No. 17-

IN THE

Supreme Court of the United States

HONEYWELL INTERNATIONAL INC., ET AL.,

Petitioners,

v.

MEXICHEM FLUOR, INC., ET AL.,

Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit

PETITION FOR A WRIT OF CERTIORARI

THOMAS A. LORENZEN
ROBERT J. MEYERS
CROWELL & MORING LLP
1001 Penn. Ave., NW
Washington, DC 20004
(202) 624-2500
tlorenzen@crowell.com

Counsel for Petitioner The Chemours Company FC, LLC

LISA S. BLATT
Counsel of Record
JONATHAN S. MARTEL
ELISABETH S. THEODORE
ANDREW T. TUTT
STEPHEN K. WIRTH
ARNOLD & PORTER KAYE SCHOLER LLP
601 Mass. Ave., NW
Washington, DC 20001
(202) 942-5000
lisa.blatt@arnoldporter.com

DAVID B. RIVKIN JR.
BAKER & HOSTETLER LLP
1050 Conn. Ave., NW
Washington, DC 20036
(202) 861-1500
drivkin@bakerlaw.com

Counsel for Petitioner Honeywell International Inc.

QUESTION PRESENTED

Section 612 of the Clean Air Act makes it unlawful to "replace" an ozone-depleting substance with any "substitute substance" that EPA "determines may present adverse effects to human health or the environment," if EPA has identified "an [available] alternative to such replacement that … reduces the overall risk to human health and the environment." 42 U.S.C. § 7671k(c). In 1994, EPA approved hydroflourocarbons (HFCs) as "near-term" substitutes for ozone-depleting chemicals in several end uses. But in 2015, EPA determined that, for certain products and uses, available alternatives reduce the overall risk to health and the environment compared to certain HFCs. Accordingly, and per § 612's instruction, EPA prohibited the use of those HFCs where safer available alternatives may be used instead.

In the decision below, however, the D.C. Circuit held that the word "replace" in § 612 refers only to the initial replacement of an ozone-depleting substance with a non-ozone-depleting substitute, not to subsequent uses of that same substitute or any other substitute. The court held that EPA cannot apply § 612 to any manufacturer or user that has already "replaced" an ozone-depleting substance with a non-ozone-depleting substitute, like an HFC. The court held that such entities are forever free to continue using the original substitutes, no matter how harmful they are compared to safer substitutes that enter the market.

The question presented is whether, under the "safe alternatives policy" of § 612 of the Clean Air Act, EPA lacks authority to prohibit the use of a less-safe substitute for an ozone-depleting substance in favor of a safer alternative, just because a company has already begun using the less-safe substitute.

PARTIES TO THE PROCEEDING

Petitioners, who intervened as respondents below, are Honeywell International Inc., and The Chemours Company FC, LLC. The Natural Resources Defense Council, which also intervened below, is petitioning separately.

Respondents Arkema Inc. and Mexichem Fluor, Inc., were petitioners below. Respondent Environmental Protection Agency was respondent below.

CORPORATE DISCLOSURE STATEMENT

Honeywell International Inc. has no parent corporations and there are no publicly held corporations known to Honeywell that own 10% or more of the outstanding shares of Honeywell's common stock.

The Chemours Company FC, LLC, is a wholly owned subsidiary of The Chemours Company, which is a publicly traded company. No publicly held corporation other than The Chemours Company owns 10% or more of The Chemours Company FC, LLC's stock.

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The opinion of the U.S. Court of Appeals for the D.C. Circuit is reported at 866 F.3d 451. App. 1a.

JURISDICTION

The D.C. Circuit issued its opinion on August 8, 2017. App. 1a. The court denied rehearing en banc on January 26, 2018. App. 47a. On March 8, 2018, the Chief Justice extended the time to file a petition for certiorari until June 25, 2018. This Court has jurisdiction pursuant to 28 U.S.C. § 1254(1).

STATUTES AND REGULATORY PROVISIONS INVOLVED

Section 612 of the Clean Air Act, Pub. L. No. 101-549, tit. VI, § 602(a), 104 Stat. 2667 (1990) (codified at 42 U.S.C. § 7671k), provides:

> (a) Policy
>
> To the maximum extent practicable, class I and class II substances [*i.e.*, ozone-depleting substances] shall be replaced by chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment.
>
> …
>
> (c) Alternatives for class I or II substances
>
> Within 2 years after November 15, 1990, the Administrator shall promulgate rules under this section providing that it shall be unlawful to replace any class I or class II substance with any substitute substance which the Administrator determines may present adverse effects to human health or the environment, where the Administrator has identified an alternative to such replacement that—

> (1) reduces the overall risk to human health and the environment; and
>
> (2) is currently or potentially available.
>
> The Administrator shall publish a list of (A) the substitutes prohibited under this subsection for specific uses and (B) the safe alternatives identified under this subsection for specific uses.
>
> (d) Right to petition
>
> Any person may petition the Administrator to add a substance to the lists under subsection (c) of this section or to remove a substance from either of such lists. The Administrator shall grant or deny the petition within 90 days after receipt of any such petition. If the Administrator denies the petition, the Administrator shall publish an explanation of why the petition was denied. If the Administrator grants such petition the Administrator shall publish such revised list within 6 months thereafter. …

Relevant portions of EPA's regulations implementing § 612 of the Clean Air Act are reproduced at App. 49a-128a.

STATEMENT OF THE CASE

In 1990, Congress enacted Title VI of the Clean Air Act, with three goals: to phase out the use of ozone-depleting chemicals, to replace those chemicals with the safest possible alternatives, and to incentivize the development of safer alternatives. To that end, Congress enacted § 612, the aptly-titled "safe alternatives policy." Section 612 mandates the substitution not simply of non-ozone-depleting alternatives, but of alternatives that "reduce *overall risks* to hu-

man health and the environment." 42 U.S.C. § 7671k(a) (emphasis added); *see id.* § 7671k(b), (c). To incentivize the significant investment needed to develop safer alternatives, Congress required EPA to maintain and update lists of prohibited and permissible alternatives, and allowed any person to petition EPA to move substances from one list to the other. *Id.* § 7671k(c), (d).

In 1994, EPA implemented Congress's mandate through the Significant New Alternatives Policy—or "SNAP"—program. Since then, EPA has periodically moved substances from the acceptable to the unacceptable list as technology evolved and safer alternatives became available. In the 2015 final rule here at issue, EPA prohibited the use of certain HFCs, which do not deplete the ozone layer but contribute significantly to global warming, in certain products such as new commercial refrigeration systems and motor-vehicle air conditioners. EPA relied on the development of alternative chemicals that contribute almost nothing to global warming.

In the decision below, a divided D.C. Circuit disregarded the plain text of the Clean Air Act, gutting this crucial 25-year-old environmental program and upending over a billion dollars in U.S. investments made in reliance on the program. The court held that EPA is powerless under § 612 to regulate any company that has previously replaced ozone-depleting chemicals with non-ozone-depleting chemicals—even if the replacement turns out to be *worse* overall for human health and the environment than the ozone-depleting chemicals were in the first place, and even if safer non-ozone-depleting alternatives have become available. The court reasoned, in essence, that there can be only one "replacement" per regulated party, and EPA can only regulate that ini-

tial replacement. The court thus held that EPA *could* add HFCs to the prohibited list where a safer alternative became available, but that EPA could not *apply* the prohibition to manufacturers or others that had already begun using HFCs. Under this Alice-in-Wonderland approach, the very entities Congress sought to target—the ones actually manufacturing or using products with an unsafe substitute—are immune from regulation.

The decision calls out for this Court's review. It cuts out the heart of EPA's statutory authority to ensure the adoption of safer alternative chemicals in millions of everyday products, from aerosols to air-conditioning to refrigeration. SNAP is not a new or controversial program, and the regulatory provision banning use of substances on the prohibited list has been around since 1994. But as Judge Wilkins explained in dissent, the majority's "extreme" interpretation of § 612 "makes a mockery of the statutory purpose" to replace ozone-depleting chemicals with the safest available alternatives. App. 34a-35a.

Petitioners Honeywell and Chemours and their suppliers have invested over $1 billion in creating and commercializing alternative CFC replacements that are safer than HFCs. They made this investment in reliance on the decades-old statutory and regulatory framework promising to reward innovation in the U.S. market, while their non-U.S. competitors continued to make older, less safe products. The decision robs petitioners of the benefits of their investment, perversely rewards the companies who did nothing by keeping the U.S. market open to their products no matter how unsafe, and all but eliminates industry's incentive to invest in new innovative and safe chemicals going forward.

The environmental consequences of this decision are equally alarming. EPA prohibited certain uses of HFCs because they are so-called super greenhouse gases that contribute enormously to climate change. 80 Fed. Reg. 42,870, 42,879, 42,944 (2015); J.A. 213.[1] HFC use continues to grow rapidly; by 2050, the annual global-warming impact of HFC emissions could be equivalent to 27% to 69% of the world's carbon dioxide emissions. *Id.* The alternative compounds that petitioners developed have a negligible global-warming potential, less than 1/1000th of the impact of HFCs. *Id.* Whether § 612 of the Clean Air Act allows EPA to prohibit those who have begun using HFCs from continuing to do so will have profound effects on the climate.

But make no mistake: the health and safety effects of the decision below extend far beyond climate impacts. The majority held that EPA cannot regulate any product manufacturer once it has "replaced" its ozone-depleting chemicals with non-ozone depleting substitutes, even if those substitutes later turn out to cause cancer or kidney damage—or any other disease. The manufacturer is forever free to continue using the unsafe substitute. A manufacturer could even switch from a benign substitute to one EPA has prohibited for decades.

The decision is irreconcilable with the text and purpose of the statute and with decades of EPA practice and oversight, and it has created enormous nationwide uncertainty, both for industry and regulators. In a recent guidance document attempting to apply the court's decision, EPA admitted that it could not say what the court even meant by its distinction

[1] "J.A." refers to the Joint Appendix filed in the D.C. Circuit.

between manufacturers who had already "replaced" ozone-depleting chemicals and those who had not—given that manufacturers and others make and use multiple products in multiple end-uses at multiple facilities. 83 Fed. Reg. 18,431, 18,435-36 (Apr. 27, 2018). Nor does EPA have any idea how to apply the decision to retailers or end-users who—to give just one example—may have replaced ozone-depleting chemicals with HFCs in some equipment at some stores but not others.

In the end, EPA gave up trying, stating that it would not apply *any* aspect of the 2015 Rule's HFC prohibitions against *anyone*, manufacturer or otherwise, pending a full-blown rulemaking to try to make sense of the mess the decision below has created. The result will be an extended period of uncertainty that could last for years, inevitably followed by many more years of litigation challenging EPA's guidance and the new rulemaking.

The situation is untenable, and this Court should grant review. A decision of this magnitude gutting an important, longstanding regulatory scheme would merit review in any event, but the irreversible environmental consequences and the chaos the decision has unleashed on a multi-billion-dollar industry render immediate review imperative. The D.C. Circuit has exclusive jurisdiction over challenges to SNAP rules. There is no possibility of further percolation, and the decision below will be permanent unless this Court steps in.

A. The 1990 Clean Air Act Amendments and the Significant New Alternatives Policy

1. In 1990, Congress amended the Clean Air Act to add Title VI, which phases out the use of ozone-depleting substances, commonly used in products

like aerosols, air conditioners, and refrigeration systems. Pub. L. No. 101-549, 104 Stat. 2468 (codified at 42 U.S.C. §§ 7671-71q). Most relevant here, Title VI also directs EPA to promulgate regulations governing the development and use of alternatives to certain ozone-depleting substances, particularly chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which Title VI designates "class I" and "class II" substances, respectively. 42 U.S.C. § 7671a(a)-(b).

Importantly, Congress was not simply concerned with eliminating ozone-depleting chemicals themselves, but also with ensuring that their elimination does not result in other dangers to human health or the environment. Section 612(a) thus provides that, "[t]o the *maximum extent practicable*, [ozone-depleting] substances shall be replaced by chemicals, product substitutes, or alternative manufacturing processes that *reduce overall risks* to human health and the environment." *Id.* § 7671k(a) (emphases added). Section 612(c) implements this directive by providing that "it shall be unlawful to replace any [ozone-depleting] substance with any substitute substance which the Administrator determines may present adverse effects to human health or the environment" where alternatives that "reduce[] the overall risk to human health and the environment" are "currently or potentially available." *Id.* § 7671k(c).

Section 612(c) further requires EPA to publish a list of prohibited substitutes and safe alternatives for specific uses. *Id.* And § 612(d) requires EPA to update these lists continually. It allows any person to petition EPA at any time to "add a substance to" or "remove a substance from" either list. *Id.* § 7671k(d). The statute requires EPA to respond within 90 days

and to publish any revisions to the lists within six months. *Id.*

2. In 1994, EPA promulgated regulations establishing the SNAP program, a framework for carrying out the Agency's obligation under § 612 to identify safe alternatives and prohibit the use of less-safe ones. *See* 40 C.F.R. pt. 82, subpt. G; 59 Fed. Reg. 13,044 (Mar. 18, 1994). As Congress mandated in § 612, SNAP promotes the use of alternatives that not only present lower overall risks to human health and the environment relative to the ozone-depleting substances being phased out, but also lower risks relative to *other* potential substitutes. *See* 40 C.F.R. § 82.170(a).

The SNAP regulation adopted a "comparative risk framework," under which EPA continually evaluates substitutes by end-use, such as motor-vehicle air conditioning or aerosol propellants. For each end-use, EPA restricts the use of substitutes that present relatively higher risks to human health or the environment, considering the cost and availability of alternative substitutes. *See* 59 Fed. Reg. at 13,046. EPA classifies alternatives as "acceptable" (safe) or "unacceptable" (prohibited) for a specific use. 40 C.F.R. § 82.180(a)(7), (b). The 1994 rule declared that "[n]o person may use a substitute after" the effective date of a rule adding the substitute to the unacceptable list. 40 C.F.R. § 82.174(d).

The 1994 rule also made clear that listings, once made, are not set in stone. EPA interpreted § 612 in 1994 to permit the Agency to change the acceptability status of substitutes based on new data regarding other substitutes, so that substitutes could be prohibited in favor of safer substitutes as they were developed. 59 Fed. Reg. at 13,047, 13,063. EPA explained

that its ability to remove substances from the acceptable list would maintain "marketplace incentive[s] for continuing research and investment into new, potentially environmentally superior substitutes." Response to Comments on the Significant New Alternatives Policy Rule (1994 RTC) 10 (Mar. 15, 1994) (reproduced at J.A. 37-129).

EPA further explained that "[ozone-depleting substances] are 'replaced' within the meaning of section 612(c) each time a substitute is used, so that once EPA identifies an unacceptable substitute, any future use of such substitute is prohibited." 59 Fed. Reg. at 13,048. In other words, when a product manufacturer that used ozone-depleting chemicals makes a refrigerator with a substitute chemical on Monday, it is still "replacing" ozone-depleting chemicals when it makes a second refrigerator with a substitute on Tuesday. Otherwise, EPA noted, a manufacturer could end-run the Agency's regulatory authority by starting to use a non-ozone-depleting substitute before EPA had a chance to deem it unacceptable, thus forever insulating use of potentially dangerous substitutes from regulation. *Id.*

3. EPA has continually maintained and updated the lists of acceptable and unacceptable substitutes for each end-use. Since 1994, the Agency has issued 21 rules and 33 notices concerning the SNAP program, and has consistently exercised its authority to add substances to the prohibited list as safer substitutes became available. *See* EPA, *Significant New Alternatives Policy (SNAP): SNAP Regulations*, goo.gl/Uq1GjC.

B. The 2015 Rule

1. When EPA promulgated the 1994 rule, the Agency approved certain HFCs, like HFC-134a, as

"near-term option[s]" to replace certain ozone-depleting chemicals. *See* 59 Fed. Reg. at 13,072. HFCs are used in a variety of applications, including aerosols, foams, refrigeration, and air conditioners. But while HFCs do not deplete the ozone layer, they are extremely potent greenhouse gases and major contributors to climate change. J.A. 201, 205. Recognizing as much, and consistent with EPA's view that it could disapprove previously-approved substitutes, the Agency in 1994 approved HFCs but reserved the option to prohibit their continued use later. 59 Fed. Reg. at 13,071-72.

Since then, HFC use has increased dramatically—and is expected to accelerate with increased demand for refrigeration and air conditioning worldwide. J.A. 237. At the same time, EPA and the scientific community have come to better understand the harmful effects of greenhouse gases, including HFCs, on human health and the environment. EPA has concluded that the adverse effects of climate change—both observed and projected—include sickness or mortality from reduced air quality, intensified heat waves, and more frequent and intense storms and droughts. 74 Fed. Reg. 66,496, 66,497-99, 66,516-36 (Dec. 15, 2009).

2. Honeywell and Chemours have invested significantly to research and develop new, safer substitutes for CFCs that neither deplete the stratospheric ozone layer *nor* materially contribute to climate change. These investments culminated in the invention of the breakthrough product HFO-1234yf and other hydrofluoroolefins. In 2011, EPA approved HFO-1234yf as a substitute for CFC-12 for use in motor-vehicle air-conditioning systems. 76 Fed. Reg. 17,488, 17,489 (Mar. 29, 2011). HFO-1234yf does not deplete the ozone layer and has a global-warming po-

tential that is 99.98% less than that of HFC-134a, an original substitute for CFCs. *See* 80 Fed. Reg. at 42,888. Similarly, Honeywell developed HFO-1233zd(E), which can replace ozone-depleting chemicals in foam blowing and other applications and reduces carbon-dioxide equivalent emissions by 99.3% to 99.9% compared to HFCs. J.A. 247.

3. In 2015, after a lengthy rulemaking process, EPA determined that certain HFCs should be removed from the SNAP acceptable-substitutes list and placed on the unacceptable list for certain end-uses. 80 Fed. Reg. at 42,870. EPA concluded that certain HFCs in certain products and uses posed a greater risk to human health and the environment than other available CFC substitutes. *Id.* at 42,871-73. EPA explained that its decision furthered "the overall goal of the SNAP program … to ensure that substitutes listed as acceptable do not pose significantly greater risk[s] to human health and the environment than other available substitutes." *Id.* at 42,877.

EPA tailored its analysis by sector (*e.g.*, aerosols, foams, refrigeration, or air conditioning) and by specific end-use (*e.g.*, aerosol propellants or aerosol solvents). For example, EPA determined that HFC-134a remains acceptable for use in certain cleaning products due to the lack of safer available alternatives. But EPA determined that HFC-134a is no longer acceptable in most new motor-vehicle air conditioners beginning in 2021, because HFO-1234yf and other substitutes are both safer and available for that end-use. *Id.* at 42,888.

C. Proceedings Below

1. Respondents Mexichem Fluor and Arkema are multinational corporations that make HFC-134a for use in a variety of products, but have not developed

and do not produce HFC alternatives. They petitioned for review of the 2015 Rule in the D.C. Circuit. They argued that EPA lacked authority to prohibit HFCs, on the theory that HFCs had already "replaced" ozone-depleting chemicals in various sectors and that EPA could not order "replacements of replacements." App. 38a (quoting Pet'rs' Br. 29). They further claimed that EPA's decision to move certain HFCs to the unacceptable-substitute list was arbitrary and capricious. Petitioners Honeywell and Chemours, along with the Natural Resources Defense Council, intervened below in support of the EPA.

2. The court of appeals unanimously concluded that § 612 allows EPA to consider the risks of climate change, and that EPA could permissibly move HFCs to the unacceptable substitute list because HFOs and other alternatives with substantially lower global-warming potentials are now available. App. 22a-25a. The court held that EPA had properly concluded that certain HFCs posed a "significantly greater risk" than these safer, available alternatives. App. 23a.

But, in a divided decision, the court held that EPA lacks authority under § 612(c) to apply the prohibition against continued use of HFCs to manufacturers that had already "replaced" ozone-depleting substances with HFCs. In both the 1994 regulations and the 2015 Rule, EPA had explained that § 612(c) renders it "unlawful to replace any [ozone-depleting substance] with any substitute substance" where an available alternative substitute would reduce overall risk to human health or the environment. EPA advised the court that the 2015 Rule simply rendered it unlawful to continue to replace ozone-depleting substances with certain HFCs for end-uses where safer alternatives were now available. App. 13a-14a. Un-

der *Chevron*, the court was required to defer to EPA's reasonable interpretation of § 612. But the court did not defer. It held that, under step one of *Chevron*, "replace" has only one meaning—to "take the place of" the thing that came immediately before—and that, consequently, a "replacement" of an ozone-depleting substance can only happen once. App. 14a-16a.

The court accordingly held that if a product manufacturer had substituted HFCs for an ozone-depleting chemical at any point prior to 2015, then any subsequent chemical the manufacturer used did not "replace" an ozone-depleting chemical, even if the chemical's sole purpose was to perform the function of the ozone-depleting chemical. App. 11a-15a. The court thus "vacate[d] the 2015 rule to the extent it requires manufacturers to replace HFCs with a substitute substance." App. 26a. The court stated in a footnote that its reasoning "applie[d] to any regulated parties," not just manufacturers. App. 10a.

3. Judge Wilkins dissented. He explained that the plain text of the statute at minimum *permitted* EPA's interpretation, because "the term 'replace' is susceptible of multiple interpretations in this context." App. 27a. Indeed, while the majority asserted that "replace" can only mean "to take the place of," Judge Wilkins observed that every dictionary the majority cited includes an alternative definition that supported EPA's interpretation. App. 30a. The dictionaries provide that "replace" can also mean "to provide a substitute for," in the sense that HFCs and HFOs both serve as substitutes for ozone-depleting substances. *Id.* Judge Wilkins criticized the majority for disregarding *Chevron*. App. 37a.

Judge Wilkins further observed that the court's holding "makes a mockery of the statutory purpose" to replace ozone-depleting chemicals "[t]o the maximum extent practicable" with substitutes that "reduce overall risks to human health and the environment." App. 34a (quoting 42 U.S.C. § 7671k(a)). Under the majority's interpretation, manufacturers and others who replace an ozone-depleting chemical with a substitute have a permanent grandfather clause for use of that substitute, no matter how harmful it turns out to be or how safe newer substitutes are in comparison. *Id.* And they can easily circumvent the statutory scheme simply by replacing an ozone-depleting chemical with a non-ozone-depleting substitute before EPA has a chance to evaluate it. *Id.*

Judge Wilkins noted that the majority's "cramped" interpretation of § 612 was so "extreme" that not even Mexichem and Arkema had advanced it. App. 35a. He observed that the majority's interpretation rendered EPA "powerless" under § 612 and had "no semblance of consistency" with Congress's purpose to reduce "overall risks" to human health and the environment. App. 34a-35a.

4. On remand, EPA and industry stakeholders have struggled to understand, much less apply, the court's opinion and judgment. In recently published guidance, EPA has explained that, not only has the partial vacatur of the 2015 Rule caused "substantial confusion and uncertainty," but EPA is incapable of implementing it. 83 Fed. Reg. at 18,433-34. Although the court vacated the 2015 Rule only "to the extent it requires manufacturers to replace HFCs with a substitute substance," App. 26a, EPA stated that the distinction the court drew was irreconcilable with the way the SNAP program has operated since 1994. EPA accordingly declared that, pending a new

rulemaking to take place at some unspecified future time, it "w[ould] not apply the HFC use restrictions or unacceptability listings in the 2015 rule *for any purpose*"—even for purposes the D.C. Circuit upheld as lawful, such as prohibiting manufacturers from switching to HFCs for the first time. 83 Fed. Reg. at 18,433 (emphasis added).

REASONS THE PETITION SHOULD BE GRANTED

I. The Decision Below Upends an Important Federal Regulatory Scheme, Undermines Investments, and Will Harm the Environment

The "safe alternatives policy" mandated by § 612 is an immensely consequential federal program designed to foster the development and use of the safest available substitutes for ozone-depleting substances in millions of products. The decision below eviscerated it. The vast majority of manufacturers today have already begun using substitutes for ozone-depleting chemicals, but many substitutes threaten harm to health and the environment. The decision robs EPA of the authority to regulate substitutes in precisely the circumstances on which § 612 focuses: where companies are in fact *using* less-safe substitutes despite the ready availability of safer ones. The decision drains an extremely effective 25-year-old federal statute of nearly all its force, and this Court's review is warranted for that reason alone.

At the same time, the decision upends investment-backed expectations of petitioners and other companies who heeded Congress's call to innovate, based on the promise that EPA would bar unsafe products as safer alternatives were developed. Petitioners and their suppliers invested over $1 billion in reliance on this longstanding statutory and regulato-

ry regime. The decision below renders the statutory incentives a nullity and will spur a race to the bottom in which manufacturers may compete to supply and use the cheapest substitutes on the market, disregarding environmental or health consequences.

And those consequences will be severe and irreparable. The court held that § 612 permits manufacturers who are using HFCs as substitutes for ozone-depleting chemicals across the air-conditioning, refrigeration, aerosol, and countless other sectors to continue doing so indefinitely. The court so held even though HFCs are the fastest-growing contributor to climate change; scientists estimate that by 2050 the climate effects of HFC emissions could be equivalent to 27% to 69% of the world's total carbon dioxide emissions. EPA has no viable regulatory authority in this space other than § 612.

The decision is also causing chaos for U.S. businesses. EPA has explained that it can neither administer nor enforce the D.C. Circuit's distinction between manufacturers who have already "replaced" ozone-depleting chemicals and those who have not. 83 Fed. Reg. at 18,435. EPA has accordingly given up on carrying out the regulatory scheme. The Agency announced that it will not apply its prohibition of HFCs *at all*—even as to manufacturers and others who have not yet "replaced" ozone-depleting chemicals—pending a rulemaking that has yet to commence and that is of uncertain scope and duration.

It would be difficult to imagine a decision more disruptive to the express statutory purpose, to the environment, and to industry than the decision below. This Court's review is urgently needed.

A. The Decision Below Disrupts a Critical, Carefully-Crafted Federal Program Designed to Promote the Safety of Millions of Products

1. The decision below dramatically curtails EPA's authority under § 612 of the Clean Air Act and guts an immensely consequential regulatory program.

Since 1994, § 612 has been the principal means by which the government regulates the health and environmental impacts of refrigerants, foam-blowing agents, and propellants used in air conditioners, refrigeration, foams, aerosols, and solvents—ubiquitous products that historically were ozone-depleting. 80 Fed. Reg. at 42,874; J.A. 504-05. In Title VI, Congress directed the phase-out of these ozone-depleting chemicals. But it also required more: § 612 specifically directs EPA to ensure that companies use the *safest* available substitutes, the ones that "reduce overall risks." 42 U.S.C. § 7671k(a), (c). EPA's continually-updated lists of acceptable and unacceptable substitutes are the statutorily mandated mechanism by which the Agency implements Congress's directive. *Id.* Since 1994, EPA has issued more than a dozen rules requiring companies ranging from automobile manufacturers to supermarkets to phase out harmful substitutes where safer substitutes are available.

The decision below renders Congress's express directive a dead letter. As Judge Wilkins observed in dissent, the decision means that, once a manufacturer has substituted a non-ozone-depleting substance for an ozone-depleting substance, EPA loses all authority under § 612 to ensure the safety of that substitute. App. 34a-35a. The lists of prohibited and permissible substitutes that §§ 612(c) and (d) require EPA to maintain and continually update will become

toothless, as will the petition process in § 612(d). The decision below means that EPA cannot require the very parties that are *using* the prohibited substitute to stop. EPA is limited instead to applying its prohibition to the few companies still using ozone-depleting substances. In short, the decision perversely immunizes the continued use of the very chemicals that are most widespread and that cause the most risk to human health and the environment—such as HFCs. And the decision impedes their replacement by newer and safer chemicals, frustrating Congress's goal in enacting § 612 and creating the SNAP program.

2. The consequences are breathtaking. Under the decision below, every manufacturer or end user that has ever replaced an ozone-depleting chemical with an HFC now has a license to continue using HFCs indefinitely, even though far-safer alternatives can serve the same function. HFCs, like the ozone-depleting products for which they substitute, are used in nearly every aspect of everyday life to create foam, propel liquids and gases, and adjust temperatures. They are used in commercial, industrial, and consumer refrigeration and air-conditioning equipment, vehicle air conditioners, foam products, aerosols, fire protection systems, and solvents. J.A. 212.

It is hard to overestimate the sheer number of products this decision unsettles. U.S. manufacturers sold nearly *four billion* units of aerosol products in 2011. J.A. 506. A mere subset of HFC-containing aerosol products known as "consumer aerosols" includes "[c]osmetics, hairspray, body sprays, and deodorants; automotive products such as tire inflators, auto lubricants, and brake cleaners; noise horns and safety horns; animal repellants; spray adhesives …; household cleaning products; hand-held spray paint

cans; eyeglass and keyboard dusters; consumer freeze sprays …; air fresheners; food dispensing products; … artificial snow, plastic string, noise makers, and cork poppers." 79 Fed. Reg. at 46,136.

Mobile air conditioning offers a paradigmatic window into the importance of the decision below. As of 2017, the U.S. produced more than 11 million new cars and light trucks annually; 98% have air conditioning.[2] In other words, just with respect to cars and trucks, the decision below frees manufacturers to produce millions of vehicles in the coming decade using HFCs, notwithstanding the availability of alternatives with 1/1000th of the global-warming impact. 80 Fed. Reg. at 42,879.

The impact on refrigeration is likewise enormous. As of 2013 there were roughly 6 million commercial refrigeration systems in use in the United States, with roughly 600,000 new units sold each year. J.A. 528. Many of these systems leak refrigerants at a rate of 20% per year or more. 80 Fed. Reg. 69,458, 69,488-89 (Nov. 9, 2015). The decision frees millions of new refrigeration systems to use HFCs in the coming decade, notwithstanding that there are available substitutes with *zero* global-warming potential. 80 Fed. Reg. at 42,904.

3. The immediate impact of the decision below, moreover, is not limited to HFCs or to global warming. It also guts EPA's authority under SNAP to require manufacturers to discontinue use of carcinogens, toxins, flammable products, and other harmful chemicals even where safer alternatives are readily

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[2] Automotive News Data Center, North American Car & Light-Truck Production (Jan. 2018), *available at* autonews.com; J.A. 522.

available. The decision permanently grandfathers all non-ozone-depleting substitutes. For example, the decision below effectively stops EPA from ever revisiting the use of a solvent like trichloroethylene (TCE) as a substitute cleaning solvent, even though EPA has determined that it is highly toxic and a likely carcinogen. 81 Fed. Reg. 20,535, 20,536 (Apr. 8, 2016). To be sure, under the decision below, EPA may still add TCE to the prohibited list, but it will be powerless to apply the prohibition against those already using TCE.

Going forward, the decision effectively eliminates EPA's ability to regulate cautiously or incrementally, by radically amplifying the stakes of EPA's initial decision to allow or prohibit a particular substitute. As an example, EPA in 1994 approved HFCs as a "near-term" substitute for CFCs while the industry developed safer alternatives with less global-warming potential. 80 Fed. Reg. at 42,939 (citing 59 Fed. Reg. at 13,071-72). But the D.C. Circuit's decision means there can be no such thing as a "near term" substitute. The moment a non-ozone depleting substitute is used, it is grandfathered forever. EPA can completely prohibit that substitute only by banning it *immediately upon its development*, before it has ever been used. If the substitute's dangers are discovered later, it is nonetheless immune from regulation.

Indeed, the holding below reaches further still, encouraging and rewarding gamesmanship by manufacturers. As Judge Wilkins explained, the statute only *prohibits* the use of substitutes on the prohibited list; it does not *mandate* the use of substitutes on the acceptable list. App. 34a. Thus, under the decision below, a manufacturer could forever escape SNAP oversight simply by commencing use of a substitute before EPA is able to complete its initial eval-

uation. *Id.* The decision thus incentivizes manufacturers to rush to replace remaining ozone-depleting chemicals with the cheapest substitutes before EPA can finish reviewing them.

Judge Wilkins explained that "Congress desired the safe alternatives list to be a fluid and evolving concept that promotes those alternatives that pose the least overall risk to human health and the environment." App. 36a. The decision below does the opposite, and this Court's review is imperative.

4. Beyond rewarding companies that switch to unsafe substitutes, the decision below also destroys the substantial reliance interests of petitioners and others who invested to develop safer alternatives to ozone-depleting chemicals based on Congress's promise in § 612. And the decision obliterates incentives to innovate in the future.

A key goal of § 612's aptly-named "safe alternatives policy" is fostering innovation to continually reduce risks to health and the environment. The statute rewards innovators by requiring EPA to ban continued use of older, unsafe chemicals once innovative alternative substitutes are "currently or potentially available." § 7671k(c). Congress placed its "faith in the ingenuity of the manufacturers in this realm of industry" to make "investments that are needed, which should start now, on truly safe substitutes." 136 Cong. Rec. 3939 (1990) (statement of Sen. Gore).

Over the past decade, petitioners and their suppliers have invested more than $1 billion to develop and manufacture safer alternatives to ozone-depleting chemicals. Honeywell and its suppliers have completed a significant investment program in R&D and production capacity, and recently opened a $300 million manufacturing facility in Louisiana.

Chemours has similarly invested hundreds of millions of dollars bringing alternative products to market, and recently broke ground on a $300 million production facility in Ingleside, Texas, that will triple the company's capacity to produce HFO-1234yf.

Honeywell's and Chemours's substantial investments resulted in the invention and commercialization of HFOs, revolutionary substances that have nearly all of the desirable performance characteristics of CFCs but none of the ozone-depleting impacts, and virtually none of the global-warming impacts of HFCs. Petitioners made these investments in environmentally superior technology in reliance on § 612 and the SNAP program, on the understanding that successful development of a safer substitute would be rewarded. As this Court has often recognized, agency regulations can "engender[] serious reliance interests." *Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2126 (2016). The decision below significantly prejudices companies that invested and structured their activities in reliance on SNAP, and therefore merits review.

Going forward, the decision eviscerates incentives to engage in future research and development of safer alternatives to ozone-depleting chemicals, and advantages cheap foreign substitutes being dumped on the market, because EPA now lacks the authority to limit use of those significantly less-safe substitutes. This is unfortunate, because SNAP has been an instrumental driver of innovation in a number of industries. Consider the evolution of cleaning solvents since 1990. Originally, many industrial solvent makers replaced CFCs with TCE, an inexpensive but highly toxic and potentially carcinogenic solvent. *See The U.S. Solvent Cleaning Industry and the Transition to Non-Ozone Depleting Substances* i-iii,

26-27 (2004).[3] SNAP spurred Chemours to develop progressively safer substitutes, culminating in the introduction in 2015 of MPHE, a cleaning agent that is non-ozone-depleting, non-carcinogenic, and low-toxicity. *See* 80 Fed. Reg. 42,053, 42,053-66 (July 16, 2015). Despite TCE's dangers, however, it is not an ozone-depleting chemical, and the decision below thus immunizes current users of TCE against any SNAP prohibition.

For years, the SNAP program has delivered on its key goal of promoting research and development of safer alternatives. 42 U.S.C. § 7671k(b)(1), (3). But, left undisturbed, the decision below will eliminate the economic incentive to innovate. Less-safe chemicals are often less expensive, and in the wake of the decision below, the remaining incentive is to develop and use cheaper chemicals, not safer ones. This Court's review is necessary to stop the inevitable race to the bottom the decision encourages, and to restore the incentives to innovate that Congress envisioned and made law.

B. The Environmental and Health Consequences of the Decision Below Are Enormous

1. The decision below demonstrably increases the likelihood of disastrous climate impacts from global warming. HFCs are super greenhouse gases, over a thousand times more powerful than carbon dioxide, 80 Fed. Reg. at 42,879; J.A. 213. HFC-134a, the most abundant HFC in use today, is "1,430 times more damaging to the climate system than carbon dioxide." 80 Fed. Reg. at 42,879. As a result, even small quantities of HFCs in the atmosphere can do serious

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[3] EPA, *Risk Management for Trichloroethylene (TCE)* (Dec. 14, 2017), goo.gl/FPscXP.

climate damage. 79 Fed. Reg. at 46,135; 80 Fed. Reg. at 42,936; J.A. 135, 260.

EPA's 2015 Rule, ending use of certain HFCs where there are CFC substitutes with dramatically lower global-warming impacts, went a long way toward checking the growth in use of these chemicals. HFCs were predominantly commercialized to replace CFCs and HCFCs. J.A. 212, 223, 237. As noted previously, in listing HFCs as acceptable substitutes for CFCs in 1994, EPA, aware that HFCs "could contribute to global warming," labeled them a "near-term option for moving away from CFCs." 80 Fed. Reg. at 42,939 (citing 59 Fed. Reg. at 13,071-72). EPA never expected them to be a permanent solution. But HFC emissions are now increasing more quickly in the United States than any other greenhouse gas, and their contribution is only expected to grow in the coming decades. 80 Fed. Reg. at 42,879. Atmospheric concentrations of HFCs are increasing by 10% per year or more. *Id.*

The consequence of the decision below, however, is that any manufacturer that has once replaced ozone-depleting chemicals with HFCs is free to continue using them forever, at enormous cost to the environment. Globally, the continued unchecked use of HFCs, by themselves, could lead to a 1° Fahrenheit increase in temperatures over the next 100 years.[4] Left unchecked, by 2050 the climate effects of annual HFC emissions could be equivalent to 27% to 69% of the world's annual carbon dioxide emissions. 80 Fed. Reg. at 42,879.

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[4] Yangyang Xu et al., *The Role of HFCs in Mitigating 21st Century Climate Change*, 13 Atmos. Chem. Phys. 6087 (2013), goo.gl/e99Uod.

By effectively insulating HFCs from regulation under § 612, the decision below will significantly contribute to the harms projected to occur from climate change: stronger and more frequent heat waves, droughts, fires and floods, more intense and frequent hurricanes and storms, changes in the location and amount of arable cropland worldwide, widespread deforestation and desertification, the decimation of several island nations, the dissolution of the northern polar ice cap, the death of the Great Barrier reef, the displacement of millions of people, and the loss, ultimately, of several major coastal cities to rising seas. J.A. 135, 275-76.[5] This Court's review is warranted for that reason alone.

2. The decision below is doubly important because its costs so disproportionately outweigh its benefits. EPA estimated that the cost to transition from HFCs to HFOs would be minimal. For air conditioners in light-duty vehicles, the cost is "less than 1% relative to the total direct manufacturer cost for a light duty vehicle." 80 Fed. Reg. at 42,898. EPA determined that across all sectors of the economy, the 2015 Rule would have an impact "well below" $100 million per year. 80 Fed. Reg. at 42,944, 42,949. Although 500,000 small businesses could be affected by the rule, more than 99% of those businesses were expected to experience *zero* compliance costs. 80 Fed. Reg. at 42,949.

In contrast to these negligible compliance costs, EPA calculated that the rule would have a tremen-

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[5] *See, e.g.*, U.S. Dep't of Def., 2014 *Climate Change Adaptation Roadmap* 2 (2014), goo.gl/KLBs27; U.S. Global Change Research Program, *Climate Change Impacts in the United States: Third National Climate Assessment* 7-17 (2014), goo.gl/B8uJQP.

dous positive impact on climate change, potentially preventing the annual emission of the equivalent of 100 million metric tons of carbon dioxide by 2030. *Id.* The disparity strongly militates in favor of this Court's review.

3. The health and environmental consequences of the decision extend far beyond global warming. Although this matter concerns HFCs, which contribute substantially to climate change, nothing in the D.C. Circuit's decision was limited to that particular risk.

The holding below equally restricts EPA from addressing other health and safety risks from non-ozone-depleting substitutes already in use. Some such substitutes (*e.g.*, ammonia) are toxic. Others (*e.g.*, hydrocarbons) are flammable and potentially explosive. The decision below bars EPA from prohibiting the use of any such substitutes under SNAP, no matter what risks they may pose in comparison to other available alternatives.

This is not a hypothetical concern. For example, some manufacturers had used hexafluoropropylene (HFP), which is non-ozone-depleting, as a substitute for ozone-depleting chemicals in the refrigeration and air-conditioning sectors. But in 1999, EPA added HFP to the unacceptable substitute list after learning that it caused kidney damage. 64 Fed. Reg. 3865, 3867 (Jan. 26, 1999). Under the decision below, however, EPA would have been powerless to prevent manufacturers or anyone else from using HFP as a substitute for ozone-depleting chemicals so long as they had been early adopters. Indeed, under the decision below, a company that is currently using a safe substitute could *start* using HFPs now. Such nonsensical results militate in favor of this Court's review.

C. The Decision Below Has Thrown EPA's Implementation of the Safe Alternatives Policy into Chaos

This Court's review is further warranted because the decision below is causing chaos at EPA and in the industry. EPA took the position that the distinction the D.C. Circuit drew between manufacturers who have and have not stopped using ozone-depleting chemicals is irreconcilable with the statutory language and regulatory scheme and cannot even be administered. As a consequence, EPA has overstepped the court's decision, announcing that henceforth it will not apply the 2015 Rule *at all*—even the parts the D.C. Circuit upheld—until it can engage in a new rulemaking.

1. In a guidance document issued shortly after the D.C. Circuit denied rehearing en banc, EPA put it starkly: "[R]egulated entities are experiencing substantial confusion and uncertainty regarding the meaning of the vacatur in a variety of specific situations." 83 Fed. Reg. at 18,434. That is because, since 1994, EPA's regulations have provided that "[n]o person may use a substitute after" EPA has added the substitute to the unacceptable list. 40 C.F.R. § 82.174. As EPA explained, the 1994 rule "has applied to all users (e.g., product manufacturers, intermediate users, end-users) within a regulated end-use without making distinctions between product manufacturers and other users or between those who were using ozone-depleting substances (ODS) at the time a substitute was listed as unacceptable and those who were not." 83 Fed. Reg. at 18,433. Similarly, the 2015 Rule that the D.C. Circuit partially vacated made no such distinctions. *Id.*

As a consequence, EPA explained, the distinction the D.C. Circuit drew makes no sense in the context

of the SNAP program and is not a distinction that the program, as currently structured, can accommodate. The court's ruling makes the identity of the product manufacturer—and whether that particular manufacturer has ever stopped using ozone-depleting chemicals—of central importance. As EPA explained, however, even deciding who is a "manufacturer" in the context of a particular product covered by SNAP would require rulemaking, because "some appliances are shipped fully assembled and charged" while "others are assembled or charged in the field." *Id.* at 18,434. And manufacturers have never before been required to document the date of a switch from CFCs to HFCs. *Id.* at 18,434-35.

EPA observed that the distinction the D.C. Circuit drew will be extremely difficult to accommodate even through a rulemaking. *Id.* at 18,435. Manufacturers own multiple facilities, have multiple production lines, and make multiple products, including products that could operate with or without ozone-depleting chemicals. EPA cannot simply distinguish between manufacturers that have "replaced ozone-depleting substances with HFCs" and those who have not, App. 12a, as the court below put it. For example, EPA explained, a manufacturer of supermarket refrigeration equipment might currently produce new equipment designed to operate with HFCs but also assist customers with replacing parts of systems that use ozone-depleting chemicals. 83 Fed. Reg. at 18,435. May EPA regulate that manufacturer? The court does not say.

The uncertainty for end-users is equally significant. The D.C. Circuit noted in a footnote that its interpretation "applies to any regulated parties," App. 10a, suggesting that an end-user such as a supermarket that has replaced ozone-depleting chemicals

with HFCs in its refrigeration systems could not be required to use HFOs instead, while a supermarket that still used some ozone-depleting chemicals could be required to use HFOs. How are these things to be measured? If a chain of supermarkets uses HFCs in some of its stores and ozone-depleting chemicals in others, is the chain subject to EPA regulation? Only the stores that haven't switched? Only the refrigerators within a store that have ozone-depleting chemicals but not the refrigerators with HFCs? Again, the court does not say.

The court's interpretation threatens to immensely complicate the regulatory scheme and *increase* the burden on end-users. As EPA noted, until now, end-users—which include many smaller businesses—have relied on manufacturers to ensure their own compliance with the statute; if the manufacturer was still using a chemical for a particular end-use, the end-user could be confident that the chemical was permissible. 83 Fed. Reg. at 18,436. But the decision below renders such reliance impossible, because a manufacturer may be exempt from § 612 but an end-user may not be. Each end-user will now have to individually monitor its own "replacement" status, product by product and perhaps unit by unit. *Id.* at 18,435-36.

In short, as EPA explained, "[t]he court's interpretation of CAA section 612 raises potentially complex and difficult implementation questions for the SNAP program." *Id.* at 18,435. Put differently, the decision below has created an utter mess.

2. EPA has taken the position that it is *impossible* to implement the partial vacatur the D.C. Circuit ordered. EPA declared in its recent guidance document that, until it completes a new rulemaking ad-

dressing the questions just described and others, it will not apply the HFC prohibitions in the 2015 Rule *at all*. 83 Fed. Reg. at 18,435. In other words, because of the confusion the decision has created, a manufacturer that has *never* made the switch from ozone-depleting chemicals to HFCs may *now* switch to HFCs in violation of the 2015 Rule and then continue to use HFCs forever. That is so even though the D.C. Circuit held unequivocally that the 2015 Rule is lawful as applied to such a manufacturer.

3. This Court's intervention is necessary to clear up the confusion created by the decision and the guidance and stave off their severe consequences. The distinctions EPA is being called upon to draw are at once so byzantine and so arbitrary that they effectively prove the wrongness of the decision below. The D.C. Circuit tried to fix what wasn't broken. EPA should not be required to go through a lengthy and complex rulemaking—one that leaves regulated parties and innovative companies in limbo for possibly several years—when this Court's review could obviate the need for such rulemaking in the first place by restoring the proper interpretation of the statute.

The decision's impenetrability, and EPA's resultant inability to understand what it needs to do in response, multiplies the effects of the error below. Because EPA has ceased applying the new SNAP rule, there will be a delay of years before *any* HFC prohibitions are in effect. Every year's delay multiplies the economic and environmental consequences of inaction. Every year's delay means millions more new products with HFCs, millions more dollars on R&D foregone, millions more past investment dollars wasted, and the equivalent of millions more metric tons of carbon dioxide released to warm the planet.

The consequences of the error below are too grave to neglect.

* * *

This Court's review is warranted immediately. The D.C. Circuit has exclusive jurisdiction over challenges to Clean Air Act rules implementing § 612, *see* 42 U.S.C. § 7607(b)(1), meaning there is no possibility of further percolation and no possibility that a split will develop. This Court regularly reviews decisions striking down or upholding EPA regulations and other final actions in the absence of a split. *E.g.*, *Michigan v. E.P.A.*, 135 S. Ct. 2699 (2015); *E.P.A. v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014); *Util. Air Regulatory Grp. v. E.P.A.*, 134 S. Ct. 2427 (2014); *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 217 (2009); *Massachusetts v. E.P.A.*, 549 U.S. 497 (2007). Left standing, the decision below will permanently and erroneously constrain EPA's authority to protect human health and the environment.

II. The Decision Below Is Wrong

This Court's review is also warranted because the decision below is incorrect. The rule that "no person" may use a chemical EPA had deemed unacceptable was not some new invention; it has been on the books since 1994. *See* 40 C.F.R. § 82.174(d). The court was wrong to upset this nearly 25-year-old understanding based on a challenge in 2015. *See* 42 U.S.C. § 7607(b)(1) (imposing 60-day jurisdictional limitation on judicial review of Clean Air Act regulations).

Under § 612(c), it is "unlawful to replace" an ozone-depleting substance with a substitute that EPA lists as prohibited because a safer alternative is available. 42 U.S.C. § 7671k(c). The majority held that in this context the word "replace" can only mean

one thing: "to take the place of" what immediately came before. In the majority's view, all other definitions of "replace" are unreasonable. From there, the majority concluded that an ozone-depleting substance may be "replaced" once and only once, such that after a manufacturer has transitioned to a non-ozone-depleting substitute, there can be no further "replacement." App. 14a. This narrow definition is wrong as a matter of common-sense English usage, and it is irreconcilable with the structure and express purpose of § 612(c). At a minimum, EPA's contrary interpretation is a reasonable construction of the statute.

1. The term "replace" has multiple meanings, including to "substitute for" or "to assume the former role, position, or function of" something that came before. Dictionaries confirm this common-sense understanding. *See* The American Heritage Dictionary of the English Language (5th ed. online 2018); Webster's Third New International Dictionary 1925 (1993); The Oxford English Dictionary 642 (2d ed. 1989); Dictionary.com Unabridged (2018), goo.gl/xGD3jb. The term "replacement," also used in § 612(c), likewise has multiple meanings, including something "that replaces another especially in a job *or function*." *E.g.*, Merriam-Webster Dictionary (online ed. 2018) (emphasis added). Section 612(c) incorporates that meaning when it uses the terms "substitute substance" and "replacement" interchangeably. *See* 42 U.S.C. § 7671k(c) ("unlawful to replace … with any substitute substance" where EPA has identified a safer "alternative to such replacement"). Section 612(c)'s language is thus capacious enough to mean that a user "replaces" an ozone-depleting substance each time it uses another chemi-

cal to perform the same function in a specific end-use.

For example, each time an automaker manufactures a car using HFC-134a instead of CFC-12 as an air-conditioner refrigerant, it uses HFC-134a as a CFC-12 replacement or substitute. The "replacement," or substitution, does not end with the first car, first model, or first model-year version produced using HFC-134a. So long as the substance serves the same function as CFC-12, it is "replacing" CFC-12. Contrary to the majority's suggestion, App. 12a, EPA approved HFO-1234yf as a replacement *for an ozone-depleting substance*, namely CFC-12, not for HFC-134a (*i.e.*, a "replacement of a replacement"). 76 Fed. Reg. at 17,489. That is apparent from the fact that HFO-1234yf was added to the list of acceptable substitutes in 2011, four years *before* EPA removed HFC-134a from that list. All EPA did in 2015 was move HFC-134a from the acceptable substitute list to the prohibited list for specified uses—a move the court below unanimously upheld. This regulatory history confirms that "replacing" ozone-depleting substances is not a one-time event; it is an ongoing endeavor, supported by continued scientific inquiry and innovation. As new, safer substitutes for ozone-depleting substances are developed, they are replacing the ozone-depleting substances, no less than HFCs once did.

The majority's narrow interpretation, based upon just one of several dictionary definitions of "replace," is contrary to common usage and common sense. Take sugar. When a person uses saccharin to sweeten coffee, one would naturally say that she used saccharin to "replace" sugar, even if she also used saccharin the day before. Similarly, when Coca-Cola experimented with sucralose instead of aspartame to

sweeten Diet Coke, one would naturally say the company used sucralose as a sugar replacement. As Judge Wilkins observed, the "ubiquitous product" (sugar), is "replaced" by any number of functional substitutes (saccharin, aspartame, sucralose, stevia) developed "over the course of years" and "not at a specific point in time, not just once, and not by a single substitute." App. 30a-31a.

In any case, the statutory text cannot support the majority's insistence that "replace" has only one reasonable meaning. At a bare minimum, the term "replace" is ambiguous, and "to substitute for" or "assume … the function of" just as likely manifests Congress's intent as the definition adopted by the majority below. The decision below is irreconcilable with the central teaching of *Chevron* that EPA's reasonable interpretation of a statutory term merits deference.

2. The majority's interpretation nullifies Congress' intent that ozone-depleting substances be replaced "[t]o the maximum extent practicable … by chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment." 42 U.S.C. § 7671k(a).

Since 1994, EPA has exercised authority to "initiate changes to SNAP determinations independent of any petitions or notifications received," based on "new data on either additional substitutes or on characteristics of substitutes previously reviewed," and considering risks to human health and the environment other than ozone depletion. 59 Fed. Reg. at 13,047. The majority thus acknowledged that "the lists of safe substitutes and prohibited substitutes are not set in stone." App. 6a. "[I]f EPA places a

substitute on the list of safe substitutes, EPA may later change its classification." *Id.* Indeed, § 612(d) explicitly authorizes anyone, at any time, to petition EPA to make a change, and requires EPA to act upon that petition promptly, no matter when it was filed. 42 U.S.C. § 7671k(d).

But the majority rendered EPA's reclassification power all but a nullity by permitting manufacturers and indeed the entire regulated community to use a non-ozone-depleting substitute in perpetuity so long as the user employs that substitute before it is listed as unacceptable, no matter how unsafe it may later turn out to be. And the majority did not even attempt to square its decision with the statutory directive that EPA order the substitution of the safest substitutes "[t]o the maximum extent practicable." 42 U.S.C. § 7671k(a). Interpreting the statute to bar EPA from prohibiting continued use of an unsafe substitute by incumbent users is irreconcilable with that language.

Taking the majority's interpretation to its logical conclusion highlights just how far the decision below strayed from Congress's intent. Under the apparent logic of the decision below, nothing would stop a manufacturer that previously switched away from ozone-depleting chemicals from later adopting a substance that has been on the prohibited list since 1994. It could switch to a known carcinogen, and EPA could do nothing about it. Per the majority, the "replacement" of the ozone-depleting substance has already occurred; from that point on, EPA cannot regulate any further "replacements of replacements." App. 38a (Wilkins, J., dissenting) (quoting Pet'rs' Br. 29).

3. The majority's statement that EPA previously disclaimed its authority to prohibit use of non-ozone-depleting substitutes is difficult to fathom. App. 12a-13a. In fact, since 1994, EPA has consistently maintained that "[ozone-depleting substances] are 'replaced' within the meaning of section 612(c) each time a substitute is used, so that once EPA identifies an unacceptable substitute, *any future use of such substitute is prohibited*." 59 Fed. Reg. at 13,048. EPA's prior statements concerning separate data and reporting requirements under § 612(e), 42 U.S.C. § 7671k(e), have nothing to do with the issue here. App. 41a-44a (Wilkins, J., dissenting); *see* 59 Fed. Reg. at 13,052. In any event, even if the EPA had changed its position (which it did not), its 2015 interpretation would still warrant the fullest deference. *See F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 514 (2009).

The majority also suggested in passing that EPA could address these problems through "other statutory authorities," such as the Toxic Substances Control Act. App. 17a. But the majority provided no support for its assertion that these other pathways are viable, particularly for purposes of regulating substances based on global-warming potential or comparative risk. Nor are they practical for industry. Section 612 is simply the only statutory authority EPA has to prohibit the use of ozone-depleting substance substitutes based on comparative risks. Indeed, Congress presumably enacted § 612's comparative risk regime because Congress viewed existing law as insufficient.

CONCLUSION

The Court should grant certiorari.

Respectfully submitted,

THOMAS A. LORENZEN
ROBERT J. MEYERS
CROWELL & MORING LLP
1001 Penn. Ave., NW
Washington, DC 20004
(202) 624-2500
tlorenzen@crowell.com

Counsel for Petitioner The Chemours Company FC, LLC

LISA S. BLATT
Counsel of Record
JONATHAN S. MARTEL
ELISABETH S. THEODORE
ANDREW T. TUTT
STEPHEN K. WIRTH
ARNOLD & PORTER KAYE SCHOLER LLP
601 Mass. Ave., NW
Washington, DC 20001
(202) 942-5000
lisa.blatt@arnoldporter.com

DAVID B. RIVKIN JR.
BAKER & HOSTETLER LLP
1050 Conn. Ave., NW
Washington, DC 20036
(202) 861-1500
drivkin@bakerlaw.com

Counsel for Petitioner Honeywell International Inc.

APPENDIX

APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued February 17, 2017 Decided August 8, 2017

No. 15-1328

MEXICHEM FLUOR, INC.
PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY,
RESPONDENT

THE CHEMOURS COMPANY FC, LLC, ET AL.,
INTERVENORS

Consolidated with 15-1329

On Petitions for Review of Final Action by the
United States Environmental Protection Agency

Dan Himmelfarb argued the cause for petitioners. With him on the joint briefs were *John S. Hahn*, *Roger W. Patrick*, *Matthew A. Waring*, *William J. Hamel*, *W. Caffey Norman*, *T. Michael Guiffré*, and *Kristina V. Foehrkolb*.

Dustin J. Maghamfar, Attorney, U.S. Department of Justice, argued the cause for respondent. On the brief were *John C. Cruden*, Assistant Attorney General, *Elizabeth B. Dawson*, Attorney, U.S. Department of Justice, and *Jan Tierney* and *Diane McConkey*, Attorneys, U.S. Environmental Protection Agency.

Thomas A. Lorenzen argued the cause for intervenors The Chemours Company FC, LLC, and Honeywell International Inc. in support of respondent. With him on the brief were *Robert J. Meyers*, *Sherrie A. Armstrong*, *Jonathan S. Martel*, and *Eric A. Rey*.

David Doniger, *Benjamin Longstreth*, *Melissa J. Lynch*, and *Emily K. Davis* were on the brief for intervenor Natural Resources Defense Council in support of respondent.

Before: BROWN, KAVANAUGH, and WILKINS, Circuit Judges.

Opinion for the Court filed by *Circuit Judge* KAVANAUGH, with whom *Circuit Judge* BROWN joins, and with whom *Circuit Judge* WILKINS joins as to Part I and Part III.

Opinion concurring in part and dissenting in part filed by *Circuit Judge* WILKINS.

KAVANAUGH, *Circuit Judge*: The separation of powers and statutory interpretation issue that arises again and again in this Court is whether an executive or independent agency has statutory authority from Congress to issue a particular regulation. In this case, we consider whether EPA had statutory authority to issue a 2015 Rule regulating the use of hydrofluorocarbons, known as HFCs.

According to EPA, emissions of HFCs contribute to climate change. In 2015, EPA therefore issued a rule that restricted manufacturers from making certain products that contain HFCs. HFCs have long been used in a variety of familiar products—in particular, in aerosol spray cans, motor vehicle air conditioners, commercial refrigerators, and foams. But as a result of the 2015 Rule, some of the manufactur-

ers that previously used HFCs in their products no longer may do so. Instead, those manufacturers must use other EPA-approved substances in their products.

As statutory authority for the 2015 Rule, EPA has relied on Section 612 of the Clean Air Act. 42 U.S.C. § 7671k. Section 612 requires manufacturers to replace *ozone-depleting substances* with safe substitutes.

The fundamental problem for EPA is that HFCs are not ozone-depleting substances, as all parties agree. Because HFCs are not ozone-depleting substances, Section 612 would not seem to grant EPA authority to require replacement of HFCs. Indeed, before 2015, EPA itself maintained that Section 612 did *not* grant authority to require replacement of non-ozone-depleting substances such as HFCs. But in the 2015 Rule, for the first time since Section 612 was enacted in 1990, EPA required manufacturers to replace non-ozone-depleting substances (HFCs) that had previously been deemed acceptable by the agency. In particular, EPA concluded that some HFCs could no longer be used by manufacturers in certain products, even if the manufacturers had long since replaced ozone-depleting substances with HFCs.

EPA's novel reading of Section 612 is inconsistent with the statute as written. Section 612 does not require (or give EPA authority to require) manufacturers to replace non-ozone-depleting substances such as HFCs. We therefore vacate the 2015 Rule to the extent it requires manufacturers to replace HFCs, and we remand to EPA for further proceedings consistent with this opinion.

I

A

In the 1980s, an international movement developed to combat depletion of the ozone layer. Depletion of the ozone layer exposes people to more of the sun's harmful ultraviolet light, thereby increasing the incidence of skin cancer, among other harms. The international efforts to address ozone depletion culminated in the Montreal Protocol, an international agreement signed in 1987 by the United States and subsequently ratified by every nation in the United Nations. The Protocol requires signatory nations to regulate the production and use of a variety of ozone-depleting substances. Montreal Protocol on Substances that Deplete the Ozone Layer, *opened for signature* Sept. 16, 1987, S. Treaty Doc. No. 100-10, 1522 U.N.T.S. 29.

Congress implemented U.S. obligations under the Montreal Protocol by enacting, with President George H.W. Bush's signature, the 1990 Amendments to the Clean Air Act. Those amendments added a new Title VI to the Clean Air Act. Title VI regulates ozone-depleting substances.

Title VI identifies two classes of ozone-depleting substances: "class I" and "class II" substances. 42 U.S.C. § 7671a(a), (b). Section 612(a), one of the key provisions of Title VI, requires manufacturers to replace those ozone-depleting substances: "To the maximum extent practicable, class I and class II substances shall be replaced by chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment." *Id.* § 7671k(a). With a few exceptions, Title VI requires manufacturers to phase out their use of

some ozone-depleting substances by 2000, and to phase out their use of other ozone-depleting substances by 2015. *Id.* §§ 7671c(b)-(c), 7671d(a).

When manufacturers stop using ozone-depleting substances in their products, manufacturers may need to replace those substances with a substitute substance. Under Section 612(a), EPA may require manufacturers to use safe substitutes when the manufacturers replace ozone-depleting substances. *Id.* § 7671k(a).

To implement the Section 612(a) requirement that ozone-depleting substances be replaced with safe substitutes, Section 612(c) requires EPA to publish a list of both safe and prohibited substitutes:

> Within 2 years after November 15, 1990, the Administrator shall promulgate rules under this section providing that it shall be unlawful to replace any class I or class II substance with any substitute substance which the Administrator determines may present adverse effects to human health or the environment, where the Administrator has identified an alternative to such replacement that—
>
> (1) reduces the overall risk to human health and the environment; and
>
> (2) is currently or potentially available.
>
> The Administrator shall publish a list of (A) the substitutes prohibited under this subsection for specific uses and (B) the safe alternatives identified under this subsection for specific uses.

Id. § 7671k(c). In short, Section 612(c) requires EPA to issue a list of both authorized and prohibited sub-

stitute substances based on the safety and availability of the substances.

Importantly, the lists of safe substitutes and prohibited substitutes are not set in stone. Section 612(d) provides: "Any person may petition the Administrator to add a substance to the lists under subsection (c) of this section or to remove a substance from either of such lists." *Id.* § 7671k(d). In other words, if EPA places a substance on the list of safe substitutes, EPA may later change its classification and move the substance to the list of prohibited substitutes (or vice versa).

In 1994, EPA promulgated regulations to implement Section 612(c). *See* Protection of Stratospheric Ozone, 59 Fed. Reg. 13,044 (Mar. 18, 1994). At the time, EPA indicated that once a manufacturer has replaced its ozone-depleting substances with a non-ozone-depleting substitute, Section 612(c) does not give EPA authority to require the manufacturer to later replace that substitute with a different substitute. EPA explained that Section 612(c) "does not authorize EPA to review substitutes for substances that are not themselves" ozone-depleting substances covered under Title VI. EPA Response to Comments on 1994 Significant New Alternatives Policy Rule, J.A. 50.

B

Hydrofluorocarbons, known as HFCs, are substances that contain hydrogen, fluorine, and carbon. When HFCs are emitted, they trap heat in the atmosphere. They are therefore "greenhouse gases." But HFCs do not deplete the ozone layer. As a result, HFCs are not ozone-depleting substances covered by Title VI of the Clean Air Act. Instead, HFCs are po-

tential *substitutes for* ozone-depleting substances in certain products.

In 1994, acting pursuant to its authority under Section 612(c), EPA concluded that certain HFCs were safe substitutes for ozone-depleting substances when used in aerosols, motor vehicle air conditioners, commercial refrigerators, and foams, among other things. *See* Protection of Stratospheric Ozone, 59 Fed. Reg. at 13,122-46. Over the next decade, EPA added HFCs to the list of safe substitutes for a number of other products. *See, e.g.*, Protection of Stratospheric Ozone: Listing of Substitutes for Ozone-Depleting Substances, 68 Fed. Reg. 4004, 4005 (Jan. 27, 2003); Protection of Stratospheric Ozone; Listing of Substitutes for Ozone-Depleting Substances, 64 Fed. Reg. 22,982, 22,984 (Apr. 28, 1999).

As a result, in the 1990s and 2000s, many businesses stopped using ozone-depleting substances in their products. Many businesses replaced those ozone-depleting substances with HFCs. HFCs became prevalent in many products. HFCs have served as propellants in aerosol spray cans, as refrigerants in air conditioners and refrigerators, and as blowing agents that create bubbles in foams.

Over time, EPA learned more about the effects of greenhouse gases such as HFCs. In 2009, EPA concluded that greenhouse gases may contribute to climate change, increasing the incidence of mortality and the likelihood of extreme weather events such as floods and hurricanes. *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,497-98 (Dec. 15, 2009).

In 2013, President Obama announced that EPA would seek to reduce emissions of HFCs because HFCs contribute to climate change. EXECUTIVE OFFICE OF THE PRESIDENT, THE PRESIDENT'S CLIMATE ACTION PLAN 10 (2013). The President's Climate Action Plan indicated that "the Environmental Protection Agency will use its authority through the Significant New Alternatives Policy Program" of Section 612 to reduce HFC emissions. *Id.*

Consistent with the Climate Action Plan, EPA promulgated a Final Rule in 2015 that moved certain HFCs from the list of safe substitutes to the list of prohibited substitutes. Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program, 80 Fed. Reg. 42,870 (July 20, 2015) [hereinafter Final Rule]. In doing so, EPA prohibited the use of certain HFCs in aerosols, motor vehicle air conditioners, commercial refrigerators, and foams—even if manufacturers of those products had long since replaced ozone-depleting substances with HFCs. *Id.* at 42,872-73.

Therefore, under the 2015 Rule, manufacturers that used those HFCs in their products are no longer allowed to do so. Those manufacturers must replace the HFCs with other substances that are on the revised list of safe substitutes.

In the 2015 Rule, EPA relied on Section 612 of the Clean Air Act as its source of statutory authority. EPA said that Section 612 allows EPA to "change the listing status of a particular substitute" based on "new information." *Id.* at 42,876. EPA indicated that it had new information about HFCs: Emerging research demonstrated that HFCs were greenhouse

gases that contribute to climate change. *See id.* at 42,879. EPA therefore concluded that it had statutory authority to move HFCs from the list of safe substitutes to the list of prohibited substitutes. Because HFCs are now prohibited substitutes, EPA claimed that it could also require the replacement of HFCs under Section 612(c) of the Clean Air Act even though HFCs are not ozone-depleting substances.

Mexichem Fluor and Arkema are businesses that make HFC-134a for use in a variety of products. The 2015 Rule prohibits the use of HFC-134a in certain products. The companies have petitioned for review of the 2015 Rule. They raise two main arguments. *First*, they argue that the 2015 Rule exceeds EPA's statutory authority under Section 612 of the Clean Air Act. In particular, they contend that EPA does not have statutory authority to require manufacturers to replace HFCs, which are non-ozone-depleting substances, with alternative substances. *Second*, they allege that EPA's decision in the 2015 Rule to remove HFCs from the list of safe substitutes was arbitrary and capricious because EPA failed to adequately explain its decision and failed to consider several important aspects of the problem. We address those arguments in turn.

II

A

We first consider whether Section 612 of the Clean Air Act authorizes the 2015 Rule.

In 1987, the United States signed the Montreal Protocol. The Montreal Protocol is an international agreement that has been ratified by every nation that is a member of the United Nations. The Protocol requires nations to regulate the production and use

of certain ozone-depleting substances. *See* Montreal Protocol on Substances that Deplete the Ozone Layer, *opened for signature* Sept. 16, 1987, S. Treaty Doc. No. 100-10, 1522 U.N.T.S. 29.

In 1990, in part to implement U.S. obligations under the Protocol and to regulate the production and use of ozone-depleting substances, Congress added a new Title to the Clean Air Act: Title VI. Among Title VI's provisions is Section 612.

Section 612(a) of the Act provides: "To the maximum extent practicable," ozone-depleting substances that are covered under Title VI "shall be replaced by chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment." 42 U.S.C. § 7671k(a). Title VI sets phase-out dates for those ozone-depleting substances. *Id.* §§ 7671c, 7671d.

To implement Section 612(a), EPA maintains lists of both safe substitutes and prohibited substitutes for ozone-depleting substances. The provision governing those lists, Section 612(c), provides: It "shall be unlawful to replace any" ozone-depleting substance that is covered under Title VI "with any substitute substance" that is on EPA's list of "prohibited" substitutes. *Id.* § 7671k(c). A manufacturer that violates Section 612(c) can be subject to substantial civil and criminal penalties. *See id.* § 7413(b), (c).[1]

In the years since 1990, many manufacturers of the products relevant here—aerosols, motor vehicle

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[1] Although we focus primarily on product manufacturers in this case, our interpretation of Section 612(c) applies to any regulated parties that must replace ozone-depleting substances within the timelines specified by Title VI. *See, e.g.*, 42 U.S.C. §§ 7671c, 7671d.

air conditioners, commercial refrigerators, and foams—have stopped using ozone-depleting substances in those products. Manufacturers have often replaced those ozone-depleting substances with HFCs that have long been on the list of safe substitutes.

In the 2015 Rule, acting under the authority of Section 612(c), EPA moved some HFCs from the list of safe substitutes to the list of prohibited substitutes. As a result, manufacturers replacing ozone-depleting substances can no longer use those HFCs as a safe substitute. Even more importantly for present purposes, under the Rule, manufacturers that have already replaced ozone-depleting substances with HFCs can no longer use those HFCs in their products.

In this case, all parties agree that EPA possesses statutory authority to require manufacturers to replace ozone-depleting substances within the timelines specified by Title VI—generally by 2000 for some ozone-depleting substances, and by 2015 for other ozone-depleting substances. *See, e.g.*, 42 U.S.C. §§ 7671c, 7671d. If a substance on the safe substitutes list is later found to be an ozone-depleting substance, EPA possesses direct statutory authority to order the replacement of that ozone-depleting substance in accordance with those statutory timelines.

All parties in this case also agree that EPA may change the lists of safe and prohibited substitutes based on EPA's assessment of the risks that those substitutes pose for "human health and the environment." *Id.* § 7671k(c); *see id.* § 7671k(d). It follows that Section 612(c) allows EPA to move a substitute from the list of safe substitutes to the list of prohibit-

ed substitutes. Therefore, assuming that all other statutory criteria are satisfied, EPA may move HFCs from the list of safe substitutes to the list of prohibited substitutes, as it did in the 2015 Rule.

In addition, all parties agree that, under Section 612(c), EPA may prohibit a manufacturer from replacing an ozone-depleting substance that is covered under Title VI with a prohibited substitute. It follows that EPA may bar any manufacturers that *still make products that contain ozone-depleting substances* from replacing those ozone-depleting substances with HFCs. Of course, that aspect of the 2015 Rule is not a big deal as of now because there are few (if any) manufacturers that still make products that use ozone-depleting substances.[2]

The key dispute in this case is whether EPA has authority under Section 612(c) to prohibit manufacturers from making products that contain HFCs *if those manufacturers already replaced ozone-depleting substances with HFCs at a time when HFCs were listed as safe substitutes*. In those circumstances, does EPA have authority to require a manufacturer to now replace HFCs, which are non-ozone-depleting substances, with another substitute?

For many years, EPA itself stated that it did not possess authority under Section 612(c) to require the replacement of non-ozone-depleting substances. For example, in 1994, EPA explained that Section 612(c) "does not authorize EPA to review substitutes for

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[2] The parties disagree over whether, as a factual matter, *any* manufacturers still make products that use ozone-depleting substances. EPA says yes. Mexichem and Arkema say no. We need not resolve that factual dispute here, as it has no bearing on our legal analysis of the meaning of Section 612(c).

substances that are not themselves" ozone-depleting substances. EPA Response to Comments on 1994 Significant New Alternatives Policy Rule, J.A. 50. Two years later, EPA reiterated that interpretation: EPA explained that it "does not regulate the legitimate substitution" of one substance for another "first generation non-ozone-depleting" substance. EPA Response to OZ Technology's Section 612(d) Petition, J.A. 145.

EPA now argues that it actually possesses such authority under the statute. For the first time, EPA has sought to order the replacement of a non-ozone-depleting substitute that had previously been deemed acceptable by the agency.[3]

EPA's new interpretation of Section 612(c) depends on the word "replace." As noted above, Section 612(c) makes it unlawful to "replace" an ozone-depleting substance that is covered under Title VI with a substitute substance that is on the list of prohibited substitutes. 42 U.S.C. § 7671k(c). EPA recognizes that manufacturers "replace" an ozone-depleting substance when the manufacturers initially replace that ozone-depleting substance with a safe substitute. But EPA argues that the initial substitution is not the only time when manufacturers "replace" an ozone-depleting substance. EPA claims

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[3] During oral argument, EPA conceded that it had never previously moved a non-ozone-depleting substance from the list of safe substitutes to the list of prohibited substitutes. Counsel for EPA stated: "I believe it is correct that the prior de-listings have involved ozone depleting substitutes, and I may not be correct for that, but we can assume for this morning that that is correct." Tr. of Oral Arg. at 14. Since the time of oral argument, EPA has not made any filings to this Court to retract that concession.

that a manufacturer continues to "replace" the ozone-depleting substance every time the manufacturer uses the substitute substance, indefinitely into the future. According to EPA, replacement is not a one-time occurrence but a never-ending process. In EPA's view, because manufacturers continue to "replace" ozone-depleting substances with HFCs every time they use HFCs in their products, EPA continues to have authority to require manufacturers to stop using HFCs and to use a different substitute.

EPA's current reading stretches the word "replace" beyond its ordinary meaning. As relevant here, the word "replace" means to "take the place of." THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2017 online); WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1925 (1993); THE OXFORD ENGLISH DICTIONARY 642 (2d ed. 1989). In common parlance, the word "replace" refers to a new thing taking the place of the old. For example, President Obama replaced President Bush at a specific moment in time: January 20, 2009, at 12 p.m. President Obama did not "replace" President Bush every time President Obama thereafter walked into the Oval Office. By the same token, manufacturers "replace" an ozone-depleting substance when they transition to making the same product with a substitute substance. After that transition has occurred, the replacement has been effectuated, and the manufacturer no longer makes a product that uses an ozone-depleting substance. At that point, there is no ozone-depleting substance to "replace," as EPA itself long recognized.[4]

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[4] The dissenting opinion says that the word "replace" may mean "to provide a substitute for," rather than "to take the

Under EPA's current interpretation of the word "replace," manufacturers would continue to "replace" an ozone-depleting substance with a substitute even 100 years or more from now. EPA would thereby have indefinite authority to regulate a manufacturer's use of that substitute. That boundless interpretation of EPA's authority under Section 612(c) borders on the absurd.

Because the text is sufficiently clear, we need not consider the legislative history. *See NLRB v. SW General, Inc.*, 137 S. Ct. 929, 942, slip op. at 14 (2017). In any event, the legislative history strongly supports our conclusion that Section 612(c) does not grant EPA continuing authority to require replacement of non-ozone-depleting substitutes. The Senate's version of Title VI applied to "Stratospheric Ozone *and Global Climate Protection*." S. 1630, 101st Cong. tit. VII (as passed by Senate, Apr. 3, 1990) (emphasis added). The Senate's version of the safe alternatives policy would have required the replacement not just of ozone-depleting substances, but also of substances that contribute to climate change. *Id.* sec. 702, §§ 503(8), 514(a). In other words, the Senate bill would have granted EPA authority to require the

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place of." Dissenting Op. at 4, 6. But the dissenting opinion's alternative interpretation of the word "replace" suffers from the same flaw as EPA's interpretation. A manufacturer "provides a substitute for" an ozone-depleting substance in a product when the manufacturer transitions to making that product with a substitute substance. After that transition takes place, the manufacturer can no longer "provide a substitute for" an ozone-depleting substance. At that point, there is no ozone-depleting substance to "provide a substitute for." Therefore, even under the dissenting opinion's interpretation, a manufacturer cannot "replace" an ozone-depleting substance after the manufacturer stops using that substance.

replacement of non-ozone-depleting substances such as HFCs. But the Conference Committee did not accept the Senate's version of Title VI. *See* H.R. Rep. No. 101-952, at 262 (1990) (Conf. Rep.). Instead, the Conference Committee adopted the House's narrower focus on ozone-depleting substances. *Id.*; *see* S. 1630, 101st Cong. sec. 711, § 156(b) (as passed by House, May 23, 1990). In short, although Congress contemplated giving EPA broad authority under Title VI to regulate the replacement of substances that contribute to climate change, Congress ultimately declined.

Put simply, EPA's strained reading of the term "replace" contravenes the statute and thus fails at *Chevron* step 1. And even if we reach *Chevron* step 2, EPA's interpretation is unreasonable. *See Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 843 & n.9 (1984); *see also Global Tel*Link v. FCC*, 859 F.3d 39, 59-60 (D.C. Cir. 2017) (Silberman, J., concurring).

Notwithstanding our conclusion regarding Section 612, EPA still possesses several statutory authorities to regulate HFCs.

For one thing, EPA has statutory authority under Section 612(c) to prohibit any manufacturers that still use ozone-depleting substances that are covered under Title VI from deciding in the future to replace those substances with HFCs. Those manufacturers have yet to "replace" ozone-depleting substances with a substitute. When they ultimately do replace ozone-depleting substances, EPA may prohibit them from using HFCs as substitutes.[5]

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[5] To be sure, Mexichem and Arkema argue that EPA acted arbitrarily and capriciously in removing HFCs from the list of safe substitutes. As explained in Part III below, however, we

For another thing, EPA possesses other statutory authorities, including the Toxic Substances Control Act, to directly regulate non-ozone-depleting substances that are causing harm to the environment. *See* 15 U.S.C. §§ 2601-2629 (Toxic Substances Control Act); *see also* 42 U.S.C. § 7408 (National Ambient Air Quality Standards program); *id.* § 7412 (Hazardous Air Pollutants program); *id.* §§ 7470-7492 (Prevention of Significant Deterioration program); *id.* § 7521 (Section 202 of Clean Air Act). Our decision today does not in any way cabin those expansive EPA authorities.

In addition, EPA still has statutory authority to require product manufacturers to replace substitutes that (unlike HFCs) are themselves ozone depleting. *See, e.g.*, 42 U.S.C. §§ 7671c, 7671d. Suppose, for example, that EPA determines that a substance is a safe substitute for ozone-depleting substances, but EPA later concludes that the substitute is itself an ozone-depleting substance that is covered under Title VI. In that circumstance, EPA possesses statutory authority to order the replacement of that ozone-depleting substance in accordance with the timelines prescribed by Title VI.

However, EPA's authority to regulate ozone-depleting substances under Section 612 and other statutes does not give EPA authority to order the replacement of substances that are not ozone depleting but that contribute to climate change. Congress has not yet enacted general climate change legislation. Although we understand and respect EPA's overarching effort to fill that legislative void and regulate

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reject that argument. We conclude that EPA acted lawfully in removing HFCs from the list of safe substitutes.

HFCs, EPA may act only as authorized by Congress. Here, EPA has tried to jam a square peg (regulating non-ozone-depleting substances that may contribute to climate change) into a round hole (the existing statutory landscape).

The Supreme Court cases that have dealt with EPA's efforts to address climate change have taught us two lessons that are worth repeating here. *See, e.g.*, *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014). *First*, EPA's well-intentioned policy objectives with respect to climate change do not on their own authorize the agency to regulate. The agency must have statutory authority for the regulations it wants to issue. *Second*, Congress's failure to enact general climate change legislation does not authorize EPA to act. Under the Constitution, congressional inaction does not license an agency to take matters into its own hands, even to solve a pressing policy issue such as climate change. Justice Breyer has summarized that separation of powers point in another context—there, the war against al Qaeda. *See Hamdan v. Rumsfeld*, 548 U.S. 557, 636 (2006) (Breyer, J., concurring). Justice Breyer stated in *Hamdan* that war is not a blank check for the President. *Id.*; *see also Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579, 637 (1952) (Jackson, J., concurring). So too, climate change is not a blank check for the President.

Those bedrock separation of powers principles undergird our decision in this case. However much we might sympathize or agree with EPA's policy objectives, EPA may act only within the boundaries of its statutory authority. Here, EPA exceeded that authority.

B

EPA's reliance on the statutory term "replace" does not justify the 2015 Rule. But that is not necessarily the end of the matter. EPA suggests that it may be able to require manufacturers to replace HFCs under an alternative theory. The question under that alternative theory is this: May EPA *retroactively* conclude that a manufacturer's past decision to "replace" an ozone-depleting substance with HFCs is no longer lawful, even though the original replacement with HFCs was lawful at the time it was made? Under such a "retroactive disapproval" approach, EPA could prohibit manufacturers from making products that use HFCs even though those HFCs were deemed safe substitutes at the time the manufacturers decided to initially replace an ozone-depleting substance with HFCs.

EPA's brief to this Court advanced such an argument only in passing. In its brief, EPA stated: An "agency's inherent authority to revise an earlier administrative determination where faced with new developments or in light of reconsideration of the relevant facts is an essential part of the office of a regulatory agency." EPA Br. 27 (internal quotation marks omitted).

The problem for present purposes is that EPA did not squarely articulate a "retroactive disapproval" rationale in the 2015 Rule. Instead, EPA relied on its expansive interpretation of the word "replace" in the Rule. Therefore, we may not uphold the Rule based on the "retroactive disapproval" theory. *See SEC v. Chenery Corp.*, 332 U.S. 194, 196 (1947); *Pasternack v. National Transportation Safety Board*, 596 F.3d 836, 838 (D.C. Cir. 2010).

Rather, we must remand to EPA. On remand, if EPA decides to pursue this "retroactive disapproval" approach, the agency would have to address at least three issues.

First, for this "retroactive disapproval" theory to hold up, EPA would have to reasonably conclude either (i) that Section 612(c) provides EPA with statutory authority to employ a "retroactive disapproval" approach or (ii) that EPA has inherent authority to retroactively disapprove a prior replacement, even a replacement that occurred many years ago. *See generally Vartelas v. Holder*, 566 U.S. 257, 266 (2012) (retroactivity principles in statutory interpretation); *Ivy Sports Medicine, LLC v. Burwell*, 767 F.3d 81, 86 (D.C. Cir. 2014) (scope of agencies' inherent reconsideration authority).

Second, if EPA concludes that it has authority for "retroactive disapprovals," EPA must explain the basis for its conclusion and explain its change in interpretation of Section 612(c). *See FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009). As noted above, before the 2015 Rule, EPA indicated that Section 612(c) "does not authorize EPA to review substitutes for substances that are not themselves" covered ozone-depleting substances. EPA Response to Comments on 1994 Significant New Alternatives Policy Rule, J.A. 50; *see* Protection of Stratospheric Ozone, 59 Fed. Reg. 13,044, 13,052 (Mar. 18, 1994); EPA Response to OZ Technology's Section 612(d) Petition, J.A. 145. But under the retroactive disapproval approach, EPA would in effect require manufacturers to replace their HFCs, which are not ozone-depleting substances, with other substitutes. Such a change in EPA's approach would require an explanation. Moreover, to the extent that EPA's prior ap-

proach had "engendered serious reliance interests," EPA would need to provide a "more detailed justification" for its change. *Fox*, 556 U.S. at 515.

Third, even if EPA has authority for a "retroactive disapproval" approach, EPA must comply with applicable due process constraints on retroactive decisionmaking. The Due Process Clause limits the Government's authority to retroactively alter the legal consequences of an entity's or person's past conduct. To satisfy the Due Process Clause, EPA must at a minimum "provide regulated parties fair warning of the conduct a regulation prohibits or requires." *Christopher v. SmithKline Beecham Corp.*, 567 U.S. 142, 156 (2012) (internal quotation marks and alteration omitted). In this case, for example, even if EPA has statutory authority to retroactively disapprove the replacement of an ozone-depleting substance with HFCs, EPA plainly may not impose civil or criminal penalties on a manufacturer based on the manufacturer's *past* use of HFCs at the time when EPA said it was lawful to use HFCs. *See id.* We do not understand EPA to disagree with that proposition.

Unless and until EPA concludes on remand that it has cleared those three hurdles,[6] EPA may not apply the 2015 Rule to require manufacturers to replace one non-ozone-depleting substitute with another substitute, so long as the initial substitute was listed as safe at the time the substitution was effec-

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[6] We take no position now on whether EPA can meet those requirements. Moreover, we note that those three requirements would be necessary for EPA to prevail on a "retroactive disapproval" theory. We do not opine here on whether they would be sufficient.

tuated. Of course, even if EPA concludes that it has cleared those hurdles, EPA's conclusions may be subject to review in this Court in another case.

In short, we vacate the 2015 Rule to the extent the Rule requires manufacturers to replace HFCs with a substitute substance. We remand to EPA. On remand, if it chooses, EPA may determine whether it has "retroactive disapproval" authority—whether, in other words, it has authority to conclude that a manufacturer's past decision to replace an ozone-depleting substance with HFCs is no longer lawful.

III

Our conclusion that the 2015 Rule must be vacated to the extent it requires manufacturers to replace HFCs does not answer the question whether EPA reasonably removed HFCs from the list of safe substitutes in the first place. Mexichem and Arkema assert that EPA's decision to remove HFCs from the list of safe substitutes was arbitrary and capricious. In support, they advance a number of arguments.

The arbitrary and capricious standard requires that a rule be "reasonable and reasonably explained." *Communities for a Better Environment v. EPA*, 748 F.3d 333, 335 (D.C. Cir. 2014) (internal quotation marks omitted). EPA must "examine the relevant data and articulate a satisfactory explanation for its action." *Motor Vehicle Manufacturers Association of United States, Inc. v. State Farm Mutual Automobile Insurance Co.*, 463 U.S. 29, 43 (1983). Applying that deferential standard, we reject all of Mexichem and Arkema's arbitrary and capricious challenges.

First, Mexichem and Arkema assert that EPA ignored a key "requirement" in the 1994 Rule implementing Section 612(c)—namely, that EPA may "re-

strict only those substitutes that are significantly worse" than the available alternatives. Reply Br. 21; Protection of Stratospheric Ozone, 59 Fed. Reg. 13,044, 13,046 (Mar. 18, 1994) (capitalization altered). They claim that EPA did not demonstrate that HFCs are significantly worse than the available alternatives. In fact, however, the 1994 Rule said that restricting significantly worse substitutes was just one of seven "guiding principles" for EPA—not a hard-and-fast requirement. Protection of Stratospheric Ozone, 59 Fed. Reg. at 13,046. Moreover, based on data regarding the environmental effects of the relevant substances, EPA repeatedly concluded that the substances EPA added to the list of prohibited substitutes posed a "significantly greater risk" than the available alternatives. *See, e.g.*, Final Rule, 80 Fed. Reg. at 42,904, 42,905, 42,912, 42,915, 42,917, 42,919. So that challenge fails.[7]

Second, Mexichem and Arkema argue that EPA should not have relied so heavily on the numeric Global Warming Potential score to assess the "Atmospheric effects and related health and environmental impacts" of HFCs and other substitutes. 40 C.F.R. § 82.180(a)(7)(i). But as EPA has explained, that is the tool preferred by leading scientists for analyzing the effects of greenhouse gases. EPA Response to Comments on Proposed Rule at 162, J.A.

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[7] Mexichem and Arkema also assert that EPA's decision to change the listing status of HFCs violated EPA's regulations because EPA did not compare HFCs to the proper comparator substances. *See* 40 C.F.R. §§ 82.170(a), 82.172. That is not accurate. In the 2015 Rule, EPA compared HFCs with other substances that are on EPA's list of safe substitutes, as EPA is permitted to do under its regulations. *See id.* § 82.170(a); Final Rule, 80 Fed. Reg. at 42,937.

727. EPA reasonably relied on the Global Warming Potential score.

Third, Mexichem and Arkema suggest that EPA failed to provide objective benchmarks for determining which substances' Global Warming Potential scores were too high to be acceptable. But EPA was not assessing the score of each individual substance in isolation. Instead, EPA was *comparing* substances with one another. EPA reasonably concluded that substances with higher scores posed a greater global warming risk than substances with lower scores. *See, e.g.*, Final Rule, 80 Fed. Reg. at 42,882. That is a "comprehensible" and objective method for assessing environmental risks. *Postal Service v. Postal Regulatory Commission*, 785 F.3d 740, 753 (D.C. Cir. 2015).

Fourth, according to Mexichem and Arkema, EPA failed to consider data regarding the overall amount of each substitute that would be emitted into the atmosphere. Not so. EPA considered whether there were "substantial differences" between HFCs and other substitutes that "might affect total atmospheric emissions." Final Rule, 80 Fed. Reg. at 42,938. EPA also looked at other factors related to atmospheric emissions, "such as charge size of refrigeration equipment and total estimates of production," as part of "its assessment of environmental and health risks of new alternatives." *Id.* Because EPA accounted for factors that affect the quantity of emissions, EPA did not entirely fail to "consider an important aspect of the problem." *State Farm*, 463 U.S. at 43.

Fifth, Mexichem and Arkema assert that EPA should have accounted for energy efficiency when assessing the atmospheric effects of HFCs. But as EPA explained, the energy efficiency of a substance often

is not informative in isolation. Final Rule, 80 Fed. Reg. at 42,921-22. The efficiency of the substance depends on the efficiency of the *equipment* in which the substance is used. In part because EPA cannot control the efficiency of equipment under Section 612(c), EPA decided not to evaluate the energy efficiency of substitutes in its analysis. *Id.* Under those circumstances, EPA's approach was reasonable and reasonably explained.

Sixth, Mexichem and Arkema argue that EPA should have placed conditions on how HFCs could be used, rather than entirely prohibiting certain uses of HFCs. But EPA adequately explained that use controls are typically appropriate when a *particular use* of a substance carries an especially high risk that can be mitigated by placing conditions on that use. *Id.* at 42,899. Use controls would not be appropriate for HFCs, EPA stated, because the hazards of HFCs are not unique to particular uses. Instead, "the environmental risks" from HFCs "are due to the collective global impact of refrigerant emissions released over time." *Id.* EPA also explained that use controls for HFCs did not make sense because other substitutes are readily available. *Id.* That conclusion is reasonable and reasonably explained for purposes of arbitrary and capricious review under the Administrative Procedure Act.

Seventh, Mexichem and Arkema claim that EPA failed to consider transition costs—that is, the costs of transitioning from prohibited HFCs to approved substitutes. But EPA did take transition costs into account when it decided to give certain product manufacturers extra time to comply with the Rule. *See, e.g.*, *id.* at 42,933. EPA acted reasonably for purposes of arbitrary and capricious review.

* * *

In sum, we grant the petitions and vacate the 2015 Rule to the extent it requires manufacturers to replace HFCs with a substitute substance. We remand to EPA for further proceedings consistent with this opinion. We reject all of Mexichem and Arkema's other challenges to the 2015 Rule. The petitions are therefore granted in part and denied in part.

So ordered.

WILKINS, Circuit Judge, concurring in part and dissenting in part:

I must depart from the Court's opinion concluding that Section 612 of the Clean Air Act unambiguously prohibits EPA from requiring the replacement of HFCs. The majority claims that "EPA's novel reading of Section 612 is inconsistent with the statute as written," because Section 612 does not provide EPA with the authority to require "manufacturers to replace non-ozone-depleting substances such as HFCs." Maj. Op. 3. Accordingly, the majority disposes of the issue in a *Chevron* step-one analysis through an interpretation of the word "replace." *See id.* at 9-15. I disagree. The bar for deciding a case at *Chevron* step one is high, requiring clear and unambiguous congressional intent. *See Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 843 (1984). Because the term "replace" is susceptible of multiple interpretations in this context, it cannot serve as the basis for discerning clear congressional intent. *See, e.g.*, *U.S. Postal Serv. v. Postal Regulatory Comm'n*, 640 F.3d 1263, 1267 n.4 (D.C. Cir. 2011) ("Our second inquiry will require us to proceed to *Chevron* step 2 because the phrase 'due to' has an additional—and ambiguous—meaning, which the Commission did not address."). Thus, the Court must proceed to *Chevron* step two and decide whether EPA's interpretation of the statutory scheme is reasonable. Because I find that it is, I would deny the petition on all grounds.

I.

We review EPA's interpretation of the Clean Air Act under the two-step framework established in *Chevron*. *See Catawba Cnty., N.C. v. EPA*, 571 F.3d

20, 35 (D.C. Cir. 2009). Pursuant to step one of the *Chevron* analysis, "both the agency and the courts [must] give effect to Congress's unambiguously expressed intent if the underlying statute speaks directly to the precise question at issue." *Citizens of Coal Council v. Norton*, 330 F.3d 478, 481 (D.C. Cir. 2003). In other words, "if the intent of Congress is clear and unambiguously expressed by the statutory language at issue, that would be the end of our analysis." *Zuni Pub. Sch. Dist. No. 89 v. Dep't of Educ.*, 550 U.S. 81, 93 (2007). When making this determination, we may rely on the traditional tools of statutory interpretation, including the statute's text, structure, purpose, and legislative history. *Citizens of Coal Council*, 330 F.3d at 481.

I respectfully disagree with the majority that the relevant language in Section 612 meets the *Chevron* step one standard. This is simply not a case where Congress has clearly and directly spoken to the issue in a manner that "unambiguously foreclosed the agency's statutory interpretation." *Catawba Cnty.*, 571 F.3d at 35.

The majority focuses primarily upon two provisions of Section 612 as clearly and unambiguously demonstrating that the 2015 Rule was not authorized by Congress. Here are the two provisions:

> To the maximum extent practicable, *class I and class II substances shall be replaced by chemicals, product substitutes, or alternative manufacturing processes* that reduce overall risks to human health and the environment.

42 U.S.C. § 7671k(a) (emphasis added).

> Within 2 years after November 15, 1990, the Administrator shall promulgate rules under

> this section providing that *it shall be unlawful to replace any class I or class II substance with any substitute substance* which the Administrator determines may present adverse effects to human health or the environment, where the Administrator has identified an alternative to such replacement that—
>
> (1) reduces the overall risk to human health and the environment; and
>
> (2) is currently or potentially available.
>
> The Administrator shall publish a list of (A) the substitutes prohibited under this subsection for specific uses and (B) the safe alternatives identified under this subsection for specific uses.

Id. § 7671k(c) (emphasis added).

The majority contends that the word "replace," when used in these two provisions, can have only one meaning: to "take the place of." Maj. Op. 13-14; *see id.* at 14 ("In common parlance, the word 'replace' refers to a new thing taking the place of the old."). Under this definition, a substitute can only "replace" an ozone-depleting substance *once*. After the manufacturer has transitioned from an ozone-depleting substance to a non-ozone-depleting substitute, there is nothing left to "replace." *Id.* While the majority's definition may be one way to interpret the statute, for several different reasons, it is by no means the only way to construe the text.

First, with respect to the plain text of the statute, the meaning of the word "replace" is ambiguous. Nowhere in Section 612 is the term "replace" statutorily defined. *See* 42 U.S.C. § 7671 (definitions). The majority does not disagree, and instead relies on dic-

tionary definitions to conclude that "replace" means to "take the place of." Maj. Op. 13-14. However, each of the dictionaries cited by the majority also defines "replace" to mean to "substitute for." *See* THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2017 online) ("To fill the place of; provide a substitute for"); WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1925 (1993) ("[T]o take the place of: serve as a substitute for or successor of"); THE OXFORD ENGLISH DICTIONARY 642 (2d ed. 1989) ("To take the place of, become a substitute for (a person or thing).").

The difference in meaning between "to take the place of" and "to provide a substitute for" may be subtle, but it is rather significant in the context of this statute. Section 612 pertains to replacing a category, or *class*, of chemical substances; indeed the substances are defined in the statute as "class I" and "class II" substances. 42 U.S.C. § 7671(3), (4). Thus, this statute is not directed to a specific individual or position, and the majority's example noting that "President Obama *replaced* President Bush at a specific moment in time," Maj. Op. 14, is therefore inapposite. A more pertinent example would be: "Hybrid electric engines, fully electric engines, hydrogen fuel cell power, and other alternatives are replacing the internal combustion engines in passenger cars." The Oxford Dictionary provides a similar example sentence: "This is required to replace older medicines that will eventually face competition from generic substitutes." *Replace*, OXFORD DICTIONARY, https://en.oxforddictionaries.com/definition/replace (last accessed July 14, 2017). In both examples, the ubiquitous product that has become the industry standard is "replaced" by a number of substitutes, and the re-

placement takes place not at a specific point in time, not just once, and not by a single substitute. Instead, the ubiquitous item is "replaced" by any number of substitutes over the course of years, and it may be the case that one substitute is succeeded by a better substitute at some point in time. As one dictionary puts it, "*Replace* applies both to substituting something new or workable for that which is lost, depleted or won out and to placing another in the stead of one who leaves or is dismissed from a position." AMERICAN HERITAGE DICTIONARY (2d Coll. ed. 1982).

Second, the structure of the statutory text also contradicts the clear meaning proffered by the majority. The two key provisions of Section 612 are not directed to any particular group of individuals or class of companies. They provide that "class I and class II substances shall be replaced by chemicals, product substitutes, or alternative manufacturing processes," 42 U.S.C. § 7671k(a), and that "it shall be unlawful to replace any class I or class II substance with any substitute substance," *id.* § 7671k(c). These Congressional mandates, written in the passive voice and without identifying a particular target of the regulation, appear to apply to anyone and everyone, including retailers, product manufacturers and chemical manufacturers.[1] The majority focuses on product

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[1] In other provisions of Section 612, Congress identified the target of the regulation as chemical manufacturers, like the petitioners in this case. *See, e.g.*, 42 U.S.C. § 7671(e) ("The Administrator shall require *any person who produces* a chemical substitute for a class I substance to provide the Administrator with such person's unpublished health and safety studies on such substitute and *require producers* to notify the Administrator not less than 90 days before new or existing chemicals are introduced into interstate commerce for significant new uses as substitutes for a class I substance." (emphasis added)); *see also*

manufacturers, contending that once the manufacturer replaces the class I or class II substance in its product with a non-ozone-depleting substitute, "the replacement has been effectuated." Maj. Op. 14.

However, this point of view ignores the retailer. Suppose a retailer needs to refurbish an air conditioner manufactured in the early 1990s that uses a class I substance as a refrigerant. If the retailer chooses to have the air conditioner serviced by recharging it with new refrigerant, she is prohibited from "replacing" the class I substance with a chemical substitute "which the Administrator determines may present adverse effects to human health or the environment[,]" 42 U.S.C. § 7671k(a). If the retailer chooses to purchase a new air conditioner instead, she is still "replacing" a class I substance, and the new air conditioner cannot contain an unsafe substitute. *Id.* Either way, the retailer's action falls within the scope of the mandates in Section 612. And if the retailer purchases a new air conditioner, the fact that the manufacturer may have previously "replaced" a class I substance with an HFC as the refrigerant in its air conditioners does not mean that "the replacement has [already] been effectuated" with respect to that retailer. *See* Maj. Op. 14. By the express terms of the statute, if the EPA determines as of 2017 that HFCs are no longer safe substitutes for class I substances given available refrigerant alternatives, it would appear that Congress has given EPA the authority to prohibit the further use of HFCs in air conditioners so that the retailer in our example cannot "replace" her class I substance-

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id. § 7671(11) (defining "produce" as "the manufacture of a substance from any raw material or feedstock chemical ....").

utilizing air conditioner with a new air conditioner utilizing an unsafe substitute. The majority holds otherwise. Alternatively, the express terms of the statute appear to give EPA the authority to prohibit the retailer from recharging her old air conditioner with an HFC as the refrigerant, which the agency could implement by restricting the manufacture, marketing, and use of HFCs. Given its focus on product manufacturers, the majority opinion is curiously silent about how its statutory interpretation affects retailers and other end users who have products utilizing class I and class II substances, despite the obvious importance of the issue.

In my view, the connotation of "replace" as "to provide a substitute for" more accurately reflects the intent of Congress given the use of the term and sentence structure in the key statutory provisions. This interpretation is further supported by the fact that Congress used the word "substitute" ten separate times in Section 612, and the word "alternative" a dozen times more, including in the title of the section. *See* 42 U.S.C. § 7671k ("Safe Alternatives Policy"). In that context, "replacing" the class I or class II substance is not necessarily a one-time event and alternatives or substitutes can be deemed replacements or successors, even if they are not the first-generation successor. At a minimum, the definition of "replace" is ambiguous, and "to provide a substitute for" just as likely manifests Congress's intent as the definition proffered by the majority. "Confronted by two plausible readings of the statute, we cannot declare Congress' intent unambiguous." *Adirondack Med. Ctr. v. Sebelius*, 740 F.3d 692, 698 (D.C. Cir. 2014).

Third, the majority's interpretation also undermines the purpose of Section 612, which is, "[t]o the maximum extent practicable," to carry out the replacement of class I and class II substances with "chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment." 42 U.S.C. § 7671k(a). Significantly, Congress authorized EPA to develop a list of unsafe alternatives and a list of safe alternatives, but Congress chose, for whatever reason, only to bar the use of alternatives on the "unsafe list," rather than mandating the use of only those alternatives appearing on the "safe list." *See id.* § 7671k(c) ("it shall be unlawful to replace any class I or class II substance with any substitute substance which the Administrator determines may present adverse effects to human health or the environment"). By writing the statute in this manner, Congress allowed manufacturers to replace class I and II substances with alternatives that have not been specifically approved by the EPA, so long as the substitute has not been specifically deemed unsafe by the EPA. The majority's interpretation of "replace" makes a mockery of the statutory purpose, because a product manufacturer could "replace" a class I substance with a substitute before the EPA has a chance to evaluate it completely, and if the agency later determines that a different substitute "reduce[s] overall risks to human health and the environment," *id.* § 7671k(a), the agency would be powerless to tell that product manufacturer that it could no longer use the more risky substitute. In the majority's view, the "replacement" is a *fait accompli*, and EPA is powerless to act under Section 612. Such an interpretation undermines Congress's intent to "reduce overall risks

to human health and the environment" in a manner "to the maximum extent practicable." *Id.*

In doing so, the majority takes an even more extreme position than petitioners, who conceded that "if ozone-depleting substances are in use, EPA can list and de-list" to and from the lists of acceptable and unacceptable alternatives. Oral Arg. at 11:07, *Mexichem Fluor, Inc. v. EPA* (Feb. 17, 2017) (No. 15-1328). According to petitioners, EPA "can list or de-list ozone-depleting substances and non-ozone-depleting substances *because the list at that point is consisting of things that will replace the things that are in use, which are ozone-depleting substances ....*" *Id.* at 11:14 (emphasis added). The petitioners are at least trying to interpret "replace" in a manner consistent with the statutory purpose—but as explained *infra* in part II, they are simply wrong on the facts, because ozone-depleting substances are still in use. The majority's definition of "replace," on the other hand, has no semblance of consistency with this aspect of Congress's purpose.

Indeed, Section 612 is aimed at regulating which substitutes can be used as replacements for class I and class II substances, rather than regulating those ozone-depleting substances themselves. Congress phased out the production and manufacture of ozone-depleting substances in other statutory provisions. *See* 42 U.S.C. §§ 7671c, 7671d. Section 612, on the other hand, is focused solely on substituting class I and class II substances with safe alternatives. *See id.* § 7671k. Because Section 612 promotes the use of safe substitutes, it necessarily requires a reading of the word "replace" that comports with this congressional intent. The majority's cramped reading of the statute contradicts Congress's intent that the EPA

prohibit the use of "*any* substitute substance" that may "present adverse effects to human health and the environment" where a less risky substitute is available. *Id.* § 7671k(c) (emphasis added).

Moreover, the majority's interpretation also runs counter to the purpose of the petition process contained in Section 612. Congress provided that "[a]ny person may petition the Administrator to add a substance to the [safe or unsafe alternatives] lists ... or to remove a substance from either of such lists." *Id.* § 7671k(d). The petition process becomes a half-measure if EPA is only allowed to "replace" an ozone-depleting substance once and only once. The majority's interpretation grants EPA one bite at the apple, prohibiting additions to the unsafe substitutes list or removals from the safe substitutes list if the product manufacturer has already begun using a non-ozone-depleting substitute for the class I or class II substance. By creating this petition process, it is evident that Congress desired the safe alternatives list to be a fluid and evolving concept that promotes those alternatives that pose the least overall risk to human health and the environment. Congress undoubtedly knew how to instruct EPA to develop a list of acceptable and unacceptable substitutes by a certain date and then stop there. The fact that Congress did not do so is telling. *See City of Arlington, Tex. v. FCC*, 133 S. Ct. 1863, 1868 (2013) ("Congress knows to speak in plain terms when it wishes to circumscribe, and in capacious terms when it wishes to enlarge, agency discretion."). Congress chose a starkly different path, and the majority has taken the power that Congress granted individuals to request the addition of more risky substitutes to the unsafe list and rendered it largely impotent. When interpreting two

interrelated statutory provisions, "[a]bsent clearly expressed congressional intent to the contrary, it is our duty to harmonize the provisions and render each effective." *Adirondack Med. Ctr.*, 740 F.3d at 698-99.

Fourth, the majority's references to EPA's prior interpretations of its statutory authority cannot change the *Chevron* step one analysis. *See* Maj. Op. 12. I agree with the majority that we must reject any EPA interpretation of "replace" if we determine that Congress has clearly and directly spoken to the contrary, because "[t]he judiciary is the final authority on issues of statutory construction and must reject administrative constructions which are contrary to clear congressional intent." *Chevron*, 467 U.S. at 843 n.9. But the EPA's interpretations of the statute are not themselves suitable evidence of Congress's clear intent. *See Village of Barrington, Ill. v. Surface Transp. Bd.*, 636 F.3d 650, 660 (D.C. Cir. 2011); *see also Kentuckians for Commonwealth Inc. v. Rivenburgh*, 317 F.3d 425, 443 (4th Cir. 2003) ("Agency interpretations of statutory provisions only come into play if Congress has not spoken clearly. Relying on *agency* interpretations as evidence of a clear *congressional* intent is therefore misguided." (emphasis in original)).

Finally, an examination of Section 612's legislative history does not change the outcome. Where "a statute is silent or ambiguous with respect to the question at issue," we must "defer to the 'executive department's construction of a statutory scheme it is entrusted to administer,' unless the legislative history of the enactment *shows with sufficient clarity that the agency construction is contrary to the will of Congress.*" *Japan Whaling Ass'n v. Am. Cetacean Soc.*,

478 U.S. 221, 233 (1986) (quoting *Chevron*, 467 U.S. at 844 (emphasis added, citation omitted)). In other words, "conflicting [legislative history] cannot clarify ambiguous statutory language," *Am. Bankers Ass'n v. Nat'l Credit Union Admin.*, 271 F.3d 262, 269 (D.C. Cir. 2001), and "[w]hile [legislative] history can be used to clarify congressional intent even when a statute is superficially unambiguous, the bar is high," *Williams Companies v. FERC*, 345 F.3d 910, 914 (D.C. Cir. 2003).

Here, the legislative history cited by the majority cannot meet the required high bar to show clear Congressional intent, particularly since the legislative activity "was not ... addressed to the precise issue raised by th[is] case[]." *Chevron*, 467 U.S. at 853,. The precise question presented here is whether "Section 612 unambiguously covers only replacements of ozone-depleting substances and does not authorize 'replacements of replacements'." Pet'rs' Br. 29. The Senate bill cited by the majority had no provisions whatsoever regarding how replacements of covered substances were to be carried out. Instead, the Senate bill would have phased out production entirely of not only ozone-depleting substances, but also certain substances which were known or reasonably suspected to contribute to "atmospheric or climatic modification." S. 1630, 101st Cong. §§ 504, 506 (as passed by Senate, Apr. 3, 1990). But the Senate bill had no provisions for creating a list of acceptable substitutes or for prohibiting unacceptable substitutes; nor did it have any provisions for adding substitutes to, or removing substitutes from, the "acceptable" and "unacceptable" lists. Instead, the Senate bill directed EPA to support programs to identify and promote the development of safe alternatives

and to maintain a public clearinghouse of "available" alternatives. *Id.* § 514. All of the statutory provisions in Section 612 concerning acceptable and banned alternatives originated in the House bill. S. 1630, 101st Cong. § 156 (1990) (as passed by House, May 23, 1990). At best, this legislative history shows that Congress rejected a proposal to ban and phase out the production of substances that contribute to climate change. However, the history is silent on the much different question of whether Congress intended to allow EPA to make "replacements of replacements" of the substitutes for banned ozone-depleting substances. Because "the legislative history as a whole is silent on the precise issue before us," *Chevron*, 467 U.S. at 862, it cannot demonstrate clear congressional intent on that question.

* * *

Given my interpretation of Section 612's plain language, purpose, and legislative history, I cannot agree with my colleagues that the word "replace" clearly and unambiguously means to "take the place of," and only permits a one-time replacement of ozone-depleting substances. Rather, at a minimum, sufficient ambiguity exists to proceed to *Chevron* step two. *See, e.g.*, *NRDC v. EPA*, 22 F.3d 1125, 1138 (D.C. Cir. 1994) ("Because the phrase 'take effect' is itself ambiguous, its meaning must be discerned according to *Chevron* 's second step.").

II.

The second step in the *Chevron* framework requires courts to grant deference to an administrative agency's construction of an ambiguous statute if that interpretation is reasonable. *Chevron*, 467 U.S. at 843. "[A] court may not substitute its own construc-

tion of a statutory provision for a reasonable interpretation made by the administrator of an agency." *Id.* Where the interpretation would be one Congress could have sanctioned, the administrative agency is entitled to deference and its construction should be afforded "considerable weight." *Id.*

For the reasons discussed in Part I, I find EPA's interpretation of Section 612 to be reasonable. EPA's interpretation comports with a common definition of the word "replace," which is to "[p]rovide a substitute for." *See, e.g.*, *Replace*, OXFORD DICTIONARY, *supra.* This meaning of "replace" is consistent with Section 612's statutory purpose, which is, "*to the maximum extent practicable*," to replace ozone-depleting substances with "chemicals, product substitutes, or alternative manufacturing processes *that reduce overall risks to human health and the environment.*" 42 U.S.C. § 7671k(a)(emphasis added). Comparing alternatives to each other and selecting the alternative that creates the lowest level of overall risk to human health and the environment accords nicely with the policy choice explicitly stated by Congress. EPA's interpretation further avoids the majority's manufacturer-by-manufacturer structure, which does not fully comport with the statutory framework.

Finally, I do not read the administrative record in the same manner as the majority. EPA never stated that regulation of non-ozone-depleting substitutes was completely off limits, nor clearly acted in a manner to foreclose its present interpretation.

The past language of EPA that is relied upon by the majority is far from conclusive on the meaning of "replace" in this context. It is true that EPA stated in the course of the 1994 rulemaking that "Section

612(c) authorizes EPA to review all substitutes to Class I and II substances, but does not authorize EPA to review substitutes for substances that are not themselves class I or II substances." J.A. 50. But this excerpt alone does not tell the whole story. At the time, several commenters requested that "EPA clarify that SNAP should only apply to substitutes for Class I or Class II compounds," while another commenter suggested "that SNAP should aggressively reevaluate previously approved second-generation alternatives as new and environmentally preferable alternatives are developed." *Id.* EPA began its response to these comments as follows:

> A key issue is whether there exists a point at which an alternative should no longer be considered a class I or II substitute as defined by Section 612. The Agency believes that as long as class I or II chemicals are being used, *any substitute designed to replace these chemicals* is subject to review under Section 612.

J.A. 50 (emphasis added). This statement by the agency is consistent with how it has construed "replace" in the 2015 Rule.

Furthermore, EPA's seemingly contradictory statement relied upon by the majority must be placed in context. In Section 612, Congress specified that producers of chemical substitutes for class I substances are required "to provide the Administrator with such person's unpublished health and safety studies on such substitute and require producers to notify the Administrator not less than 90 days before new or existing chemicals are introduced into interstate commerce for significant new uses as substitutes for a class I substance." 42 U.S.C. § 7671k(e).

This advance reporting requirement gives the agency a 90-day period to review the chemical substitute and related data and make a determination as to whether it is a safe alternative or unsafe alternative for a class I or class II substance before the substitute hits the marketplace.[2] The EPA and the National Resources Defense Council contend that EPA's 1994 comment only pertained to the 90-day advance reporting—and concomitant—review requirements of the SNAP program. Resp't's Br. 6; NRDC Intervenor's Br. 13. Thus, when the agency stated that "Section 612(c) authorizes EPA to review all substitutes to Class I and II substances, but does not authorize EPA to review substitutes for substances that are not themselves class I or II substances," J.A. 50, EPA argues it meant only that 1) it could not require 90-day advance reporting of intended use and health data for certain second-generation substitutes by chemical manufacturers, and 2) the agency was not required to conduct an advance review before any such second-generation substitute hit the market. Thus, EPA contends that it never said, or meant to say, that EPA had no power whatsoever to review second-generation substitutes, either in response to a petition or on the agency's own accord. While the back

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[2] During the 1994 rulemaking, EPA stated its intent to apply the 90–day advance reporting requirement to new substitutes for class II substances, even though the statute only expressly mentions the advance reporting requirement in the context of substitutes for class I substances. J.A. 42. This deadline for review following advance notice and reporting is the same as in the petition process, where Congress required that EPA, within 90 days, to "grant or deny" a petition to add a substitute to, or remove a substitute from, either the safe alternatives list or the unsafe alternatives list for class I and class II substances. 42 U.S.C. § 7671k(d).

and forth in the commentary during the 1994 rulemaking is not crystal clear, it appears to support the interpretation that EPA only intended to disclaim authority to "review" second-generation substitutes in the 90-day advance notification and review context, and only if the first-generation substitute was a non-ozone-depleting substance. *See id.* ("For example, if a hydrofluorocarbon (HFC) is introduced as a first-generation refrigerant substitute for either a class I (*e.g.*, CFC-12) or class II chemical (*e.g.*, HCFC-22), it is subject to review and listing under section 612. Future substitutions to replace the HFC *would then be exempt from reporting* under section 612 because the first-generation alternative did not deplete stratospheric ozone." (emphasis added)).[3]

The majority also relies upon EPA's statement in response to a 1995 petition by OZ Technology, Maj. Op. 12, but there the EPA appears to have disclaimed regulatory authority under SNAP if the substance is being proffered as a "legitimate substitut[e]" for a non-ozone-depleting substance, rather than as a substitute for a class I or class II ozone-depleting substance. J.A. 145, 412. EPA exerted regulatory authority over the petition because it found that OZ Technology submitted its proposed alternative as a substitute for CFC-12, an ozone-depleting substance, rather than as a substitute to HFC-134a, a non-ozone-depleting substitute. J.A. 412, 415. This

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[3] Similarly, in this same passage, EPA also stated "[w]here second-generation substitutes replace first-generation substitutes that are themselves ozone-depleters (*e.g.*, HCFCs), these second-generation substitutes are bound by the same notification and review requirements under section 612 as first-generation substitutes to ozone-depleting chemicals." *Id.* (emphasis added).

course of events seems to be consistent with the agency's position here. At any rate, petitioners concede that the HFCs they manufacture are substitutes for CFCs, which are ozone-depleting substances. Thus, petitioners do not stand in the same shoes as OZ Technology and they have not identified any statements where EPA has disclaimed authority to regulate HFCs or other direct substitutes for ozone-depleting substances such as CFCs.

I understand (and share) the majority's concern that the Clean Air Act does not grant EPA the authority to take a completely unbounded approach and thereby regulate "substitutes" for class I and class II substances forever. In my view, the regulation of substitutes under Section 612 requires that the traditional and ubiquitous ozone-depleting substance originally utilized for the specific end-use is still in service. Without the prerequisite of an ozone-depleting substance, there can be nothing for the substitute to "replace." In other words, where ozone-depleting chemicals are no longer in existence or in use for a particular industry or end-use, then EPA cannot regulate substitutes for those end-uses under Section 612.

Here, petitioners claim that "class I and class II substances have already been replaced" with respect to the 25 end-uses addressed in the 2015 Rule. Pet'rs' Br. 20. In support of this assertion, Petitioners rely on two examples. First, Petitioners state that in the motor-vehicle air conditioning sector, CFC-12, which is an ozone-depleting substance, had historically been used. *Id.* However, Petitioners claim that the record shows that by the mid-1990s, use of CFC-12 in the manufacture of new cars stopped in the United States, and manufacturers uniformly adopted HFC-

134a as a substitute. *Id.* This statement is true as far as it goes, but it does not show that ozone-depleting substances are not still in use in the motor-vehicle air conditioning sector. Indeed, the record confirms "some older vehicles may still be using CFC-12." J.A. 815. Thus, we cannot conclude that ozone-depleting substances are not still in "use" in this sector.

Second, Petitioners reference the commercial refrigeration industry, arguing that because the commercial refrigeration industry has "transitioned away" from ozone-depleting substances, such substances are no longer in use in this sector. *See* Pet'rs' Br. 21; J.A. 528. This argument suffers from the same flaw as the motor-vehicle air conditioning argument. The fact that modern commercial refrigeration systems may not use ozone-depleting chemicals does not mean that older refrigeration systems do not continue to use such substances, and the record indicates that ozone-depleting substances remain in "use" in the commercial refrigeration industry. J.A. 535. With respect to the other 23 challenged end-uses, Petitioners are silent and offer no support to prove that ozone-depleting substances have been completely eliminated in those sectors.

EPA responds to Petitioners' claim, arguing that "ozone-depleting substances are still being directly 'replaced' by approved alternatives," Resp't's Br. 21 n.8, and that "as long as ozone-depleting substances are being used, any substitute designed to replace these chemicals is subject to review" under Section 612, *id.* at 31 (alterations omitted). While EPA acknowledges that "in some cases the use of ozone-depleting substances has ceased," it contends that ozone-depleting substances have not been completely eliminated such that a "second-generation substitute

world" exists. *Id.* Petitioners failed to respond to this argument in their reply brief. Given that the burden is on Petitioners to demonstrate that EPA's interpretation of Section 612 is unreasonable or statutorily impermissible with respect to these 25 end-uses, they have failed to show that the agency's policy choice "runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Mtr. Vehicle Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 43 (1983).

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In sum, I disagree with the majority's holding in Part II, and concur with all remaining parts. I would find the word "replace" sufficiently ambiguous to require a *Chevron* step two analysis. Because I find that EPA's interpretation of Section 612 is reasonable, I would deny the petition for review on all grounds.

APPENDIX B

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 15-1328 September Term, 2017
EPA-80FR42870
Filed On: January 26, 2018

MEXICHEM FLUOR, INC.
PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY,
RESPONDENT

THE CHEMOURS COMPANY FC, LLC, ET AL.,
INTERVENORS

Consolidated with 15-1329

BEFORE: Garland, Chief Judge, and Henderson, Rogers, Tatel, Griffith, Kavanaugh, Srinivasan, Millett*, Pillard, Wilkins, and Katsas*, Circuit Judges

O R D E R

The petitions of intervenor-respondent Natural Resources Defense Council and Industry intervenor-respondents for rehearing en banc, the joint response thereto, and the joint reply; and the briefs amici curiae of Administrative Law Professors and the States were circulated to the full court, and a vote was requested. Thereafter, a majority of the judges eligible to participate did not vote in favor of the petitions. Upon consideration of the foregoing, it is

ORDERED that the petitions be denied.

Per Curiam

FOR THE COURT:
Mark J. Langer, Clerk

BY: /s/
Michael C. McGrail
Deputy Clerk

* Circuit Judges Millett and Katsas did not participate in this matter.

APPENDIX C

40 C.F.R. Part 82, Subpart G

Significant New Alternatives Policy Program

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§ 82.170 Purpose and scope.

(a) The purpose of these regulations in this subpart is to implement section 612 of the Clean Air Act, as amended, regarding the safe alternatives policy on the acceptability of substitutes for ozone-depleting compounds. This program will henceforth be referred to as the "Significant New Alternatives Policy" (SNAP) program. The objectives of this program are to identify substitutes for ozone-depleting compounds, to evaluate the acceptability of those substitutes, to promote the use of those substitutes believed to present lower overall risks to human health and the environment, relative to the class I and class II compounds being replaced, as well as to other substitutes for the same end-use, and to prohibit the use of those substitutes found, based on the same comparisons, to increase overall risks.

(b) The regulations in this subpart describe persons and substitutes subject to reporting requirements under the SNAP program and explain preparation and submission of notices and petitions on substitutes. The regulations also establish Agency procedures for reviewing and processing EPA's determinations regarding notices and petitions on substitutes. Finally, the regulations prohibit the use of alternatives which EPA has determined may have adverse effects on human health or the environment where EPA has identified alternatives in particular industrial use sectors that on an overall basis, reduce

risk to human health and the environment and are currently or potentially available. EPA will only prohibit substitutes where it has identified other substitutes for a specific application that are acceptable and are currently or potentially available.

(c) Notifications, petitions and other materials requested shall be sent to: SNAP Document Control Officer, U.S. Environmental Protection Agency (6205-J), 1200 Pennsylvania Ave., NW., Washington, DC 20460.

§82.172 Definitions.

Act means the Clean Air Act, as amended, 42 U.S.C. 7401 *et seq*.

Agency means the U.S. Environmental Protection Agency.

Application means a specific use within a major industrial sector end-use.

Class I or class II means the specific ozone-depleting compounds described in section 602 of the Act.

Decision means any final determination made by the Agency under section 612 of the Act on the acceptability or unacceptability of a substitute for a class I or II compound.

EPA means the U.S. Environmental Protection Agency.

End-use means processes or classes of specific applications within major industrial sectors where a substitute is used to replace an ozone-depleting substance.

Formulator means any person engaged in the preparation or formulation of a substitute, after

chemical manufacture of the substitute or its components, for distribution or use in commerce.

Health and safety study or *study* means any study of any effect of a substitute or its components on health and safety, or the environment or both, including underlying data and epidemiological studies, studies of occupational, ambient, and consumer exposure to a substitute, toxicological, clinical, and ecological, or other studies of a substitute and its components, and any other pertinent test. Chemical identity is always part of a health and safety study. Information which arises as a result of a formal, disciplined study is included in the definition. Also included is information relating to the effects of a substitute or its components on health or the environment. Any available data that bear on the effects of a substitute or its components on health or the environment would be included. Examples include:

(1) Long- and short-term tests of mutagenicity, carcinogenicity, or teratogenicity; data on behavioral disorders; dermatoxicity; pharmacological effects; mammalian absorption, distribution, metabolism, and excretion; cumulative, additive, and synergistic effects; acute, subchronic, and chronic effects; and structure/activity analyses;

(2) Tests for ecological or other environmental effects on invertebrates, fish, or other animals, and plants, including: Acute toxicity tests, chronic toxicity tests, critical life stage tests, behavioral tests, algal growth tests, seed germination tests, microbial function tests, bioconcentration or bioaccumulation tests, and model ecosystem (microcosm) studies;

(3) Assessments of human and environmental exposure, including workplace exposure, and effects

of a particular substitute on the environment, including surveys, tests, and studies of: Biological, photochemical, and chemical degradation; air, water and soil transport; biomagnification and bioconcentration; and chemical and physical properties, e.g., atmospheric lifetime, boiling point, vapor pressure, evaporation rates from soil and water, octanol/water partition coefficient, and water solubility;

(4) Monitoring data, when they have been aggregated and analyzed to measure the exposure of humans or the environment to a substitute; and

(5) Any assessments of risk to health or the environment resulting from the manufacture, processing, distribution in commerce, use, or disposal of the substitute or its components.

Importer means any person who imports a chemical substitute into the United States. Importer includes the person primarily liable for the payment of any duties on the merchandise or an authorized agent acting on his or her behalf. The term also includes, as appropriate:

(1) The consignee;

(2) The importer of record;

(3) The actual owner; and

(4) The transferee, if the right to draw merchandise in a bonded warehouse has been transferred.

Major Industrial Use Sector or *Sector* means an industrial category which EPA has reviewed under the SNAP program with historically high consumption patterns of ozone-depleting substances, including: Refrigeration and air conditioning; foam-blowing; fire suppression and explosion protection;

solvents cleaning; aerosols; sterilants; tobacco expansion; pesticides; and adhesives, coatings and inks sectors.

Manufacturer means any person engaged in the direct manufacture of a substitute.

Mixture means any mixture or blend of two or more compounds.

Person includes an individual, corporation, partnership, association, state, municipality, political subdivision of a state, and any agency, department, or instrumentality of the United States and any officer, agent, or employee of such entities.

Pesticide has the meaning contained in the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136 *et seq.* and the regulations issued under it.

Potentially available is defined as any alternative for which adequate health, safety, and environmental data, as required for the SNAP notification process, exist to make a determination of acceptability, and which the Agency reasonably believes to be technically feasible, even if not all testing has yet been completed and the alternative is not yet produced or sold.

Premanufacture Notice (PMN) Program has the meaning described in 40 CFR part 720, subpart A promulgated under the Toxic Substances Control Act, 15 U.S.C. 2601 *et seq.*

Producer means any person who manufactures, formulates or otherwise creates a substitute in its final form for distribution or use in interstate commerce.

Research and development means quantities of a substitute manufactured, imported, or processed or proposed to be manufactured, imported, or processed solely for research and development.

Residential use means use by a private individual of a chemical substance or any product containing the chemical substance in or around a permanent or temporary household, during recreation, or for any personal use or enjoyment. Use within a household for commercial or medical applications is not included in this definition, nor is use in automobiles, watercraft, or aircraft.

Significant new use means use of a new or existing substitute in a major industrial use sector as a result of the phaseout of ozone-depleting compounds.

Small uses means any use of a substitute in a sector other than a major industrial use sector, or production by any producer for use of a substitute in a major industrial sector of 10,000 lbs. or less per year.

Substitute or alternative means any chemical, product substitute, or alternative manufacturing process, whether existing or new, intended for use as a replacement for a class I or II compound.

Test marketing means the distribution in interstate commerce of a substitute to no more than a limited, defined number of potential customers to explore market viability in a competitive situation. Testing must be restricted to a defined testing period before the broader distribution of that substitute in interstate commerce.

Use means any use of a substitute for a Class I or Class II ozone-depleting compound, including but not limited to use in a manufacturing process or product,

in consumption by the end-user, or in intermediate uses, such as formulation or packaging for other subsequent uses.

Use restrictions means restrictions on the use of a substitute imposing either conditions on how the substitute can be used across a sector end-use or limits on the end-uses or specific applications where it can be used within a sector.

§82.174 Prohibitions.

(a) No person may introduce a new substitute into interstate commerce before the expiration of 90 days after a notice is initially submitted to EPA under §82.176(a).

(b) No person may use a substitute which a person knows or has reason to know was manufactured, processed or imported in violation of the regulations in this subpart, or knows or has reason to know was manufactured, processed or imported in violation of any use restriction in the acceptability determination, after the effective date of any rulemaking imposing such restrictions.

(c) No person may use a substitute without adhering to any use restrictions set by the acceptability decision, after the effective date of any rulemaking imposing such restrictions.

(d) No person may use a substitute after the effective date of any rulemaking adding such substitute to the list of unacceptable substitutes.

(e) *Rules Stayed for Reconsideration.* Notwithstanding any other provision of this subpart, the effectiveness of subpart G is stayed from December 8, 1994, to March 8, 1995, only as applied to use of substitutes for export.

§82.176 Applicability.

(a) Any producer of a new substitute must submit a notice of intent to introduce a substitute into interstate commerce 90 days prior to such introduction. Any producer of an existing substitute already in interstate commerce must submit a notice as of July 18, 1994, if such substitute has not already been reviewed and approved by the Agency.

(b) With respect to the following substitutes, producers are exempt from notification requirements:

(1) *Substitutes already listed as acceptable.* Producers need not submit notices on substitutes that are already listed as acceptable under SNAP.

(2) *Small sectors.* Persons using substitutes in sectors other than the nine principal sectors reviewed under this program are exempt from the notification requirements. This exemption shall not be construed to nullify an unacceptability determination or to allow use of an otherwise unacceptable substitute.

(3) *Small volume use within SNAP sectors.* Within the nine principal SNAP sectors, persons introducing a substitute whose expected volume of use amounts to less than 10,000 lbs. per year within a SNAP sector are exempt from notification requirements. This exemption shall not be construed to allow use of an otherwise unacceptable substitute in any quantity. Persons taking advantage of this exemption for small uses must maintain documentation for each substitute describing how the substitute meets this small use definition. This documentation must include annual production and sales information by sector.

(4) *Research and development.* Production of substitutes for the sole purpose of research and development is exempt from reporting requirements.

(5) *Test marketing.* Use of substitutes for the sole purpose of test marketing is exempt from SNAP notification requirements until 90 days prior to the introduction of such substitutes for full-scale commercial sale in interstate commerce. Persons taking advantage of this exemption are, however, required to notify the Agency in writing that they are conducting test marketing 30 days prior to the commencement of such marketing. Notification shall include the name of the substitute, the volume used in the test marketing, intended sector end-uses, and expected duration of the test marketing period.

(6) *Formulation changes.* In cases where replacement of class I or II compounds causes formulators to change other components in a product, formulators are exempt from reporting with respect to these auxiliary formulation changes. However, the SNAP submitter is required to notify the Agency if such changes are expected to significantly increase the environmental and human health risk associated with the use of any class I or class II substitute.

(7) *Substitutes used as feedstocks.* Producers of substitutes used as feedstocks which are largely or entirely consumed, transformed or destroyed in the manufacturing or use process are exempt from reporting requirements concerning such substitutes.

(c) Use of a substitute in the possession of an end-user as of March 18, 1994, listed as unacceptable or acceptable subject to narrowed use limits may continue until the individual end-users' existing supply, as of that date, of the substitute is exhausted.

Use of substitutes purchased after March 18, 1994, is not permitted subsequent to April 18, 1994.

§82.178 Information required to be submitted.

(a) Persons whose substitutes are subject to reporting requirements pursuant to §82.176 must provide the following information:

(1) *Name and description of the substitute.* The substitute should be identified by its: Chemical name; trade name(s); identification numbers; chemical formula; and chemical structure.

(2) *Physical and chemical information.* The substitute should be characterized by its key properties including but not limited to: Molecular weight; physical state; melting point; boiling point; density; taste and/or odor threshold; solubility; partition coefficients (Log Kow, Log Koc); atmospheric lifetime and vapor pressure.

(3) *Substitute applications.* Identification of the applications within each sector end-use in which the substitutes are likely to be used.

(4) *Process description.* For each application identified, descriptive data on processing, including in-place pollution controls.

(5) *Ozone depletion potential.* The predicted 100-year ozone depletion potential (ODP) of substitute chemicals. The submitter must also provide supporting documentation or references.

(6) *Global warming impacts.* Data on the total global warming potential of the substitute, including information on the GWP index and the indirect contributions to global warming caused by the production or use of the substitute (e.g., changes in

energy efficiency). GWP must be calculated over a 100, 500 and 1000-year integrated time horizon.

(7) *Toxicity data.* Health and safety studies on the effects of a substitute, its components, its impurities, and its degradation products on any organism (e.g., humans, mammals, fish, wildlife, and plants). For tests on mammals, the Agency requires a minimum submission of the following tests to characterize substitute risks: A range-finding study that considers the appropriate exposure pathway for the specific use (e.g., oral ingestion, inhalation, etc.), and a 90-day subchronic repeated dose study in an appropriate rodent species. For certain substitutes, a cardiotoxicity study is also required. Additional mammalian toxicity tests may be identified based on the substitute and application in question. To sufficiently characterize aquatic toxicity concerns, both acute and chronic toxicity data for a variety of species are required. For this purpose, the Agency requires a minimum data set as described in "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses," which is available through the National Technical Information Service (#PB 85-227049). Other relevant information and data summaries, such as the Material Safety Data Sheets (MSDS), should also be submitted. To assist in locating any studies previously submitted to EPA and referred to, but not included in a SNAP submission, the submitter must provide citations for the date, type of submission, and EPA Office to which they were submitted, to help EPA locate these quickly.

(8) *Environmental fate and transport.* Where available, information must be submitted on the environmental fate and transport of substitutes.

Such data shall include information on bioaccumulation, biodegradation, adsorption, volatility, transformation, and other data necessary to characterize movement and reaction of substitutes in the environment.

(9) *Flammability.* Data on the flammability of a substitute chemical or mixture are required. Specifically, the flash point and flammability limits are needed, as well as information on the procedures used for determining the flammability limits. Testing of blends should identify the compositions for which the blend itself is flammable and include fractionation data on changes in the composition of the blend during various leak scenarios. For substitutes that will be used in consumer applications, documentation of testing results conducted by independent laboratories should be submitted, where available. If a substitute is flammable, the submitter must analyze the risk of fire resulting from the use of such a substitute and assess the effectiveness of measures to minimize such risk.

(10) *Exposure data.* Available modeling or monitoring data on exposures associated with the manufacture, formulation, transport, use and disposal of a substitute. Descriptive process information for each substitute application, as described above, will be used to develop exposure estimates where exposure data are not readily available. Depending on the application, exposure profiles may be needed for workers, consumers, and the general population.

(11) *Environmental release data.* Data on emissions from the substitute application and equipment, as well as on pollutant releases or discharge to all environmental media. Submitters

should provide information on release locations, and data on the quantities, including volume, of anticipated waste associated with the use of the substitute. In addition, information on anticipated waste management practices associated with the use of the substitute. Any available information on any pollution controls used or that could be used in association with the substitute (e.g., emissions reduction technologies, wastewater treatment, treatment of hazardous waste) and the costs of such technology must also be submitted.

(12) *Replacement ratio for a chemical substitute.* Information on the replacement ratio for a chemical substitute versus the class I or II substances being replaced. The term "replacement ratio" means how much of a substitute must be used to replace a given quantity of the class I or II substance being replaced.

(13) *Required changes in use technology.* Detail on the changes in technology needed to use the alternative. Such information should include a description of whether the substitute can be used in existing equipment—with or without some retrofit—or only in new equipment. Data on the cost (capital and operating expenditures) and estimated life of any technology modifications should also be submitted.

(14) *Cost of substitute.* Data on the expected average cost of the alternative. In addition, information is needed on the expected equipment lifetime for an alternative technology. Other critical cost considerations should be identified, as appropriate.

(15) *Availability of substitute.* If the substitute is not currently available, the timing of availability of a substitute should be provided.

(16) *Anticipated market share.* Data on the anticipated near-term and long-term nationwide substitute sales.

(17) *Applicable regulations under other environmental statutes.* Information on whether the substitute is regulated under other statutory authorities, in particular the Clean Water Act, Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Toxic Substances Control Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Emergency Planning and Community Right-to-Know Act, or other titles under the Clean Air Act.

(18) *Information already submitted to the Agency.* Information requested in the SNAP program notice that has been previously submitted to the Agency as part of past regulatory and information-gathering activities may be referenced rather than resubmitted. Submitters who cannot provide accurate references to data sent previously to the Agency should include all requested information in the SNAP notice.

(19) *Information already available in the literature.* If any of the data needed to complete the SNAP program notice are available in the public literature, complete references for such information should be provided.

(b) The Significant New Alternatives Policy (SNAP) Information Notice is designed to provide the Agency with the information necessary to reach a decision on the acceptability of a substitute.

(1) Submitters requesting review under the SNAP program should send the completed SNAP no-

tice to: SNAP Document Control Officer, U.S. Environmental Protection Agency (6205-J), 1200 Pennsylvania Ave., NW., Washington, DC 20460.

(2) Submitters filing jointly under SNAP and the Premanufacture Notice Program (PMN) should send the SNAP addendum along with the PMN form to: PMN Document Control Officer, U.S. Environmental Protection Agency (7407), 1200 Pennsylvania Ave., NW., Washington, DC 20460. Submitters must also send both documents to the SNAP program, with a reference to indicate the notice has been furnished to the Agency under the PMN program. Submitters providing information on new chemicals for joint review under the TSCA and SNAP programs may be required to supply additional toxicity data under TSCA section 5.

(3) Submitters filing jointly under SNAP and under the Federal Insecticide, Fungicide, and Rodenticide Act should send the SNAP form to the Office of Pesticide Programs, Registration Division, (7505C) 1200 Pennsylvania Ave., NW., Washington, DC 20460, as well as to the SNAP Document Control Officer.

§82.180 Agency review of SNAP submissions.

(a) *Processing of SNAP notices*—(1) *90-day review process.* The 90-day review process will begin once EPA receives a submission and determines that such submission includes data on the substitute that are complete and adequate, as described in §82.178. The Agency may suspend or extend the review period to allow for submission of additional data needed to complete the review of the notice.

(2) *Initial review of notice.* The SNAP Document Control Officer will review the notice to en-

sure that basic information necessary to process the submission is present (i.e., name of company, identification of substitute, etc.). The SNAP Document Control Officer will also review substantiation of any claim of confidentiality.

(3) *Determination of data adequacy.* Upon receipt of the SNAP submission, the Agency will review the completeness of the information supporting the application. If additional data are needed, the submitter will be contacted following completion of this review. The 90-day review period will not commence until EPA has received data it judges adequate to support analysis of the submission.

(4) *Letter of receipt.* The SNAP Document Control Officer will send a letter of receipt to the submitter to confirm the date of notification and the beginning of EPA's 90-day review period. The SNAP Document Control Officer will also assign the SNAP notice a tracking number, which will be identified in the letter of receipt.

(5) *Availability of new information during review period.* If critical new information becomes available during the review period that may influence the Agency's evaluation of a substitute, the submitter must notify the Agency about the existence of such information within 10 days of learning of such data. The submitter must also inform the Agency of new studies underway, even if the results will not be available within the 90-day review period. The Agency may contact the submitter to explore extending or suspending the review period depending on the type of information received and the stage of review.

(6) *Completion of detailed review.* Once the initial data review, described in paragraphs (a)(2) and (3) of this section, has been completed, the Agency will complete a detailed evaluation of the notice. If during any time the Agency perceives a lack of information necessary to reach a SNAP determination, it will contact the submitter and request the missing data.

(7) *Criteria for review.* To determine whether a substitute is acceptable or unacceptable as a replacement for class I or II compounds, the Agency will evaluate:

(i) Atmospheric effects and related health and environmental impacts;

(ii) General population risks from ambient exposure to compounds with direct toxicity and to increased ground-level ozone;

(iii) Ecosystem risks;

(iv) Occupational risks;

(v) Consumer risks;

(vi) Flammability; and

(vii) Cost and availability of the substitute.

(8) *Communication of decision*—(i) *Communication of decision to the submitter.* Once the SNAP program review has been completed, the Agency will notify the submitter in writing of the decision. Sale or manufacture of new substitutes may commence after the initial 90-day notification period expires even if the Agency fails to reach a decision within the 90-day review period or fails to communicate that decision or the need for additional data to the submitter. Sale or manufacture of existing substitutes

may continue throughout the Agency's 90-day review.

(ii) *Communication of decision to the public.* The Agency will publish in the Federal Register periodic updates to the list of the acceptable and unacceptable alternatives that have been reviewed to date. In the case of substitutes proposed as acceptable with use restrictions, proposed as unacceptable or proposed for removal from either list, a rulemaking process will ensue. Upon completion of such rulemaking, EPA will publish revised lists of substitutes acceptable subject to use conditions or narrowed use limits and unacceptable substitutes to be incorporated into the Code of Federal Regulations. (See Appendices to this subpart.)

(b) *Types of listing decisions.* When reviewing substitutes, the Agency will list substitutes in one of five categories:

(1) *Acceptable.* Where the Agency has reviewed a substitute and found no reason to prohibit its use, it will list the alternative as acceptable for the end-uses listed in the notice.

(2) *Acceptable subject to use conditions.* After reviewing a notice, the Agency may make a determination that a substitute is acceptable only if conditions of use are met to minimize risks to human health and the environment. Where users intending to adopt a substitute acceptable subject to use conditions must make reasonable efforts to ascertain that other alternatives are not feasible due to safety, performance or technical reasons, documentation of this assessment must be retained on file for the purpose of demonstrating compliance. This documentation shall include descriptions of substitutes examined

and rejected, processes or products in which the substitute is needed, reason for rejection of other alternatives, e.g., performance, technical or safety standards. Use of such substitutes in ways that are inconsistent with such use conditions renders them unacceptable.

(3) *Acceptable subject to narrowed use limits.* Even though the Agency can restrict the use of a substitute based on the potential for adverse effects, it may be necessary to permit a narrowed range of use within a sector end-use because of the lack of alternatives for specialized applications. Users intending to adopt a substitute acceptable with narrowed use limits must ascertain that other alternatives are not technically feasible. Companies must document the results of their evaluation, and retain the results on file for the purpose of demonstrating compliance. This documentation shall include descriptions of substitutes examined and rejected, processes or products in which the substitute is needed, reason for rejection of other alternatives, e.g., performance, technical or safety standards, and the anticipated date other substitutes will be available and projected time for switching to other available substitutes. Use of such substitutes in applications and end-uses which are not specified as acceptable in the narrowed use limit renders them unacceptable.

(4) *Unacceptable.* This designation will apply to substitutes where the Agency's review indicates that the substitute poses risk of adverse effects to human health and the environment and that other alternatives exist that reduce overall risk.

(5) *Pending.* Submissions for which the Agency has not reached a determination will be de-

scribed as pending. For all substitutes in this category, the Agency will work with the submitter to obtain any missing information and to determine a schedule for providing the missing information if the Agency wishes to extend the 90-day review period. EPA will use the authority under section 114 of the Clean Air Act to gather this information, if necessary. In some instances, the Agency may also explore using additional statutory provisions (e.g., section 5 of TSCA) to collect the needed data.

(c) *Joint processing under SNAP and TSCA.* The Agency will coordinate reviews of substitutes submitted for evaluation under both the TSCA PMN program and the CAA.

(d) J*oint processing under SNAP and FIFRA.* The Agency will coordinate reviews of substitutes submitted for evaluation under both FIFRA and the CAA.

§82.182 Confidentiality of data.

(a) *Clean Air Act provisions.* Anyone submitting information must assert a claim of confidentiality at the time of submission for any data they wish to have treated as confidential business information (CBI) under 40 CFR part 2, subpart B. Failure to assert a claim of confidentiality at the time of submission may result in disclosure of the information by the Agency without further notice to the submitter. The submitter should also be aware that under section 114(c), emissions data may not be claimed as confidential.

(b) *Substantiation of confidentiality claims.* At the time of submission, EPA requires substantiation of any confidentiality claims made. Failure to provide any substantiation may result in disclosure of infor-

mation without further notice by the Agency. All submissions must include adequate substantiation in order for an acceptability determination on a substitute to be published. Moreover, under 40 CFR part 2, subpart B, there are further instances in which confidentiality assertions may later be reviewed even when confidentiality claims are initially received. The submitter will also be contacted as part of such an evaluation process.

(c) *Confidentiality provisions for toxicity data.* In the event that toxicity or health and safety studies are listed as confidential, this information cannot be maintained as confidential where such data are also submitted under TSCA or FIFRA, to the extent that confidential treatment is prohibited under those statutes. However, information contained in a toxicity study that is not health and safety data and is not relevant to the effects of a substance on human health and the environment (e.g., discussion of process information, proprietary blends) can be maintained as confidential subject to 40 CFR part 2, subpart B.

(d) *Joint submissions under other statutes.* Information submitted as part of a joint submission to either SNAP/TSCA or SNAP/FIFRA must adhere to the security provisions of the program offices implementing these statutes. For such submissions, the SNAP handling of such notices will follow the security provisions under these statutes.

§82.184 Petitions.

(a) *Who may petition.* Any person may petition the Agency to amend existing listing decisions under the SNAP program, or to add a new substance to any of the SNAP lists.

(b) *Types of petitions.* Five types of petitions exist:

(1) Petitions to add a substitute not previously reviewed under the SNAP program to the acceptable list. This type of petition is comparable to the 90-day notifications, except that it would generally be initiated by entities other than the companies that manufacture, formulate, or otherwise use the substitute. Companies that manufacture, formulate, or use substitutes that want to have their substitutes added to the acceptable list should submit information on the substitute under the 90-day review program;

(2) Petitions to add a substitute not previously reviewed under the SNAP program to the unacceptable list;

(3) Petitions to delete a substitute from the acceptable list and add it to the unacceptable list or to delete a substitute from the unacceptable and add it to the acceptable list;

(4) Petitions to add or delete use restrictions on an acceptability listing.

(5) Petitions to grandfather use of a substitute listed as unacceptable or acceptable subject to use restrictions.

(c) *Content of the petition.* The Agency requires that the petitioner submit information on the type of action requested and the rationale for the petition. Petitions in paragraphs (b)(1) and (2) of this section must contain the information described in §82.178, which lists the items to be submitted in a 90-day notification. For petitions that request the reexamination of a substitute previously reviewed under the SNAP program, the submitter must also ref-

erence the prior submittal or existing listing. Petitions to grandfather use of an unacceptable substitute must describe the applicability of the test to judge the appropriateness of Agency grandfathering as established by the United States District Court for the District of Columbia Circuit (see Sierra Club v. EPA, 719 F.2d 436 (D.C. Cir. 1983)). This test includes whether the new rule represents an abrupt departure from previously established practice, the extent to which a party relied on the previous rule, the degree of burden which application of the new rule would impose on the party, and the statutory interest in applying the new rule immediately.

(d) *Petition process*—(1) *Notification of affected companies.* If the petition concerns a substitute previously either approved or restricted under the SNAP program, the Agency will contact the original submitter of that substitute.

(2) *Review for data adequacy.* The Agency will review the petition for adequacy of data. As with a 90-day notice, the Agency may suspend review until the petitioner submits the information necessary to evaluate the petition. To reach a timely decision on substitutes, EPA may use collection authorities such as those contained in section 114 of the Clean Air Act as amended, as well as information collection provisions of other environmental statutes.

(3) *Review procedures.* To evaluate the petition, the Agency may submit the petition for review to appropriate experts inside and outside the Agency.

(4) *Timing of determinations.* If data are adequate, as described in §82.180, the Agency will respond to the petition within 90 days of receiving a complete petition. If the petition is inadequately

supported, the Agency will query the petitioner to fill any data gaps before the 90-day review period begins, or may deny the petition because data are inadequate.

(5) *Rulemaking procedures.* EPA will initiate rulemaking whenever EPA grants a petition to add a substance to the list of unacceptable substitutes, remove a substance from any list, or change or create an acceptable listing by imposing or deleting use conditions or use limits.

(6) *Communication of decision.* The Agency will inform petitioners within 90 days of receiving a complete petition whether their request has been granted or denied. If a petition is denied, the Agency will publish in the Federal Register an explanation of the determination. If a petition is granted, the Agency will publish the revised SNAP list incorporating the final petition decision within 6 months of reaching a determination or in the next scheduled update, if sooner, provided any required rulemaking has been completed within the shorter period.

APPENDIX D

80 Fed. Reg. 42,872 (July 20, 2015)

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[EPA-HQ-OAR-2014-0198; FRL-9926-55-OAR]

RIN 2060-AS18

Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action changes the status from acceptable to unacceptable; acceptable, subject to use conditions; or acceptable, subject to narrowed use limits for a number of substitutes, pursuant to the U.S. Environmental Protection Agency's Significant New Alternatives Policy program. We make these changes based on information showing that other substitutes are available for the same uses that pose lower risk overall to human health and the environment. Specifically, this action changes the listing status for certain hydrofluorocarbons in various end-uses in the aerosols, refrigeration and air conditioning, and foam blowing sectors. This action also changes the status from acceptable to unacceptable for certain hydrochlorofluorocarbons being phased out of production under the Montreal Protocol on Substances that Deplete the Ozone Layer and section 605(a) of the Clean Air Act.

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I. General Information

A. *Executive Summary*

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In an August 6, 2014, Federal Register Notice of Proposed Rulemaking (79 FR 46126), the U.S. Environmental Protection Agency (hereafter referred to as EPA or the Agency) proposed to change the status of certain substitutes[1] that at that time were listed as acceptable under the SNAP program. After reviewing public comments and available information, in today's action, EPA is modifying the listings from acceptable to unacceptable; acceptable, subject to use conditions; or acceptable, subject to narrowed use limits for certain hydrofluorocarbons (HFCs) and HFC blends in various end-uses in the aerosols, foam blowing, and refrigeration and air conditioning sectors where other alternatives are available or potentially available that pose lower overall risk to human health and the environment. Per the guiding principles of the SNAP program, this action does not specify that any HFCs are unacceptable across all sectors and end-uses. Instead, in all cases, EPA considered the intersection between the specific HFC or HFC blend and the particular end-use and the availability of substitutes for those particular end-uses. EPA is also not specifying that, for any sector, the only acceptable substitutes are HFC-free. EPA recognizes that both fluorinated (*e.g.*, HFCs, hydrofluoroolefins (HFOs)) and non-fluorinated (*e.g.*, hydrocarbons (HCs) and carbon dioxide (CO_2)) substitutes may pose lower overall risk to human health and the environment, depending on the particular use. Instead,

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[1] The terms "substitutes" and "alternatives" are used interchangeably.

consistent with CAA section 612 as we have historically interpreted it under the SNAP program, EPA is making these modifications based on our evaluation of the substitutes addressed in this action using the SNAP criteria for evaluation and considering the current suite of other available and potentially available substitutes.

On that basis, EPA is modifying the following listings by sector and end-use as of the dates indicated. EPA will continue to monitor the development and deployment of other alternatives as well as their uptake by industries affected by today's action. If EPA receives new information indicating that other alternatives will not be available by the change of status dates specified, EPA may propose further action to adjust the relevant dates.

(1) Aerosols

- EPA is listing HFC-125 as unacceptable for use as an aerosol propellant as of January 1, 2016.
- EPA is listing HFC-134a, HFC-227ea, and blends of HFC-134a and HFC-227ea as unacceptable for use as aerosol propellants as of July 20, 2016, except for those uses specifically listed as acceptable, subject to use conditions.
- EPA is listing HFC-227ea and blends of HFC-134a and HFC-227ea as acceptable, subject to use conditions, as of July 20, 2016, for use in metered dose inhalers (MDIs) approved by the U.S. Food and Drug Administration (FDA).
- EPA is listing HFC-134a as acceptable, subject to use conditions, as of July 20, 2016, until January 1, 2018, for the following specific uses:
  - ○ products for which new formulations require federal governmental review, including: EPA pesti-

cide registration, military or space agency specifications, or FDA approval (aside from MDIs); and

○ products for smoke detector functionality testing.

• EPA is listing HFC-134a as acceptable, subject to use conditions, as of July 20, 2016, for the following specific uses:

○ cleaning products for removal of grease, flux and other soils from electrical equipment or electronics;

○ refrigerant flushes;

○ products for sensitivity testing of smoke detectors;

○ sprays containing corrosion preventive compounds used in the maintenance of aircraft, electrical equipment or electronics, or military equipment;

○ duster sprays specifically for removal of dust from photographic negatives, semiconductor chips, and specimens under electron microscopes or for use on energized electrical equipment;

○ adhesives and sealants in large canisters;

○ lubricants and freeze sprays for electrical equipment or electronics;

○ sprays for aircraft maintenance;

○ pesticides for use near electrical wires or in aircraft, in total release insecticide foggers, or in certified organic use pesticides for which EPA has specifically disallowed all other lower-GWP propellants;

○ mold release agents and mold cleaners;

○ lubricants and cleaners for spinnerettes for synthetic fabrics;

○ document preservation sprays;

○ MDIs approved by the FDA for medical purposes;

○ wound care sprays;

○ topical coolant sprays for pain relief; and

○ products for removing bandage adhesives from skin.

(2) Refrigeration and air conditioning sector; Motor vehicle air conditioning (MVAC) systems for newly manufactured light-duty vehicles

EPA is listing HFC-134a as unacceptable for newly manufactured light-duty motor vehicles beginning in Model Year (MY) 2021 except as allowed under a narrowed use limit for use in newly manufactured light-duty vehicles destined for use in countries that do not have infrastructure in place for servicing with other acceptable refrigerants. This narrowed use limit will be in place through MY 2025. Beginning in MY 2026, HFC-134a will be unacceptable for use in all newly manufactured light-duty vehicles. EPA is also listing the use of certain refrigerant blends as unacceptable in newly manufactured light-duty motor vehicles starting with MY 2017.

(3) Refrigeration and air conditioning sector; Retail food refrigeration and vending machines

EPA is listing a number of refrigerants as unacceptable in a number of retail food refrigeration categories and in the vending machines end-use, as follows:

- Retrofitted supermarket systems: R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, and R-507A as of July 20, 2016
- New supermarket systems: HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, and R-507A as of January 1, 2017
- Retrofitted remote condensing units: R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, and R-507A as of July 20, 2016

- New remote condensing units: HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, and R-507A as of January 1, 2018
- Retrofitted vending machines: R-404A and R-507A as of July 20, 2016
- New vending machines: FOR12A, FOR12B, HFC-134a, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-426A, R-437A, R-438A, R-507A, RS-24 (2002 formulation), and SP34E as of January 1, 2019
- Retrofitted stand-alone retail food refrigeration equipment: R-404A and R-507A as of July 20, 2016
- New stand-alone medium-temperature units with a compressor capacity below 2,200 Btu/hr and not containing a flooded evaporator: FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-507A, RS-24 (2002 formulation), RS-44 (2003 formulation), SP34E, and THR-03 as of January 1, 2019
- New stand-alone medium-temperature units with a compressor capacity equal to or greater than 2,200 Btu/hr and stand-alone medium-temperature units containing a flooded evaporator: FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-428A, R-434A, R-437A, R-438A, R-507A, RS-24 (2002 formulation), RS-44

(2003 formulation), SP34E, and THR-03 as of January 1, 2020

- New stand-alone low-temperature units: HFC-227ea, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-428A, R-434A, R-437A, R-438A, R-507A, and RS-44 (2003 formulation) as of January 1, 2020

We are also providing clarification on several questions identified during the comment period. Specifically, we are providing clarification of the terms we are using for the various end-use categories covered by this rule, including "supermarket systems," "remote condensing units," and "stand-alone equipment." We are also providing clarification on certain types of equipment that do not fall within the categories and end-uses covered by this rule, including blast chillers, certain ice makers, very-low temperature refrigeration equipment, and equipment that dispenses chilled beverage or food (*e.g.*, soft-serve ice cream) via a nozzle. Finally, we are also providing clarification regarding our use of the terms "new" and "retrofit" and how those terms relate to service of existing equipment.

(4) Foams

EPA is listing a number of foam blowing agents unacceptable in each foams end-use excluding rigid PU spray foam, except as allowed under a narrowed use limit for military or space- and aeronautics-related applications. For military or space- and aeronautics-related applications, we are changing the listing status to acceptable, subject to a narrowed use limit, as of the status change date for the remainder of each end-use (January 1 of 2017, 2019,

2020 or 2021) and then to unacceptable as of January 1, 2022. We are not taking final action on rigid PU spray foam at this time. The unacceptable listing for all other end-uses is as follows:

- Rigid polyurethane (PU) appliance foam: HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2020
- Rigid PU commercial refrigeration and sandwich panels: HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2020
- Rigid PU slabstock and other: HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2019
- Rigid PU and polyisocyanurate laminated boardstock: HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; as of January 1, 2017
- Flexible PU: HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; as of January 1, 2017
- Integral skin PU: HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2017
- Polystyrene extruded sheet: HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2017
- Polystyrene extruded boardstock and billet (XPS): HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel B, and Formacel Z-6, as of January 1, 2021
- Polyolefin: HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2020

- Phenolic insulation board and bunstock: HFC-143a, HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; as of January 1, 2017
- Rigid PU marine flotation foam: HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, and Formacel Z-6, as of January 1, 2020

While EPA proposed and requested comments on interpreting the SNAP unacceptability determinations to apply to the import of foam products that retain the blowing agents (*i.e.*, closed cell foams), EPA is not finalizing that change in this rulemaking.

(5) Hydrochlorofluorocarbons (HCFCs)

As proposed, EPA is also modifying the listings for HCFC-141b, HCFC-142b, and HCFC-22, as well as blends that contain these substances in aerosols, foam blowing agents, fire suppression and explosion protection agents, sterilants, and adhesives, coatings and inks. These modifications align the SNAP listings with other parts of the stratospheric protection program, specifically section 605 and the implementing regulations at 40 CFR part 82 subpart A and section 610 and the implementing regulations at 40 CFR part 82 subpart C. …

(6) Overview of public comments

EPA received over 7,500 comments on the proposed rule. EPA requested and received comments on the proposed listing decisions as well as the proposed change of status dates. As noted in response to comments throughout this document, the decision on modifying each listing is based on the SNAP program's comparative risk framework. This includes information concerning whether there are alternatives available with lower overall risk to human health and the environment for the end-uses considered. As part of our consideration of the availability

of those alternatives, we considered all available information, including information provided during the public comment period, and information claimed as confidential and provided during meetings, regarding technical challenges that may affect the time at which the alternatives can be used safely and used consistent with other requirements such as testing and code compliance obligations. …

The sections that follow describe EPA's final action for each of the three sectors covered in this rulemaking—aerosols; foam blowing; and refrigeration and air-conditioning, including commercial refrigeration and motor vehicle air conditioning. For the end-uses addressed within each sector we explain the change of status determination and the dates when the change of status will apply. …

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B. Does this action apply to me?

Potential entities that may be affected by this final rule include:

TABLE 1—POTENTIALLY REGULATED ENTITIES BY NORTH AMERICAN INDUSTRIAL CLASSIFICATION SYSTEM (NAICS) CODE

Category	NAICS Code	Description of regulated entities
Part II		
Industry	238220	Plumbing, Heating, and Air Conditioning Contractors.
Industry	324191	Petroleum Lubricating Oil and Grease Manufacturing.
Industry	325199	All Other Basic Organic Chemical Manufacturing.
Industry	325412	Pharmaceutical Preparation Manufacturing.

Category	NAICS Code	Description of regulated entities
Industry	325510	Paint and Coating Manufacturing.
Industry	325520	Adhesive Manufacturing.
Industry	325612	Polishes and Other Sanitation Goods.
Industry	325620	Toilet Preparation Manufacturing.
Industry	325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing.
Industry	326140	Polystyrene Foam Product Manufacturing.
Industry	326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing.
Industry	333415	Air Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.
Industry	336211	Motor Vehicle Body Manufacturing.
Industry	3363	Motor Vehicle Parts Manufacturing.
Industry	336611	Ship Building and Repairing.
Industry	336612	Boat Building.
Industry	339113	Surgical Appliance and Supplies Manufacturing.
Retail	423620	Household Appliances, Electric Housewares, and Consumer Electronics Merchant Wholesalers.
Retail	423740	Refrigeration Equipment and

Category	NAICS Code	Description of regulated entities
		Supplies Merchant Wholesalers.
Retail	44511	Supermarkets and Other Grocery (except Convenience) Stores.
Retail	445110	Supermarkets and Other Grocery (except Convenience) Stores.
Retail	445120	Convenience Stores.
Retail	44521	Meat Markets.
Retail	44522	Fish and Seafood Markets.
Retail	44523	Fruit and Vegetable Markets.
Retail	445291	Baked Goods Stores.
Retail	445292	Confectionary and Nut Stores.
Retail	445299	All Other Specialty Food Stores.
Retail	4453	Beer, Wine, and Liquor Stores.
Retail	446110	Pharmacies and Drug Stores.
Retail	44711	Gasoline Stations with Convenience Stores.
Retail	452910	Warehouse Clubs and Supercenters.
Retail	452990	All Other General Merchandise Stores.
Services	72111	Hotels (except Casino Hotels) and Motels.
Services	72112	Casino Hotels.
Retail	72241	Drinking Places (Alcoholic Beverages).
Retail	722513	Limited-Service Restaurants.
Retail	722514	Cafeterias, Grill Buffets, and Buffets.
Retail	722515	Snack and Nonalcoholic Beverage Bars

This table is not intended to be exhaustive, but rather a guide regarding entities likely to use the substitute whose use is regulated by this action.

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II. How does the SNAP program work?

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D. What are the guiding principles of the SNAP program?

The seven guiding principles of the SNAP program, elaborated in the preamble to the initial SNAP rule and consistent with section 612, are discussed below.

• Evaluate substitutes within a comparative risk framework

The SNAP program evaluates the risk of alternative compounds compared to available or potentially available substitutes to the ozone depleting compounds which they are intended to replace. The risk factors that are considered include ozone depletion potential as well as flammability, toxicity, occupational health and safety, and contributions to climate change and other environmental factors.

• Do not require that substitutes be risk free to be found acceptable

Substitutes found to be acceptable must not pose significantly greater risk than other substitutes, but they do not have to be risk free. A key goal of the SNAP program is to promote the use of substitutes that minimize risks to human health and the environment relative to other alternatives. In some cases, this approach may involve designating a substitute acceptable even though the compound may pose a risk of some type, provided its use does not pose significantly greater risk than other alternatives.

- Restrict those substitutes that are significantly worse

EPA does not intend to restrict a substitute if it has only marginally greater risk. Drawing fine distinctions would be extremely difficult. The Agency also does not want to intercede in the market's choice of substitutes by listing as unacceptable all but a few substitutes for each end-use, and does not intend to do so unless a substitute has been proposed or is being used that is clearly more harmful to human health or the environment than other available or potentially available alternatives.

- Evaluate risks by use

Central to SNAP's evaluations is the intersection between the characteristics of the substitute itself and its specific end-use application. Section 612 requires that substitutes be evaluated by use. Environmental and human health exposures can vary significantly depending on the particular application of a substitute. Thus, the risk characterizations must be designed to represent differences in the environmental and human health effects associated with diverse uses. This approach cannot, however, imply fundamental tradeoffs with respect to different types of risk to either the environment or to human health.

- Provide the regulated community with information as soon as possible

The Agency recognizes the need to provide the regulated community with information on the acceptability of various substitutes as soon as possible. To do so, EPA issues notices or determinations of acceptability and rules identifying substitutes as unacceptable, acceptable to use conditions or acceptable subject to narrowed use limits in the Federal Register. In addition, we maintain lists of acceptable and

unacceptable alternatives on our Web site, *www.epa.gov/ozone/snap*.

• Do not endorse products manufactured by specific companies

The Agency does not issue company-specific product endorsements. In many cases, the Agency may base its analysis on data received on individual products, but the addition of a substitute to the acceptable list based on that analysis does not represent an endorsement of that company's products.

• Defer to other environmental regulations when warranted

In some cases, EPA and other federal agencies have developed extensive regulations under other sections of the CAA or other statutes that address potential environmental or human health effects that may result from the use of alternatives to class I and class II substances. For example, use of some substitutes may in some cases entail increased use of chemicals that contribute to tropospheric air pollution. The SNAP program takes existing regulations under other programs into account when reviewing substitutes.

E. What are EPA's criteria for evaluating substitutes under the SNAP program?

EPA applies the same criteria for determining whether a substitute is acceptable or unacceptable. These criteria, which can be found at § 82.180(a)(7), include atmospheric effects and related health and environmental effects, ecosystem risks, consumer risks, flammability, and cost and availability of the substitute. To enable EPA to assess these criteria, we require submitters to include various information including ozone depletion potential (ODP), GWP, tox-

icity, flammability, and the potential for human exposure.

When evaluating potential substitutes, EPA evaluates these criteria in the following groupings:

• *Atmospheric effects*—The SNAP program evaluates the potential contributions to both ozone depletion and climate change. The SNAP program considers the ozone depletion potential and the 100-year integrated GWP of compounds to assess atmospheric effects.

• *Exposure assessments*—The SNAP program uses exposure assessments to estimate concentration levels of substitutes to which workers, consumers, the general population, and the environment may be exposed over a determined period of time. These assessments are based on personal monitoring data or area sampling data if available. Exposure assessments may be conducted for many types of releases including:

(1) Releases in the workplace and in homes;

(2) Releases to ambient air and surface water;

(3) Releases from the management of solid wastes.

• *Toxicity data*—The SNAP program uses toxicity data to assess the possible health and environmental effects of exposure to substitutes. We use broad health-based criteria such as:

(1) Permissible Exposure Limits (PELs) for occupational exposure;

(2) Inhalation reference concentrations (RfCs) for non-carcinogenic effects on the general population;

(3) Cancer slope factors for carcinogenic risk to members of the general population.

When considering risks in the workplace, if OSHA has not issued a PEL for a compound, EPA

then considers Recommended Exposure Limits from the National Institute for Occupational Safety and Health (NIOSH), Workplace Environmental Exposure Limits (WEELs) set by the American Industrial Hygiene Association (AIHA), or threshold limit values (TLVs) set by the American Conference of Governmental Industrial Hygienists (ACGIH). If limits for occupational exposure or exposure to the general population are not already established, then EPA derives these values following the Agency's peer reviewed guidelines. Exposure information is combined with toxicity information to explore any basis for concern. Toxicity data are used with existing EPA guidelines to develop health-based limits for interim use in these risk characterizations.

- *Flammability*—The SNAP program examines flammability as a safety concern for workers and consumers. EPA assesses flammability risk using data on:

(1) Flash point and flammability limits (*e.g.* American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) flammability/combustibility classifications);

(2) Data on testing of blends with flammable components;

(3) Test data on flammability in consumer applications conducted by independent laboratories; and

(4) Information on flammability risk mitigation techniques.

- *Other environmental impacts*—The SNAP program also examines other potential environmental impacts like ecotoxicity and local air quality impacts. A compound that is likely to be discharged to water may be evaluated for impacts on aquatic life. Some substitutes are volatile organic compounds (VOC).

EPA also notes whenever a potential substitute is considered a hazardous or toxic air pollutant (under CAA sections 112(b) and 202(l)) or hazardous waste under the Resource Conservation and Recovery Act (RCRA) subtitle C regulations.

Over the past twenty years, the menu of substitutes has become much broader and a great deal of new information has been developed on many substitutes. Because the overall goal of the SNAP program is to ensure that substitutes listed as acceptable do not pose significantly greater risk to human health and the environment than other available substitutes, the SNAP criteria should be informed by our current overall understanding of environmental and human health impacts and our experience with and current knowledge about available and potentially available substitutes. Over time, the range of substitutes reviewed by SNAP has changed, and, at the same time, scientific approaches have evolved to more accurately assess the potential environmental and human health impacts of these chemicals and alternative technologies.

F. How are SNAP determinations updated?

Three mechanisms exist for modifying the list of SNAP determinations. First, under section 612(d), the Agency must review and either grant or deny petitions to add or delete substances from the SNAP list of acceptable or unacceptable substitutes. That provision allows any person to petition the Administrator to add a substance to the list of acceptable or unacceptable substitutes or to remove a substance from either list. The second means is through the notifications which must be submitted to EPA 90 days before introduction of a substitute into interstate

commerce for significant new use as an alternative to a class I or class II substance. These 90-day notifications are required by section 612(e) of the CAA for producers of substitutes to class I substances for new uses and, in all other cases, by EPA regulations issued under sections 114 and 301 of the Act to implement section 612(c).

Finally, since the inception of the SNAP program, we have interpreted the section 612 mandate to find substitutes acceptable or unacceptable to include the authority to act on our own to add or remove a substance from the SNAP lists. In determining whether to add or remove a substance from the SNAP lists, we consider whether there are other available substitutes that pose lower overall risk to human health and the environment. In determining whether to modify a listing of a substitute we undertake the same consideration, but do so in the light of new data not considered at the time of our original listing decision, including information on new substitutes and new information on substitutes previously reviewed.

G. What does EPA consider in deciding whether to modify the listing status of an alternative?

As described in this document and elsewhere, including in the initial SNAP rule published in the Federal Register on March 18, 1994 (59 FR 13044), CAA section 612 requires EPA to list as unacceptable any substitute substance where it finds that there are other substitutes currently or potentially available that reduce overall risk to human health and the environment.

The initial SNAP rule included submission requirements and presented the environmental and

health risk factors that the SNAP program considers in its comparative risk framework. Environmental and human health exposures can vary significantly depending on the particular application of a substitute; therefore, EPA makes decisions based on the particular end-use where a substitute is to be used. EPA has, in many cases, found certain substitutes acceptable only for limited end-uses or subject to use restrictions.

It has now been over twenty years since the initial SNAP rule was promulgated. In that period, the menu of available alternatives has expanded greatly and now includes many substitutes with diverse characteristics and varying effects on human health and the environment. When the SNAP program began, the number of substitutes available for consideration was, for many end-uses, somewhat limited. While the SNAP program's initial comparative assessments of overall risk to human health and the environment were rigorous, often there were few substitutes upon which to apply the comparative assessment. The immediacy of the class I phaseout often meant that SNAP listed class II ODS (*i.e.*, HCFCs) as acceptable, recognizing that they too would be phased out and were only an interim solution. Other Title VI provisions such as the section 610 Nonessential Products Ban and the section 605 Use Restriction made clear that a listing under the SNAP program could not convey permanence.

Since EPA issued the initial SNAP rule in 1994, the Agency has issued 19 rules and 30 notices that generally expand the menu of options for all SNAP sectors and end-uses. Comparisons today apply to a broader range of options—both chemical and non-chemical—than was available at the inception of the

SNAP program. Industry experience with these substitutes has also grown during the history of the program. This varies by sector and by end-use.

In addition to an expanding menu of substitutes, developments over the past 20 years have improved our understanding of global environmental issues. With regard to that information, our review of substitutes in this rule includes comparative assessments that consider our evolving understanding of a variety of factors, including climate change. GWPs and climate effects are not new elements in our evaluation framework, but as is the case with all of our review criteria, the amount and quality of information has expanded.

To the extent possible, EPA's ongoing management of the SNAP program considers new information and improved understanding of the risk to the environment and human health. EPA previously has taken several actions revising listing determinations from acceptable or acceptable with use conditions to unacceptable based on information made available to EPA after a listing was issued. For example, on January 26, 1999, EPA listed the refrigerant blend known by the trade name MT-31 as unacceptable for all refrigeration and air conditioning end-uses. EPA previously listed this blend as an acceptable substitute in various end-uses within the refrigeration and air conditioning sector (June 3, 1997; 62 FR 30275). Based on new information about the toxicity of one of the chemicals in the blend, EPA subsequently removed MT-31 from the list of acceptable substitutes and listed it as unacceptable in all refrigeration and air conditioning end-uses (January 26, 1999; 64 FR 3861).

Another example of EPA revising a listing determination occurred in 2007 when EPA listed HCFC-22 and HCFC-142b as unacceptable for use in the foam sector (March 28, 2007; 72 FR 14432). These HCFCs, which are ozone depleting and subject to a global production phaseout, were initially listed as acceptable substitutes since they had a lower ODP than the substances they were replacing and there were no other available substitutes that posed lower overall risk at the time of EPA's listing decision. HCFCs offered a path forward for some sectors and end-uses at a time when substitutes were far more limited. In light of the expanded availability of other substitutes with lower overall risk to human health and the environment in specific foam end-uses, and taking into account the 2010 class II ODS phasedown step, EPA changed the listing for these HCFCs in relevant end-uses from acceptable to unacceptable. In that rule, EPA noted that continued use of these HCFCs would contribute to unnecessary depletion of the ozone layer and delay the transition to substitutes that pose lower overall risk to human health and the environment. EPA established a change of status date that recognized that existing users needed time to adjust their manufacturing processes to safely accommodate the use of other substitutes.

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III. What actions and information related to greenhouse gases have bearing on this final action to modify prior SNAP determinations?

GWP [global-warming potential] is one of several criteria EPA considers in the overall evaluation of

alternatives under the SNAP program. During the past two decades, the general science on climate change and the potential contributions of greenhouse gases (GHGs) such as HFCs to climate change have become better understood.

On December 7, 2009, at 74 FR 66496, the Administrator issued two distinct findings regarding GHGs[18] under section 202(a) of the CAA:

- Endangerment Finding: The current and projected concentrations of the six key well-mixed greenhouse gases in the atmosphere—CO_2, methane (CH_4), nitrous oxide (N_2O), HFCs, perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Like the ODS they replace, HFCs are potent GHGs.[19] Although they represent a small fraction of the current total volume of GHG emissions, their warming impact is very strong. The most commonly used HFC is HFC-134a. HFC-134a is 1,430 times more damaging to the climate system than carbon dioxide. HFC emissions are projected to increase

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[18] The relevant scientific and technical information summarized to support the Endangerment Finding and the Cause or Contribute Finding can be found at: *www.epa.gov/climatechange/Downloads/endangerment/Endangerment_TSD.pdf*.

[19] IPCC/TEAP (2005) Special Report: Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons (Cambridge Univ Press, New York).

substantially and at an increasing rate over the next several decades if left unregulated. In the United States, emissions of HFCs are increasing more quickly than those of any other GHGs, and globally they are increasing 10-15% annually.[20] At that rate, emissions are projected to double by 2020 and triple by 2030.[21] HFCs are rapidly accumulating in the atmosphere. The atmospheric concentration of HFC-134a, the most abundant HFC, has increased by about 10% per year from 2006 to 2012, and the concentrations of HFC-143a and HFC-125 have risen over 13% and 16% per year from 2007-2011, respectively.[22] [23]

Annual global emissions of HFCs are projected to rise to about 6.4 to 9.9 Gt CO_2eq in 2050,[24] which is comparable to the drop in annual GHG emissions from ODS of 8.0 Gt CO_2eq between 1988 and 2010 (UNEP, 2011). By 2050, the buildup of HFCs in the atmosphere is projected to increase radiative forcing by up to 0.4 W m-2 . This increase may be as much as one-fifth to one-quarter of the expected increase in radiative forcing due to the buildup of CO_2 since 2000, according to the Intergovernmental Panel on Climate Change's (IPCC's) Special Report on Emis-

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[20] UNEP 2011. HFCs: A Critical Link in Protecting Climate and the Ozone Layer. United Nations Environment Programme.

[21] Akerman, Nancy H. Hydrofluorocarbons and Climate Change: Summaries of Recent Scientific and Papers, 2013.

[22] Montzka, S.A.: HFCs in the Atmosphere: Concentrations, Emissions and Impacts, ASHRAE/NIST Conference 2012.

[23] NOAA data at *ftp://ftp.cmdl.noaa.gov/hats/hfcs/*.

[24] Velders, G.J.M., D.W. Fahey, J.S. Daniel, M. McFarland, S.O. Andersen (2009) The large contribution of projected HFC emissions to future climate forcing. Proceedings of the National Academy of Sciences USA 106: 10949-10954.

sions Scenarios (SRES) (UNEP, 2011). To appreciate the significance of the effect of projected HFC emissions within the context of all GHGs, HFCs would be equivalent to 5 to 12% of the CO_2 emissions in 2050 based on the IPCC's highest CO_2 emissions scenario and equivalent to 27 to 69% of CO_2 emissions based on the IPCC's lowest CO_2 emissions pathway.[25] [26] …

…

IV. What petitions has EPA received requesting a change in listing status for HFCs?

…

B. How This Action Relates to the Climate Action Plan and Petitions

This action is consistent with a provision in the President's CAP announced June 2013: Moving forward, the Environmental Protection Agency will use its authority through the Significant New Alternatives Policy Program to encourage private sector investment in low-emissions technology by identifying and approving climate-friendly chemicals while prohibiting certain uses of the most harmful chemical alternatives.

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[25] HFCs: A Critical Link in Protecting Climate and the Ozone Layer. United Nations Environment Programme (UNEP), 2011, 36pp

[26] IPCC, 2013: Annex II: Climate System Scenario Tables [Prather, M., G. Flato, P. Friedlingstein, C. Jones, J.-F. Lamarque, H. Liao and P. Rasch (eds.)]. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

The CAP further states: "to reduce emissions of HFCs, the United States can and will lead both through international diplomacy as well as domestic actions." This rule is also consistent with that call for leadership through domestic actions. As regards international leadership, for the past five years, the United States, Canada, and Mexico have proposed an amendment to the Montreal Protocol to phase down the production and consumption of HFCs. Global benefits of the amendment proposal would yield significant reductions of over 90 gigatons of carbon dioxide equivalent (CO_2eq) through 2050.

This action also addresses certain aspects of the three petitions referred to above. First, this action responds to the one aspect of the three petitions that EPA found complete, namely petitioners' request that EPA change the listing of HFC-134a from acceptable to unacceptable in new MVAC systems. (See section V.B.) Second, regarding the remaining aspects of the three petitions, which EPA found to be incomplete, EPA has independently acquired sufficient information to address certain other requests made by the petitioners. EPA's action in this final rule may be considered responsive to certain aspects of those petitions such as: Changing the listing of certain HFCs used in specific aerosol uses from acceptable to unacceptable or acceptable, subject to use conditions; changing the listing of certain HFCs used in specific foams end-uses from acceptable to unacceptable for most uses; changing the listing of HFC-134a from acceptable to unacceptable for new stand-alone retail food refrigerators and freezers; and changing the listing of a number of refrigerant blends with higher GWPs from acceptable to unacceptable for new and retrofit stand-alone retail food

refrigerators and freezers. Specifically, as explained in more detail in the sector-specific sections of this document, we are revising the listings for substitutes in the aerosols, foams, and refrigeration and air conditioning sectors that pose significantly greater overall risk to human health and the environment as compared with other available or potentially available substitutes in the specified end-uses.

Throughout the process of our discussions with the regulated community, we have sought to convey our continued understanding of the role that certainty plays in enabling the robust development and uptake of alternatives. Unfortunately, some of the key strengths of the SNAP program, such as its chemical and end-use specific consideration, its multi-criteria basis for action, and its petition process, tend to militate against some measures that could provide more certainty, such as setting specific numerical criteria for environmental evaluations (*e.g.*, all compounds with GWP greater than 150). That being said, we believe that the action we are taking today, and future action we may take, does provide additional certainty in the specific cases addressed. In addition, we remain committed to continuing to actively seek stakeholder views and to share our thinking at the earliest moment practicable on any future actions, as part of our commitment to provide greater certainty to producers and consumers in SNAP-regulated industrial sectors.

V. What is EPA's final action concerning the HFCs addressed in this rule?

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B. MVAC Systems for Newly Manufactured Light-Duty Motor Vehicles

1. Background

MVAC systems cool passenger cars, light-duty trucks, buses, and rail vehicles. CFC-12 was the refrigerant historically used in the manufacture of MVAC systems. HFC-134a, along with a number of other substitutes, was found acceptable for use in light-duty vehicles in 1994 and at the same time, CFC-12 was being phased out of production. By the mid-1990s, use of CFC-12 in manufacturing new light-duty vehicles ceased in the United States and manufacturers of light-duty vehicles uniformly decided to adopt HFC-134a for use in MVAC. Today, while MVAC systems in some older vehicles may still be using CFC-12, HFC-134a remains the dominant refrigerant used in light-duty vehicles worldwide. More recently, additional alternatives for MVAC have been listed as acceptable, subject to use conditions,[31] including HFO-1234yf, HFC-152a, and carbon dioxide (CO_2 or R-744). Manufacturers are currently manufacturing or are actively developing light-duty models using HFO-1234yf, HFC-152a, and CO_2. The development of MVAC systems using lower-GWP refrigerants has been encouraged by MVAC refrigerant requirements in Europe, where the European Union Directive on Mobile Air Conditioning (MAC Directive) mandates transition to a refrigerant

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[31] Listed at 40 CFR part 82, subpart G.

with a GWP below 150 by January 1, 2017,[32] and in the United States by the availability of credits under the Light-Duty Greenhouse Gas (LD GHG) Rule, described in further detail below.

Neither HFC-134a nor any of the refrigerants listed more recently is ozone-depleting. HFO-1234yf, HFC-152a, and CO_2 have much lower GWPs than HFC-134a. HFO-1234yf has a GWP of 4, HFC-152a has a GWP of 124, and CO_2 (by definition) has a GWP of 1 while HFC-134a has a GWP of 1,430. HFC-134a and CO_2 are nonflammable; HFO-1234yf and HFC-152a are flammable. All of the gaseous refrigerants can cause asphyxiation at high concentrations. CO_2 concentrations that could potentially result from refrigerant leaks into the passenger compartment without mitigation measures could reduce a driver's attentiveness and performance. HFC-134a and the three lower-GWP alternatives are exempt from the definition of VOC under CAA regulations (see 40 CFR 51.100(s)) addressing the development of SIPs to attain and maintain the national ambient air quality standards. As discussed in the NPRM, EPA has created use conditions for HFC-134a, HFO-1234yf, HFC-152a, and CO_2 that establish unique fittings and labeling requirements, and where appropriate, mitigate flammability and toxicity risks.

HFO-1234yf is being used in cars on the road today in the United States. At the time of the proposal for this rule, EPA was aware that HFO-1234yf was

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[32] Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 (EU MAC Directive). This document is accessible at: *eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0040:EN:HTML*.

in use in MVAC systems in approximately nine[33] models in the United States produced by several manufacturers of light-duty vehicles. EPA expects, and several commenters indicated that, additional models have or will be introduced using HFO-1234yf systems over the next several years. The results of a 2014 industry survey submitted by AAM and the Association of Global Automakers (Global Automakers) as a public comment to this rule found that automobile manufacturers who responded to the survey had plans in place to transition 90% of light-duty models sold in the United States by or before MY 2021.[34] According to comments submitted by Honeywell, there are approximately 28 different automobile brands selling around 60 different models designed to use HFO-1234yf globally.[35] DuPont stated that more than 7 million vehicles using HFO-1234yf are estimated to be on the road by the end of 2015 globally, and in addition to infrastructure being in place at vehicle assembly plants, equipment suppliers are already producing the under hood, in factory, and service equipment.[36]

While EPA was aware in the 1990s that CO_2 might be a feasible alternative in this application, the state of research and development indicated that it was not yet available because a design had not yet been developed that would allow safe use in MVAC

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[33] Nelson, 2013. Gabe Nelson. Automakers' switch to new refrigerant will accelerate with EPA credits, European mandate. Automotive News. Available online at *www.autonews.com/article/20131230/OEM01/312309996/warming-to-the-idea*.

[34] EPA–HQ–OAR–2014–0198–0207 and EPA–HQ–OAR–2014–0198–0113.

[35] EPA–HQ–OAR–2014–0198–0170.

[36] EPA–HQ–OAR–2014–0198–0077.

systems in light-duty vehicles. More than 20 years later, EPA is still not aware of current commercial use of CO_2 in MVAC systems. However, significant research and development are occurring in order to design a system that will ensure CO_2 can be used safely as an MVAC refrigerant. At least one global manufacturer of light-duty vehicles has announced its intention to commercialize vehicles that use CO_2 as the MVAC refrigerant in the next five years, and perhaps as early as 2016.[37]

In 2008, EPA found HFC-152a acceptable subject to use conditions. MVAC systems using HFC-152a have not been commercialized to date; however, EPA is aware of a demonstration project in India with a major Indian motor vehicle manufacturer considering HFC-152a in secondary loop MVAC systems.[38]

In addition to the use and development of HFO-1234yf, HFC-152a, and CO_2 MVAC systems, EPA is aware of ongoing research and development which could ultimately result in future listings of additional alternatives for light-duty MVAC systems. For example, since the publication of the proposed rule, the SNAP program received a new submission for another low-GWP alternative that is a blend with a GWP below 150.

There are also several blend refrigerants that have been listed as acceptable or acceptable, subject

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[37] Daimler, 2014.

[38] Andersen et al., 2015. "Secondary Loop Motor Vehicle Air Conditioning Systems (SL–MACs). Using Low-Global Warming Potential (GWP) Refrigerants in Leak-Tight Systems In Climates with High Fuel Prices and Long, Hot and Humid Cooling Seasons. Building on the Previous Success of Delphi, Fiat, General Motors, Volvo, Red Dot, SAE Cooperative Research Projects, And Other Engineering Groups." MACS Briefing, 2015.

to use conditions, since 1994, but that have never been developed for use in MVAC or used in manufacture of new vehicles. Today's action will change the status of these refrigerant blends to unacceptable as of MY 2017 for use in newly manufactured light-duty vehicles. These substitutes include HFC blends SP34E and R-426A (also known as RS-24) with GWPs of 1,380 and 1,508, respectively, and the HCFC blends, R-416A (also known as HCFC Blend Beta or FRIGC FR12), R-406A, R-414A (also known as HCFC Blend Xi or GHG-X4), R-414B (also known as HCFC Blend Omicron), HCFC Blend Delta (also known as Free Zone), Freeze 12, GHG-X5, and HCFC Blend Lambda (also known as GHG-HP), with GWPs ranging from 1,480 to 2,340 and ODPs ranging from 0.012 to 0.056. For simplicity, we refer to these substitutes as "the refrigerant blends" in the following discussion.

As noted above, none of these are currently used by the original equipment manufacturers (OEMs) nor are we aware that any models are being developed for use with these substitutes. All of these refrigerant blends have GWPs that are significantly higher than the GWPs for HFO-1234yf, HFC-152a, and CO_2 and the blends containing HCFCs have ODPs ranging from 0.012 to 0.056. As discussed, there are alternatives with lower overall risk to human health and the environment that are available for this use.

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6. How is EPA responding to comments concerning this end-use?

…

(c) Environmental impacts

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Comment: A few commenters noted the high price of HFO-1234yf relative to HFC-134a. One commenter, referring to the NPRM, stated that EPA continues to believe that HFO-1234yf is unlikely to ever be as inexpensive as HFC-134a is currently. Commenters stated that the high price of HFO-1234yf is likely to slow the transition away from HFC-134a in the United States.

Response: As explained in more detail in the response to comments later in this preamble, under the SNAP criteria for review in 40 CFR 82.180(a)(7), the only cost information that EPA considers as part of its SNAP review is the cost of the substitute under review. As part of EPA's cost analysis conducted in support of this rulemaking, the potential costs to manufacturers were estimated based on per-system costs of alternative systems, as identified in EPA's report on Global Mitigation of Non-CO_2 Greenhouse Gases: 2010-2030 (EPA, 2013a), and converted to 2013 dollars. The incremental per-system cost of an alternative MVAC system compared to an HFC-134a system is estimated to be about $62/unit. EPA previously analyzed these costs in documents supporting the LD GHG Rule and in that analysis accounted for the cost of 100% of domestic vehicles to transition to use of HFO-1234yf by MY 2021. These incremental costs are less than 1% relative to the total direct manufacturing cost for a light-duty vehicle.[58] EPA

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[58] Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA). 2012. Joint Technical Support Document: Final Rulemaking for 2017–2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. August 2012.

does not believe an incremental cost of less than 1% of the total direct manufacturing cost will slow the transition away from HFC-134a. EPA understands that often new alternatives have higher initial costs, but this is not always true. In addition, over time the cost of the alternative often drops as demand and supply increase.

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VII. How is EPA responding to other public comments?

A. Authority

1. General Authority

Comment: The Agency received several comments, including those from Solvay, Arkema, AHAM, BASF, Mexichem, NRDC and IGSD, Whirlpool, and Bally Refrigerated Boxes on its authority to change the status of HFC-134a and other substitutes that were addressed in the proposed rule. NRDC and IGSD asserted that under section 612 of the CAA ((42 U.S.C. 7671k), EPA has the authority—if not the affirmative mandate—to remove the proposed substances from the SNAP list of acceptable substitutes. They quoted from section 612(a), emphasizing that replacement of ODS with substitutes that reduce overall risk is to occur "to the maximum extent practicable" (42 U.S.C. 7671k(a)). They stated that under section 612(c)(2), EPA has authority to decide which substances may and may not be used in the SNAP sectors. Finally, they asserted that in speaking of both alternatives "currently" available, and those that are "potentially" available, Congress recognized

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Available online at: http://www.epa.gov/otaq/climate/documents/420r12901.pdf.

that the universe of alternatives will evolve over time, so that as additional alternatives become available, EPA has an obligation to revise the SNAP list to ensure that the substances included will minimize "overall risks to human health and the environment" (42 U.S.C. 7671k(c)).

In contrast, Mexichem, Solvay, AHAM/Electrolux and Arkema asserted that the proposed actions were outside the scope of Title VI, section 612 of the CAA, and EPA's SNAP regulations. Specifically, these commenters asserted that Congress and EPA designed the SNAP program to safeguard stratospheric ozone, and not to address climate change and greenhouse gases. AHAM stated that Title VI of the CAA does not provide EPA broad authority to regulate refrigerants, foams and chemicals in circumstances unrelated to ozone depletion. Mexichem stated that the repeated references in section 612 to class I and class II substances demonstrate that Congress was concerned with ODS.

Several commenters emphasized evaluation of a substitute in relation to ODS. Mexichem asserted that EPA recognized "the limited nature of the statute" in 1994 when it promulgated the statement of purpose and scope for the SNAP program (59 FR 13044, Mar. 18, 1994; 40 CFR 82.170). In its comment, Mexichem provided a quotation from the statement of purpose and scope, suggesting that substitutes are to be compared only to ODS. Arkema quoted an EPA "Guide to Completing a Risk Screen"[91] for the fire suppression sector as explaining that environmental effects would be evaluated by comparing the substitute's GWP to the GWP of the

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[91] *http://www.epa.gov/ozone/snap/fire/riskscreenfire.pdf*

ODS it replaces. Solvay contended that changing the listing status of a previously approved substitute would eliminate the user's ability to use a substance that met the statutory objective of providing better overall health and safety in comparison to the use of an ODS in a specific end-use.

Several commenters also asserted that nothing has happened with respect to any attribute or impact of the HFCs addressed in this rulemaking that would warrant a change in the initial decisions to list HFCs as acceptable.

Response: EPA agrees with NRDC and IGSD's conclusion that the Agency has authority to take the change of status actions included in the proposed rulemaking and disagrees with comments suggesting that the sole purpose of section 612 and the SNAP program is to safeguard the ozone layer. Section 612(c) requires EPA to take action when the Agency (1) determines that a substitute may present adverse effects to human health and the environment, and (2) identifies an alternative that reduces overall risk to human health and the environment and is currently or potentially available. That provision makes clear that the mandate of section 612 is to reduce overall risk; it does not limit the risks of concern to those associated with ozone depletion. In addition, while section 612 refers repeatedly to class I and class II substances, it also refers repeatedly to substitutes or alternatives, requiring specific actions with regard to such substances.

EPA cannot fulfill its section 612(c) mandate to compare alternatives with a view to reducing overall risk without considering impacts related to issues other than ozone depletion. Toward that end, the SNAP regulations require submitters to include in-

formation on a wide range of factors in addition to ODP, including GWP, toxicity, flammability, and the potential for human exposure (59 FR 13044, Mar. 18, 1994 and codified at 40 CFR 82.178). Further, the SNAP regulations state that EPA will consider atmospheric effects (including GWP), exposure assessments, toxicity data, flammability, and other environmental impacts such as ecotoxicity and local air quality impacts (59 FR 13044, Mar. 18, 1994; 40 CFR 82.180).

In addition, while section 612(a) states the Congressional policy of reducing overall risk in broad terms, section 612(c) specifically requires EPA to compare the risk of the substitute under review to other substitutes or alternatives. In that regard, Mexichem's comment omits a crucial phrase in the statement of "purpose and scope" in the SNAP regulations. The complete statement reads: "The objectives of this program are . . . to promote the use of those substitutes believed to present lower overall risks to human health and the environment, relative to the class I and class II compounds being replaced, as well as to other substitutes for the same end-use, and to prohibit the use of those substitutes found, based on the same comparisons, to increase overall risks [emphasis added]" (59 FR 13044, Mar. 18, 1994; 40 CFR 82.170). In addition, Arkema's reference to a single document containing language mentioning a substitute-to-ODS comparison ignores the large number of risk screens that EPA has prepared over the years that compare the ODP and GWP, and other environmental and health attributes, of substitutes to those of other substitutes, as well to those of ODS (*e.g.*, risk screens in the following dockets: EPA-HQ-OAR-2013-0798 and EPA-HQ-OAR-2003-0118.) Fur-

ther, EPA's listings over the years have included comparisons of substitutes to other available alternatives in the same end-uses (*e.g.*, 67 FR 13272, 67 FR 77927, 68 FR 50533, 69 FR 58903, 71 FR 15589, 71 FR 55140, 71 FR 56359, 74 FR 21, 74 FR 50129, 75 FR 34017, 76 FR 17488, 76 FR 61269, 76 FR 78832, 77 FR 47768, 77 FR 58035, 78 FR 29034, 79 FR 62863). The substitute-to-substitute comparison is essential to fulfilling EPA's obligation under section 612(c) to determine whether there are alternatives that reduce overall risk as compared with the substitute under review.

To the extent possible, the Agency has always sought to ensure that our SNAP decisions are informed by the most current overall understanding of environmental and human health impacts associated with available and potentially available alternatives. In that regard, the Agency has, since the inception of the SNAP program, asserted its authority, consistent with the language of section 612(c) and the section's statement of congressional policy, to review substitutes listed as acceptable and to take action with respect to those substitutes on the basis either of new information generally, including that related to overall risk, or of the availability of new alternatives that pose less overall risk. Specifically, in the preamble to the initial SNAP rule, EPA made clear that "the Agency may revise these [listing] decisions in the future as it reviews additional substitutes and receives more data on substitutes already covered by the program" (59 FR 13044, 13047). We interpret section 612 as allowing both addition of new, safer alternatives to the listings and removal from the listings of substitutes found to pose more risk overall than other available alternatives.

With regard to additional data on substitutes already covered by the program, the Agency has previously responded to the evolution of scientific and technical information by revisiting the listing status of a substitute. For example, on the basis of new information on toxicity, EPA took action in January of 2002 to change the listing for HBFC-22B1 from acceptable, subject to use conditions to unacceptable (67 FR 4185, January 29, 2002; 40 CFR 82 subpart G, appendix J).

With regard to additional alternatives, the suite of available or potentially available alternatives changes over time. For example, over the past several years, and as standards and familiarity with the safe use of various alternatives has developed, EPA has listed several specific flammable refrigerants as acceptable for some end-uses subject to use conditions (*e.g.*, 76 FR 78832, December 20, 2011; 40 CFR 82 subpart G appendix R; 80 FR 19453, April 10, 2015). Most of these refrigerants (*e.g.*, ethane, propane, isobutane, HFC-32) are not new molecules; rather, their recent listing as acceptable subject to use conditions is based on an increased understanding of their ability to be used in a manner that would reduce overall risk. The availability of those alternatives enables a broader review of comparative risk under section 612(c).

Further, we disagree with the notion that our understanding of the impact of HFCs has remained static. Our understanding of the impact that HFCs have on climate has evolved and become much deeper over the years. As mentioned elsewhere in this rulemaking, a significant indication of that change can be seen in EPA's December 7, 2009, Endangerment Finding (74 FR 66496, 66517, 66539) which

makes clear that like the ODS they replace, HFCs are potent GHGs. In addition, HFCs are now in widespread usage. The most commonly used HFC is HFC-134a. HFC-134a is 1,430 times more damaging to the climate system than carbon dioxide (see Table A-1 to subpart A of 40 CFR part 98). Further, HFC emissions are projected to accelerate over the next several decades; if left unregulated, emissions are projected to double by 2020 and triple by 2030.[92] Additional information concerning the peer-reviewed scientific literature and emission scenarios related to HFCs is available in the docket for this rulemaking (*e.g.*, Akerman, 2013; EPA, 2013b and 2014; IPCC, 2007 and 2013; IPCC/TEAP 2005; Montzka, 2012; Velders et al., 2009). This information was taken into account in this rulemaking.

2. Second Generation Substitutes

Comment: Several comments focused on the term "replace" in section 612(c), suggesting that once a company has switched to a non-ODS alternative, it is no longer "replacing" a Class I or Class II ODS in its products, and that it is unsupportable to read "replacement" as a continuous process rather than as a single event. Solvay stated that the proposed rule would require users that have already "replaced" ODS with non-ODS to make a second replacement, and that EPA lacks authority to require this second replacement. Arkema stated that the statutory terms "replace" and "replacement" must be given their ordinary meanings, and that to replace an ODS means to take the place of an ODS. Arkema further noted

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[92] Climate Change and President Obama's Action Plan. June, 2013. Available in the docket and online at *www.whitehouse.gov/share/climate-action-plan*.

that EPA defines a "substitute or alternative" in its SNAP regulations as something "intended for use as a replacement for" an ODS (59 FR 13044, Mar. 18, 1994 and 40 CFR 82.172). Arkema concluded that Congress and EPA designed the SNAP program to regulate things taking the place of ODS, not to replace substances with no ozone depletion potential. Arkema contended that EPA has interpreted the statute and regulations as excluding non-ODS. In support of this argument, Arkema quoted the preamble to the initial SNAP rule as saying that "a key issue" was "whether there exists a point at which an alternative should no longer be considered a class I or class II substitute as defined by 612" (59 FR 13044, 13052). The commenter further quoted the preamble to that rule as saying that "if a hydrofluorocarbon (HFC) is introduced as a first-generation refrigerant substitute for [an ODS], it is subject to review and listing under section 612. Future substitutions to replace the HFC would then be exempt from reporting under section 612 . . . ." (*id.*). In addition, Arkema quoted a 1996 petition response[93] as stating that EPA does not review substitutes for non-ozone-depleting substances such as HFC-134a. Arkema also quoted the SNAP Instruction Manual[94] as instructing applicants to specify the ODS being replaced.

AHAM commented that the appliance industry no longer intends HFCs as a substitute or replacement for ODS. The commenter stated that there are very few remaining models that ever used ODS, and that the substances used in today's models are not

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[93] Response to Oz Technology's Petition (Aug 30, 1996).

[94] *www.epa.gov/ozone/snap/submit/appguide.pdf*.

substitutes or replacements in the common-sense meaning of those words.

Arkema further stated that EPA should be precluded from comparing non-ODS first-generation alternatives (such as HFC-134a) to second-generation non-ODS alternatives (such as HFO-1234yf, HFC-152a, and R-744). Arkema contended that none of these second-generation compounds is a "substitute" for SNAP purposes.

Response: In this rulemaking, the Agency is revising the listing status of substitutes that are direct replacements for ODS. Arkema admits as much on p. 8 of their comment letter, where they describe HFC-134a as a "first generation refrigerant substitute." While we are not exploring the full scope of the "first generation" concept in this action, there is no question that HFC-134a directly replaced ODS in the relevant sectors. For example, with respect to foam blowing, when HFC-134a was listed as acceptable in foam blowing applications, foam was still being blown with HCFCs (59 FR 13044, March 18, 1994; 64 FR 30410, June 8, 1999). In this action, we are not addressing the extent of EPA's authority to revise the listings of alternatives that are arguably indirect replacements for ODS, sometimes termed "second-generation alternatives."

EPA does not agree with the commenters who suggest that while HFC-134a may have replaced ODS at one point in time, it no longer does so. The term "replace" is not defined in section 612, EPA therefore interprets this term as it is commonly used. Dictionary definitions can provide insight into how a reasonable or ordinary person would interpret the term. Dictionary definitions of "replace" include the

following: "to be used instead of"[95] "to take the place of,"[96] and "to provide a substitute or equivalent for."[97] None of these definitions suggests that something used "instead of" or "to take the place" of something else ceases to "replace" it simply due to the passage of time. Nor does the Agency view the replacement of a ODS with a substitute (*e.g.*, HFC-134a) as limited to the first time a product manufacturer uses the substitute. Indeed, in the preamble to the initial SNAP rule, we interpreted the term "replace" to apply "each time a substitute is used." (59 FR 13044, 13047). We noted that "[u]nder any other interpretation, EPA could never effectively prohibit the use of any substitute, as some user could always start to use it prior to EPA's completion of the rulemaking required to list it as unacceptable" (*Id.*). Thus, the fact that HFC-134a is already in use as a replacement for ODS does not mean that its future use is any less of a replacement. In context, the language that Arkema quotes ("whether there exists a point at which an alternative should no longer be considered a class I or II substitute") does not suggest that a substance that directly replaces the ODS might somehow cease to qualify as an ODS substitute. Rather, it raises the question of whether a substance that indirectly replaces the ODS might fail to qualify. That question is not addressed in this rulemaking because this rulemaking addresses only substances

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[95] Merriam-Webster, *http://www.merriam-webster.com/dictionary/replace*.

[96] Collins, *www.collinsdictionary.com/dictionary/american/replace*.

[97] *Id.*

that are direct replacements for ODS in the relevant sectors.

Similarly, the mere passage of time does not mean that the substances addressed in this rulemaking have somehow ceased to be "substitutes or alternatives" under the regulatory definition at 40 CFR 82.172. No commenter suggests that at the time of their initial SNAP listing these substances were anything other than "chemicals . . . intended for use as a replacement for a class I or II compound." Rather, commenters assert that these substances are no longer intended for use as an ODS replacement. However, introducing a temporal aspect into this definition would mean that a product manufacturer could make an initial substitution for a class I or II substance 90 days after providing the required notification to EPA and thereafter continue to use the substitute while disclaiming any intent to replace the ODS. This is not a supportable interpretation because it would allow the manufacturer to circumvent SNAP requirements simply by beginning to use a substitute prior to its SNAP listing.

In addition, EPA implements the section 612(c) mandate to list substances as acceptable or unacceptable "for specific uses" by listing substitutes on an end-use or sector basis.[98] Similarly, the Agency views transition as occurring on an end-use by end-use or sector-by-sector basis, not—as one commenter suggests—on a model-by-model basis. Thus, the act of "replacing" is not limited to the redesign of a particular model, or the introduction of a new model, but

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[98] This is reflected in the appendices to 40 CFR part 82, subpart G.

instead occurs repeatedly within a given end-use or sector.

Contrary to Solvay's comment, EPA has authority to regulate the continuing replacement of ODS with HFC-134a and the other substitutes whose listing status is addressed in this action. In this rulemaking, EPA considered whether such replacement should continue to occur given the expanded suite of other alternatives to ODS in the relevant end-uses and our evolving understanding of risks to the environment and public health. The commenter's line of reasoning would undermine EPA's ability to comply with the statutory scheme reflected in section 612(c), under which EPA's authority to prohibit use of a substitute is tied to information on overall risk and the availability of substitutes.

Regarding Arkema's suggestion that HFO-1234yf, HFC-152a, and R-744 are not "substitutes" for SNAP purposes and thus they cannot be used as part of a review of whether EPA should change the status of HFC-134a, we disagree. HFO-1234yf, HFC-152a and R-744 (as well as the other substances we used for comparison purposes in this rulemaking)[99]

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[99] We note that the requirement under section 612 does not limit our analysis of whether there are "safer" alternatives only to "substitutes" listed under the SNAP program. Rather section 612(c) refers to "alternatives" that are currently or potentially available. Thus, in instances where we are aware of other alternatives that may not have completed SNAP review and we have sufficient information for those alternatives relative to the SNAP review criteria, we may include those alternatives in our comparative analysis. In this action, for purposes of the refrigeration end-uses, we included in our comparative analysis several substances we were concurrently reviewing under SNAP and which we have taken action to list as acceptable, subject to use conditions (April 10, 2015, 80 FR 19453) and for which we

are currently listed as acceptable or acceptable, subject to use conditions under SNAP. Thus, we have separately taken action to treat these substances as substitutes for the purposes of section 612(c) and the corresponding regulatory provisions. We are not reexamining in this rulemaking whether the substances used for comparison purposes in this action qualify as substitutes. Rather, in this rule, we are making listing determinations for substances that are direct substitutes for ODS based on their overall risk compared to these other alternatives.

3. GWP Considerations

Comment: The Agency received several comments relating to EPA's authority to consider GWP in its comparative risk evaluation, and to take action on the basis of GWP. Specifically, Solvay and Mexichem stated that while section 602 of the CAA requires EPA to publish the GWP of each listed class I and class II substance, the Agency's authority is limited by the language stating that it "shall not be construed to be the basis of any additional regulation under this chapter." Solvay stated that this language expresses Congress's intent that no provision of Title VI—including, but not limited to, § 602, § 608, § 612, and § 615—provides statutory authority for the Agency to implement an overarching program under which it can force users to cease using substances with global warming, but not ozone-depleting, potentials. Mexichem commented that if GWPs of listed compounds cannot be the basis of further regulation under Title VI, it follows that regulation based on comparisons of GWPs of both listed substances and

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are taking action concurrently with this rule to list as acceptable.

unlisted alternatives was intended by Congress equally to be foreclosed. Commenters asserted that EPA inappropriately used the physical characteristic of GWP as a surrogate for risk; failed to assess the significance to climate change of the emissions reductions estimated to be brought about by the action as they relate to risk for each substance in each sector covered; failed to assess and account for indirect climate impacts; and failed to apply its customary tests for consideration of atmospheric effects.

BASF commented that EPA proposed to find HFCs unacceptable because they have "high GWPs as compared with other available or potentially available substitutes in those end-uses and pose significantly greater overall risk to human health and the environment." BASF noted that while CAA section 612 does require an assessment of risk, it does not explain how that assessment should be done. BASF added that whatever that assessment should involve, it is possible that Congress did not intend GWP to be part of that assessment.

Response: As noted by some commenters, section 602 of the CAA calls on EPA to publish the GWP for each class I or class II substance, but goes on to say that this mandate "shall not be construed to be the basis of any additional regulation under this chapter." Consistent with this provision, we are not relying on section 602 as authority for the action being taken in this rulemaking. Rather, we are relying on section 612, which specifically provides that EPA is required to list a substance as unacceptable if it "may present adverse effects to human health or the environment" where EPA has identified alternatives that are currently or potentially available and that

"reduce the overall risk to human health and the environment."

Considerations of atmospheric effects and related health and environmental impacts have always been a part of SNAP's comparative review process, and the provision of GWP-related information is required by the SNAP regulations (see 40 CFR 82.178 and 82.180). The issue of EPA's authority to consider GWP in its SNAP listing decisions was raised in the initial rule establishing the SNAP program. In the preamble to the final 1994 SNAP rule, EPA stated: "The Agency believes that the Congressional mandate to evaluate substitutes based on reducing overall risk to human health and the environment authorizes use of global warming as one of the SNAP evaluation criteria. Public comment failed to identify any definition of overall risk that warranted excluding global warming" (59 FR 13044, March 18, 1994).

Consistent with that understanding, the 1994 SNAP rule specifically included "atmospheric effects and related health and environmental impacts" as evaluation criteria the Agency uses in undertaking comparative risk assessments (59 FR 13044, March 18, 1994; 40 CFR 82.180(a)(7)(i)). That rule also established the requirement that anyone submitting a notice of intent to introduce a substitute into interstate commerce provide the substitute's GWP (see 40 CFR 82.178(a)(6)). Accordingly, we have considered the relative GWP of alternatives in many SNAP listing decisions. For example, in the decision to list C7-Fluoroketone as acceptable we noted that "C7 Fluoroketone's GWP of about 1 is lower than or comparable to that of other non-ozone-depleting substitutes in heat transfer uses, such as HFE-7100 with GWP of 297, HFC-245fa with a GWP of 1030, and

CO_2 with a GWP of 1" (77 FR 47768, August 10, 2012). In that same action, EPA also considered ODP, VOC status, flammability, toxicity and exposure, concluding that "EPA finds C7 Fluoroketone acceptable in the end-use listed above because the overall environmental and human health risk posed by C7 Fluoroketone is lower than or comparable to the risks posed by other substitutes found acceptable in the same end-use" (id). Similarly, in finding the use of isobutane and R-441 acceptable subject to use conditions in household refrigeration, we included an-in depth discussion of the relative GWP of these and other alternatives listed for household refrigeration (76 FR 78832, December 20, 2011).

In response to comments that EPA inappropriately used the physical characteristic of GWP as a surrogate for risk and that EPA failed to assess the significance to climate change of the emissions reductions estimated to be brought about by the action, as they relate to risk for each substance in each sector covered, we note that GWP is a relative measure and that if comparable amounts of two substitutes are used, then the relative climate effects of resultant emissions will be higher for the substitute with higher GWP. EPA considers factors such as charge size of refrigeration equipment and total estimates of production in its assessment of environmental and health risks of new alternatives, so we can consider if there would be substantial differences that might affect total atmospheric emissions. We believe that we have appropriately considered GWP as a metric for comparing climate effects of substitutes.

In response to comments that EPA failed to assess and account for indirect climate impacts, we note that we do not have a practice in the SNAP pro-

gram of including indirect climate impacts in the overall risk analysis. We do consider issues such as technical needs for energy efficiency (*e.g.*, to meet DOE standards) in determining whether alternatives are "available," and have followed that practice in this rulemaking. We believe that there is a sufficient range of acceptable alternatives that end users will be able to maintain energy efficiency levels We also note that federal energy conservation standards will continue to ensure that equipment regulated by this rule will not increase its indirect climate impacts. See in particular section V.C.7 for a discussion on energy efficiency for commercial refrigeration products and section V.D.3.c for a response to comments on energy efficiency of foams.

In this action, EPA used the same comparative risk approach it has used in the past, including the consideration of GWP.

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5. Montreal Protocol/International

Comment: Solvay comments that HFCs are not regulated under the Montreal Protocol and are not Class I or Class II substances under Title VI. Mexichem states that the United States, Canada, and Mexico have proposed to amend the Montreal Protocol to provide an across-the-board phase down of HFCs, but until then, EPA's regulatory authority under Title VI is limited to ODS. AHAM adds that if at some point EPA is authorized to phase out HFCs consistent with future international obligations that may constitute a more appropriate avenue for phase-down measures. AHAM believes there is minimal purpose in promoting an international regulatory regime if EPA is going to apply what it considers to be

a "blunt and inappropriate" regulatory instrument domestically, regardless of the shape of a future international scheme. AHAM comments that the appliance industry's transition from HFCs is well underway, and EPA's proposal should reflect and support this progress, rather than impede it. Five commenters commented on the perceived inconsistency of the proposed timeline and the proposed amendments to the Montreal Protocol to adopt a gradual phase down of HFCs.

Response: EPA agrees that the Montreal Protocol does not currently regulate HFCs. Nevertheless, several sections of Title VI call on EPA to take measures that are not required by the Montreal Protocol but are complementary to the ODS phaseout. These sections include, in addition to section 612, sections 608 (national emissions reduction program), 610 (nonessential products), and 611 (labeling). In addition, while HFCs are not a Class I or Class II substance under the Clean Air Act, HFCs are substitutes for Class I and Class II ODS, and section 612 and its implementing regulations specifically call on the agency to restrict substitutes for ODS where the Agency has identified other available or potentially available alternatives that reduce overall risk to human health and the environment.

The CAP considers both domestic and multilateral action to address HFCs. The United States co-proposed and is strongly advocating for an amendment to the Montreal Protocol to phase down production and consumption of HFCs. EPA sees no conflict between the United States' strong support for a global phase-down and this domestic action. The amendment proposal calls for a phase-down of production and consumption of a group of HFCs, includ-

ing HFC-134a as well as HFC-125 and HFC-143a (components of R-404A, R-507A and other blends), on a total CO_2-equivalent basis. It applies phase-down steps to this group of HFCs as a basket and does not assign individual deadlines to specific HFCs or address specific uses.

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B. Cost and Economic Impacts of Proposed Status Change

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2. EPA's Cost Analysis and Small Business Impacts Screening Analysis

Comment: EPA received a number of comments indicating that small businesses bear a disproportionate share of the regulatory burden and that the NPRM represents a "significant regulatory action," NAFEM comments that EPA must conduct a complete analysis of the impacts on small entities before any final regulation can be promulgated. NAFEM comments that EPA's analysis is too narrow, is incomplete, and that its conclusions are unsupported. NAFEM further comments that the NPRM disproportionately affects small entities. NAFEM comments that the NPRM represents a major rule and will have a $100 million effect on the economy and a major impact on the commercial refrigeration industry and its consumers. NAFEM commented that the docket lacks a robust industry analysis of the effects on small business manufacturers and customers, or reasonable support for EPA's Regulatory Flexibility Act conclusions. NAFEM recommends that EPA initiate a Small Business Regulatory Enforcement Fairness Act (SBREFA) Small Entity Representative review panel to help inform final rulemaking, as re-

quired by the Regulatory Flexibility Act. Solvay also commented that EPA should convene a Small Business Advocacy Review Panel under the SBREFA.

Response: E.O. 12866 states that rules that have an impact on the economy of $100 million per year qualify as significant regulatory actions. EPA disagrees that this rule would have an impact on the economy of $100 million more per year. We performed an analysis of the costs of the proposed rule on businesses and estimated the total annualized upfront compliance costs to range from $8.9 million to $41.6 million; total annual savings are estimated to be about $25.1 million (ICF, 2014g). This cost analysis did not evaluate the share of costs likely to be borne by consumers, since it is not clear what proportion of cost impacts may be carried on to consumers, and further, such economic analyses typically look at costs to the regulated community rather than indirect impacts on consumers. We updated this analysis based upon the regulatory options and change of status dates in the final rule, and using cost information provided by commenters. The changes in the final rule—especially with respect to compliance dates—reduce the cost impacts on small businesses, while the updated cost information resulted in higher cost estimates. In this updated analysis, we estimated the total annualized upfront compliance costs to range from $28.0 million to $50.6 million, using a 7% discount rate, and from $19.5 million to $37.8 million, using a 3% discount rate. Total annual savings are estimated to be about $19.3 million (ICF, 2015c). In either case, this is well below the $100 million per year threshold to consider this an economically significant rule on economic grounds.

EPA disagrees with the commenter that the "docket lacks a robust industry analysis on the effects on small business manufacturers and customers, or reasonable support for EPA's Regulatory Flexibility Act conclusions." The Agency's screening analysis at proposal stage is included in the docket (ICF, 2014f). The commenters do not point to any specific aspect of that analysis that they believe are deficient. A Small Business Advocacy Panel is convened when a proposed rulemaking is expected to have a significant impact on a substantial number of small entities, or "SISNOSE." We have updated our small business impacts screening analysis using the change of status decisions and dates in the final rule, adding boat manufacturers as affected entities, and using detailed cost information provided by commenters (ICF, 2015b). EPA's preliminary and final screening analyses concluded that this rulemaking would not pose a SISNOSE. In the analyses, EPA recognized that some small businesses may experience significant costs, but concluded that the number of small businesses that would experience significant costs was not substantial.

Both the screening analysis for purposes of determining whether there was a SISNOSE and the analysis to determine whether the rule was significant based upon economic grounds were conducted based on the best market and cost information available to the Agency. Where commenters provided specific market or cost information, the Agency used that information to update these analyses. The updated analyses came to the same conclusions: That the final rule would not pose a SISNOSE and that it is not an economically significant rule (ICF, 2015b,c).

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VIII. Additional Analyses

EPA does not consider the cost of transition to other alternatives in making listing decisions because under the SNAP criteria for review in 40 CFR 82.180(a)(7), consideration of cost is limited to cost of the substitute under review. However, EPA has prepared technical support documents including analyses of costs associated with sector transitions, estimated avoided GHG emissions associated with the transition to alternatives, and potential small business impacts.

The transition scenarios analyzed possible ways to comply with the final rule. The transition scenario in the cost analysis reflects a direct compliance cost method and does not assume the regulated community chooses higher-cost solutions where known less costly solutions exist. The scenarios analyzed in the avoided GHG emissions analysis reflect possible transitions for compliance based on considerations of the market and activity towards lower-GWP solutions. While the emission reductions have been quantified, they have not been monetized. Thus, higher or lower GHG emission reductions do not necessarily correlate to higher or lower costs due to the different assumptions and methodologies used in the different analyses. However, the transitions assumed in the lower, less aggressive scenario here are similar to the transitions assumed in the cost analysis.

To extend the assessment to all-sized businesses potentially affected by the rulemaking, EPA conducted an analysis on costs to all-sized businesses building on the approach taken to estimate potential economic impacts on small businesses. Using a 7% discount rate, total annualized compliance costs across affected businesses are estimated to range

from $28.0 million to $50.6 million; total annual savings are estimated to be about $19.3 million. Using a 3% discount rate, total annualized compliance costs across affected businesses are estimated to range from $19.5 million to $37.8 million, total annual savings are estimated be about $19.3 million.

EPA conducted an analysis on the potential avoided GHG emissions associated with implementation of this final rule. The emissions avoided from this final rule are estimated to be 26 to 31 $MMTCO_2eq$ in 2020. The avoided emissions are estimated to be 54 to 64 $MMTCO_2eq$ in 2025 and 78 to 101 $MMTCO_2eq$ in 2030 (EPA, 2015b).

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