Assessment of Public Comments

6 NYCRR Part 494, Hydrofluorocarbon Standards and Reporting

Comments received from December 29, 2023 to March 19, 2024

The New York State Department of Environmental Conservation (Department) published a proposal to amend 6 NYCRR Part 494 (Part 494) on December 29, 2023. Formal notice of the proposal was provided in the State Register and Environmental Notice Bulletin on January 10, 2024. Comments on the proposed regulation were accepted until March 19, 2024. Two public hearings were held virtually on March 13, 2024. This Assessment of Public Comments responds to all comments within the scope of the regulation received during the public comment period, including written comments and oral statements made at the public hearings. Comments were compiled, reviewed, and categorized based on their content. This Assessment of Public Comments does not address comments received after the public comment deadline. The Department received comments from 230 entities, of which 103 were unique written or oral statements. An additional 127 written statements appeared to be from letter-writing campaigns from which few unique comments could be extracted.

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Summary

This Assessment of Public Comments provides a response to each issue and significant alternative within the scope of the regulation raised by commenters and a description of any changes made to the express terms of rule as a result of such comments. The changes made in response to the comments are all non-substantive revisions. For ease of review, the following is a brief summary of the Department's response to the most frequently commented topics.

The Department appreciates the broad support for climate change mitigation policy demonstrated by the comments. The majority of comments stated general support for reducing greenhouse gas emissions or "decarbonization,"[1] implementation of the Climate Leadership and Community Protection Act (or Climate Act[2]), federal hydrofluorocarbon (HFC) policies (ratification of the international Kigali Amendment to the Montreal Protocol (Kigali Amendment), the American Innovation and Manufacturing (AIM) Act,[3] or related regulations by the US Environmental Protection Agency (EPA)), and/or HFC regulations in other states [Campaign letter 1 and 3, 6, 8, 24, 25, 27, 30, 36, 46-48, 50-56, 59-61, 63, 64, 67, 68, 71-74, 77, 79, 80-82, 84, 97, 112, 115, 120, 130-132, 168, 178, 179, 181, 184-186, 190, 191, 193, 194, 202, 204-208, 213, 217-222[4], 224-229]. The remaining commenters either did not mention the topics above [Campaign letter 2, 13, 18, 19, 23, 26, 34, 35, 39, 42, 57, 66, 78, 86, 98, 128, 129, 137, 174, 183, 195, 198, 199, 201, 203, 210, 214], or did not raise issues related to this rule or the topics above.

Several commenters stated strong support for the Department's proposal to amend Part 494, citing the reduction of HFC emissions or fairness to entities that are already making the transition away from HFCs [36, 44, 46-48, 50-52, 55, 67, 72-74, 79]. Some commenters referred to the proposed timeline as ambitious but realistic [36, 67, 80] or provided examples of ultralow global warming potential (GWP)[5] technologies available today or that are available in other parts of the world [36, 50, 52, 80]. For example, the HFC phasedown has been underway for longer in Europe and there are more ultralow GWP solutions on the market there. Some commenters provided examples of either businesses in New York State that are already transitioning away from HFCs [52, 55, 72, 74] or specific steps being taken by industry [54, 81] to reduce HFCs. This echoed information received during the Department's pre-proposal outreach.[6] Some commenters thanked the Department for the effort taken to harmonize with current federal laws [55, 81, 112]. Other commenters indicated that HFCs need to be phased out faster than the federal laws to keep global warming below 1.5 degrees [73, 74, 115] and that the Climate Act requirements cannot be achieved without directly addressing HFC sources and reducing HFCs in New York State [52, 73, 74, 79, 80].

Many other commenters requested that the Department rescind the proposal or only consider regulations as first established by the federal government or by other states. As explained in the Regulatory Impact Statement, the Department made considerable efforts to align the regulation with federal government and US Climate Alliance (USCA) states rules, with some limited differences to meet

[1] Not defined but likely refers to policies to reduce greenhouse gases, including those that do not contain carbon.
[2] Chapter 106 of the Laws of 2019.
[3] 42 U.S.C. § 7675.
[4] Commenters 216 and 221 provided identical letters.
[5] e.g., Global Warming Potential, a metric published by the International Panel on Climate Change to describe the impact of a substance relative to carbon dioxide. "Ultralow" GWP was also first defined as a "GWP of less than 10" by in California SB1206 (California Health & Saf. Code § 39735, 39736). To date, no HFC has an ultralow GWP.
[6] A full description of the 2022-2023 pre-proposal stakeholder outreach is in the Regulatory Impact Statement.

New York State's requirements. There is no regulation that would achieve the same purpose – namely to help meet the Climate Act requirements, including the statewide greenhouse gas (GHG) emission limits. California's SB1206 law has a similar target, but there are no implementing regulations yet. Some states like California and Washington adopted regulations similar to EPA, but these are limited in scope. The AIM Act implements the Kigali Amendment and requires and otherwise provides authority to EPA to promulgate regulations to phasedown HFC *consumption*[7] *and production* 85% by 2036. Recent regulations by other USCA states and the EPA are an initial step, and EPA is expected to continually issue regulations pursuant to the AIM Act over time. This reduction in HFC supplies at the national level is needed, but it does not ensure the HFC emissions reductions in New York State that are required by the Climate Act. Instead, the Department follows the recommendations from the Climate Action Council Scoping Plan to promulgate this regulation while seeking to align with laws in other jurisdictions to the greatest extent possible.

The other most frequent comments related to prohibitions on the sale of bulk substances (such as for servicing), concerns about alternative substances, and the feasibility of an HFC phasedown. The details of each comment are provided in the following sections. In summary, the Department's intent for regulating bulk substances is to align with California's SB1206 law. Revisions have been made to ensure this alignment by incorporating California's law by reference and to address most comments regarding bulk substances. This would, for example, allow the sale of bulk R-410a until 2030 and clarifies that there is no prohibition on reclaimed substances. Secondly, while some comments stated a preference for or against certain substances based on criteria other than GWP, there is no prohibition on any substance in this rule unless it exceeds a specified GWP limit. There is also no requirement to use any specific substance, such as if it is synthetic or natural, hydrofluoroolefin (HFO), or hydrocarbon. For example, natural refrigerants like propane or carbon dioxide are ultralow GWP substances that are already in use in many applications, but there is no requirement to use these substances. The availability of different substances on the market will continue to be determined by manufacturers, safety standards and codes, and the federal government through various laws, including the Significant New Alternatives Policy (SNAP) Program. In response to comments raised regarding particular substances in specified sectors, the Department has revised certain GWP limit prohibitions to allow for the use of substances with a GWP of 20 or lower, including HCFO-1233zd, in sectors identified by commenters. Since the purpose and focus of this rule is to address greenhouse gas emissions, any other potential environmental impacts from substances regulated by this rule are beyond the scope of this rulemaking. These substances may be regulated by other state and federal laws and programs, including those that relate to potential environmental impacts, such as the SNAP program and the Toxic Substances Control Act.

Finally, some commenters noted concerns about feasibility and the availability of compliant technologies by the prohibition dates outlined in this regulation. The global phasedown of HFCs necessitates that manufacturers develop alternatives and that these alternatives are made available on the market to meet the 2036 HFC phasedown timeline outlined in the Kigali Amendment and AIM Act. This further reinforces the need for a clear, long-term regulatory signal to supplement the international and federal HFC policies. The timelines adopted in this regulation are based on the best information available today, regulations in other jurisdictions, and multiple years of pre-proposal stakeholder outreach. The regulation also provides variance provisions for flexibility as needed.

[7] Consumption means production plus imports minus exports of regulated substances. 42 U.S.C. § 7675(b)(3).

A. General Comments

The following is a summary of general comments received on the proposed Part 494 regulation that do not relate to specific requirements.

Rulemaking Process and Timeline

Comment. The rulemaking or the Governor did not follow the democratic process, individuals did not vote on this regulation. [134, 135]

Comment. Individuals or specific groups were not aware of the rulemaking, were not contacted directly, or were not invited to participate in an expert workgroup referenced in the Regulatory Impact Statement. [Campaign Letter 2, 53, 68] Further contention that the latter workgroup was "a foundation for [the] amended regulations." [53]

Comment. There should be more notice between the onset of a rulemaking and any equipment standard or prohibition such as "roughly 3 years"[8] as in the EPA Technology Transitions rulemaking [168] or a minimum of ~6 years between assessments for Department of Energy equipment standards [64].

Comment. The commenter is pleased that revisions were proposed for Part 494 that they and partner organizations had recommended in response to the original Part 494 rulemaking in 2020. [46]

Response: The Department met or exceeded all requirements of the State Administrative Procedure Act (SAPA) and Environmental Conservation Law (ECL) regarding the rulemaking process, including those involving notice and stakeholder engagement.

The Department has provided more than adequate notice of the regulatory requirements in the rule. With one exception, all prohibitions are already in place at the federal level or in other US states or were made available for pre-proposal review and comment over 2022 and 2023 – or earlier. Specifically, the Department issued an initial pre-proposal prohibition timeline for feedback in May 2022 and then presented a more detailed anticipated timeline in February 2023. All materials were announced in the Environmental Notice Bulletin, open for comment, and made available on the Department website. The one exception is the proposed 700 GWP stepdown for "other HVAC," for which a 10 GWP Limit had been considered in February 2023.[9] As discussed in the Regulatory Impact Statement, stakeholder outreach has also been ongoing for multiple years prior to the formal proposed rulemaking. This proposal follows the recommendations from the Climate Action Council Scoping Plan (Scoping Plan), which was also available for public comment for six months (January-July, 2022). Finally, manufacturers and other stakeholders have likely been active in over a decade of deliberations on the Kigali Amendment as well as laws in Europe and California, and the EPA SNAP program, some of which contain more stringent timelines than this rule.

Regarding the workgroup mentioned by commenters, the Department convened experts over April-June of 2023 to discuss barriers and opportunities for adopting natural refrigerants. The Department did not seek expertise from entities that do not use natural refrigerants. Neither this workgroup nor its report was a "foundation" for the timeline proposed in the rule, which predated the workgroup and meetings

[8] The time provided between a petition and a final rule.

[9] See the specific comments and response to "Prohibitions and Sell-through of Products and Systems" below.

(per the February 2023 pre-proposal materials). Instead, the rule is based on the Department's independent judgment on the best method of regulating HFCs to help meet the requirements of the Climate Act as well as the Scoping Plan recommendations. Also, as discussed above, Part 494 does not require the use of natural refrigerants. The resulting report was instead described in the Regulatory Impact Statement as it "supports the proposed regulation, provides additional information for stakeholders when reviewing the proposed regulation, as well as useful case studies and resources." The Department will continue to support research, demonstration projects, and planning for natural refrigerants.

Authority

Comment. HFCs do not meet the definition of air pollution and so the Department cannot cite Environmental Conservation Law (ECL) Article 19 for authority. The Legislature has not defined GHGs as air pollution but gave the Department "ample authority" to regulate GHGs in the Climate Act. [68]

Comment. The Department has the necessary authority [79, 80, 199] particularly regarding air emissions under ECL Article 19 and 71 [193].

Comment. The regulation or terms within the regulation are in conflict with Climate Act requirements that, "DEC design and implement regulations that are equitable, minimize costs, maximize the total benefits to New York, and encourage early action to reduce GHG emissions."[10] [60, 68]

Comment. The regulation may conflict with New York City's Local Law 97 as NYC building owners may have to use less efficient options. [53]

Response. The Regulatory Impact Statement provides the Department's statutory authority to promulgate this regulation. As already identified in section 1 of the Regulatory Impact Statement, HFCs are an "air contaminant" that causes "air pollution" as defined in the ECL because it is a gas that is present in the outdoor atmosphere in quantities that engender and/or provoke climate change, which is injurious to life and property in New York State. The Climate Act, specifically Article 75 of the ECL, provided the Department additional authority to regulate greenhouse gases and greenhouse gas sources. Moreover, the Climate Act directs the Department to promulgate regulations to ensure achievement of the Statewide greenhouse gas emission limits. This regulation is one example of action necessary to help ensure the Department meets this requirement.

As discussed throughout this Assessment of Public Comments and the Regulatory Impact Statement, the revised Part 494 regulation is designed to help ensure that the Department can achieve the requirements of the Climate Act. However, this is not the only regulation or policy being undertaken to achieve these requirements; the Scoping Plan provides a variety of recommendations to address greenhouse gases from multiple sources. This regulation does not affect the authority or responsibilities granted to other NYS entities or to undermine their respective GHG reduction policies. With respect to New York City's Local Law 97, it is possible and required for entities to comply with both that law and Part 494. There are no conflicting requirements in the two laws.

Regarding ECL Section 75-0109, the primary directive of this portion of the Climate Act is for the Department to promulgate regulations to meet the statewide GHG emission limits. The Department has

[10] Quote from ECL 75-0109

addressed costs through the inclusion of various provisions, including establishing a variance process for economic hardship and providing multiple options to comply with the supermarket refrigerant program in Section 494-2.8. Further, the regulation reinforces the global phasedown and provides a consistent and longer-term signal to the market than is provided by corresponding federal laws.

Comment. The Department must issue rules in accordance with existing provisions in law. This proposal conflicts with the Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022 (Appliance Efficiency Standards Law) because it would prohibit the installation of substances that are allowed by EPA. [68]

Comment. The EPA "has not brought [all equipment] into scope of the EPA SNAP, so the use of these refrigerants is impermissible" based on the commenter's interpretation of the Appliance Efficiency Standards Law. [218]

Comment. States like New York enacted the Appliance Efficiency Standards Law provision above because they could not adopt the correct building codes. The entity would prefer to operate in a market where the codes are known before transitioning to available substitutes. [220]

Comment. Future prohibition dates should follow updates to building codes, EPA SNAP approval, and subsequent R&D. [64, 168] This must be considered separately "for each applicable end use (and charge size within that end use)." [168]

Response. Further discussion regarding safety standards and the GWP phasedown in this rule are found in the sections below. The Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022[11]provides that "[a] *building code* or other requirement applicable to commercial or residential buildings or construction may not prohibit the use of a substance allowed pursuant to the United States Environmental Protection Agency's significant new alternatives policy to implement 42 U.S.C. 767lk, provided that such substance and the refrigeration or air conditioning system or other equipment or products utilizing such substance are designed, installed, and used in accordance with nationally recognized published standards that protect building occupant safety and reduce fire risks." The Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022 does not restrict or conflict with the Department's authority to regulate emissions, including greenhouse gases, under the ECL. The intent of Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022 was, as acknowledged by the Scoping Plan, "Chapter 374 of the Laws of 2022 (Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022) bolsters New York's regulatory and policy environment to support energy efficiency and GHG reduction strategies in buildings, expanded appliance standards, and changed building code law to *allow the utilization of certain HFC substitutes*."[12]

Requests to include additional equipment types in the EPA SNAP program or into safety standards and building codes are beyond the scope of this regulation. Commenters are referred to EPA, including the SNAP Program, regarding the evaluation, approval, and listing of substances for their desired use cases. Finally, as discussed in the Regulatory Impact Statement, the NYS Department of State determined that state building code did not need to be revised to enable the use of new substitutes.[13] The Department

[11] Chapter 374 of the Laws of 2022.
[12] Scoping Plan at p. 43.
[13] Technical Bulletin TB-4001-MCNYS, available at https://dos.ny.gov/system/files/documents/2023/07/2020-code-cycle_tb-4001-mcnys_alternative-refrigerants_final.pdf.

refers business entities and other stakeholders to NYS Department of State, Division of Building Standards and Codes for further information on building codes in New York State.

Purpose and Scope

Comment. This state regulation is not needed because the AIM Act and related EPA regulations are sufficient to reduce emissions or it has not yet been determined if the EPA regulations are insufficient or that NYS has not analyzed this. [4, 30, 42, 53, 60, 77, 98, 168, 208, 221, 222, 227, 228] EPA regulations "also constrain the upstream supply of HFCs on a CO2-equivalent basis as part of the production and consumption phase down, with supply declining to 60 percent of the baseline period in 2024 and then to 30 percent of the baseline period in 2029." As such there's little value in "edging forward" on compliance dates or imposing a second step down to ultralow GWP. [168]

Comment. The Department should delay this rulemaking until EPA has finalized future rulemakings. [60, 168, 181, 182]

Comment. The AIM Act and Kigali Amendment are a phasedown in HFC consumption "rather than a phaseout of HFCs." [60]

Comment. Comments referring to the proposed regulation as unprecedented, more aggressive than other jurisdictions, that the requirements would be unique to New York, or impose additional requirements on New York businesses as compared to the AIM Act. [Campaign letter 2, 1, 2, 9, 24, 60, 61, 128, 172, 178, 217, 202]

Comment. Comments referring to precedents in other jurisdictions to achieve similar prohibitions on bulk refrigerant and new products including California's SB1206 law and the European Union's F-gas regulation that established a much earlier transition. [36, 52, 55, 115] "This transition will be more effective if carefully aligned with other large and influential states such as California." [73]

Comment. Manufacturers indicated that they are developing "products for European and global markets and understand that ultra-low GWP natural refrigerant systems are likely part of our domestic future" [190] and are "familiar with more restrictive markets overseas, and is working towards solutions in those markets" [220].

Comment. The AIM Act and Kigali Amendment are uncertain and state regulations to backstop EPA's programs are needed to secure them. [46, 52, 55, 73, 115] "By adopting EPA regulations in New York, our influential state is indicating to industry that … the current rules regarding HFCs will still need to be followed." [51] "We support backstopping GWP limits for end-uses covered by the EPA's Technology Transitions rulemaking, and the action to set limits for uses not covered by the federal regulation. This allows adequate time for end users to plan the transition to ultra-low GWP systems as current systems age and are replaced if they cannot be repaired... and avoid higher refrigerant costs for systems at a time of decreasing HFC supply." [52]

Response. The primary purpose of the amended Part 494 regulation is to reduce HFC emissions in alignment with the Department's statutory requirement to promulgate rules and regulations to ensure compliance with the statewide GHG emission limits and "reflect, in substantial part, the findings of the scoping plan." [14] To meet these requirements, the Department proposed a regulation that substantially

[14] ECL § 75-0109(1), (2)(a)-(c).

reflected the Scoping Plan recommendations regarding HFCs and would meet the HFC reductions sought in the Scoping Plan.[15]

The Department provided an analysis in the Regulatory Impact Statement comparing the HFC emission reductions that are required in New York State, to comply with the statewide GHG emission limits set in the Climate Act, with the EPA rules as they existed when this rule was proposed. As shown by the modeling, EPA's regulations would not be sufficient to meet the Department's statutory requirements under the Climate Act to meet the GHG emission limits. The Department also assessed the potential impact of the full AIM Act phasedown, which would also fall short of achieving the necessary HFC emission reductions to achieve the statewide GHG emission limits. As commenters point out, the AIM Act does not "phase out" HFCs but allows for these powerful GHGs to continue to be used (and emitted) indefinitely.[16] While the AIM Act should reduce the availability of HFCs supplies on the market by 2036 by regulating production and consumption, the Climate Act statewide GHG emission limits require that HFCs be all but eliminated by 2050 – including HFCs in existing products and equipment. So, while Part 494 aligns with the AIM Act phasedown and EPA's implementing regulations, that does not mean they should be identical. The Department's analysis has been further updated to reflect recent federal actions to shift the Technology Transition rule timelines and potential future actions that could also undermine that regulation.

As also discussed in the Regulatory Impact Statement, the Department will continue to use the Part 494 regulation to ensure consistent policy on HFCs given potential uncertainty at the federal level. The original Part 494 regulation stemmed from a collaboration among states to backstop EPA regulations from 2015 and 2016 that were partially vacated by the courts or otherwise rescinded or not enforced by a previous federal administration. Regarding the AIM Act, EPA has already revised its 2023 Technology Transitions regulation[17] and the rule has been challenged in the courts.[18] Given the requirements of the Climate Act, while the Department will continue to support action by EPA to implement the AIM Act and reduce HFCs, this regulation will remain necessary to ensure sufficient emission reductions within the State.

> **Comment.** "Align the rule with the approach being taken by the U.S. Environmental Protection Agency, California Air Resources Board, and the Kigali Amendment to the Montreal Protocol… these entities have developed sector-specific and technology-neutral standards for HFC phasedown that are based on extensive industry dialogue and scientific assessment of technology readiness and transition cost per sector." [Campaign letter 1]

Response. The Department considered the same extensive industry dialogue and scientific assessment as EPA and other states. Firstly, the full timeline for phasing down reliance on HFCs is based on the Kigali Amendment. Secondly, where EPA's regulations differ from a related USCA state rule, the Department follows the USCA state model. This is because state regulations are designed to address GHG emissions

[15] i.e., the HFC portion of the GHG emission pathways modeled for the Scoping Plan.
[16] The Department acknowledges the AIM Act grants EPA authority to limit the use of HFCs in specific technology sectors and subsectors (e.g., Technology Transitions Rule) and to manage the use and reuse of HFCs and their substitutes from equipment.
[17] Federal Register Docket ID No. EPA-HQ-OAR-2021-0643-0234.
[18] *See, e.g.,* Food Marketplace, Inc. et al. v. EPA, No. 23-1347 (D.C. Cir. filed Dec. 26, 2023); The Chemours Co. FC, LLC v. EPA, No. 23-1345 (D.C. Cir filed Dec. 26, 2023).

at the state-level and ensure consistent policy on HFCs. This is the case for all components of the regulation, including prohibitions, labeling, reporting, and refrigerant management. Finally, the Part 494 variance provisions are also aligned with other USCA state rules, which allows the Department to continue to coordinate with other states.

Comment. The contribution of HFCs to overall emissions is low, the benefits of this regulation are overstated, or the causal link between HFC emissions and climate change impacts is unproven. [30, 174, 222]

Comment. This regulation conflicts with other climate policies such as electrification or heat pump adoption, the Department should withdraw this proposal and focus regulatory action on other GHG sources such as from the energy sector, and/or this regulation should also address energy or lifecycle emissions. [Campaign letter 1, 22, 30, 34, 53, 60, 64, 77, 129, 207, 209, 221, 224] This regulation would ban heat pumps because R-410a is the only refrigerant available. [6]

Response. As described in the Regulatory Impact Statement, this regulation reflects specific recommendations from the Scoping Plan, which provides recommendations for achieving the required GHG emission reductions outlined in the Climate Act. Stakeholders are referred to the Scoping Plan at http://climate.ny.gov. This rule represents one of many actions recommended to address greenhouse gas emission sources. Many such actions are needed – together – to achieve the Climate Act requirements. For example, the Scoping Plan addresses the increase in energy demand that accompanies electrification and heat pump adoption as well as the simultaneous adoption of HFC regulations. Other regulations and policies address other sectors of the economy, including the energy sector. These regulations and policies are complementary in nature.

This regulation does not prohibit heat pumps. The regulation incorporates by reference EPA regulations regarding heat pump requirements to replace the current refrigerant (R-410a) with alternatives as they are available on the market.

Finally, there is a large body of literature available for additional information on the impact of GHGs like HFCs, including the IPCC Assessment Reports cited in the regulation and Regulatory Impact Statement. Further, the legislative findings and declaration in Section 1 of the Climate Act directly addresses the link between GHGs and climate change. Consistent with the extensive scientific evidence regarding this link, HFCs are statutorily defined as a greenhouse gas by the Climate Act and recognized by law as a contributor to climate change that must be reduced in line with the GHG emission limits.

Comment. The scope of this rule should be the same as the AIM Act and limited to the same list of HFCs in the AIM Act and end-uses regulated in EPA's current Technology Transitions rule. [77, 168, 221]

Comment. There were previous state, federal, and international efforts to reduce ozone depleting substances in refrigerants [130, 168]. The Department should account for ozone depleting substances and acknowledge the industry's efforts to reduce these in the past. [168]

Comment. Regulations on HFCs should apply to other high-GWP gases including ozone depleting substances (CFCs, HCFCs), PFCs, NF_3, SF_6, and SO_2F_2 [115]. This regulation will help protect the climate and ozone layer. [52]

Comment. HFCs are used in semiconductor manufacturing and this regulation does not provide the same allowances that EPA provides in 40 CFR Part 84 Subpart A), the AIM Act allocations rule. [219]

Comment. "The final rule should include a research and development exemption from prohibition, which would allow important research and development activities in New York." [60]

Response. The applicability and scope of this regulation is outlined in the express terms. The Climate Act's directive to the Department is to achieve certain greenhouse gas emission reductions, as measured with carbon dioxide equivalence using a 20-year GWP. The statutory definition of greenhouse gas includes any substance emitted into the air that may be reasonably anticipated to cause or contribute to anthropogenic climate change.[19] As such, the restrictions on certain substances in this rule are based on GWP and apply to any substance that meets the definition of regulated substance and exceeds the applicable GWP limit. A s such, the restrictions on certain substances in this rule are based on GWP and apply to any substance that meets the definition of regulated substance and exceeds the applicable GWP limit. Additionally, the scope of this regulation need not be limited to end-uses, or emission sources, covered by EPA regulations. As discussed, EPA regulations are not sufficient to meet the Climate Act requirements. Since ozone depleting substances (ODS) are also powerful GHGs they are subject to the same GWP-based requirements in this rule as the other substances, including reporting requirements, leakage controls, and bulk prohibitions.

Semiconductor manufacturing and research and development are not sectors or subsectors subject to the requirements of this rule or regulated in Section 494-1.4. Thus, no exemption is necessary. However, the requirements of Section 494-1.4 and other sections of Part 494 may apply to substances, products, systems, or equipment used within such facilities or processes if such substances, products, systems, or equipment are in a regulated sector or subsector or otherwise meet the applicability requirements of Subpart 494-2. For example, if a semiconductor manufacturing facility utilizes air conditioning in one of the regulated subsectors, the requirements of the regulation apply to such air conditioning.

The AIM Act authorizes EPA to regulate HFCs in three main ways: (1) phasing down their production and consumption, (2) promulgating certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers, and (3) facilitating the transition to next-generation technologies through sector-based restrictions. Part 494 focuses on the latter two areas. EPA's allocation rule regulates the production and consumption of HFCs and is a regulatory structure different than Part 494.

Global Warming Potential

Comment. Affected entities will be confused by 20-year GWP values, the Department needs to provide more clarity. [60, 61, 64, 81, 98, 168, 207, 220, 221, 226]

Comment. The Department should use the same convention as the AIM Act, or only refer to 100-year Global Warming Potential values from the IPCC's Fourth Assessment Report. [30, 54, 59, 71, 77, 97, 168, 186, 194, 228]

[19]ECL § 75-0101(7).

Comment. Commenters state support for the use of 20-year GWP out of a concern for the near-term impacts from climate change. Further comments note that using only a 100-year GWP deprioritizes short-lived climate pollutants. [36, 52, 185]

Response. As the Department stated in the 2022 Request for Feedback and all subsequent discussions and documents related to on this rulemaking, it is not considering using 100-year GWP values because doing so would be inconsistent with the Climate Act. The Climate Act requires that GHG emissions be calculated using a 20-year GWP.[20] Given this statutory requirement, deliberations on the relative merit of prioritizing climate impacts over the next 20 years versus the next 100 years is beyond the scope of this rulemaking. As reviewed in the Regulatory Impact Statement, the IPCC provides both metrics with the intent that policymakers will choose the metric that fits their policy objectives.

Comment. The IPCC Assessment Reports are not updated quickly enough to be the only source for GWP values. Commenters suggested the World Meteorological Organization (WMO) annual assessment reports be used in the rule. [54] EPA refers to the WMO as a "backup reference" in the "preamble" to their rule and the Department should do this as well. [199, 207]

Comment. The Department should "freeze" the regulation at the IPCC's Sixth Assessment Report to avoid future compliance challenges. [54, 60, 199]

Comment. The following portion of the regulated substance definition should be removed or clarified, "[a] substance is considered a regulated substance if the GWP20 is unknown, but the substance may be reasonably anticipated to cause or contribute to anthropogenic climate change." Where an explanation was provided, commenters cautioned that an unintended impact could be to prohibit substances with GWP20 value below 10 (such as cyclopentane). [199, 207, 226]

Comment. The Department should use GWP values for HFOs such as HCFO-1233zdE from AR4. [Campaign letter 3, 41, 197] Further comment that all current regulations in the United States use the 100-year GWP values from AR4 for HFCs and 100-year GWP values from AR5 for HFOs. [60]

Response. The Department appreciates the suggestions as to how to address GWP values that are subject to change and that not all substances have been included in the IPCC reports to-date. However, NYS regulations cannot incorporate-by-reference or utilize documents that have not yet been published, including future IPCC or WMO synthesis reports. The Department further notes that the research on the environmental impacts of HFOs is ongoing,[21] which may lead to further updates by the IPCC and WMO. The regulation will continue to reference the IPCC's latest report in the definitions adopted in Part 494 as the IPCC is the authority on GWP as used in governmental accounting and represents the best available information with respect to GWPs. However, in light of these comments, the definition of regulated substance has been revised to account for substances that may not be reflected in IPCC's latest report or 6 NYCRR Part 496. The definition of "regulated substance" is now as follows: "any chemical intended for use in the sectors listed in Section 494-1.4 of this Part that has a GWP20 greater than 10 *or that is reasonably anticipated to have a Global Warming Potential greater than 10 over an integrated twenty-year time frame* including hydrofluorocarbons, chlorofluorocarbons, hydrochlorofluorocarbons,

[20] *See* ECL § 75-0101(2), (8).

[21] e.g., Salierno G. On the Chemical Pathways Influencing the Effective Global Warming Potential of Commercial Hydrofluoroolefin Gases. ChemSusChem. 2024 Apr 4:e202400280. doi: 10.1002/cssc.202400280.

hydrofluoroolefins, and blends thereof. Regulated substances must be referred to using standard naming conventions such as from the IPCC Assessment Report, the American Society of Heating, Refrigerating and Air-conditioning Engineers, Chemical Abstracts Service, or International Union of Pure and Applied Chemistry." This revision allows the regulation to be comprehensive in its regulation of substances with GWP and provides regulated entities clarity on the requirements for substances that are not currently listed in the IPCC report or Part 496. The Department may consider new information as needed, such as if updated GWP information is included in a variance application.

There are three key differences between the IPCC's Fourth, Fifth, and Sixth Assessment Reports (AR4, AR5, and AR6) that are relevant to this rule. Firstly, GWP values will always be updated in every subsequent report because greenhouse gases are accumulating, and the impact of additional emissions is therefore also changing. Older reports are by their nature less accurate and do not represent the best available science. Secondly, only AR6 reflects the latest science on hydrocarbons. The scientific community has updated its understanding of how these substances contribute to anthropogenic climate change such that earlier reports would not be accurate.[22] Thirdly, unlike AR4 or AR5, AR6 has the most complete list of newly invented substances like HFOs. The Legislature did not refer to any specific IPCC's Assessment Report in the Climate Act. Instead, the Climate Act directs the Department to use the best available science and methods of analysis.[23] Currently, as discussed above, the best available science for GWP values is IPCC's AR6 Report, which is what the Department utilized in Part 494.

EPA's SNAP provides GWP information from many sources. This is reasonable as HFOs are new and such analyses are still underway. For example, where IPCC's AR4 from 2007 contained no information about HFOs, AR5 (2013) included GWPs for some of the HFOs that are SNAP-listed (1234yf, 1234ze), and then AR6 (2021) added more substances (1336mzzZ, 1336mzzE). Still more of the EPA's SNAP-listed substances have yet to be included in any IPCC report. Furthermore, although the AIM Act utilizes exchange (i.e., GWP) values for HFCs from the AR4 report, EPA uses AR5 GWP values for producing the national GHG inventory following the United Nations Framework Convention on Climate Change protocols. There is no requirement that the Department utilize the exchange values (i.e., GWP values) in the AIM Act. Overall, this regulation uses the most complete IPCC report at this time, AR6, which represents the best and most comprehensive information and science.

> **Comment.** The Department should list acceptable or unacceptable substances, or the regulation should reference both the AIM Act values and the 20-year values. [55, 60, 64, 71, 81, 207]

> **Comment.** If the Department does not list acceptable substances, it should provide clarity on the "source and authority for determining the GWP20 value beyond the AR4 or AR6." [207]

Response. The Department does not intend to supplement or supplant the federal government's role to identify and evaluate substitutes in end-uses that have historically used ozone-depleting substances (ODS). EPA evaluates substances as ODS substitutes under multiple regulatory frameworks, including SNAP and, if relevant, the Toxic Substances Control Act. Furthermore, it is not possible to anticipate the GWP100 or GWP20 for all potential substances or blends of substances that may be invented or marketed in the future. Please see the previous response regarding the revised definition of "regulated substance" regarding substances with no GWP value in AR6 or Part 496. Finally, as adopted in other

[22] https://naturalrefrigerants.com/ipcc-includes-gwps-for-hydrocarbons-in-new-report/
[23] *See* ECL § 75-0107(3); ECL § 75-0105(6).

USCA states, the rule includes new requirements for labelling to aid consumers and further outreach and educational materials can be provided. The Department welcomes additional feedback on how to best communicate GWP information in such materials.

Comment. HCFO-1233zdE has a GWP100 below 10 but a GWP20 of 14 in the IPCC Sixth Assessment Report. The Department should consider this substance to be aligned with the international HFC phasedown or GHG reduction policies. The Department should not prohibit the use of HCFO-1233zdE in "foams, chillers, heat pumps, aerosols and solvents products for which suitable replacements are not available in many applications." [60] HCFO-1233zdE has "has an ultra-low global warming impact, and due to this, can be used indefinitely in all other US jurisdictions. [41]

Comment. Other requests to allow for HCFO-1233zdE in foam end-uses. [Campaign letter 3, 1, 2, 41, 60, 71, 169, 197, 199, 207] Two additional commenters referred to centrifugal chillers. [53, 64]

Comment. Different commenters requested that GWP20 limits in this rule be no lower than 20, 25, 30, 70, or stay at the 150 limit (using GWP100), to accommodate HCFO-1233zdE [Campaign letter 3, 60, 63, 71, 194, 199, 213]. Note: Additional commenters referred to "A2Ls", but it cannot be determined if they were referring to HCFO-1233zdE specifically.

Comment. The AIM Act lists HFC-152a as having a GWP100 of 124, or under EPA's GWP Limit of 150 and it is exempted as a Volatile Organic Compound (VOC). HFC-152a in personal care products should be exempted in this rule, should be fully permitted, and should not be subject to other administrative requirements on regulated substances. [77, 226]

Response. Most of the ultralow GWP requirements for foam, aerosol/solvent, or HVAC end-uses would go into effect in 2030 or later. In response to these comments and concerns, the GWP limit has been revised from 10 to 20 for foam end-uses and chillers. This increase for these specified uses will allow for the use of particular substances noted by the commenters, while minimizing any impact on the GHG reductions realized by the regulation. There is not sufficient information provided by any commenters or otherwise to warrant a higher GWP limit for other uses including solvents and aerosol propellants. Applying a higher GWP limit more broadly could also reduce the effectiveness of the regulation in terms of GHG emission reductions, which is the primary purpose of the regulation consistent with the requirements of the Climate Act. To the extent necessary and appropriate, and based on additional information available, the Department may consider other applications of this or other substances as part of any future variance requests or in future rulemakings.

As described in the updated Regulatory Impact Statement, the Department assessed the emissions impacts of raising the post-2030 GWP20 limits based on the comments received. If the GWP20 limit were raised from 10 to 20 for all requested uses, emissions would be 1.3mmt CO_2e higher in 2050. However, this is almost entirely driven by the relatively high rate of GHG emissions projected from the residential air-conditioning and heat pump subsector as these uses are projected to grow and have high end-of-life emissions. Any increase in the projected GWP of such products results in significant increases in projected GHG emissions. Commenters did not suggest ways that a requested increase in GWP could or would be mitigated.

Regarding HFC-152a, the most updated GWPs for this substance are 164 in GWP100 and 591 in GWP20 (IPCC AR6[24]). As indicated above, the Department is required to use GWP20 and is not considering the use of GWP100. For personal care products, the initial prohibitions were incorporated-by-reference from EPA and would allow the use of HFC-152a as indicated. However, the commenters did not address the continued use of HFCs in these products after 2030 or why this HFC should not be monitored like similar GHG substances.

Refrigerant Leakage, Safety, and Reclaim

Comment. Reducing leaks is the only action needed to address emissions or significant emissions reductions can be achieved through the servicing and maintenance of the large installed base of equipment. [98]

Comment. Due to the second law of thermodynamics, all HVAC-R equipment is prone to leakage and it is not possible to eliminate leakage. It is appropriate to assume that 100% of refrigerant is lost from small appliances when they are disposed of, barring an EPA requirement to recover refrigerant at end of life. [80]

Comment. Setting low leak rates is an extremely high priority for lifecycle refrigerant management because they can lead to large climate benefits at low cost. For many equipment types, more than half of all refrigerant used in the equipment throughout its life is lost to leaks and thus not available for recovery and reclamation, underscoring the importance of timely repair. [52]

Comment. Safety standards are designed to minimize risks from refrigerant leaks. [53]

Comment. No country has had complete success in improving HFC recovery rates or reducing refrigerant leakage, therefore it is unreasonable to require the use of reclaimed refrigerant. [81]

Response: As also discussed in the Regulatory Impact Statement, leakage controls are an important component of this rule, but they alone are not sufficient to ensure that the State meets its legal requirements under the Climate Act, namely the statewide GHG emission limits. One reason is that it is not possible to eliminate leakage of refrigerants. The largest sources of leakage are large, custom-built systems with many connections.[25] In addition, not all emissions are the result of leakage during the operation of the equipment. The fastest growing source of emissions, residential air-conditioning and heat pumps, is primarily comprised of products that are sealed in the factory and for which almost all refrigerant is emitted at the end-of-life. As commenters noted, this is because there is a very low rate of refrigerant recovery at disposal. Thus, because leaks cannot be eliminated and reducing leaks will not be sufficient on its own to address HFC emissions, phasing down the use of HFCs in new products and equipment is also necessary.

Comment. The proposed regulation "picked winners and losers in the marketplace by fiat" [213] and prohibited low GWP HFOs. Comments that the proposed regulation only allows natural refrigerants or "unsafe" refrigerants and requests that the Department provide exemptions or raise the GWP limits to accommodate HFOs or "A2Ls". [Campaign letter 1, 1, 2, 21, 22, 28, 29, 33, 37, 40, 41, 54, 59, 186, 195, 213]

[24] Op cit

[25] Commercial refrigeration. DEC (2023) Statewide GHG Emissions Report.

Comment. Concerns regarding regulatory uncertainty around hydrofluoroolefins (HFOs) given proceedings in Europe to classify some like HCFO-1233zd as PFAS. [36, 59, 71, 115, 229]

Comment. "While not meeting the ultra-low criteria, [HFC-32] still has a GWP20 nearly 2x lower than R-410a. R-32 is therefore a reasonable transition refrigerant while the environmental uncertainties about HFOs are resolved and while the codes and standards are updated to allow for flammable refrigerants." [229]

Comment: General statements in support of natural refrigerants or that the US does not need synthetic refrigerants; there's nothing physically different between the US and other parts of the world that already use natural refrigerants. Safety testing has already been completed in Europe, such as for using propane in residential heat pump appliances. Further comments on the process to have such standards adopted in the US and New York and that the same substances can be used safely, can improve energy efficiency, and have lower environmental risks. [36, 47, 51, 52, 55, 72-74, 80]

Comment: Commenters shared concerns about marketing materials stating that natural refrigerants aren't natural because they are processed or come from fossil sources. [47]

Comment. Concerns regarding natural refrigerants: current safety standards severely limit the allowable charge of naturals as compared to the international standards and the same options are not available in the US, it is "misguided" to think that A3, or flammable, refrigerants like propane would be available by 2034, carbon dioxide is high pressure and will therefore leak and be a safety risk to the surrounding occupied space, there may not be sufficient supplies or technicians, and/or that there are no natural refrigerant technologies available. [Campaign letter 2, 19, 24, 28, 31, 33, 53, 60, 61, 64, 71, 77, 86, 190, 200, 208, 229]

Comment. Comments regarding design considerations for natural refrigerants in specific end-uses, including referring to some options as "lower capacity". [30, 53, 64, 77, 224]

Comment. Prohibitions cannot be put in place for any end-use sector before applicable safety standards and an EPA SNAP listing is complete for every applicable end-use within that sector. [168] The proposal lacks a review of the significant challenges that must be addressed regarding human safety, the lack of technology availability, the lack of readiness of equipment, the reduction in overall equipment efficiency, the substantial cost burdens that will fall on businesses and especially environmental justice communities, and overall equipment emissions. [53, 60, 64, 77]

Comment. The Department and other organizations should manifest code changes to allow A3 in "low probability" systems. Need greater certainty on code allowance or transition will be delayed after 2034. [190]

Response. There are no requirements in this rule related to safety classification[26] (A1, A2L, or A3), the origin of refrigerants (naturally occurring or synthetic), or the performance of different refrigerants or applications. Comments related to these issues are outside the scope of this regulation. Additionally, environmental impacts of regulated substances beyond GWP, such as potential PFAS designations, are outside the scope of this rule. As discussed in response to previous comments, outside of this regulation, substances may be regulated by other state and federal laws and programs, including those that relate to

[26] Designations from ASHRAE

potential environmental impacts outside of GWP, such as the SNAP program and the Toxic Substances Control Act. To the extent these topics relate to the compliance with Part 494 requirements, the variance process will enable the Department and stakeholders to consider issues such as infeasibility, as needed.

Natural refrigerants, like ammonia or carbon dioxide, are naturally-occurring, ultralow GWP substances that are already in use in many applications. There is no requirement to use these substances nor does Part 494 regulate natural refrigerants. Thus, the definition of natural refrigerants is outside the scope of the rule. The comments suggest that the proprietary nature of some fluorinated GHGs (e.g., ODS, HFCs, HFOs) could continue to delay international phasedowns, but this is also beyond the scope of this regulation. Entities subject to this regulation are not prohibited from utilizing non-proprietary substances.

The Department does not regulate safety standards regarding use of refrigerants or building codes. Safety standards and building codes are what enable businesses and homeowners to use all of the current refrigerants as well as to deliver, store, and combust fossil fuels. For example, commenters pointed out that one way that safety standards address the risk of flammability (from fossil fuels or refrigerants) is to limit the amount that is permissible within a type of appliance or container within a certain type of structure. Many household appliances already use flammable refrigerants because a very small amount, or charge, is required to provide the same cooling capacity as an HFC refrigerant. For example and context, household refrigerators may use up to 150 grams of isobutane as a refrigerant, or roughly 1/3 of a pound. By comparison, homeowners may purchase and store a 20 pound or larger propane tank (such as for a grill) or even tanks with hundreds of gallons of liquid fuels (for heating).

Comment. The Department should delay this rulemaking until EPA has finalized the concurrent rulemaking under subsection h of the AIM Act [60, 168, 181]. Alternatively, the Department should wait on the specific provisions regarding reclaim [55] or not consider these at all because the commenter does not support EPA's rule [64].

Comment. It is unlikely that manufacturers will be able to attain sufficient supplies of reclaimed refrigerant ahead of the proposed near-term prohibitions on virgin refrigerant in new HVAC equipment, including heat pumps. [60, 71, 81, 98, 168] Further caution against aligning with related EPA provisions as they "could lead to widespread market disruption" and an alternative would be a gradual increase in reclaim. [60, 64] This should start no earlier than 2029 and matching the US phasedown in virgin supplies. [60] If manufacturers do not have sufficient supply they could be forced to dry-ship equipment. [64]

Comment. The Department will face significant challenges avoiding fraud in the market for reclaimed refrigerant. The reclaim requirements should ensure that the reclaim is of US origin and NY should require full documentation of the source of recovered refrigerant. [81]

Comment. Reclaim mandates should be focused on users (service and aftermarket), rather than manufacturers, to keep the costs of new equipment low. A service-focused mandate could be implemented sooner than 2028 but should be based on reclaim production rates rather than estimates. [60, 64]

Comment. Certain entities have patents or intellectual property rights on synthetic refrigerants that prohibit reclamation and would pose a challenge for building a reclaim market [64, 81]. Patent infringement is one of the unintended consequences of "virgin bans". [60]

Comment. "Recovered R410A should primarily be utilized to service the installed base of R410A equipment that has not reached the end of its useful life" rather than used as a source of HFC-32 for lower GWP blends. [64]

Comment. "The Scoping Plan specifically recommends that a final rule address the management of HFCs from appliances at end of life. The Proposed Rule does not include incentives or compensation for reclamation, which are particularly valuable steps at the state level to complement federal regulatory requirements. The proposal also does not include provisions that address the process of reclamation or destruction of refrigerants, or any requirements to reclaim refrigerants." [60]

Comment. Adjust the definition of reclaim to address potential issues related to fraud and enforceability, such as to replace the requirement to use no more than 15% virgin content with a requirement that the content be recovered from US sources. [81]

Response. The comments suggest widespread agreement that there is a substantial loss of refrigerant occurring in the field, including from equipment in operation and at disposal (end-of-life). There is also agreement that there is a potential for greater recovery and reclamation. However, no regulation or incentive program to-date has resulted in an adequate supply of reclaim available to meet the demand for new equipment, at least in the near term. These challenges underscore the importance of seeking direct emission reductions, including by transitioning away from HFCs in new products and equipment as soon as possible and by controlling leakage from existing equipment, which are the focus of this regulation.

The Department proposed the use of reclaim to enable manufacturers more time to adopt low GWP options and to backstop some, but not all, of the requirements proposed by EPA in its AIM Act subsection h rule proposal. The intent was not to prolong the use and leakage of high GWP refrigerants beyond the Kigali Amendment and AIM Act phasedown timeline.

The comments illustrate that the regulation of reclaimed refrigerant would be challenging for several reasons, including the potential for fraud. Given the lack of support for this provision and uncertainty regarding actual emission reduction impacts at this time, this regulation has been revised to remove the prohibitions on virgin refrigerants in new products and systems. The Department may consider these requirements when conducting regulatory reviews of Part 494 as required by SAPA and the Climate Act. Thus, future regulations may seek to backstop this portion of a federal program or address emissions in other ways, such as based on other Scoping Plan recommendations (below). Additionally, this regulation retains the requirements regarding labelling and reporting by suppliers, the refrigerant management program, as well as the option to consider reclaim in future decisions, including as a potential form of GHG mitigation in applications for variances. Finally, there are no requirements regarding reclaim in this final rule that necessitate further clarifications to the definition of given the removal of certain prohibitions as described above.

The Department disagrees that the responsibility for managing refrigerant loss should be placed solely on technicians and consumers. This regulation seeks to address major sources of leakage, but leakage

can never be fully eliminated, and consumers can only adopt technologies that are made available by manufacturers, including the choice of refrigerant. Regarding end-of-life, the Scoping Plan specifically recommended that the Legislature create an Extended Producer Responsibility program. This is beyond the scope of this regulation. As recommended by the Scoping Plan, such a program should ensure that the suppliers take responsibility for disposal, not the consumer. The Department similarly maintains that the focus of reclaimed refrigerant should be on manufacturing rather than servicing.

B. Specific Comments

The following is a summary of comments related to specific terms of the rule, particularly requests for specific revisions to sections of the rule.

Applicability (§ 494-1.2)

Comment. Concern that certain provisions would apply to homeowners that own split air-conditioning systems. [216/221]

Comment. The prohibition on renting or leasing conflicts with statements on allowing use of existing equipment. [210]

Response. As with the original Part 494 regulation, the amended Part 494 regulation does not apply to the use of products or systems by private individuals for non-commercial purposes. This Applicability provision also applies to both subparts of this regulation. In other words, the Refrigerant Management Program does not apply to homeowners, but it may apply to owners of commercial multifamily facilities if that facility meets the threshold requirements. The Applicability provision has been revised for additional clarity consistent with this original intent. The Department agrees with the comment regarding renting and leasing and has made the requested revision, but notes that entities may not purchase new products for the purposes of leasing after the applicable prohibition date.

Comment. Do not prohibit the manufacturing in New York of non-compliant products and avoid moving manufacturing out of the US where the AIM Act is in place. [81]

Comment. Explicitly allow transshipments. [168]

Comment. Clarify that motor vehicles are not included because the term "motor-bearing" in the definition of equipment is confusing. [227] Claim that this rule would isolate vehicles sold in New York state by deviating from federal standards for air conditioners to meet stringent New York refrigerant requirements, likely driving up new vehicle purchase prices in the state. [129] Concern that this rule will impact tractors. [214]

Response. The Department does not have any information to suggest that this regulation will directly impact product manufacturing in this State. The Department welcomes additional information from any entity that manufactures affected products in New York. There is no prohibition on transporting or storing any product or equipment in New York in this regulation. This rule does not regulate motor vehicles or motor vehicle air-conditioning or impact in any way the market for new vehicles or the servicing of tractors. The term “motor-bearing” is used consistently across USCA state regulations, including the original Part 494 regulation from 2020.

Definitions (§494-1.3)

Comment. This regulation should use definitions from EPA's regulations, 40 CFR Parts 82 or 84, unless there is a clearly identifiable reason. [227] Requests to adopt federal definitions without further explanation. [53, 168, 216/221, 227]

Comment. Request to provide a definition for products that are not subject to this rule. [226]

Response. There is no requirement that the Department adopt identical definitions as federal laws. The terminology used in this regulation is based on state and federal regulations, including the USCA state regulations cited in the Regulatory Impact Statement. Variations from state and federal models reflect SAPA or other NYS requirements, specific requests by stakeholders, or where an alternative would improve the effectiveness of this rule. The Department also notes that although incorporation by reference is used in certain places in this rule, there is no functional difference between providing a reference to another statute versus copying the text from that law.

Comment. The term "new refrigeration facility" requires clarity or is not necessary. [60, 168, 203] "The term 'New Refrigeration Facility'" needs clearer definition, as it currently could be read to include new supermarkets; it should be modified to specifically exclude sectors addressed in other parts of § 494-1.4(e)(3)." [60]

Comment. "Newly constructed, repurposed, or significantly remodeled facilities can transition to ultra-low GWP alternatives sooner than existing facilities carrying out system replacements, so clarifying the distinction between them will likely help alleviate some concerns." [55]

Response. This provision of Part 494 is based on similar terms in other state regulations with the exception that it separates equipment in existing facilities from new facilities, rather than combining these into one definition.[27] As indicated by commenters, this reflects the additional challenges to existing facilities in adopting new refrigerants if they already contain large, complex refrigeration systems such as supermarket racks.

The term "new refrigeration facility" refers to new construction for the purposes of retail refrigeration, ice rinks, industrial process refrigeration, or cold storage warehouses – or the repurposing of facilities for these uses. This definition is distinct from the installation of new equipment in any type of existing facility, which is simply defined as "new". The term "retail food refrigeration" or "retail food facility" was revised to more clearly apply to supermarkets. Examples of "new refrigeration facility" could include the construction of a new supermarket or the repurposing of an existing building into a new supermarket. To also improve clarity, the definition of "supermarket chain" has been revised to refer to the specific entities and equipment subject to the Supermarket Refrigerant Program in Section 494-2.8. See, infra, the response to comments on Section 494-2.8.

Comment. This regulation should define "new" products or systems in the same way as the EPA SNAP and Technology Transitions rules and allow the unlimited replacement of components for servicing

[27] e.g., California and Washington regulations define "new" as including new equipment and new construction. Cal. Code Regs Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Subarticle 5, § 95373; WAC 173-443-030.

[228] and/or it should not include retrofitting [59, 60, 77, 168, 186, 216/221]. The incorporation of retrofits into the definition of "new" deviates from state and federal regulations. [55]

Comment. The commenter, **"**greatly appreciates the closure of [the] loophole in the Part 494 proposal in the definition of "new air-conditioning equipment" with the replacement of a condensing unit in a system with a single condensing unit and single evaporator triggering the requirement for a new refrigerant." Further comment on dry shipping in previous federal regulations. [81]

Comment. Consider defining "retrofit" to only allow conversion to a lower GWP refrigerant, requiring the use of a lower GWP after the end of useful life (or after 15 years), and defining "new" to allow retrofits to lower GWP, as in other state regulations. [52]

Comment. Concern that this regulation requires entities such as restaurants or farms to retrofit or replace their equipment such as walk-in or remote condensing units [217] or on-farm refrigeration systems [214].

Comment. "While we appreciate an exemption to the substance prohibitions for systems retrofitted to a lower 20-year GWP refrigerant until 2029, we request that the timeframe be extended to cover the expected ordinary equipment lifecycles to prevent the premature decommissioning of equipment." For example, because "a chiller designed for the use of R134a that was sold in 2023 could reasonably be expected to be operational for 20-30 years; however, it may need to be retrofitted to do so as R134a becomes less accessible." [53]

Response. The Department revised the definition of "new" based on updates to HFC regulations in other states and described above. This includes clarifications that the definition applies to replacement of system components and retrofitting.[28] As discussed above, the Department has aligned with other USCA states because the state-level HFC policies are designed to meet specific GHG emission reductions, unlike the EPA SNAP and Technology Transitions rules.

Although the term "useful life" was used by many commenters, this term cannot be consistently defined and would vary across sectors and subsectors. It is particularly difficult to determine the specific useful life of systems where components can be continuously replaced or where refrigerant can be replaced (or retrofitted). Importantly, these modifications do not reduce refrigerant leaks. The USCA state policies recognize when a system has been modified to the point that it is equivalent to a new system. This regulation does not require entities to *prematurely* replace their equipment or require existing systems to be replaced or retrofitted.

This regulation provides an exemption in Section 494-1.5 for retrofitting with a lower GWP substance until 2029. This is consistent with other state regulations. The intent is to allow users a specified time to adopt "drop-in" substitutes to comply with near-term prohibitions in EPA's 2023 Technology Transitions rule. However, prolonging the use of regulated substances in retrofits, and the leakage of these substances, for an additional 20-30 years would not be consistent with the Climate Act requirements, including the statewide GHG emission limits. Thus, the definition of "new" continues to apply to certain retrofits.

[28] Washington's regulation applies the same prohibitions to new and retrofitted systems, e.g., WAC 173-443-040(2). Part 494 combines these terms for simplicity.

Commenters are correct that this regulation does not allow the unlimited replacement of system components or the installation of "dry-shipped" components with regulated substances that are prohibited pursuant to Section 494-1.4. Closing the "loophole" referred to by commenters avoids the prolonged use of regulated substances and controls GHG emissions.

Comment. "Paragraph (23) of subsection 494-1.3(a) states in the definition of 'equipment or appliance' regarding a device with multiple independent refrigerant circuits that 'each circuit is considered a separate and distinct piece of equipment or appliance.' This is not consistent with definitions used by EPA and should be harmonized with federal nomenclature." [168]

Response. This provision was adopted from federal regulation. EPA addresses the sale of new equipment and appliances versus the management of refrigerant in separate regulations. The Part 494 regulation addresses both categories of HFC regulation and thus adopts terminology from multiple EPA regulations. EPA's refrigerant management regulations specify that "for a system with multiple circuits, each independent circuit is considered a separate appliance."[29]

Comment. "The current definition for 'Residential and light commercial air conditioning and heat pumps' excludes multi-family dwellings and residential facilities such as dormitories, assisted living facilities, and similar residential buildings which may have occupants from multiple families living in shared spaces." [210]

Comment. "The proposed regulations cover residential and light commercial air conditioning, which includes '[e]quipment for cooling or heating air in individual rooms' and 'self-contained or packaged equipment.' Under AHAM's interpretation of the rule, this implicates room air conditioners, portable air conditioners, and dehumidifiers." [199, 207]

Comment. "Residential and light commercial air conditioning and heat pumps. It is unclear what the difference is between such systems 'for cooling or heating. . . small commercial buildings' and plain 'heat pump chillers' (in 494-1.3(a)(32)) that may be used in large commercial or industrial buildings." [227]

Response. EPA does not define the "residential and light commercial AC and heat pumps" subsector in regulation, but made the following statement as part of the Technology Transitions rulemaking, "the residential and light commercial air conditioning and heat pump subsector includes equipment for cooling [and heating] air in individual rooms, single-family homes, and small commercial buildings."[30] The Department has further defined this term as encompassing all stationary equipment that uses refrigerant, except for those subsectors that EPA defined separately or refrigeration, chillers, variable refrigerant flow (VRF), and data centers. Thus, this subsector includes equipment used in the types of facilities mentioned by the commenter, even if "multifamily" is not used by EPA. The Department has revised the definition of "facility" for clarity and now refers to facility in the definition of the subsector.

Regarding dehumidifiers, the Department understands that although EPA established separate prohibitions for residential dehumidifiers[31] they were regulated concurrently with this subsector in the

[29] Definition of "appliance" in 40 CFR 82.152 and "refrigerant-containing appliance" pursuant to subsection h of the AIM Act.
[30] From the summary of the final Technology Transitions rule.
[31] E.g., 40 CFR 84.54(2)

Technology Transitions rule. Accordingly, the Department has moved residential dehumidifiers into this subsector, which also aligns with other states. Regarding “heat pump chiller,” federal regulations address chillers separately and the Part 494 regulation further distinguishes chillers that provide both heating and cooling.

> **Comment.** Opposition to defining heat pump water heaters as air-conditioning, request that these have a separate category, and/or that the definitions be based on US Department of Energy (DOE) terminology. [53, 218, 228]

> **Comment.** “DEC’s proposal lists “clothes drying” as one of the functions that falls within the definition of “Other Residential HVAC.” The underlying statute does not implicate clothes dryers, so AHAM seeks confirmation that it is DEC’s intent to keep heat pump clothes dryers out of scope under the proposed regulation.” [199]

Response. Each of EPA’s current air-conditioning subsectors include hydronic systems as well as systems that may be used to heat air or water. It would be appropriate for heat pump water heaters, clothes dryers, and all other heating and cooling of air and water using a refrigerant to be integrated in these subsectors. For clarity, the Department separated such equipment from EPA’s more established air-conditioning subsectors by adding new subsectors for “other residential HVAC” and “other commercial HVAC”. See below for a response to comments on the prohibitions for “other HVAC” appliances.

This regulation is specifically modeled after EPA’s AIM Act and SNAP regulations, which may differ in terminology from DOE energy regulations across all appliances; this is not unique to this subsector.

> **Comment.** Specific requests such as that “export” and “import” should be state specific, that “automated leak detection” should also "work on the reduction of oxygen concentration", that “destruction” should be aligned with the Montreal Protocol, and requests to add definitions or terms related to products that don’t use regulated substances. [81, 226, 227]

Response. Regarding automated or advanced leak detection (ALD), the definition does not preclude the method mentioned by commenters as it may “interpret measurements.” There is no need to revise the definition of destroy as this term is used to refer to reporting on destruction activities; there is no prohibition or requirements in this rule on other destruction activities.

> **Comment.** The Department should incorporate-by-reference or otherwise use the same definition of “leak rate” as EPA (thereby allowing EPA’s annualizing method). [59, 186, 227] “It appears that significant parts of this definition were somehow (inadvertently) omitted.” [227]

Response. The Department intentionally omitted EPA’s annualized leak rate and the option to choose between this or the rolling-average leak rate. The State needs consistent information that can be aggregated to assess HFC usage and emissions for enforcement of the rule, to inform the annual NYS Statewide GHG Emissions Report and to inform other State programs and policies regarding GHGs. All USCA states regulations apply only the rolling average method.

> **Comment.** “The current definition of Mothballing proposed in Part 494 requires equipment to be shut down for longer than 60 days. There is no reason to include a 60 day timeframe in this definition. The federal definition of mothball in 40CFR § 82.152 is more appropriate because once refrigerant

has been evacuated, there is no need to have a set timeframe" [210]. Related requests to adopt EPA's definition. [59, 227]

Comment. "§ 494-2.4 (b), (c), and (d) Leak Repair Requirements should be amended to allow all deadlines for leak repairs to be paused when a leaking component has been isolated from non-leaking components or a system has been mothballed by removing all refrigerant. Under those two conditions, leaks are mitigated and owners should be allowed to have as much time as needed to obtain parts and conduct repairs. This would be consistent with current best practices in the trade and also consistent with federal regulations. Once refrigerant has been removed or leaking components have been isolated and can no longer leak, risks have been appropriately controlled. § 494-2.4 (h) appears to try to do this, but with the current definition of mothballing requiring a 60-day shut-down, it becomes impractical in many instances." [210]

Response. The Department proposed the definition of "mothballing" as adopted in similar state regulations. This definition was designed by the California Air Resources Board in 2010 based on the definition used by EPA at that time. EPA revised the definition in a 2016 rulemaking. The Department revised the definition of "mothballing" in response to these comments and the current federal definition has been adopted as requested to align with the Technology Transitions rule and utilize the most updated and relevant definition to the requirements in Part 494.

Comment. Use the following definition for VRF, "an engineered direct expansion (DX) multi-split system ≥65,000 BTU/h incorporating the following: a split system air-conditioner or heat pump incorporating a single refrigerant circuit that is a common piping network to two or more indoor evaporators each capable of independent control." [53]

Response. The proposed definition differed from other state and federal regulations by omitting "an engineered direct expansion multi-split system." The definition has been revised to add this phrase in response to these comments. The Department is not aware of any other regulatory definition that refers to a BTU/h range and will not be adding such reference to allow for consistency amongst HFC regulations.

Comment. "The definition of distributor includes 'regulated substance' while the definition of manufacturer or producer includes 'bulk regulated substance' or 'a product that contains regulated substances in its final form'. We request the Department to clarify the definitions of distributor and manufacturer or producer, and whether the applicability for distributor excludes 'bulk' and whether the applicability for manufacturer or producer solely includes 'bulk' or also is the intent to include 'bulk' and 'product'." [226]

Response. "Bulk" has been removed from the definition of the term "Manufacturer or Producer". All suppliers (manufacturers, producers, and distributors) of bulk regulated substances or products that contain regulated substances are subject to the requirements of Section 494-1.7.

Prohibitions and Exemptions (§494-1.4(a)-(e) and 494-1.5)

Comment. "We did not have the opportunity to compare these prohibitions - particularly, those in 494-1.4(e) – to the US EPA, the SNAP Program in particular. However, it seems clear that most of 494-1.4(e) goes well beyond current (or proposed) US EPA prohibitions. This belies the statements in the Regulatory Impact Statement that this proposal does not conflict with, duplicate, or exceed any

similar federal standards. These regulatory standards should match US EPA to the maximum extent feasible." [227]

Comment. The proposed rule does not meet the Climate Action Council Scoping Plan recommendations to align with EPA because it does not provide a similar stepwise or "phased-in approach." [60]

Comment. "In this decade, for most sectors, [the proposal] integrates into New York's HFC regulation, federal HFC rules recently adopted or currently proposed by U.S. Environmental Protection Agency (EPA) under the American Innovation and Manufacturing (AIM) Act; this is a safeguard meant to guarantee that the emission benefits expected from the federal rules occur in New York even if the federal rules suffer from legal challenges or potential rollbacks." [55] The commenter thanks the Department for aligning with EPA and is prepared for all of the "first step" or near-term prohibitions with the exception of IPR chillers and intermodal containers. [81]

Response. The regulation provides a phasedown timeline for HFC emission sources that is aligned with EPA and state regulations to date. Where no regulation exists, Part 494 uses the US AIM Act and California SB1206 timeline as a guide. The majority of near-term prohibitions are either directly incorporated-by-reference from the EPA Technology Transitions rule (e.g., foams, propellants and solvents, air-conditioning, ice machines, transport refrigeration) or are considered by the Department as being effectively the same because the equipment and products on the market meet both state and federal standards (e.g., vending machines, household refrigerators, ice rinks, stand-alone cases, and food processing equipment). As discussed in the Regulatory Impact Statement, the near-term Part 494 prohibitions differ from EPA's final Technology Transitions rule in a few specific areas: a 1-year "sell-through" period for products (Section 494-1.4(c)), alignment with prior EPA and current USCA regulations on commercial refrigeration and data centers (Section 494-1.4(e)(3)), and the addition of comparable regulations for "other HVAC" (Section 494-1.4(e)(2)). A response to issues and alternatives on each of these is below. The regulation also adopts an ultralow GWP stepdown aligned with the US AIM Act phasedown timeline and the GHG emission reduction requirements of the Climate Act. While Part 494 has additional prohibitions beyond EPA's Technology Transitions rule, none of these provisions conflict with the US AIM Act phasedown. Part 494 aligns with EPA regulations pursuant to the AIM Act in a manner that backstops federal law while ensuring actual GHG emission reductions occur in New York State as required by the Climate Act.

Comment. "The most important policy signal embedded in DEC's proposal is a long-term vision of an ultra-low GWP future." [55] The early and consistent signal to the market is needed to enable this transition. [52, 55] The commenter, "operates globally and can confirm that bans are the clearest signal to prompt industry's transition." [36]

Comment. The Department shouldn't adopt a regulation with future GWP limits until it can demonstrate that the EPA's "initial limits" are not sufficient to achieve the state's emission reduction goals. [216/221]

Comment. "To avoid market confusion and unnecessary investment, the availability and safety of alternative technologies should be assessed on a device-by-device and application-by-application basis in a framework similar to SNAP as implemented by the US EPA. Amendments to Table 1 should be reconsidered to set more feasible GWP values and enforcement dates in line with the results." [71]

Comment. "We kindly request that DEC not assume that future technology improvements will be developed and commercialized in time to meet New York's proposed second transition mandates. New York should also understand there is sufficient financial motivation for refrigerant producers and OEM's to innovate to develop and commercialize low and ultra-low GWP alternatives and the resulting HVACR equipment that will utilize the new refrigerant." [64]

Comment. The commenter requests revisions to the proposed prohibitions to consider custom or niche applications [120, 168] or the expected development timeline for specific business entities [81].

Response. The 2023 EPA Technology Transitions regulation will not by itself achieve the full AIM Act phasedown. For example, EPA adopted an initial limit of 700 GWP100 for HVAC, which manufacturers may meet by replacing the R-410a blend[32] with HFC-32 (or R-32). However, HFC-32 it is still a powerful pollutant subject to the AIM Act and international Kigali phasedown, as well as the Climate Act.

The EPA phasedown process began 30 years ago. In that process, EPA sets prohibitions for specific subsectors under a short timeframe, announcing a prohibition within a few years of the prohibition date.[33] As such, EPA can reference specific product designs, safety, or efficiency standards with reasonable assurance that these will be sufficient. EPA may then revise their rules, such as by issuing an interim update. This regulation is intended to align with EPA, but it is not limited to the same procedures. It is also not necessary to limit a regulation with a longer timeframe based on products or safety standards available today. The Department anticipates variance applications when a business entity cannot comply with a given requirement, such as to meet the needs of a niche application, due to impossibility.

EPA's approach is also less beneficial to New York in terms of GHG reductions. Extending the phasedown timeline means that more HFC-containing equipment will still be in use as New York approaches 2050. One result would be higher annual emissions, which endangers both the 2050 statewide GHG emission limit and the net zero emissions goal of the Climate Act.

Comment. The regulation should adopt the same sell-through provisions as in EPA's October 2023 Technology Transitions regulation such as by extending the period from one to three years for products and/or allowing products to be sold until a proscribed federal prohibition. [Campaign letter 2, 68, 112, 168, 195, 199, 224]. Alternatively, the Department should extend the prohibition date to align with EPA's sell-through period. [199]

Comment. "Moving to a shorter sell-through less than a year before the prohibition date will harm distributors who have made economic decisions based on the planned availability of products after the manufacturing prohibition." [68]

Comment. "… no product that has entered commerce should be restricted from continued sale or use because of a regulatory change after the product has left the factory. We believe the proposed amendment utilizing an install date prohibition is a regulatory taking and will cause severe economic harm to New York businesses." [68]

[32] R-410a is a 50:50 blend of HFC-32 and HFC-125. Emissions of R-410a are 50% HFC-32.
[33] EPA has updated the Significant New Alternatives Program rules 25 times since 1993.

Comment. DEC should consider base compliance on the date of manufacture rather than the date of sale as well as address or clarify the manufacturers liability over items that have relinquished control over the product to retailers or distributors. [195, 199]

Response. The Department has revised the sell-through provision in Section 494-1.4(c) for clarity but does not extend such sell-through period. Extending a sell-through period has the same impact on emissions as extending a prohibition date. The sell-through period is intended to provide a reasonable but limited buffer for entities with an existing stock of products. Additionally, the Department organized the regulation to align with the cited EPA regulation. This included adopting the distinction between products and systems. Products are sealed at the factory, whereas systems are installed with refrigerant on-site. Thus, similar to EPA, the sell-through provision does not apply to systems for which the prohibition date is the date of install. Additionally, other USCA state regulations already had these prohibitions in place. For example, the State of Washington allows the sell-through of products made prior to 2024 until 2026.[34] None of the Part 494 requirements constitute a regulatory taking for a variety of reasons. The potential economic impact of these requirements is not expected to be onerous and the expectations of any potentially affected entities must account for the extensive pre-proposal outreach for this regulation as well as the federal and international actions on HFCs.

Comment. The commenters request that the Department align with EPA and provide a sell through for residential and light commercial air conditioning and heat pump systems [68, 112], an expected future sell-through for VRFs [190], and any future updates to EPA's sell-through periods [68, 168].

Response. The Department will evaluate any future EPA actions as part of the regulatory review required by SAPA and the Climate Act and may take any appropriate regulatory action at any time. EPA has not adopted a sell-through period for any system. EPA undertook two rulemakings[35] that considered limited exemptions for the systems mentioned by commenters. The Department is adopting the approach used in other state regulations for such projects and by EPA for refrigeration systems; specifically, a limited exception has been added for systems when an approved building permit issued prior to the effective date of this Part specifies the use of a restricted regulated substance, or blend containing a regulated substance, in a system detailed in that permit. In other words, the Department is not providing an exemption or extending a prohibition or sell-through date for components but added a time-limited exemption for certain systems.

EPA described the 2023 interim update to the Technology Transitions Rule as a narrow extension of the 2025 install prohibition for a specific subsector. The Department adopted EPA's narrow extension as the prohibition is imminent. However, allowing the installation of new systems with old components could also be confusing and burdensome on owners and operators in New York. EPA released a proposal in June 2024 regarding its 2026 prohibition on VRF systems. [36] EPA's proposal addressed construction projects that may have been underway in the US prior to EPA's 2023 Technology Transitions regulation that would not be complete by 2026. EPA determined that it was not necessary to extend the prohibition for VRF systems and instead proposed two alternative approaches. The first is a narrow extension for the installation of VRF components of one-year, or to 2027. EPA's alternative approach would apply a permit-based extension to VRF systems as was allowed for certain refrigeration systems. As EPA describes it, this

[34] WAC Chapter 173-443-075(2)
[35] Federal Register Docket ID No. EPA-HQ-OAR-2021-0643-0234 and EPA-HQ-OAR-2021-0643
[36] Federal Register Docket ID No. EPA-HQ-OAR-2021-0643, Proposal for comment June 26 2024

"would extend the compliance date for installation of new VRF systems…where the building permit both specified the HFC or HFC blend to be used and was issued prior to the signature date of the 2023 Technology Transitions Rule (October 5, 2023)." This approach is included in the amended Part 494 regulation as a limited exemption for any system for which there is an applicable building permit.

Comment. Part 494 should align with EPA's 2028 sell-through period for household refrigerators and freezers that use HFC-134a. [199]

The original Part 494 regulation adopted in 2020 prohibited the use of HFC-134a and other high GWP substances in household refrigerators and freezers as of January 1, 2022. That regulation was based on EPA SNAP regulations that were partially vacated. Non-HFC alternatives with a GWP20 under 10 are already on the market for such products.

Comment. Comments that the regulation would prohibit spray foam insulation and thereby impact building owners and businesses in the State. [Campaign letter 3, 71]

Comment. Special consideration should be provided when considering alternative substances for aerosol applications with a high possibility of human exposure. Also, metered dose inhalers (MDI) propellants should be exempted [71] or are an additional challenge [56]. It is also challenging to develop new alternatives for aerosol propellants due to VOC regulations and so the industry has been transitioning to HFC-152a, which has a GWP20 above 10. [56, 77, 226]

Response. The regulation incorporates by reference EPA's 150 GWP prohibition timeline for foams, solvents, and aerosol propellants in Sections 494-1.4(e)(1) and (4). EPA does not provide exemptions for aerosol propellants but provides an extended 2028 deadline for certain applications within the prohibition that has been incorporated into this rule. Regarding the 2030 ultralow GWP timeline, the Department considers the 150 GWP100 to be effectively the same as 10 GWP20. However, the proposed GWP limit for 2030 has been raised to 20 to allow for certain substances in the foam sector, as discussed above. Additionally, a variance process is included in the regulation for potential impossibility, including if alternatives are not available.

Comment. "To enable the domestic heat pump growth in the most sustainable way, we must promote the adoption of best-in-class heat pumps that minimize both direct (refrigerant) and indirect (energy-related) GHG emissions. Here, the nature and timing of refrigerant regulations will play an important role in balancing those two priorities… Ultimately, getting to ultra-low emission AC/HPs will be a big lift, but we believe it can be done. And for the sake of holistic building decarbonization, it must be done within the next decade." [55] Further comment on how this transition is occurring outside of the US [55, 80, 229] and requests that the Department also consider PFAS risk [229] and notes that EU f-gas regulations for heat pumps will consider the risk from relevant HFOs [36].

Comment. The Department should finalize 10 GWP limits for residential and light commercial air conditioning and heat pumps with input from stakeholders and California, who are required under SB1206 to "post an assessment on its internet website by January 1st, 2025, specifying how to transition the state's economy, by sector, away from HFCs and to ultra-low GWP or no-GWP alternatives no later than 2035." [55]

Comment. "Residential and light commercial AC and heat pumps and VRF Systems limits should be 2700 (GWP20) through 2034 until commercially viable refrigerant and equipment technology are

developed." [60] It is too early to know if 2034 will be too soon [112], more time will be needed because there isn't anything available now [190, 193, 220]. While Europe is beginning to have R-290 options for RACHP, the US "are a long way away" because of codes. [190]

Comment. Without ultralow GWP options, "manufacturers have told [contractors] that they will be forced to pull out of the New York market entirely while alternatives are developed, equipment is certified, and building codes are updated." Incentives and certification for quality installation would have a far greater impact. [184]

Response. See discussion above regarding reclaim, sell-through periods, and ultralow GWP prohibitions. Part 494 incorporates-by-reference EPA near-term prohibitions for air-conditioning subsectors in Section 494-1.4(e)(2) and includes an ultralow GWP stepdown in 2030-2034. As discussed in the Regulatory Impact Statement, this timeline is designed to address the GHG emission limits in the Climate Act and aligns with both the national and global phasedown of HFCs as well as California's ultralow GWP law (SB1206). The Department is adopting the sell-through provision as proposed as well, with the narrow exception from EPA's 2023 interim update. The Department removed prohibitions on virgin refrigerant in new products but retained requirements regarding reclaim in Sections 494-1.6 and 494-1.7.

The Department appreciates the comments regarding heat pumps and their importance in building decarbonization and electrification. It is not necessary to choose between decarbonization and eliminating HFCs. As shown by Europe, an ultralow GWP transition is possible. The Climate Action Council, as outlined in the Scoping Plan, also found that both transitions are necessary to achieve the Climate Act requirements. As discussed in the general comments above, the challenges relate to safety standards and building code processes that have already been addressed internationally. The Department shares the goal of decarbonization/electrification. DEC provides non-regulatory support for heat pump and electric vehicle adoption, such as through the Climate Smart Communities grant program. HFCs are potent GHGs, and the Climate Act requires a holistic perspective to reduce all greenhouse gases. The Department can evaluate the progress on codes and standards and the availability of alternatives as part of the regulatory review required by SAPA and the Climate Act.

Comment. EPA and state governments exempted the "other HVAC" end-uses. [168, 208, 228] Unlike the other equipment regulated by EPA that had "several years" this proposal gives these manufacturers "a few months" from the date of adoption. [168, 228]

Comment. The Department should consider a 2023 DOE proposal that could result in new efficiency standards for water heaters in 2029 that are expected to drive significant adoption of heat pumps [34, 168, 218, 228]. Request that any HFC restriction occur after 2030 in light of these standards [168] or wait for the industry to "mature" [218].

Comment. The "other HVAC" appliances have a climate benefit, even when using high GWP refrigerants. [34, 218] The benefits also reflect that residential products are factory sealed. [34, 218]

Comment. The "other HVAC" appliances are nascent and a small portion of the market so there is no meaningful climate benefit from the prohibitions, and they will slow the planned growth in adoption of this equipment. [34, 168, 208, 218, 228] Further comments that an aggressive redesign on the proposed timeline is not economically justified [53], that the proposal requires

manufacturers to redesign 3 times (2025, 2027, 2029) [228], and that manufacturers are focused on "driving down costs, not reviewing and preparing for the use of alternate refrigerants" [218].

Comment. There are ultralow GWP models for the residential "other HVAC" on the market, but these have restrictions. Heat pump water heaters can use CO_2, but they are a small percentage of the market, are split systems, and cost more. [34, 218] The Department should work with code officials and delay any prohibition until they allow flammable refrigerants, although these are expected to be too costly for LMI households. [208]

Comment. The commenter "… requests that DEC reconsider the GWP20 limit. Currently there are two blends of refrigerant that have been designated as A1 and carry a GWP100 of less than 150 *(public data on GWP20 values for these refrigerants are currently unavailable but best effort calculations based on the known refrigerant in the blend put the GWP20 at approximately 420*)." Also delay the ultralow timeline for residential HPWHs to 2034 to match commercial equipment. [218]

Comment. Heat pump clothes dryers can use propane, but current safety standards limit the charge size so there are only compact and not standard or larger capacity models [199, 207]. The commenter "believes that many companies could voluntarily shift to lower GWP refrigerants, specifically R-290, but not on the timeline DEC suggests. This is a result of international HFC refrigerant regulations and anticipated future supply issues for non-hydrocarbon refrigerants." [199] Support for the previous comment letter and a request to postpone the prohibition [195]. Alternative suggestion that the proposed 2027 GWP 10 prohibition "should allow sufficient time for UL standards to be updated and for manufacturers to transition." [207]

Response. No jurisdiction has exempted the "other HVAC" sources of HFC emissions. The majority of these appliances currently use HFC-134a, which is subject to the Kigali Amendment and AIM Act. Efforts must be taken to ensure that the HFC transition aligns with the growth in the adoption of these technologies. As discussed above, based on current conditions, it's the expectation that 100% of refrigerant is emitted when "factory-sealed" products are disposed of at the end-of-life.

The Department proposed a near-term reduction in GWP akin to the EPA Technology Transitions prohibition for similar technology. The Department appreciates comments about the timeframe proposed for an initial stepdown, particularly as the initial pre-proposal timeline from February 2023 did not include this stepdown. Based on comments received on this rule, the Department removed the initial stepdown for "other HVAC". However, part 494 retains an ultralow GWP stepdown in 2027 for residential equipment and 2034 for commercial equipment. The revision reflects the comments and is intended to enable this industry to invest in future proof and least cost alternative refrigerants. The Department can evaluate the progress on codes and standards and the availability of alternatives as part of the regulatory review required by SAPA and the Climate Act.

Comment. See also comments regarding natural refrigerants, the definition of "new", and prohibitions on bulk refrigerant as they apply to refrigeration. Further concerns from commercial food or beverage businesses or trade groups regarding existing facilities such as there are no ultralow GWP alternatives available today to retrofit existing equipment [Campaign letter 1, 61, 129] and there will need to be multiple retrofits [59, 61] or that the rule requires entities to immediately replace their

equipment and costs of compliance will be high and passed to consumers [Campaign letter 1, 24-26, 59, 183], and this will result in store closures [27] and more food deserts [61].

Comment. Businesses plan to retrofit to HFC-32 blends, so the phasedown of HFC-32 is not reasonable [59, 61] or businesses request that the rule allow for HCFO-123yf. [Campaign letter 1]

Comment. Part 494 should adopt the same prohibition dates and/or size thresholds as EPA for commercial refrigeration equipment, which allows a higher GWP for equipment with less than 200lbs of refrigerant and go into effect in 2027 [60, 61] or no earlier than 2026. [228]

Comment. Commenter requests that "stand-alone refrigeration equipment for medical, scientific, and research purposes" be treated as separate subsector with a 2029 prohibition date based on their interpretation of how the EPA regulations would apply to their equipment. [198]

Response. This regulation does not require any entity to prematurely replace their equipment or to conduct any form of retrofit; it also does not prohibit retrofitting in general. As discussed in the definitions section above, systems retrofitted to use a lower GWP20 substitute are exempted from any prohibitions, i.e., fully permissible, until January 1, 2029, pursuant to this rule. After January 1, 2029, retrofitting is treated and regulated as new. The primary focus of this regulation is on new products and equipment. There are only two topics related to existing equipment: the Refrigerant Management Program to control refrigerant leaks and the Supermarket Refrigerant Program that is focused on the large equipment used by supermarkets chains. These are discussed in more detail below.

The Supermarket Refrigerant Program requires supermarket chains, the largest businesses in this sector, to address HFC emissions from supermarket racks, their largest HFC emission sources. The rule provides supermarket chains with multiple options to address such HFC emissions and comply with Section 494-2.8, including to reduce leakage or to replace their supermarket racks with lower GWP technology that is available today. Additionally, supermarket chains are given the option to work directly with the Department to develop a compliant replacement plan and request up to five additional years for replacement. The Department has non-regulatory programs to further support supermarkets, including programs to fund projects that replace refrigeration systems that use HFCs with refrigeration products or systems that contain natural refrigerants for facilities in disadvantaged communities and providing training for the equipment servicing industry.

With respect to commercial refrigeration prohibitions, the rule imposes the same near-term requirements as EPA's Technology Transitions rule, or a 150 and 300 GWP limit depending on subsector and charge size. As indicated above and in the Regulatory Impact Statement, the deviations from the EPA rule are to align with USCA states and address Climate Act requirements. The USCA model aligns with the phasedown originally started by EPA SNAP regulations in 2015, substances that are already allowed by EPA, and size classes used in EPA's existing refrigerant management rules. The current state regulations will ensure a consistent transition in this sector. The Part 494 regulation aligns with the other state regulations while aligning with EPA for equipment with less than 50lbs of refrigerant. The Department is not introducing new subsectors to replace EPA's existing subsectors, including equipment used for research.

The global HFC phasedown is already underway, which will reduce the supply of HFCs 85% by 2036, including HFC-32. These substances will also be subject to the Refrigerant Management Program.

Comment. Comments on the use of HCFO-1233zd in chillers, specifically low pressure centrifugal chillers [53, 60, 64] and models that were available as early as 2018 [64]. Related recommendation that high pressure chillers not be subject to the same 2030 GWP limits as low pressure "given the lack of acceptable low-GWP options." [60]

Comment. "Many of the same chillers are used in buildings for comfort cooling, most industrial process refrigeration (chillers), ice rinks, data centers and other uses. It is most logical for them all to have the same GWP limits and transition timing. The exception is for very low temperatures for industrial process refrigeration (IPR) where different processing temperatures and capacities are needed." [81]

Comment. Request that a 50lb threshold be applied to IPR chillers because "a typical high-volume semiconductor manufacturing facility may have between 35-200 chillers greater than 50 lbs. If the threshold were lowered to less than 50 pounds, an additional 200-500 chillers per facility are brought into scope." [219]

Comment. Request that the 2025 prohibition on IPR chillers be raised to allow the use of R-32 a viable low GWP substitute" per the 700-750 GWP100 limits in other jurisdictions, delayed as in EPA regulations, and that the 2030 limit allow the use of R-454c. [120]

Response. The Department appreciates the detailed comments received on IPR and other chiller applications and the recommendations to simplify the rule. As discussed in the Regulatory Impact Statement, the Department's intention is to align with state regulations on commercial refrigeration that predate the EPA Technology Transitions regulation. Regarding the relative readiness of different chiller applications for the ultralow GWP transition, such as based on pressure, this rule allows the market to find the right solutions for different heating and cooling needs that align with the Climate Act. Finally, as discussed in earlier sections, R-32 is not a low GWP option and all HFC blends are subject to the global HFC phasedown. As discussed above, in response to comments received, The Department raised the ultralow GWP limit for chillers to 20 to enable the use of additional substances such as HCFO-1233zdE. The indefinite use of HFCs in new products and systems would be inconsistent with the Climate Act, including the statewide GHG emission limits. Regarding IPR chillers, the rule has been revised to match other state regulations by raising the allowable GWP. However, no state has set a size threshold for IPR chillers and the Department will continue to align with other states and not impose a size threshold. The California variance described by commenters is also not relevant, as that rule's relevant prohibition date is 2024 and a one-year extension would result in a 2025 prohibition date. Finally, due to the history of subsector-specific regulations at the federal level, it is not possible for the Department to establish a single requirement for all chiller applications.

Comment. Statements in support [81] versus opposition [71] to the proposed 2025 prohibition for data centers.

Response. USCA states differ in the categorization of data centers as a reflection of changes in EPA's categorization of this as air conditioning versus industrial process refrigeration. The Department understands that data centers are a potentially unique use. However, all USCA states have the same near-term prohibition date as Part 494. EPA initially proposed a 2025 date that matched the state regulations, but later adopted a 2027 prohibition indicating that this timeline aligns with residential air-

conditioning. Part 494 seeks to align with USCA state regulations and the initial EPA proposal for data centers while acknowledging the imminent prohibition date.

Comment. "EPA limited 700 global warming potential (GWP) for intermodal containers as of January 1, 2025, where refrigerant temperature entering the chiller evaporator is >-50C. EPA incorrectly referenced chillers and ignored the -30 to +30C box temperature limit in the Thermo King Containers Fresh and Frozen (CFF) literature they cited in justifying the limit." The commenter has petitioned EPA to reconsider the regulatory terms. [81]

Response. The Department appreciates the commenter's concerns regarding EPA's treatment of this subsector and is aware that the EPA is considering action, including as it relates to "life sciences products such as blood plasma and pharmaceuticals."[37] Part 494 incorporates by reference the provision as it was published in the 2023 Technology Transitions regulation. As such, there is no action to take at this time. The Department will review and evaluate EPA's actions in this subsector and others as part of the regulatory review required by SAPA and the Climate Act.

Bulk Substance Prohibitions and Servicing (§494-1.4(f))

Comment. Allow for the servicing of equipment through its useful life. [Campaign letter 1 and 2, 4, 6-8, 18, 19, 22-27, 30, 32, 39, 42, 60, 77, 222, 227] Allow for additional time for bulk sales of refrigerants marketed as of 2024, e.g., R-410a, or otherwise ensure that entities do not need to replace equipment because they cannot service a leak. [51, 207] Or only apply restrictions to the small containers. [51]

Comment. Clarify that the bulk prohibitions do not apply to reclaim, as was the case in California's SB1206 statute. [51, 52, 55, 185, 203, 229] "However, reclaimed refrigerants may not necessarily lead to the displacement of virgin refrigerant production and could eventually prolong emissions of HFCs. It may be appropriate to allow the use of reclaimed refrigerant to facilitate phasedown in the near term, but ultimately prohibit the sale of some HFCs (whether reclaimed or virgin) deeper into the phasedown." [185]

Comment. "We think § 494-1.4(f) does not apply to bulk refrigerants that should be used for repairs of Very low temperature applications since § 494-1.5(a)(10) stipulates that the applications are exempt from the prohibitions under this regulation." [198]

Response. As discussed above with regard to the definition of "new," there is no practical way to define useful life for the variety of sectors and subsectors subject to this regulation. However, the intent of this section of the regulation is to adopt the same prohibitions on bulk substances as are in place in California. As such, the regulation has been revised to incorporate by reference California's law. This provision applies to the entering into commerce in New York State of any bulk regulated substance for any intended use or application. The Department agrees with the comments regarding the use of reclaim and may consider future prohibitions as needed based on the implementation of this regulation and the Climate Act.

Comment. Suggests an alternative to the 2027 prohibition on small containers of automotive refrigerant based on California statute that would be "a phase-in towards 100% certified reclaim such

[37] https://www.epa.gov/climate-hfcs-reduction/petitions-reconsideration-technology-transitions-2023-final-rule-and-epa

that DEC can monitor the marketplace and ensure that this regulatory action does not incentivize the use of 'unsafe and unapproved' products." [56]

Comment. "Do-it-yourself automotive AC rechargers represent a largely unknown source of dangerous greenhouse gas emissions. Requiring the shift to reclaimed refrigerants in this subsector will maintain the right to repair while reducing overall greenhouse gas emissions." [51]

Response. The prohibition on small containers is based on an amendment to long-standing California regulations.[38] The Department adopted California's final 2027 requirement without a 3-year phase-down to avoid additional regulatory and compliance burdens. These "DIY cans" are marketed to consumers for refilling air-conditioning systems in existing vehicles that have leaked, in lieu of repairing such leaks. This primarily affects HFC-134a (GWP20 of 4140), which has already been replaced in most vehicle models. Unlike other containers of refrigerant that can only be sold to certified technicians, DIY cans represent a completely unmitigated source of HFC emissions that is inconsistent with the Climate Act. The Department appreciates the comments received throughout the pre-proposal outreach period regarding the use of these canisters by lower-income vehicle owners. The prohibition is limited to banning virgin substances to allow for the use of reclaim as an option for DIY servicing of these vehicles.

Labeling and Disclosure Requirements and Requirements for Suppliers (§494-1.6-7)

Comment. Request that the labeling requirement be delayed 3 years for to allow time to mitigate cost of stranded inventory, or until 2028 as "EPA is allowing consumer aerosols manufactured or imported prior to January 1, 2025 without a label that meets the requirements of this rule to be sold until January 1, 2028." [226]

Comment. The commenter opposes state-level labeling or registration requirements [228] or states that it is preferred for the requirements here to be aligned with the EPA requirements [168, 226]. For example, because EPA's labels will use the AIM Act GWP values. [226]

Comment. It will be difficult for manufacturers to ascertain total quantity of regulated substances supplied to NY, such as if a supplier sold substances to a regional distributor in the state and that entity sells it to a neighboring state [168]. "Consider the type of data collected by CARB, which allows companies to determine California sales based on the population percentage represented by California, opposed to requiring companies to report data on a state basis." [226]

Comment. Requests clarity on how the requirements in Section 494-1.6(a) apply to household and consumer products. [56] The general record-keeping requirements are heavy and duplicative. Simplify this process by limiting the information to the invoicing and the manufacturing site. We also understand that this requirement is limited to regulated substances and not products while the annual reporting includes products [226].

Comment. Supports the requirement that systems 50 lbs and greater have a label affixed with details on the regulated substances contained in the equipment. [52] These requirements should be on the owner, not the manufacturer because the latter, "are not present for that part of the process." [168]

[38] Effective July 1, 2024

Comment. Recordkeeping and reporting should be limited to suppliers located in New York State. [216/221]

Comment. The provision to include reclaim information on a label should be omitted because there won't be a sufficient volume of reclaim on the market until 2035-2040. [53] Reclaimer reporting requirements should include quantity of regulated substances shipped [81].

Comment. Opposition to retroactive record-keeping requirements in Section 494-1.7(d)(2) and 494-1.7(e) and/or to a 5-year interval as opposed to EPA's 3-year interval. [30, 77, 168, 221, 226]. All submission deadlines should say "by" rather than "on". [226]

Response. The requirements on the suppliers of GHGs are not overly burdensome, especially given the harm incurred by global climate change. The sell-through period applies to products and equipment manufactured before the relevant prohibition date thus it is not necessary to align the timeline of these requirements. The Regulatory Impact Statement provided the requested information on the justification and basis for these requirements. One clarification has been added that these requirements apply to the supply of equipment "systems," using EPA's newest terminology as adopted in this rule. The labeling and reporting requirements are needed to enforce this regulation and to collect information on GHGs as recommended in the Climate Action Council Scoping Plan and further directed by the Climate Act. Specifically, ECL 75-0105 directs DEC to consider establishing a mandatory registry and reporting system from individual GHG sources to obtain data on greenhouse gas emissions. See above for comments regarding the importance of accurate analyses of HFC emissions and the lack of information.

The Department agrees that it would be most efficient and least burdensome for state and national labeling requirements to align, and the Department made the same request to EPA.[39] This is also why labels required by Part 494 must provide simple information to allow some flexibility and align with other jurisdictions as much as possible, such as the name of the regulated substance, and do not refer to GWP or require information on reclaim unless relevant. As stated in the Regulatory Impact Statement, "the DEC and EPA requirements are not in conflict, and both this proposed regulation and the EPA regulation allow entities to utilize a label as required by other laws if that meets the requirements. For many products, the existing labels used today will be sufficient." For example, federal labeling requirements for personal care products already require the disclosure of the ingredients (i.e., regulated substances).

In response to specific alternatives proposed by commenters, an estimate of HFC supplies to New York based on population size would be as insufficient for the Department's purposes as using national scale information, even if it were made publicly available by EPA.

The Department made clarifications to Sections 494-1.6 and 494-1.7 as requested to refer to specific dates in the future. Regarding the labeling of systems, Section 494-1.6 has been revised such that manufacturers must instead ensure that the owner/operator is able to produce the information, such as by providing that information or a means for determining the information. For example, they may provide a model label or calculations. The Department understands that manufacturers are not always involved with the installation of systems, but they are responsible for these systems entering into

[39] Comment submitted by New York State Department of Environmental Conservation, Feb 1, 2023. EPA-HQ-OAR-2021-0643-0199.

commerce in New York State and must assist other regulated entities in attaining all necessary technical information.

Comment. Concerns regarding confidential business information or requests that DEC should aggregate data collected from entities or provide specificity on how regulated entities will be protected from public disclosure. [168, 221]

Response. An entity may, at the time of submission, request that DEC exempt such information from disclosure under the Freedom of Information Law on the basis such information contains trade secrets, confidential commercial information, or critical infrastructure information pursuant to 6 NYCRR Section 616.7.

Variances (§494-1.8)

Comment. Support for the variance provision as proposed because it adds to the flexibility provided to compliance entities and considers economic hardships on small businesses in disadvantaged communities. [52]

Comment. The variance process is burdensome and "a regulatory approach aligned with the federal HFC regulations under the AIM Act would negate the need for variances." [30, 77]. "The criteria for 'Impossibility' and 'Force Majeure' variances are very limiting and will be not accessible to many businesses." [227]

Comment. Request that the Department "establish procedures for granting a variance for an entire sector or product category, rather than just on a company-specific basis", grant a retroactive variance while an application is considered, and commit to a 60-day review period. [168]

Comment. There may be independent stores outside the defined Disadvantaged Communities that could face economic hardship. An alternative is to widen the eligibility and provide financial support. [51, 73] "Economic hardship variances are limited…meaning that medium and large businesses effectively have no chance to qualify for any variance." [227]

Response. The variance section reflects requests from compliance entities under the current Part 494 regulation to adopt the variance provisions in California's regulation or consider variance applications granted under that process. The Part 494 variance section is structured to increase transparency, assist in compliance, and to allow for flexibility. In cases of impossibility or force majeure, the Department may also release the application for public comment, enabling stakeholders to provide input on the agency's decision. The process commits the Department to an initial completeness review within 30 days, and, if an application is released for public comment, a 30-day comment period, and a 60-day review period following public comment.

The Department may issue variances that cover subsectors or product/system types based on the applications made by individual business entities. There is no restriction on coordination among such entities. The Department appreciates the concern regarding potential economic hardship to businesses. The focus of the economic hardship provision is intentionally designed to address the most at-risk entities in disadvantaged communities, as required by the Climate Act. The Department will continue to seek additional non-regulatory assistance for all entities. With respect to the impossibility variance, the analysis of the required information and factors, including that granting such a variance will not increase the overall risk to human health or the environment, will not be based on a "no action" alternative. In

other words, it is not intended that an impossibility variance would be denied based solely on the GWP of a substance, so long as a compliant substance is not currently or potentially available or a component needed for repair is not currently or potentially available.

Refrigerant Management Program (§494-2.1-7)

Comment. "Management of HFCs in appliances and large equipment is crucial to minimize HFC emissions and it is very satisfying that the DEC has spent considerable effort in setting out details of a viable management system." [46] "The leak monitoring requirements in the proposal will cut emissions and costs for businesses by preventing leaked refrigerants." [74] Further comments in support of the proposed program. [51, 52, 55, 73, 79, 115]

Comment. Consider balancing the HFC phasedown with stricter refrigerant management requirements such as "(i)stricter rules around the timely repair of HFC gas leaks, (ii) the requirements for sectors to install automatic leak detection…, and (iii) requirements to ensure… preventative maintenance is being done on their equipment and leak detection equipment." [223]

Comment. Comments summarized above requesting the Department wait until EPA has finalized the "subsection h" regulation [60, 168, 181], that the Part 494 requirements are more prescriptive or should "align" more with federal requirements [59, 186, 227], or that the requirements are burdensome and will require additional staff [61, 203].

Comment. "We question whether the Department researched these prescriptive requirements to assess their achievability" and further hypothetical issues with using certain terms differently than EPA, such as "large". [227]

Comment. "The shift for refrigerant users from the passive requirements of record keeping to active information reporting will, in and of itself, tend to improve refrigerant management outcomes. It will also provide data that enhances clarity for how refrigerant management policies should be adapted going forward." [51]

Comment. "There is very little measured, published leak rate data (e.g., when charging equipment, from operating equipment, at the end of life during decommissioning). We recommend that the Department integrate an allowance for upgrades to emissions estimates as more measured data becomes available. We also recommend that the Department encourage experts to provide actual data to be periodically averaged and published by the Department." [81]

Comment. "The leak detection and repair requirements will also drive early replacements in commercial refrigeration, such as grocery stores" contrary to statements from the Department that grocery stores will not be required to replace equipment before the end of its "useful life". [68]

Comment. Request that reporting be compatible with current tracking software but also concern that the data will be made public and "equipment providers could potentially raise prices knowing how urgent our compliance needs are." [61]

Response. As discussed in other sections and in many comments, there is no way to completely eliminate refrigerant leakage from equipment once it is in operation. For this reason, refrigerant management alone will not achieve the GHG emission reductions required by the Climate Act. However, leakage controls are necessary to mitigate ongoing HFC emissions from existing equipment. As also

discussed in previous sections, particularly given uncertainty associated with federal action, the Department cannot rely on current or potential future federal regulations or compliance to ensure the GHG emission reductions required by the Climate Act. As pointed out by commenters, the existing federal reporting program has not provided the industry sufficient information on leakage rates in this equipment. The State also requires this information to inform the annual statewide GHG emissions report, inform policies and programs, and ultimately help to determine if its statutory GHG emission reductions are being met. As such, the information to be collected in this program is needed to enforce leakage controls as well as to monitor statewide GHG emissions. The Department agrees that leak information should be published, while adhering to its responsibilities pursuant to 6 NYCRR Section 616.7. As such, to the extent possible, aggregate leak rate information may be published as part of the annual statewide GHG emissions report.[40]

Finally, the Department used existing and long-standing regulatory terms from EPA and other states as models for this rule, as described in the Regulatory Impact Statement. Specifically, the majority of provisions have been in place in California since 2010 and some have also been adopted by Washington and New Jersey. The major exceptions being that the Department is not imposing fees on compliance entities and has incorporated updates to align with EPA's AIM Act subsection h regulation.[41] In other words, differences between Part 494 and federal requirements largely reflect an effort by states to improve refrigerant management and reduce emissions at the state-level. The Department will work with compliance entities as needed to aid in their reporting and intends to make reporting as compatible as possible with current tracking methods. Regarding hypothetical scenarios in which entities will not be able to comply with the leak repair requirements, such entities may apply for a variance. Finally, it was not necessary to wait for final AIM Act subsection h regulations from EPA, as the majority of the refrigerant management provisions in this rule are based on model rules from other states. However, some components of EPA's final rule were incorporated to align with final definitions such as for "virgin substances" or provisions such as to subtract purged and destroyed substances from the annual leak rate.

> **Comment.** "Determining applicability based on potential emission rates is an understandable approach (to capture the most emissive systems), but it may be simpler - for both ease of implementation by agency and ease of compliance for regulated entities - if the applicability criteria are simplified. Here, DEC may wish to consider applying a charge threshold to AC equipment, regardless of potential emission rates. This is the approach taken by Washington state's RMP and the South Coast Air Quality Management District in California." [55]
>
> **Comment.** "Potential Emission Rate – This definition requires a complicated calculation that will have far reaching compliance implications for equipment owners, including homeowners, who normally do not have such compliance obligations imposed on them. United urges DEC to remove this definition and any compliance obligations tied to it." [216/221]
>
> **Comment.** "The Department may wish to consider requiring reporting on designed refrigerant charge rather than potential emissions rates." [81]

[40] https://dec.ny.gov/environmental-protection/climate-change/greenhouse-gas-emissions-report
[41] 40 CFR 84 Subpart C

Response. The Department provides a charge-based applicability threshold for commercial air-conditioning and refrigeration systems as in other state refrigerant management program (RMP) regulations. RMP does not apply to non-commercial uses,[42] including the use of split systems by homeowners. The Department is also unaware of information on the accuracy of methods to estimate refrigerant charge size or leakage rates for complex air-conditioning systems and requested information on leakage in the 2022 Request for Feedback. Commenters responded with a concern that GHG emissions from complex split systems such as VRF are higher than chillers of a comparable capacity. This is due to the additional refrigerant contained in the extensive piping and the likelihood of leakage in joints that may also be inaccessible for inspection. In summary, these systems may be leak-prone and there is not enough information to determine if leak volumes can be adequately assessed based on refrigerant charge. Additionally, the complexity of these systems means that owners and operators subject to this regulation could inadvertently underestimate the refrigerant charge and therein their compliance obligations.

The "potential emission rate" was proposed in response to this issue as it balanced the obligation for chillers and split systems based on GHG emissions. In this approach, compliance entities could use an emissions estimate that is also simpler to calculate than refrigerant charge, which requires detailed design information such as pipe diameter and lengths. Because the calculation includes GWP, entities could lower their compliance obligation by lowering the GWP of the refrigerant. The suggested alternative, to use the charge size threshold for all air conditioning equipment, does not address the leakage issue. To address the issues identified by commenters, the Department revised Part 494 to simplify the approach for split systems. Specifically, the potential emissions rate has been omitted, but the definition of refrigerant charge has been modified to add the potential leak rate.

> **Comment.** Requests to match specific federal requirements, such as to extend leak repair from 14 to 30 days. [59, 210, 227] The federal rules have more reasonable allowable leak rate of 10-20%. [203]
>
> **Comment.** Low leak thresholds are important but "it's unclear if the proposed rule has set leak thresholds for the repair requirements by sector. We recommend providing more detail on this aspect and explore specific leak rate thresholds to help enforce the proposed repair requirements." [52]

Response. All refrigerant management provisions in this regulation, including leak repair requirements, are primarily based on model regulations in other states that have been successfully implemented for over a decade. An example is the "Refrigerant Leak Repair 14-Day Requirement" in California Code of Regulations 95386. Unlike federal requirements, there is no acceptable leakage threshold. California and Part 494 regulations require leak monitoring, and all detected leaks must be repaired. Washington regulations include an additional requirement to notify the agency if annual leakage exceeds a set threshold. The Department considers the reporting already required under this regulation to provide sufficient notice of leakage.

> **Comment.** "We strongly support the proposed requirement for ALDS to accurately detect the ambient concentration of regulated substances at a minimum of 10 parts per million (ppm).

[42] See response to comments on Applicability.

However, we also recommend using 10 ppm for the alarm threshold to alert the operator instead of the proposed 100 ppm threshold." [52]

Comment. "…consider leak reduction mandates based on annual leak rates. For example, if an owner operator has equipment designed to contain more than 250 lbs that has leaked more than 20% for 2 years, ALD is required to be installed within 6 months." Further comments regarding challenges to detection, burdens on small businesses, and considerations if ALD is applied to systems with less than 50lbs of charge. [81]

Comment. "494-2.3(c) requires that leak detection devices must be "calibrated" and accurately detect a minimum concentration of 10 ppm. Our primary ACR service contractor says he does not know if the detector he uses can discern down to 10 ppm, and he is not aware of any calibration routine." Further comment that known devices do not show ppm or that manuals/specification documents do not refer to ppm or calibration. [227]

Comment. "The proposal requires leak inspections whenever 5 lbs. or 1% of the total system charge is added, which exceeds the EPA rule and will require additional inspections even for those facilities with ALDS installed. ALDS does not appear to affect these intermittent inspections, only the monthly, quarterly, and annual inspections. This should be consistent." [59]

Response. The Department appreciates the feedback received on the requirement that large refrigeration equipment subject to this subpart adopt automated or advanced leak detection (ALD) and that ALD may be used for other types of equipment in lieu of regular leak inspection. The standards proposed, including the 10ppm concentration level and requirement to maintain the detection device through regular calibration, have been in place in other jurisdictions and is also in the EPA rule. Compliance entities should work with certified technicians and equipment manufacturers to meet the requirements. Regarding the alternatives suggested by commenters, the Department will consider revisions to this rule as part of the regulatory review required by SAPA and the Climate Act, including based on data collected from this program. The Department is not considering revisions based on annual leak rates because there is not sufficient information to evaluate the effectiveness of such alternative. Similarly, the Department does not have information at this time on the feasibility of a 10ppm alarm threshold.

The requirement to conduct a leak inspection when refrigerant is added to a system (in an amount equal or greater than 5lbs or 1% of the refrigerant charge) applies regardless of the charge size of the system or if an ALD is installed. This requirement is intended to be an additional check for leakage in response to an apparent loss of refrigerant. As with other provisions adopted from similar programs in other states, the intent is to ensure emission controls that are feasible and effective.

Supermarket Refrigerant Program (§494-2.8)

Comment. Questions regarding the applicability of this rule to retail food stores and comments that the rule will require the replacement of equipment, have specific impacts on small and independent stores, will exacerbate food deserts. [Campaign letter 1, 24-27, 39, 205, 221, 222]

Comment. Commenters support this proposed program because the management of leakage in this equipment is crucial to minimize HFC emissions, the transition is feasible given the availability today of compliant technologies, and it will prevent emissions and costs from refrigerant leakage. [51, 52,

55, 73, 74, 115] “To accelerate this transition, we support the proposal to convert supermarket systems to use low GWP, climate safe refrigerants <10 GWP by 2035.” [46]

Comment. “New York is home to many well-capitalized food store chains for whom the requirements to transition all equipment using 200 or more pounds of refrigerant to a GWP20 of less than 10 before 2035 is quite feasible. There are currently available technologies that make this possible, and for the retail food chains it would mean prioritizing capital investments to avoid the massive emissions that would be a burden on everyone else.” [51]

Comment. “Require supermarket systems to convert to <10 GWP by 2032. This would have the most impact of any rule because of the high leak rate in this sector.” [115]

Comment. This program isn’t necessary given the federal regulations or they should be removed following future federal regulations. [60, 77, 168, 216/221]

Comment. “Retail Food Chains are not strangers to refrigerant regulations… DEC should not unfairly burden this sector further by implementing regulatory requirements on their existing facilities that will have the unstated effect of devaluing any investment made in transitioning to lower GWP HFCs and resulting in equipment obsolescence.” [216/221] “The proposed amendments would force the entire industry now using HFCs, which replaced CFCs and HCFCs, to once again finance upgrades to alternative refrigerants with unproven performance and a higher energy demand.” [9]

Comment. The proposed 1% leak rate isn’t possible. “In 2021, GreenChill partners’ average leak rate was 12.9%, which is about half of the estimated industry average of 25%. The federal standard under the AIM Act would be 20% for commercial refrigeration.” [203]

Comment. Leak rates should be achievable and the GreenChill average leak rate of 12.9% is an example. “However, we also note here that leak rates are not permanent. Achieving a low leak rate in 2035 does not guarantee that the leak rates will remain that low throughout the lifetime of the system. Guaranteed and permanent emissions reductions are really only achievable through GWP and charge reduction. DEC may wish to establish targets that focus on those aspects.” [55]

Comment. Other recommended alternatives were to raise the targeted leak rate for supermarket chains to the EPA GreenChill platinum rate of 5%; employ a company-wide target; delay the regulation to work with chains to develop a plan; or delay the regulation to conduct a study of the costs to stores. [52, 55, 179, 221]

Response. The Department’s 2022 Request for Feedback and the proposal included the term “retail food store” based on other New York State laws. However, this term resulted in confusion by some stakeholders. Although many entities and facilities may be considered a “retail food store” under the broad proposed definition, not all provisions in this rule apply to all such entities and facilities. Section 494-2.8 applies to supermarket chains defined as a business entity owning or operating 20 or more retail food facilities that contain supermarket systems with a refrigerant charge capacity of 200 pounds or greater in New York or that operates more than 100 such facilities in the United States, including in New York. The requirements in this section would likely not apply to grocery stores with a small building footprint or convenience stores because these facilities typically do not use this size equipment, specifically supermarket systems with a refrigerant charge capacity of 200 pounds or greater. Section 494-2.8 does not apply to non-retail facilities such as cold storage warehouses. Additionally, Section 494-

2.8 would likely not apply to independent or small businesses as they likely do not meet the definition of a supermarket chain given the threshold of more than 20 retail food facilities in New York State or more than 100 retail food facilities nationwide, including New York State. To aid in clarity, the applicability of this section has been revised to explicitly apply only to supermarket chains and supermarket systems. The Department is replacing the term "retail food chain" with "supermarket chain" and the program title "Food Chain Refrigerant Replacement Program" with "Supermarket Refrigerant Program" to reflect the applicability and requirements of this section of the rule more accurately. See comments above regarding other provisions in the rule that may apply to retail food stores (e.g., §494-1.3 Definitions, §494-1.4 Prohibitions, §494-1.8 Variance, and §494-2.1 Refrigerant Management Program).

Commercial refrigeration is the largest source of HFC emissions in New York and in the US.[43] As such, the ongoing and substantial leakage from this equipment, specifically supermarket racks, is a significant barrier to achieving the requirements of the Climate Act as well as potentially the US AIM Act. The alternatives suggested to delay the HFC transition or to defer to the federal government would not meet the Department's legal requirements under the Climate Act, namely the statewide GHG emission limits. The phasedown of HFCs is now underway and supermarket chains, as well as other entities and facilities, will be faced with a declining supply of HFCs nationally and internationally. However, as discussed, the federal phasedown is not sufficient for meeting the Climate Act requirements, especially considering that this sector has the highest annual leak rate.[44]

The Supermarket Refrigerant Program requires supermarket chains, the largest businesses in this sector, to address HFC emissions from supermarket racks, their largest HFC emission sources. The rule provides supermarket chains with multiple options to address such HFC emissions and comply with Section 494-2.8, including to reduce leakage or to replace their supermarket racks with lower GWP technology that is available today. This regulation does not require any entity to conduct planning or to replace their equipment, nor would it be necessary for every chain to do so. Feedback received during the extensive pre-proposal outreach conducted by the Department highlighted that many supermarket chains are already prepared or have made commitments in line with this timeline because of the global HFC phasedown. Additionally, supermarket chains are given the option to work directly with the Department to develop a compliant replacement plan and request up to five additional years to conduct a replacement. The Department has non-regulatory programs to further support supermarkets, including programs that fund projects to replace refrigeration systems that use HFCs with refrigeration products or systems that contain natural refrigerants for facilities in disadvantaged communities and providing training for the equipment servicing industry.

The terms of the Supermarket Refrigerant Program have been revised in response to comments regarding the leak rate. The proposed 1% leak rate is comparable in terms of GHG emissions to replacing an HFC system with an ultralow GWP substitute. However, a 5% leak rate is a feasible and achievable option as demonstrated by the EPA GreenChill program. The cited 20% annual leak rate from EPA is adopted in the regulation as the minimum standard for the sector as a whole, as opposed to individual facilities or supermarket systems. The intent of the Supermarket Refrigeration Program is to achieve a more stringent emissions standard in supermarket chain businesses by 2035. If existing supermarket

[43] 23% of US emissions of "ozone-depleting substance substitutes" in 2022; EPA (2024).
[44] EPA allows an annual leak rate of 20% for commercial refrigeration or twice the rate allowed for residential systems. 40 CFR Part 82.157(c).

systems cannot be managed to reduce emissions to meet the required leak rate, then replacement must be evaluated. Additionally, the suggested alternative to set company-wide targets[45] rather than a facility-level target was discussed during pre-proposal outreach. However, the intent of this program is to require and enable supermarket chains to achieve the same emission standard in all facilities, rather than achieve a reduction in average GWP. Importantly, this also helps ensure that facilities located in disadvantaged communities[46] receive comparable investment and reduction in greenhouse gas emissions.

Other Comments

> **Comment.** "The Proposed Rule does not provide incentives, grants, or other assistance." Further recommendation to provide training, education, and certification for technicians [60]. Refrigerant recovery can be improved through "rebate, incentive, and education programs" [228]. Funding assistance may be needed for food stores [51].

Response. Incentives and other non-regulatory programs are beyond the scope of this regulation. The Department agrees that funding support for the food industry is of primary importance in this transition and recently announced the intent to expand the current funding program for supermarkets.[47] The Department will continue to seek additional funding and support for supermarkets and other critical infrastructure such as food banks as well as education, research, planning support, demonstrations, and incentives for natural refrigerants across the HVAC-R sector.

> **Comment.** The labor force is not ready for the new refrigerants. The transition will require major training updates and workforce development. [Campaign letter 2, 129]

> **Comment.** "We also recommend uniform refrigerant management and training practices for HVAC technicians in the state for leak detection and repair, which can be verified in the central database." [46] "A significant amount of emissions reductions can be achieved through the servicing and maintenance of the large installed base of HFC equipment which should include enhanced contractor training as well as incentives." [64]

Response. The Department has received substantial feedback on the need for workforce development to support the HVAC-R transition, but also to address other long-standing workforce issues such as worker shortage. The Department included workforce training in its current natural refrigerants funding program and will continue to seek feedback on how to best support such training. Workforce development is also one of the key issues addressed in the Scoping Plan.

[45] California's regulation adopted in 2022 would reduce the GWP of equipment used in chains to an average level of 1400 GWP100 or 55% below 2019 levels.
[46] ECL §75-0109(3)(d).
[47] DEC 06/26/2024 "Eligibility Guidelines for Food Security and Refrigeration Grant Program" Environmental Notice Bulletin

Appendix: List of Commenters by Commenter Number

Commenter	Commenter Name, Affiliation
1	Sam Joseph, Energy Evolution Inc
2	Bob Dionne, EnergSmart Insulation
4	Heath Ferry
6	Ramuel Gall
7	Michelle Leo
8	Tom Vesotski, Rieds Food Barn
18	Bob Donnelly, 2001 Refrigeration
19	Matt Tempesta, Tempco Inc
22	Jayson Tucker, C&S Wholesale Grocers Inc.
23	Pete Lew, Perry's Ice Cream Co. Inc.
24	Maureen Hosken, Tom Murphy, Sandy Lew, Mark March, Irr Supply Centers
25	Brenda Hanson
26	Jennifer Laga
27	Barry Neckers, Neckers Company General Store
30	Robert Moody, Sid Harvey Industries Inc
32	Brian Becker, Duct Mate
33	David McIlwaine, HVAC Distributors Inc.
34	Nicole Dunbar, Northwest Energy Efficiency Alliance
35	Richard Fennelly, CoilPod LLC/The Coil Cleaning Consortium
36	Thomas Trevisan, ATMOsphere
39	Tony Pacella, Dash's Family-Owned Markets
42	Christopher Cosentino, MastersMind HVAC Corp
46	Margaret Perkins, 350 NYC
47	Eric Smith, IIAR
48	Anne Erling, NYers for Cool Refrigerant Management
50	Michael Garry, ATMOsphere
51	Michael Helme, NYers for Cool Refrigerant Management
52	Beth Porter, EIA
53	Kelley Raymond, Daikin USA
54	Justin Koscher, PIMA
55	Richie Kaur, NRDC
56	Nicholas Georges, HCPA
59	Michael Durant, Food industry Alliance of NY
60	Ryan Hulse, Honeywell
61	Tim Bowen, Tops Maintenance
63	Ian Choiniere, Erin Desantis, American Chemistry Council Center
64	Chris Forth, Johnson Controls Inc
66	Holly Anderson, Anderson's Frozen Custard
67	Dave Malinauskas, CIMCO
68	Todd Titus, HARDI
70	Charlie Ortmann
71	Junichi Ishikawa, Japan Fluorocarbon Manufacturers Association
72	John DeCicco, DeCicco and Sons
73	Margaret Mccasland, Quakers
74	Dan Howells, Green America
76	Gail Katz

77	Junichi Ishikawa, Schuyler Pulleyn, Masaki Kobayashi, Chemours
78	Lucy Smorto
79	James Ralston
80	Tom Kacandes
81	Helen Walter-Terrinoni, Trane
82	Paul Vukelic, Try it Distributers
84	Anu Otgonbayar, National Supermarket Association
86	Vincent Vuolo
97	Jenna Prasad, Ambient Enterprises
98	Kevin Teakell, AAON
112	Jason Thomas, Carrier
115	Daniel Chandler, 350 Humboldt Steering Committee
120	Scott Stone, SMC Corporation
128	Bill Murray, American Council of Engineering Companies of New York
129	Dawn M Timm, Niagara County Department of Public Works
130	Daniel Avery, Real Estate Board of New York
134	Marie E Ulrich
135	Gregory Wiatrowski
137	Caitlin Anderson, New York State Brewers Association
168	Samantha M. Slater, AHRI
172	April McIver, The Plumbing Foundation
174	Roger Caiazza, Pragmatic Environmentalist of New York
178	Christopher Tryjankowski, PCS Plumbing & Heating Inc
179	Kent Sopris, New York Association of Convenience Stores
181	Ronald Shebik, Hussman
183	Patrick Gallivan, NY Senate
184	Chris Czarnecki, Air Conditioning Contractors of America and the Metropolitan Air Conditioning Contractors of New York
185	Tilden Chao, Carbon Containment Lab
186	Richard B Milne, Mayor of Village of Honeoye Falls
190	Dana Fischer, Mitsubishi Trane (METUS)
191	Zackary Knaub, Hudson Technologies
193	Noah Rohde, NY Senate
194	Andrew Brackbill, Extruded Polystyrene Foam Association (XPSA)
195	Sean M Southard, Whirlpool
198	Shunsuke Kiyotoki, PHC Corporation
199	Sriram Gopal, Association of Home Appliance Manufacturers
201	Dave Bruns, Bruns Realty Group, LLC
202	Joseph R. Ciffa
203	Julie Cook, Wegmans
204	Allyson Jones-Brimmer, Northeast Dairy Producers Association (NEDPA)
205	Kenneth Zebrowski, NY Assembly
207	John Schlafer, GE Appliances, Haier
208	Robert Wolfer, Bradford White Corporation
210	Ilene Miller, Cornell University
213	Tom Faist, NYS Chemistry Council
214	Jeff Williams, NY Farm Bureau
216	Maureen Beatty, National Refrigerants
217	Kevin Dugan, NYS Restaurant Association

218	Kyle Bergeron, A. O. Smith Corporation
219	Alex Gordon, Semiconductor Industry Association
220	Ned Bent, Fujitsu General America
221	Russ Barnthouse, United Refrigeration Inc
222	John Ketcham, Manhattan Institute
224	Matt Kremers, Modular Comfort Systems
225	Patricia Brown, Stewart's Shops
226	Kenisha Cromity, Personal Care Products Council
227	Ken Pokalsky, The Business Council of New York State, Inc.
228	Allison Skidd, Rheem
229	Jason Wexler, Gradient Comfort