

A6.4-INFO-MISC-009

Information note

Summary of the comments received from stakeholders on “A6.4-PMM007: Recovery and plasma-based destruction of residual HFCs remaining in ISO tank containers”

Version 01.0



TABLE OF CONTENTS	Page
1. INTRODUCTION	3
2. SUMMARY OF VIEWS TO THE A6.4-PMM007: “RECOVERY AND PLASMA-BASED DESTRUCTION OF RESIDUAL HFCs REMAINING IN ISO TANK CONTAINERS”	3
2.1. General.....	3
2.2. Applicability	3
2.3. Demonstration of additionality.....	4
2.4. Baseline scenario	5
2.5. Leakage.....	5
APPENDIX. LIST OF SUBMISSIONS.....	6

1. Introduction

1. The note provides a summary of views stakeholders submitted in response to the call for public inputs on the “A6.4-PMM007: Recovery and plasma-based destruction of residual hydrofluorocarbons (HFCs) remaining in ISO tank containers” launched as an outcome of the initial assessment of the PMM.
2. The call for public inputs was open between 13 February and 6 March 2026, and total of 3 stakeholders submitted their views. The full list of submissions can be found in the appendix to this note.

2. Summary of views to the “A6.4-PMM007: Recovery and plasma-based destruction of residual HFCs remaining in ISO tank containers”

3. The following sections summarizes the views expressed in the submissions.

2.1. General

4. There are better methodologies to adopt to achieve real climate impact. These methodologies are reputable and robust, as seen through years of use, expert review, and continuous refinement. Hundreds of successful destruction projects have been implemented around the world through these methodologies. Not only do they introduce a scope that allows project developers to scale real climate impact, but they also include additionality and perverse incentive safeguards that the market relies on to maintain project integrity and quality. Refer to the following protocols:
 - (a) American Carbon Registry’s Methodology for the Quantification, Monitoring, Reporting, and Verification of GHG Emission Reductions from the Destruction of Ozone-Depleting Substances and High-GWP Foam (February 2023)
 - (b) American Carbon Registry’s Methodology for the Quantification, Monitoring, Reporting, and Verification of GHG Emission Reductions from the Destruction of Ozone-Depleting Substances from International Sources (April 2021)
 - (c) Verra’s VM0016 Destruction of Ozone Depleting Substances and Hydrofluorocarbons (December 2025)
 - (d) OneShot’s Methodology for the Quantification, Monitoring, Reporting, and Verification of Greenhouse Gas Emission Reductions and Removals from HFC Destruction from End-of-Life Appliances in the US (August 2025) [3]

2.2. Applicability

5. The proposed mechanism methodology currently focuses on destruction as the principal eligible pathway. Additional discussion on the potential role of reclamation during the transition period could further strengthen the overall rationale. Although the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (Kigali Act) supports a progressive transition toward low-global warming potential (GWP)

refrigerants, this transition is gradual rather than immediate. In many markets, adoption of advanced and natural refrigerants continues to face practical constraints, including:

- safety considerations related to flammability;
- higher retrofit and equipment costs;
- availability and compatibility limitations; and
- established servicing practices and market habits.

Under these conditions, HFCs may continue to play a role during the transition period in many developing countries. This context suggests that the treatment pathway for recoverable refrigerants may warrant broader consideration. In practice, recovery of residual gas from ISO tank containers can be technically straightforward. More advanced recovery systems are available at costs below 100,000 USD, and relatively simple recovery setups, e.g. basic transfer pumps, are available even at prices as low as 20,000 USD. In the latter case, additional reclamation steps may be necessary due to potential oil contamination. It therefore may be useful to further explain why carbon finance mechanisms were considered for destruction only, why reclamation is not considered, and how potential interactions with ongoing market demand for HFCs were assessed. Additionally, the proposed mechanism methodology should ensure that HFCs sent for destruction are not effectively replaced by equivalent virgin HFC imports, particularly in countries that are not yet subject to phase-down obligations, or are in the early stages of phase-down. It is therefore suggested that the proposed mechanism methodology should consider HFC reclamation as a potential pathway for recovered refrigerants. [1]

6. The proposed mechanism methodology narrowly focuses on destroying HFC residues in ISO tank containers. There are other higher impact areas in the HFC space, such as HFCs from end-of-life appliances or stockpiles that cannot re-enter the HFC supply chain. These areas merit the opportunity to generate carbon credits and offer more potential to do so. The follow eligibility conditions restrict the opportunity to very few project developers:
 - a) only HFC residues in ISO tanks qualify;
 - b) plasma destruction is the only permitted technology;
 - c) the destruction facility must be newly built; and
 - d) monitoring requires specific equipment (e.g., flowmeters, fourier transform infrared spectroscopies (FT-IR)), which are not present in most destruction facilities. [3]

2.3. Demonstration of additionality

7. The additionality demonstration would benefit from further clarification in light of current technical and economic practices in the refrigerant sector. Recovery systems such as pneumatic recovery pumps combined with condensing units are already commercially available and used by refrigerant importers. These systems can allow recovery of residual HFCs from ISO tanks from approximately 600-500 kg down to less than 50 kg, meaning that around 450 kg per tank may potentially be recovered under normal operating conditions. Using this technology, the recovered refrigerant remains within AHRI-700 quality specifications and may be reintroduced into the commercial market. From a

practical perspective, investment requirements for such recovery systems appear relatively moderate. For example:

- a) CAPEX for this advanced pump skid is in the range of USD 100k;
- b) operation may require two operators for less than one day per ISO tank container;
- c) depending on refrigerant value assumptions (e.g., ~USD 6/kg), return on investment may occur within a limited number of ISO tanks.

These observations suggest that recovery can, under certain circumstances, generate economic value and may not always represent a purely cost-only activity. At the same time, the methodology assumes that there are no viable utilization options for recovered gas and that no revenues exist beyond carbon credits. Additional explanation on how this assumption reflects market practice would help strengthen the additionality assessment. It is therefore suggested that the additionality assessment should reflect local market conditions, including the existing HFC market value and the technologies available to recover residues from ISO tanks, as these factors influence whether such recovery activities would already be economically viable without carbon finance. [2]

8. A stronger financial additionality demonstration is needed, particularly consideration is needed on the financial benefit in recovering and (re)using the residues. Other, non-carbon credit opportunities should be considered to preserve the principles of additionality and mitigation of perverse incentives. [3]

2.4. Baseline scenario

9. Allowing credit generation for destroying residues creates a perverse incentive. There are little safeguards available that limit project developers from behaviours that are misaligned with the intent of achieving emission reductions including, but not limited to, not recovering residues that are in fact recoverable, and producing more HFCs to produce more residues for destruction. [3]
10. Further clarification may be helpful regarding the use of a fixed 6% residual loss assumption derived from IPCC guidance. Given that residual quantities in ISO tank containers can often be determined through standard operational measurements (e.g., weighbridge or cylinder weighing), it would be useful to understand the rationale for applying a default factor rather than relying on direct measurement where feasible. It is therefore proposed that rather than requiring a wording amendment, this could be addressed through a technical approach by considering direct mass measurement of ISO tank residues instead of relying on a fixed default factor. [2]

2.5. Leakage

11. Leakage is assumed to be zero, even though the destruction of these residues will unintentionally result in emissions outside of the project boundary. This is an incorrect assumption, and the risks of this is magnified by the perverse incentives created by the methodology.[3]

Appendix. List of submissions

1. The following table contains submissions received.

Table 1: List of submissions received

Submission #	Stakeholder	Submission date
1	Energy Changes Projektentwicklung GmbH	4 March 2026
2	Alstern Specialist Pte Ltd	5 March 2026
3	Tradewater LLC	6 March 2026

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01.0	17 March 2026	Compilation of inputs from stakeholders by the secretariat.
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