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Allison Cain
Office of Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: AHRI Comments on EPA Notice of Proposed Rulemaking (NOPR) and Advanced (A) NOPR on the American Innovation and Manufacturing (AIM) Act Technology Transitions, , Docket Identification Number EPA-HQ-OAR-2021-0643

Dear Ms. Cain

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) is commenting on the U.S. Environmental Protection Agency (EPA) Notice of Proposed Rulemaking (NOPR) and Advanced Notice of Proposed Rulemaking (A-NOPR) on the *Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons* under Subsection (i) of the American Innovation and Manufacturing (AIM) Act, Agency/Docket Numbers: EPA–HQ–OAR–2021–0643; FRL–8831–01– OAR

AHRI represents more than 330 manufacturers of heating, ventilation, air conditioning, and refrigeration (HVAC-R) and water heating equipment. It is an internationally recognized advocate for the HVAC-R industry and certifies the performance of many of the products manufactured by its members. In North America, the annual economic activity resulting from the HVACR industry is approximately $256 billion. In the U.S. alone, AHRI members companies, along with distributors, contractors, and technicians, employ more than 1.3 million people. Many of our members operate small businesses providing the important lens of that perspective.

AHRI has worked for more than a decade to support regulations to reduce the consumption and production of hydrofluorocarbons (HFCs). Our members strongly supported the agreement to amend the Montreal Protocol on Substances that Deplete the Ozone Layer to phase down HFC production and consumption as a proven, predictable, and practical approach. We demonstrate that support in our work with state regulators, environmental non-governmental organizations (E-NGOs) and other stakeholders around the world even sharing information regarding transitions with local industries to encourage a positive outcome. AHRI and its members greatly appreciate the efforts of the EPA staff who published this NOPR to further this work.

EPA has asked for comment on several aspects of the NOPR and A-NOPR which AHRI addresses below. The proposed Technology Transitions (TT) support the implementation of the AIM Act

by guiding manufacturers' priorities for transition rather than purely relying on the market forces of the phase-down to facilitate transition timing. While AHRI supports TTs to create an orderly transition as soon as technology, codes and standards, and substitutes enable the transition, they are not necessary to achieve the environmental benefits of the phase-down, and it is important to work in close coordination with regulated industries and end-users to ensure that there is no disruption to critical benefits to society, including preserving food and medicine and providing life-saving cooling and heating.

AHRI commends the expeditious development of this NOPR and A-NOPR due to the short timeline given by the AIM Act and the thoughtful development of the key questions and topics for stakeholder comment. AHRI submitted petitions supporting Technology Transitions to provide for orderly equipment transitions rather than the disorder seen in other countries during the phase-down. AHRI continues to support those requests and greatly appreciates the EPA's consideration of those petitions in this rulemaking process. AHRI submitted separate comments on the proposed record-keeping and reporting requirements and submits these comments with respect to the achievable timing and global warming potential (GWP) for various technologies.

AHRI appreciates EPA's consideration of the many AHRI petitions for GWP limits and transition compliance effective dates for various categories of equipment. AHRI worked with nearly one hundred other stakeholders affected by the TTs to develop its various petitions striving to reach consensus on appropriate timing for transitions and GWP limits.

As EPA notes in the TT NOPR, HFCs are primarily used in refrigeration and air conditioning equipment in homes, commercial buildings, retail buildings, and industrial operations (~75 percent of total HFC use in 2018). The HVAC-R and water heating industry also installs foam insulation which has been estimated to use ~11 percent of HFCs by GHG footprint.

In 2019, AHRI created the Safe Refrigerant Transition Task Force (SRTTF) to ensure that barriers to the refrigerant transition were addressed in a timely manner.

Industry, in partnership with other stakeholders, has invested nearly $10 million in research, communicated with more than 80,000 stakeholders, supported training development, and successfully worked to update standards and building codes, while addressing other issues.

Although there is continued effort needed to enable the transition to low GWP refrigerant, stakeholders are well on their way preparing for a transition in 2025 for air conditioning, heat pumps, and chiller timing. Just for clarity, the Department of Transportation (DOT) has provided AHRI with a Letter of Interpretation that up to 25 pounds of next generation, ASHRAE Class A2L refrigerant can be contained in equipment shipped over road per current DOT Hazardous Materials Regulations (HMR)[1] without being transported as a hazardous material[2]. AHRI is

[1] 49 CFR §173.307

[2] Larger quantities are permitted but must be transported as HazMat that is placarding + HazMat-certified CDL.49 CFR Part 173.306.

discussing special permit instructions with DOT related to shipping pre-charged equipment in larger quantities.

AHRI submitted comments in support of a modification[3] to Occupational Health and Safety Administration's (OSHA's) Hazard Communication Standard (HCS)[4] to align with revision 7 of the Global Harmonized System of Classification and Labeling of Chemicals (GHS)[5] technically differentiating between classes of flammable gases and applicable handling and storage requirements and is anxiously awaiting this necessary upgrade to further enable the transition.

AHRI is working with state and local officials and policymakers to update building codes to allow for next generation refrigerants. Air conditioning (AC) and heat pump (HP) safety standards[6] have been adopted into building codes directly or have been mandated for allowance through legislation in twenty-six states, representing nearly 75% of industry sales for AC / HP, in support of the 2025 transition. Commercial refrigeration safety standards were published a year later than those for ACs and HPs and have only been adopted into building codes directly or have been mandated for allowance through legislation in 15 states, representing nearly 50% of industry sales, in support of a 2026 transition. Sufficient time is needed to allow building designers and contractors to incorporate new leak detection and mitigation systems. Some states will allow alternative adoption methods to allow A2L use but believe this work-around is not a sound approach for a wholesale transition.

AHRI supports the continued harmonization that EPA is proposing in its compliance dates for air conditioning equipment and heat pumps of January 1, 2025, with the exception of variable refrigerant flow (VRF) equipment, proposed for January 1, 2026. AHRI supports the January 1, 2025, transition date proposed for chillers. AHRI opposes the proposal to shift the transition date of refrigeration equipment from the petitioned January 1, 2026 transition date to January 1, 2025.

AHRI, with 35 signatories of like-minded organizations, aligned with other petitioners, to submit a petition asking EPA to limit the GWP for residential and light commercial equipment to 750 GWP with a January 1, 2025[7], transition date, excluding for variable refrigerant flow VRF equipment, which was petitioned to transition on January 1, 2026, with the same 750 GWP limit.

AHRI petitioned EPA for transitions for refrigeration equipment on January 1, 2026. The necessary safety standard that allows for compliance with this transition date was published a year after the standard for ACs and HPs, and as such, the adoption of this safety standard has been incorporated into building codes in fewer jurisdictions than the standard for ACs and HPs.

[3] 86 Fed. Reg. 9576, Hazard Communication Standard (February 16, 2021) (to be codified at 29 CFR Part 1910).
[4] 29 CFR §1910.1200
[5] OSHA update to their Hazard Communication Standard to conform with Revision 7 of GHS of Classification of Labeling of Chemicals Rulemaking docket OSHA-2019-0001
[6] UL/CSA Standard 60335-2-40, 3rd edition or later
[7] SNAP 23 has also been published prior to the petitions giving OEMs the certainty they need to move forward with product development (which in some cases is optimized for a particular fluid).

AHRI believes that the refrigeration industry should not be required to transition earlier than the petitioned date to allow 1) building codes to be updated; 2) time for listing of equipment impeded by practical constraints at Nationally Recognized Testing Laboratories (NRTLs); 3) SNAP listings for low-GWP substitutes in refrigeration applications to be finalized; and 4) manufacturing facilities to convert to allow for the safe storage and handling of new refrigerants.

AHRI asked EPA to forego a negotiated rulemaking in the promulgation of this regulation as it had reached consensus with the vast majority of regulated and interested stakeholders and believed it unlikely to reach further consensus, as time is of the essence to avoid placing additional equipment in the market that will extend the time needed for equipment to be serviced with higher GWP refrigerants as the AIM Act phase-down places pressure on the available supply.

These compliance dates represent the most ambitious, achievable transition timing, which is necessary to avoid disruption to the long-term implementation of the AIM Act. Any earlier timing will further limit equipment availability beyond the challenges of the continuing pandemic supply chain issues. This will impact low- and medium-income households and small businesses, especially in urban and rural food deserts already struggling with access to food.

A compliance date less than 24 months from now, and likely only 14 months from the publication of the final TT rule, is simply not realistic for food retailers. Historically, these retailers have planned new stores more than one year in advance. However, since the COVID pandemic, this design and build cycle has lengthened considerably due to longer permitting times, supply chain constraints, limited industry (OEM) capacity, and much longer components and equipment lead times. For example, the current lead time for a compressor rack ranges from 4-8 months. As a result, many food retailers are already in the planning process for stores to be built in late 2024 or early 2025. To require these retailers to immediately switch stores already in the design process to a refrigeration system architecture with a GWP of less than 150 (or 300) is problematic, particularly when the next SNAP rule, which will presumably incorporate new A2L refrigerants and larger charges of R290, for larger capacity stand-alone equipment, has not even been proposed yet. State and local codes are not on track to be updated in time to support a January 2025 transition for refrigeration equipment.

Consequently, to establish the compliance date at 1/1/25, EPA is essentially requiring that retailers must design their stores with carbon dioxide systems. This is, reportedly, not currently possible because the OEMs manufacturing these systems in North America are already running at full capacity. More technicians need training to handle higher pressure refrigerants safely. It will take time for the OEMs and their suppliers to re-tool facilities from manufacturing systems containing HFCs to carbon dioxide-based systems.

AHRI OEM member companies have from hundreds to thousands of basic model groups listed in the AHRI directory as active products. Individual companies may contact EPA regarding availability of components to transition. During the last transition from

hydrochlorofluorocarbons (HCFCs) to HFCs, it took approximately 3-6 years to develop and certify products through NRTLs. Companies have reported that they are working to expedite this process but are facing challenges in having sufficient access to components because of competing priorities to commercialize equipment compliant with new efficiency standards and ongoing supply chain challenges. Pandemic related quarantines meant that component manufacturers, OEMs and NRTLs lost valuable design and test time critical to this transition. Commercialization of compressors for some systems that needed to be compliant with new Department of Energy (DOE) energy efficiency standards January 1, 2023, were delayed until early 2022, which meant safety and performance testing only started at that time. Current lead times have increased to as long as six months. OEMs are already experiencing delays with the availability of components designed and certified for use with low GWP refrigerants

AHRI notes that there have been issues with access to HFC replacements, and a mechanism should be added to the regulation to allow for exceptions or enforcement discretions if alternatives are not available or the transition is delayed for a legitimate reason.

Original equipment manufacturers (OEMs) were unable to comply with mandated foam transitions in states limiting GWP due to HFC replacement shortages for several years. Even now, the shortages have eased some, but supply is still allocated. Shortages of some refrigerants have also been reported and the foam blowing agent shortages extend beyond fluorochemicals to foam-grade hydrocarbons.

An option to request a deviation or another mechanism could be necessary given the speed of this transition, supply chain disruptions and other challenges. Perhaps installations of purchased equipment is delayed or in case solutions are not available in a timely manner with the SNAP program or there is a unique, unconsidered product or equipment type or even market that simply needs more time for technical development or is unable to transition because of other regulatory limitations.

AHRI supports the GWP limits listed for Retail Food Refrigeration and Cold Storage Warehouses as proposed in the NOPR and petitioned by AHRI. AHRI requests that EPA use the petitioned GWP limits and exceptions for other products.

AHRI supports the GWP limits petitioned for in the Step 2 petition and proposed in the NOPR for Retail Food Refrigeration and Cold Storage Warehouses provided the following provisions are met with continued allowance to maintain equipment, as described below, and a January 1, 2026 transition date.

Although some manufacturers may be prepared to convert to new refrigerants for certain models, the building codes do not yet enable such a transition. Building codes must be implemented for manufacturers to have clarity around design requirements. Also, each company is prioritizing equipment readiness differently on the fastest pathways that they can. There is no uniform readiness across the refrigeration sector. Companies will transition as quickly as they are able to do so because of the AIM Act phase-down schedule. Please note that

AHRI requested 2 refrigerant transitions for refrigeration equipment, which would have allowed for equipment using refrigerants in the same safety classification as currently used alternatives to be immediately used.

Due to the many supply chain challenges identified above, EPA should eliminate its proposed sell-through requirements.

There is not enough time or component availability for the supply chain to stock up on older equipment using high GWP refrigerants. Any limitation in sell-through will further limit access to equipment in remote areas, such as rural food deserts which serve low- and medium-income families. Smaller businesses that distribute this equipment will be hit hardest with a sell-through limitation. Stranding inventory of slower moving components and equipment will create more challenges for struggling businesses which will be exacerbated by more economic changes or a downturn in the economy.

The long-term environmental benefit of the AIM Act is from the phase-down of the supply of HFCs. No technology will impact that benefit, and the HFC price increases and lack of availability of refrigerants will provide a market force to transition to lower GWP refrigerants where possible, per the designed construct of the AIM Act. To the contrary, limiting the sale of existing equipment will mean that that it must be collected and shipped for either landfilling or recycling creating unnecessary waste. At the very least, any sell-through requirement should be limited to self-contained equipment. The environmental impact of prematurely obsoleting equipment with substantial embodied carbon dioxide should be considered in EPA's analysis of the proposed sell through requirement.

The time is too short, the supply chain too strained for stockpiling of old equipment to become a problem. As a result, AHRI requests that EPA eliminate this part of the proposal. A sell-through period attempts to solve a problem that simply cannot exist at a large scale. If the sell-through period is not eliminated it should be extended to multiple years.

AHRI asks that EPA modify and add the following definitions to clarify the allowance for servicing equipment and to minimize supply chain disruptions.

For the subsectors that are comprised of field-erected and field-charged equipment (i.e., supermarket systems and remote condensing units), EPA must clearly define in the final rule when an existing system, when modified as part of a remodel or maintenance, is covered by the new GWP limit. For example, if a supermarket store owner with a refrigeration system containing 800 lb of R-448A replaces 20 remote display cases out of the 80 in the store, is this supermarket system now covered by the TT rule, thus forcing the use of a new refrigerant with a GWP less than 150? What if there is replacement of a compressor rack or a condenser? A precise and clear definition for when an "existing" system becomes "new" equipment and how they are covered by the TT rule, is vital for food retailers to understand how they can plan and utilize their existing assets without stranding them prematurely.

AHRI requests that EPA define the **"Date of Manufacture of Self-contained Equipment**" as the date found on the nameplate for equipment charged at the factory. Self-contained equipment manufactured prior to an effective compliance date of January 1, 2026 to be charged with the HFC or HFC blends allowed prior to January 1, 2026.

AHRI requests that EPA define the **"Date of Manufacture of Remote Equipment[8] [9]:"** as the earlier date of either the date on the equipment nameplate or the date that the refrigeration circuit was completed and initially filled with refrigerant for equipment that is not charged in the factory.

Remote condensing equipment manufactured prior to the effective compliance date of January 1, 2026 can be charged with the HFC or HFC blend allowed prior to January 1, 2026.

AHRI requests that EPA define **"Existing Equipment"** as equipment with a date of manufacture prior to the compliance date of the regulation. Existing Equipment may be maintained using the refrigerants allowed before the compliance date.

AHRI asks that EPA define **"New Refrigeration Equipment"** as equipment that is first installed using new components, used components, or a combination of new and used components, or modified such that any refrigeration equipment in a new facility that is first installed using new components, used components, or a combination of new and used components applicable to refrigeration end-uses, in new construction; an existing facility not previously used for cold storage, retail food refrigeration, commercial refrigeration, industrial process refrigeration, or ice rinks; or an existing facility used for cold storage, retail food refrigeration, commercial refrigeration, or industrial process refrigeration that has undergone replacement of 75 percent or more of its evaporators (by number) and 100 percent of its compressor racks, condensers, and connected evaporator loads.

The compliance date of January 1, 2026 should apply to "New Refrigeration Equipment" as defined above.

- EPA should allow for variances if a portion of the system is labeled with a later date.
- EPA should allow for replacement of appliance components, including but not limited to cases, compressors, valves, condensers, evaporator units, piping and other components to keep that existing system running.

[8] Note that AHRI members would also support the California Air Resources Board structure and definitions for New Refrigeration Equipment and New Facilities, as well as the structure of their 2020 regulations.
A New Facility" means any of the following. (1) New construction; (2) An existing facility not previously used for cold storage, retail food refrigeration, commercial refrigeration, industrial process refrigeration, or ice rinks; or (3) An existing facility used for cold storage, retail food refrigeration, commercial refrigeration, or industrial process refrigeration that has undergone replacement of 75 percent or more of its evaporators (by number) and 100 percent of its compressor racks and condensers.

[9] EPA could then use an exception: the Compliance Date does not apply to any new facility with new refrigeration equipment that received an approved building permit prior to the compliance date so long as the circuit holding the regulated substance is completed, charged with a full charge, and otherwise made functional for use for its intended purpose no later than January 1, 2027.

- EPA should allow for remodel or retrofits, which will likely result in the use of new, more efficient, cases and higher operational efficiency and reduction of leaks.
- EPA should allow for installation of commercial and applied products where building permits have already been received.
- EPA should clarify that withing the definition of a "component" that is not a prohibited product for maintenance of appliances.

EPA states that “For purposes of this rule, EPA is proposing restrictions on newly manufactured products (and the subsequent sale, distribution, export, and offer for sale or distribution of those products) and is not proposing to apply the specific use restrictions that are the subject of this action to existing products or equipment and used products or equipment, except as to the import of existing or used products or equipment.”

AHRI concurs that EPA should continue to allow replacement of components, parts, and partial units in existing refrigeration equipment. HVAC-R and water heating equipment, which is designed for 10 to 50 years of service, represents a significant investment for homeowners, building owners and retailers. Existing equipment should continue to be readily maintained throughout its lifetime. Due to the significant investment in equipment, regulatory limitations should not obsolete it and cause economic hardship, and EPA must account for the carbon impact of prematurely obsoleting equipment.

Again, the long-term environmental benefit of the AIM Act is from the phase-down of the supply of HFCs. No technology will impact that benefit, and the HFC price increases and lack of availability of refrigerants will provide a market force to transition to lower GWP where possible, per the designed construct of the AIM Act. To the contrary, limiting the sale of existing equipment will mean that that it must be collected and shipped for either landfilling or recycling creating unnecessary waste.

EPA states that they do not have authority to mandate changes prior to December 26, 2020, under the AIM Act and cannot require replacement of that equipment. EPA should not mandate replacement of any equipment that has a date of manufacture of the compressor-bearing equipment prior to the effective compliance date.

As noted earlier, AHRI concurs that EPA should continue to allow replacement of components, parts, and partial units in existing refrigeration equipment. HVAC-R and water heating equipment, which is designed for 10 to 50 years of service, represents a significant investment for homeowners, building owners and retailers. Existing equipment should continue to be readily maintained throughout its lifetime. Due to the significant investment in equipment, regulatory limitations should not obsolete it and cause economic hardship. EPA must account for the carbon impact of prematurely obsoleting equipment.

EPA should specify that replacement components may be manufactured, imported or exported, and installed after the Compliance Date to maintain, service, or remodel an existing field-

erected system in an existing facility, provided they are labeled, “For retrofit, replacement, remodel, or maintenance only.”

For larger applied products, the reality is that often they are designed custom, and the building may be designed around the equipment. It may be built and then retained for a period of 3-4 years while a building completes its design, permitting, and construction phases before being installed on site. Commercial equipment which has already been permitted ahead of the sell-through period should be exempt to ensure customers are not forced to expensively re-design and re-permit buildings.

Please note that EPA seems to have an error in the NOPR related to the phase-down of HCFC-22. This unintentional error would be a boon to the refurbished equipment market and lead to unintended reductions in energy efficiency and reversion to old refrigerants.

“Existing equipment” will need to be maintained and components will need to be replaced well beyond one year after the compliance date. Having a limiting sell through date would not allow product for maintenance to be manufactured. We request no limitations on sell through product as product will be manufactured after January 1,2026 for maintenance and repair. If the compliance date is 2026, the sell-through period would be through January 1, 2027.

EPA is proposing certain new definitions to implement subsection (i) of the AIM Act including “use” and “manufacture.” By including sale and distribution in the definition of “use”, the term becomes overly broad, and it appears to be a mechanism for the Agency to extend its regulatory reach to include the sell through limitation.

If EPA defines an “appliance” as the entire refrigeration circuit, all parts of the closed circuit (display case, compressor, evaporator units, piping, condensing unit, and components) would still need to be available for repair or replacement. Use of the Date of Manufacture simplifies enforcement as a clear compliance date that everyone in the supply chain can understand without unnecessarily stranding scarce assets.

AHRI asks that EPA eliminate this additional labeling requirement if the date of manufacture, HFC, and GWP are included in another label or nameplate to avoid duplication.

EPA is proposing on-product labeling for all regulated products in the covered sectors and subsectors of this proposed rule. For products that use HFCs or blends containing an HFC, EPA is proposing that the label include (1) the HFC or blend containing an HFC used in the product; (2) the GWP of that HFC or blend containing an HFC, labeled as ‘‘global warming potential’’; and (3) the date of manufacture, or at a minimum, the year.

AHRI requests that EPA define “New Air Conditioning Equipment” and set AIM Act TT compliance dates related to “New Air Conditioning Equipment” on January 1, 2025, excluding for VRF, on January 1, 2026.

AHRI requests that EPA define "New Air Conditioning Equipment" as any air-conditioning equipment or system that is one of the following: (1) First installed using new components, used components, or a combination of new and used components; (2) An existing system with a single condenser and single evaporator that has a new exterior condenser, condensing unit, or remote condensing unit; or (3) An existing system having more than one condenser and/or more than one evaporator that is modified such that the system has undergone cumulative replacements, within any three-year time period, of 75 percent or more of its indoor evaporator units (by number) and 100 percent of its air source or water source condensing units.

At the very least, air handlers and other components should be allowed to be replaced that are part of a data center or computer room, as defined below, or a commercial system with 62.5 tons capacity or more. These systems are oftentimes integrated into the structure of the building creating significant cost for building owners. The condenser or condensing unit is often housed outside and needs to be replaced several times during its lifetime. It would be cost-prohibitive to replace the indoor units with A2L compatible units instead of allowing for maintenance and repair.

AHRI requests that EPA harmonize servicing needs of VRF equipment.

EPA's proposed requirements for residential and light commercial, VRF equipment refer to "a period of ordinary utilization or operation of the product by an ultimate consumer." The utilization of this additional text does not allow the specificity required to understand the servicing capabilities for VRF equipment for the consumer. When CARB completed its rule to phase down high GWP equipment, a specific tandem service capability for VRF equipment was included. This high-efficiency equipment requires a unique installation which precludes a customer from easily being able to switch from one refrigerant to another These systems will not utilize drop-in and place refrigerant lines throughout a building. The environmentally friendly equipment requires a substantial investment for the installation of the ultimate consumer.

In the CARB requirements, up to 75% of indoor units and 100% of outdoor units can be replaced in case of significant servicing needs and for warranty purposes. AHRI requests EPA clarify the statement referencing the capability to ensure a period of ordinary utilization of a customer matches CARB requirements for harmonization and to ensure consumers who invested in high-efficiency solutions are able to service them.

EPA is proposing on-product labeling for all regulated products in the covered sectors and subsectors of this proposed rule.

For products that use HFCs or blends containing an HFC, EPA is proposing that the label include (1) the HFC or blend containing an HFC used in the product; (2) the GWP of that HFC or blend containing an HFC, labeled as ''global warming potential''; and (3) the date of manufacture, or

at a minimum, the year. AHRI asks that EPA eliminate this additional labeling requirement if the date of manufacture, HFC, and GWP are included in another nameplate to avoid duplication.

AHRI requests that EPA clarify the category of Commercial Unitary AC (CUAC), commercial unitary heat pumps (CUHPs) equipment in the definition of light commercial and residential AC and HPs. AHRI requests harmonization with this transition of 700 GWP on January 1, 2025, and that the same refrigerants SNAP listed for residential and light commercial equipment are allowed for commercial unitary AC and HP (operational above 65,000 BTUs)

Many direct cooling applications use R410A today and therefore need a 700GWP limit and associated high pressure substitutes (R454B, R32) enabled in the building codes for this transition to lower GWP refrigerants.

Currently, the EPA SNAP program website describes "Air-conditioning (AC) Equipment" or "Air-conditioning System" as equipment that cools, heats or dehumidifies spaces in residential or non-residential settings for comfort cooling and other purposes, including, but not limited to, room air conditioning such as window units, packaged terminal air conditioners (PTACs), packaged terminal heat pumps (PTHPs), residential dehumidifiers, and portable air conditioners; ducted central air conditioners and heat pumps; non-ducted air conditioners and heat pumps (both mini- and multi-splits); packaged rooftop units; water-source and ground-source heat pumps; and other dehumidifiers. "Air-conditioning equipment" also includes computer room and data center cooling and remote condensing units for comfort cooling applications. Chillers are defined separately from "air-conditioning equipment." "Air conditioning equipment" refers to stationary air-conditioning equipment and does not include mobile air-conditioning equipment, including that used in vehicles, rail and trains, buses, aircraft, watercraft, recreational vehicles, recreational trailers, and campers.

It is unclear what the definition of "light" commercial equipment is. It seems unnecessary given the duplicative designs, standards and uses of unitary equipment. CUAC and CUHP could be included in this category to help achieve a uniform equipment transition. However, AHRI notes that CUAC and CUHP equipment should be allowed replacement of compressors as this larger equipment is often built into building design and must have multiple compressor replacements during its lifetime.

At the very least, air handlers and other components should be allowed to be replaced that are part of a data center or computer room, as defined below, or a commercial system with 62.5 tons capacity or more. These systems are oftentimes integrated into the structure of the building creating significant cost for building owners. The condenser or condensing unit is often housed outside and needs to be replaced several times during its lifetime. It would be cost-prohibitive to replace the indoor units with A2L compatible units instead of allowing for maintenance and repair.

EPA proposes four GWP limits across all the sectors and subsectors that it is regulating in this rulemaking (i.e., 0 GWP, 150 GWP, 300 GWP, and 700 GWP).

AHRI opposes the use of "zero" GWP as a limit for any class of product, in case current or planned alternatives are added to the list of controlled substances, including hydrocarbons. AHRI is supportive of using 150 GWP, 300 GWP, and 700 GWP to categorize GWP limits as reasonable, given currently available alternatives.

AHRI supports EPA's proposed limit of 700 GWP for AC/HPs and chillers.

EPA stated that there are no approved refrigerants having a GWP between 700 and 750 for AC/HPs. AHRI concurs that 700 GWP would allow for commercially available alternatives to be used in ACs, HPs, and chillers.

AHRI does ask EPA to list R513A for residential and light commercial AC / HP equipment. There are some smaller manufacturers that would like to commercialize this refrigerant for specialized equipment.

AHRI supports EPA's proposal to restrict the use of HFCs and blends containing HFCs that have a GWP of 700 or greater for new equipment beginning January 1, 2025, excluding equipment where the temperature of the chilled fluid leaving the equipment (i.e., the supply temperature to the facility) is less than –58 °F (-50 °C). AHRI asks for a small number of exceptions to this proposal.

EPA excluded chillers where the chilled fluid leaving the equipment is less than -50C as requested by AHRI in its petitions. AHRI continues to support this exception for ultra-low[10] temperature exemption for all equipment due to continued challenges in identifying low GWP alternatives with sufficient efficacy.

AHRI continues to ask that medical, scientific, laboratory, and research applications be exempted from any specific requirements related to this regulation.
Medical, scientific, laboratory, and research applications may require unique conditions and refrigerants to meet them in very small volumes. Innovation should not be stymied by limiting the ability to develop or research of new products or to protect medicines and vaccines. Equipment used for this purpose is well maintained with very low leak rates and refrigerant is responsibly collected at end-of-life.

AHRI requests that EPA limit the GWP for ice skating rinks to 700 GWP as chillers are used interchangeably for ice skating rinks and other uses.

[10] SNAP defines very low temperature refrigeration systems require maintaining temperatures at approximately -80 degrees Fahrenheit (-62 degrees Celsius) or lower. Examples include medical freezers and freeze-dryers, which generally require extremely reliable refrigeration cycles to maintain low temperatures and must meet stringent technical standards that do not normally apply to refrigeration systems.

Creating a specialized product class for ice skating rinks would result in additional costs and delays during times of stress in the supply chain. Chillers are well maintained with very low leak rates and refrigerant is responsibly collected at end-of-life.

The long-term environmental benefit of the AIM Act is from the phase-down of the supply of HFCs. No technology will impact that benefit, and the HFC price increases and lack of availability of refrigerants will provide a market force to transition to lower GWP where possible, as the designed construct of the AIM Act.

AHRI asks for following exceptions for equipment used in dairy farms, data centers, computer rooms, and chemical production facilities. These markets are currently included in Industrial Process Refrigeration (IPR). Note that AHRI requests a January 1, 2026 transition date for IPR equipment.

AHRI notes that there are some unique technical considerations of industrial process refrigeration equipment for which an exception is needed from proposed GWP limits. Manufacturers and end-users of certain chemical processing equipment ask that EPA ban the following refrigerants for use in chillers in chemical production facilities.

As an exception to the EPA proposed GWP limits for the IPR end-uses, AHRI requests EPA to instead prohibit the following refrigerants in new IPR Equipment.

- Industrial Process Refrigeration equipment (new) designed for chilled fluid leaving the equipment at temperatures ≤ +35 °F (2 °C) and > -10 °F (-23 °C) ban the use of the following refrigerants after January 1, 2025: R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R402A, R-422D, R-421A, R-125/ R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B
- Industrial Process Refrigeration equipment (new) designed for chilled fluid leaving the equipment at temperatures ≤ -10 °F (-23 °C) and > - 58 °F (-50 °C) ban the use of the following refrigerants after January 1, 2025: R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/ R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B

Manufacturers and end-users of equipment for dairy farms ask that EPA ban the following refrigerants for use in dairy farm IPR applications as of January 1, 2025.

- Industrial Process Refrigeration equipment (new) designed for chilled fluid leaving the equipment at temperatures ≤ +35 °F (2 °C) and > -10 °F (-23 °C) ban the use of the following refrigerants after January 1, 2025: R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/ R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B

Manufacturers and end-users of computer room air conditioning (CRAC) equipment ask that EPA limit the GWP of refrigerants to 700 GWP, if CRAC equipment (including chillers) are not separated into another category.

AHRI asks for some small adjustments to the proposed transport refrigeration sector as follows.

- AHRI supports the following proposed refrigerant bans for "transport refrigeration road" for refrigerated transport: truck, trailer, aircraft, and rail. AHRI requests that EPA drop the terminology of "transport refrigeration road" and "intermodal transport" as they are not standard terminology for these products, markets are uses.
- Proposed refrigerant bans for refrigerated transport: truck, trailer, aircraft, and rail follow, as A1 refrigerants are required for this category. R-404A, R-507, R-507A, R-428A, R-422C, R434A, R-421B, R-408A, R-422A, R-407B, R402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, and R-410B.[11]
- Marine could be added to this list of refrigerated transport if there were an allowance for the use of R-452A for frozen cargo.
- AHRI asks that EPA use distinct category and definition for "Stand-alone Transport Refrigeration" for stand-alone equipment that must be operational during transport (i.e., food storage on aircrafts, shipping medicines etc.).[12] A1 refrigerants are required for this category. AHRI asks that EPA ban the following refrigerants for "Stand-alone Transport Refrigeration": R-404A, R-507, R-507A, R-428A, R-422C, R434A, R-421B, R-408A, R-422A, R-407B, R402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-134a, and R-410B

Harmonization is needed as shipping containers can be used for multiple modes of transportation (intermodal) both nationally and internationally. ASHRAE class A1 refrigerants must be available for transport refrigeration equipment, and R-452A must be allowed for use to prepare for this transition, especially for frozen cargo for marine containers. The listed banned refrigerants proposed could be reasonable provided R-452A is listed as approved well before the transition, so that OEMs can receive other approvals for use.

Transport lane definitions should be aligned with the definitions in prior SNAP listings for clarity and uniformity during the AIM Act transitions. References to "intermodal" and "transport refrigeration road" should be eliminated or harmonized with the SNAP program.

AHRI asks that EPA clarify that refrigerated containers, shipped by any means, that are imported into the U.S. and intended for export, passing through the US should continue to be allowed to be serviced with existing, in-kind refrigerants, as it is unlikely that the thousands of refrigerated containers shipped around the world will transition in conformance with this timeframe globally.

AHRI further notes that EPA states that refrigerant leakage from international containers during their stay in the U.S. is quite limited. The reason is that "transport refrigeration equipment"

[11] R-134a is only used for marine and self-contained equipment. It could be added to this list.
[12] AHRI recognizes that this stand-alone transport equipment may need to be created as a sub-category under the SNAP program under stand-alone equipment. Other approved refrigerants need to be available for this equipment.

accounts for 8% of CO2 consumption in the U.S., and more than half of transportation refrigeration equipment is land transportation equipment such as truck and trailer. Intermodal Marine Containers are fewer than half, and international ocean-going containers are physically present in the U.S. mainly during "in-use" and "in-repair" periods in the life cycle of the equipment. Refrigerant leakage occurs most frequently during disposal, and AHRI recognizes that the amount of leakage during "use" and "repair" is very limited. In addition, container refrigeration units are equipped with an “refrigerant automatic pump-down function" as a function for refrigerant recovery during "repairs" and are designed to minimize leakage.

Containers shipped internationally are used for essential uses (i.e. transportation of food and medicines), so there are no regulations at this time, and national regulations apply only to domestic containers which are imported by customs law. There are forecasted to be approximately 2 million intermodal refrigerated containers in service in every part of the world in 2025. Any of these containers could be used to import refrigerated products into the U.S.. It is not feasible for the entire refrigerated transport industry to preemptively transition refrigerants in anticipation of a U.S. mandate. Most of the parties to the Montreal Protocol where refrigerated containers are manufactured have ratified the Kigali Amendment to phase down the supply of HFCs which means that there will be local mandates to transition to lower GWP refrigerants without further action in the U.S. Any other construct could result in perishable goods being held at customs while finding an alternate container to ship goods locally.

AHRI also asks that refrigerated and frozen beverages covered under UL 621 be provided with an exception to any transition requirements.

UL 621 standard addresses some refrigerated and frozen beverage equipment, such as soft-serve ice cream. It has not been updated to allow for flammables and they are excluded from scope for CSA/UL 60335-2-89. Refrigerated and frozen beverage equipment are in scope of CSA/UL 60335-2-89, but some markets were not included. These small markets will need an extension until this is resolved.

AHRI requests that the transition effective date for other food processing equipment that is included in UL 60335-2-89 is set as January 1, 2026, as requested for all other refrigeration application due to the reasons listed earlier in the document.

AHRI recently was made aware of concerns related to transition readiness for certain Commercial Refrigeration Equipment (CRE).

Some manufacturers of roll-ins, blast chillers, prep tables, and chef bases have focused on equipment using larger quantities of refrigerant and have asked AHRI to support consideration of an extended transition date for those equipment types. AHRI members do not object to a delay for this equipment, if needed and justified. We understand that those companies will provide their own comment.

Automatic Commercial Ice Machines (ACIM) and vending machines that may be used in hallways and areas of egress must have an ASHRAE safety classification A1 class refrigerant option to be compliant with building codes.

Building codes limit the use of flammable refrigerants in hallways and areas of egress, which applies to ACIM and vending machines, and other equipment. In addition to the safety standard, ASHRAE 15 limits the installation of equipment containing flammable refrigerant charges within 20 feet of an open flame, such as in a commercial kitchen. It is unlikely that either will be changed in time for a 2026 transition as any new standard would have to be adopted by all building codes to allow for a uniform transition.

AHRI asks that any ACIM technology transition determination be delayed until there is resolution of issues including development of viable refrigerant blends that can meet building code limits and harmonize with other regulations impacting this industry.

Ice machines do not just cool product but produce a food product. ACIMs are used to manufacture ice akin to food processing equipment. It is a diverse and complex market. The ACIM refrigeration cycle is unique compared to other refrigeration systems requiring specialty compressors and components. Ice Machines require alternating freeze and harvest cycles for production of ice which requires specially designed condensing units. Many different machine types are required to meet the varying demands for ice shapes (i.e., square, sphere, crescent, flaked, chewable, other gourmet ice types).

It should also be noted that additional time is needed for ACIM transitions because of the varying demands for many end-uses including restaurants, health care (medicinal, therapeutic), supermarkets, hotels, offices, universities, and schools (not just for beverages)

Since EPA has only approved up to 150 grams of R-290 for ACIM the suppliers of compressors are waiting to design compressors and TXV's for larger than 150 grams till the EPA officially approves the use of R-290 up to 500 grams. By them sitting on this ruling it is shortening our window of design time

Similar to the technology transition applications where AHRI requests additional time or a different GWP-limit than proposed by the Agency, ACIM is a small market requiring a small amount, comparatively, of annual refrigerant supply. This small market means that component suppliers do not prioritize these markets, providing refrigerants and components after larger markets are satisfied.

The Department of Energy will likely set a new minimum energy efficiency standard for ACIMs within the coming year with an effective date between 2027 and 2029. Environment Climate Change Canada (ECC) has set a GWP limit of 1500. ACIMs manufacturers continue to research solutions through the Air Conditioning, Heating, and Refrigeration Technical Institute (AHRTI). There is insufficient data available to set an appropriate transition date and GWP limit that will comport with the building code requirements.

An alternate construct might be to ban refrigerants as follows commensurate with the next energy conservation standard, specifically, R-404A, R-507, R-507A, R-428A, R-422C, R434A, R-421B, R-408A, R-422A, R-407B, R402A, R-422D, R-421A, R-125/ R-90/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B

Again, the long-term environmental benefit of the AIM Act is from the phase-down of the supply of HFCs. No technology will impact that benefit, and the HFC price increases and lack of availability of refrigerants will provide a market force to transition to lower GWP refrigerants where possible, per the designed construct of the AIM Act.

AHRI asks that EPA consider the following options for Computer Room Air Conditioning (CRAC) for Data Centers as follows. CRAC equipment should have a 700 GWP limit and not be included with Industrial Process Equipment.

AHRI asks that CRAC equipment be either placed into its own category, including for chillers used in data centers, with harmonization with transition timing and GWP limits with chillers and light commercial and residential equipment or that it be specifically described in the Light Commercial and Residential Air Conditioning category, as having specialized needs. Cooling for data centers is a nascent market with similar refrigerant usage to AC and HPs and lead times for equipment can be as high as 20 months.

CRAC OEMs are concerned that EPA may be unaware of the nuanced differences for the necessary cooling for the functionality of data centers with its high-level heat load, indirect cooling through air conditioning by chillers or more traditional AC equipment, and new technologies such as dielectric fluids for direct contact systems and full immersion chip heat exchangers. They note that SNAP Program approval use limits need to be updated to allow for the use of the 4th edition of UL 60335-2-40 to allow for changes made specifically to enable new refrigerants for use within data centers.

Currently, the EPA SNAP program website describes “Air-conditioning (AC) Equipment” or “Air-conditioning System” means equipment that cools, heats or dehumidifies spaces in residential or non-residential settings for comfort cooling and other purposes, including, but not limited to, room air conditioning such as window units, packaged terminal air conditioners (PTACs), packaged terminal heat pumps (PTHPs), residential dehumidifiers, and portable air conditioners; ducted central air conditioners and heat pumps; non-ducted air conditioners and heat pumps (both mini- and multi-splits); packaged rooftop units; water-source and ground-source heat pumps; and other dehumidifiers.

As described in more detail below, “air-conditioning equipment” may also be considered to include computer room and data center cooling that is subject to specialized needs and requirements unique to that end use as well as remote condensing units for comfort cooling applications. Chillers are defined separately from “air-conditioning equipment.” “Air conditioning equipment” refers to stationary air-conditioning equipment and does not include

mobile air-conditioning equipment, including that used in vehicles, rail and trains, buses, aircraft, watercraft, recreational vehicles, recreational trailers, and campers. It is unclear what the definition of "light" commercial equipment is and it seems unnecessary given the duplicative designs, standards and uses of unitary equipment.

EPA describes "data centers" "data servers" and "server farms" as being part of the Industrial Process Refrigeration subsector.[13] Rather than responding to the technology transitions that have been filed in this manner, AHRI asks that EPA remove any reference to data centers, data servers and server farms from the IPR subsector and consider the following options for Computer Room Air Conditioning (CRAC) used in Data Centers as follows.

AHRI asks that CRAC equipment for Data Centers be either: (1) specifically described in the Light Commercial and Residential Air Conditioning subsector. In this case, the applicable GWP limit should be 700 and requirements related to manufacturing, sale or (2) placed into its own sector or subsector, inclusive of chillers that are used in Data Centers, and subject to additional review of technically achievable and cost-effective approaches to mandating new GWP limits and the timeframe in which such requirements would be applied. As with respect to option (1), AHRI would not advise that such equipment be subject to a GWP limitation lower than 700. CRAC original equipment manufacturers (OEMs) are concerned that EPA may be unaware of multiple technical and nuanced differences that are necessary for cooling Data Centers. These directly affect the functionality of CRAC used in data centers. CRAC and Data Center equipment has a high-level heat load, indirect cooling through air conditioning by chillers or more traditional AC equipment, and new technologies such as dielectric fluids for direct contact systems and full immersion chip heat exchangers.

AHRI notes that, like VRF equipment, Significant New Alternative Policy (SNAP) Program approval use limits need to be updated to allow for the use of the 4th edition of UL 60335-2-40 to allow for changes made specifically to enable new refrigerants for use within data centers. EPA should recognize that there is an objective need to have applicable standards adopted in final form in state and local codes. CRAC OEMs ask that EPA take the need for access to UL 6035-2-40 edition 4 into consideration, and asks for a January 1, 2029, transition date. Finally, although harmonization with other products for this transition may be reasonable, it may not be in the future. It may be helpful for EPA to meet with AHRI members to discuss.

If CRAC equipment is included in IPR, AHRI asks that the GWP limit be set to 700 GWP as much of this equipment is subject to UL 60335-2-40 like light residential and commercial AC and HPs.

CRAC equipment should be allowed to be maintained. At the very least, air handlers and other components should be allowed to be replaced that are part of a data center or computer room, as defined below, or a commercial system with 62.5 tons capacity or more. These systems are oftentimes integrated into the structure of the building creating significant cost for building owners. The condenser or condensing unit is often housed outside and needs to be replaced

[13] 87 Fed. Reg. at 76,774, 76,786.

several times during its lifetime. It would be cost-prohibitive to replace the indoor units with A2L compatible units instead of allowing for maintenance and repair.

AHRI supports the proposed 150 GWP limit starting January 1, 2025, for foams provided there is a caveat or enforcement discretion in the event of supply shortages.

AHRI requests that EPA allow for enforcement discretion or some other mechanism in the event of supply shortages, that are continuing for low GWP foam blowing agents and refrigerants. Foams are used as insulation in refrigeration and other equipment. It should be noted that these shortages extend to non-fluorinated refrigerants such as carbon dioxide and hydrocarbons of sufficient quality for use as a refrigerant.

EPA should incorporate GWP limits and transition dates for HFCs contained in imported products regulated under the TT regulations.

HFCs contained in imported products should be regulated via this provision of the AIM Act, restricting the use of certain HFCs in certain product categories. The TT rules should require that all imported products containing HFCs should be required to transition to lower GWP alternatives at the same time and with the same GWP limit as required by domestically manufactured products, ensuring that the environmental benefit of the phase down is realized in full. Furthermore, there could be additional environmental benefit by introducing low GWP technologies in these countries to move toward faster adoption.

Import should be defined as in the Code of Federal Regulations for the AIM Act[14] as a *means to land on, bring into, or introduce into, or attempt to land on, bring into, or introduce into, any place subject to the jurisdiction of the U.S., regardless of whether that landing, bringing, or introduction constitutes an importation within the meaning of the customs laws of the U.S.. Offloading used regulated substances recovered from equipment aboard a marine vessel, aircraft, or other aerospace vehicle during servicing is not considered an import.*

AHRI requests that EPA clarify that manufacturers may still export equipment designed to use current refrigerants and are not subject to US EPA GWP limitations.

AHRI asks that EPA continue to allow for the export and sale of equipment containing or designed to contain regulated substances at currently used GWP levels. Other jurisdictions may not have building codes updated to allow for next generation refrigerants, while depending on supply from US manufacturers. Banning these sales would harm American manufacturing and limit access to receiving markets further encouraging the sale and use of older or refurbished equipment with potentially lower energy efficiency that may leak more refrigerant.

For example, Canada has just started the code update process and the Canadian market purchases the majority of the AC / HP equipment from U.S. manufacturers. Other countries are in a similar position and would unduly be impacted by this requirement. Countries that depend

[14] 40 CFR 84.3

on US imports should continue to be allowed to have access to products until such time as they determine that they are prepared for the transition to next generation alternatives.

AHRI requests that EPA clarify that manufacturers may still export equipment designed to use current refrigerants and are not subject to these limitations.

AHRI asks that EPA continue to allow for the export and sale of equipment containing or designed to contain controlled substances at currently used GWP levels. Other jurisdictions may not have building codes updated to allow for next generation refrigerants, while depending on supply from the U.S.. Banning these sales would harm American manufacturing and limit access to receiving markets further encouraging the sale and use of older or refurbished equipment with potentially lower energy efficiency that may leak more refrigerant.

For example, revisions to the 2020 editions of the Canadian National Model Codes are underway[15] and Canadians purchase the majority of the AC / HP equipment from the U.S.. Other countries are in a similar position and would unduly be impacted by this requirement disadvantaging US manufacturing further. Countries that depend on US imports should continue to be allowed to have access to products until such time as they determine that they are prepared for the transition to next generation alternatives.

EPA requested comment on the technological feasibility of a transition for heat pump water heaters (HPWH), and AHRI believes that more time is needed for development of this space. EPA also asked if there was a preference for bans of specific refrigerants such as HFC-134a and R-410A or a GWP ban. Finally, EPA asked for comment regarding the impact of restrictions on HPWH adoption.

Regarding the questions in the proposed NOPR addressing heat pump water heaters ("HPWHs"), AHRI supports EPA's decision to exclude this product class from the scope of its proposed regulatory requirements, at this time, and is pleased to provide additional information on the uses of HFCs in HPWHs. As a threshold matter, AHRI would remind EPA that while HPWHs are an energy-efficient alternative to electric-resistance and combustion water heaters, the installed base of these water heaters is relatively small compared to the overall market. In fact, according to the ENERGY STAR® program, in 2021 total shipments of residential HPWHs was 112,000 compared to the ~4.8 million residential electric storage water heaters shipped nationally.[16] Moreover, shipments of commercial HPWHs are exponentially smaller at this point with no or very limited public sources of data given commercial technology offerings are very limited currently. Therefore, while market adoption of HPWHs – for residential and commercial applications – will grow in the years ahead, HPWH manufacturers would rather see broader adoption of current technology offerings – and the efficiency and greenhouse gas emission reductions broader adoption would yield – versus having to comply with a new federal

[15] Canadian Commission on Building and Fire Codes. (2022, October 24). *Public review on proposed changes to the 2020 National Model Codes – Fall 2022*. Retrieved January 25, 2023, from https://ccbfc-cccbpi.ca/en/get-involved/public-review-on-proposed-changes-to-codes-canada-publications-2022/

[16] AHRI shipment data https://www.ahrinet.org/sites/default/files/2023-01/November%202022%20Numbers.xls

regulatory requirement that would force them to redesigning products with new refrigerants, which will only make an already expensive technology even more so for customers.

What are the main reasons for the continued use of HFCs in HPWHs and for which applications?

As the EPA stated in its preamble to its questions on heat pump water heaters, HPWHs, instead of heating water by running electrical current through heating elements, or via fossil fuel combustion, use a vapor compression refrigerant cycle (the same basic mechanism used by standard heat pumps, air conditioners, and refrigerators) to transfer heat from the surrounding air to heat water.[17] Therefore, HPWHs by their design must use a refrigerant to execute the heat transfer in either an air to water or water to water product offering. This is also applicable to unitary (i.e., integrated) as well as spilt system products in residential or commercial applications. The type of refrigerant (e.g., HFC, HFO, CO2, or "natural refrigerants") is a matter of design to ensure the HPWH can serve the necessary hot water load in each application. As a result, the type of refrigerant and the amount used will differ. By way of comparison a typical residential HPWH utilizes less than 2.0 lbs. of refrigerant compared to a typical residential air conditioning system that holds 5 to 20 pounds.

What work is underway to identify suitable lower-GWP alternatives?

HPWH manufacturers are following the market development of lower-GWP alternatives being manufactured and are cognizant that their product offerings will be subject to market forces associated with the AIM Act phase-down, fluorinated gas regulations in Europe, as well as state and local regulations, building codes, and product adoption incentives. AHRI is aware that the U.S. Department of Energy ("DOE") via Oak Ridge National Laboratory ("ORNL") is engaged in testing the efficacy of lower-GWP refrigerants in HPWHs for future use. The results of that research are still being evaluated and additional field testing will be required. Lastly, HPWH manufacturers are engaged in their own testing of lower-GWP alternatives that could address future market applications, but commercialization of products is still a future exercise.

What would be the timeline for use of alternatives?

Notwithstanding the limited availability of suitable lower-GWP alternatives, HPWH manufacturers are increasingly aware that within the next ten years the manufacture and supply of lower-GWP alternatives may be sufficiently robust to allow them to cost-effectively transition to use lower-GWP alternatives in their products.

AHRI suggests that EPA develop a guidance document or "frequently asked questions" or FAQs regarding the difference between "New" and "Existing" equipment, with the publication of the TT Final Rule later this year.

FAQ sheets and guidance documents have been invaluable in previous transitions for the HVAC-R industry. AHRI recommends EPA create such a document and include the following practical

[17] 87 FR 76795

examples to help the supply chain to understand when they are allowed to continue to maintain or are required to replace equipment.

Examples that could be used in a FAQ sheet or guidance document.

AHRI provides these examples of concern that need to be addressed for the subsectors that are comprised of field-erected and field-charged equipment, EPA must clearly define in the final rule when an existing system, when modified as part of a remodel or maintenance, is covered by the new GWP limit.

Cases, compressors, condensers, evaporators, condensing units and other parts are all considered to be replaceable components. AHRI asks that they are allowed to continue to be used, to maintain HVAC-R systems. Replacement components manufactured after the GWP limit effective date can be used to maintain or service an existing system, provided they are labeled "For retrofit, replacement, remodel, or maintenance only".

Here is a non-exhaustive list of continued needs to replace components for maintenance, retrofit, remodel and servicing.

- Replacement components manufactured prior to the GWP limit effective date can be used for maintenance.
- Display cases can be replaced with like product in 2028 with cases that were built in 2027 (or 2020).
- Display cases can be replaced with different cases in 2028, removing 3 *open* cases and installing 6 cases *with doors* to reduce energy consumption.
- Compressors may be replaced in 2028 with compressors that were built in 2027 (or 2020) as a repair.
- Compressors may be replaced with a replacement service model that is slightly higher in capacity.
- New compressors, condensers, evaporators, and cases with a date of manufacture prior to Dec 31, 2025, can be installed, in a system that is subsequently charged with R-448A.

Clarity is needed for food retailers, cold storage warehouse owners, and Industrial Process Refrigeration (IPR) system owners around how they will be able to maintain, repair, and remodel their existing refrigeration systems without the need to replace them with a new system, especially given the concern that current building codes and safety standards do not allow existing refrigeration systems using an ASHRAE safety group A1 refrigerant to be retrofitted with a safety group A2L or A3 refrigerant and it is not technologically or economically practical to retrofit them using CO2 as a refrigerant.

Environmental Justice

EPA provided a discussion on their perspective of environmental justice impacts in relationship to this proposal and the importance of including engagiement with potentially affected

communities and to examine potential changes to exposure related to chemical production facilities.

AHRI requests that EPA consider a few more potential impacts through the lens of environmental justice. EPA should ensure that policies do not negatively impact the availability and cost of equipment for low- and medium-income households and small businesses, especially retailers in rural and urban food deserts, such that they cannot afford to replace equipment. These "Mom & Pop" shops have slim profit margins and may be forced to continue to operate old leaky equipment with lower energy efficiency performance or purchase refurbished equipment without energy efficiency and refrigerant upgrades because they cannot afford new equipment.

Finally, AHRI appreciates EPA's use of microsimulation models to better model the environmental justice impacts of this rule. This analysis is important, and AHRI encourages EPA to explore longitudinal American Community Survey (ACS) datasets in any forecasting it attempts. IPUMS may be a helpful resource for tracking this data over time (https://usa.ipums.org/usa/).

Thank you, in advance, for the work to move this NOPR to a final regulation by the statutory deadline, which is a high priority for AHRI and the U.S. HVACR industry. We appreciate EPA's prompt attention and swift action in promulgating the regulation as required by legislation. We would be happy to provide any further information you may require.

Sincerely,

Helen Walter-Terrinoni

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