# Summary and Response to Public Comments

A draft of the *Methodology for the Quantification, Monitoring, Reporting, and Verification of Greenhouse Gas Emissions Reductions and Removals from Advanced Refrigeration Systems, version 3.0* was developed by ACR.

All methodology modifications, whether developed internally or brought to ACR by external parties, undergo a process of public consultation. Due to the nature of the updates, this new version also underwent scientific peer review prior to approval.

The methodology was posted for public comment from August 03, 2024 – September 02, 2024. Comments and responses are documented here.

| # | ORGANIZATION / COMMENTER | COMMENT | AUTHOR RESPONSE |
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| 1 | Therm Solutions, Inc. | **Cold Storage Baseline GWP**<br>Section 5.3 Baseline Refrigerant GWP; Table 8 does not specify a Baseline GWP for Cold Storage. Are we to use the Large Commercial Refrigeration Baseline Values? | Table 8 has been updated with baseline GWP values for cold storage warehouses. |
| 2 | Therm Solutions, Inc. | **Start Date:**<br>When a project is completed in phases, in the past we have used the date the entire system is operational and open to the public. Is it possible to clarify this in the methodology to avoid confusion during verification? | Section 4.2.1 Start Date is updated to include the following “For projects that involve filling equipment after manufacture, the project Start Date is the date that the advanced refrigeration system(s) first became fully operational.”<br>Section 10 Definitions is updated to define “fully operational” as “With respect to the Start Date, for new |

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| | | | construction, this means the date on which the advanced refrigeration system has fully charged all racks and the Site is officially open, as evidenced by documentation like a press release for a grand opening or a certificate of occupancy. For existing Sites that are completely replacing or retrofitting their refrigeration with an advanced refrigeration system, or that are adding additional refrigeration that is an advanced refrigeration system, this means the date on which the new advanced refrigeration system has fully charged all racks and the Site has started storing or preparing food or other perishable items in the refrigerated units or areas." |
| **3** | Therm Solutions, Inc. | **Parameters Monitored:**<br>**QBR*j*,*i*** (Quantity of refrigerant j (i.e., charge size of equipment) used in baseline system i): Current revision states: *"Project Proponents that replace or retrofit existing refrigeration system shall use information from installer specifications of existing system or service technician reports."* If charge data from the baseline system is unavailable from installer specifications or service technician reports, would a peer review technical document be acceptable? If no such documentation exists, how is the baseline charge determined? | For projects in which the Project Proponent replaces or retrofits an existing refrigeration system with an advanced refrigeration system, if the charge size data for the existing refrigeration system, as required by the methodology, is unavailable, the Project Proponent may submit a methodology deviation request for review by ACR. The methodology deviation request must follow the process in the *ACR Standard* and explain why the data was unavailable, what efforts were made to obtain the data, what alternative method/source is proposed to estimate the charge size, and why this estimated charge size is conservative. |
| **4** | Therm Solutions, Inc. | **Parameters Monitored:** | Footnote 32 has been added to clarify the following "'The previous five years' shall start five years before |

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| | | **AER*j*,*i*** (Annual amortized emission rate of refrigerant j used in baseline system i): 5 years leak data refers to 5 years prior to the install year correct? For example: if the retrofit occurs in 2024, the leak data would be from 2019-2023 | the date the existing refrigeration system is taken offline for retrofitting and end on the day before the existing refrigeration system is taken offline for retrofitting. In other words, if the advanced refrigeration system at a Site is taken offline for retrofitting on September 3, 2024, the period over which the average leak rate is calculated is September 3, 2019 through September 2, 2024." |
| **5** | True Manufacturing Co., Inc. | The public comment draft has unnecessarily limited the scope of version 2.1 and removed the necessary incentives for use of propane as a refrigerant for stand-alone refrigeration units deployed in Mexico and Canada. ACR should retain Table 4 from version 2.1 with a modification that it still applies to units listed in those categories deployed in Mexico and Canada. The definition of eligible units should also be expanded to include those same categories.<br><br>The rationale for these requests comes directly from section 3.2 of the proposed version 3.0<br><br>"This Methodology utilizes a practice -based performance standard to demonstrate that a GHG project carrying out the eligible project activities are implementing | ACR reviewed the latest national GHG emissions inventories of Mexico and Canada and found no market share of low-GWP refrigerants[1] in the refrigeration sector as a whole. Additionally, in Canada, regulation allows for the use of refrigerants with high GWPs in Stand-Alone Commercial Refrigeration equipment, so there is no requirement to use low-GWP refrigerants.<br><br>Given that there is no penetration of low-GWP refrigerants in Stand-Alone Commercial Refrigeration in Mexico and Canada, all equipment—including six refrigerator and freezer equipment types—within this application will remain eligible for projects in Mexico and Canada.<br><br>Despite the change described above, the authors disagree that the quoted material from Section 3.2 (Performance Standard) supports the rationale for including this category in Mexico and Canada because |

[1] In the final version of the Methodology, the authors changed the term "low-GWP refrigerant" to "ultra-low-GWP refrigerant" to align with common usage of the terms. For retrofit projects, the final version of the Methodology uses (and defines) the term "lower-GWP refrigerant."

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| | | technologies that exceed the industry standard for the relevant sectors and applications (see Table 1) in the applicable geographic areas. Market adoption rates for low-GWP refrigerants and associated technologies are discussed below.<br><br>U.S. market adoption rates for low-GWP refrigerants and associated technologies eligible under this Methodology are sourced from U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks (1990-2022) (U.S. EPA Inventory) (U.S. EPA, 2024a). This data shows no market penetration for SNAP-acceptable, low-GWP refrigerants in condensing units (equivalent to Remote Condensing Units application) and large retail food refrigeration (a subset of the Large Commercial Refrigeration application) and around 7% market penetration for ammonia as refrigerant in cold storage refrigeration (a subset of the Large Commercial Refrigeration application). U.S. market adoption rates for low-GWP refrigerants and associated technologies…. In the Stand-Alone Commercial Refrigeration application, there is no market penetration for low-GWP refrigerants in | the information referenced covers U.S. penetration rates, not penetration rates in Mexico or Canada.<br><br>The authors also disagree that the additional quoted material from Section 3.2 supports eligibility for Stand-Alone Commercial Refrigeration for Mexico and Canada because those paragraphs address the penetration rates for Large Commercial Refrigeration, which is a separate eligibility category. |

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| | | refrigerated food processing and dispensing equipment."<br><br>The same holds true for all listed categories in the existing method which are deployed in Mexico and Canada.<br><br>Again, the proposed version 3.0 supports True's understanding of the market conditions of the market conditions in Mexico and Canada and justifies continuing to apply the ARS method to those areas.<br><br>"Market adoption rates in Canada and Mexico were evaluated using data from ATMOsphere's Natural Refrigerants: State of the Industry report. The 2022 and 2023 editions of this report show persistently low adoption rates of low-GWP refrigerants in North America. As of December 2023, 1,080 food retail stores in Canada have installed transcritical CO2-based refrigeration systems (i.e., the most commonly used low-GWP commercial refrigeration system in supermarkets and grocery stores) (ATMOsphere, 2023). This represents just a 6% penetration level among the 18,078 supermarkets, groceries and convenience stores in Canada (ATMOsphere, 2023). The same ATMOsphere report states that there is at least one store in Mexico that has | |

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| | | installed a transcritical $CO_2$ system and a number of ammonia/CO2 systems installed by a cold storage operator (ATMOsphere, 2023). Assuming that 'a number' of systems plus one store translates to less than 100 such installations, evaluated conservatively against Mexico's 3,333 supermarket chain stores (U.S. Department of Agriculture, 2023), the penetration level is less than 0.1%.<br><br>The low (0.1% - 7%) penetration levels for the U.S., Canada, and Mexico demonstrate that the use of low-GWP refrigerants for commercial refrigeration purposes is not common practice in these countries. Adoption rates are expected to remain low in the near future as a result of market entry barriers, including the high upfront costs and a technician shortage for these systems (North American Sustainable Refrigeration Council, 2023).<br><br>As a result of the analysis and findings of low market adoption rates for low-GWP refrigerants and associated technologies within the eligible sectors and segments, any Advanced Refrigeration System project that meets the eligibility and other requirements of the Methodology exceeds common practice." | |

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| 6 | True Manufacturing Co., Inc. | In light of U.S. EPA's recent decision to allow a larger charge size, one of the categories from the 2.1 version should be retained: Vertical Open Refrigerators.<br><br>Until July 2024, the largest propane charge size allowed was 0.150kg/unit. That charge size was not large enough to provide sufficient cooling in such units. True sold virtually no such units, and we doubt any other manufacturer did either. But with the larger charge size now allowed, ACR should not cut off the opportunity to convert these kinds of units into propane-cooled units. We urge ACR not to abandon this category of stand-alone refrigeration units. | The latest U.S.EPA GHG Emissions Inventory shows a market penetration of ~30% for propane (a low-GWP refrigerant) in EPA's "small retail food" inventory category that primarily includes commercial refrigerators and freezers. The U.S. EPA GHG Emissions Inventory does not provide data at the equipment level (i.e., sub-categories of small retail food). In the absence of equipment-level data, the authors cannot differentiate and conservatively assume that the market penetration of propane applies to the entire small retail food category, which includes all commercial stand-alone refrigerators and freezers.<br><br>U.S., EPA's decision to increase the charge limit up to 500 g per unit will only further increase the penetration of propane for this category.<br><br>This category is distinct from the "refrigerated food processing and dispensing equipment" inventory category, which has low penetration of low-GWP refrigerants. Based on this, the authors are retaining the eligibility only of Stand-Alone Commercial Refrigeration – refrigerated food processing and dispensing equipment in the U.S.<br><br>All equipment types within the Stand-Alone Commercial Refrigeration application will be eligible for crediting in Mexico and Canada where, unlike in the U.S., the penetration rates of low-GWP refrigerants are low. |