

Mitigating HFC-23: New Rules in the USA

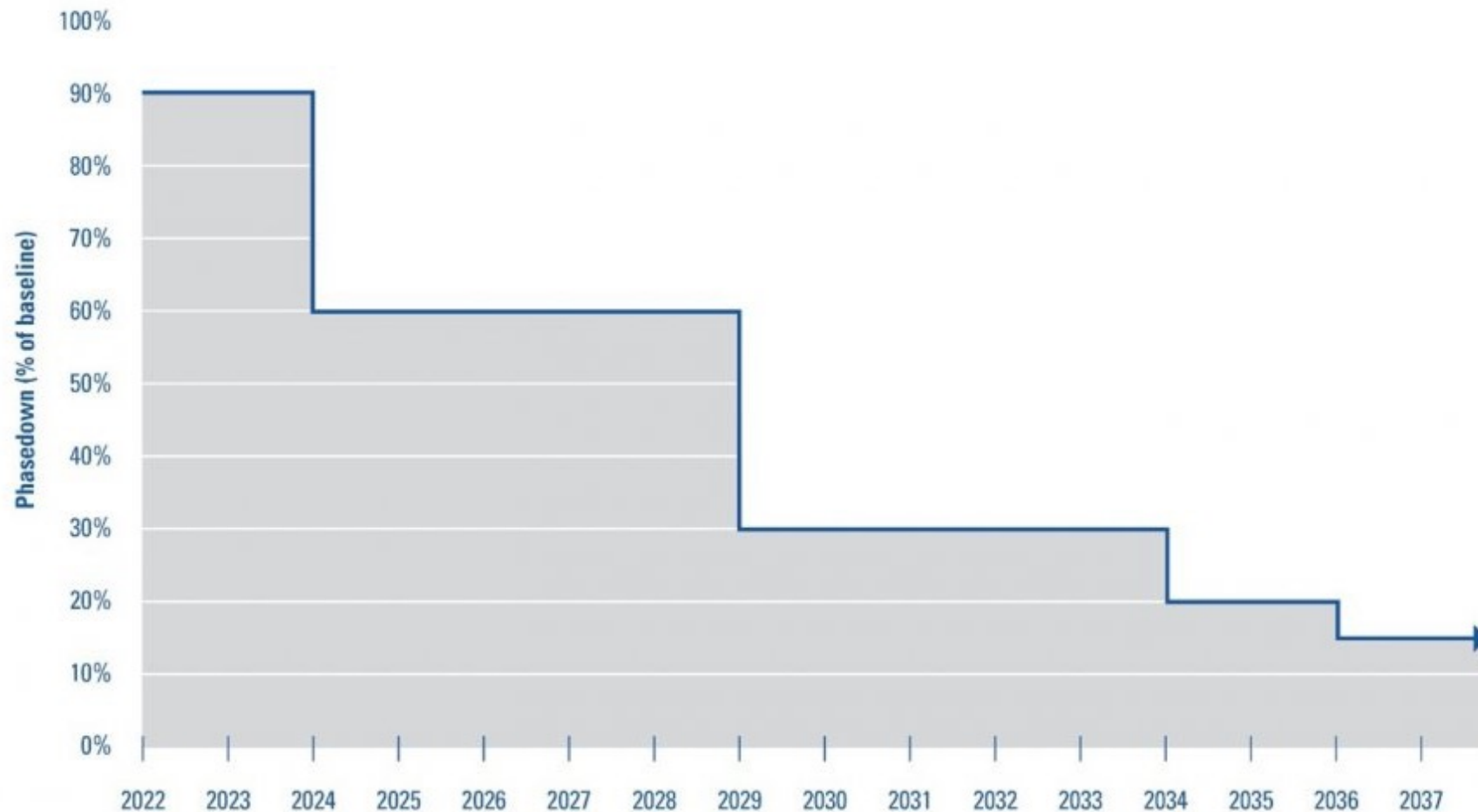
Institute for Governance & Sustainable Development


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The American Innovation & Manufacturing Act

- The American Innovation and Manufacturing (AIM) Act was enacted by the United States (US) Congress on December 27, 2020.
- The AIM Act directs the US Environmental Protection Agency (EPA) to address hydrofluorocarbons (HFCs) by:
 - phasing down production and consumption
 - maximizing reclamation and minimizing releases from equipment, and
 - facilitating the transition to next-generation technologies through sector-based restrictions.

The AIM Act has the Same Phase-Down Schedule as the Kigali Amendment to the Montreal Protocol





EPA has Already Begun Issuing Rules

- **Completed:** The HFC Allocation rule:
Establishes baselines & production and consumption allowances; includes HFC-23 provisions
- **Proposed:** Addressing HFC-23 from HCFC-22 Manufacturing

The HFC Allocation Rule

- Finalized in September and published in the Federal Register on October 5th, 2021
- What this rulemaking does:
 - establishes the hydrofluorocarbon production and consumption baselines, from which allowed production and consumption will decrease consistent with the statutory phasedown schedule;
 - provides an initial approach to allocating calendar-year allowances and allowing for the transfer of those allowances;
 - establishes provisions for the international transfer of allowances;
 - establishes recordkeeping and reporting requirements;
 - establishes provisions to support implementation, compliance with, and enforcement of, statutory and regulatory requirements under the AIM Act's phasedown provisions
 - **addresses HFC-23 and establishes capture & destruction technology requirements**
- More details at: <https://www.epa.gov/climate-hfcs-reduction/final-rule-phasedown-hydrofluorocarbons-establishing-allowance-allocation>

HFC-23 in the Allocation Rule

Federal Register Vol.
86, No. 190, October
5, 2021 Page 552014

§ 84.27 Controlling emissions of HFC-23.

(a) No later than October 1, 2022, as compared to the amount of chemical intentionally produced on a facility line, no more than 0.1 percent of HFC-23 created on the line may be emitted.

(1) *Requests for extension.* The producer may submit a request to the relevant Agency official to request a six-month extension, with a possibility of one additional six-month extension, to meet the 0.1 percent HCFC-23 limit. No entity may have a compliance date later than October 1, 2023.

(2) *Timing of request.* The extension request must be submitted to EPA no later than August 1, 2022, for a first-time extension or February 1, 2023, for a second extension.

(3) *Content of request.* The extension request must contain the following information:

(i) Name of the facility submitting the request, contact information for a person at the facility, and the address of the facility.

(ii) A description of the specific actions the facility has taken to improve their HFC-23 control, capture, and destruction; the facility's plans to meet the 0.1 percent HFC-23 limit including the expected date by which the equipment will be installed and operating; and verification that the facility has met all applicable reporting requirements.

(4) *Review of request.* Starting on the first working day following receipt by the relevant Agency official of a complete request for extension, the relevant Agency official will initiate review of the information submitted under paragraph (a)(3) of this section and take action within 30 working days. Any grant of a compliance deferral by the relevant Agency official will be made public.

(b) Captured HFC-23 is permitted to be destroyed at a different facility than where it is produced. In such instances, HFC-23 emissions during the transportation to and destruction at the different facility will be incorporated into calculations of whether the producer meets the 0.1 percent standard outlined in paragraph (a) of this section.

§ 84.29 Destruction of regulated substances.

(b) The following technologies are approved by the Administrator for destruction of HFC-23:

- (1) Gaseous/fume oxidation;
- (2) Liquid injection incineration;
- (3) Reactor cracking;
- (4) Rotary kiln incineration;
- (5) Argon plasma arc;
- (6) Nitrogen plasma arc;
- (7) Chemical reaction with hydrogen and carbon dioxide; and
- (8) Superheated steam reactor.

HFC-23 Rulemaking

- EPA has also proposed a complementary rule on HFC-23, “Protection of Stratospheric Ozone: Standards Related to the Manufacture of Class II Ozone- Depleting Substances for Feedstock”
- Under the proposed rule, by October 1, 2022, unless a deferral is granted, plants must limit their emissions of HFC-23 to no more than 0.1% of the amount of intentionally produced HCFC-22 in their manufacturing process. The rest must be either captured and used for commercial purposes or destroyed using an Environmental Protection Agency (EPA)-approved technology.
- To ensure compliance with the proposed limits, EPA is proposing both a one-time report and quarterly reporting.
- Details about this rule can be found at:
<https://www.epa.gov/ods-phaseout/hfc-23-emission-standards-production-class-ii-ods>

Making Voluntary Commitments Enforceable

“the known plants affected by this rulemaking have made public commitments to control and, to the extent feasible, eliminate byproduct emissions of HFC-23. In recent discussions with EPA, affected companies described ongoing efforts to control, capture, and destroy HFC-23, including planned facility upgrades. EPA is proposing regulations to establish permanent and federally enforceable requirements in addition to these voluntary commitments.”

--Federal Register, Vol. 86, No. 186, September 29, 2021, page 53920

What is EPA proposing for recordkeeping and reporting requirements?

- EPA is proposing a one-time report, to be submitted within 45 days after the effective date of the rule, containing the following: (i) Information on the capacity to manufacture the intended chemical(s) on the line(s) where HFC-23 byproduct is generated; (ii) a description of actions taken at the plant to control the generation and emissions of HFC-23; (iii) identification of approved destruction technology and its location intended for use for HFC-23 destruction; and (iv) a copy of the DRE report associated with the destruction technology. Any changes to the information provided in the one-time report be reflected in a revision submitted to EPA within 60 days of the change(s).
- EPA is also proposing quarterly reporting, to be submitted 45 days after the end of the applicable reporting period, for production line data on HFC-23: (i) Emissions; (ii) generated, whether captured or not; (iii) generated and captured for all uses; (iv) generated and captured for feedstock use in the United States; (v) generated and captured for destruction; (vi) used for feedstock without prior capture; and (vii) destroyed without prior capture.

What is EPA proposing for recordkeeping and reporting requirements?

- If captured HFC-23 byproduct is destroyed in a subsequent calendar year, EPA is further proposing to require the entity that generated the HFC-23 to report that the HFC-23 has been destroyed. The information must be submitted within 45 days after destruction occurs.
- In addition, where destruction of HFC-23 occurs at a different plant than where it is generated, EPA is proposing to require the entity that generated the HFC-23 to report that the HFC-23 has been destroyed within 90 days of being generated. The information must be submitted within 45 days after destruction occurs.

Assuring Accuracy

- **To ensure that reported values for HFC-23 generation, capture, transformation, and destruction are reliable, EPA is proposing to require entities to comply with certain monitoring and calculation provisions. (Link to detailed rules next slide)**
- Specifically, EPA is proposing to require entities to meet the same requirements in 40 CFR part 98, subpart L or subpart OO, depending on the quantity being reported. These provisions include validated methods for measuring concentrations of HFC-23 in process streams and the mass flow rates of those streams; accuracy, precision, and calibration requirements for instrumentation; and specific calculation methods for uncontrolled emissions and for quantities transformed and destroyed.
- EPA proposes to include these reporting requirements to ensure that reported data are accurate, precise, and comparable over time and across plants and companies.

40 CFR part 98, subpart L & OO

Subpart L Fluorinated Gas Production 98.120 – 98.128

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-L?toc=1>

- § 98.120 Definition of the source category.
- § 98.121 Reporting threshold.
- § 98.122 GHGs to report.
- § 98.123 Calculating GHG emissions.
- § 98.124 **Monitoring and QA/QC requirements.**
- § 98.125 Procedures for estimating missing data.
- § 98.126 Data reporting requirements.
- § 98.127 Records that must be retained.
- § 98.128 Definitions.

Subpart OO

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-OO>

Insights on HFC Destruction & Enforcement

- When rules force HFC-23 destruction, companies re-optimize to produce less HFC-23 and more HCFC-22 and marketable byproducts (turning waste to revenue, saving money on destruction by producing less HFC-23)
- A level competitive playing field is important
 - Lack of enforcement at one company encourages others to cheat too
 - Reporting, independent auditing, and monitoring help assure compliance



Thank you

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Back-up Slides

HFCs controlled by the AIM Act

Chemical Name	Common Name	Exchange Value*
CHF ₂ CHF ₂	HFC-134	1,100
CH ₂ FCF ₃	HFC-134a	1,430
CH ₂ FCHF ₂	HFC-143	353
CHF ₂ CH ₂ CF ₃	HFC-245fa	1,030
CF ₃ CH ₂ CF ₂ CH ₃	HFC-365mfc	794
CF ₃ CHF ₂ CF ₃	HFC-227ea	3,220
CH ₂ FCF ₂ CF ₃	HFC-236cb	1,340
CHF ₂ CHF ₂ CF ₃	HFC-236ea	1,370
CF ₃ CH ₂ CF ₃	HFC-236fa	9,810
CH ₂ FCF ₂ CHF ₂	HFC-245ca	693
CF ₃ CHFCH ₂ CF ₂ CF ₃	HFC-43-10mee	1,640
CH ₂ F ₂	HFC-32	675
CHF ₂ CF ₃	HFC-125	3,500
CH ₃ CF ₃	HFC-143a	4,470
CH ₃ F	HFC-41	92
CH ₂ FCH ₂ F	HFC-152	53
CH ₃ CHF ₂	HFC-152a	124
CHF ₃	HFC-23	14,800

* Exchange Value is numerically equivalent to the 100-year GWP of the chemical as given in the Errata to Table 2.14 of the IPCC's 2007 Fourth Assessment Report (AR4).

HFC Phasedown Schedule and Consumption & Production Allowance Caps

Year	Consumption & Production Allowance Caps as a Percentage of Baseline	Estimated Consumption and Production Allowance Caps in MMTEVe*
Baseline	Consumption: 303.89 MMTEVe Production: 382.55 MMTEVe	
2020–2023	90 percent	Consumption: 273.5 Production: 344.3
2024–2028	60 percent	Consumption: 182.3 Production: 229.5
2029–2033	30 percent	Consumption: 91.2 Production: 114.8
2034–2035	20 percent	Consumption: 60.8 Production: 76.5
2036 & after	15 percent	Consumption: 45.6 Production: 57.4

* Baselines and caps are expressed in million metric tons of exchange value equivalent (MMTEVe), which is numerically equivalent to one million metric ton of CO₂ equivalent (MMTCO₂e).

How Production & Consumption Allowances are Issued for 2022 and 2023

- EPA established an initial methodology for issuing allowances for 2022 and 2023 that:
 - Issues allowances to companies that produced and/or imported HFCs in 2020, based on the three highest non-consecutive years of production or import between 2011 – 2019.
 - Issues “application-specific allowances” directly to the entities that operate within the six applications listed in the AIM Act. These entities will be able to confer their allowances to producers or importers to acquire needed HFCs.
 - Sets aside some allowances for application-specific end users and small importers that are only identified after the public comment period ends and new market entrants.
- EPA also established a methodology for trading allowances between companies, while requiring an offset of allowances to further benefit the environment. The offset is 5% of the amount transferred and is reduced from the transferor’s allowance balance.

Compliance & Enforcement Provisions

- The EPA's Allocation final rule:
 - Establishes an electronic tracking system for the movement of HFCs through commerce;
 - Requires the use of refillable cylinders and container labeling requirements;
 - Establishes administrative consequences (e.g., revocation or retirement of allowances) for noncompliance that would be in addition to any civil and criminal enforcement action;
 - Requires third-party auditing of companies' recordkeeping and reporting; and
 - Provides transparency of HFC production and consumption data for the general public and participants in the market
- In addition, to prevent illegal trade in HFCs, EPA is coordinating with other federal agencies, in particular, U.S. Customs and Border Protection.

HFC-23 in the Allocation Rule

- *What is EPA requiring for HFC-23 emission controls?*
- “As discussed in the Section V, the creation of a regulated substance beyond insignificant quantities inadvertently or coincidentally created in five specific circumstances is considered ‘production.’ Such production, whether intentional or unintentional, would generally require the expenditure of production and consumption allowances unless the regulated substance is timely destroyed.”
- “Given the extremely high exchange value of HFC- 23, EPA is exercising its significant discretion to determine that production and consumption allowances cannot be expended for HFC-23 production if that HFC-23 is emitted rather than being captured and either destroyed or sold for consumptive use.”
- “Put another way, if a facility produces HFC-23 and emits that HFC-23 onsite beyond the numerical standard established in this final rule, production and consumption allowances cannot be expended to cover the generation of the HFC-23, and the facility will be deemed to have undertaken production of HFC-23 without an accompanying expenditure of allowances in violation of the AIM Act and the regulations established in this rulemaking.”
- **“Instead of being emitted, HFC-23 must be captured and controlled to a specific standard** stated later in this subsection. Entities can either destroy the HFC-23 or expend production and consumption allowances to capture, refine, and sell it for consumptive uses.”