

January 30, 2023

U.S. Environmental Protection Agency
EPA Docket Center
Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460.

Re: Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons under Subsection (i) the American Innovation and Manufacturing Act of 2020 87 Fed. Reg. 76,738 (Dec. 15, 2022), Docket ID No. EPA-HQ-OAR-2021-0643

I. Introduction

Vertiv was launched as a stand-alone business in 2016, focused on designing, building and servicing mission-critical technologies. Among our product lines are Liebert® power and thermal management equipment for Information Technology (“IT”). Liebert started manufacturing computer room air conditioning (“CRAC”) units in 1965 to cool early, room-sized mainframe computers. Our systems are specifically designed for precision cooling in information technology (“IT”) environments and include room cooling, in-row cooling, rack cooling, evaporative free cooling, free cooling chillers and thermal control and monitoring. Vertiv produces CRAC and air conditioning equipment utilized in Data Centers and Information Technology Equipment Facilities (“ITEF”), ranging in size from a computer closet that calls for one ton of cooling, to large hyperscale data centers requiring hundreds of tons of cooling.

As described in more detail in the comments to follow, equipment utilized for CRAC, Data Centers and ITEFs is subject to unique demands given the need for such equipment to be continuously available while operating within tight parameters with consistent performance. Facilities using our equipment often have both critical missions and security concerns which affect both the design of new equipment and the degree of testing and validation which is required before a new product can be brought to market. In many applications – 911 call centers, health care, cloud computing, national security-related facilities – equipment must be factory-witness tested and fully commissioned to ensure that when delivered and operational, it can serve its intended purpose. These requirements are distinctly different from those that apply in other commercial air-conditioning applications and, in the case of EPA’s proposed rule, Industrial Process Refrigeration (“IPR”).

Vertiv therefore has a substantial and direct interest in the Environmental Protection Agency’s (“EPA’s”) response to technology transition petitions that have been filed with the Agency pursuant to subsection (i) of the American Innovation and Manufacturing Act (“AIM Act”). Specifically, as proposed, EPA’s response to these petitions could severely constrain the choice of refrigerants utilized in CRAC applications, Datacenters and ITEF. And to the extent that A2L refrigerants are effectively required by proposed limitations on global warming potential (“GWP”) many applications would be effectively prohibited due to the inability to install such equipment under local codes and ordinances. Therefore, Vertiv requests that EPA: (1) create a specific category or subcategory for CRAC, Data Centers and ITEF; (2) delay applicable dates for utilizing low-GWP refrigerants until January 1, 2029; and (3) maintain a maximum GWP limit of 700 or above for such equipment. All three of these actions are necessary to avoid what Vertiv believes are unintended detrimental consequences of EPA’s proposed rule. And all three of these actions will help to ensure a smooth transition for this equipment to lower-GWP refrigerants.

II. CRAC and ITEF Represent A Unique End Use and Are Not Similar to Industrial Process Refrigeration (IPR)

A. EPA Has Not Defined IPR for Purposes of AIM Act, Nor Explained How CRAC, Data Centers and ITEF Fall Within IPR

EPA currently describes Industrial Process Refrigeration (“IPR”) as systems used to “cool process streams in industrial applications.”¹ This definition, however, is not contained in AIM Act, nor any existing or proposed regulations to implement the AIM Act. Rather, EPA has defined IPR only with respect to ozone depleting substances (“ODS”) and then only with regard to recycling and emission reductions in 40 C.F.R. Part 82, Subpart F.² Under this definition, IPR means:

for the purposes of § 82.156(i), complex customized appliances used in the *chemical, pharmaceutical, petrochemical and manufacturing* industries. These appliances are directly linked to the industrial process. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks. Where one appliance is used for both industrial process refrigeration and other applications, it will be considered industrial process refrigeration equipment if 50 percent or more of its operating capacity is used for industrial process refrigeration.³

Within the proposed rule, EPA has not provided any regulatory text that defines IPR for purposes of the AIM Act. Rather, EPA generally (and inconsistently with regard to the Part 82 definition cited above) describes IPR *systems*, stating that they are used to:

cool process streams at a specific location in manufacturing and other forms of industrial processes and applications use in, for example, the chemical production, pharmaceutical, petrochemical, and manufacturing industries. This also includes appliances used directly in the generation of electricity and for large scale cooling of heat sources such as data centers and data servers.⁴

EPA also briefly mentions “server farms” (again without defining this term) but only in connection with the use of chillers.⁵ No further explanation is given in the proposed rule why “data centers,” “data servers” (or potentially “server farms”) should be considered to be IPR and a review of the docket for this rulemaking does not reveal any other supporting information supplied by EPA. EPA provides no explanation for either the technical basis for this classification, nor any explicit rationale why “data centers” and “data servers” could be considered in the same category as chemical, pharmaceutical, petrochemical or manufacturing facilities.⁶

¹ See <https://www.epa.gov/snap/substitutes-refrigeration-and-air-conditioning>.

² Within the Significant New Alternatives Program (“SNAP”) program itself, restrictions apply to IPR only on the basis of whether the use is for new or retrofitted equipment. See Appendices A, B to Subpart G of Part 82.

³ 40 C.F.R. §82.152 (emphasis added).

⁴ 84 Fed. Reg. at 76,774. EPA subsequently discusses chillers used in IPR separately. *Id.* at 76,786. Regulatory text impacting IPR only describes use restrictions based on the size of refrigerant charges. Proposed 40 C.F.R. §84.56.

⁵ *Id.* at 76,786.

⁶ There is no discussion of “data centers” within EPA’s supporting technical documents addressing safety (EPA-HQ-OAR-2021-0643-0066), available substitutes (EPA-HQ-OAR-2021-0643-0066), building codes (EPA-HQ-OAR-2021-0643-0066), technological achievability and commercial demands (EPA-HQ-OAR-2021-0643-006) or within the Montreal Protocol Technical Options Committee Report 2018 (EPA-HQ-OAR-2021-0643-0029) or the Staff Report: Initial Statement of Reasons for the California Air Resources Board consideration of restrictions on GWP for data centers (as part of residential and commercial air conditioning) (EPA-HQ-OAR-2021-0643-0017).

Inclusion of data centers within IPR was suggested within a technical transition petition filed by the producers of ammonia who obviously have an interest in seeking the lowest possible GWP limitation to benefit their product.⁷ But this document does not contain any technical information to support its recommended inclusion of data centers and data servers within IPR. And while California has addressed “computer rooms” within its regulations to control HFCs, it did so with regard to placing within the Refrigeration and Air Conditioning category.⁸ Lacking any indication in the proposed rule why EPA suggests that IPR might include data centers and data servers, it is not possible for Vertiv (or indeed any commenter) to discern what EPA’s intention is with respect to this classification, nor the parameters of any such classification.

As explained in more detail below in Section IV, this sparse discussion is wholly insufficient for rulemaking purposes. And, on a fundamental level, EPA’s potential inclusion of data centers and data servers” within IPR is contrary to EPA’s available descriptions of IPR. Specifically, EPA currently defines “industrial process refrigeration” as that used to “cool process streams in industrial applications. The choice of substitute for specific applications depends on ambient and required operating temperatures and pressures.”⁹ CRAC and equipment utilized in Data Centers and ITEF requires year-round cooling and (unlike comfort cooling designed for summer conditions) requires non-stop, continuous cooling operation and technical designs capable of rejecting indoor IT heat to the outdoors from extreme winter temperature conditions to extreme summer conditions.¹⁰ [Such systems are not meant or designed to “cool process streams” such as those found in industrial applications, nor can their current operations be described as cooling process streams.]

EPA’s preamble statements also do not comport with EPA’s previous descriptions of IPR in either previous rulemaking or Significant New Alternative Program (“SNAP”) determinations. In its first SNAP rule in 1994, EPA indicated that “[m]any industrial applications require cooling process streams. These applications include systems designed to operate in a wide temperature range. Included within this category are industrial ice machines and ice rinks. The choice of substitute for specific applications depends on ambient and required operating temperatures and pressures.”¹¹ Other subsequent SNAP rules and determinations do not appear to have affected this initial explanation, but just applied the term “industrial process refrigeration” to specific end use restrictions.¹²

A search for available guidance on this issue revealed one document, which also does not support EPA’s inclusion of “data centers,” “data servers” or “server farms” within IPR. In the current Compliance Guide for Industrial Process Refrigeration, EPA has described IPR as being “[c]omplex, customized systems used in the chemical, pharmaceutical, petrochemical, and manufacturing industries. These systems are directly

⁷ See Petition for Technology Transitions under AIM Act Consistent with Restoring U.S. Climate Ambition, EPA-HQ-OAR-2021-0643-0011 at 4, suggesting that EPA define IPR as “[a] complex customized appliance used to cool process streams that are directly linked to the processes used in, for example, the chemical, pharmaceutical, petrochemical, and manufacturing industries. This also includes appliances used directly in the generation of electricity, ice, and ice rinks, and for large scale cooling of heat sources such as data centers and data servers.”

⁸ 17 CCR §95373.

⁹ See <https://www.epa.gov/snap/substitutes-refrigeration-and-air-conditioning>. Without indicating whether or not “industrial process air conditioning” is a subset of IPR, EPA also defines this term as being “distinct from commercial and residential air conditioning, provide comfort cooling for operators and protect process equipment. This end-use is often used when ambient temperatures approach 200°F (93°C) and corrosive conditions exist.” *Id.*

¹⁰ See, e.g., https://www.se.com/us/en/download/document/SPD_VAVR-5UDTU5_EN/; <https://journal uptimeinstitute.com/a-look-at-data-center-cooling-technologies/>; and <https://dataspan.com/blog/data-center-cooling-best-practices/>.

¹¹ 59 Fed. Reg. at 13070 (Mar. 18, 1994).

¹² See 60 Fed. Reg. 31,092 (June 13, 1995), 62 Fed. Reg. 10,700 (Mar. 10, 1997), 62 Fed. Reg. 30,275 (June 3, 1997), 81 Fed. Reg. 32,241 (May 23, 2016).

linked to the industrial process. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks.”¹³ None of this description applies to what would commonly be understood to be data centers or servers.

In this same publication, EPA also distinguished as between appliances used in cooling applications versus IPR, creating a test for when an appliance would be categorized as IPR. Specifically, EPA stated that “[i]f less than 50 percent of the *appliance’s* capacity is being used in an *industrial process refrigeration* application, then this system would not be considered *industrial process refrigeration*.”¹⁴ CRAC, Data Centers and ITEF (or facilities that EPA refers to as data centers,” “data servers” and “server farms”) are focused on cooling sensitive electronic equipment. This is clearly distinct from available EPA non-regulatory definitions of IPR and should therefore not generically fall within the definition of IPR.

B. CRAC, Data Centers and ITEF Equipment Have Unique Designs and Stringent Operating Conditions Not Replicated in Other Sectors or Subsectors

CRAC and equipment used in Data Centers and ITEF are distinctly different from IPR, as EPA has interpreted this subsector over the past 28 years. First, the amount of “downtime” that is allowable in these end uses is tiered, but the *lowest tier* required 99.7% uptime, or a maximum of 28.8 hours of downtime per year. Other tiers include more stringent requirements, up to the highest tier which requires 99.995% uptime, or a maximum of 26.3 minutes of downtime per year. Vertiv does not possess data for other industries for which IPR is used, but clearly, this requirement for near 24/7/365 availability is distinct from industrial sectors which often undergo periodic downtime for maintenance of equipment (often for days or weeks), interruption in their operations due to supply disruptions, technical or economic adjustments made to account for consumer demand and other factors. Many industrial facilities also have limited operation due to utilizing one or two shifts and not full, 24/7 operation and some factories will periodically close for holidays or employee vacation time. Such objective, external factors are simply inapplicable to Data Centers and ITEF.

The extreme operational demands that are placed on computers and information technology reflect the fact that these technologies underpin the U.S. economy through the mission-critical preservation of data. This “use” is distinct from uses applicable to nearly all other goods and products, which among other distinctions, may be produced and stored in the case of supply disruptions. Computers and IT are essential to the preservation of national security, efficient delivery of health care, monitoring and control of energy production and transmission, and the support of domestic and international manufacturing and global financial systems. Again, these critical uses are distinctly different from EPA’s determination of what constitutes IPR (since its initial consideration of the sector in 1994) and the Agency’s consideration of available substitutes for consumables found in chemical, pharmaceutical, petrochemical, and manufacturing industries.

While Vertiv appreciates that other industries produce products that have direct connection to U.S. national security, because of the sensitivity of data across multiple end uses of that data, CRAC, Data Center and ITEF installations also require high security measures, including for public safety (e.g., 911 call centers), financial transactions (with attendant liability) and the maintenance of confidential information (e.g., for federal agencies, businesses and industry). This means both measures to prevent public access to facilities as well as specific designs for cooling equipment.

¹³ EPA 300-B-95-010 at B-1.

¹⁴ *Id.* at B-2 (emphasis in original). EPA separately indicated that “[w]here one appliance is used for both industrial process refrigeration and other applications, it will be considered an industrial process refrigeration system if 50 percent or more of its operating capacity is used for industrial process refrigeration.” *Id.* at J-3.

CRAC and equipment used in Data Centers and ITEF requires year-round cooling with continuous air flow and must address low ambient air condensing temperatures. Data never sleeps. The servers that house mission-critical data are continuously rejecting heat into their respective ITEF resulting in a necessary uninterrupted cooling demand. Compressors are typically located indoors within conditioned space for multiple reasons including better performance and reliability, access for repair, and building and operational security.

Additionally, compressors for CRAC equipment are designed for optimized efficiency for this critical application with its ever-growing market. One source estimates that 70% of the global internet traffic moves through the suburbs of Washington D.C. daily,¹⁵ where the local climate experiences extremes for all four seasons; CRAC equipment must be designed that can pull ITEF heat loads out of the space and reject it into the atmosphere regardless of what the temperature differential is between the indoor and outdoor environments. It is not apparent from the brief discussion contained in the preamble of the proposed rule, nor the documentation supplied in the docket, whether EPA has considered any of these distinctions from historic and “typical” IPR.

III. EPA Should: (A) Create New Sector or Subsector for CRAC, Data Centers and ITEF; (B) Utilize a GWP Limit of 700 or Below for Such Equipment; and (C) Extend Deadlines to 2029

A. A New Sector or Subsector is Necessary Given Unique Designs, Application and Operation of CRAC, Datacenters and ITEF

In the proposed rule, EPA is proposing to define “sector” and “subsector”¹⁶ but paradoxically, does not seek to provide further definitions for what specific equipment or products fall within each AIM Act sector or subsector. A “sector” is proposed to mean a “broad category of applications . . . including refrigeration, air conditioning [and other items].”¹⁷ A “subsector” is simply defined as “processes, classes of applications, or specific uses that are related to one another within a single sector or subsector.”¹⁸ Specifically with respect to IPR, EPA provides no information with regard to how data centers and data servers (as they are described by EPA) are related to other IPR, nor does EPA describe why data centers and data servers should be considered to fall within the IPR subsector. As described in more detail below, EPA should therefore not include data centers, data servers or server farms within IPR but rather, if they are addressed at all in the final rule, create a new sector or subsector specific to this end use.

Vertiv believes that EPA should look to how the Department of Energy (“DOE”) as well as the UL 60335-2-40 4th Ed. have separately categorized ITE cooling equipment. DOE has set minimum efficiency requirements for “Air Conditioners and Heat Pumps - Computer Room Air Conditioners” with a distinct test method for CRACs separate from other air conditioner types. In UL 60335-2-40, there is a separate annex which separately applies to ITE cooling applications. It provides various definitions and scope to define the exact equipment that this annex intends to cover for safety. The scope provided in this annex states that it applies to refrigerant bearing appliances and their constituent parts and assemblies, designed specifically for the purposes of cooling Information Technology Equipment (“ITE”) and ITE Areas. This equipment is also categorized as not accessible to the general public, or accessed only by authorized individuals and is fixed or stationary equipment.

The DOE and the UL 60335-2-40 4th Ed. have defined terms such as ITEF, ITE, ITE AREA, Data Center, CRAC, and other terms to have very specific meanings. This serves to limit the possibility that there will

¹⁵ <https://energynews.us/2023/01/16/in-virginia-carbon-emissions-drop-as-data-centers-boom-thanks-to-rggi-pact/>

¹⁶ 87 Fed. Reg. at 76,754; proposed 40 C.F.R. §84.52.

¹⁷ *Id.*

¹⁸ *Id.*

be uncertainty regarding what kinds of equipment the requirements apply to. These definitions also align with ASHRAE 90.4 the Energy Standard for Data Centers. In addition, there are efforts underway to include similar scope, requirements, and/or definition in the safety installation standard ASHRAE 15 as well as various building and mechanical codes throughout the U.S., although it is Vertiv's understanding that these efforts will take a significant amount of time to complete.

On the basis of the above, in any final rule, EPA should create an end-use sector or subsector for "Information Technology Equipment Facilities, Data Centers, and Computer Rooms" utilizing available codes and standards categories. Further, the scope of this new sector or subsector can be defined as cooling applications including refrigerant-bearing equipment and their constituent parts and assemblies, designed specifically for the purposes of cooling ITE and ITE Areas. Creation of such a sector or subsector would ensure that EPA fully considers AIM Act issues regarding the phaseout of HFCs for such equipment in a manner that is fully aligned with safety standards and codes that will apply to the equipment.

As referenced below in Section IV, under SNAP, EPA created end use categories for "commercial ice machines" "ice skating rinks" "residential dehumidifiers" "vending machines" and "water coolers." In each of these actions, EPA determined that the type of equipment involved and the available technology and refrigerants justified the creation of a separate category and individualized consideration of available substitutes. Whether or not the current SNAP end uses cited above are larger or smaller than on the basis of related refrigerant charges, the distinct characteristics of CRAC, Data Centers and ITEF justify create of a separate sector or subsector for the purposes of implementing the AIM Act. CRAC, Data Centers and ITEF are subject to unique operating conditions and important safety considerations not shared by other sectors or subsectors. Their efficient, near-continuous operation is also of vital importance to the U.S. economy and national security. And the degree of any design, equipment and/or refrigerant considerations that apply to ice machines, ice rinks, dehumidifiers and vending machines – justifying differentiated treatment of such equipment from other equipment in the Refrigeration and Air Conditioning sector – certainly are not of a magnitude greater than those that apply with respect to CRAC Data Centers and ITEF. As an issue of first impression, EPA must consider these differences in applying its new AIM Act authority.

B: EPA Should Utilize a 700 GWP Maximum Limit for CRAC, Data Centers and ITEF

While, as noted above, there are substantial differences in equipment design and operational demands, historically, refrigerant selection for ITE has been the same as that which applied to residential and light air commercial air conditioning.¹⁹ In 2021, California amended regulations prohibiting the use of certain HFCs and in this action defined "Air-Conditioning (AC) Equipment" or "Air-Conditioning System" to include "computer room and data center cooling."²⁰ The amendments had the effect of imposing a GWP limitation of 750 on such equipment, beginning on January 1, 2025. California, however, also included a variance provision, allowing exceptions to the 750 GWP limitation based on impossibility (e.g. non-availability of a lower-risk substitute).²¹

In the proposed rule, EPA applies a GWP limit of 700 to residential and light commercial air-conditioning and heat pump systems beginning with a prohibition on manufacturing starting on January 1, 2025 and

¹⁹ As EPA is well aware, these refrigerant choices have been driven by the phaseout of ozone depleting substances and not HFCs.

²⁰ 17 CCR §§95373, 95374(c) Table 3; 95378(b).

²¹ 17 CCR §95378. To be clear, Vertiv did not support explicit inclusion of computer room and data center cooling within the light air conditioning category and commented on the proposed regulation to that effect. See filed comments (Attachment 1). But for whatever reason, the California Air Resources Board promulgated final regulations with this classification, applying a 750 GWP limitation.

prohibition on sale or distribution starting on January 1, 2026.²² But by indicating that data centers and servers fall within IPR, EPA's proposed rule could be interpreted to apply a limit of 150 or 300 GWP on such equipment depending on refrigerant charge capacity.²³ It also does not appear that EPA has proposed any regulatory mechanism that would allow variances similar to that provided in the CARB regulations cited above.

EPA should not impose a 150 or 300 GWP limitation on refrigerants used in CRAC, Data Centers and ITEF, but rather utilize a 700 GWP limit, which the Agency has found to be reasonable for other sectors and subsectors. Imposing a 150 or 300 maximum GWP limit is not technically achievable and, even if it were achievable, would impose excessive economic costs without appreciable environmental gains. With regard to residential and light commercial air conditioning, the general method of removing a heat load and rejecting it into another space for IT equipment is identical between these applications; however, the higher operating pressures resulting from the higher temperatures within ITE Areas versus comfort cooling applications generates a unique design for the common components, like compressors and safety shut-off valves, that are required in ITE Areas. Thus, given that the challenge of designing, building, manufacturing and testing ITE equipment to address operational needs is far in excess of that for residential and light commercial air conditioning, it is illogical for EPA to allow a 700 GWP limitation for residential and light commercial air conditioning while potentially imposing a much more stringent 150 or 300 GWP limitation on CRAC, Data Centers and ITEF.

In addition, EPA needs to consider that the ITE industry is a small market share of the component purchases relative to the comfort cooling industry. This means that ITE manufacturers are dependent on the supply of equipment, the design and capabilities of which are dictated by the component manufacturers who design first and foremost for their core industries. In this regard, given California's promulgation of a 750 GWP limitation for air conditioning equipment and systems, it is Vertiv's understanding that, to date, most investment in new equipment has centered around California GWP requirements, not the substantially lower levels being proposed in this rulemaking. It is also likely that significant investments will not be made to develop components and get production quantities up for the ITE industry until, at the earliest, the time that EPA finalizes this pending rulemaking, which adds approximately an additional year (Dec 2022-Oct 2023) on top of the overall new product development cycle. For all these reasons, EPA should not impose any GWP limitation that is lower than 700 GWP on CRAC, Data Centers and ITEF.

C. EPA Should Extend Any Deadlines That Apply to Data Centers, Servers and ITEF

Given that the proposed rule defines neither "data centers," "data servers" or "server farms" nor provides a definition for "industrial process refrigeration," it is unclear how the proposed deadlines related to the manufacture of equipment and sale or distribution of equipment apply. To the extent that EPA considers the proposed dates of January 1, 2025 and January 1, 2026 to apply to CRAC, Data Centers and ITEF, however, both deadlines do not provide sufficient time for the industry to transition to lower-GWP alternatives.

As referenced above, the first issue occurs in relation to the availability of suitable equipment that can accommodate lower GWP refrigerants. Specifically, equipment manufacturers are a vital part of the process in addressing AIM Act requirements, but CRAC, Data Centers and ITEF are a small part of the overall business of large component manufacturers. Overall, ITE equipment within the industry accounts for less than 4 percent of new refrigerant charge in air conditioning systems nationwide.²⁴ For this reason,

²² Proposed 40 C.F.R. §§84.54(a), (b), 84.56(a)(24).

²³ Proposed §84.56(a)(1), (2).

²⁴ Figure derived from comparison of AHRI 2020 Annual Sales report of Central Air Conditioners and Air-Source Heat Pumps (not including chillers and entire refrigeration industry) and Vertiv OMDIA sales data for 2020.

there does not exist today a full suite of available components optimized for use within ITEF equipment. CRAC units have not been put through the appropriate prototyping and testing cycle to ensure that future HFC substitutes listed acceptable for use by EPA (or required by GWP limitations) actually provide for a practical, energy-efficient, and safe deployment. This renders phaseout dates of January 1, 2025 and January 1, 2026 not technically achievable, in accordance with AIM Act requirements.²⁵ In order to allow for sufficient time to transition to new refrigerants, EPA should therefore not finalize a manufacture, sales or distribution deadline for CRAC, Data Center and ITEF equipment until at least January 1, 2029.

The second issue occurs with respect to the development and adoption of codes allowing the use of A2L refrigerants. As EPA well knows, it will take multiple years before new code requirements may be implemented across the country; ITEF equipment needs to be located based on several factors which do not correspond to the rate of adoption of state and local building codes.

Applicable standards and codes are not currently far enough in development and implementation in order to allow for safely using flammable refrigerants in a datacenter. As of now, only the UL 60335-2-40 4th Edition product safety standard addresses the use of flammable A2L refrigerants in ITEF. The ASHRAE 15-2022 safety standard for refrigeration installations currently has no regulations/requirements for ITE cooling appliances or data centers. The various codes throughout the U.S. also do not have any regulations/requirements for data centers.

The International Code Council (ICC) has 3-year cycles for incorporating new code changes and the next opportunity for such changes to be adopted will not be until the next code cycle in 2027. Then, following any addition of data center requirements, each state takes time to adopt such code changes. Between 2024 and 2027 there is substantial ambiguity and too much is left to interpretation within the building codes to dictate all safety provisions required to design a data center with HFC refrigerant. Based on projected code adoption in 2027, the earliest date on which it would be feasible to impose lower GWP limits would occur in 2029. Based on past experience with the state code adoption process nationwide and best industry practices, EPA should not impose GWP limitations on CRAC, Data Centers and ITEF prior to January 1, 2029.

In addition, the UL 60335-2-40 3rd edition did not allow data center applications to have sufficient charge amounts to allow for the cooling of the high heat loads found in data centers and ITEF. It was not until the UL 60335-2-40 4th edition, which was only just published on December 15, 2022, that ITE cooling applications were addressed separately from other application sectors due to the unique challenges of this application, so the industry has not had time to digest the content of this standard and effectively start implementing these requirements into new designs including newly-invented components. Given the recent nature of this change, there will not be sufficient time for manufacturers to develop adequate and safe products for CRAC, Data Center and ITEF applications by the dates that EPA has proposed for IPR and other end uses. As per above, the earliest feasible time for such new requirements is January 1, 2029.

IV. The AIM Act Requires That EPA Consider Unique ITEF, Data Center and Computer Room End Uses

A. The AIM Act Requires a Specific Analysis Before New Regulations are Put in Place

As noted above, it appears that EPA intends to promulgate rules affecting the manufacture, sale and distribution of regulated substances utilizing the same categories and end uses that the Agency used in

²⁵ Other factors with regard to commercial demand and overall economic costs may also preclude the ability to transition to lower-GWP by the required dates in 2025 and 2026.

SNAP (without any corresponding regulatory language). But under the AIM Act, EPA may only restrict the use of a regulated substances in a sector or subsector after considering multiple factors including technical achievability, safety, building codes and other relevant factors.²⁶ The extremely limited discussion of data centers, data servers and server farms in the preamble to the proposed rule – separate from any consideration of the required statutory factors -- does not provide a sufficient basis on which EPA may promulgate proposed restrictions for such end uses.²⁷

B. EPA Lacks Sufficient Basis to Impose Proposed GWP Limits that Could Affect CRAC, Data Centers or ITEF

While Vertiv is supplying additional technical information to the Agency in response to the proposed rule, it does not appear that EPA has performed *any* analysis with regard to the technical achievability and safety of low-GWP refrigerants for the data center, data server and server farm end uses it describes.²⁸ To the extent that EPA relies on information produced for the 2015 and 2016 SNAP rules, that information is either missing or outdated with regard to CRAC, Data Center and ITEF equipment that will be developed and deployed fully 10 or more years later. No documents appear to have been submitted to the docket that address appliances utilized in these end uses. And EPA's cursory discussion of data centers and servers in the preamble is an insufficient basis on which to promulgate proposed GWP restrictions for these end uses.

Among documents that *are available* in the docket, the ICF report on availability of substitutes indicates that building codes “have not completely addressed the use of flammable refrigerants, particularly low-flammability A2L refrigerants in high-probability systems (*i.e.*, systems that have a high probability of leaking refrigerant into an occupied area).” This situation has not marginally improved over the last year and EPA does not explain why this is not an important factor to consider.

EPA has also not provided rationale why CRAC, Data Center and ITEF should be considered to be a similar end-use to other IPR applications. EPA's description of end uses related to the SNAP program does not mention data centers within either the broader Refrigeration and Air Conditioning sector or the two IPR end uses.²⁹ And given that explicitly EPA proposes to maintain “commercial ice machines” “ice skating rinks” and “vending machines” as separate subsectors in this proposed AIM Act rulemaking -- it would be arbitrary and capricious for EPA to consider data centers, data servers, server farms (or CRAC, Data Centers and ITEF) to be within a generic IPR subsector given that such uses (subsectors) are distinctly different from other IPR.

V. Conclusion

Vertiv supports EPA's efforts to move from higher GWP refrigerants to lower GWP refrigerants and is actively examining the means by which it can incorporate lower GWP refrigerants within its product lines. But the dates and GWP limits EPA has proposed for IPR -- which EPA at least suggests will apply to “data centers,” “data servers” and “server farms” -- are simply not feasible. As noted above, EPA should first create a distinct subsector for CRAC, Data Centers and ITEF. In addition, EPA must allow more time, until 2029, to effectively transition these end uses and related equipment to alternative, low-GWP refrigerants. Finally, any GWP limit for this new sector or subsector must be 700 or above.

Taking such actions will not be detrimental to EPA's implementation of the AIM Act. When considered together, these end uses represent a relatively small share of the use of refrigerant within the Refrigeration

²⁶ Such is *required* pursuant to AIM Act section (i)(4)-(5).

²⁷ See also n. 3, *supra*.

²⁸ See n. 6, *supra*.

²⁹ See [n. 9, supra](#).

and Air Conditioning sector. Allowing consideration of the unique needs and requirements of CRAC, Data Centers and ITEF – and sufficient time for industry to address new limitations -- will also assist in the responsible development of the next generation of efficient equipment that can utilize lower GWP refrigerants and promote a smooth transition to such alternatives.

Any near-term “loss” in terms of allowing the manufacture and sale of higher-GWP systems until 2029 may realistically be offset by additional gains in energy and operational efficiency that must be developed over that period in concert with DOE’s impending updated minimum efficiency requirements (in current public review). Conversely, if EPA moves to impose a near-term cut-off date of 2025 for the manufacture of “large” ITEF equipment (by virtue of considering such equipment to be IPR), CRAC, Data Center and ITEF equipment manufacturers will not have equipment available for sale. Vertiv’s main component manufacturers, including those for compressors, will not be ready for production for some time, impact our ability to develop and test new systems prior to commercial production, and they will not be in position to support new equipment installations that would be compliant with code requirements until 2029.

We ask that EPA address all of the concerns addressed above and are more than willing to meet with the Agency to provide further explanation of CRAC and ITEF details in order to find an acceptable path forward.

Respectfully submitted,



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