

**PUBLIC COMMENT TEMPLATE**

An *Emission Reduction Measurement and Monitoring Methodology for Use of Reclaimed HFC Refrigerants and Advanced Refrigeration Systems* was prepared by EOS Climate. ACR reviewed the methodology and provided comments to EOS Climate with a revised methodology presented by EOS based on the ACR review process.

The methodology was posted for public comment from March 16 – April 24. Public comments and responses by EOS Climate are provided via the below template.

Following public consultation, the methodology will be submitted to an expert scientific peer review panel.

- 1. BACKGROUND AND APPLICABILITY ..... 2**
- 2. PROJECT BOUNDARIES ..... 4**
- 3. BASELINE DETERMINATION AND ADDITIONALITY ..... 4**
- 4. QUANTIFICATION OF GHG EMISSION REDUCTIONS ..... 6**
- 5. MONITORING AND DATA COLLECTION..... 7**
- APPENDIX A: BASELINE DATA INPUTS..... 7**
- APPENDIX B: OTHER METHODOLOGY CONSIDERATIONS AND GUIDANCE..... 7**
- APPENDIX C: REFERENCES ..... 7**

## 1. Background and Applicability

Comment	Commenter	Author Response	Author Changes to Methodology
<p>Thank you for the opportunity to comment on the proposed methodology for Reclaimed HFC refrigerants. I cannot stress enough that a protocol that provides an incentive to capture and reuse HFC is desperately needed. The cost of virgin material makes the recovery and reclamation of HFC impractical. The carbon incentives provided by this proposed methodology could provide that incentive and could have a huge impact on HFC recovery and reclamation volumes and, in turn, cut the manufacture of new HFCs. I am 100% behind this effort, but I also want to be sure to protect the validity of the overall programs for the generation of offset credits.</p>	Rich Dykstra	Agree.	None needed.
<p>As an operator who would only be involved with the HFC Reclamation component of the methodology, it would be helpful to have the two components (HFC reclamation and Advanced Refrigerant Systems) separated into two methodologies.</p>	Rich Dykstra	The methodology is separated into 2 distinct sections with distinct quantification procedures and monitoring requirements. The methodology was organized so that operators can easily extract out the relevant portions for their projects.	None needed.
<p>I am in favor of the limiting of the methodology to AHRI 700 Standard Reclamation. I could see problems if it were to encompass on-site recycling.</p> <p>Having said that, I would like to see language that limits the definition of Reclamation to processes occurring in an EPA-certified Reclamation Facility. Part of the documentation should include the address where the actual reclamation took place, as</p>	Rich Dykstra	<p>Agree on the AHRI-700 comment.</p> <p>The methodology does specify that only HFC refrigerant that is reclaimed by an EPA-certified reclaimer is eligible for crediting. The suggestion to add information regarding physical location is a good one. We agree that a physical site visit to the reclaimer should be</p>	<p>As suggested, the changes to include the permanent address of the reclamation facility and report on any changes in address, and to provide the equipment list used for certification have been added to Table 2 (see Certified, reclaimed HFC refrigerant definition) and to the</p>

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<p>is the case for the destruction facility in the ARB CFC destruction protocol. The EPA requires a permanent physical address along with an equipment list for reclamation certification. They also require change of address notices, indicating the location is critical to the continuing certification of the plant. If processing is not done in the EPA certified Reclamation facility, regardless of the testing involved, it is by definition recycling, not reclamation. It may be appropriate to include a verifier site visit to the reclamation facility as part of the protocol.</p>		<p>part of the verification.</p>	<p>documentation requirements found in Section 5.2.1.</p>
<p>I have a concern that in the real world it may be tempting for an equipment owner to work with a reclaimer to generate credits that are not part of a normal course of business. HFC systems could be recovered, with the refrigerant reclaimed and returned to the market, and eligible for carbon credit generation. The equipment owner could then reinstall new, or reclaimed HFC refrigerant. It would be possible for the equipment owner and reclaimer to do this over and over again, creating an artificial source for carbon eligible material.</p> <p>As a practical matter, there are reclaimers currently providing services to recover and reclaim refrigerant to remove oil for the purpose of improving the performance of the equipment. In some cases it is done as an ongoing preventive maintenance procedure. It would be a very small step to document this process in a way to qualify this repetitive activity for carbon offsets. Given enough incentive, generating the credits could</p>	<p>Rich Dykstra</p>	<p>Any potential revenue from generating carbon offsets from reclaiming refrigerant would likely represent a small fraction of the cost involved in recovery, transport, and reclamation, as well as the verification costs. Nevertheless, this is a valid concern if carbon prices rise significantly over time, which is why the methodology requires information on the source of the HFC refrigerant. We will make an adjustment in the reporting requirement so a verifier will be able to detect any pattern involving the same facility and equipment.</p>	<p>In addition to point of origin of the refrigerant (facility, equipment), reclaimers will be required to report on previous projects conducted under the methodology involving that source. This new attestation requirement is found in Section 5.2.1.</p>

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become the primary objective in this scenario. I would suggest that this be addressed by setting a limit or time line for the eligibility of the refrigerant coming from a particular piece of equipment. It could be once a year, or five years, or even once a lifetime. It could be enforced by attestation and/or document review.			

## 2. Project Boundaries

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## 3. Baseline Determination and Additionality

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Why is 407C the baseline refrigerant in Section 3.1.2? About 95% of supermarkets that use 407 series refrigerants use 407A.	Keilly Witman	R407A has been the predominant choice for low and medium temperature applications. R407C has been used in higher temperature applications. Our understanding from talking to supermarkets is that 407C is becoming a more attractive alternative for lower temperature systems, and given that it has a significantly lower GWP, we wanted to make the most conservative assumption for the future baseline. We can make an adjustment to reflect that R-407A is predominant	For now, change the baseline refrigerant to R-407A (see Section 3.1.2).

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		refrigerant in supermarket systems, and revise the methodology in the future as needed. Alternatively, we can take a more conservative approach and assume that R-407A will be increasingly used because of its low GWP and that the baseline will be 50:50 R-407A:R-407C. We will look for more guidance during the peer review.	
<p>During the public comment webinar, it was stated that this meth is intended for voluntary emission reduction crediting. In this case, it might be effective to further differentiate the baseline and the project scenarios.</p> <p>For reclaimed refrigerant, a distinction is possible between refrigerant recovery from End-of-life equipment and recovery during normal maintenance. In the EoL case, 100% of refrigerant can be credited, plus the energy that would be consumed for production of virgin refrigerant. The average energy intensity of refrigerant production for the main refrigerants can be included in the meth. Whereas for the recovery during maintenance case, equation #1 would be suitable.</p> <p>For the Low-GWP alternatives, the proposed meth describes only supermarkets. It is indeed a wise choice to demonstrate the feasibility of this meth for this end-use category. It would be suitable to add in 3.1.2, that further end-use</p>	Thomas Grammig	<p>Regarding the comment to distinguish between EOL and recovery during normal maintenance:</p> <p>The methodology calculates the avoided emissions from production of virgin HFC refrigerant. Thus, it does not matter whether the gas that is recovered and reclaimed is sourced from normal operating equipment or end of life equipment. That gas, once reclaimed, displaces production of new virgin HFC.</p> <p>We agree with the comment that additional end-use categories can be added to the “low-GWP” section of the methodology as additional categories become applicable for establishing a baseline (including new SNAP listings), additionality conditions, and quantifying the GHG reductions</p>	A note will be added in the “low-GWP” section that additional end-use categories in addition to commercial refrigeration will be considered for future revisions to the methodology as regulatory and market conditions develop.

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categories will be added, a list of the straightforward end-use categories foreseen, and a statement that all end-use categories that SNAP will rule on in the future will also be quantified in this meth. Straightforward end-use categories could be domestic refrigerators, domestic A/C with split units and window types, etc. Each end-use categories could also contain an approach to define a market penetration threshold above which the introduction of Low-GWP refrigerant is not judged additional any more. Since this meth is for voluntary emission reduction crediting, more judgment can be mobilized to determine this penetration threshold in light of the average cost of conversion to Low-GWP refrigerants for each end-use category.		associated with technology conversions.	
R- 502 is listed on Table 5 and seemingly included. It is a mixture of CFC- 115 and HCFC- 22 and contains no HFC. There are others as well, R-401a and R-500. Also, R-508b is 54% FC-116 and should likely be handled like R-502 and R-500 on the ARB CFC Destruction Protocol.	Rich Dykstra	Agree.	Tables 4, 5, and 10 were revised to include only HFC refrigerants.

#### 4. Quantification of GHG Emission Reductions

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The VR quantity, as in section 3.1.1, refers back to the right column in Table 10. And the right column in Table 10 is also AL {HFC,j,i} so effectively equation 1 contains the square of the 10-year emission rate. What could that physically represent?	Thomas Grammig	Equation 1 cites Table 4 for the AL {HFC,j,i} parameter. Table 10 in Section A.2 simply explains the emission rates which are reproduced in Table 4.	None needed.

## 5. Monitoring and Data Collection

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It looks like section 5.2.1 uses similar requirements as those used for CFC destruction under ARB (for instance, in the determination of point of origin), which is good.	Rich Dykstra	Agree.	None needed.

## Appendix A: Baseline Data Inputs

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## Appendix B: Other Methodology Considerations and Guidance

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## Appendix C: References

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