



Strengthening The American
Innovation and Manufacturing (AIM)
Act of 2020:

**A Commonsense Approach to
Increasing America's Competitive
Advantage**



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Executive Summary

This paper will describe what is at stake in this fight against HFC smuggling and what steps President Trump and the 119th Congress can take to support essential American industries from illegal trade practices, including giving Customs and Border Patrol (CBP) an explicit role in interdicting these illegal shipments.

President Trump and the Republican majorities in the House and Senate rode to power on a handful of political themes: addressing inflation of consumer goods, securing our nation's borders and bolstering national security, and using trade policy – including tariffs – to protect the American economy and grow domestic manufacturing in the face of illegal dumping practices by our competitors, particularly China.

These policy priorities will be implicated in a whole host of executive actions, regular order legislation, and budget reconciliation language over the next four years. A simple early win that can be taken by the Trump Administration, and draw rare bipartisan plaudits in Congress, would be improved implementation of a law already on the books that delivers on all of these goals simultaneously. The time is now to call upon legislators to expand on these important legal authorities to address trade abuses from adversaries that are happening on the ground as we speak.

The law in question, the American Innovation and Manufacturing (AIM) Act of 2020¹ demonstrated a rare, broad bipartisan consensus on trade, economic competitiveness, and environmental issues. The Senate bill, led by Senator John N. Kennedy (R-LA), was cosponsored by 33 Senators from across the political spectrum and all across the country: Lindsey Graham (R-SC) and Cindy Hyde-Smith (R-MS) to Ed Markey (D-MA) and Brian Schatz (D-HI). Its House counterpart, led by Representative Paul Tonko (D-NY-20) also bridged the partisan divide and then some, with 20 cosponsors as politically diverse as Michael McCaul (R-TX-10) and Elise Stefanik (R-NY-21) to Raja Krishnamoorthi (D-IL-8) and Gerald Connolly (D-VA-11). The bill was signed into law by none other than President Trump himself during his first term.

What brought this disparate, and often opposed, constellation of political stars into alignment? A straightforward, commonsense policy approach backed by economic imperatives and sound science, which had the benefit of also improving environmental outcomes. In short, the AIM Act directed the Environmental Protection Agency (EPA) to set a 15-year timetable for the phaseout of domestic production and use of third-generation hydrofluorocarbon (HFC) as fourth-generation hydrofluoroolefin (HFO) production scales up.²

Advancing fluorine gas (f-gas) technology provides America with a competitive advantage in the refrigeration and air conditioning sectors. As the race to master artificial intelligence heats up, keeping those data centers cool as efficiently and affordably as possible becomes imperative. Making the semiconductors necessary to populate these clusters requires f-gases for heat transfers from sensitive chipmaking

¹ P.L. 116-260, Division S, §103

² First-generation fluorine-based gases, chlorofluorocarbons (CFC), successfully phased out via implementation of the Montreal Protocol to prevent further harm to the ozone layer. Hydrochlorofluorocarbons were the second generation of fluorinate gases, which still had a slight, though significantly lesser depletion effect on stratospheric ozone. HFCs have zero impact on the ozone layer, but significant global warming potential. HFOs have zero impact on the ozone layer and a far lower global warming potential than HFCs.

equipment during the manufacturing process. Vehicles can benefit in terms of fuel economy from less energy-intensive heating and cooling systems made possible by these technologies. Leadership in HFO chemistries and the equipment utilizing it is therefore of significant value to American innovation and leadership in several economic sectors beyond the traditional heating, cooling, and refrigeration applications most often associated with the f-gas product category.

Indeed, HFOs were first discovered in America. The earliest synthesis of HFO1234yf was reported in the *Journal of the American Chemical Society* in 1946 by researchers at The Ohio State University.³ However their utility, and environmental friendliness compared to existing alternatives, as a refrigerant was not realized until decades later. Early patents for the use of HFOs as refrigerants began – again led by scientists like Rajiv Singh in the United States – in 1993, leading to the breakthroughs in technology now available in the marketplace. Today, HFO research, development, and manufacturing occurs all over the United States, from labs in New York to industrial facilities in Louisiana and Texas. This continuous, multi-decade development has conferred leadership status on the United States in this critical fields of advanced chemistry.

However, these benefits are at risk from foreign competitors that, despite being subject to the same global treaty obligations requiring a transition away from HFCs to HFOs as the United States, are seeking to avoid their legal responsibilities and flood the global marketplace with obsolescent alternatives. Economic rivals, particularly China, which lack the intellectual property (IP) for sophisticated HFO chemistries, or are unwilling to make the necessary investments in the technology, are dumping cheaper HFCs into the US and other regional markets. This undercuts American chemical and equipment manufacturers that are abiding by the law and making cutting-edge, energy-efficient technologies available to consumers, both as they seek to serve the domestic market and compete in markets abroad, such as Europe. Moreover, it undermines consumer confidence that what they are actually buying, especially with regards to heating, ventilation, and air conditioning (HVAC) systems, are what they think they are – in terms of liability, code compliance, and especially operating costs.

As the HFO transition continues, the incentives for unscrupulous smugglers and purveyors of HFC coolants and equipment to get more creative in skirting the law will only intensify. Already, HFCs are being smuggled into the country through ports of call and our porous southern border, at the expense of American industry, the law, and our environment.

³ *J. Am. Chem. Soc.* 1946, 68, 3, 496–497

Introduction – What is the AIM Act?

The AIM Act, introduced by Senator Kennedy on October 30, 2019,⁴ was signed into law by President Trump as section 103 of the Consolidated Appropriations Act for Fiscal Year 2021.⁵ It established a 15-year phasedown of 18 covered HFCs both produced and consumed (including imports of covered gases themselves, but not finished products in which they are incorporated) in the United States, with the goal of an 85-percent reduction compared to a baseline modeled off of historic production and consumption levels between 2011 and 2013.⁶

The baselines and phaseout glidepath are detailed in the statute and the result of significant bipartisan negotiation. The EPA has some discretion in how it allocates allowances to particular sectors and sector participants, but otherwise congressional intent, direction, and timelines in the AIM Act are explicitly defined. The statute expressly aligns this phaseout schedule with the process implemented to reduce CFCs under the Montreal Protocol on Substances that Deplete the Ozone Layer in 1989 and complies with the Kigali Amendment to the Montreal Protocol – ratified by Congress in bipartisan fashion 69-27⁷ – to which 163 countries are currently party.⁸ This process ensures that American producers and exporters cannot be subject to countervailing duties or other trade measures by the other countries that represent the vast majority of markets for HFO applications.

The AIM Act had specific allowances for certain sectors, such as medical applications, defense sprays, aerospace, and defense. It also included provisions superseding state authorities to prevent a patchwork of regulatory standards within the US market.

To ensure continued availability of legacy HFC gases to serve homes and businesses with legacy equipment, the AIM Act explicitly allows reclamation activities of HFCs from discarded equipment. Over time, attrition will replace these units; however, this provision defrays the cost of transition for owners and operators of older HVAC and refrigeration units.

The projected economic benefits to the United States are immense.

For consumers, the shift to HFOs will go largely unnoticed. Legacy HFCs will still be available for “recharging” legacy equipment that has leaked coolant. When this equipment ultimately must be retired, replacement equipment will be comparable in cost. Even if HFOs are assumed to cost as much as five times as much as their predecessors (an extremely liberal assumption, based on the historic trends in costs of

4 “S.754 - 116th Congress (2019-2020): American Innovation and Manufacturing Act of 2019.” Congress.gov, Library of Congress, 30 October 2019, <https://www.congress.gov/bill/116th-congress/senate-bill/2754>.

5 “Text - H.R.133 - 116th Congress (2019-2020): Consolidated Appropriations Act, 2021.” Congress.gov, Library of Congress, 27 December 2020, <https://www.congress.gov/bill/116th-congress/house-bill/133/text>.

6 “Frequent Questions on the Phasedown of Hydrofluorocarbons | US EPA.” US EPA, 28 Dec. 2021, www.epa.gov/climate-hfcs-reduction/frequent-questions-phase-down-hydrofluorocarbons#HFC-allocation.

7 “Treaty Document 117-1 - Amendment to Montreal Protocol (“Kigali Amendment”).” Congress.gov, Library of Congress, 25 January 2025, <https://www.congress.gov/treaty-document/117th-congress/1>.

8 “United Nations Treaty Collection.” Treaties.un.org, https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-2-f&chapter=27.

f-gases as economies of scale are achieved by manufacturers), consumers can expect marginal cost savings of around \$400 over the lifetime of their HVAC equipment.⁹

The reason for this is that coolant – both the initial charging of the equipment and any refills – is only about 1 percent of the operating cost of HVAC units. The vast majority of ownership costs – 66 percent for residential operators and 90 percent for commercial – result from electricity consumption. HFOs are more thermally efficient and less prone to leakage, slightly reducing electricity usage and the need for maintenance, offsetting any potential increases from their use. For refrigeration, the reductions in energy use are even more significant, with an up to 50-percent reduction in energy use over the lifetime of a commercial refrigeration unit.¹⁰

Any reduction in operational or maintenance costs reduces prices for American consumers not only with regard to HVAC and refrigeration itself, but all of the sectors that these processes touch. Lower prices through more efficient vehicles, longer-lasting groceries, and other consumer goods reliant upon f-gas chemistries provide myriad small cost savings that can serve to diminish broader inflationary pressures.

For American f-gas and HVAC and refrigeration manufacturers, the economic benefits are significant. Even prior to enactment of the AIM Act, American manufacturers had invested more than \$5 billion into HFO chemistries and equipment. The American Air-Conditioning, Heating and Refrigeration Institute (AHRI) estimates the AIM Act phasedown schedule will have an overall impact of 150,000 good-paying jobs economywide, in science, technology, engineering, and mathematics (STEM) fields. While most of these are the result of expanded manufacturing of modern f-gases and equipment, even the reclamation sector is expected to generate \$800 million in additional economic activity and nearly 4,000 jobs to serve the legacy market.

The global market for HVAC and refrigeration is only growing as developing countries in warmer climates grow their middle classes. Export growth globally is estimated to expand by 6 percent each year over the AIM Act phasedown period. As a lead innovator, assuming fair trade, the US will outperform in claiming this growing market – expanding its share of an ever-growing pie from 7.2 percent to 9 percent.

The implementation of the AIM Act, both on domestic producers and consumers as well as preventing illegal smuggling of HFCs, is left to the EPA's limited enforcement capacity. Interdiction of illegally shipped articles is essential to preserving the benefits described above and is beyond the capacity of the EPA alone.

9 Economic & Consumer Impacts of HFC Phasedown. US House of Representatives report. 2019. <https://www.congress.gov/116/meeting/house/110388/documents/HHRG-116-IF18-20200114-SD003.pdf>.

10 Yana Motta, Samuel F., Bo Shen, Zhenning Li, Brian Fricke, and Edward Allan Vineyard. Building Technologies Office 03.02. 02.38 Milestone Report—Technology Options for Low Environmental Impact Air-Conditioning and Refrigeration Systems. No. ORNL/TM-2023/3041. Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States), 2023. <https://www.osti.gov/biblio/1996644>.

Illegal Trade Practices Undermine American Competitive Advantage in HFOs

As with prior generational shifts with f-gases subject to the Montreal Protocol and its subsequent amendments, unscrupulous actors both large and small are seeking to arbitrage legacy gases into markets where they are being phased out in order to illegally profit from short-term scarcity of obsolescent coolants and equipment. This illicit activity ranges from major efforts by state-owned-enterprises – particularly in China – to undercut American manufacturers by dumping large volumes of HFC coolants into the marketplace before key phasedown deadlines (both directly and surreptitiously) to small time smugglers shipping cannisters of coolant across international borders in a piecemeal fashion.

To begin with the larger issue – countries like China and India have benefitted from their categorization under the Montreal Protocol as a “developing economy,” giving them additional time and laxer targets for compliance. This is not the first instance in which China’s status as a “developing country” despite being the world’s second-largest economy has allowed it to skirt international obligations. India and China together account for 40 percent of the world’s greenhouse gas emissions and 80 percent of HFC emissions to the atmosphere.¹¹

However, their market approaches are distinct. India’s growing middle class is clamoring for access to air conditioning and refrigeration, and most of the continued production of HFCs made possible by a slower phasedown schedule are serving this domestic market.

By contrast, the Chinese Communist Party (CCP) has implemented its Kigali compliance policies in a manner similar to its other state-subsidized, export-focused manufacturing policies of the past 40 years. China’s large middle class is already saturated with HVAC and refrigeration, and consumer demand is stunted – with the central government seeking to goose it with a “cash for clunkers” trade-in incentive model for these appliance categories. Even official Chinese mouthpiece news outlets are reporting this reality.¹² Sales have flattened and revenue from air conditioners declined year-on-year.

China recognizes that, for its products to be accepted into foreign markets, it needs to at least “talk the talk” when it comes to the rules adopted in its largest markets, the United States and Europe. Seeking to distinguish itself as a more upright global citizen than its Indian competitors (a market which China is also trying to dominate), China has adopted a comparatively shorter-term phasedown of HFCs.¹³

However, China’s actual compliance with these targets is illusory. Decades after the US and other countries phased out CFCs to protect the ozone layer, China continues to emit significant, undocumented volumes

11 Yang, Shiming. “Growing Apart: China and India at the Kigali Amendment to the Montreal Protocol.” *Global Environmental Politics*, 15 Dec. 2022, pp. 1–28, https://doi.org/10.1162/glep_a_00698.

12 “China’s Air Conditioning Industry Seizes Development Opportunities, Spurs Momentum amid Pressure - Xinhua Silk Road.” *Imsilkroad.com*, 2024, <https://en.imsilkroad.com/p/342203.html>.

13 See Yang, Shiming.

of these environmentally destructive gases, evidence of which has been detected by satellite.¹⁴ Chinese enforcement of even its own domestic laws are lax, to put it mildly. There is simply too much pressure for national and regional bureaucrats, subsidized state-owned enterprises, and even private businesses to meet ambitious targets for production and economic growth than to meet requirements on labor, health, and human rights. Due to these political pressures, environmental enforcement is especially delinquent. The issue is severe enough that the US Department of State during the first Trump Administration maintained an online compendium of Chinese environmental abuses.¹⁵

Rather than face politically difficult reductions in subsidizing the production of HFCs and downstream sectors, the solution is to dump excess capacity on the international market – as China has with commodities as diverse as steel and aluminum, wood veneer, and electronics.¹⁶ This undercuts manufacturers in other countries that cannot compete with subsidized, artificially cheap imports.

The European Union began its phasedown of HFCs earlier than the United States, and its experience is telling. Cannisters of HFCs originating in China or manufactured by foreign-owned subsidiaries, have been smuggled into the European Union trade area in significant volumes across the land borders with Eastern Europe and Turkey.¹⁷ Once within the Eurozone, they can easily be trafficked across national borders without meaningful scrutiny by customs agencies. Even following Brexit, the British market is awash in illegally shipped cannisters of HFCs. A small cannister of an HFC coolant can sell in Britain for more than six times what it cost in China, making the incentives to smuggle immense.¹⁸ This illegal trade does real harm to both European suppliers of HFOs and modern HVAC and refrigeration equipment, but also American companies competing in the European market that comply with the rules. It has been estimated that fully one-third of the European market’s Kigali-compliant quota for refrigerants has been subsumed by the illegal trade of legacy coolants.¹⁹

As the US has begun implementing the AIM Act to comply with its obligations under Kigali and ensure continued market access abroad for its exports, the same movie is playing out here. In just the ten weeks before its first formal meeting on March 14, 2022, the Interagency Task Force of Illegal HFC Trade estimated it had prevented the illegal trade HFCs equivalent to the atmospheric impact of 100,000 American homes’ electricity use in a year.²⁰ That is only representative of volumes that were actually detected and stopped, and in only two-and-a-half months’ time.

The reason for this scale of violation is simple: China is dumping immense volumes of HFCs into our market.

14 Russell, Lynn. “Need for Better Accounting of CFC-12 Emissions from China.” Eos, 18 July 2024. <https://eos.org/editor-highlights/need-for-better-accounting-of-cfc-12-emissions-from-china>.

15 U.S. Department of State. “China’s Environmental Abuses.” United States Department of State, 20 Jan. 2017. <https://2017-2021.state.gov/chinas-environmental-abuses/>.

16 “AD/CVD Order on Products from the People Republic of China - Scope Rulings.” Trade.gov, 2025. <https://legacy.trade.gov/enforcement/operations/scope/country/china/index.asp>.

17 “Illegal Trade in Refrigerants.” Environmental Investigation Agency, 2020, <https://eia-international.org/climate/international-regulation-of-ozone-and-climate-under-the-montreal-protocol/illegal-trade-in-refrigerants/>.

18 Crawford, Angus, and Tony Smith. “Polluting Greenhouse Gases Being Sold Online and Smuggled to UK.” BBC News, 23 Nov. 2021. www.bbc.com/news/uk-59061805.

19 “Illegal Refrigerant Imports Could Be as Much as One Third of EU Market.” EFCTC, 26 June 2020. https://www.fluorocarbons.org/wp-content/uploads/2020/09/EFCTC_Press-Release_EN-2.pdf.

20 “U.S. Takes Aim at Violators of Greenhouse Gas Phasedown and Reporting Programs | US EPA.” US EPA, 15 Mar. 2022. www.epa.gov/newsreleases/us-takes-aim-violators-greenhouse-gas-phasedown-and-reporting-programs.

It does this directly before scheduled reductions in its production. Whatever it cannot ship into a market where the HFC consumption quota is already met, it obscures the identity of the product through misleading or outright fraudulent bills of lading – simply shipping cannisters in mislabeled or undisclosed shipping containers, directly or via third-party countries.^{21,22}

China can use third-party countries not only to obscure the original source of the HFCs, but also to essentially inflate and capture the transit countries' phasedown allowances for its own exports. This is analogous to an issue seen in several other export sectors, such as steel and aluminum, and which is a driving issue motivating the Trump Administration's issuance of reciprocal tariffs and reopening of the US-Mexico-Canada Agreement (USMCA) free trade agreement as Mexico becomes a growing conduit of products sourced from China that have had their origins laundered.²³

Proof of this third-party country laundering is hiding just below the surface in the data. For 2023, imports into the US of HFC blends were up 181 percent from China, but 1,000 percent from Turkey, and a staggering 100,000 percent from Mexico compared to 2022. In the case of a single restricted HFC blend, the one-year increase in Mexican exports was 1,600 percent – despite Mexico lacking domestic manufacturing capacity for either of the HFCs in the blend.²⁴ These surges were timed with the next step in the US phasedown in 2024 and almost certainly represent masked Chinese production rather than a staggering expansion of Turkish and Mexican production.

Finally, Chinese entities can open subsidiaries within the United States itself, inflating the domestic baseline for phasedowns and then selling Chinese-sourced HFCs directly into the US market. As the Trump Administration nominee for US Trade Representative (USTR) Jamieson Greer put in an October letter on behalf of the Alliance for Responsible Atmospheric Policy (ARAP) to the Biden-era USTR:

Chinese producers are SOEs and benefit from subsidies that promote exports to the United States. Moreover, Chinese SOEs also have substantial control over HFC distribution in the U.S. market. For example, Juxin set up affiliated HFC blenders in the United States, including IGas, BMP, and Scales N Stuff. This direct investment by the central government of China into U.S. blenders has allowed Chinese exporters rapidly expand in the U.S. market and operate under non-market principles...

In other instances, Chinese exporters are sending blends to the United States that have limited commercial usage and are not covered by the AD/CVD orders, but that will be processed in the

21 "Antidumping Duty Order on Hydrofluorocarbon Blends from the People's Republic of China: Final Affirmative Determination of Circumvention with Respect to R-410B, R-407G, and a Certain Custom Blend from the People's Republic of China." Federal Register, 11 July 2024. www.federalregister.gov/documents/2024/07/11/2024-15264/antidumping-duty-order-on-hydrofluorocarbon-blends-from-the-peoples-republic-of-china-final.

22 "Antidumping Duty Order on Hydrofluorocarbon Blends from the People's Republic of China: Final Affirmative Determination of Circumvention with Respect to R-410A from the Republic of Türkiye." Federal Register, 11 July 2024. www.federalregister.gov/documents/2024/07/11/2024-15263/antidumping-duty-order-on-hydrofluorocarbon-blends-from-the-peoples-republic-of-china-final.

23 Estefan, Brenda, and Jose Carlos Rodriguez Pueblita. "China Ties Could Be a Liability for Mexico under Trump 2.0." Americas Quarterly, 24 Jan. 2025. www.americasquarterly.org/article/china-ties-could-be-a-liability-for-mexico-under-trump-2-0/.

24 "The American HFC Coalition Applauds the U.S. Department of Commerce for Initiating an Investigation into Unlawful Circumvention of U.S. Law by Imports of HFC Refrigerant R-410B from Mexico." Prnewswire.com, Cision PR Newswire, 30 Oct. 2023. www.prnewswire.com/news-releases/american-hfc-coalition-applauds-the-us-department-of-commerce-for-initiating-an-investigation-into-unlawful-circumvention-of-us-law-by-imports-of-hfc-refrigerant-r-410b-from-mexico-301971848.html.

United States into an HFC product that otherwise would be subject to AD/CVD duties. With respect to these latter imports (e.g., HFC blend 410B), the American HFC Coalition is actively pursuing an anticircumvention case with the U.S. Department of Commerce to demonstrate that this blend should be subject to the AD/CVD orders established in 2017 and that these imports constitute illicit circumvention activity.²⁵

Such are the volumes of HFCs coming out of China and other dumping countries that this formalized network of trade protection avoidance cannot soak it all up. Small-time criminals – operating independently or as a network, the latter sometimes associated with international criminal organizations – recognize the short-term price differences of HFCs as phasedowns impose short-periods of scarcity that can drive up costs of the legacy coolants. These smugglers are comparable to scalpers – manipulating near-term market demand to capture undue profits for themselves due to market inefficiency.

Already, this has been witnessed at the US-Mexico border. US Customs and Border Protection and the EPA have worked together on busts of cannisters being smuggled into the United States. Michael Hart, of San Diego, has the ignominious recognition of being the first American arrested for intentional violation of the AIM Act in March of 2024.^{26,27} He plead guilty in September to minimize his jail sentence. Hart will also be liable for a \$250,000 dollar fine, with sentencing due in February.²⁸ Despite being initially warned in 2022 after being caught trafficking in HFCs and claiming they were for his construction business, he continued to coordinate with off takers until his arrest in 2024, promising “15 to 20 cannisters per week.” These trafficked cannisters were then sold by middlemen through online platforms. Hart is only one of many seeking to trade in illegal cannisters of HFCs. based on the figures coming out of Europe. Smuggling at the border is already prevalent enough that CBP offices are putting out bulletins warning would-be perpetrators of the legal risks associated with trafficking refrigerants.²⁹

25 Greer, Jamieson L. “Comments Regarding Foreign Trade Barriers to U.S. Exports of Hydrofluorocarbons for 2024 Reporting – European Union, China, Mexico, India, and Others.” Regulations.gov, 2025. www.regulations.gov/comment/USTR-2024-0015-0043.

26 “Southern District of California | San Diego Man Is First in Nation to Be Charged with Smuggling Potent Greenhouse Gases into the United States.” United States Department of Justice, 4 Mar. 2024, www.justice.gov/usao-sdca/pr/san-diego-man-first-nation-be-charged-smuggling-potent-greenhouse-gases-united-states.

27 Tabuchi, Hiroko. “He’s Accused of Smuggling, but Not Drugs or Guns: It’s Greenhouse Gases.” The New York Times, 5 Mar. 2024. www.nytimes.com/2024/03/05/climate/greenhouse-gases-smuggling.html.

28 Dinan, Stephen. “Michael Hart Pleads Guilty in Groundbreaking Greenhouse Gas Smuggling Case.” The Washington Times, 25 Sept. 2024. www.washingtontimes.com/news/2024/sep/25/california-man-pleads-guilty-in-groundbreaking-gre/.

29 “Laredo Field Office Reminds Traveling Public Not to Bring Freon Canisters, It Is Illegal and May Result in Fines And/or Vehicle Seizure.” U.S. Customs and Border Protection, 2025. www.cbp.gov/newsroom/local-media-release/laredo-field-office-reminds-traveling-public-not-bring-freon-canisters.

Policy Recommendations to Address HFC Dumping

The Trump Administration and the 119th Congress have a mandate to reduce inflation and address trade imbalances. Policymakers on the Hill and in federal agencies can take steps to reduce the illegal, economically harmful dumping and smuggling of HFCs from China and other countries in the US by leveraging and expanding upon the authorities of the AIM Act.

Recommendations for maximizing the benefits of AIM Act implementation for American consumers and businesses include:

- Giving explicit authority to the CBP to interdict illegal HFC imports at ports of entry, as well as those already stored in US warehouses that are suspected of having been imported to avoid quota or tariff enforcement. As Congress considers granting additional authority and funding to CBP to address illegal immigration, addressing dumping of HFCs must not be overlooked as part of CBP's core customs mission.
- The EPA should reallocate remaining HFC allowances from noncompliant actors – both importers and domestic blenders – found to be illegally dumping material or facilitating duty avoidance in the US. Stripped allowances can be reallocated to market participants that comply with the law. This simple step will punish bad actors and reward those that have invested in legal and transparent supply chains in the United States, employing domestic workers.
- Implementation of the AIM Act includes periodic updates of the Technology Transitions Rule (TTR).³⁰ American companies in sectors including specialty chemicals, HVAC manufacturers, retailers, and semiconductor producers have made, been planning, and are actively making investments according to the regular cadence of these rulemakings, as explicitly directed by the AIM Act.³¹ The statute and TTR program allows flexibility for “essential uses” in the event there are not ready replacements for HFCs in specialty applications, such as aerosols for certain fire suppression systems. The EPA must maintain the current applicable TTR and continue to advance future iterations. Failure to do so will only harm American companies to the benefit of foreign competitors and illicit traders of legacy refrigerants, largely sourced from China, that cannot make a justifiable claim for any allowance or essential use exemptions in accordance with the law.

³⁰ 40 C.F.R. Part 84.

³¹ See 42 U.S.C. 7675(i)

- Congressional authorizers and appropriators should use their oversight authorities to ensure the AIM Act is implemented according to its authors' intent. Unusual among many environmental statutes, Congress went to great lengths defining the timelines and scope of the HFO transition in the AIM Act legislative text. Members of Congress therefore have an institutional interest in seeing its implementation through, beyond the significant parochial benefits to their constituents.
- As the Trump Administration leverages trade policy to secure policy concessions from America's trade partners, the AIM Act and the Kigali Amendment provide readymade domestic and international policy levers to address a particularly malevolent form of tariff avoidance that also undercuts American industry and the environment. Trade agreements, whether within the USMCA or trade partners beyond North America, should incorporate considerations of the HFO phasedown within their terms. Any partner with which the US would conceivably conduct trade negotiations is a signatory of the Kigali Amendment, and so negotiations to ensure compliance and transparency in bilateral trade of f-gases should not be controversial for those countries that are honest negotiators. As the US takes on a more robust trade negotiation posture, other countries' compliance with Kigali and commitment to the prevention of illegal trade in f-gases should be a requirement of any final agreements in order to protect American manufacturing and investments in innovation.

Conclusion

The domestic and international markets for HFOs will only increase. What was an approximately \$3 billion industry in 2024 will grow by an average of 15 percent per year before reaching approximately \$19 billion in 2037 – one year after the conclusion of the AIM Act phasedown schedule.³²

Currently, HFCs sourced from Asia have a plurality of the global market for coolants. However, the United States is leading in HFO chemistries and innovation. American companies are investing billions into domestic research, development, and production of cutting-edge HFO chemistries.³³ American researchers are securing patents for their work, a proxy for innovation. For the automotive applications of a single HFO chemistry, American companies hold seven patents.³⁴

Safeguarding this American intellectual property, and the multibillion-dollar market opportunities and hundreds of thousands of jobs it supports, will require granting authority and resources to the EPA and CBP to coordinate efforts to combat illegal trade and trafficking of legacy HFCs into both the US and export markets for US-made goods. It will also provide benefits to consumers by protecting them from fraudulent and mislabeled goods, facilitating the transition to HFO coolants and equipment that will be more reliable and cost-efficient, and keeping a lid on costs of goods as diverse as cars and groceries.

Delivering on the implementation of the AIM Act and stopping the illegal transiting of HFCs should be an imperative not only of the EPA, but also CBP, USTR, and the Department of Commerce as they seek to enforce the law and protect our economy from bad actors. That doing so provides such immense benefits for American households, businesses, and the environment make these policy efforts a win-win-win for the nation.

32 "Hydrofluoroolefins (HFOs) Market Trends, Growth Outlook 2037." Research Nester, 2025. www.researchnester.com/reports/hydrofluoroolefins-hfos-market/3830.

33 "Honeywell Expands Baton Rouge Facility to Drive Growth of Low Global Warming Technologies." Press release, Nov. 17, 2021. <https://ess.honeywell.com/us/en/about-ess/newsroom/press-release/2021/11/honeywell-expands-baton-rouge-facility-to-drive-growth-of-low-global-warming-technologies>.

34 Taddonio, Kristen, et al. "Status of Patents and Legal Challenges: Patents Related to the Use of HFO-1234YF in Auto Air Conditioning." 7 Jan. 2022. <http://www.igsd.org/wp-content/uploads/2023/11/Status-of-Patens-and-Legal-Challenges-HFO-1234yf-3Dec21.pdf>.