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Hydrofluorocarbons (HFCs): EPA and State Actions

Many fluorinated and chlorinated substances, including hydrofluorocarbons (HFCs) and chlorofluorocarbons (CFCs), are potent greenhouse gases (GHGs). Multiple scientific assessments conclude that anthropogenic GHGs (e.g., carbon dioxide [CO_2], HFCs, and CFCs) have been a major driver of observed climate change since 1950.

Recent legislative proposals—S. 2754, the American Innovation and Manufacturing Act of 2019, and H.R. 5544, the American Innovation and Manufacturing Leadership Act of 2020—would establish a schedule to reduce domestic HFC production and consumption. S. 2754 and H.R. 5544 would require implementation by the U.S. Environmental Protection Agency (EPA) and an 85% reduction by 2036 compared to a 2011-2013 baseline.

Background

HFCs are used in air conditioning, refrigeration, foam blowing agents, insulation, and other applications. HFCs were first manufactured in the context of efforts to reduce damage to the earth's stratospheric ozone layer. Stratospheric ozone absorbs harmful incoming solar radiation, and it also affects the earth's climate. HFCs are referred to as "substitute refrigerants" under Clean Air Act (CAA) Title VI regulations, because EPA approved HFCs as replacements for CFCs and other more potent ozone depleting substances (ODS).

Title VI of the CAA represents the United States' primary response domestically to abate stratospheric ozone depletion caused by manufactured chemicals. Title VI contains a phase-out schedule for ODS as well as several implementing strategies to avoid releases of ODS to the atmosphere, such as an allowance trading program; requirements for labeling, recovery, and recycling of ODS; a program to approve safer substitutes for ODS; and certification requirements for technicians who service equipment containing ODS.

To address HFC emissions and their projected effect on climate change, EPA promulgated changes to the regulatory requirements for HFCs under Title VI of the CAA. The 2015 and 2016 rulemakings, discussed further below, have been subject to legal challenges to EPA's authority to regulate HFCs under CAA Title VI. (For more about EPA's authority to regulate HFCs, see CRS Legal Sidebar LSB10155, *D.C. Circuit Rejects EPA's Efforts to Ban Hydrofluorocarbons: Part 2*.)

Title VI also implements U.S. international responsibilities under the Montreal Protocol on Substances that Deplete the Ozone Layer (and its amendments). International cooperation to phase down CFCs and other ODS has been effective under the Montreal Protocol. Given the global nature of HFCs and other GHGs emissions, efforts to effectively address climate change will likely need to occur on a global scale. In 2016, nearly 200 nations, including the United States, agreed to the Kigali Amendment to the Montreal Protocol, which contains commitments to phase down global production and consumption of HFCs because they are potent GHGs that substitute for ODS controlled under the protocol. The United States is a party to the Montreal Protocol. As of May 2020, the United States is not party to the Kigali Amendment.

Absent mitigation actions, global HFC emissions and consumption are projected to increase, especially in developing countries as demand is expected to rise for cooling services that would use HFCs. In developed countries, projected emissions increases are driven primarily by the aging and replacement of existing ODS-using equipment (EPA, *Global Non-CO_2 GHG Emission Projections and Mitigation, 2015-2050*, 2019). Several means can reduce HFC production and consumption. These include conserving and recycling HFCs, substituting other substances (e.g., ammonia or CO_2) that are less potent GHGs than HFCs, and modifying the technologies that use HFCs, including greater energy efficiency. (For more about energy efficiency standards, see CRS In Focus IF11354, *Department of Energy Appliance and Equipment Standards Program*.)

Many industry groups and environmental NGOs support U.S. ratification of the Kigali Amendment, as well as EPA regulation to assure compliance with it. According to industry groups that support U.S. ratification of Kigali, a domestic commitment to phase down HFCs would allow chemical manufacturers to remain competitive in international markets, which have begun transitioning to new refrigerant technologies under the treaty. Some stakeholders oppose U.S. ratification of Kigali, citing concerns about consumer costs, such as those from maintaining or purchasing new air conditioners, or potential unavailability of substitutes. (See CRS In Focus IF10904, *Potential Hydrofluorocarbon Phase Down: Issues for Congress*.) Others' concerns include use of the Montreal Protocol to address GHGs and limits on U.S. sovereignty of any treaty.

Significant New Alternatives Policy

CAA Section 612 authorized EPA to establish Significant New Alternatives Policy (SNAP), a program to approve "safer" substitutes for ODS. Under SNAP, EPA evaluates alternatives to ODS production and use, creating lists of "acceptable" and "unacceptable" substitutes. CAA Section 612(c) directs EPA to consider if the substitute "reduces the overall risk to human health and the environment" and is "currently or potentially available." EPA makes this

determination based on seven criteria: (1) atmospheric effects and related health and environmental impacts, (2) general population risks from ambient exposure to compounds with direct toxicity and to increased ground-level ozone, (3) ecosystem risks, (4) occupational risks, (5) consumer risks, (6) flammability, and (7) cost and availability of the substitute (40 C.F.R. §82.180(a)(7)).

In the 1990s and early 2000s, EPA approved certain HFCs and HFC-containing blends as acceptable substitutes for ODSs. In 2015, EPA finalized a rule that changed the status of various HFCs and HFC-containing blends, listing some as unacceptable for various end-uses in the aerosols, refrigeration and air conditioning, and foam blowing sectors. EPA cited HFC contributions to global climate change ("atmospheric effects") and based the rule on its determination that "other substitutes are available for the same uses that pose lower risk overall" to health and the environment (80 *Federal Register* 42870, July 20, 2015).

In 2017, a federal court vacated the 2015 rule "to the extent it requires manufacturers to replace HFCs with a substitute substance" and remanded the rule to EPA for further proceedings (see CRS Legal Sidebar LSB10154, *D.C. Circuit Rejects EPA's Efforts to Ban Hydrofluorocarbons: Part 1*). In 2018, EPA suspended enforcement of the HFC limits from the 2015 rule while it addressed the court's remand through a notice-and-comment rulemaking (83 *Federal Register* 18433, April 27, 2018). As of the date of this publication, EPA has not proposed a rule to address the remand. In April 2020, the U.S. Court of Appeals for the D.C. Circuit vacated EPA's 2018 notice and remanded it to the agency for further consideration (Natural Res. Def. Council v. Wheeler, No. 18-1172, 2020 U.S. App. LEXIS 10846 (D.C. Cir. Apr. 7, 2020)).

Refrigerant Management Practices

CAA Section 608 requires EPA to establish a refrigerant management program, including regulations for proper handling of ozone-depleting refrigerants recovered during the maintenance, service, repair, and disposal of air conditioning and refrigeration appliances. The CAA requires reductions of use and emissions of certain ODS to the "lowest achievable level" and to "maximize the recapture and recycling of such substances" (42 U.S.C. §7671g(a)). CAA Section 608(c), referred to as the "venting prohibition," prohibits the knowing venting, release, or disposal of ODS during maintenance, service, repair, or disposal of air conditioning and refrigeration appliances. Unless otherwise exempted, substitute refrigerants are subject to the venting prohibition (42 U.S.C. §7671g(c)).

EPA first promulgated regulations for the refrigerant management program in 1993 and later revised them on various occasions. The regulations include provisions related to leaks, referred to as "maintenance and leak repair," and provisions related to knowing releases (e.g., venting), referred to as "non-leak repair."

In 2016, EPA revised the refrigerant management regulations for ODS and extended the maintenance, leak repair, and non-leak repair requirements to apply to HFCs and other substitutes as appropriate (81 *Federal Register* 82272, November 18, 2016). For example, the 2016 rule lowered the leak rate threshold for repairing certain appliances with ODS and extended this requirement to appliances with HFCs and other substitute refrigerants. In 2019, a federal court vacated the 2016 rule "to the extent it requires manufacturers to replace HFCs that were previously and lawfully installed as substitutes" for ODS (Mexichem Fluor, Inc. v. EPA, 866 F.3d 451, 464 (D.C. Cir. 2017)).

In 2020, EPA rescinded the portions of the 2016 rulemaking that extended maintenance and leak repair requirements to appliances using HFCs and other substitute refrigerants (85 *Federal Register* 14150, March 11, 2020). Other provisions from the 2016 rule remain in effect, including extension of non-leak repair requirements to HFCs and other substitutes. EPA cited a change in its legal interpretation as the basis for the 2020 rule, concluding that it lacks legal authority to extend the maintenance and leak repair requirements to substitute refrigerants. EPA determined that the extension of non-leak repair requirements to substitutes was within its legal authority. EPA interprets CAA Sections 608(a) and (c) as providing "some authority to regulate substitute refrigerants" but that authority is more limited than for ODS (85 *Federal Register* 14160, March 11, 2020).

State Actions on HFCs

In 2018, the U.S. Climate Alliance, which includes 24 states and Puerto Rico, committed to reduce HFCs and other potent GHGs. At least four of these states—California (SB 1013, SB 1383), Washington (HB 1112), Vermont (Act 65), and New Jersey (A-5583/S-3919)—enacted legislation to phase down HFCs. These laws incorporate certain provisions from EPA's 2015 and 2016 HFC rulemakings as they were prior to the partial vacature by federal courts. For example, they prohibit use of certain HFC refrigerants and authorize phasedown schedules. At least two more state legislatures are considering bills to reduce HFCs (Oregon, Hawaii). At least eight other states announced plans to reduce HFCs. Some have begun developing or proposed regulations to phase down HFCs. While this is not an exhaustive list of state-level HFC initiatives, these examples illustrate a range of state actions.

Potential Issues for Congress

Congress may exercise oversight or consider legislative proposals to reduce HFC production and consumption. Issues include potential climate and economic impacts of federal and judicial actions as well as the influence of policy options on projected availability and costs of HFC replacements. Congress may consider federal and state roles and interactions, including the influence of federal options and states' efforts on scope, ambition, cost, and timing of abating climate change impacts. Congress may also examine consistency among states' efforts, the effect of federal preemption of state actions to transition to HFC replacements, and implications for certainty of business investments. In that context, Congress may consider past examples of federal preemption of state actions—for example, the tailored ODS state preemption provisions in the 1977 CAA Amendments.

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