

Performance Standard Supplemental Description

GREENHOUSE GAS EMISSIONS REDUCTION METHODOLOGY FOR CERTIFIED RECLAIMED HFC REFRIGERANTS, PROPELLANTS, AND FIRE SUPPRESSANTS

VERSION 2.0

2023-10-03

Introduction

ACR's Methodology for the Quantification, Monitoring, Reporting, and Verification of Greenhouse Gas Emissions Reductions and Removals from Certified Reclaimed HFC Refrigerants, Propellants, and Fire Suppressants, v2.0 (HFC methodology) enables the issuance of carbon credits to projects in the U.S., Canada, and Mexico that reclaim and use certified reclaimed HFCs in newly manufactured equipment or to service existing equipment in eligible sectors, including domestic refrigeration, commercial refrigeration, cold storage warehouses, industrial process refrigeration, transport refrigeration, mobile air conditioning, stationary air conditioning, aerosols (propellants), and fire suppression. The climate benefits of projects developed under this methodology are additional to what would have occurred under a business-as-usual scenario, current laws and regulations, and current industry practices, and without carbon market incentives. To demonstrate that the activities eligible under the HFC methodology are not common practice, ACR established a performance standard by evaluating adoption rates for certified reclaimed HFCs.

This supplemental description of the performance standard aligns with and complements the HFC methodology. It is intended to supply additional details to interested parties about the sources consulted and analysis performed during methodology development to support the performance standard established therein. ACR was inspired to publish this document to provide even more transparency on a core component of the methodology and principle of the ACR Program. Project Proponents and Validation and Verification Bodies do not need to consult this supplemental when performing the work of developing and validating/verifying projects under the methodology.

HFC Methodology Performance Standard

To qualify as additional under the HFC methodology, projects must exceed the performance standard defined in the methodology and pass a regulatory additionality test. The HFC methodology establishes a practice-based performance standard developed by evaluating the market adoption rates for certified reclaimed HFCs in the U.S. and the appropriateness for application to Canada and Mexico and concludes that, based on low penetration rates within certain sectors and segments, any HFC project that meets the eligibility and other requirements of the methodology is additional.¹

Adoption Rates for Practice-Based Performance Standard

Market adoption rates for the U.S. are displayed in Table 4 of the HFC methodology depicting the supply of reclaimed HFCs for years 2017-2020, in pounds (lbs) as sourced from the U.S. EPA Refrigerant Reclamation Summary. Note that the original source cited has been updated since the April 2022 publication date so the HFC Refrigerant Reclamation Totals by Year (pounds)² values available now deviate slightly (<2%) from those presented in the table. That amount of reclaimed HFCs for a given year was then converted to million metric tons (MT) carbon dioxide equivalent (CO₂e) for the purpose of comparing to the availability of virgin HFCs. The same table is presented below with an additional column for the net virgin HFCs available for consumption in the U.S. for the same years (content was previously provided as text in the HFC methodology and the citation below has been updated to a more specific reference).

¹ See the eligible sectors and segments listed in Table 1 of the HFC methodology.

² While the table title implies that these quantities are specific to refrigerants, the quantities includes HFCs that are reclaimed from air conditioning, refrigeration, aerosols, and fire suppressants and the same HFC compounds included in the table can be used for any of these sectors.

Table 1: Total Reclaimed HFCs Reported to EPA

YEAR	AMOUNT RECLAIMED IN POUNDS ³	AMOUNT RECLAIMED IN MILLION MTCO ₂ e ⁴	NET VIRGIN HFCs AVAILABLE ⁵
2017	5,001,821	4.4	290
2018	5,158,987	4.6	306
2019	6,056,195	5.1	314
2020	5,496,623	4.7	309

The U.S. supply of certified reclaimed HFCs as a percentage of the total HFCs available for consumption (penetration level) is referred to as the Virgin HFC Replacement Rate (RR_{BL}) in the methodology.

The Virgin HFC Replacement Rate for a given year = HFC Reclaimed (in Million MTCO₂e) ÷ Net Virgin HFCs available for use in the U.S. (in Million MTCO₂e)

The Virgin HFC Replacement Rate used in the methodology is the percentage averaged over the 2017-2020 time period and is calculated as follows:

$$[(4.4 \div 290) + (4.6 \div 306) + (5.1 \div 314) + (4.7 \div 309)] \div 4 \times 100 = 1.54\% \text{ (rounded to 2\%)}$$

The data used to calculate penetration levels in the U.S. is not similarly available for Canada or Mexico, but alternative analysis and a comparison of the policy environments in the three countries justifies application of the U.S. replacement rates in these countries.

Per Canada’s GHG Inventory report (1990-2021): Part 1,⁶ GHG emissions from HFC use peaked in 2018 and 2019 at around 12 million MTCO₂e. In 2021, this dropped to around 11 million MTCO₂e partly due

³ U.S. EPA. Refrigerant Reclamation Summary, 2000-2021. https://www.epa.gov/sites/default/files/2020-07/documents/2020_reclamation_table.pdf.

⁴ To convert lbs of HFCs to million MTCO₂e, the quantity of HFC reclaimed (in lbs) is first converted to MT by dividing it with 2204.62 (lbs per MT). The MT of each HFC is then converted to MTCO₂e by multiplying the HFCs quantity by their respective GWP values (using IPCC AR5 values). For unidentified HFCs that are reported in the Other HFCs category, a conservative GWP value of 3,000 is used.

⁵ U.S. EPA. Greenhouse Gas Reporting Program (GHGRP) Data Relevant to the AIM Act, Net Supply of AIM-Listed HFCs Reported to GHGRP in Years 2011-2021. <https://www.epa.gov/ghgreporting/ghgrp-data-relevant-aim-act>.

⁶ Environment and Climate Change Canada. National Inventory Report 1990-2021: Greenhouse Gas Sources and Sinks in Canada. Figure 4-2, page 139. https://publications.gc.ca/collections/collection_2023/eccc/En81-4-2021-1-eng.pdf.

to reduced import of bulk HFCs. This is only a small decrease from peak use mainly due to 10% phase down starting 2019 under Kigali Amendment, suggesting consumption of virgin HFCs is still a common practice. This report also states that there are two HFC reclamation facilities in Canada but the data on amount of HFCs destroyed or reclaimed is not publicly available. Given that the U.S. and Canada have both ratified the Kigali Amendment and are on the same schedule to phase down their production and consumption of HFCs (i.e., 10% by 2019 and 40% by 2024 from baseline) and that Canada has only two reclaimers compared to more than 65 EPA certified reclaimers in the U.S.,⁷ reclamation of recovered HFCs is assumed to be similarly uncommon in Canada as it is in the U.S.

Mexico's HFC phasedown per the Kigali Amendment is ten years behind with 10% reduction in 2029 and 30% in 2035. Mexico has come up with a roadmap to implement Kigali Amendment which targets introducing regulations post 2024 when the HFC consumption level freezes and as the 10% phase down deadline approaches in 2029. Given that the phasedown of HFCs has not yet started in Mexico, the rate of recovery and reclamation of HFCs in Mexico can be expected to be less than in U.S. and Canada.

The extremely low 2% penetration level for the U.S., and as extrapolated for Canada and Mexico, demonstrates that the reclaim and use of certified reclaimed HFCs is not common practice in these countries. Adoption rates are expected to remain low in the near future as a result of barriers to increasing refrigerant recovery and reclamation, including the contamination, blends and mixed cylinders, increasing costs and market fluctuations, and limits on recovery potential as a result of accidental or intentional release.⁸

As a result of the analysis and findings described above, the HFC methodology concludes that, based on low penetration levels for such projects, any Certified Reclaim HFC Refrigerants, Propellants, and Fire Suppressants project that meets the eligibility and other requirements of the methodology is additional.

NOTE: *In February of 2021, ACR temporarily suspended new listings of projects using this methodology while ACR reviewed the American Innovation in Manufacturing (AIM) Act and subsequent potential regulation in the United States as well as regulations in Canada and Mexico for potential impacts to additionality, eligibility, or baselines. In July of 2021, ACR returned to accepting new listings for these projects and released a policy update for methodologies related to HFCs available at <https://acrcarbon.org/news/policy-update-methodologies-related-to-hfcs/>.*

⁷ U.S. EPA. EPA-Certified Refrigerant Reclaimers. <https://www.epa.gov/section608/epa-certified-refrigerant-reclaimers>.

⁸ U.S. EPA. Draft Report - Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices (2022). https://www.epa.gov/system/files/documents/2022-10/Draft_HFC-Reclamation-Report_10-13-22%20sxf%20v3.pdf.