

PEER REVIEW COMMENT TEMPLATE

A revision to the approved *Methodology for the Quantification, Monitoring, Reporting, and Verification of Greenhouse Gas Emissions Reductions from The Transition to Advanced Formulation Blowing Agents in Foam Manufacturing and Use* was prepared by Dentons US, LLP. ACR reviewed the revision to the methodology and provided comments to the authors prior to the public comment period. The methodology was posted for public comment from December 4, 2017 – January 12, 2018.

Note to reviewers: This template is organized by section of the methodology. Please insert your review comments in the table for that section. In the first round of review, peer reviewers should insert their comments in the first column, leaving the second column for methodology author responses. This will be followed by an abbreviated second round of review in which the reviewers comment on the authors’ responses and methodology revisions, followed by a second round of responses from the authors.

Please add rows to each table as needed.

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1. Background and Applicability

	1st Peer Review	Author Response	2nd Peer Review	Author Response
1	In Definitions , recommend adding “i.e., hermetically sealed” after “the refrigeration circuit is entirely brazed or welded.”	Ok		
2	In Definitions , for Retail Food Refrigeration, suggest changing “all refrigeration components and integrated...” to “all refrigeration components are integrated...”	Ok		
3	In Definitions , for Retail Food Refrigeration, a period is missing at the end of the sentence “These systems are fully charged with refrigerant at the factory and typically require only an electric supply.” In general, suggest reviewing the entire document for punctuation and grammar issues.	Ok		
4	In Table 1 , large refrigeration systems used in supermarkets are not typically referred to as “Industrial Refrigeration” but rather an application within “Retail Food Refrigeration” or “Commercial Refrigeration.” In particular, this is because it is equipment designed to store and display chilled or frozen goods for commercial sale whereas	We are ok with revising the eligible end-use categories as suggested.		

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
<p>Industrial Refrigeration equipment is used in industrial processes and warehouses. See end-use definitions on EPA’s SNAP website, here and here.</p> <p>Recommend revising the bullets in the Description column of Table 1:</p> <ul style="list-style-type: none"> • <u>Small Retail Food Refrigeration</u> – Includes Stand Alone Equipment and Refrigerated Food Processing and Dispensing Equipment • <u>Large Retail Food Refrigeration</u> – Includes large, “engineered” systems used in supermarkets and walk-in freezers • <u>Industrial Refrigeration</u> – Includes industrial process refrigeration and cold storage applications that employ cold storage panel insulation 			

2. Project Boundaries

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
Adopting emission factors from IPCC is still appropriate if projects are outside of the United States (i.e., located in North America).	We agree. Note that the methodology is only applicable for projects located in North America.		

3. Baseline Determination and Additionality

1 st Peer Review	Author Response	2 nd Peer Review	Author Response

4. Quantification of GHG Emission Reductions

1 st Peer Review	Author Response	2 nd Peer Review	Author Response

5. Monitoring and Data Collection

1 st Peer Review	Author Response	2 nd Peer Review	Author Response

Appendix A: Development of Performance Standard

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
<p>In Table 6, large refrigeration systems used in supermarkets are not typically referred to as “Industrial Refrigeration” but rather an application within “Retail Food Refrigeration” or “Commercial Refrigeration.” In particular, this is because it is equipment designed to store and display chilled or frozen goods for commercial sale whereas Industrial Refrigeration equipment is used in industrial processes and warehouses. See end-use definitions on EPA’s SNAP website, here and here.</p> <p>Recommend revising the bullets in the Description column of Table 6:</p> <ul style="list-style-type: none"> • <u>Small Retail Food Refrigeration</u> – Includes Stand Alone Equipment and Refrigerated Food Processing and Dispensing Equipment • <u>Large Retail Food Refrigeration</u> – Includes large, “engineered” systems used in supermarkets and walk-in freezers • <u>Industrial Refrigeration</u> – Includes industrial process refrigeration and cold storage applications that employ cold storage panel insulation 	<p>We are ok with revising the eligible end-use categories as suggested.</p>		

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
(same comment as for Table 1)			
Market penetration estimates for “eligible BAs” in Table 7 and for “eligible BAs with HCs” in Table 8 for retail food refrigeration are lower than those assumed in the U.S. Greenhouse Gas Inventory (see Annex 3 , pg. A-239, Table A-250 for commercial refrigeration foam blowing agent market assumptions). These assumptions reflect the market’s compliance with EPA’s Status Change Rules . Given the recent court rulings surrounding these regulations, however, accelerated transitions away from HFCs could slow down. Therefore, we agree that estimates shown in Table 7 and Table 8 are reasonable and also agree that all known HFOs, methyl formate, and inert gases should be eligible BAs in the methodology.	We agree with this conclusion. Current market information indicates that transitions away from HFCs have slowed.		

Appendix B: Eligible BA GWP

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
GWPs reported here are different than those used in the previous peer review round. EPA has not yet adopted GWPs reported in AR5 for purposes of estimating weighted emissions. Recommend using GWPs reported by	Table 4 should be labeled Table 9 and we have made this change. Table 9 in Appendix B contains the same GWPs as the same table (Table 10) in version 1.0.	Please note that using the hierarchy of AR4, AR5, and then SNAP is inconsistent with the methodologies used by the U.S. Federal government. U.S. EPA uses the GWPs for chemicals listed under its SNAP program for	

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<p>EPA's SNAP program as listed on EPA's SNAP website for chemicals not listed in IPCC AR4. Therefore, in accordance with EPA, the hierarchy is following AR4, then EPA's SNAP program, and then AR5 for GWP sources. GWPs for commercial refrigeration substitutes can be found here on EPA's SNAP website.</p>	<p>We don't agree with using the SNAP listed GWPs ahead of using AR5 for the following reasons:</p> <p>AR4 and AR5 GWP values are provided for GHG emission inventory calculation purposes and the GWP value is the primary purpose for these publications and, therefore, align with an offset methodology's need to accurately calculate GHG reductions.</p> <p>The SNAP regulation's primary purpose is to identify those chemicals that are and are not allowed under the regulation. The GWP value of each chemical is provided for information purposes only which is why in many instances they use GWP ranges instead of the definitive values provided by IPCC.</p> <p>Therefore, we propose the following hierarchy of using AR4, AR5, and then SNAP.</p> <p>In accordance with this hierarchy, we will make the following changes to Table 9 in Appendix B:</p> <p>Methyl formate GWP = 5</p> <p>Footnote 21 will be revised to say "Per U.S. EPA, methyl formate's GWP is expected to be low, based on</p>	<p>more than information purposes. In particular, for chemicals that are not listed in AR4, GWPs from EPA's SNAP program are used to quantify the emissions for substitutes of ozone depleting substances reported in the annual U.S. Greenhouse Gas Inventory.</p> <p>Because the GWPs of the eligible BAs are significantly smaller than those of the HFC Bas being replaced, the difference in magnitude between the GWPs used by the U.S. Federal government and those in this methodology is not expected to be significant.</p> <p>We, therefore, do not contest the authors' proposed approach, but would like to point out that this is not consistent with the approach taken by the Federal government.</p>	

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	<p>similarity to other compounds with GWP's that have been published in the peer-reviewed literature (see IPCC 4th Assessment Report, Table 2.15). Per the Federal Register, the GWP is stated to be "very low or zero" in all Federal Register listings (for methyl formate and Ecomate). For purposes of this methodology, the GWP shall be set equal to 5 in Project emission reduction calculations.</p> <p>HCFO-1233zd(E) GWP = 1</p> <p>HCFO-1233zd(E) is included in AR5 and so the footnote will be changed to reference AR5.</p> <p>Methylal incorrectly has a reference to footnote 16 which will be removed.</p> <p>HFO-1234 incorrectly has a reference to footnote 15 which will be removed.</p>		
<p>In Table 4, "HFO-1336" should be "HFO-1336mzz(Z)."</p>	<p>Please see the above response on the table numbering revision.</p> <p>We will make the suggested change to the HFO nomenclature.</p> <p>We also suggest removing the text "trans-1-chloro-3,3,3, -trifluoroprop-</p>		

1 st Peer Review	Author Response	2 nd Peer Review	Author Response
	1-ene” from the description of HCFO-1233zd(E) because we do not provide the chemical name for the other HFOs.		
In Table 4 , recommend GWP of 5 for methyl formate. While the GWP is expected to be low, it is likely greater than that of CO ₂ . See GWP recommended by EPA here as an ODS substitute for foam.	Please see the above response on the table numbering revision. Please see the above response.		
In Table 4 , recommend GWP of 6 for HFO-1234ze and 9 for HFO-1336mzz(Z) for consistency to EPA’s SNAP program.	Please see the above response on the table numbering revision. Please see the above response.		

Appendix C: References and Other Information

1 st Peer Review	Author Response	2 nd Peer Review	Author Response