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Hydrofluorocarbon Phasedown: Background and Issues Facing Congress

The United States is phasing down hydrofluorocarbons (HFCs) under the American Innovation and Manufacturing Act of 2020 (AIM; P.L. 116-260, Division S, §103; codified at 42 U.S.C. §7675) and the Kigali Amendment to the Montreal Protocol (MP). HFCs are greenhouse gases (GHGs) used in refrigeration and air conditioning, aerosols, foam blowing, fire suppression, solvents, semiconductor manufacturing, and other applications. HFCs gained widespread use as substitutes for ozone-depleting substances (ODSs), which have largely been phased out worldwide under the MP. According to scientists, HFCs have a negligible impact on stratospheric ozone but are potent GHGs. Their potency, measured as Global Warming Potential (GWP), can be hundreds to thousands of times greater than the equivalent mass of carbon dioxide (CO_2) when measured over near-term time horizons (e.g., 20 or 100 years).

Kigali Amendment to the Montreal Protocol (MP)

Parties to the Vienna Convention for the Protection of the Ozone Layer, including the United States, adopted the MP in 1987 to set binding schedules for countries to phase out listed ODSs, which were largely replaced by HFCs as substitutes. The MP also provides for international cooperation on ODS substitutes, research, and financial assistance—including through its Multilateral Fund—and trade restrictions with nonparties.

In 2016, MP parties agreed to phase down HFCs through the Kigali Amendment. The Kigali Amendment requires ratifying countries to phase down the production and consumption of 18 HFCs. Nondeveloping (or non-Article 5) countries, including the United States, must reduce HFC production and consumption by 85% by 2036. Developing (or Article 5) countries must reduce HFC production and consumption to either 80% by 2045 or 85% by 2047. Most Article 5 countries froze HFC consumption levels in 2024, while a smaller group of Article 5 countries with high ambient temperatures are to freeze consumption in 2028.

The Kigali Amendment updates the MP's financial mechanism to support Article 5 countries' incremental costs of compliance. It also sets a 2033 deadline for parties to ban trade of HFCs with any country that has not ratified the amendment. The Kigali Amendment entered into force in 2019. The United States ratified it in 2022. As of October 2026, there were 176 parties to the Kigali Amendment. According to the National Oceanic and Atmospheric Administration, scientists estimate that compliance with the Kigali Amendment could avoid 0.3–0.5° Celsius of global warming by 2100, relative to a scenario without controls.

American Innovation and Manufacturing Act of 2020 (AIM)

AIM addresses domestic HFC use in three main ways: (1) phasing down HFC production and consumption through an allowance allocation program administered by the U.S. Environmental Protection Agency (EPA); (2) facilitating the transition to "next-generation technologies" by authorizing EPA to restrict the use of HFCs in the sector or subsectors in which they are used; and (3) directing EPA to promulgate regulations for purposes of maximizing reclaiming and minimizing releases of HFCs from equipment. Examples of "next-generation technologies" include hydrofluoroolefins (HFOs), which are sometimes referred to as "natural refrigerants" (e.g., CO_2, ammonia, and propane), and lower-GWP HFC blends.

AIM establishes a 15-year timeline to reduce domestic HFC production and consumption. AIM's phasedown schedule aligns with multiple aspects of international obligations to phase down HFCs under the Kigali Amendment to the MP. In AIM, *production* refers to the quantity of HFCs made in the United States, while *consumption* refers to the HFC domestic production plus imports minus exports. AIM phases down the same 18 HFCs as the Kigali Amendment. Benchmarking from a 2011-2013 baseline, AIM requires a 10% reduction in production and consumption within the first time period, 2020-2023, and an 85% reduction by the last, 2036 and beyond. AIM does not completely eliminate HFCs (see **Table 1**) and allows limited exceptions such as for *essential uses*, including for asthma inhalers and military fire suppression.

Table 1. American Innovation and Manufacturing Act of 2020 (AIM) Phasedown of HFCs

Time Period	Percentage of Reduction in HFC Production	Percentage of Reduction in HFC Consumption
2020-2023	10%	10%
2024-2028	40%	40%
2029-2033	70%	70%
2034-2035	80%	80%
2036 and beyond	85%	85%

Source: AIM, 42 U.S.C. §7675 (e)(2).

Note: The percentages shown are relative to production and consumption baselines specified in 42 U.S.C. §7675 (e)(1). The United States completed the initial 10% reduction phase and is currently implementing the 40% reduction step.

AIM directs EPA to administer an allowance allocation and trading program to implement the HFC phasedown. Pursuant to this mandate, EPA issues annual allowances for the production and consumption of HFCs, as well as application-specific allowances. AIM also addresses international trade of HFCs. It provides for EPA to reduce the number of U.S. production allowances when HFCs are exported and bans the export of HFCs to any country that has not enacted comparable requirements starting in 2023. The U.S. Court of Appeals for the D.C. Circuit has twice upheld EPA's HFC allowance allocations and trading regulations.

AIM authorizes EPA to evaluate petitions from any person to accelerate the phasedown schedule after 2024. Under the law, EPA must consider factors such as availability of substitutes, costs, and environmental impacts when deciding on petitions.

To support this HFC phasedown, EPA's Technology Transitions Program limits HFCs in specific sectors including refrigeration, air conditioning, heat pumps, foams, and aerosols. Technology Transition rules require shifts to lower-GWP alternatives in particular equipment and applications beginning in 2025, some of which EPA announced in March 2025 that it would reconsider. As a part of that reconsideration, in May 2026 EPA issued a final rule extending the compliance deadlines and revising certain GWP limits and other HFC requirements for specific sectors and subsectors, including residential air conditioning, retail food refrigeration, cold storage warehouses, and semiconductor manufacturing.

In addition, EPA has established a program for managing use and reuse of HFCs and substitutes, which regulates the management of HFCs used in equipment, such as refrigeration and air conditioning systems. As part of the program, EPA has established requirements for the installation, servicing, repair, and disposal of equipment containing HFCs and their substitutes.

The FY2022 reconciliation law (P.L. 117-169), sometimes referred to as the Inflation Reduction Act, appropriated $38.5 million for EPA to implement AIM, including $15 million for small business grants and $22.5 million for implementation and compliance. The FY2025 reconciliation law (P.L. 119-21), sometimes referred to as the One Big Beautiful Bill Act, rescinded unobligated funds previously appropriated under P.L. 117-169 to support EPA's implementation of AIM.

Considerations for Congress

Congress may consider several issues related to HFCs and their phasedown:

- Congress may consider oversight of U.S. participation in the international phasedown of HFCs under the Kigali Amendment. Areas of oversight may include compliance with international obligations, level of U.S. engagement in international decisionmaking, scientific and technical activities, and implementation-related coordination. Changes in staffing levels, organizational structure, or resource availability across agencies such as the State Department and EPA may affect capacity for U.S. participation in international cooperation to phase down HFCs.

- Congress may consider oversight, including hearings or legislation, regarding risks of illegal trade or misreporting of bulk HFCs and pre-charged equipment, such as air conditioning and refrigeration equipment, and coordination among EPA, U.S. Customs and Border Protection, and international partners. Oversight may include implementation of reporting requirements, enforcement activities, and federal monitoring programs that support detection of illegal trade and global compliance with HFC phasedown obligations.

- Congress may conduct oversight of domestic HFC phasedown activities, including EPA's allowance allocation and trading program, Technology Transitions rules and associated reconsiderations, and HFC management and reclamation requirements. The provisions in the rules—and the extent to which they are reconsidered, implemented, and enforced—may affect the pace of the U.S. phasedown of HFCs, its alignment with Kigali Amendment obligations, and implementation of the AIM Act. Some stakeholders have raised concerns about the domestic implementation of the phasedown, including potential consumer costs, compliance burdens, and implementation challenges. Others contend that these measures provide market certainty and investment signals that support the transition to lower-GWP alternatives and U.S. industry competitiveness in emerging global markets as well as facilitate progress toward phasedown requirements.

- Congress may also evaluate or appropriate additional funding to support implementation of the HFC phasedown under the Kigali Amendment and AIM. This could include bilateral or multilateral international support for HFC phasedown, such as U.S. contributions to the Multilateral Fund of the MP. Congress could also consider the role of domestic incentives—such as rebates or grants—in supporting adoption rates, market transitions, and consumer costs. For example, EPA has administered grants to support small businesses. Future appropriations could include similar programs or other incentives supporting the HFC phasedown. For example, programs could include federal grants and incentive programs, such as grants for commercial and industrial refrigeration or federal incentive programs for air conditioning with lower-GWP refrigerants. Congress also may determine that additional funding or incentives are not needed to support implementation of the HFC phasedown.

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