6001(c) & 6010 which authorize the

[10] United Nations. About Montreal Protocol Website. Accessible via: https://www.unenvironment.org/ozonaction/who-we-are/about-montreal-protocol

[11] United Nations. About Montreal Protocol Website. Accessible via: https://www.unenvironment.org/ozonaction/who-we-are/about-montreal-protocol

[12] United Nations Environment Programme. The Kigali Amendment to the Montreal protocol: another global commitment to stop climate change. Accessible via: https://www.unenvironment.org/news-and-stories/news/kigali-amendment-montreal-protocol-another-global-commitment-stop-climate

[13] United States Environmental Protection Agency, Significant New Alternatives Policy, Regulatory website. Accessible via: https://www.epa.gov/snap/snap-regulations,

[14] United States Court of Appeals for the District of Columbia Circuit. August 8, 2017. Mexichem Fluor, Inc. v. EPA. Accessible via: https://www.cadc.uscourts.gov/internet/opinions.nsf/3EDC3D4817D618CF8525817600508EF4/$file/15-1328-1687707.pdf

Department to adopt rules to control air pollution, as necessary to protect the public health, safety, and welfare.

The Division of Air Quality is developing regulation 7 DE Admin. Code 1151 "Prohibitions on Use of Certain Hydrofluorocarbons in Specific End-Uses", pursuant to the Governor's directive[15] and House Concurrent Resolution 60[16]. This proposed new regulation addresses the critical need to phase down the use of high-GWP gases, to confront climate change.

## C. Meeting Delaware's Greenhouse Gas Reduction Goals

Nationally, the use of HFCs in air conditioning, refrigeration, and other applications has been rapidly increasing, while emissions of HFCs have been increasing by as much 8% annually[17].

According to the 2016 Delaware GHG Inventory report, HFC emissions are projected to increase in multiple economic sectors18. HFCs are the fastest growing type of GHG emissions in Delaware, increasing by 36% from 2016 to 2025, as seen in Figure 1. Other GHG emissions, including N2O, methane and SF6, are projected to remain constant or decrease in that same time period.

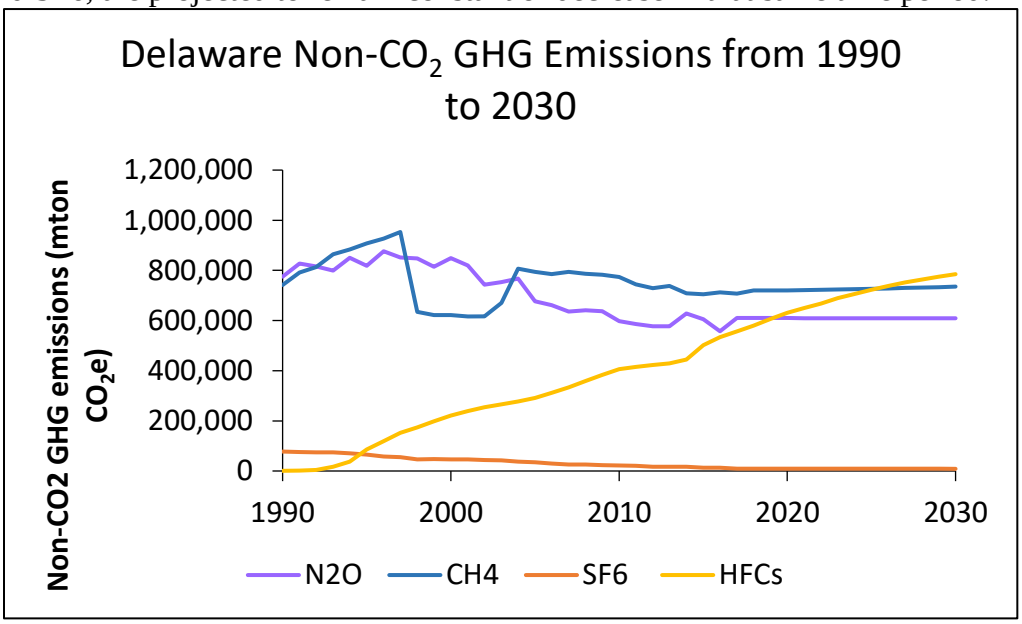


**Figure 1. Emission estimates and projections of $N_2O$, $CH_4$, and $SF_6$, and HFCs in Delaware from 1990 to 2030**

[15] Delaware News, June 30, 2019. Governor's Directive on Delaware to Eliminate HFCs to Confront Climate. Accessible via: https://news.delaware.gov/2019/06/30/delaware-to-eliminate-hfcs-to-confront-climate-change/

[16] Delaware General Assembly. Passed on June 30, 2019. House Concurrent Resolution 60. Accessible via: http://legis.delaware.gov/BillDetail/47864

[17] Delaware General Assembly. Passed on June 30, 2019. House Concurrent Resolution 60. Accessible via: http://legis.delaware.gov/BillDetail/47864

[18] Delaware Department of Natural Resources and Environmental Control. Division of Air Quality. July 2019. Delaware's 2016 Greenhouse Gas Emissions Inventory. Accessible via: http://www.dnrec.delaware.gov/Air/Documents/2016-de-ghg-inventory.pdf

Further, HFC emissions are anticipated to contribute to 4.5% of the total gross GHG emissions (in $MmtCO_2e$) in Delaware in 2025 (Figure 2). The proposed regulation will establish prohibitions for specific end-uses of certain HFC refrigerants in order to reduce associated GHG emissions. The reduction of these high-GWP emissions will help to reduce the negative impacts of climate change in Delaware and help the State to achieve its GHG emissions reduction commitment. According Delaware's 2016 Greenhouse Gas Emissions Inventory[19], the State is not on track to meet its GHG emission reduction target commitment of 26%-28% below 2005 levels, by 2025[20]. Currently, the State is projected to achieve a 16% reduction in GHG emissions from 2005 levels by 2025.

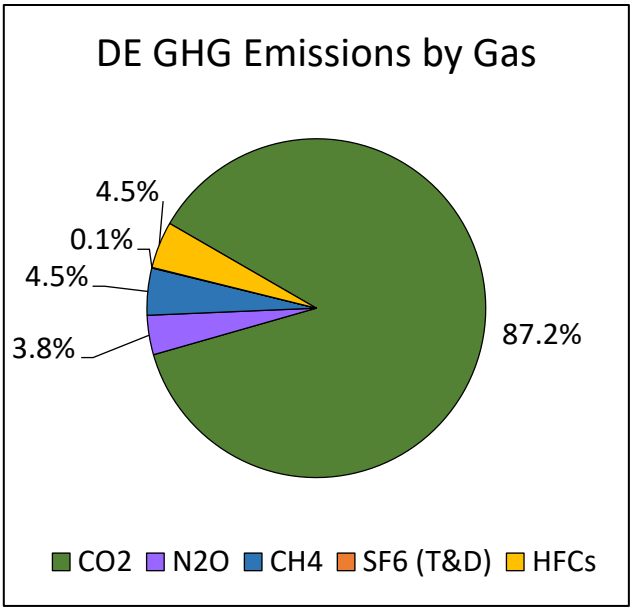


**Figure 2. Breakdown of projected GHG emissions ($MmtCO_2e$) in DE in 2025**

As HFC emissions are growing at a rapid rate in Delaware, the proposed new regulation on the manufacture and use of HFCs in the State is an important aspect to achieve the state's GHG reduction goals, as well as mitigate the environmental, social and, health risks related to climate change. Climate change poses significant threat especially to Delaware as a coastal state, which has the lowest average elevation in the country[21]. Among Delaware's industries and infrastructure that are vulnerable to the effects of climate change are the tourism, real estate, agriculture, transportation, wastewater, and more. Further, human health, air and water quality, and ecosystems are at increasing risk with the strengthening consequences of climate change[22].

Delaware is already experiencing climate change, which is causing increased temperatures, sea levels rise and heavy precipitation events.[23] Since 1900 the average annual temperature rose by 2°Fahrenheit, and average temperatures are expected to increase another 2.5 to 4.5 degrees Fahrenheit by mid-century (2050) and by as much as 8 degrees by 2100 (late century). By 2100, average precipitation is expected to increase by about 10 percent. Heavy rainstorms and the potential for flooding are expected to become more frequent and more intense. Increasing temperatures may

[19] Delaware Department of Natural Resources and Environmental Control. Division of Air Quality. July 2019. Delaware's 2016 Greenhouse Gas Emissions Inventory. Accessible via: http://www.dnrec.delaware.gov/Air/Documents/2016-de-ghg-inventory.pdf
[20] United States Climate Alliance. Alliance Member State Commitments. Accessible via: http://www.usclimatealliance.org/alliance-principles.
[21] University of Delaware. 2018. Research on Sea Level Rise. Accessible via: https://www1.udel.edu/researchmagazine/issue/vol4_no1/slr_intro.html
[22] Delaware Department of Natural Resources and Environmental Control. Division of Energy and Climate. February 2014. Delaware Climate Change Impact Assessment. Accessible via: http://www.dnrec.delaware.gov/energy/Documents/Climate%20Change%202013-2014/DCCIA%20interior_full_dated.pdf
[23] Delaware Department of Natural Resources and Environmental Control. Division of Energy and Climate. February 2014. Delaware Climate Change Impact Assessment. Accessible via: http://www.dnrec.delaware.gov/energy/Documents/Climate%20Change%202013-2014/DCCIA%20interior_full_dated.pdf

increase the risk of serious illness such as heat stroke, especially for our state's vulnerable citizens. Increased temperatures may also increase the number of days when ground-level ozone concentrations exceed health-based standards, which will impact children, the elderly, and healthy individuals. Changes in precipitation patterns and temperature may also impact how disease spreads, including mosquito and tick-borne diseases.

Because of its location, low average elevation, and dependence on the coast, Delaware is particularly vulnerable to the effects of rising sea levels including loss of low-lying land and structures, saltwater intrusion into ground and surface waters, and increased coastal flooding from storm events. Statewide, between 8% and 11% of the state's land area could be inundated by sea level rise by the year 2100.[24] Sea level rise is likely to affect the condition of roads and bridges and other infrastructure throughout the state, including access routes and evacuation routes to many beach communities and other low-lying areas. Although the direct impacts from sea level rise will be felt primarily in areas near tidal waters, every Delawarean is likely to be affected whether through increased costs of maintaining public infrastructure, decreased tax base, loss of recreational opportunities or loss of community character."

Because climate change is impacting Delaware's residents, natural resources, infrastructure and industries, Delaware believes that strong actions to mitigate greenhouse gases are necessary to ensure a high quality of life and economic vitality for generations to come. Following the 2017 decision by the Federal administration to withdraw the U.S. from the Paris climate agreement[25], the U.S. Climate Alliance[26] was formed by a bi-partisan coalition of 17 states committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement. Delaware is a founding member of the U.S. Climate Alliance, and in joining the coalition, committed to reduce its economy-wide GHG emissions by 26-28% by 2025 from a 2005 baseline.

[24] Department of Natural Resources and Environmental Control. July 2012. Preparing for Tomorrow's High Tide – Sea Level Rise Vulnerability Assessment for the State of Delaware. Accessible via: http://www.dnrec.delaware.gov/coastal/Pages/SLR/DelawareSLRVulnerabilityAssessment.aspx

[25] United Nations Climate Change. The Paris Agreement aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Accessible via: https://unfccc.int/process-and- meetings/the-paris-agreement/the-paris-agreement

[26] United States Climate Alliance is a bipartisan coalition of governors committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement. Accessible via: https://www.usclimatealliance.org/

# III. Overview of the Proposed Regulation 7 DE Admin Code 1151

In accordance with the Governor's directive, the proposed new regulation 7 DE Amin. Code 1151 *Prohibitions on Use of Certain Hydrofluorocarbons in Specific End-Uses* establishes the prohibitions and the requirements for the use and manufacture of hydrofluorocarbons in the State of Delaware, according to their specific end usage, which include air conditioning and refrigeration equipment, aerosol propellants, and foam end-uses.

## A. Applicability

The proposed regulation will establish prohibitions for any person who sells, offers for sale, leases, rents, installs, uses or manufactures in the State of Delaware, any product or equipment that uses a substance in any of the end-uses listed under the list of prohibited substances covered by the regulation.

As a flexibility mechanism, the Department proposed language to allow the use of product or equipment containing a prohibited substance if this product or equipment was acquired prior to the applicable effective date of prohibition, unless an existing system is retrofit. Additionally, the Department has proposed language to clarify that, unless an operation constitute a retrofit or reclassifies a system as "new", this proposed new regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing equipment, in any end-use covered by the proposed new regulation.

The Department has also proposed language to allow the sale, importation, exportation, installation, and use of product or equipment containing a prohibited substance after the specified date of prohibition, only if the product or equipment was manufactured prior to the applicable date of prohibition.

## B. Prohibitions

Table 2 below lists each prohibited substance and the effective date of its prohibition, according to its specific end-use. The prohibitions and effective dates detailed in the proposed new regulation were informed by the EPA SNAP rules 20 and 21 intended phase down schedule for the different substances, which took into consideration many economic constraints for the industry, along with the availability of viable and cost-effective low-GWP alternatives.

**Table 2: Proposed Regulation's List of Prohibited Substances and their Effective Date of Prohibition, by End-Use.**

| **End-use and Prohibited substances** | | |
|---|---|---|
| End-use Category: Aerosol Propellants | | |
| End-use | Prohibited Substances | Effective Date |
| Aerosol Propellants | HFC-125, HFC-134a, HFC-227ea and blends of HFC-227ea and HFC 134a. | January 1, 2021 |
| End-use Category: Air Conditioning | | |
| End-use | Prohibited Substances | Effective Date |

| | | |
|---|---|---|
| Centrifugal chillers (new) | FOR12A, FOR12B, HFC-134a, HFC-227ea, HFC-236fa, HFC245fa, R-125/ 134a/ 600a (28.1/70/1.9), R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-423A, R-424A, R-434A, R438A, R-507A, RS-44 (2003 composition), THR-03. | January 1, 2024 |
| Positive displacement chillers (new) | FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R125/ 134a/ 600a (28.1/70/1.9), R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-424A, R-434A, R-437A, R438A, R-507A, RS-44 (2003 composition), SP34E, THR-03. | January 1, 2024 |
| End-use Category: Refrigeration | | |
| End-use | Prohibited Substances | Effective Date |
| Cold storage warehouses (new) | HFC-227ea, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R404A, R-407A, R-407B, R-410A, R-410B, R-417A, R-421A, R421B, R-422A, R-422B, R-422C, R-422D, R-423A, R-424A, R428A, R-434A, R-438A, R-507A, RS-44 (2003 composition). | January 1, 2023 |
| Household refrigerators and freezers (new) | FOR12A, FOR12B, HFC-134a, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-507A, RS24 (2002 formulation), RS-44 (2003 formulation), SP34E, THR-03. | January 1, 2022 |
| Household refrigerators and freezers—compact (new) | FOR12A, FOR12B, HFC-134a, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-507A, RS24 (2002 formulation), RS-44 (2003 formulation), SP34E, THR-03. | January 1, 2021 |
| Household refrigerators and freezers—built in appliances (new) | FOR12A, FOR12B, HFC-134a, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-507A, RS24 (2002 formulation), RS-44 (2003 formulation), SP34E, THR-03. | January 1, 2023 |

| | | |
|---|---|---|
| Supermarket Systems (Retrofit) | R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R428A, R-434A, R-507A | January 1, 2021 |
| Supermarket Systems (New) | HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, R-507A. | January 1, 2021 |
| Remote Condensing Units (Retrofit) | R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R428A, R-434A, R-507A. | January 1, 2021 |
| Remote Condensing Units (New) | HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, R-507A. | January 1, 2021 |
| Stand-Alone Units (Retrofit) | R-404A, R-507A. | January 1, 2021 |
| Stand-Alone Medium-Temperature Units (New) | FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R407A, R-407B, R-407C, R-407F, R-410A, R-410B, R417A, R-421A, R-421B, R-422A, R-422B, R-422C, R422D, R-424A, R-426A, R-428A, R-434A, R-437A, R438A, R-507A, RS-24 (2002 formulation), RS-44 (2003 formulation), SP34E, THR-03. | January 1, 2021 |
| Stand-Alone Low-Temperature Units (New) | HFC-227ea, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R422A, R-422B, R-422C, R-422D, R-424A, R-428A, R434A, R-437A, R-438A, R-507A, RS-44 (2003 formulation). | January 1, 2021 |
| Refrigerated food processing and dispensing equipment (New) | HFC-227ea, KDD6, R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R424A, R-428A, R-434A, R-437A, R-438A, R-507A, RS-44 (2003 formulation). | January 1, 2021 |
| Vending Machines (Retrofit) | R-404A, R-507A. | January 1, 2021 |
| Vending Machines (New) | FOR12A, FOR12B, HFC-134a, KDD6, R125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R407C, R-410A, R-410B, R-417A, R-421A, R-422B, R422C, R-422D, R-426A, R-437A, R-438A, R-507A, RS-24 (2002 formulation), SP34E. | January 1, 2022 |
| End-use Category: Foams | | |
| End-use | Prohibited Substances | Effective Date |
| Rigid Polyurethane and Polyisocyanurate | HFC 134a, HFC 245fa, HFC 365mfc, and blends thereof. | January 1, 2021 |

| | | |
|---|---|---|
| Laminated Boardstock | | |
| Flexible Polyurethane | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof. | January 1, 2021 |
| Integral Skin Polyurethane | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Polystyrene Extruded Sheet | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Phenolic Insulation Board and Bunstock | HFC-143a, HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof. | January 1, 2021 |
| Rigid Polyurethane Slabstock and Other | HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Rigid Polyurethane Appliance Foam | HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Rigid Polyurethane Commercial Refrigeration and Sandwich Panels | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Polyolefin | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Rigid Polyurethane Marine Flotation Foam | HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6. | January 1, 2021 |
| Polystyrene Extruded Boardstock and Billet (XPS) | HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel B, Formacel Z-6. | January 1, 2021 |
| Rigid polyurethane (PU) high-pressure two-component spray foam | HFC-134a, HFC-245fa, and blends thereof; blends of HFC365mfc with at least 4 percent HFC-245fa, and commercial blends of HFC-365mfc with 7 to 13 percent HFC-227ea and the remainder HFC-365mfc; Formacel TI. | January 1, 2021 |
| Rigid PU low-pressure two-component spray foam | HFC-134a, HFC-245fa, and blends thereof; blends of HFC365mfc with at least 4 percent HFC-245fa, and commercial blends of HFC-365mfc with 7 to 13 percent HFC-227ea and the remainder HFC-365mfc; Formacel TI. | January 1, 2021 |
| Rigid PU one-component foam sealants | HFC-134a, HFC-245fa, and blends thereof; blends of HFC365mfc with at least 4 percent HFC-245fa, and commercial blends of HFC-365mfc with 7 to 13 percent HFC-227ea and the remainder HFC-365mfc; Formacel TI. | January 1, 2021 |

The EPA SNAP rules prohibition dates that pre-dated December 31st, 2020 were revised to be January 1, 2021 under this proposed new regulation, to accommodate for the Department's regulatory process development.

Additionally, the Department has allowed a one-year extension (revised to January 1st, 2022) for the new vending machine end-use category, before the effective date of prohibition for all substances covered under this end-use. This extension resulted from industry stakeholders informing the Department that the current preferred low GWP refrigerant alternative (R-290) for the vending machine industry is currently designated as a flammable chemical A-3 by the American Society of Heating, refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) guideline 34[27]. UL 541 and ASHRAE 15 have authority over products containing this chemical and their placement within buildings, and pursuant to these requirements, in the US, vending machines with any refrigerant other than A1 (non-flammable) classification may not be placed in locations of ingress, egress, hallways, or lobby areas of any buildings, at the risk of severe liabilities in case of incident. The industry informed the Department of the current work with UL and ASHRAE that may allow R-290 to work within the safety standards, by modifying UL 541 and ASHRAE 15. For these reasons, the Department is proposing to allow the industry a one-year extension to establish their compliance pathway.

## C. Disclosure Statement

This proposed regulation establishes disclosure requirements for manufacturers of the products and equipment covered under the proposed new regulation. By requiring a disclosure statement or label to be available to the buyer of products and/or equipment covered under this proposed new regulation, the Department aims to ensure that said buyer can verify that their purchase follows State regulation.

In setting the disclosure statement requirements, the Department is proposing language to allow flexibility for manufacturers to comply, while offering the customers transparent and easily accessible information on their purchase.

The Department has proposed the following disclosure statement requirements, to be made available to the buyer accompanying the product or equipment covered under this proposed regulation. These requirements were crafted in collaboration with many industry-specific stakeholders that informed the process by highlighting the practical challenges, and existing practices in their respective field.

I) For motor-bearing refrigeration and air-conditioning equipment that is neither factory-charged nor pre-charged with refrigerant. The disclosure or label will include the following statement:

*"This equipment is prohibited from using any substance on the "List of Prohibited Substances" for that specific end-use, in accordance with State regulations for hydrofluorocarbons."*

II) For motor-bearing refrigeration and air-conditioning equipment that is factory-charged or pre-charged with refrigerant. The disclosure or label will include the following information:

[27] ANSI/ASHRAE Standard 34 -2019, Designation and Safety Classification of Refrigerants. Accessible via https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda/addenda-to-standard-34-2019

a. The date of manufacture
b. The refrigerant and foam blowing agent that the product/equipment contains

For this category, the Department has proposed language to allow existing labels to be used as an alternative compliance path, if they contain the required information mentioned above.

III) For foam products, the disclosure or label will comply with either one of the following options:
   a. **Option 1** should include de following information:
      i. The date of manufacture
      ii. The foam blowing agent that the product contains.
         1. For this criterion, the Department has proposed language to allow Safety Data Sheet[28] as an alternative compliance path.
   b. **Option 2** should include the following statement:
      *"Where sold, compliant with State HFC regulations."*

IV) For aerosol propellants, the disclosure or label will comply with either one of the following options:
   a. **Option 1** should include de following information:
      i. The date of manufacture
         1. For this criterion, the Department has proposed language to allow a date code[29] as an alternative compliance path.
      ii. The aerosol propellant the product contains.
         1. For this criterion, the Department has proposed language to allow Safety Data Sheet[30] as an alternative compliance path.
   b. **Option 2** should include the following statement:
      *"Where sold, compliant with State HFC regulations."*

[28] A reference to a Safety Data Sheet that is in compliance with 29 CFR 1910.1200 requirements, and identifies the foam blowing agent the product contains.
[29] Where a date code representing the date, shall be indicated on the label, lid, or bottom of the container. If the manufacturer uses a date code for any product, the manufacturer shall file an explanation of each code to the Department.
[30] A reference to a Safety Data Sheet that is in compliance with 29 CFR 1910.1200 requirements, and identifies the propellant the product contains.

# IV. ECONOMIC IMPACTS

## A. EPA's SNAP Economic Impact Analysis

I) Aerosols, foams, commercial refrigeration and motor vehicle air conditioning end-uses

EPA's analysis estimates the nationwide potential annualized compliance costs associated with the requirements to change certain high-GWP alternatives used in aerosols, foams, commercial refrigeration, and motor vehicle air conditioning (SNAP 20)[31], to range from $28.0 million to $50.6 million, in 2013 dollars using a 3% discount rate. When combined with the estimated savings, the total annualized costs are estimated to range from $0.2 million to $31.9 million. The estimated annualized compliance costs for these specific end-uses are shown in Table 3, below.

For example, as illustrated in Table 3, no annual costs or savings are assumed for Supermarket Systems and Remote Condensing Units, since supermarkets the incremental cost of using R-407A in new systems in lieu of R-404A or R-507A is negligible for end-users (e.g. supermarkets), given that the composition of the chemicals are similar the cost of the refrigerant is assumed to be the same.

Scaling down these national estimates of annualized compliance costs associated with SNAP 20, the highest potential annualized costs (including savings) for the entire State of Delaware are estimated to total $93,460 in 2013 U.S. dollars[32]

[31] ICF International. July 2015. Revised Cost Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives. Accessible via: https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0242

[32] Using the United States Census Bureau population data of 967,171 people and 330,119,397 for Delaware population and National population respectively, on December 10, 2019. Accessible via: https://www.census.gov/popclock/

**Table 3. U.S. EPA's National Estimate of Annualized Compliance Cost of the Regulatory Changes Associated with SNAP 20, using a 3% Discount Rate[33]**

| Sector | Higher | | | Lower | | |
|---|---|---|---|---|---|---|
| | Annualized Upfront Costs[a] | Annual Savings[b] | Annualized Upfront Cost and Annual Savings[c] | Annualized Upfront Costs[a] | Annual Savings[b] | Annualized Upfront Cost and Annual Savings[b] |
| **Motor Vehicle Air Conditioning – Exports[d]** | **$8,760,000** | **$0** | **$8,760,000** | **$0** | **$0** | **$0** |
| **Aerosols** | **$860,000** | **($5,250,000)** | **$0[c]** | **$210,000** | **($5,250,000)** | **($5,040,000)** |
| **Foams** | **$26,940,000** | **($14,090,000)** | **$21,860,000** | **$18,910,000** | **($14,090,000)** | **$4,820,000** |
| *Polystyrene foam product manufacturing* | $18,400,000 | $0 | $18,400,000 | $11,810,000 | $0 | $11,810,000 |
| *Household refrigerator and freezer manufacturing* | $2,280,000 | ($6,600,000) | $0[c] | $1,900,000 | ($6,600,000) | ($4,700,000) |
| *Commercial and industrial refrigeration equipment manufacturing* | $2,790,000 | ($7,480,000) | $0[c] | $2,320,000 | ($7,480,000) | ($5,160,000) |
| *Urethane and other foam product (except polystyrene) manufacturing* | $3,480,000 | ($10,000) | $3,470,000 | $2,890,000 | ($10,000) | $2,880,000 |
| **Commercial Refrigeration** | **$1,280,000** | **$0** | **$1,280,000** | **$400,000** | **$0** | **$400,000** |
| New Equipment | **$1,280,000** | **$0** | **$1,280,000** | **$400,000** | **$0** | **$400,000** |
| *Supermarket systems* | $0 | $0 | $0 | $0 | $0 | $0 |
| *Remote condensing units* | $0 | $0 | $0 | $0 | $0 | $0 |
| *Stand-alone equipment* | $1,080,000 | $0 | $1,080,000 | $320,000 | $0 | $320,000 |
| *Vending machines* | $200,000 | $0 | $200,000 | $80,000 | $0 | $80,000 |
| Retrofits | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** |
| *Supermarket systems* | $0 | $0 | $0 | $0 | $0 | $0 |
| *Remote condensing units* | $0 | $0 | $0 | $0 | $0 | $0 |
| *Stand-alone equipment* | $0 | $0 | $0 | $0 | $0 | $0 |
| *Vending machines* | $0 | $0 | $0 | $0 | $0 | $0 |
| **ALL SECTORS** | **$37,840,000** | **($19,340,000)** | **$31,910,000[c]** | **$19,530,000** | **($19,340,000)** | **$180,000** |

*Totals may not sum due to independent rounding.*

*[a] Includes annualized upfront capital costs as well as recurring annual costs.*

*[b] Savings are shown as negative values; costs are shown as positive values.*

*[c] Annualized upfront costs and annual savings have been rounded to zero rather than a negative combined annualized upfront costs and annual savings for the higher estimate. The rounding assumes that at least some portion of the industry would have made the change even in the absence of the regulation.*

*[d] Costs are estimated on a per vehicle basis and are assumed for a subset of the export market only.*

[33] Id at 31.

II) Refrigeration, air conditioning, foams and fire suppression end-uses

EPA's analysis estimates the nationwide potential annualized compliance costs associated with the requirements to change certain high-GWP alternatives used in refrigeration and air conditioning, foams, and fire suppression (SNAP 21)[34], to range from $59.3 million to $71.2 million, in 2015 dollars using a 3% discount rate, as shown in Table 4. For these end-uses, however, the potential costs savings associated with the changes in energy efficiency were not estimated because energy efficiency was related to a large number of factors, including equipment design, and equipment characteristics. Energy efficiency does not just depend on the refrigerant or foam blowing agent used.

For example, in EPA's estimate illustrated in Table 4, manufacturers of refrigerated food processing and dispensing equipment incur an incremental cost of $4-5 for each for each piece of equipment they produce using R-450A in place of R-404A (regulated substance). With units estimated to sell for $10,000 a piece on average, manufacturers are estimated to incur, on average, an annual incremental cost of ~$200-$200,000 (2015 dollars), depending on the size of the firm.

**Table 4. U.S. EPA's National Estimate of Annualized Compliance Cost of the Regulatory Changes Associated with SNAP 21, using a 3% Discount Rate[35]**

| Sector | Estimated Number of Businesses Impacted by the Rule[a] | Higher Annualized Costs[a] | Lower Annualized Costs[a] |
|---|---|---|---|
| **Refrigeration and Air Conditioning** | **50** | **$69,659,000** | **$58,213,000** |
| *Centrifugal Chillers* | <10 | $29,352,000 | $25,879,000 |
| *Positive Displacement Chillers* | | $33,799,000 | $27,039,000 |
| *Food Processing and Dispensing Equipment* | 20 | $419,000 | $335,000 |
| *Household Refrigerators and Freezers* | 20 | $5,604,000 | $4,616,000 |
| *Cold Storage Warehouses* | <10 | $142,000 | $69,000 |
| **Foams** | **50** | **$1,560,000** | **$1,118,000** |
| *High-Pressure Two-Component Spray Foam* | 40 | $1,089,000 | $726,000 |
| *Low-Pressure Two-Component Spray Foam* | <10 | $467,000 | $359,000 |
| *One-Component Foam* | <10 | $5,000 | $3,000 |
| *Flexible Polyurethane* | 0 | $0 | $0 |
| **Fire Suppression** | **0** | **$0** | **$0** |
| *Total Flooding* | 0 | $0 | $0 |
| **ALL SECTORS** | **100** | **$71,219,000** | **$59,331,000** |

Totals may not sum due to independent rounding.

[a] Includes annualized upfront capital costs as well as recurring annual costs.

[34] ICF International. September 2016. Cost Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives used in Refrigeration and Air Conditioning, Foams, and Fire Suppression.

[35] ICF International. September 2016. Cost Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives used in Refrigeration and Air Conditioning, Foams, and Fire Suppression.

Scaling down these annualized compliance costs associated with SNAP 21, the highest potential annualized costs for the entire State of Delaware are estimated to total $208,599 in 2015 U.S. dollars[36].

### III) SNAP 20 and 21 entities in the State of Delaware

EPA's Economic Impact Screening Analyses[37] uses the North American Industry Classification System (NAICS) codes for all sectors, potentially affected by the SNAP rules to clarify the industry sectors covered under each end-use.

For illustration purposes, Table 5 below lists all sector of activities targeted by the vacated SNAP rules, and their corresponding NAICS codes (used for EPA's Economic Impact Analyses), along with the number of corresponding entities in Delaware falling in these NAICS codes and potentially impacted by the proposal.

It should be noted that EPA's economic impact analyses are likely to overestimate the compliance costs as they would be implemented in Delaware with prohibitions dates starting not earlier than January 2021. The reasons include:

1) EPA's estimates of costs are primarily applied to manufacturers that are not located in Delaware state,

2) The current proposal does not cover Motor Vehicle Air Conditioning end-uses, which was included in the EPA rules,

3) EPA rules had their first effective date of prohibitions starting in 2016, thus some of the covered entities have already made the transition to alternative substances and already incurred the costs that would be associated with this proposal, and

4) The current proposal does not contain record-keeping requirements where the EPA SNAP rules did.

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[36] Using the United States Census Bureau population data of 967,171 people and 330,119,397 for Delaware population and National population respectively, on December 10, 2019. Accessible via: https://www.census.gov/popclock/

[37] ICF International for U.S. Environmental Protection Agency. July 2015. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives – Revised. Accessible via https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0240

*And*

ICF International for U.S. Environmental Protection Agency. September 2016. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives used in Refrigeration and Air Conditioning, Foams, and Fire Suppression.

**Table 5. Identified Delaware Entities by NAICS Codes, based on EPA's Screening Analysis for SNAP rules 20 and 21 Impacted Entities**

| Category | NAICS Code | Number of Entities in Delaware |
|---|---|---|
| Motor Vehicle Air Conditioning | NAICS 336111 Automobile Manufacturing | 0 |
| | NAICS 336112 Light Truck and Utility Vehicle Manufacturing | 0 |
| Aerosols<br>*The broader industries represented by these NAICS codes may also manufacture a majority of products which are not aerosols, and aerosol products that are already using non-HFC technologies.* | NAICS 325620 Perfumes, makeups and other toiletries | 1 |
| | NAICS 325612 Polishes and other sanitation goods | 1 |
| | NAICS 325520 Adhesive manufacturing | 1 |
| | NAICS 324191 Petroleum lubricating oil and grease manufacturing | 1 |
| | NAICS 325998 All other miscellaneous chemical product and preparation manufacturing | 8 |
| | NAICS 325412 Pharmaceutical preparation manufacturing | 16 |
| | NAICS 325199 All other basic organic chemical manufacturing | 6 |
| | NAICS 339113 Surgical appliance and supplies manufacturing | 8 |
| Foam Sector | NAICS 326140 Polystyrene foam product manufacturing | 1 |
| | NAICS 335222 Household refrigerator and home freezer manufacturing | 0 |
| | NAICS 333415 Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 4 |

| Category | NAICS Code | Number of Entities in Delaware |
|---|---|---|
| | NAICS 326150 Urethane and other foam product (except polystyrene) manufacturing | 5 |
| Remote Retail Food Equipment | NAICS 44511 Supermarkets and other grocery (except convenience) stores | 157 |
| | NAICS 44512 Convenience stores | 103 |
| | NAICS 44521 Specialty food stores – meat markets | 20 |
| | NAICS 44522 Specialty food stores – fish and seafood markets | 20 |
| | NAICS 44523 Specialty food stores – fruit and vegetable markets | 15 |
| | NAICS 445291 Specialty food stores – baked goods stores | 4 |
| | NAICS 445292 Specialty food stores – confectionary and nut stores | 12 |
| | NAICS 445299 All other specialty food stores | 12 |
| | NAICS 4453 Beer, wine, and liquor stores | 258 |
| | NAICS 453110 Florist | 35 |
| | NAICS 44711 Gasoline stations with convenience stores | 165 |
| | NAICS 44719 Other gasoline stations | 15 |
| | NAICS 446110 Pharmacies and drug stores | 265 |
| | NAICS 452311 Warehouse clubs and superstores | 24 |
| | NAICS 452319 All other general merchandise stores | 129 |

| Category | NAICS Code | Number of Entities in Delaware |
|---|---|---|
| | NAICS 72111 Hotels (except casino hotels) and motels | 171 |
| | NAICS 72112 Casino hotels | 1 |
| | NAICS 722511 Full-service Restaurants | 817 |
| | NAICS 722513 Limited-service restaurants | 722 |
| | NAICS 722514 Cafeterias, buffets, and grill buffets | 18 |
| | NAICS 722515 Snack and nonalcoholic beverage bars | 232 |
| | NAICS 72241 Drinking places | 52 |
| Stand-Alone Retail Food Equipment | NAICS 333415 Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 4 |
| Vending Machines | NAICS 333311 Automatic vending machine manufacturing | 0 |
| Centrifugal and positive displacement chiller manufacturers | NAICS code 333415, air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 4 - *already counted under "Stand-Alone Retail Food Equipment"* |
| Household Refrigerators and Freezers | NAICS 335222 Household refrigerator and home freezer manufacturing | 0 |

## B. Low-GWP Alternative Costs

Most HFCs are used as refrigerants in refrigeration and air conditioning equipment, but also as blowing agents, aerosol propellants and solvents. The lower-GWP alternatives to commonly used HFCs include natural refrigerants, HFCs with lower GWP (such as R32), hydrofluoroolefins (HFOs), and HFC-HFO blends. Each substance varies in terms of flammability and toxicity potential, and although many industries already have adopted preferred low-GWP alternatives for specific end-uses, for most end-use categories, there is ongoing research and development for optimal climate-friendly, energy-efficient, safe and proven alternatives.

Table 3, presented in section IV(A) of this Technical Support Document details nationwide estimated savings expected for the transition to lower-GWP substances in some end-uses[38]. For example, EPA's Screening Analysis[39] estimated that if 50% of the nation's large supermarkets choose to replace an old R404A or R507A system with a new transcritical $CO_2$ system, those supermarkets were estimated to incur an additional total annualized upfront cost of ~$979,000 and total annual cost savings of ~$72,000 (in 2013 dollars).

Unfortunately, there are no simple formula to quantify the potential savings associated with the transition to a lower-GWP system/equipment, simply because these savings are dependent on a very large number of factors, including equipment design, energy efficiency and equipment characteristics, not just on the refrigerant or foam blowing agent used.

From a European Parliament commission study[40], we know that for natural refrigerants (e.g. $CO_2$, 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.

With growing production (demand) the capital cost of equipment is expected to decrease due to economies of scale, and as more suppliers enter the market and the availability of components increases, making the new technology competitive with the conventional HFC systems. For these reasons, along with the urgency of climate action, HFC regulations are an essential component of driving the industry towards adopting long-term solutions.

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[38] ICF International. July 2015. Revised Cost Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives. Accessible via https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0242

[39] ICF International. July 2015. Revised Cost Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives. Accessible via: https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0242

[40] Shecco. October 2016. F-Gas Regulation shaking up the HVAC&R industry. Report commissioned in the European Parliament. Accessible via: https://issuu.com/shecco/docs/f-gas_impact_shecco_october2016

As a way to alleviate the financial burden to the industry and the end-users, the Division of Climate, Coastal & Energy has designed an incentive program[41] to help accelerate the transition away from high-GWP refrigerants. The latter approach is a less intrusive method to reduce the use of HFCs in Delaware, since it implies a voluntary program that will incentivize Delaware residents and businesses to use or switch to low-GWP refrigerants. The Department believes that combining the regulatory approach to the incentive program, and deploying them in close timeline, offers the best way to accelerate the transition and achieve the most efficient transition schedule.

## C. Small Business Impact Statement

According to EPA's Screening Analysis for the SNAP rules 20[42] and 21[43] implementation in the nation, the estimated highest aggregated Total Annualized Economic Impact on Small Businesses (for all industries affected by the SNAP rules) is $18,700,000 when a 3% discount rate is applied. National impact values across each of the sectors, by NAICS code, can be seen in Table 6 below.

According to the EPA, the implementation of the SNAP rules 20 and 21 can be presumed to have no Significant Economic Impact on a Substantial Number of Small Entities (SISNOSE), because of the following reasons:

- About 500,000 small businesses could be subject to the rulemaking nationally, and more than 99% of these small businesses would be expected to experience zero compliance costs.
    - For about 120 small businesses that are expected to incur compliance costs as a result of SNAP, their costs are estimated to be less than 1% of annual sales.
    - This analysis indicates that fewer than 80 of the nearly 500,000 affected small businesses—or <0.1%—could incur costs in excess of 1% of annual sales, and that fewer than 60 small businesses could incur costs in excess of 3% of annual sales.
- For the refrigeration, and air conditioning, foams, and fire suppression sectors particularly:
    - Roughly 89 small businesses could be subject to the rulemaking, although roughly 76% of small businesses subject to this rulemaking would be expected to incur compliance costs that are estimated to be less than 1% of annual sales.
    - This analysis indicates that up to 21 of the 89 affected small businesses—or roughly 24%—could incur costs in excess of 1% of annual sales, and that up to 12 small businesses could incur costs in excess of 3% of annual sales.

[41] Department of Natural Resources and Environmental Control. March 2020. Cool Switch Low Impact Refrigerant Program. Accessible via: https://dnrec.alpha.delaware.gov/climate-coastal-energy/efficiency/cool-switch/

[42] ICF International for U.S. Environmental Protection Agency. July 2015. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives – Revised. Accessible via https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0240

[43] ICF International for U.S. Environmental Protection Agency. September 2016. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives used in Refrigeration and Air Conditioning, Foams, and Fire Suppression.

**Table 6. U.S. EPA' Estimate off SNAP 20 and 21 Rules' National Impact to Small Businesses, using a 3% Discount Rate[44, 45]**

| Sector | NAICS | Industry | Estimated Number of Small Businesses Affected by the Rule | Total Annualized Economic Impact on Small Businesses | |
|---|---|---|---|---|---|
| | | | | Lower | Higher |
| MVACs | 336111 | Automobile Manufacturing | 0 | $0 | $0 |
| | 336112 | Light truck and utility vehicle manufacturing | 0 | $0 | $0 |
| Aerosols | 325620 | Perfumes, Makeups and Other Toiletries | - | $0 | $0 |
| | 325612 | Polishes and Other Sanitation Goods | - | $0 | $0 |
| | 325520 | Adhesive manufacturing | - | $0 | $0 |
| | 324191 | Petroleum lubricating oil and grease manufacturing | - | $0 | $0 |
| | 325510 | Paint and Coating Manufacturing | - | $0 | $0 |
| | 325998 | All Other Miscellaneous Chemical Product and Preparation Manufacturing | 5 | ($390,000) | ($20,000) |
| | 325412 | Pharmaceutical Preparation Manufacturing | - | $0 | $0 |
| | 325199 | All Other Basic Organic Chemical Manufacturing | - | $0 | $0 |
| | 339113 | Surgical Appliance & Supplies Manufacturing | - | $0 | $0 |
| Foams | 326140 | Polystyrene foam product manufacturing | - | $0 | $0 |
| | 335222 | Household refrigerator and home freezer manufacturing | 5 | $240,000 | $490,000 |
| | 333415 | Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 47 | ($800,000) | ($370,000) |
| | 326150 | Urethane and other foam product (except polystyrene) manufacturing | 61 | $2,870,000 | $3,460,000 |
| Retail Food | 44511 | Supermarkets and Other Grocery (Except Convenience) Stores | 31,665 | $0 | $0 |
| | 44512 | Convenience Stores | 16,072 | $0 | $0 |

[44] ICF International for U.S. Environmental Protection Agency. July 2015. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives – Revised. Accessible via: https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0198-0240

[45] ICF International for U.S. Environmental Protection Agency. September 2016. Economic Impact Screening Analysis for Regulatory Changes to the Listing Status of High-GWP Alternatives used in Refrigeration and Air Conditioning, Foams, and Fire Suppression.

| Sector | NAICS | Industry | Estimated Number of Small Businesses Affected by the Rule | Total Annualized Economic Impact on Small Businesses | |
|---|---|---|---|---|---|
| | | | | Lower | Higher |
| | 44521 | Specialty Food Stores – Meat Markets | 4,305 | $0 | $0 |
| | 44522 | Specialty Food Stores – Fish & Seafood Markets | 1,470 | $0 | $0 |
| | 44523 | Specialty Food Stores – Fruit & Vegetable Markets | 1,884 | $0 | $0 |
| | 445291 | Specialty Food Stores – Baked Goods Stores | 2,109 | $0 | $0 |
| | 445292 | Specialty Food Stores – Confectionary & Nut Stores | 1,520 | $0 | $0 |
| | 445299 | All Other Specialty Food Stores | 3,004 | $0 | $0 |
| | 4453 | Beer, Wine, & Liquor Stores | 21,562 | $0 | $0 |
| | 453110 | Florist | 15,201 | $0 | $0 |
| | 44711 | Gasoline Stations with Convenience Stores | 41,538 | $0 | $0 |
| | 44719 | Other Gasoline Stations | 11,553 | $0 | $0 |
| | 446110 | Pharmacies and Drug Stores | 16,216 | $0 | $0 |
| | 452910 | Warehouse Clubs and Superstores | - | $0 | $0 |
| | 452990 | All Other General Merchandise Stores | 6,536 | $0 | $0 |
| | 72111 | Hotels (Except Casino Hotels) & Motels | 29,170 | $0 | $0 |
| | 72112 | Casino Hotels | 19 | $0 | $0 |
| | 72211 | Full-Service Restaurants | 134,992 | $0 | $0 |
| | 722211 | Limited-Service restaurants | 98,304 | $0 | $0 |
| | 722212 | Cafeterias, Buffets, & Grill Buffets | 3,900 | $0 | $0 |
| | 722213 | Snack & Nonalcoholic Beverage Bars | 23,226 | $0 | $0 |
| | 72241 | Drinking Places | 35,185 | $0 | $0 |
| | 333415 | Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing | 30 | $300,000 | $1,010,000 |
| | 333311 | Automatic Vending Machine Manufacturing | 7 | $50,000 | $120,000 |
| Chillers | 333415 | Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 1[a] | $2,880,000 | $3,260,000 |

| Sector | NAICS | Industry | Estimated Number of Small Businesses Affected by the Rule | Total Annualized Economic Impact on Small Businesses | |
|---|---|---|---|---|---|
| | | | | Lower | Higher |
| | 333415 | Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | | $3,030,000 | $3,790,000 |
| Retail Food | 333415 | Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 19 | $70,000 | $90,000 |
| Household Refrigeration | 335222 | Household refrigerator and home freezer manufacturing | 20 | $4,590,000 | $5,500,000 |
| Cold Storage | 333415 | Air-Conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing | 4 | $70,000 | $140,000 |
| Foam | 326150 | Urethane and other foam product (except polystyrene) manufacturing | 36[b] | $600,000 | $600,000 |
| | | | 8[c] | $300,000 | $400,000 |
| | | | 1[d] | $2,000 | $4,000 |
| | | | 0[e] | $0 | $0 |
| Fire Suppression | 3399991 | Fire extinguishing equipment, handportable and fixed-system (excluding water sprinkler systems), including parts and attachments, manufacturing | 0 | $0 | $0 |
| TOTAL | | | | $13,812,000 | $18,474,000 |

[a] The same small business is affected by both regulatory decisions (per EPA)
[b] Rigid polyurethane: high-pressure two-component spray foam
[c] Rigid polyurethane: low-pressure two-component spray foam
[d] Rigid polyurethane: one-component foam sealants
[e] Flexible polyurethane

Scaled to the state of Delaware, on a population basis (0.30% of U.S.A. population), this corresponds to a negligible probability (<0.0003%) of having one small businesses in Delaware incurring costs in excess of 1% or 3%.

Additionally, the proposed regulation is not expected to add substantive burden on Delaware's individuals and small businesses for the following reasons:

1) The proposed regulation does not warrant end-users to cease the use product or equipment acquired before the prohibition date. Thus, individuals and small businesses are likely to follow their existing replacement/repair & maintenance schedules for their products and equipment covered under the proposed new regulation.
2) Only when a system needs to be retrofitted or replaced will businesses need to purchase compliant product/equipment – and alternatives are readily available for end-uses covered under this proposed new regulation.
3) The proposed new regulation includes a sell through provision, allowing manufacturers to sell all products and equipment manufactured prior the effective date of the prohibition for that specific end-use.
4) The impacts of the regulation will be borne primarily by foam manufacturers and refrigeration equipment manufacturers who have developed or will develop compliant materials and equipment. Contractors, installers of equipment, and service technicians would be impacted by the requirement to sell, offer for sale, lease, rent, install, or use only compliant equipment.
5) The proposed regulation does not include recordkeeping requirements.
6) Increased energy efficiency of the systems using low-GWP refrigerants are expected to result in savings for many businesses over the lifecycle of their equipment, which alleviates the higher capital costs associated with new compliant equipment covered under this proposed new regulation.

## D. Economic Benefits

Adopting HFCs regulations regionally or nationwide is expected to lead to many benefits for the industry and U.S. residents, beyond Delaware.

Manufacturers of products and equipment covered by this proposed regulation would prefer the development of a unified (nationwide) rule, since they would have to comply with only one national standard. However, apart from this consideration, the industry has expressed support for adopting the prohibitions for the end-uses covered under this proposed regulation, as they recognize the urgency of climate action, but also the economic opportunity of being an early supplier of the new technology (increased competitiveness), as more and more countries and regions are looking at reducing emissions from HFCs.

For example, some companies, such as The Chemours Company, headquartered in Delaware, that already manufactures acceptable alternatives to the prohibited substances covered

by this proposal, will benefit from their proactive research and development, and will have short term benefits from the implementation of the regulation.

The end users of the new technology will also benefit from the proposed regulation, through cost savings in the form of increased energy efficiency, and lower maintenance costs, of their new or retrofitted equipment using lower-GWP refrigerants.

Additionally, HFCs regulations are anticipated to have an impact on the training requirements of technicians and contractors offering equipment in the end-uses covered by this proposed new regulation. This implies both costs and opportunities for the industry, and stakeholders have informed the Department that the industry is already preparing for the new demand in training and continuous improvement. These new opportunities are associated with increased employment in more sustainable technologies. In the long haul, the U.S. Climate Alliance has estimated that phasing down the use of HFCs has the potential to create tens of thousands of jobs, and tens of billions of annual economic value nationwide[46].

[46] United States Climate Alliance. September 2018. From SLCP Challenge to Action: A roadmap for reducing short-lived climate pollutants to meet the goals of the Paris Agreement. Accessible via: https://static1.squarespace.com/static/5a4cfbfe18b27d4da21c9361/t/5b9a9cc1758d466394325454/1536859334343/USCA+SLCP+Roadmap_final+Sept2018.pdf

# V. Health, Environmental, and Public Welfare Benefits

## A. Projected Emissions Reductions

To quantify potential HFC emissions reduction achievable by the proposed new regulation, the Department used an HFC emissions inventory tool developed by the California Air Resources Board (CARB) and the USCA. The tool, called the Short-Lived Climate Pollutants (SLCP) Emissions Tool, uses state population and other economic data to apportion HFC emissions to specific end-uses. The following data sources and methodologies are referenced within the tool:

- Population Projections, United States, 2004 - 2030, by state, age and sex, on CDC WONDER Online Database, September 2005. Accessed at http://wonder.cdc.gov/population-projections.html on May 30, 2018
- Annual Estimates of Housing Units for the United States, Regions, Divisions, States, and Counties: April 1, 2010 to July 1, 2017 on US Census Bureau American FactFinder Online Database, May 2018. Accessed at https://www.census.gov/data/tables/2017/demo/popest/total-housing-units.html on May 30, 2018
- 2005 Residential Energy Consumption Survey (RECs) Survey Data on U.S. Energy Information Administration (EIA) Webpage. Accessed at https://www.eia.gov/consumption/residential/data/2005/ on September 9, 2018
- 2009 Residential Energy Consumption Survey (RECs) Survey Data on U.S. Energy Information Administration (EIA) Webpage, 19 August 2011. Accessed at https://www.eia.gov/consumption/residential/data/2009/ on June 1, 2018
- 2015 Residential Energy Consumption Survey (RECs) Survey Data on U.S. Energy Information Administration (EIA) Webpage. Accessed at https://www.eia.gov/consumption/residential/data/2015/#ac on September 9, 2018
- United States Environmental Protection Agency (US EPA). MOVES 2014a: Latest Version of MOtor Vehicle Emissions Simulator (MOVES). https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves (accessed 10 August 2018) (US EPA, 2015)
- California's High Global Warming Potential Gases Emission Inventory: Emission Inventory Methodology and Technical Support Document, California Air Resources Board (2016), https://ww3.arb.ca.gov/cc/inventory/slcp/doc/hfc_inventory_tsd_20160411.pdf

The SLCP Emissions Tool quantifies HFC emissions under a business as usual (BAU) case, as well as various policy scenarios including the incorporation of EPA SNAP Rules 20 and 21. Using the tool, HFC emissions can be estimated from 2005 through 2030. The tool categorizes HFCs in the end-uses shown in Table 7.

Using the tool, it is estimated that in the course of 10 years, the total cumulative reduction in HFC emissions is roughly 0.832 $MMTCO_2e$, or roughly the equivalent of the annual greenhouse gas emissions of 176,000 passenger cars in Delaware.

**Table 7. HFC use categories as provided in the USCA/CARB SLCP Emissions Tool**

| |
|---|
| Commercial Refrigeration |
| Industrial Refrigeration |
| Domestic Refrigeration |
| Commercial Stationary A/C > 50 lbs. refrigerant |
| Commercial Stationary A/C < 50 lbs. refrigerant |
| Stationary A/C Residential Heat Pumps |
| Stationary Central A/C Residential |
| Stationary Room Unit AC/ Residential |
| Light-duty MVAC |
| Heavy-duty MVAC |
| Transport Refrigeration |
| Foam |
| Aerosol Propellants |
| Solvents and Fire Suppressant |

Per the proposed regulation, not all end-uses categorized in the SLCP Emissions Tool are applicable. To reflect the affected end-uses as listed in the proposed regulation, the Department focused only on the appropriate categories. Table 8 shows the identified categories as applicable to the purpose of the proposed regulation.

**Table 8. End-use categories of HFCs that are anticipated to show emission reductions per the proposed regulation**

| |
|---|
| Commercial Refrigeration |
| Industrial Refrigeration |
| Domestic Refrigeration |
| Commercial Stationary A/C > 50 lbs. refrigerant |
| Commercial Stationary A/C < 50 lbs. refrigerant |
| Foam |
| Aerosol Propellants |

It should be noted that the proposed regulation does not include the following end-uses categorized by the SLCP Emissions Tool: Stationary A/C Residential Heat Pumps, Stationary Central A/C Residential, Stationary Room Unit A/C Residential, Light-duty MVAC, Heavy-duty MVAC, Transport Refrigeration, Solvents and Fire Suppressant. As such, there are no emissions reductions in these end-uses that would be associated directly with the prohibitions in the proposed regulation.

The emissions and associated potential reductions anticipated by the proposed regulation are provided in Table 99 for years 2020-2030 for Delaware. It can be seen that, compared to a BAU case, HFC emissions are anticipated to have been reduced by 25% in 2030 with implantation of the proposed regulation. Once reductions begin in the year 2021, the average annual reduction rate is 20%. It should be noted that there are no emissions reductions for the industrial refrigeration end-use until 2023 and for commercial stationary A/C (> 50 lbs refrigerant) until 2024, as is consistent with the proposed new regulation.

**Table 9. HFC emission estimates in a BAU case and the case with implementation of the proposed regulation (emissions in $MmtCO_2e$) in Delaware**

| Year | BAU* | SNAP** | Savings | Savings (%) |
|---|---|---|---|---|
| 2020 | 0.347 | 0.347 | 0 | 0% |
| 2021 | 0.362 | 0.314 | 0.048 | 13% |
| 2022 | 0.376 | 0.320 | 0.056 | 15% |
| 2023 | 0.391 | 0.327 | 0.064 | 16% |
| 2024 | 0.403 | 0.331 | 0.072 | 18% |
| 2025 | 0.415 | 0.335 | 0.080 | 19% |
| 2026 | 0.426 | 0.338 | 0.088 | 21% |
| 2027 | 0.435 | 0.340 | 0.095 | 22% |
| 2028 | 0.444 | 0.342 | 0.103 | 23% |
| 2029 | 0.452 | 0.342 | 0.110 | 24% |
| 2030 | 0.460 | 0.343 | 0.117 | 25% |
| TOTAL | 4.511 | 3.679 | 0.832 | - |

* The BAU case emissions shown are only those from the end-use categories displayed in Table 8

** The SNAP column is representative for the emission reductions from the proposed regulation (effectively, SNAP 20 and 21 implementation) for the end-use categories specified in Table 8

The emissions reductions by end-use category can be seen in Figure 3. The "Regulation BAU" line refers to the BAU emissions in the affected end-use categories only (as listed in Table 8). The greatest potential HFC emissions reductions are projected to be achieved in the commercial refrigeration end-use followed by aerosol propellants on a mass basis. On a percentage basis, potential HFC emissions reductions are greatest for the aerosol propellant and foam end-uses. From 2021 through 2030, the aerosol propellant end-use is projected to have a cumulative reduction of 62%, while the foam end-use category is projected a cumulative emission reduction of 54%. It should also be noted that relative to BAU emissions, no reduction is projected for the commercial stationary A/C (< 50 lbs refrigerant) end-use category. This likely because the proposed regulation lists centrifugal and positive displacement chillers as the prohibited end-uses in commercial A/C. Centrifugal chillers are typically used for larger commercial systems, such as those in office buildings, hotels, convention halls, and others[47]. Positive displacement chillers are typically used for relatively smaller commercial systems, such as those in mid- and low-rise buildings[48].

[47] U.S. EPA. December 2016. Proposed Final rule for SNAP 21. Accessible via: https://www.govinfo.gov/content/pkg/FR-2016-12-01/pdf/2016-25167.pdf

[48] While relatively smaller than centrifugal chillers, commercial applications of positive displacement chillers are most likely above 50 lbs of refrigerant.

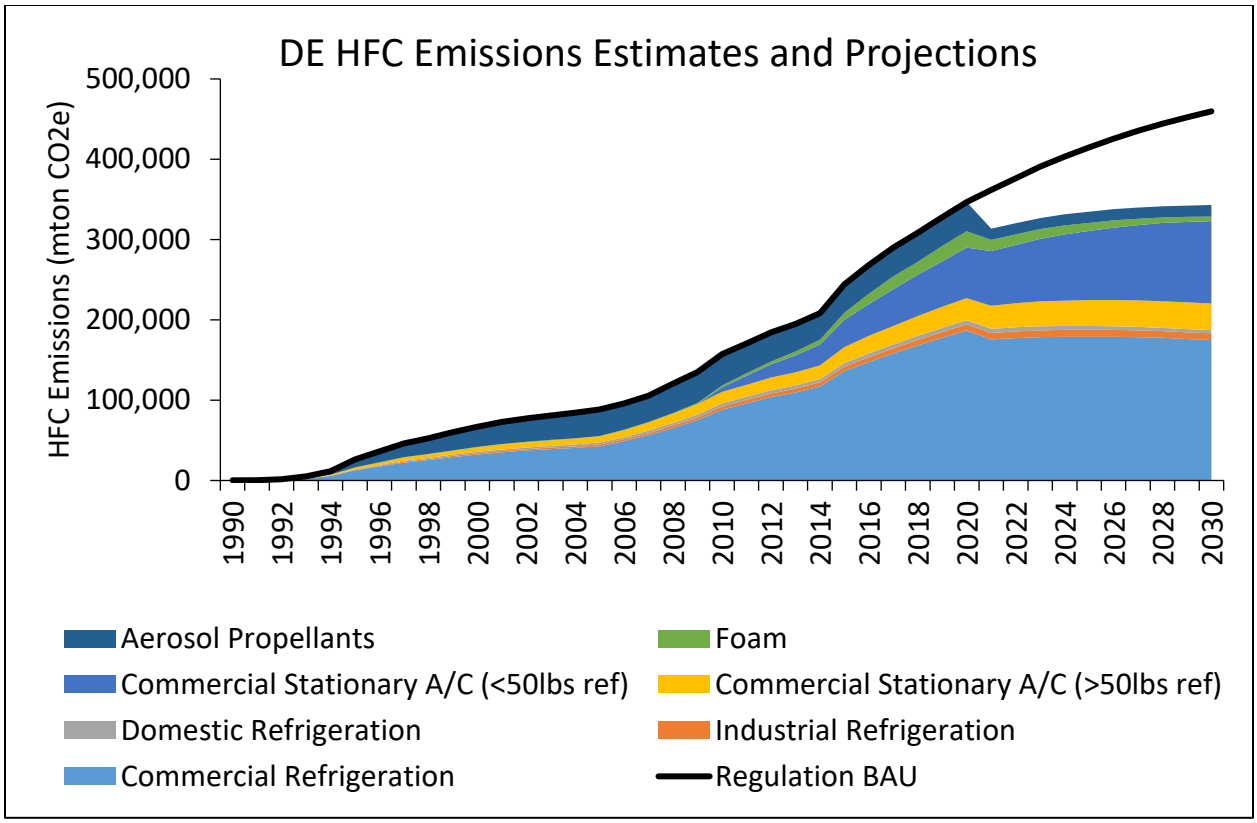


**Figure 3. Potential HFC emissions reductions by end-use category in Delaware from the proposed regulation**

## B. Quantifying Benefits

The science of quantifying environmental and social impacts of a given emissions reduction is still in its infancy, given the complexity of economic, social and environmental systems and their underlying assumptions. For this technical support document, the Department has chosen to use the Theory of the Social Cost of Carbon (SCC) [49] to help quantify the impacts of the proposed regulation. SCC is a concept used in policy evaluation to offer a monetized value of the net impact from the global climate change that results from a small (1 metric ton) increase in carbon dioxide emissions. These monetized impacts include, but are not limited to, changes in net agricultural productivity, energy use, property damage from increased flood risk, human health and services that the natural ecosystems provide to society.

SCC's estimates require several steps using specialized computer models to be relevant, since it factors several detailed economic, social, and environmental assumptions. Following Resources for the Future latest published article on the topic, the Department chose to use the Global SCC

[49] The National Academies Press. 2017. Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide. Accessible via: https://www.nap.edu/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of

estimate of 50 USD per metric ton of $CO_2$ equivalent[50] (in 2019 dollars, using a discount rate of 3%) to support this technical support documentation.

Using the previously estimated 0.832 $MmtCO_2e$ reduction for Delaware from 2020 to 2030, the SCC theory estimates that this proposed new regulation could help achieve global benefits equivalent to $41.4 million within this ten-year timeframe.

If the regulation was similarly adopted nationwide (including Washington, D.C.), a cumulative reduction of 295.3 $MmtCO_2e$ is estimated from 2020 to 2030. Using the Social Cost of Carbon, these emissions reduction would result in approximately $14.8 billion in global benefits, from 2020 to 2030.

## VI. Stakeholder Participation

Two review committee meetings were held (September 24, 2019, and October 8, 2019) to closely interact with key stakeholders in the early development stages of the proposed regulation. Discussions with key stakeholders helped shape the proposed regulation to ensure the viewpoints of a diverse group of representatives from industry, trade groups, environmental groups, and Delaware-specific organizations were understood. The initial meeting on September 24th included a presentation and other materials to inform participants of the development of the proposed regulation. After the presentation, the review committee consisted of open discussion and suggestions to the draft language. Comments were received and informed technical and non-technical edits to the draft language of the proposed regulation. Participants in the first review committee meeting largely supported the effort of the proposed regulation.

A second review committee meeting took place on October 8, 2019 and included a draft regulatory language presentation informed by the comments received from stakeholders at the first review committee meeting and those received by staff after the meeting. Attendees of this review committee meeting included representatives from industry, trade and environmental groups, and Delaware-specific organizations, similar to the first review committee meeting. Stakeholders were walked through the revised draft language, and offered comments and feedback to assist in crafting the final proposed new regulation language. This review committee meeting also included a brief presentation from staff from the Division of Climate, Coastal, and Energy to introduce their voluntary incentive program to switch to low-GWP refrigerants, the Cool Switch Low Impact Refrigerant Program[51].

In between, and after the review committee meetings, the Department continuously engaged with key stakeholders to develop the proposed new regulation, through documented written exchanges, phone call conversations, and face-to-face meetings with the goal of tailoring the final language to best address the key social, environmental and economic concerns raised by the stakeholders.

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[50] Resources for the Future. August 2019. Social Cost of Carbon 101. A review of the social cost of carbon, from a basic definition to the history of its use in policy analysis. Accessible via: https://www.rff.org/publications/explainers/social-cost-carbon-101/

[51] Department of Natural Resources and Environmental Control. March 2020. Cool Switch Low Impact Refrigerant Program. Accessible via: https://dnrec.alpha.delaware.gov/climate-coastal-energy/efficiency/cool-switch/

## VII. PUBLIC PARTICIPATION

The Department held three public workshops to provide the public with outreach and education opportunities on the proposed new regulation 7 DE Admin Code 1151. The meetings were held in each of the New Castle, Sussex, and Kent Counties on December 9, 10, and 18, 2019, respectively, with the latest meeting offering a remote participation option via the Skype application or web access.

The public workshops consisted in a short presentation about the background leading to the regulatory initiative, followed by a presentation of the draft regulatory language (as informed by the review committee meetings), and concluded with an open question and answer format. The presentation slides, along with the supporting documents, and comments received following the workshops are posted on the Department's regulatory development website: https://dnrec.alpha.delaware.gov/air/permitting/under-development/.

Overall, the Department has received support for the regulatory initiative throughout the rulemaking process. Many of the comments offered by stakeholders consisted in additional technical or logistical consideration to edit the regulatory language to reduce the burden on the industry or to aim for consistency with other states working to develop HFCs regulations. Please find, in Table 10 below, the summary of the public comments received from October 31, 2019 to January 17, 2020 which was the deadline indicated to receive public comments for consideration for the proposed new regulation.

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| Interested Party | Date | Section in Draft Regulatory Language | Summary of Comment | Changes made |
|---|---|---|---|---|
| **Section 1.0** | | | | |
| **AHRI and Daikin US** | 1/17/2020 | 1.0 | Suggestion to remove "and manufacture" from section 1.0, as this may ban warehousing and the transport of non-Delaware products through the state, and products from being imported or transported through the state of Delaware or prevent research in the state where companies make small amounts of refrigerants. It can also prevent research in Universities or in companies located in the state that manufacture small amounts of refrigerant. | Following these comments, the Department has removed the definition of "manufacturer" from Section 3.0, as the definition previously included might have caused the confusion on the importation and transportation of products and equipment in the State. The intent of the regulation is to prohibit the manufacturing of the covered foams and aerosol propellants products, and refrigeration and air-conditioning equipment using an end-use-specific substance covered under this regulation, after their respective prohibition dates. |
| **Section 2.0** | | | | |
| **Honeywell** | 12/7/2019 | 2.1 | Recommendation to edit the language to not only prohibit the sale or installation of a listed substance, but also the sale or installation of a product or equipment using a listed substance, within the state after the relevant end-use transition date.<br>Suggested edits:<br><br>*2.1. This regulation applies to any person who sells, offers for sale, installs, uses, or manufactures in the State of Delaware, any substance used in end-uses listed in Section 6.0 or any product or equipment using any such substance.* | **The Department staff made no changes based on the received comments.**<br><br>Honeywell has provided additional comments on January 17, 2020 on this topic. |
| **Honeywell** | 1/17/2020 | 2.1 | Request to prohibit not the sale or installation of a listed substance, but the sale or installation of *a product or equipment using* a listed substance, within the state after the relevant end-use transition date. For consistency with CA, VT, WA, NJ (intent). If the DE regulation fails to incorporate such language, it will potentially be | The Department has edited the regulatory language to clarify the intent of this regulation, which is to regulate any person who sells, offers for sale, leases, rents, installs, uses, or manufactures in the State of Delaware, any product or equipment that uses a substance in any of the end-uses covered under the proposed new regulation. |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| | | | | |
|---|---|---|---|---|
| | | | applying its prohibition on HFCs to a smaller subset of activities and excluding instances in which products or equipment are delivered to, or installed in, the state containing prohibited substances. | |
| **NRDC** | 1/17/2020 | 2.1 | Recommendation to modify the scope of prohibitions to the products and equipment containing prohibited substances, not to the substances themselves | The Department has edited the regulatory language to clarify the intent of this regulation, which is to regulate any person who sells, offers for sale, leases, rents, installs, uses, or manufactures in the State of Delaware, any product or equipment that uses a substance in any of the end-uses covered under the proposed new regulation. |
| **Chemours** | 1/17/2020 | 2.0 | As written, language in draft regulation 1151 may be interpreted to prohibit the sale or installation of a listed substance rather than sale or installation of a product or equipment using a listed substance within the state, according to Section 6 of the proposed regulation. Such an interpretation could prevent research and development activities within the State of Delaware. It is imperative that the regulation be clear that research and development activities are exempt from any prohibitions established by this regulation. | The Department has edited the regulatory language to clarify the intent of this regulation, which is to regulate any person who sells, offers for sale, leases, rents, installs, uses, or manufactures in the State of Delaware, any product or equipment that uses a substance in any of the end-uses covered under the proposed new regulation.<br><br>The Department believes that this language does not prevent research and development activities. |
| **PIMA** | 1/17/2020 | 2.0 | Recommendation for the Dept. to scope its regulations narrowly to exclude polyisocyanurate insulation products, which as a category do not use the prohibitive HFC substances, from the draft regulation's disclosure statement requirements. | The Department has acknowledged this comment and has clarified the intent of the Disclosure Statement requirement, in Section 2.2, where any person who manufactures product or equipment covered in the specific end-uses covered under this regulation is subject to disclosure statement requirements.<br><br>The Department wants to clarify that the end goal of including Disclosure requirements is to inform potential buyers as to whether the product/equipment they purchased is in compliance with State Regulations. Additionally, the Department believes the proposed disclosure requirements offer flexibility for manufacturers to comply, without substantive financial or operational burden. |
| **Section 3.0** | | | | |
| **AHRI and Daikin US** | 1/17/2020 | 3.0 | Recommendation to modify the definition of the term "use", since banning the formulation or packaging of controlled substances inequitably impacts small and medium distributors, packagers, and companies who | **The Department staff made no changes based on the received comments.**<br><br>The Department has edited the regulatory language to clarify the intent of this regulation, which is to regulate any person |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| | | | | |
|---|---|---|---|---|
| | | | may not have sufficient capital to move distribution in another state.<br><br>AHRI is concerned that the definition of "Use" in the draft regulation may prohibit the proper collection of refrigerant during maintenance and at the end of life for the equipment<br><br>Additional recommendation to modify the definition of "new" based on stakeholders' feedback | who sells, offers for sale, leases, rents, installs, uses, or manufactures in the State of Delaware, any product or equipment that uses a substance in any of the end-uses covered under the proposed new regulation. Thus, the Department does not believe that the current definition of "use" overburdens the small and medium distributors, packagers, and companies in Delaware, or prohibit the proper collection of refrigerant during maintenance and at the end of life of the equipment.<br><br>The Department believes that the current definition of "new" captures the technical considerations for the implementation of this regulation. This definition is consistent with U.S. EPA, which reclassifies systems as new if a modification is made, which increases the capacity of the system. This formulation is also preferred to prevent existing refrigeration systems from undergoing extensive repairs to the extent that they become a new piece of equipment with a few older parts remaining, which could be a strategy to avoid the regulations covering new equipment. This definition does not prevent end-users or customers to repair, update and improve their systems. |
| **ACC CPI** | 1/17/2020 | 3.0 | Offered technical considerations to promote clarity to the regulated entities<br><br>CPI suggests developing a definition for "polyurethane," and then referencing the term polyurethane in the definition of the end uses. This builds a consistent approach to the end use definitions. CPI has suggested a definition for "polyurethane", and edits to 9 polyurethane end-uses' definitions. | **The Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged the comments received, however it does not believe that making these amendments is warranted at this time. The current definitions of the different foam end-uses have been reviewed by a review committee during the first phase of the stakeholders engagement, and they are consistent with U.S. EPA SNAP rules. The proposed edits by the stakeholder may be considered as part of a future amendment to the proposed regulatory language, following an additional technical review from other industry stakeholders. |
| **Honeywell** | 1/17/2020 | 3.0 | Support CPI's suggested edits to definitions regarding foam end-uses | **The Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged the comments received, however it does not believe that making these amendments is warranted at this time. The current definitions of the different |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| | | | | |
|---|---|---|---|---|
| | | | | foam end-uses have been reviewed by a review committee during the first phase of the stakeholders engagement process, and they are consistent with U.S. EPA SNAP rules. The proposed edits by the stakeholder may be considered as part of a future amendment to the proposed regulatory language, following an additional technical review from other industry stakeholders. |
| **HCPA** | 1/17/2020 | 3.0 | Recommendation to modify the definition of "aerosol propellant", for consistency with Delaware's "limiting emissions of volatile organic compounds from consumer and commercial products" regulation | **The Department staff made no changes based on the received comments.**<br><br>The Department will keep the current definition of "Aerosol Propellant", since it believes that it captures all the technical considerations for the current regulation. |
| **InterMetro Industries Corporation** | 12/19/2019 | 3.0 | Request to have a definition of "stationary" added to the regulation, to identify whether or not mobile refrigerators intended for use with central kitchens inside heavy-duty vehicles serving remote locations are covered under this regulation. | **The Department staff made no changes based on the received comments.**<br><br>The description of the refrigeration equipment detailed by the stakeholder clearly falls under commercial refrigeration end-uses, even if it is designed with rollers and is used inside of a heavy-duty vehicle. The Department does not believe that a definition of the term "stationary" is warranted at this time. |
| **Illinois Tool Works Inc.** | 12/18/2019 | 3.0 | Offer their interpretation of the issue raised during the 12/18/2019 public workshop, where InterMetro asked for clarification on the definition of "stationary" in Refrigeration Equipment. According to ITW, being designed to roll into a vehicle, where that vehicle will transport food to another physical location, does not qualify as mobile refrigeration in the industry. Thus, this commercial refrigeration equipment is covered under EPA SNAP rules and should be covered under DE's proposed regulation. | **The Department staff made no changes based on the received comments.**<br><br>The Department agrees that refrigeration equipment designed to roll into a vehicle, to be utilized to deliver food in remote location, is a commercial refrigeration equipment, and is consequently covered under this regulation. |
| **Cold Technology** | 12/20/2019 And 12/09/2019 | 3.0 | Suggested edits to the definition of "new" using "nominal compressor capacity". The reasoning for the use of the term "nominal compressor capacity" is that various efficiency upgrades to a system could actually result in an increase to system heat removal capacity. Obviously, we would not want to dissuade owner's from performing upgrades on their systems to more energy | **The Department staff made no changes based on the received comments.**<br><br>The Department believes that the current definition of "new" captures the technical considerations for the implementation of this regulation. This definition is consistent with U.S. EPA, which reclassifies systems as new if a modification is made, which increases the capacity of the system. This formulation |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| | | | | |
|---|---|---|---|---|
| | | | efficient equipment by forcing them to perform a retrofit on top of the component upgrade. | is also preferred to prevent existing refrigeration systems from undergoing extensive repairs to the extent that they become a new piece of equipment with a few older parts remaining, which could be a strategy to avoid the regulations covering new equipment. This definition does not prevent end-users or customers to repair, update and improve their systems. |
| **Section 4.0** | | | | |
| **HCPA** | 11/8/2019<br><br>And<br><br>11/15/2019 | 4.2.1.4 | Suggestion to add the date coding which aerosol manufacturers comply with for Delaware's *Limiting Emissions of Volatile Organic Compounds from Consumer and Commercial Products* regulation, section 2.5.1 under Administrative Requirements, as a compliance path for the date of manufacture disclosure requirement.<br><br>Suggestion to allow for the Material Safety Data Sheet to be an acceptable compliance path for the disclosure statement requirements. | Following this comment, the Department is proposing language to include date codes and Safety Data Sheet to be acceptable compliance options to meet the Disclosure Statement requirements for foam and aerosol propellant products. |
| **PIMA** | 12/9/2019 | 4.2 and subsections | Commented that the Polyisocyanurate industry is opposed to the proposed disclosure statement requirements, since the industry does not manufacture with HFCs.<br>Recommendation to edit the draft regulatory language to regulate the current uses of HFCs only. Suggested addition:<br>*4.2.1.1 As of the effective date of this regulation, any person who does not manufacture and/or sell products or equipment containing any substance listed as prohibited in Section 6.0 shall not be required to provide a written disclosure to the buyer.*<br><br>Suggestion, as an alternative to a full exemption, for any future regulation to include an opportunity for polyiso insulation manufacturers to submit a one-time certification to DE that their respective products do not contain the prohibited HFC substances. | Although the Department recognizes that some industries may have shifted from manufacturing products and equipment with HFCs, the Department believes that the intent of the disclosure statement is to inform the buyer as to whether the product/equipment purchased is in compliance with State regulation.<br><br>To clarify the intent of the Department, we have added language in Section 2.0 of the proposed regulation, stating that manufacturers of products and equipment of the specific end-uses covered in this regulation, are subject to disclosure statement requirements.<br><br>By subjecting all manufacturers to disclosure statement requirements, the Department ensures that any industry that previously moved away from the use of HFCs, are required to disclose it if they go back to using these substances. |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

| | | | | |
|---|---|---|---|---|
| | | | | The suggestion of a one-time certification process to identify that a manufacturer does not use HFCs may be studied under a future regulation/amendment. |
| **PIMA** | 12/9/2019 | 4.2.1.3 | If the Department does decide to proceed with disclosure requirements, any labeling requirements should allow a label to be placed on the product itself or factory packaging. And another potential alternative would be for product manufacturers to provide or make available Safety Data Sheets to the buyers, disclosing the blowing agent. | The Department believes that the regulation, as it is drafted, allows for labels and disclosure statements to be placed on the product itself or factory packaging.<br><br>Following this comment, the Department has included language to allow Safety Data Sheets to be used as a compliance path to disclose the blowing agent information to the buyers, for foam manufacturers. |
| **Cold Technology** | 12/20/2019 And 12/09/2019 | 4.1.2 | Suggested amendments to 4.1.2 to clarify the intent not to affect the operators' ability to maintain/preserve the operability of existing systems. | The Department has recognized the value of specifying that operations to maintain and preserve the operability of an existing system are not prohibited by the proposed regulation. Thus, the Department is proposing language to address this consideration, in 4.1.3.: "This regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing product or equipment in an end-use listed in Section 6.0, which contains or was designed to contain a prohibited substance, except if the operations constitute a retrofit or reclassifies the system as new." |
| **Cold Technology** | 12/20/2019 And 12/09/2019 | 4.2.1 | Comment that in 4.2.1. the language should clarify that the burden of disclosure is solely that of the manufacturer, not the re-seller. The wording "any person who manufactures and/or sells" can lead to believe than any contractor/distributor that re-sells and installs the equipment would have disclosure responsibility. | The Department agrees that disclosure requirements are targeting manufacturers of the covered products and equipment, thus the Department proposing language to clarify this intent, by modifying the language to read "who manufactures for sale in the State of Delaware" |
| **HCPA** | 1/17/2020 | 4.2.1.4 | Recommendations for modifying the Disclosure requirements of aerosol products<br>Proposed language:<br><br>*4.2.1.4:*<br>*For aerosol propellant products, the aerosol propellant must be listed in a Safety Data*<br>*Sheet (SDS) that complies with the requirements of the 29 CFR 1910.1200. The person who manufactures and sells or introduces into commerce in the State must also ensure that each aerosol propellant product complies* | **The Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged the comment, and considers that the current approach offering two alternatives for disclosure compliance offers flexibility and answers the considerations raised.<br><br>The Department is allowing for Safety Data Sheet and Date Code to be acceptable compliance paths to meet the disclosure requirements. |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| | | | *with the product-dating requirements in 7 DE Admin. Code 1141 § 2.5.1.* | |
| **Honeywell** | 1/17/2020 | 4.0 | Suggestion to clarify that the sale of prohibited substitutes for servicing (i.e., for recharging existing equipment that was installed prior to the effective date of the prohibited use of that substitute) is allowable. | The Department has recognized the value of specifying that operations to maintain and preserve the operability of an existing system are not prohibited by the proposed regulation. Thus, the Department is proposing language to address this consideration, in 4.1.3.: "This regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing product or equipment in an end-use listed in Section 6.0, which contains or was designed to contain a prohibited substance, except if the operations constitute a retrofit or reclassifies the system as new." |
| **ACC CPI** | 1/17/2020 | 4.2.1.3.1 | Commented that while CPI does not have significant opposition to proposed disclosure alternative 1 in section 4.2.1.3.1, CPI is concerned that it is not entirely clear that regulated entities can choose either option. Additionally, alterative 1 focuses on disclosure of specific chemistries, not compliance status. Disclosure of a specific chemistry likely does not provide the clarity needed for users and enforcement officials to know the product they would like to use is compliant – especially if an exemption is granted for certain foam end uses to continue to use HFC blowing agents. In this example, users and enforcement officials will likely assume the product is not compliant if it discloses use of an HFC. Alternative 2 covers all scenarios because it focuses on compliance status. Additionally, CPI urges DNREC to clarify that the disclosure can be on the product or on the product packaging. CPI anticipates that manufacturers of polyurethane systems will include the disclosure on the drum or on the box for low pressure SPF systems. | The Department has acknowledged the comment and is proposing language to clarify that regulated entities can choose one of the two alternatives presented in the Disclosure Statement requirements.<br><br>Other foam end-uses stakeholders have requested for Safety Data sheets to be considered as a compliance path for disclosing the foam blowing agents, thus the Department still believes that offering the two alternatives offers flexibility to the manufacturers, along as the proper information for consumers/buyers that want to access the information.<br><br>The Department believes that the current language does not prevent the disclosure or label to be either on the product or on the product packaging, thus including the disclosure on the drum or on the box for low pressure SPF systems is allowed. |
| **ACC CPI** | 1/17/2020 | 4.1.2 | Commented that spray polyurethane foam systems manufactured or blended prior to the date of restriction can be used or applied in Delaware after the effective date of the restriction. Multiple types of polyurethane | The Department has understood and agrees with the technical consideration provided by the stakeholder and has incorporated the suggested edit to the proposed regulatory language. |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| | | | foams – not just spray foam – that are used as "systems." For context, the polyurethane industry refers to the liquid components of the "A-side" and "B-side" together as a system.<br>Recommendation:<br>[…] Products or equipment manufactured prior to the applicable effective date of the restrictions specified in Table 1 of subsection 6.1.1 of this regulation (including ~~spray~~ polyurethane foam systems not yet applied) may be sold […]. | |
| **National Refrigerants, Inc.** | 1/17/2020 | 4.1.2 | Commented that, as it is currently drafted, 4.1.2 appears to prohibit the use of a substance for service of equipment installed prior to the dates specified in section 6.0. Section 4.1.2 clearly includes equipment manufactured prior to the applicable effective date of the restrictions in Table 1 of subsection 6.1.1 of the regulation but it does not include the word 'substance' which is defined as "any chemical intended for use in the end-uses listed in Section 6.0." Since substance, by definition, is the refrigerant, its exclusion from the exception in 4.1.2 could be interpreted as not allowing any refrigerant listed in section 6.0 to be used to service the installed equipment. | The Department has recognized the value of specifying that operations to maintain and preserve the operability of an existing system are not prohibited by the proposed regulation. Thus, the Department is proposing language to address this consideration, in 4.1.3.: "This regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing product or equipment in an end-use listed in Section 6.0, which contains or was designed to contain a prohibited substance, except if the operations constitute a retrofit or reclassifies the system as new." |
| **Chemours** | 1/17/2020 | 4.1.1 & 4.1.2 | Suggested edits to section 4.0 that will clarify this regulation does not prohibit the continued use of listed substances for servicing of existing equipment.<br>In Section 4.0, Standards (Requirements) | The Department has recognized the value of specifying that operations to maintain and preserve the operability of an existing system are not prohibited by the proposed regulation. Thus, the Department is proposing language to address this consideration, in 4.1.3.: "This regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing product or equipment in an end-use listed in Section 6.0, which contains or was designed to contain a prohibited substance, except if the operations constitute a retrofit or reclassifies the system as new." |
| **Daikin US** | 1/17/2020 | 4.2 | Recommendation that the state accepts UL label as sufficient for disclosure requirements. | **Department staff made no changes based on the received comments.** |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| | | | | The Department believes that the proposed regulation allows for UL labels to be used as a disclosure compliances path, as long as they contain the required information, as stated in 4.2.1.2 : " Except for products and equipment with existing labeling required by state building codes and safety standards which contain the information required in subsections […]". |
| **AHRI and Daikin US** | 1/17/2020 | 4.0 | In Section 4.0, clarify that products intended for the servicing, maintenance, or repair of existing equipment may still be manufactured and used after the effective date of the regulation, so long as they do not fall under the definition of "new equipment". | The Department has recognized the value of specifying that operations to maintain and preserve the operability of an existing system are not prohibited by the proposed regulation. Thus, the Department is proposing language to address this consideration, in 4.1.3.: "This regulation does not prevent the use of a prohibited substance in the servicing, maintenance and repair operations of an existing product or equipment in an end-use listed in Section 6.0, which contains or was designed to contain a prohibited substance, except if the operations constitute a retrofit or reclassifies the system as new." |
| **AHRI and Daikin US** | 1/17/2020 | 4.2 | Recommendation to allow internet disclosures as a compliance path for disclosure requirements. Internet disclosures ease the burden on manufacturers and to allow for a more effective means of communicating compliance with consumers and regulators. | **Department staff made no changes based on the received comments.**<br><br>The Department believes that the proposed disclosure requirements currently offer a flexible, low-cost and convenient way for manufacturers to comply. Although the Department acknowledges the advantages of having a centralized online database for disclosures, this system would need to be comprehensively detailed and developed before being integrated into regulatory language.<br><br>This option can be studied as part of a future amendment/regulation. |
| **Section 5.0** | | | | |
| **HCPA** | 1/17/2020 | 5.0 | Recommendation to modify record keeping requirement: 3 years instead of 5 years | **Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged the comment; however no edits were made to the proposed regulatory language since the proposed language at the public workshops did not include recordkeeping requirements. The recordkeeping requirements were removed from the proposed new regulation following |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| | | | | the first phase of the stakeholder engagement process, the review committee meetings. |
| **Section 6.0** | | | | |
| **Honeywell, Chemours** | 11/18/2019 | 6.1.2 | Commented that they were not in support of the suggested language recognizing potential future EPA approvals of foam-blowing agents if the language allows for any EPA approvals to be automatically recognized by Delaware. The state should have a process to determine whether it is appropriate to allow subsequently approved blowing agents that have a higher climate impact than other currently allowed, approved and available substitutes | After receiving these comments, the Department is proposing language in 6.1.2.1 that establishes a process where the Department will consider approving (or rejecting) HFC blends with lower global warming potential for two identified foam end-uses, provided the requested blends have been approved by the EPA, and offer sufficient technical support in favor of the request. The Department reserves the right to base their decision on the supporting technical documentation, and additional stakeholders' review. |
| **Honeywell, NRDC** | 12/4/2019 | 6.1.2 | Suggestion to edit the 6.1.2. proposed language to conform the scope of the language to the two foam types identified by the industry. | Following these comments, the Department has modified the language in subsection 6.1.2. to only apply to rigid polyurethane low-pressure two-component spray foam and polystyrene extruded boardstock and billet (XPS). |
| **Dupont** | 12/12/2019 | 6.1.2.1 | Request clarification on the use of the word "exclude" in section 6.1.2.1. There is confusion as to whether the current language could be interpreted to mean either " 750 blends would be excluded from the prohibited list" or if It should read that "the blends would be included in the regulation as being allowed". | To clarify the intent of this section, the department is proposing the following modification to subsection 6.1.2.1: "[…] *modify the regulation to exempt hydrofluorocarbon blends with a global-warming-potential of 750 or less in rigid polyurethane low-pressure two-component spray foam and polystyrene extruded boardstock and billet (XPS) from the list of prohibited substances in Section 6.0.* " |
| **Arkema** | 1/13/2020 | 6.0 | Request that the end-use date for the following four foam applications be extended to 1/1/2022, to allow for enough time for product reformulation, customer trials, production changes, equipment and plant design, capital appropriation, equipment order and implementation (12-18 months process after selecting the new formulation):<br>• Extruded Polystyrene (XPS) Board Stock and Billet<br>• Rigid Polyurethane (PU) Spray – High Pressure 2-Component Foam<br>• Rigid Polyurethane (PU) Spray – Low Pressure 2-Component Foam<br>• Rigid Polyurethane (PU) Spray –One Component Foam | **Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged Arkema's request, however it believes that the proposed timeline is still appropriate as it offers enough lead-time from the intended schedule of the vacated EPA SNAP rules (effective dates prior to January 2019 for all 4 foam end-uses). EPA's analyses to justify an earlier prohibition date included technical and economic considerations for the availability of lower GWP alternatives for these end-uses. |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| | | | This would enable local businesses the opportunity to compete across the state lines where restrictions are not being considered.<br><br>Mentioned the costs of switching to new refrigerants, and the implications for businesses that operate on thin margins. Recommends that the Department reach out to smaller businesses, such as groceries to understand the impact. | The Department has invited grocery stores associations to the initial rounds of review committee meetings – for them to be part of the initial discussions on the regulatory language.<br><br>The impact to small businesses was compiled in Department's Regulatory Flexibility Analysis and Impact Statement Form – based on EPA's screening analyses of SNAP rules 20 and 21, the impact of the proposed regulation can be presumed to have no Significant Economic Impact on a Substantial Number of Small Entities, and more details are offered in Section IV C of the Technical Support Document. |
| **NRDC** | 1/17/2020 | 6.1.2.1 | Commented that NRDC conditionally supports the amendment to section 6.1.2.1 which allows a person to submit a request to exclude from the prohibition an HFC-blend with a GWP of 750 or less for use in rigid polyurethane low-pressure two-component spray foam and polystyrene extruded boardstock and billet (XPS). NRDC's support is contingent on the GWP and end-use criteria being met. To ensure a transparent and equitable process, stakeholders should have an opportunity to provide input and feedback on the request prior to a determination by DNREC. | The Department understands the concerned raise by the stakeholder and wants to emphasize the intent to receive/build strong technical support documentation, along with general agreement from industry stakeholders, for any future request for exemption of the two identified foam products.<br><br>The Department is proposing language in 6.1.2.1 that establishes a process where the Department will consider approving (or rejecting) HFC blends with lower global warming potential for two identified foam end-uses, provided the requested blends have been approved by the EPA, and offer sufficient technical support in favor of the request. The Department reserves the right to base their decision on the supporting technical documentation, and additional stakeholders' review. |
| **Overall Regulation** | | | | |
| **Citizen: Jeanette Robinson** | 11/19/2019 | Overall Regulation | Comment on the urgency of Climate Action, and general support for stringent regulations and policies phasing down Hydrofluorocarbons and the use and production of fossil fuels. | **The Department staff made no changes based on the received comments.**<br><br>The Department agrees with the general sentiment, and the need for policies supporting GHG reductions. |
| **Citizen: Nancy Hannigan** | 12/9/2019 | Overall Regulation | Expressing support for the HFCs regulation proposed by DNREC. | **The Department staff made no changes based on the received comments.**<br><br>The Department appreciates the support. |
| **Out of Scope of this Regulation** | | | | |

**Table 10**: **Summary of public comments received from October 31, 2019 and January 17, 2020, and the actions taken following these comments.**

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| **Arkema** | 1/13/2020 | Out of Scope | Comment that the Department should start discussing regulated organizations' timing needs to address their workforce training considerations.<br>Arkema offered to facilitate these discussions. | **The Department staff made no changes based on the received comments.**<br><br>The Department has acknowledged this comment and thanks Arkema for the proposition to facilitate further discussion on workforce training considerations, following the potential adoption of this regulation.<br><br>These suggestions will be further reviewed out of the scope of this proposed new regulation. |
| **NRDC** | 1/17/2020 | Out of Scope | Comments on the following items, out of the scope included in this proposed new regulation.<br>o NRDC opposes essential purpose permits<br>o NRDC supports refrigerant reclamation in general, but warns that there is no need to exempt reclaimed refrigerant from the proposed rule<br>o NRDC encourages coordination with the relevant department to update the state's building codes | **The Department staff made no changes based on the received comments.**<br><br>The Departments thanks NRDC for offering these comments, however, will not be integrating them as part of this proposed regulatory development process.<br><br>These suggestions will be further reviewed out of the scope of this proposed new regulation. |
| **AHRI and Daikin US** | 1/17/2020 | Out of Scope | Comments on the following items, out of the scope included in this proposed new regulation.<br>o Recommends that DNREC take affirmative steps to promote reclamation by requiring the use of reclaimed refrigerant in state procurement processes.<br>o Recommendation for Delaware to work with county offices to adopt building codes that allow for low GWP refrigerants (ASHRAE 15-2019 & UL 60335-2-40 3rd edition – or equivalent).<br>o Offers to help working with stakeholders on guidance for training materials and curriculum<br>o Recommendation to allow for an "essential purpose permit option" | **The Department staff made no changes based on the received comments.**<br><br>The Departments thanks AHRI and Daikin for offering these comments, however, will not be integrating them as part of this proposed regulatory development process.<br><br>These suggestions will be further reviewed out of the scope of this proposed new regulation. |

The Department has provided a register notice and published the proposed new regulation on April 1st, 2020, via the Delaware Registrar of Regulations[52] which is at least 20 days prior to holding the public hearing. The public hearing notice, proposed regulation, and background document will be made available on DNREC's website at:
https://dnrec.alpha.delaware.gov/air/permitting/under-development/

Questions about this document may be addressed to:
Ajo Rabemiarisoa at (302) 323-4542 or via email at ajo.rabemiarisoa@delaware.gov

[52] Delaware General Assembly. Registrar of Regulations. Accessible via:
https://legis.delaware.gov/Offices/DivisionOfResearch/RegistrarOfRegulations