



B.C. Refrigerant's Offset Protocol Consultation What We Heard Report 2025

Greenhouse Gas Industrial Reporting and Control Act (GGIRCA)

Introduction

The Ministry of Energy and Climate Solutions ('the Ministry'), has concluded public consultation on the draft British Columbia Refrigerant Offset Protocol (BCROP). The Ministry engaged on the draft protocol for a period of 30-days.

The BCROP will incentivize commercial and industrial facilities to reduce greenhouse gas (GHG) emissions by retrofitting or installing refrigeration/air conditioning systems that use low global warming potential (GWP) refrigerants.

The Ministry thanks all those who submitted feedback with Ministry staff. This report contains a summary of the feedback the Ministry received during consultation between June 10 and July 10, 2025.

Background

Established under the *Greenhouse Gas Industrial Reporting and Control Act* (GGIRCA), the BCROP provides the eligibility requirements and quantification methodology for emission offset projects that permanently reduce GHG emissions from refrigeration/air conditioning ('R/AC') systems that utilize high GWP refrigerants. The BCROP must be read in conjunction with the [Emission Offset Project Regulation](#) (EOPR), which sets the regulatory requirements applicable to all emission offset projects in British Columbia.

The BCROP is an emission offset protocol under the GGIRCA and establishes the quantification methodology and eligibility requirements to ensure that any offsets generated by a project are high-quality, permanent, real, verifiable and additional. In alignment with the Ministry's 2025-26 and 2027-28 [Service Plan](#), under Goal 1 and 3, BCROP supports the timely implementation of provincial climate policies and programs that are expected to achieve progress towards the province's GHG emissions reduction targets while supporting affordability and business competitiveness.

This report reflects Stages 5-6 of the protocol development process, as defined in B.C.'s Offset Protocol Policy ([OPP](#)). These stages aim to reflect and incorporate the feedback received throughout public engagement and to strengthen the final protocol.

Consultation

Consultation on the draft version of the BCROP took place for 30-days between June 10, 2025, to July 10, 2025. During this period, the Ministry welcomed feedback and perspectives from First Nations, Indigenous groups, industry and government stakeholders to ensure the practical application of the final protocol upon release. The Ministry evaluated each comment received individually, considering its value and significance to ensure the practical application of the protocol on release.

Summary of Feedback

In total, the Ministry received 3 formal submissions with 5 individual comments (see Table 1) in the 2025 engagement period. The Ministry received some questions regarding the applicability of the BCROP to specific project instances that were not considered formal submissions.

The submissions, individual comments, and key themes are outlined below:

Table 1: 2025 BCROP Engagement Submissions by Group

Party	Submissions	Individual Comments
Government	2	3
First Nations	1	2
Total	3	5

Based on the feedback received, the following 3 key themes were identified:

- Refrigerant Safety
- Quantification Methodology
- Diesel-Fired Projects Considered Ineligible

Refrigerant Safety

One comment from First Nations raised concerns regarding potential adverse effects associated with the use of ammonia as a refrigerant, which given its low GWP, could potentially be incentivized and used in eligible project activities under the BCROP. This comment spoke to the potential adverse effects associated with ammonia use in the event of equipment failure

and sought clarification to which safeguards, monitoring, and design considerations, prospective projects would have in place to keep people and the environment safe.

The Ministry clarifies that in British Columbia, the [Safety Standards Act](#) empowers [Technical Safety BC](#) (TSBC) to oversee refrigeration systems, classifying refrigeration plants and components as regulated products subject to inspection and enforcement. The [Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation](#) sets out technical requirements governing installation, operation, and maintenance. It enforces compliance with national codes where applicable. Anyone operating ammonia refrigeration systems above specified capacity must hold a [Certificate of Qualification](#) (e.g. Refrigeration Operator or Power Engineer) and operate under a documented Plant Supervision Program, with continuous on-site supervision while in operation. TSBC issues Safety Orders when risks are identified.

Directives from TSBC outline design expectations for ammonia pressure vessels in closed-circuit refrigeration systems, including compliance pathways under Canadian Standards Association (CSA) codes. In B.C., CSA codes like B52 (Canadian Standard for Mechanical Refrigeration Systems) and B51 (Boiler, Pressure Vessel, and Pressure Piping Codes) are actively adopted and enforced, guiding safety-consistent design, manufacture, and maintenance. TSBC safety officers conduct in-service assessments, including physical inspections, paperwork reviews, and operator audits. Non-compliance can trigger orders, monetary penalties, or suspension of operating permits. These inspections verify that monitoring systems, pressure relief devices, ventilation, and oversee that safety mechanisms are functioning properly, especially detection alarms and ventilation in enclosed ammonia machine rooms.

In B.C. ammonia is considered a hazardous substance and is regulated under the [Occupational Health and Safety Regulation](#) (OHS Regulations), created under the [Workers Compensation Act](#). Under Part 5 (Chemical Agents and Biological Agents) of the OHS Regulations, key requirements are laid out specifically to reduce ammonia exposure risk in the workplace. WorkSafeBC has also published a safety manual entitled [Ammonia in Refrigeration Systems](#) that is designed as a guide for workers and employers in industries that pose a risk of exposure to ammonia, and can be used as a tool to complement regulatory requirements and support workplace safety.

The safety measures, checks, and regulations are in place for projects operating ammonia refrigeration systems. The Ministry clarifies that the BCROP is a technical document that provides the quantification methodology for carrying out emission offset projects that incentivize the use of refrigeration/air conditioning systems that use low GWP refrigerants, over R/AC systems that use high GWP refrigerants. The BCROP is not a law that governs refrigerant health and safety, nor does it set health and safety requirements. An offset protocol

enables approved projects to generate offset units under the GGIRCA, and proponents can sell or trade these offset units.

Quantification Methodology

Refrigerant Transport

The Ministry received comments regarding BCROP's quantification methodology. One First Nation raised concerns around assumptions the protocol makes regarding potential leakage of refrigerants during transport. This comment suggested that protocols should not rely on assumptions and should be evidence-based. The Ministry agrees that assumptions surrounding refrigerant transport emissions should be supported by data to ensure transparency and credibility.

The protocol makes the assumption that refrigerant transport emissions are negligible and equivalent in both baseline and project scenarios and is based on the following rationale:

- Refrigerants are typically transported in sealed, pressurized containers designed to prevent leakage.
- Transport distances and methods (e.g. truck delivery) are generally similar in both scenarios, meaning any emissions would cancel out in a comparative analysis.
- Leakage during transport is rare and is usually associated with accidents or poor handling, which are not systemic or predictable enough to model accurately.

While there is limited published data quantifying refrigerant leaks during transport, industry best practices and regulatory requirements – such as [Transportation of Dangerous Goods Regulations](#) in Canada – mandate the use of leak-proof containers and proper handling procedures. The Ministry clarifies that these regulations are designed to prevent accidental releases under normal transport conditions, making transport-related emissions both rare and equivalent across baseline and project scenarios.

Annual Average Refrigerant Leakage Rates

The Ministry received further comment from within government that the annual average refrigerant leakage rates for refrigeration/AC systems in the protocol may be too high. Feedback outlined that project proponents should be permitted to use equipment-specific leak rates based on direct measurement. While this approach could theoretically improve accuracy, it presents practical and methodological challenges that make it difficult to implement.

For instance, many older systems lack reliable service records, and undocumented leaks or repairs are common. Data may also be unintentionally or strategically reported that overrepresents actual leakage, which has the potential to impact offset issuances. Allowing custom leak rates may also introduce bias, complicate the verification process, and undermine the consistency and credibility of the protocol. For these reasons, BCROP applies standardized

leakage rates to ensure conservative and verifiable emissions estimates. Comparatively, other offset protocols use conservative defaults to ensure the environmental integrity and avoid over-crediting. This approach is the preferred industry standard when measurement uncertainty is high.

The leakage rates applied in BCROP are consistent with international benchmarks and reflect a conservative approach required to maintain the integrity and robust stringency measures of the B.C. Offsets Program. The leakage rates that BCROP utilizes, while adapted from Environment and Climate Change Canada's *Reducing Greenhouse Gas Emissions from Refrigeration Systems* offset protocol, were taken from the United States Environmental Protection Agency's (EPA) *Accounting Tool to Support Federal Reporting of Hydrofluorocarbon Emissions: Supporting Documentation*. This methodology is informed by the EPA's Vintaging Model, which is a robust, bottom-up methodology informed by industry data, market trends, and peer-reviewed research.

The methodology has been utilized by the U.S. to estimate the emissions of various refrigerants reported in the U.S. Greenhouse Gas Inventory and submitted annually to the United Nations Framework Convention on Climate Change. In addition, Environment and Climate Change Canada utilizes the methodology for their own refrigerant's offset protocol that BCROP was adapted from. The leakage rates reflect real-world conditions across equipment types and vintages, whilst also being consistent with international standards, including the American Standard of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), which is a globally recognized leading authority on refrigerants.

BCROP aligns with ASHRAE Standard 228 (2023) which cites similar or even higher "typical annual leakage" values, such as 30% for supermarket refrigeration and 6-10% for commercial AC systems. BC's defaults, including 25% for centralized systems and 8% for commercial air conditioning, fall within the same empirical range. The Ministry clarifies that these figures are not design targets, but policy defaults based on real-world data, ensuring that credited emissions reductions are real, credible, and conservative.

Further feedback comparatively highlighted declining leakage rates in certain markets such as Australia, however, BC's emissions profile differs significantly due to climate, equipment mix, and regulatory context. As BC shares more similarities with the U.S. market for refrigeration and HVAC systems, the U.S. EPA data and methodology serve as a more applicable technical basis for the province to adapt. Data within BC's Provincial Inventory of Greenhouse Gas Emissions also outlined that refrigerant-related GHG emissions have increased significantly over the last three decades, further supporting the application of conservative leakage rates. Several other comparative comments were provided but are beyond the scope of the province's regulatory and market structure.

BCROP's default values are, therefore, designed to reflect local conditions whilst also maintaining environmental integrity. In the absence of robust, standardized measurement practices, the Ministry has applied the default leakage values in the protocol as a safeguard and to ensure the practical application of the BCROP on release.

High GWP Limits in Table 3 Could Inflate Baseline Emissions

Feedback from within government raised concerns that the global warming potential (GWP) values listed in Table 3 of the BCROP may be too high compared to the refrigerants typically found in equipment, potentially leading to an overestimation of baseline emissions and an over-issuance offset credits to projects. Comments suggested that Table 3 should reference the most conservative refrigerant that may be used in each piece of equipment.

The Ministry clarifies that Table 3 uses the maximum GWP values permitted under Schedule 1.1. of the Federal Ozone Depleting Substances and Halocarbon Alternatives Regulations (ODSHAR). The ODSHAR sets the maximum GWP allowed in new or imported equipment sold in Canada. These values are generally lower than the GWPs of older refrigerant systems still in use. By setting baseline GWPs equal to the ODSHAR Schedule 1.1., BCROP is ensuring that baseline emissions are conservatively estimated, meaning fewer offsets are awarded than might be justified by refrigerant measurements.

By aligning the protocol to enforceable national standards, this supports transparency, consistency, and environmental integrity, while preventing over-crediting and maintaining public trust in the BC Offsets Program. Table 3 effectively future-proofs the baseline against the use of phased-out refrigerant in new equipment, aligning with the legal standard and ensures that calculations are transparent and accurately verifiable.

Diesel-Fired Projects Considered Ineligible

With respect to Remote Communities Using Diesel-Powered Generators

The original draft version of the BC Refrigerants Protocol excludes fossil fuel derived electricity as a source, sink or reservoir (SSR) of greenhouse gases from the quantification, as the amount of additional carbon emitted from the step change in refrigerants is assumed to be small and far below the materiality threshold.

The Ministry received feedback from within government expressing concern that excluding diesel-fired generators that provide electricity to refrigeration systems as an SSR could lead to over-crediting, due to diesel's high carbon intensity and the likely reduced efficiency of systems using lower-GWP refrigerants.

Feedback, therefore, suggested that this be included as a GHG source to avoid instances of over-crediting, in both project and baseline scenarios.

Although the probability of a BCROP project using diesel powered generators is small, the Ministry has opted to exclude projects that fall under this category.

[Clarification of hydrofluorocarbon \(HFC\) destruction through Canadian Environmental Protection Act \(CEPA\) Compliant Halocarbon Stewardship Program \(CHSP\).](#)

Feedback from within government recommended clarification within BCROP regarding the volumes of HFCs in the extracted refrigerant that are submitted to the CEPA-CHSP for destruction to ensure all submitted HFCs are destroyed. The feedback also highlighted the necessity of being specific about how only refrigerants destroyed under the CEPA program should be considered creditable project scenarios. The Ministry has clarified language to avoid ambiguity and provide clear instruction to the project proponent.

Next Steps:

The Ministry has considered all feedback received and evaluated each comment on its own merit in finalizing the BCROP. The Ministry extends thanks to the continued collaboration with proponents and First Nations and Indigenous groups in finalizing the BCROP to accelerate climate action policy in B.C. The Ministry is working to finalize the BCROP by Fall of 2025. If you have any questions or concerns, please direct your inquiries to GHGRegulator@gov.bc.ca.