



Ministry of
Energy and
Climate Solutions

British Columbia Greenhouse Gas Offset Protocol: Refrigerants

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Greenhouse Gas Industrial Reporting and Control Act

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GUIDANCE

This document contains both a protocol for the carrying out of emission offset projects that reduce greenhouse gas emissions from refrigeration and air-conditioning systems, and guidance associated with such projects. The Protocol is established under section 10 of the Greenhouse Gas Industrial Reporting and Control Act (“GGIRCA”). It creates legal requirements that Project Proponents, Validation Bodies, and Verification Bodies must follow for the proponent to obtain Offset Units under GGIRCA. This document also contains guidance intended to assist Project Proponents, Verification Bodies, and Validation Bodies. Such guidance is not a legal requirement imposed, although it may refer to binding legal requirements. For example, explaining implications of a Protocol requirement or reminding Project Proponents that they may be subject to other legislation or regulations and that nothing in this Protocol affects those obligations.

The guidance included within this Protocol is for the purpose of providing additional information only and may not be applicable to specific Projects. Project Proponents are responsible for ensuring compliance with all applicable laws, including but not limited to, this Protocol, [GGIRCA](#), the [Emission Offset Project Regulation \(“EOPR”\)](#), the [Ozone Depleting Substances and Other Halocarbons Regulation](#), and the federal [Ozone-depleting Substances and Halocarbon Alternatives Regulations \(“ODSHAR”\)](#) as applicable.

Text in this document that is italicized is guidance and is not part of this Protocol. Text in this document that is not italicized is part of this Protocol. Terms that are capitalized, other than for grammatical purposes, have the definitions ascribed to them in this Protocol, GGIRCA or EOPR.

The Protocol expands on EOPR requirements for Eligible Projects and provides detailed rules for quantification of Project Reductions from Eligible Projects. The Protocol must be read in conjunction with EOPR as most of the requirements of EOPR apply fully to Eligible Projects.

Simply meeting the eligibility requirements in this Protocol does not guarantee a Project will be able to generate Offset Units. Project Proponents are advised to confirm that the rules for calculating Baseline Emissions under this Protocol will allow for generation of Offset Units. Project Proponents are also advised to confirm that the required assertions related to additionality of the Project can be made.

Project Proponents are further responsible for understanding the interaction of Projects under this Protocol with other regulatory and funding programs. This will vary according to the rules of EOPR, this Protocol and the rules applicable to other programs.

Project Proponents are also responsible to ensure that the Validation Body or Verification Body used is accredited in relation to projects in the sector covered under this Protocol (i.e., accreditation by the Standards Council of Canada to Technical Sector B: GHG emission reductions from industrial processes or by the American National Standards Institute (ANSI) to Sector Group 2: GHG emission reductions from industrial processes).

Project Proponents are strongly encouraged to test the feasibility of potential projects prior to developing a Project Plan under this Protocol. Project Proponents assume all risk if the emission reductions estimated during a feasibility study, or any other means of estimation, are different from those calculated using the quantification methodology contained in the Protocol.

Please note that while this protocol is largely consistent with Environment and Climate Change Canada’s protocol, “Reducing Greenhouse Gas Emissions from Refrigeration Systems, version 1.1”, the protocols vary in some respects and Proponents must ensure compliance with this Protocol.

ACKNOWLEDGEMENT

The British Columbia Refrigerants protocol was adapted from Environment and Climate Change Canada’s [Reducing Greenhouse Gas Emissions from Refrigeration Systems](#) (RGGERS) following the guidance of the Pan-Canadian Greenhouse Gas Offsets Framework.

As part of the Pan-Canadian Framework on Clean Growth and Climate Change, the federal, provincial and territorial governments committed to work together through the Canadian Council of Ministers of the Environment on a pan-Canadian greenhouse gas offsets framework. The framework provides guidance to jurisdictions that are developing or operating an offset program, with a longer-term goal of having a consistent suite of requirements and transferability of offsets across Canada. It is also intended to support cooperation among jurisdictions by identifying possible collaborative approaches to shared offset program infrastructure and operation.

PART 1: DEFINITIONS AND INTERPRETATION

Definitions and Interpretation

1. (1) In this Protocol, a word or expression that is capitalized other than for grammatic purposes has same meaning as in GGIRCA or EOPR or as set out below:

“Absorption” means a refrigeration cycle with a fluid absorbent and a fluid refrigerant that has a GWP equal to zero that is part of a R/AC System;

“Adsorption” means a refrigeration cycle with a solid sorbent and a fluid refrigerant with a GWP equal to zero that is part of a R/AC System;

“Assertion of Completeness” means an assertion in a Project Plan or Project Report that a specific retrofit or installation of a R/AC System meets the criteria of section 3 or 4, as applicable;

“Centralized Refrigeration System” means a refrigeration system with a cooling evaporator in the refrigerated space connected to a compressor rack located in a machinery room and to a condenser located outdoors, and that is designed to maintain an internal temperature at $\geq -50^{\circ}\text{C}$;

“CEPA Compliant Halocarbon Stewardship Program” means a “stewardship program” that is compliant with the CEPA Halocarbon Notice.

Currently the only CEPA Compliant Halocarbon Stewardship Program is that operated by Refrigerant Management Canada Inc.

“CEPA Halocarbon Stewardship Notice” means the notice issued under section 56(1) of the *Canadian Environmental Protection Act*, published in the Canada Gazette, Part 1 Volume 150, Number 21: Supplement, on May 21, 2016, as amended from time to time, or such other federal statutory instrument replacing that notice that regulates the environmentally responsible reclamation and destruction of Refrigerants.

“Certificate of Destruction” means a document issued by a person who destroys HFCs in Refrigerants on behalf of a CEPA Compliant Halocarbon Stewardship Program that includes the following information:

- (a) the name of the operator, and location of the facility, destroying all HFCs in the Refrigerants,
- (b) the name of the person submitting the Refrigerant to the operator and the date of the Refrigerant’s receipt,
- (c) manifest numbers related to shipment of the Refrigerant to the destruction facility,
- (d) tracking numbers or identifiers used by the destruction facility,
- (e) a certification that all HFCs have been destroyed and the date of destruction;

“Chiller” means a R/AC System that has a compressor, an evaporator and a secondary coolant;

“Commercial air conditioning system” means an air conditioning system, other than a chiller, including large single split or multi-split air-conditioning, variable refrigerant flow (VRF) systems and ducted or packaged rooftop systems;

“Completed”, in relation to a retrofit or installation, means the retrofit or installation has been completed and met all the criteria of sections 3 or 4, as applicable;

“Condensing Unit” means a refrigeration system with a cooling evaporator in the refrigerated space connected to a compressor and a condenser unit that is located in a different location, and that is designed to maintain an internal temperature at $\geq -50^{\circ}\text{C}$;

“Effective Date” means the date on which public notice of this Protocol was provided under section 10 (3) of GGIRCA;

Note: See cover page of this protocol for Effective Date;

“Eligible Project” means a project consisting of one or more individual Eligible Retrofit/Installations;

Guidance re: Programs of Activity vs Individual Projects. The definition of Eligible Project permits a “Program of Activities” consisting of multiple retrofits and installations with a single validation and combined verifications. Note, that Proponents may wish to consider treating separate Eligible Retrofits/Installations as separate Eligible Projects in order to maximize credit generated from each retrofit or installation. See note at section 8.

“Eligible Refrigerant” means a Refrigerant that meets the criteria of section 5;

“Eligible Retrofit/Installation” means the retrofit or installation of a R/AC System that meets the criteria of section 3 or section 4, as applicable, but excludes retrofits or installations with Start Dates later than the Eligibility Date;

“EOPR” means the [Emission Offset Project Regulation](#), B.C. Reg. 24/2024;

“Federal Refrigerant Protocol” means the Federal Offset Protocol: Reducing Greenhouse Gas Emissions from Refrigeration Systems;

“GGPPA” means the federal [Greenhouse Gas Pollution Pricing Act](#), S.C. 2018, c. 12;

“GGIRCA” means the [Greenhouse Gas Industrial Reporting and Control Act](#), S.B.C. 2014, c. 29;

“Global Warming Potential” or **“GWP”** means

- (a) In relation to a Greenhouse Gas or a Refrigerant composed of a single Greenhouse Gas, a metric representing the ability of that Greenhouse Gas to trap heat in the atmosphere compared to carbon dioxide (CO_2), over a one hundred year time horizon, as provided in column 4 in the Schedule to the Carbon Neutral Government Regulation, B.C. Reg 292/2008, or in relation to a hydrofluorocarbon not listed in that Schedule, the GWP for that hydrofluorocarbon listed in Schedule 3 of the GGPPA, and
- (b) in relation to a Refrigerant made up of multiple compounds, a weighted average of the GWPs of the compounds, determined in accordance with Section 24;

Guidance re: GWPs. The Federal Refrigerant Protocol requires use of GWPs set out in Schedule 3 of the GGPPA. Section 12 of the EOPR and section 1(3) of the Greenhouse Gas Emission Reporting Regulation requires Project Plans and Project Reports to use GWPs set out in the Carbon Neutral Government Regulation. As of the Effective Date those are the same as those set out in Schedule 3; however, Proponents, Validation Bodies and Verification Bodies should confirm that there have been no amendments to the relevant GWPs in either schedule, and are responsible for ensuring that GWPs used in calculations are consistent those set out for the purposes of GGIRCA [if available]. See also section 1(6).

“Greenhouse Gas (GHG)” has the same meaning as in the [Climate Change Accountability Act](#);

“Heat Pump” means a reversible air-conditioning / heat pump unit that can operate as an air-conditioning unit in hot weather or can provide heating in cold weather, in which in heating mode the indoor unit functions as condenser and the outdoor unit as evaporator;

“HFC” means hydrofluorocarbon;

“High-GWP Refrigerant” means a Refrigerant that contains one or more HFCs and has a GWP equal to or higher than the value in column 2 of Table 1 for the corresponding R/AC System type in column 1 of Table 1;

“Ozone-Depleting Substance (ODS)” means a substance listed in Class I or Class II of Schedule A of the [*Ozone Depleting Substances and Other Halocarbons Regulation, B.C. Reg 387/99*](#);

“ODSHAR” means the federal [*Ozone-depleting Substances and Halocarbon Alternatives Regulation, SOR/2016-137*](#);

“ODSOHR” means the [*Ozone Depleting Substances and Other Halocarbons Regulation, B.C. Reg 387/99*](#);

“Project Site” means the location at which one or more R/AC Systems are operated in the Project Scenario, as applicable;

“Qualifying Pre-Existing System” is a R/AC System which is retrofitted or Replaced by the Project and meets the following criteria:

- (a) there has been no change to the type of Refrigerant used in the system that would result in a change to the GWP of that Refrigerant during the period from 3 years prior to the installation of the new system;
- (b) the system has been operating at the Project Site for more than three years prior to its Replacement or retrofit;

“R/AC System” means a system providing refrigeration or air conditioning that is made up of one or more pieces of equipment and is designed for use in commercial or industrial settings or as a central system for multi-unit residential buildings, and for greater certainty does not include a domestic appliance as defined in the CEPA Halocarbon Stewardship Notice;

“Reclaim” means recovering halocarbons that have been used as Refrigerants and then reprocessing them through methods such as filtering, drying, distillation, or chemical treatment to restore them to industry-accepted standards for reuse;

“Refrigerant” means a single-component refrigerant or refrigerant blend that is used in a R/AC System and, for greater clarity, includes refrigerant alternatives such as hydrocarbons or ammonia;

“Replace or Replacement”, in relation to an R/AC System, means that an existing system is removed from a Project Site and destroyed or rendered permanently inoperable, and replaced by a new R/AC System;

“Stand-alone Low Temperature Refrigeration System”, means a self-contained refrigeration system with components that are integrated within its structure and that is designed to maintain an internal temperature $< 0^{\circ}\text{C}$ but not $< -50^{\circ}\text{C}$;

“Stand-alone Medium Temperature Refrigeration System”, means a self-contained refrigeration system with components that are integrated within its structure and that is designed to maintain an internal temperature $\geq 0^{\circ}\text{C}$;

“V/VB” means:

- (a) in relation to a Project Plan, a Validation Body
 - (b) in relation to a Project Report, a Verification Body.
- (2) Text in this Protocol that is italicized, other than a reference to an Act, is for guidance only and is not part of this Protocol.
- (3) The *Interpretation Act* applies to this Protocol.
- (4) A definition or requirement that is expressed as including items in a list is not limited to those listed items.
- (5) Terms that are capitalized, other than for grammatical purposes, have the definitions ascribed to them in this Protocol, GGIRCA or EOPR
- (6) Section 1 (3) and (4) of the Greenhouse Gas Emission Reporting Regulation, B.C. Reg. 249/2015, applies to the calculation of carbon dioxide equivalent (CO₂e) and, for that purpose,
- (a) the GWP that applies to a calculation contained in a Project Plan is the GWP in effect as of the date of the Project Plan, and
 - (b) the GWP that applies to a calculation contained in a Project Report is the GWP in effect as of the date of the Project Report.
- (7) For certainty, unless a contrary intention appears, a requirement imposed by this Protocol applies to all Eligible Projects.
- (8) For certainty, an assertion required by this Protocol to be included in a Project Plan or Project Report is:
- (a) an assertion of the Project Proponent, and
 - (b) an assertion for the purposes of section 15 (1) (a) or section 21(1)(a) of EOPR.
- (9) A reference to a provincial enactment or a federal statute or regulation, is a reference to that enactment, statute or regulation as amended from time to time.

PART 2: APPLICABILITY AND ELIGIBILITY

Applicability of Protocol

2. This Protocol applies to the following Projects in British Columbia:
- (a) Retrofitting one or more R/AC Systems to use an Eligible Refrigerant.
 - (b) Installing one or more new R/AC Systems containing an Eligible Refrigerant.

Note: In accordance with section 10 (4) of GGIRCA, this Protocol does not apply to a project if the Project Plan was validated before the Effective Date.

Eligible Retrofits

3. The following criteria must be met for each retrofit of an R/AC System that is part of a project to which this Protocol applies:
- (a) the R/AC System being retrofitted must be of a type described in Table 1, items 1 - 7;
 - (b) all High-GWP Refrigerants must be extracted from the retrofitted system(s) and either:
 - (i) all HFCs in the extracted High-GWP Refrigerant have been destroyed under a CEPA Compliant Halocarbon Stewardship Program, and the Proponent has the information required by section 38 (g) in relation to those Refrigerants, or
 - (ii) all HFCs in the extracted High-GWP Refrigerant have been sent to a CEPA Compliant Halocarbon Stewardship Program to be Reclaimed and the Proponent has the information required by section 38 (h) in relation to that Refrigerant;
 - (c) the retrofitted system must have a cooling capacity of at least 90% of its capacity prior to retrofit;
 - (d) the retrofitted system must be a Qualifying Pre-existing System;
 - (e) all Refrigerants used by the retrofitted system must be Eligible Refrigerants.
 - (f) the R/AC System cannot be reliant on electricity generated by an external diesel fired generator.

Note: Where a project involves multiple retrofits, the above criteria apply to each individual retrofit.

Eligible New Installations

4. (1) The following criteria must be met for each installation of an R/AC System that is part of a project to which this Protocol applies:
- (a) the system being installed must be of a type listed in Table 1;
 - (b) neither the system being installed nor any significant component of it may have been previously in use;
 - (c) the new R/AC System does not utilize a fossil fuel as a direct source of compression, heat or power;
 - (d) if the installation replaces one or more pre-existing systems, all High-GWP Refrigerants must be extracted from the pre-existing systems and either:
 - (i) all HFCs in the extracted High-GWP Refrigerant have been sent to a CEPA Compliant Halocarbon Stewardship Program for destruction, the Proponent has the information required by section 38 (g) in relation to those Refrigerants, and Certificates of Destruction have been obtained for all HFCs, or
 - (ii) all extracted Refrigerants have been sent to a CEPA Compliant Halocarbon Stewardship Program to be Reclaimed and the Proponent has the information required by section 38 (h) in relation to that Refrigerant;
 - (e) If the installation Replaces one or more pre-existing systems,
 - (i) the new system must have a cooling capacity of at least 90% of the cooling capacity of the pre-existing system, or 90% of the cooling capacity of the pre-existing systems combined, and

- (ii) the pre-existing system does not use a Refrigerant that consists entirely of Ozone-Depleting Substances; and
 - (f) all Refrigerants used by the newly installed system must be Eligible Refrigerants.
- (2) For the purposes of section 4, subsection (1) (c),
- (a) Waste heat from fossil fuel combustion is not considered to be a direct source of heat or power, and
 - (b) An R/AC System which is reliant on electricity generated by an external diesel fired generator, is not eligible under this protocol.

Note: Where a project involves multiple installations, the above criteria apply to each individual retrofit

Eligible Refrigerants

5. All Refrigerants used in systems retrofitted under section 4 or installed under section 5 must meet the following criteria:
- (a) the Refrigerants must have a GWP lower than the value applicable to the corresponding R/AC System type as set out in Table 1 below;
 - (b) for systems that have been retrofitted or Replaced, the GWP of the Refrigerants must be lower than the lowest GWP of the Refrigerants used in the pre-existing system(s);
 - (c) ammonia is not used as a Refrigerant, unless it used in a new system that is Replacing a pre-existing system;
 - (d) any Refrigerant must not be or contain an Ozone Depleting Substance; and
 - (e) None of the Refrigerant(s) may have been previously used in another R/AC System owned or operated by the Proponent or the owner or operator of the new R/AC System.

Table 1: GWP Limits for Eligible Refrigerants

	Column 1	Column 2
Item	R/AC System Type	Eligible Refrigerant GWP Limit
1	Stand-alone Medium Temperature Refrigeration System	1400
2	Stand-alone Low Temperature Refrigeration System	1500
3	Centralized Refrigeration System	2200
4	Condensing Unit	2200
5	Chiller (other than absorption or adsorption chiller)	750
6	Commercial air conditioning (AC) system	2000
7	Heat Pump (other than Absorption or Adsorption Heat Pump)	2000
8	Absorption or Adsorption chiller	1
9	Absorption or Adsorption heat pump	1

PART 3: GENERAL RULES

EOPR applies unless expressly disallowed or varied

6. For greater certainty, unless this Protocol specifically states that a requirement under the EOPR is inapplicable, all Project Plans, Validation Statements, Project Reports and Verification Statements must meet the requirements of both this Protocol and EOPR.

Guidance re: consequences of failure to comply with GGIRCA or EOPR: Failure to meet such requirements may cause a project plan not being accepted under GGIRCA or offset units not being issued.

Start Date Determination

7. The Start Date for a project under this Protocol is the earliest date on which a R/AC System retrofitted or installed as part of the project began to operate with an Eligible Refrigerant.

Guidance re: Start Date: Project start dates must comply with GGIRCA section 10 (6) requirements.

Last Day of Crediting Period

8. The last day of the Crediting Period for an accepted project is the tenth anniversary of the Start Date.

Guidance re: Crediting Periods: Section 9 allows projects to generate credits for ten years from the Start Date, irrespective of when the project is accepted by the Director.

Any additional installations or retrofits that are part of a Project involving multiple retrofits or installations that start operating after the Start Date for the Project will only be eligible to generate credits for the remaining duration of the crediting period, commencing from the earliest date on which a R/AC System retrofitted or installed as part of the project began to operate with an Eligible Refrigerant.

Baseline Emissions of the Project may be adjusted to reflect increased regulatory requirements over time, and this may eliminate the ability of a Project to produce Project Reductions. See: section 21 and 14 regarding potential changes to baseline due to changing regulatory requirements.

PART 4: GENERAL PROJECT PLAN REQUIREMENTS

Required information and Assertions for Installations and Retrofits

9. (1) In addition to the requirements of section 14 of the EOPR, the Project Plan must, for each retrofit or installation which has been Completed as of the Project Plan date, contain
 - (a) the street address and GPS coordinates (latitude and longitude) of the site that contains the retrofitted or installed system,
 - (b) as part of the technical description required under section 14 (3) (o) of the EOPR, clear identification of the elements of each R/AC System at the Project Site prior to and after the installation or retrofit,
 - (c) site plans showing the location of equipment referred to in (b),

- (d) If HFCs from a the retrofitted or Replaced R/AC System have been destroyed, the mass of each type HFC extracted from the replaced or retrofitted system, that has been destroyed,
 - (e) If HFCs from the retrofitted or Replaced R/AC System have been Reclaimed, the mass of each type of HFC extracted from the replaced or retrofitted system, that have been Reclaimed, and
 - (f) An Assertion of Completeness.
- (2) If HFCs removed from a R/AC System that has been Replaced or retrofitted have been destroyed, the Project Plan must identify the total mass of each type of HFC destroyed as of the Project Plan date.
 - (3) If HFCs removed from a R/AC System that has been Replaced or retrofitted have been Reclaimed, the Project Plan must identify the total mass of each type of HFC Reclaimed as of the Project Plan date.
 - (4) If all retrofits and installations that are part of the project have been Completed, the Project Plan must contain an assertion that the Project is an Eligible Project, or
 - (5) If all retrofits and installations that are part of the project have not been Completed,
 - (a) identification of retrofits or installations that are planned or that have not been started but not Completed including, to the extent available, information referred to in subsection (1)(a) to (c);
 - (b) an assertion that, if the retrofit or installations referred to in paragraph (a) are carried out as described in the Plan, the installation or retrofit will be an Eligible Project; and
 - (c) a description of how the Proponent and Verifiers will ensure that all installations and retrofits that comprise the project will be Eligible Retrofits/Installations.

Plan for Obtaining and Maintaining Evidence of Destruction

10. If the Project Plan calls for the destruction of HFCs contained in Refrigerants removed from one or more Qualifying Pre-existing Systems, the Project Plan must include:
 - (a) a description of how the Proponent will obtain and retain evidence showing the mass of each type of HFC in Refrigerant from each such Qualifying Pre-existing System that
 - (i) has been submitted to a CEPA Compliant Halocarbon Stewardship Program for destruction, and
 - (ii) has been destroyed; and
 - (b) an assertion that the evidence referred to in paragraph (a) will provide a high level of confidence of the mass and type of HFCs destroyed under the plan.

Chronological plan for the Project

11. A chronological plan referred to in section 14 (3) (e) of EOPR must set out:
 - (a) the key events in the development of the Project that occurred before the Start Date, and
 - (b) the dates on which those events occurred.

Disapplication of Leakage Requirements in Plan

12. Section 14 (3) (k) of EOPR does not apply to a Project Plan for a project to which this protocol is applicable.

Financial Additionality

13. A Project Plan must include a counterfactual financial analysis summary that reasonably justifies the assertion in section 14 (3) (n) (xi) of EOPR and that:

- (a) compares capital and operating costs of the project scenario versus the baseline scenario.
- (b) describes the financial analysis method used (e.g. payback period, net present value)
- (c) Outlines key financial variables, including:
 - i. Capital costs (e.g., equipment, installation)
 - ii. Operating costs (e.g. maintenance, power, labor)
 - iii. Discount rate (if applicable)

Guidance re: Financial Analysis: Conduct a simplified financial analysis when project capital costs substantially exceed those of the baseline or when operating costs are comparable across both scenarios. Prepare a more detailed financial analysis to substantiate the s. 14(3)(n)(xi) assertion when the financial advantage of the baseline is not readily apparent. Retain all financial analysis in accordance with section 38(I), as they may be requested for validation purposes.

Regulatory Additionality – Project Plan Requirements

14. (1) Subject to subsection (2), for each R/AC System that is being retrofitted, Replaced or installed as part of the Project, a Project Plan must include an assertion that:

- (a) no provincial, federal or local enactment, statute or regulation (including orders or directives) directly or indirectly
 - (i) requires any person
 - (A) to retrofit, replace or retire any pre-existing system R/AC System, or
 - (B) use a Refrigerant other than a High GWP Refrigerant in new or retrofitted system
 - (ii) prohibits
 - (A) continued operation or use of the pre-existing R/AC System, or
 - (B) use of High GWP Refrigerants in the system, or
 - (iii) otherwise requires a person to carry out activities that result in Project Reductions as quantified by this protocol or prohibits a person from activities that are part of the Baseline Scenario; and
- (b) if the retrofit, Replacement or installation had not occurred, no provincial, federal or local enactment or statute would have:
 - (i) prohibited the continued operation of any pre-existing system that is being retrofitted or Replaced,

- (ii) prohibited the continued use of a High GWP Refrigerant in any pre-existing system that is being retrofitted or Replaced as part of the project, or
 - (iii) required the retrofit or removal of the pre-existing system, replacement of Refrigerants used in the pre-existing system, or installation of an Eligible Retrofit/Installation.
- (2) If the Proponent cannot make the assertions in subsection (1) or those assertions cannot be validated, the Proponent must instead include in the Project Plan
- (a) an assertion that assumptions regarding both the type of Refrigerant and type of R/AC System used in the Baseline Scenario meet both of the following criteria:
 - (i) they are consistent with all applicable legal requirements, and
 - (ii) they represent the lowest cost compliance option [taking into account capital and operating costs];
 - (b) an explanation that demonstrates how the criteria in paragraph (a) are met.

Guidance re: Regulatory Additionality: As of the Effective Date, no federal or provincial regulations that are generally applicable in British Columbia include prohibitions or requirements referred to in section 13 (1); however, the Proponent and V/VBs are responsible for ensuring that there have been no changes to relevant regulations, as well as confirming that there are no orders or regulations that are particular to a specific system or location.

Proponents and V/VBs should, at a minimum, consider:

- *amendments to ODSOHR, ODSHAR;*
- *the Federal Halocarbons Regulations, 2022 (for installations located on aboriginal or federal lands, owned by the federal government or a federal agency, or part of a federally regulated work or undertaking, including a port or interprovincial railway, trucking or pipeline undertaking);*
- *new regulations under Canadian Environmental Protection Act; and*
- *orders issued under the Safety Standards Act.*

Double Counting

- 15.** For each Completed installation or Retrofit, a Project Plan must include an assertion that emissions of gases that are included under section 28 are not emissions attributable to a regulated operation for the purposes of section 6 GGIRCA.

Guidance re: Double Counting Assertion: As of the Effective Date, section 4 of the Greenhouse Gas Emissions Reporting Regulation identifies emissions that are attributable for the purpose of section 6 of GGIRCA, and none of the emissions covered by this protocol are attributable for the purposes of section 6. While HFCs from Electric Generation Cooling Units and fugitive carbon dioxide emissions are attributable for purposes of section 3 of GGIRCA, as of the Effective Date these are “reporting only emissions”. Proponents and V/VBs should confirm that no amendments have been enacted that would make emissions attributable for the purpose of section 6. As of the Effective Date the most relevant provisions are the following provisions of the Greenhouse Gas Emissions Reporting Regulation:

- *Definition of “reporting-only emissions”,*
- *section 3 and 4,*
- *Schedule A,*
- *Schedule B.*

Quality Assurance Plan

16. Project Plans must include a description of Quality Assurance / Quality Control (QA/QC) procedures that will be implemented to ensure that all calculations are made correctly and can be verified.

Quantification

17. (1) For the purposes of section 14 (3) (l) of the EOPR, the Project Plan must calculate Project Reductions expected to be achieved by the Project using the methodologies in Part 7 of this Protocol.
- (2) The Project Plan must include
- (a) calculations of predicted Emission Reductions from each Eligible Retrofit/Installation Completed as of the Project Plan date;
 - (b) if applicable, the justification of charge size required by section 32 (2).

Measurement and Monitoring Frequency and Methodologies

18. Despite section 14 (3) (j) (iii) of the EOPR, a Project Plan is not required to include the justification of measurement and monitoring frequencies and methods.

PART 5: GENERAL PROJECT REPORT REQUIREMENTS

Project Report Period

19. (1) The first Project Report Period begins on the Start Date of a Project and extends until December 31 of the calendar year in which the Start Date occurs.
- (2) Each subsequent Project Report Period is a calendar year, with the exception of the final Project Report Period, which will end on the 10th anniversary of the Start Date.
- (3) Project Reports for multiple Project Report Periods may be combined in a single document.

Guidance re: combining project reports for multiple calendar years: Verification Bodies can verify multiple project reports at the same time, but should provide separate verification statements for each project report period. Note, however, that, if more than 3 calendar years are verified at the same time, some of the offset units issued will not be usable for the purposes of compliance with section 6 of GGIRCA. (See section 41.14 (2) (b) of the Greenhouse Gas Reporting Regulation.) This may reduce the market value of those offset units.

Updated Information and Assertions for Installations and Retrofits

- 20.** (1) In addition to the requirements of section 20 of the EOPR, each Project Report must contain
- (a) the information and assertions referred to in section 9 (1) (a) to (f) for each retrofit or installation which has been Completed as of the end of the Project Report Period and for which no Assertion of Completeness has been made in the Project Plan or a previous Project Report,
 - (b) the total amount of each type of HFC Reclaimed as a result of retrofits or installations Completed as of the end of the Project Report Period and for which no Assertion of Completeness has been made in the Project Plan or a previous Project Report.
 - (c) the total amount of each type of HFC destroyed as a result of retrofits or installations Completed as of the end of the Project Report Period and for which no Assertion of Completeness has been made in the Project Plan or a previous Project Report.
- (2) If, in relation to planned retrofits or installations that have not been Completed, there are any changes to the information required under section 9 (5) (a) [*information and site plans for planned retrofits and installations*], from what has been reported in the Project Plan or previous Project Reports, the Project Report must include the information required under section 9 (5) (a) showing changes from what has been previously reported.

Financial and Regulatory Additionality

- 21.** A Project Report must contain the information and assertions referred to in section 13 and 14 in relation to each R/AC System that is being retrofitted, Replaced or installed as part of the Project.

Double Counting – Assertion

- 22.** For each Completed retrofit or installation, a Project Report must include an assertion that during the Project Report Period no emissions of gases that are included under section 28 were attributable to a regulated operation for the purpose of section 6 GGIRCA.

See Guidance re: double counting at section 15.

If Assertions cannot be Made in Relation to Part of Project

- 23.** If in relation to an installation or retrofit is part of Project, the Proponent cannot make an assertion referred to in section 21 or 22 or those assertions cannot be verified,
- (a) that installation or retrofit is deemed to no longer be part of the Project,
 - (b) Emission Reductions resulting from the installation or Retrofit are deemed to be zero for the Project Report Period and following Project Report Periods,
 - (c) the Project Report must identify:
 - (i) the system for which an assertion referred to in section 20 or 21 cannot be made or validated,
 - (ii) the reason the assertion cannot be verified, and
 - (iii) if applicable, when the regulatory prohibition or requirement making verification not possible became applicable.

Quality Assurance - Assertion

24. For each R/AC System that is being retrofitted, Replaced or installed as part of the Project, Project Reports must either
- (a) Include an assertion that the QA/QC procedures set out in the Project Plan have been implemented and calculations can be verified as having been correctly made; or
 - (b) Include an assertion that QA/QC Procedures set out in the Project Plan have not been followed and include an assessment of whether calculations can be verified without use of alternative data.

If QA/QC Assertion cannot be verified

25. If data or records required by QA/QC procedures or this Protocol are missing, such that calculations cannot be verified in the manner contemplated by QA/QC procedures or this Protocol, alternative data may not be substituted without prior written approval of the Director and emission reductions which cannot be verified as a result of the missing data are deemed to be zero.

Quantification

26. (1) For the purposes of section 20 (3) (f) (vi) of EOPR, subject to section 23 (b) and 25, the measurements and calculations that result in the amounts asserted under section 20 (3) (f) (v) must be carried out in accordance with Part 7.
- (2) The calculations required by section 20 (3) (e) of the EOPR must include all the calculations referred to in Part 7, identifying each parameter input into calculations and how it was determined.

Operating days

27. The Project Report must include the dates, duration and reason for each instance in which a R/AC System used in the project scenario is not operating during the Project Report Period.

PART 6: CATEGORIZATION AND DESCRIPTION OF SELECTED PROJECT AND BASELINE SOURCES, SINKS, & RESERVOIRS (SSRs)

Project Greenhouse Gas Boundary (CAS 27-30)

28. (1) For the purposes of section 14 (3) (i) of EOPR, a Project Plan
- (a) must select HFCs and carbon dioxide from the sources identified as “included” in column 7 of Table 2,
 - (b) must not select any additional gases or sources, sinks or reservoirs, and
 - (c) is not required to provide an explanation as to why the source was chosen.

Figure 1: Illustration of the Project GHG Boundary (Guidance Only)

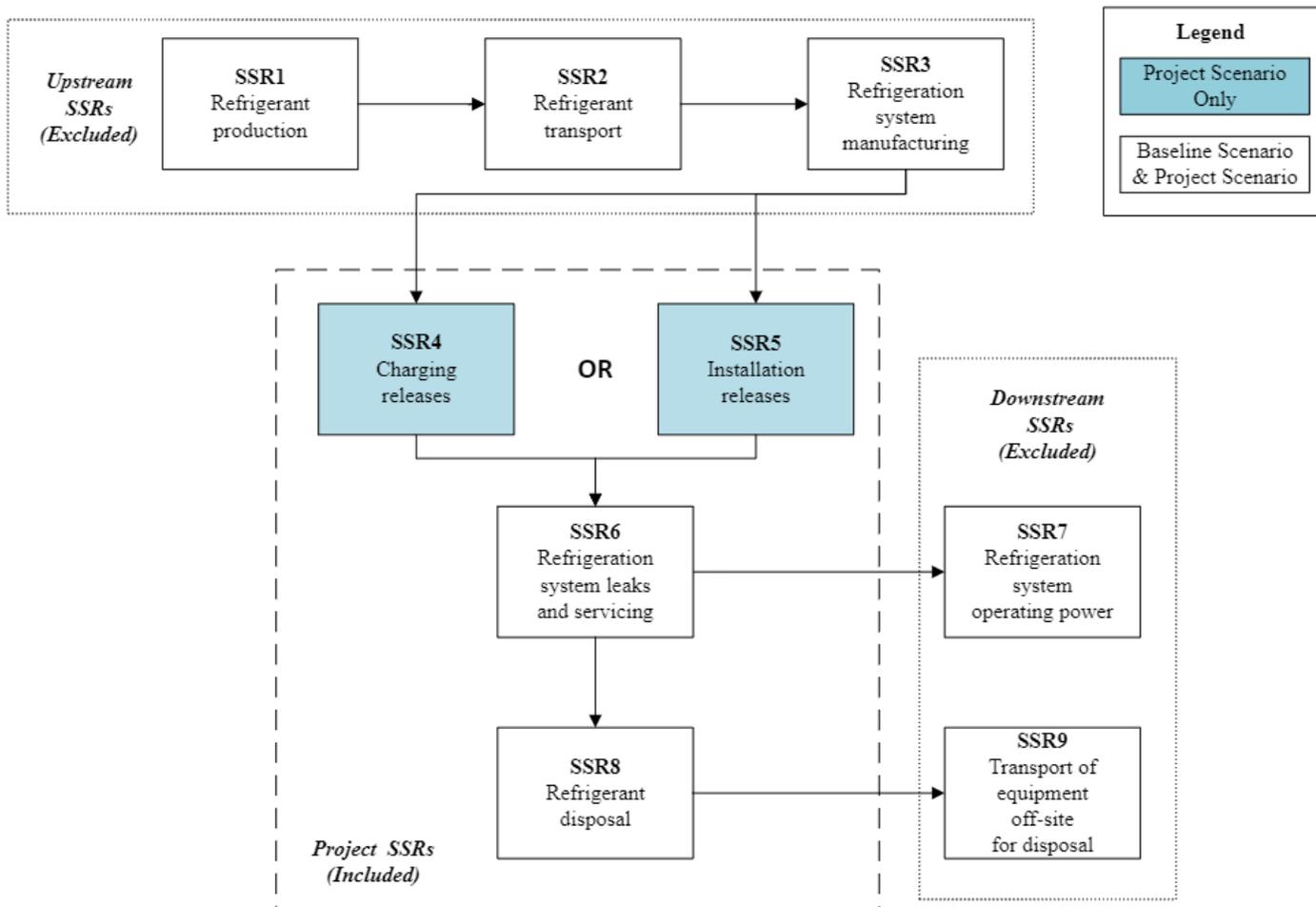


Table 2: Selected Relevant Project and Baseline SSRs

1	2	3	4	5	6	7
SSR	Title	Description	Type	Baseline or Project	GHGs	Included or Excluded
1	Refrigerant Production	Electricity consumption, fossil fuel combustion, and Refrigerant emissions during the production process.	<i>Related</i>	Baseline (B1) Project (P1)	CO ₂ , CH ₄ , N ₂ O, HFCs	Excluded: GHG emissions from this source occur outside Canada.
2	Refrigerant transport	Fossil fuel combustion from transport vehicles and Refrigerant leaks during transport	<i>Related</i>	Baseline (B2) Project (P2)	CO ₂ , CH ₄ , N ₂ O, HFCs	Excluded: GHG emissions from transport of Refrigerants are assumed to be the same in both the baseline and project scenarios. Refrigerant leaks during transport are assumed to be very small.
3	R/AC System manufacturing	Electricity consumption, fossil fuel combustion, and Refrigerant emissions during manufacturing.	<i>Related</i>	Baseline (B3) Project (P3)	CO ₂ , CH ₄ , N ₂ O, HFCs	Excluded: Assumed to be the same in baseline and project scenarios, and the vast majority of R/AC Systems are currently manufactured outside Canada.
4	Charging releases	Emissions of HFC when charging pre-existing R/AC System with Refrigerant after retrofit.	<i>Controlled</i>	Project (P4)	CO ₂ , HFCs	Included: Amount of Refrigerant released is expressed as a percentage of charge size in Equation 5.
5	Installation releases	Emissions of HFC when installing a new R/AC System.	<i>Controlled</i>	Project (P5)	CO ₂ , HFCs	Included: Amount of Refrigerant released is expressed as a percentage of charge size in Equation 5.
6	R/AC System leaks and servicing	High-GWP Refrigerant leakage during normal operations and re-filling of a R/AC System by certified technicians.	<i>Controlled</i>	Baseline (B6)	HFCs	Included: Amount of Refrigerant released is expressed as a percentage of charge size in Equation 2.
		Eligible Refrigerant leakage during normal operations and re-filling of R/AC System by certified technicians	<i>Controlled</i>	Project (P6)	CO ₂ , HFCs	Included: Amount of Refrigerant released is expressed as a percentage of charge size in Equation 5.

1	2	3	4	5	6	7
SSR	Title	Description	Type	Baseline or Project	GHGs	Included or Excluded
7	R/AC System operating power	Electricity consumption emissions from operating an R/AC System.	<i>Controlled</i>	Baseline (B7) Project (P7)	CO ₂ , CH ₄ , N ₂ O	Excluded: The use of eligible Refrigerant may be less energy efficient than using High-GWP Refrigerant, but the difference in electricity consumption per unit of cooling, and the resulting emissions, is assumed to be very small. Technical and financial challenges exist to accurately measure power consumption from sub-metering specific pieces of equipment within a R/AC System.
8	Refrigerant Disposal	Proportion of remaining high-GWP Refrigerant that is released during transfer to CEPA Compliant Halocarbon Stewardship Program, or an Authorized Destruction Facility, at the end of life of the Baseline Scenario R/AC System.	<i>Controlled</i>	Baseline (B8)	HFCs	Included: Amount of Refrigerant released is expressed as a percentage of remaining charge size in Equation 2.
		Proportion of remaining eligible Refrigerant released during transfer to an CEPA Compliant Halocarbon Stewardship Program at the end of life of the refrigeration system used in the project scenario.	<i>Controlled</i>	Project (P8)	CO ₂ , HFCs	Included: Amount of Refrigerant released is expressed as a percentage of remaining charge size in Equation 5.
9	Transport of equipment off-site for disposal	Fossil fuel combustion from transporting R/AC System equipment off-site at end of its useful life, after remaining Refrigerant has been extracted.	<i>Related</i>	Baseline (B9) Project (P9)	CO ₂ , CH ₄ , N ₂ O	Excluded: GHG emissions from this source are assumed to be the same in the baseline and project scenarios.

PART 7: QUANTIFICATION

Quantification Methodology

29. Baseline Emissions (BE), Project Emissions (PE), Emission Reductions (ER) and Project Reductions (PR) for Eligible Projects must be calculated in all Project Reports and Project Plans in accordance with this Part.

Baseline scenario GHG emissions

30. (1) Each Project Report must calculate Baseline Emissions, for each Eligible Retrofit/Installation and Project Report Period, in accordance with this section.
- (2) To calculate annualized Baseline Emissions associated with each Eligible Retrofit/Installation, the Proponent must use Equation 1 in accordance with sections 31 to 32.
- (3) To calculate Baseline Emissions during a Project Report Period associated with all Eligible Retrofit/Installations, the Proponent must use Equation 4 in accordance with section 33.
- (4) If there is more than one pre-existing refrigeration system that is Replaced by a single Eligible Installation, Equation 1 must be used and repeated for each pre-existing system to quantify the annual baseline scenario GHG emissions for the Eligible System.

GWP of Baseline Scenario Refrigerant

31. (1) In Equation 2, the variable " $GWP_{BRefrig}$ " must be determined as follows:
- (a) If there is a Qualifying Pre-existing System that is being retrofitted, the GWP of the Refrigerant used in the Baseline Scenario is the GWP of the Refrigerant in that system prior to retrofit, calculated in accordance with subsection (2);
- (b) If there is a Qualifying Pre-existing System that is being Replaced, the GWP of the Refrigerant used in the Baseline Scenario is the lower of the GWP of the Refrigerant in the pre-existing system, calculated in accordance with subsection (2) or, the regulatory limit, if any, on the GWP of Refrigerants that can be used in the type of system being installed;
- (c) If there is not a Qualifying Pre-existing System that is being Replaced or retrofitted, the lower of the GWP specified in column 2 of Table 3 corresponding to the type of R/AC System that is being installed or, the regulatory limit, if any, on the GWP of Refrigerants that can be used in the type of system being installed.
- (2) Where the GWP of a Refrigerant is not based on a regulatory limit or Table 3, the GWP of the Refrigerant must be calculated in accordance with Equation 2.
- (3) For greater certainty, section 1 (6) applies if there is a change in the GWPs applicable to all HFCs used in a Refrigerant.
- (4) If any chemical component of a Refrigerant is not listed in either the schedule to the Carbon Neutral Government Regulation or Schedule 3 of the GGPPA, the GWP of that component shall be deemed to be zero.
- (5) For the purposes of this section, prohibitions on the sale, manufacture or import of types of product that use, or are designed to be used with, Refrigerants that have a GWP that exceeds an

amount set out in provincial or federal law, are deemed to be limits on the GWPs of Refrigerants that can be used in the type of product if the system is installed on or after the date that the law prohibits the sale, manufacture or import of that system.

Guidance Re: Provincial and Federal Regulatory Limits to GWPs of Refrigerants: As of the Effective Date there are no provincial limits on the GWP of Refrigerants that can be used in R/AC System in British Columbia, and the federal limits on the GWP of Refrigerants that can be used in manufactured or imported products are equal to those set out in Table 3, for all R/AC systems other than Heat Pumps and Commercial Air Conditioning Systems. The federal limits are set out in Section 65.02 and 64.4 and Schedule 1.1 of ODSHAR. Subsection 31 (5) of the Protocol deems ODSHAR limits applicable to sales, import or manufacture of systems to be applicable to the GWP of Refrigerants used in newly installed systems. Proponents and V/VBs are responsible for confirming that there have been no changes to ODSHAR or ODSOHR that impose stricter limits than those reflected in Table 3.

If the Project is located on federally owned land or First Nations Reserves, carried out by the federal government or a federal agency, or is part of a federal work or undertaking (including ports, interprovincial railways, interprovincial trucking operations, or interprovincial pipelines) Proponents, Validators and Verifiers should also confirm no limits apply under the Federal Halocarbons Regulation, 2022.

Equation 1: Annual GHG emission for a baseline scenario R/AC System (SSR B6 and SSR B8)

Parameter	How Parameter Determined	Units
$BE_{Annual} = GWP_{BRefrig} * \frac{Q}{1000} * [AARL + (\frac{QRD(1 - RRE)}{LT})]$		
BE_{Annual}	Annualized Baseline Emissions associated with single Eligible Retrofit/Installation	tCO_2e
$GWP_{BRefrig}$	GWP of the Refrigerant in Baseline Scenario determined in accordance with section 31.	$tCO_2e/t\ refrigerant$
Q	Amount of refrigerant in the R/AC System (charge size) as determined in accordance with section 32.	kg
$AARL$	The amount in column 4 of Table 4 for the R/AC System type being installed (representing average annual refrigerant leakage for that system).	$\%/yr$
QRD	The amount in column 5 of Table 4 for the R/AC system being installed (representing the amount of Refrigerant remaining at disposal for the system type).	$\%$
RRE	Either (a) 0% if there is evidence specified in section 38 demonstrating that all HFCs from a Qualifying Pre-existing System have been submitted to a CEPA Compliant Halocarbon Stewardship for destruction and have been destroyed, or (b) 99% if (a) does not apply.	$\%$
LT	Either (a) 10 if there IS evidence of destruction of all HFCs removed from a Qualifying Pre-existing System, including certificates of destruction and the information referred to in section 38(g), or (b) if (a) does not apply, the amount in column 3 of Table 4 for the R/AC System being installed (representing the lifetime for the R/AC System).	$Years$

Guidance re: GWPs: Proponents and Verifiers are reminded to Use GWPs set out in the Carbon Neutral Government Regulation or GGPPA Schedule 3 [if applicable] that are in effect as of the date of a Project Report is Verified.

Table 3: Baseline refrigerant GWP for each project activity by R/AC System type¹

R/AC System Type Being Installed	Baseline Scenario GWP _{BRefrig}
Stand-alone medium temperature R/AC System	1400
Stand-alone low temperature R/AC System	1500
Centralized Refrigeration System	2200
Condensing unit	2200
Chiller – before January 1, 2025 (including Absorption or Adsorption)	1400
Chiller – on or after January 1, 2025	750
Commercial Air Conditioning System	2000
Heat Pump (including Absorption or Adsorption)	2000

Equation 2: Refrigerant GWP Calculation

$$GWP_{Refrig} = \sum_i^n (P_{GHG,i} \times GWP_{GHG,i})$$

Where,

GWP_{Refrig}	=	GWP of Refrigerant	Units <i>tCO₂e/t refrigerant²</i>
$P_{GHG,i}$	=	Proportion of GHG <i>i</i> , contained within the Refrigerant by mass, calculated from Refrigerant manufacturer’s specification.	%
$GWP_{GHG,i}$	=	GWP for GHG _{<i>i</i>} as specified in Schedule to Carbon Neutral Government Regulation, or if GHG _{<i>i</i>} not listed in that schedule, in Schedule 3 of the GGPPA.	<i>tCO₂e/t</i>

¹ Except for commercial AC systems and heat pumps, GWP values contained in Table 5 are taken from ODSHAR. Commercial AC systems and heat pumps are not currently regulated under ODSHAR, and corresponding GWP values in Table 5 are set to match GWP of Refrigerants currently used in Canada.

² While GWP values are constants used as multipliers, this quantification methodology assigns units of equivalent mass in order to convert one unit of Refrigerant to one unit of equivalent carbon dioxide when released directly into the atmosphere.

Refrigerant charge size

32. (1) In Equation 1, the variable “Q” is determined as follows:

- (a) Subject to paragraph (b), if there is a Qualifying Pre-existing System that is being retrofitted or replaced that does not contain a portion of ODS within the refrigerant, the lower of
 - (i) the charge size for the pre-existing system as specified by the manufacturer’s specifications or
 - (ii) if the Refrigerant in the pre-existing system is being destroyed, 90% of the manufacturer’s specifications for the pre-existing system.
- (b) If there is a Qualifying Pre-existing System that is being retrofitted or replaced that contains a portion of ODS within the refrigerant, the charge size must be determined using Equation 3 in order to subtract the mass of ODS.

Equation 3: Baseline scenario charge size of a pre-existing refrigeration system with a Refrigerant containing a portion of ODS

$Q = Q_{Pre-existing System} - Q_{ODS}$		
Where,		Units
	Q = Charge size of a Qualifying pre-existing R/AC System with a Refrigerant containing a portion of ODS, which excludes the ODS portion	kg
	$Q_{Pre-existing System}$ = Total amount of Refrigerant in the pre-existing R/AC System with a refrigerant containing a portion of ODS	kg
	Q_{ODS} = Amount of ODS in the Refrigerant of the pre-existing refrigeration system, determined using the proportions from the refrigerant manufacturer specifications	kg

- (c) If there is not a Qualifying Pre-existing System that is being retrofitted or replaced the charge size must be determined and justified in accordance with subsections (2) and (3).
- (2) If there is not a Qualifying Pre-existing System that is being Replaced or retrofitted, the Project Plan or Project Report must calculate and provide a justification for a charge size that will be used for the Baseline Scenario.

- (3) The charge size calculated under subsection (2) must provide the same cooling capacity as the R/AC System that is being installed assuming
- (a) Use of a R/AC System in the Baseline Scenario that is of the same type as that being installed (except that Baseline Scenario can assume a non-Absorption or non-Adsorption Chiller if an Adsorption or Absorption Chiller is being installed and can assume a non-Absorption or non-Adsorption Heat Pump if an Adsorption or Absorption Heat Pump is being installed), and
 - (b) the use of a Refrigerant that
 - (i) has a GWP no greater than the GWP for the Baseline Refrigerant determined under section 31;
 - (ii) is the lowest cost option [taking into account capital and operating costs].
 - (iii) is compatible with the type of R/AC System used in the Baseline Scenario.

Table 4: Default values for annual emissions of R/AC Systems³

1	2	3	4	5
R/AC System Type	Installation Loss % (IL)	Lifetime of Equipment (LT)(yrs)	Annual Average Refrigerant Leakage % (AARL)	Refrigerant remaining at disposal % (QRD)
Stand-alone medium-temperature Refrigeration System	0%	10	1%	90%
Stand-alone low-temperature Refrigeration System	0%	10	1%	90%
Centralized Refrigeration System	2.0%	18	25%	90%
Condensing unit	2.0%	18	25%	90%
Chiller	0.5%	23	2%	95%
Commercial Air Conditioning system	0%	25	8%	80%
Heat Pump	0%	25	8%	80%

Baseline Emissions from all Eligible Projects during Project Report Period

33. The Baseline Emissions for each Project Report Period must be adjusted using Equation 4 below to reflect the total Baseline Emissions from all Eligible Retrofit/Installations that are part of the project and the portion of the Project Report Period during which each Eligible Retrofit/Installation was in operation.

³ Environmental Protection Agency (EPA) report: [Accounting Tool to Support Federal Reporting of Hydrofluorocarbon Emissions: Supporting Documentation](#), October 16, Table 3-3 pg. 13 and Table 3-6, pg. 17

Equation 4: Baseline scenario GHG emissions for a calendar year covered by the reporting period

$BE_C = \sum_{ij} \left[\frac{\sum_i^{n_j} BE_{Annual,i}}{365} * T_{Cj} \right]$		
Where,		Units
BE_C	= Baseline Emissions from all Eligible Retrofit/Installations during the Project Reporting Period	tCO_2e
$BE_{Annual,i}$	= Annualized Baseline Emissions for single Eligible Retrofit/Installation, i , used in the baseline scenario corresponding to the R/AC system, j , in the project scenario as determined using Equation 1.	tCO_2e
T_{Cj}	= Number of days in a calendar year covered by the Project Report Period that the Eligible Retrofit/Installation was operated	$Days$
i	= R/AC system in the baseline scenario corresponding to the R/AC system, j , in the project scenario	$unitless$
j	= R/AC system in the project scenario corresponding to R/AC system, i , in the baseline scenario	$unitless$
n_j	= Number of R/AC systems in the baseline scenario corresponding to the R/AC system, j , in the project scenario	$unitless$
M	= Number of R/AC systems in the project scenario	$unitless$

*Note: Equation 4 is designed to accommodate all possible configurations of eligible project activities. However, for a project where one Qualifying pre-existing system is retrofitted, or where one new system is installed, the equation can be simplified as follows: $BE_C = \frac{BE_{Annual}}{365} * T_C$. If more than one Qualifying pre-existing R/AC system is replaced by a single new refrigeration system in the project scenario, the Proponent must first do the calculation of the summation in brackets ($\sum_i^{n_j} BE_{Annual,i}$) to add up the results of the multiple uses of Equation 1 for the annual GHG emissions of each pre-existing system corresponding to the new system, j , in the project scenario. It must be noted that this case n_j represents the number of Qualifying Pre-Existing Systems corresponding to a single new R/AC system, j (and not the total number of all pre-existing systems in the project should there be more than one new system).*

Project scenario GHG emissions

34. (1) Each Project Report must calculate Project Emissions for the Project Report Period in accordance with this section.
- (2) To calculate annualized Project Emissions from each Eligible Retrofit/Installation, the Proponent must use Equation 5.
- (3) To calculate Project Emissions during a Project Report Period from all Eligible Retrofit/Installations, the Proponent must use Equation 6.

As per section 28 Calculations of Project Emissions may only consider those sources identified as “included” for the baseline in column 5 of Table 2.

Equation 5: Annual GHG emissions from a project scenario R/AC System (SSR P4 or P5, SSR P6 and SSR P8)

$$PE_{Annual} = GWP_{PRefrig} * \frac{Q}{1000} * [AARL + (\frac{IL + QRD(1 - RRE)}{LT})]$$

Where,

		Units
PE_{Annual}	= Annualized Project Emissions for a single Eligible Retrofit/Installation	tCO_2e
$GWP_{PRefrig}$	= GWP of the Refrigerant used in the Eligible Retrofit/Installation, calculated in accordance Equation 2 and s. 30(3) and (4)	tCO_2e/t <i>refrigerant</i>
Q	= Amount of Refrigerant (charge size) in Eligible Retrofit/Installation as specified in Manufacturer's Specifications or in case of retrofit based on retrofit records.	kg
$AARL$	= The amount in column 4 of Table 4 for the R/AC System type being installed (representing average annual refrigerant leakage for that system).	$\%/yr$
IL	= The amount in column 2 of Table 4 for the R/AC System type being installed (representing releases of Refrigerant when installing the new R/AC System, or charging the retrofitted R/AC System)	$\%$
QRD	= The amount in column 5 of Table 4 for the R/AC system being installed (representing the amount of Refrigerant remaining at disposal for the system type).	$\%$
RRE	= 99% (representing Refrigerant recovery efficiency).	$\%$
LT	= The amount in column 3 of Table 4 for the R/AC System being installed (representing the lifetime for the R/AC System).	<i>Years</i>

Equation 6: Project scenario GHG emission during a calendar year covered by the reporting period.

$$PE_C = \sum_j^n [\frac{PE_{Annual,j}}{365} * T_{C,j}]$$

Where,

		Units
PE_C	= Project Emissions from all Eligible Retrofits/Installations during the Project Report Period	tCO_2e
$PE_{Annual,j}$	= Annualized Project Emissions for single Eligible Retrofit/Installation, j , as determined using Equation 5)	tCO_2e
$T_{C,j}$	= Number of days in a calendar year covered by the Project Reporting Period that system was operated	<i>Days</i>

Emission reductions and Project Reductions

35. (1) The Emission Reductions from the Project for each Project Reporting Period must be determined in accordance with Equation 7.
- (2) The Project Reductions from the Project for each Project Reporting Period are equal to the Emission Reductions for that period.

Equation 7: GHG emission reductions

$ER_c = BE_c - PE_c$		
Where,		Units
ER_c	= Emission Reductions during Project Reporting Period	tCO_2e
BE_c	= Baseline Emissions during Project Reporting Period (Equation 4)	tCO_2e
PE_c	= Project Emissions during Project Reporting Period (Equation 6)	tCO_2e

PART 8: MATERIALITY THRESHOLDS

Materiality Threshold for Validation

36. For the purposes of section 15 (3) (c) of EOPR, errors, omissions or misrepresentations are considered material if the aggregate effects of all errors, omissions and misrepresentations result in an overestimation of the Project Reductions that are greater than 5%.

Materiality Threshold for Verification

37. For the purposes of section 21 (4) (c) of EOPR, errors, omissions or misrepresentations are considered material if the aggregate effects of all errors, omissions and misrepresentations result in an overestimation of the Project Reductions in a Project Report Period that are greater than 5%.

PART 9: RECORD RETENTION

Record Retention

38. Without limiting section 27 of the EOPR, the Proponent must retain the following records for a period of at least seven years after the end of the Crediting Period:
- (a) Manufacturer's specifications regarding cooling capacity, charge size, installation procedures, operating conditions and/or maintenance requirements for all R/AC System equipment included in the project and systems being Replaced or retrofitted;

- (b) Bills of lading, leasing documents, contracts of purchase and sale or invoices for the purchase or lease of any newly installed systems or associated documentation indicating the manufacturer, purchase date, receipt date and if the R/AC System is pre-charged, the type of Refrigerant used;
- (c) Contracts with service providers for refrigeration or air conditioning retrofits, replacements and installations that are part of the project;
- (d) A record of the name and qualifications of the service technicians carrying out retrofits or installations, including whether the person is an approved person as defined in the ODSOHR;
- (e) Certificates of completion or invoices from a contractor conducting system retrofit or new system installation that also indicates when retrofitted or new system began operating.
- (f) A log indicating any times when a retrofitted or installed system is not operating.
- (g) In relation to Refrigerants removed from a Qualifying Pre-existing System which the Proponent has caused to be destroyed, evidence showing the amount of each type of HFC contained in the Refrigerants including,
 - (i) the evidence required in the Project Plan under section 10 (a)
 - (ii) serial numbers of containers submitted to sellers, as defined in the ODSOHR,
 - (iii) copies of the records required by section 10 (2) (b) to (e) of ODSOHR,
 - (iv) Identification of the seller, as defined in the ODSOHR, to whom Refrigerants have been returned for forwarding to a CEPA Compliant Halocarbon Stewardship Program for destruction,
 - (v) copies of the seller's records required under section 12 (4) of ODSOHR relating to the Refrigerants returned to the seller as part of the Project including records showing that the Refrigerants have been submitted to a CEPA Compliant Halocarbon Stewardship Program for destruction.
 - (vi) evidence that the Proponent has requested that all Refrigerants submitted to the CEPA Compliant Halocarbon Stewardship Program must be destroyed and that none are re-used, and
 - (vii) a certificate of Destruction issued in relation to the Refrigerants.
- (h) In relation to any HFC's Reclaimed as part of the Project, evidence showing the amount of each type of HFC Reclaimed including,
 - (i) copies of the records required by section 10 (2) (b) to (e) of ODSOHR,
 - (ii) Identification of the seller, as defined in the ODSOHR, to whom Refrigerants have been returned for forwarding to a CEPA Compliant Halocarbon Stewardship Program
- (i) For installations Replacing a Qualifying Pre-Existing System or retrofits of Qualifying Pre-Existing System:
 - (i) evidence that the same High-GWP Refrigerant has been used in the pre-existing system for more than 3 years preceding the system retrofit.
 - (ii) evidence that the pre-existing system has been operating at the Project Site for at least 3 years preceding the system retrofit.

- (iii) supporting documentation to demonstrate the last day the pre-existing system was in operation.
- (j) Service log and photos of the label or tag referred to in section 10 (2) of the ODSOHR [*charging records*] for any Qualifying Pre-Existing System, retrofitted system or newly installed system.
- (k) Photographs of the project site, including dated photos of any pre-existing systems, photos of new or retrofitted systems and photographs evidencing the type of pre-existing or newly installed system.
- (l) Full financial analysis completed for the purpose of section 13 and supporting documentation (e.g. invoices, estimates, or third-party assessments supporting key variables).

Guidance re: HFCs: *While HFCs are under the care of the CEPA Compliant Halocarbon Stewardship Program from the point of extraction to destruction, it is still the Proponent's responsibility to ensure all HFCs are destroyed.*