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chapter Q-2, r. 46.1

Regulation respecting a cap-and-trade system for greenhouse gas emission allowances

Environment Quality Act
(chapter Q-2, s. 31, 1st par., subpars. *b, c, d, e.*1, *h* and *h.*1, ss. 46.1, 46.5, 46.6, 46.8 to 46.16, 115.27 and 115.34.).

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TITLE I

GENERAL

CHAPTER I

SCOPE, APPLICATION AND INTERPRETATION

1. The purpose of this Regulation is to set rules for the operation of the cap-and-trade system for greenhouse gas emission allowances established pursuant to section 46.5 of the Environment Quality Act (chapter Q-2). For that purpose, it determines which emitters are required to cover their emissions, the terms and conditions for registering for the system, the emission allowances that can be validly used, the terms and conditions for the issue, use and trading of emission allowances, and the information that must be provided by emitters and other persons or municipalities that may register for in the system.

O.C. 1297-2011, s. 1; O.C. 1184-2012, s. 1.

2. For the purposes of this Regulation, an emitter is any person or municipality operating an enterprise in a sector of activity listed in Appendix A and reporting for an establishment or, if applicable, for the enterprise, in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), annual greenhouse gas emissions in a quantity equal to or greater than 25,000 metric tonnes CO_2 equivalent, excluding the emissions referred to in the second paragraph of section 6.6 of that Regulation.

(1) *(subparagraph replaced);*

(2) *(subparagraph replaced);*

(3) *(subparagraph replaced);*

(4) *(subparagraph replaced);*

(5) *(subparagraph replaced);*

(6) *(subparagraph replaced).*

A person or municipality operating an enterprise is also considered to be an emitter if the person or municipality

(1) acquires electricity generated outside Québec, except electricity produced in the territory of a partner entity, for its own consumption or for sale in Québec, if the greenhouse gas emissions attributable to the generation of the quantity of electricity acquired, calculated in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, are equal to or exceed 25,000 metric tonnes CO_2 equivalent;

(2) distributes 200 litres or more of fuel within the meaning of protocol QC.30 of Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere.

For the purposes of subparagraph 2 of the second paragraph, “fuel” means automotive gasoline, diesel fuels, propane, natural gas and heating fuel, except

(1) fuel used in air or water navigation;

(2) hydrocarbons used as raw material by industries that transform hydrocarbon molecules through chemical or petrochemical processes;

(3) the biomass and biomass fuel component of such fuel;

(4) fuel for which an emitter referred to in the first paragraph of section 2 or in section 2.1, including the emitter itself, as the case may be, is required to cover its emissions pursuant to section 19 for the emitter referred to in section 2 and under section 19.0.1 for the emitter referred to in section 2.1.

O.C. 1297-2011, s. 2; O.C. 1184-2012, s. 2; O.C. 1138-2013, s. 1; O.C. 902-2014, s. 1; O.C. 1089-2015, s. 1; O.C. 1125-2017, s. 1.

2.1. For the purposes of this Regulation, a person or municipality operating an enterprise in a sector of activity referred to in Appendix A that is not an emitter within the meaning of section 2, reporting for an establishment, in accordance with paragraph 1 of section 6.1 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), annual greenhouse gas emissions in a quantity equal to or greater than 10,000 metric tonnes CO_2 equivalent and that registers for the system for one of its establishments covered by the reporting without being required to do so, is also an emitter.

O.C. 1125-2017, s. 2.

3. For the purposes of this Regulation,

(1) "biomass fuel" means any fuel whose entire energy generating capacity is derived from biomass;

(2) "biomass" means a non-fossilized plant or part of a plant, an animal carcass or part of an animal, manure, liquid manure, a micro-organism and any other product derived from such matters;

(3) "emissions report" means a greenhouse gas emissions report made in accordance with Division II.1 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

(4) "compliance deadline" means the deadline referred to in the first paragraph of section 21 for covering greenhouse gas emissions in a compliance period;

(4.1) "officer" means the president, chief executive officer, chief operating officer, chief financial officer or secretary of a legal person or partnership or any person having similar functions, and any person designated as such by a resolution of the board of directors;

(5) "emission allowance" means any emission allowance referred to in the second paragraph of section 46.6 of the Environment Quality Act (chapter Q-2), namely a greenhouse gas emission unit, offset credit or early reduction credit, and any emission allowance issued by a partner entity, each allowance having a value corresponding to one metric ton of greenhouse gas CO_2 equivalent;

(6) "reported emissions" means greenhouse gas emissions that are

(a) reported in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere but that do not need to be verified pursuant to that Regulation; or

(b) calculated using data provided by the emitter when the emitter was not required, prior to 1 January 2011, to report emissions pursuant to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere;

(7) "verified emissions" means the greenhouse gas emissions mentioned in a verification report and, where applicable, a notice of correction in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), in metric tonnes CO_2 equivalent;

(8) "partner entity" means a government other than the Government of Québec, a department of such a government, an international organization, or an agency of such a government or organization, with which an agreement has been entered into in accordance with section 46.14 of the Environment Quality Act and that is referred to in Appendix B.1 to this Regulation;

(9) "covered establishment" means an establishment referred to in the first paragraph of section 2 or in section 2.1 or an enterprise referred to in the second paragraph of section 2, for which the emitter is required to cover greenhouse gas emissions in accordance with Chapter III of Title II;

(10)

"greenhouse gas" or "GHG" means one or more of the gases listed in the second paragraph of section 46.1 of the Environment Quality Act, namely carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoruride (SF_6), as well as nitrogen trifluoride (NF_3);

(10.1) "working day" means any day other than a Saturday, Sunday or statutory holiday, including statutory holidays in the territory of a partner entity;

(11) "new facility" means either

(a) a combination of apparatus and equipment intended for a specific purpose, installed and commissioned on or after 1 January 2012 on the site of a covered establishment to pursue the same type of activity, to which GHS emissions in one of the following quantities are attributable:

i. a quantity equal to or exceeding 10,000 metric tonnes CO_2 equivalent per year;

ii. a quantity representing over 15% of the average annual emissions of the establishment for the period 2007-2010; or

(b) part of all of the combination of apparatus and equipment intended for a specific purpose at a covered establishment that is modified and commissioned on or after 1 January 2012 with the result that the establishment pursues a type of activity referred to in Table B of Part I of Schedule C or any other type of activity that it did not previously pursue;

(12) "compliance periods" means any period for which an emitter is required to cover its greenhouse gas emissions, the first period starting on 1 January 2013 and ending on 31 December 2014, and the following periods are of 3 calendar years as of 1 January 2015;

(12.1) "promoter" means a person who implements an offset credit project;

(12.1.1) "total quantity of reference units" means the quantity of reference units produced or used during a year by an emitter

(a) for the years 2007 to 2011, calculated using the information provided by the emitter; and

(b) for the years 2012 and following, mentioned in the verification report in accordance with section 6.9 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere;

(13) "emissions threshold" means the level of greenhouse gas emissions or, by assimilation, the quantity of fuel determined in the first and second paragraphs of section 2;

(14) "system" means the cap-and-trade system for greenhouse gas emission allowances;

(15) ""

"reference unit" means a standard unit of measurement for a raw material used to pursue an activity or for a product resulting from an activity of an emitter, referred to in Table B of Part I of Schedule C.

O.C. 1297-2011, s. 3; O.C. 1184-2012, s. 3; O.C. 1089-2015, s. 2; I.N. 2016-01-01 (NCCP); O.C. 1125-2017, s. 3.

CHAPTER II

INFORMATION AND DOCUMENTS

4. Every person or municipality to which the provisions of this Regulation apply must keep a copy of all the information and documents that must be filed under this Regulation or relating to any transaction within the system for a minimum period of 7 years starting on the date on which they are produced.

Documents and information relating to a project involving early reduction credits referred to in Chapter III of Title III must be kept for a minimum period of 7 years starting on the date on which the application for credits was forwarded to the Minister.

Documents and information relating to an offset credit project referred to in Chapter IV of Title III must be kept for the duration of the project and for a minimum period of 7 years starting on the date on which the project ended.

Documents and information relating to an application for access to the electronic system pursuant to section 10 must be kept for the entire period during which a natural person has access to the electronic system and for a minimum period of 7 years following the date on which that person no longer has access to the system.

In addition, in the case of a designation or authorization made in accordance with section 11, 12 or 18.2, a copy of the information and documents relating to the designation or authorization must be kept for the entire period of the designation or authorization of the person concerned and for a minimum period of 7 years following the end of that period.

Documents and information referred to in this section must also be provided to the Minister on request.

Documents and information provided pursuant to this Regulation are dealt with confidentially, subject to the Act respecting Access to documents held by public bodies and the Protection of personal information (chapter A-2.1).

O.C. 1297-2011, s. 4; O.C. 1184-2012, s. 4; O.C. 1089-2015, s. 3; O.C. 1125-2017, s. 4.

5. Any information or document required to be provided under this Regulation must be sent to the Minister using the forms or templates available on the website of the Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs.

Despite the first paragraph, where all or part of the system is delegated to a person or a body pursuant to the second paragraph of section 46.13 of the Environment Quality Act (chapter Q-2), the information and documents indicated in the notice published in accordance with the third paragraph of that section must be sent to the delegatee.

O.C. 1297-2011, s. 5; O.C. 1184-2012, s. 5; O.C. 902-2014, s. 2; O.C. 1125-2017, s. 5.

TITLE II

CAP-AND-TRADE SYSTEM FOR GREENHOUSE GAS EMISSION ALLOWANCES

CHAPTER I

ADMINISTRATIVE ACCOUNTS

6. For system administration purposes, the Minister keeps the following accounts:

(1) an issuance account, containing the emission units created on the basis of the caps established in accordance with section 46.7 of the Environment Quality Act (chapter Q-2);

(1.1) an allocation account, containing the emission units available for allocation without charge, calculated in accordance with Part II of Appendix C of this Regulation;

(2) an auction account, containing the emission units to be sold at auction;

(3) a reserve account, containing emission units intended for sale by mutual agreement by the Minister or to be used to adjust the quantity of emission units allocated without charge;

(4) a retirement account, in which emission allowances retired from the system are recorded in accordance with this Regulation;

(5) an environmental integrity account, containing the offset credits that may be extinguished to replace the illegitimate offset credits not surrendered by a promoter;

(6) an invalidation account, containing offset credits issued and cancelled by a partner entity and emission allowances withdrawn from the environmental integrity account to replace illegitimate offset credits in accordance with the fourth paragraph of section 70.21;

(7) a cancellation account in which cancelled emission allowances are recorded when created by error.

O.C. 1297-2011, s. 6; O.C. 1184-2012, s. 6; O.C. 902-2014, s. 3; O.C. 1089-2015, s. 4; O.C. 1125-2017, s. 6.

CHAPTER II

REGISTRATION OF EMITTERS AND PARTICIPANTS

7. Every emitter referred to in section 2 must register for the system by providing the Minister with the following information and documents:

(1) the name and contact information for the enterprise, any other name used by the enterprise in Québec to identify itself in the pursuit of its activities, its legal status, the date and place of its constitution and the business number assigned under the Act respecting the legal publicity of enterprises (chapter P-44.1);

(2) a list of its directors and officers, with their position within the enterprise and, at the Minister's request, their work addresses;

(3) the name and contact information for each establishment covered, the type of operation, the activities pursued, the processes and equipment used and, if applicable, the 6-digit code under the North American Industry Classification System (NAICS Canada) and establishment number assigned under the Inventaire québécois des émissions atmosphériques kept by the Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs;

(4) except for the emitter referred to in subparagraph 1 of the second paragraph of section 2, for each of the 3 years preceding the application for registration and for each establishment covered that exercises an activity listed in Table A in Part I of Appendix C,

(a) the total quantity of GHG emissions, either reported or verified, by category of GHG emissions referred to in Division B of Part II of Schedule C, in metric tonnes CO_2 equivalent;

(b) the total quantity of each reference unit;

(c) the total quantity of GHG emissions, by category of GHG emissions referred to in Division B of Part II of Schedule C, for each reference unit, in metric tonnes CO_2 equivalent;

(d) the total quantity of fuel used, by type of fuel and by reference unit; and

(e) the calculation methods used;

(5) *(paragraph revoked);*

(6) a list of the subsidiaries, parent legal persons and persons having control of the emitter within the meaning of the second paragraph of section 9, with the control percentage between each entity, which information may also be provided in the form of a diagram;

(7) in the case of a business corporation, the names and contact information of the persons controlling over 10% of the voting rights attached to all the outstanding voting securities of the emitter;

(8) in the case of a partnership, the name and contact information of each partner or, in the case of a limited partnership, the name and contact information of each general partner and the name and contact information of each special partner having provided over 10% of the common stock;

(9) a declaration signed by a director or any other officer, or a resolution of the board of directors including an undertaking to comply with the conditions of this Regulation and attesting that the information and documents provided are valid and that consent has been given as to their communication when necessary for the purposes of this Regulation and of the corresponding rules and regulations of a partner entity.

An application for registration for the system must be sent to the Minister

(1) on or after 1 May 2012 but not later than 1 September 2012, in the case of an emitter other than an emitter referred to in subparagraph 2 of this paragraph whose reported emissions for 2009, 2010 or 2011 for an establishment are equal to or exceed the emissions threshold;

(2) not later than 1 September 2014, in the case of an emitter pursuing fuel distribution activities whose reported emissions for 2013 are equal to or exceed the emissions threshold;

(3) not later than 1 September following the submission of the first emissions report reporting emissions equal to or exceeding the threshold, in the case of an emitter referred to in subparagraph 1 of this paragraph whose verified emissions for an establishment are equal to or exceed the emissions threshold during a year following the year mentioned in that subparagraph;

(4) not later than 1 September 2015, in the case of an emitter pursuing fuel distribution activities whose verified emissions for 2014 for those activities are equal to or exceed 25,000 metric tonnes CO_2 equivalent;

(5) on or after 1 January 2016 but not later than 1 September 2016, in the case of an emitter pursuing fuel distribution activities who can prove that the verified emissions for 2015 for those activities will be equal to or exceed 25,000 metric tonnes CO_2 equivalent;

(6) on or after 1 January of the year concerned, but not later than 1 September following the submission of the first emissions report reporting emissions equal to or exceeding the threshold, in the case of an emitter pursuing fuel distribution activities who can demonstrate that the verified emissions for 2016 or a subsequent year will be equal to or exceed the emissions threshold.

O.C. 1297-2011, s. 7; O.C. 1184-2012, s. 7; O.C. 1138-2013, s. 2; O.C. 902-2014, s. 4; O.C. 1089-2015, s. 5; O.C. 1125-2017, s. 7.

7.1. Before a person or municipality referred to in section 2.1 registers for the system, a written notice must be sent to the Minister, not later than May 1 of the year during which the person or municipality intends to register, stating its intention.

O.C. 1125-2017, s. 8.

7.2. Any person or municipality referred to in section 2.1 must, at the time of registering for the system, provide the Minister with the information and documents referred to in subparagraphs 1 to 3, subparagraphs *b* and *c* of subparagraph 4 and subparagraphs 6 to 9 of the first paragraph of section 7.

The person or municipality must also, at the same time, provide to the Minister, for each covered establishment carrying on an activity referred to in Table A of Part I of Appendix C, the emissions reports for the 3 consecutive years immediately preceding the year during which it registers, if available, as well as a verification report of its emissions report of the year preceding the year in which the person or municipality registers. If not all the reports are available, the person or municipality must at least send the report for the year preceding the year during which the person or municipality registers.

O.C. 1125-2017, s. 8.

8. Only a natural person domiciled in Canada or another person or municipality having an establishment in Canada may register with the Minister as a participant in the system in order to acquire emission allowances. The applicant must provide the Minister with the following information and documents:

(1) the applicant's name and contact information;

(2) in the case of an applicant other than a natural person or a municipality, the information and documents referred to in subparagraphs 1 to 3 and 6 to 9 of the first paragraph of section 7, with the necessary modifications;

(2.1) in the case of a natural person, a list of the entities the person owns or controls with the control percentage between each entity, the name and contact information for the business corporations in which the person controls over 10% of the voting rights attached to all the outstanding voting securities of the business corporation, and the name and contact information of all partnerships in which the person is a partner, general partner or special partner, and in which the person provided over 10% of the common stock;

(3) if the application is made by a mandatary who is not domiciled in Québec, the name and contact information of a natural person domiciled in Québec who is designated to represent the applicant;

(4) if the application is made by a natural person, a declaration signed by the person or, in other cases, a declaration signed by a director or any other officer, or a resolution of the board of directors including an undertaking to comply with the conditions of this Regulation.

However, a natural person employed by an emitter or a participant may not be registered as a participant in the system.

Despite the second paragraph, in the case of a natural person employed by an emitter or a participant who registered as a participant before 22 October 2014, the person's registration will be authorized until 22 October 2016, after that it will be terminated. Until that date, the person may not participate in an auction sale of emission units.

O.C. 1297-2011, s. 8; O.C. 1184-2012, s. 8; O.C. 902-2014, s. 5; O.C. 1089-2015, s. 6; O.C. 1125-2017, s. 9.

8.1. Every person or municipality that is already registered as an emitter or clearing house pursuant to this Regulation or as an emitter or clearing house in the cap-and-trade system for GHG emission allowances of a partner entity is considered to be registered for the system and cannot register again as a participant or clearing house with the Minister.

O.C. 1184-2012, s. 8; O.C. 1138-2013, s. 3; O.C. 1089-2015, s. 7; O.C. 1125-2017, s. 10.

9. Every person or municipality referred to in section 7, 7.2 or 8 must also, when registering for the system, disclose to the Minister any business relationship with an emitter or participant registered for or subject to the system, including those registered with a partner entity, by providing the following information in particular:

(1) the name of any other emitter or participant with which the applicant is related, and of any other parent legal person, subsidiary or group concerned by the relationship and, upon request, their contact information;

(2) the type of business relationship between the emitters or participants with which it has a business relationship and their respective status, such as parent legal person, subsidiary, group, partner or other, along with any explanation allowing the business relationship to be understood and the control percentage between each entity, which information may also be provided in the form of a diagram;

(2.1) where applicable, the general account number of the emitter or participant with which it has a business relationship and, if the emitter or participant is not a natural person, its legal status;

(3) where applicable, the percentage share of the overall holding limit and of the overall purchasing limit at an auction that is attributed to each related entity in the distributions made, respectively, in accordance with section 33 and the fifth paragraph of section 50.

For the purposes of this section,

(1) "business relationship" means any direct or indirect relationship between several different emitters or participants when one of them

(a) holds more than 20% of the securities of another emitter or participant or holds a call provision or call option for such securities;

(b) shares more than 20% of its officers or directors with another emitter or participant, or may appoint more than 20% of its officers or directors;

(c) holds more than 20% of the voting rights in another emitter or participant;

(d) controls over 20% of the business of another emitter or participant by any means; or

(e) belongs to the same group as another emitter or participant;

(2) "subsidiary" means a person controlled by another person or by persons controlled by that other person; the subsidiary of a person that is, itself, the subsidiary of another person is deemed to be a subsidiary of that other person;

(3) "group" means 2 or more persons when

(a) one is a subsidiary of the other;

(b) all the persons are subsidiaries of the same person; or

(c) they are all controlled by the same person;

(4) "control" means a person that, with regard to another person,

(a) owns or has control or direction, whether direct or indirect, over securities of the other person or company carrying votes which, if exercised, would entitle the person to elect a majority of the directors of the other person, unless the person holds the voting securities only to secure an obligation;

(b) in the case of a partnership other than a limited partnership, holds more than 50% of the interests of the partnership; or

(c) in the case of a limited partnership, is the general partner;

(5) "related entity" means any emitter or participant with which the business relationship as defined in subparagraph 1 involves a percentage of over 50%, a subsidiary, or an emitter or participant belonging to the same group, as well as any emitter or participant who share an account representative who also works for one of them.

O.C. 1297-2011, s. 9; O.C. 1184-2012, s. 9; O.C. 902-2014, s. 7; O.C. 1089-2015, s. 8; O.C. 1125-2017, s. 11.

9.1. A person referred to in section 9 that retains the services of an advisor for the application of this Regulation must send to the Minister the name and professional contact information of the advisor, and, where applicable, the name of the advisor's employer.

A person referred to in section 9 who advises another person for the application of this Regulation must send to the Minister a list of all the persons provided with advisory services for the same purpose.

O.C. 1125-2017, s. 12.

10. To register for the system, an emitter, participant or clearing house or, if they are not natural persons, their account representatives, must first obtain access to the electronic system by providing the Minister with the following information and documents:

(1) the person's name and contact information at the person's home address;

(2) the person's date of birth;

(3) copies of at least 2 identity documents, including one with a photograph, issued by a government or one of its departments or agencies, bearing the person's name and date of birth, along with an attestation from a notary or advocate, completed less than 3 months prior to the application for registration, stating that the notary or advocate has established the identity of the person and certifying the authenticity of the copies of the identity documents;

(4) the name and contact information of the person's employer;

(5) confirmation from a financial institution located in Canada that the person has a deposit account with the institution;

(6) any conviction for a criminal offence or an offence referred to in section 13 from the 5 years prior to the submission of the information and documents;

(7) a declaration, signed by the person and attesting

(a) that the information and document provided are valid and that the person consents to their communication when necessary for the purposes of this Regulation and the corresponding rules and regulations of a partner entity;

*(a.*1*)* that the person consents to a judicial record verification by the Minister or a person mandated for that purpose; and

(b) that the person undertakes to comply with the conditions of this Regulation.

A natural person authorized to act as an account viewing agent pursuant to section 12 must also obtain access to the electronic system in accordance with the first paragraph if the person has not already obtained access to the electronic system of a partner entity.

The account viewing agent designated by the emitter or the participant, under section 11, after they register for the system, must also obtain access to the electronic system in accordance with the first paragraph.

The emitter referred to in section 2.1, the participant, the clearing house or the account viewing agent or, if they are not natural persons, their account representatives, that requests access to the electronic system under this section must, in order for the request to be admissible, send the documents listed in the first paragraph in the 12 months following the date of the request.

A person who, under this section, must obtain access to the electronic system but already has one, obtained from a partner entity, is considered to have met the obligation under this Regulation and may not obtain new access from the Minister. The person must provide the Minister with the information referred to in subparagraphs 1, 2, 4, 6 and 7 of the first paragraph. If the access has not been obtained in accordance with sections 95834(a)(b) and (d) of the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms or in accordance with paragraph 2 of section 45 of O.Reg. 144/16: The Cap and Trade Program, the person must also provide the information referred to in subparagraph 3 of the first paragraph.

O.C. 1297-2011, s. 10; O.C. 1184-2012, s. 10; O.C. 902-2014, s. 8; O.C. 1125-2017, s. 13.

11. When registering for the system, an emitter or participant that is not a natural person must also designate at least 2 and at most 5 natural persons to act as account representatives and perform any operation within the system on its behalf.

The emitter or participant must also identify a primary account representative who is the resource person to be contacted for any information concerning the emitter or participant.

For the purposes of the designation, the emitter or participant must provide the Minister with the following information and documents:

(1) the name and contact information of the emitter or participant;

(1.1) in the case of an emitter or participant that is not a natural person and is not constituted in Québec, the name and contact information of its attorney designated under section 26 of the Act respecting the legal publicity of enterprises (chapter P-44.1);

(2) the name and contact information of the designated account representatives;

(3) a declaration signed by a director or by any other officer, or a resolution of the board of directors of the emitter or participant attesting that the account representatives have been duly designated to act on behalf of the emitter or participant for the purposes of this Regulation;

(4) an attestation from a notary or advocate confirming the link between an account representative and the emitter or participant who designated the representative;

(5) a declaration, signed by each of the account representatives, attesting that they have been duly designated for that purpose by the authorized representatives of the emitter or participant, that they accept the duties they have been assigned and that they undertake to comply with the conditions of this Regulation. The declaration must also indicate the name and contact information of any other emitter or participant on whose behalf the account representative acts for that purpose.

The attestation referred to in subparagraph 4 of the third paragraph must be sent to the Minister within 3 months after the date of the attestation.

An emitter or participant that is not a natural person must have at least 2 account representatives at all times, including a primary account representative.

All representations, acts, errors or omissions made by the account representatives in the performance of their duties are deemed to be made by the emitter or participant.

The duties of the account representatives terminate when a request for revocation is received from the emitter or participant and, when an emitter or a participant has only 2 representatives, only after a new representative has been designated. The duties of the account representatives also terminate when all the accounts of the emitter or participant are closed.

If the participant is a natural person, any act that must be performed by an account representative pursuant to this Regulation must be performed by the participant.

At the written request of an emitter or participant, the Minister may, before a request for revocation of mandate is sent to the Minister by the emitter or participant under the seventh paragraph, where the urgency of the situation warrants it, withdraw access to the electronic system from one of its account representatives.

O.C. 1297-2011, s. 11; O.C. 1184-2012, s. 10; O.C. 902-2014, s. 9; O.C. 1125-2017, s. 14.

12. An emitter or participant that is not a natural person may authorize up to 5 natural persons to act as account viewing agent to observe, within the electronic system, the operations involving the accounts of the emitter or participant.

For the purposes of the authorization, the emitter or participant must provide the following information and documents:

(1) the name, contact information and account numbers of the emitter or participant;

(2) the name and contact information of the authorized account viewing agents;

(3) a declaration signed by a director or any other officer, or a resolution of the board of directors of the emitter or participant attesting that the account viewing agents are duly authorized to observe the account operations;

(4) an attestation from a notary or advocate confirming the link between the account viewing agent and the emitter or participant that authorized the account viewing agent.

The authorization of an account viewing agent ends when a request for revocation is received from the emitter or participant or when all the accounts of the emitter or participant are closed.

O.C. 1297-2011, s. 12; O.C. 1184-2012, s. 10; O.C. 902-2014, s. 10; O.C. 1125-2017, s. 15.

13. No natural person applying for registration as a participant, and no person designated as an account representative or authorized as an account viewing agent, may have been found guilty, in the 5 years prior to the application for registration or the sending of the notice of designation or authorization, of fraud or any other criminal offence connected with the activities for which registration is requested or a notice is sent, or may have been found guilty on an offence under sections 28 to 31 of this Regulation or under a fiscal Act, the Derivatives Act (chapter I-14.01), the Securities Act (chapter V-1.1) or their regulations, unless a pardon has been obtained.

Every participant who is a natural person, every account representative and every account viewing agent who is found guilty of a criminal offence or an offence referred to in the first paragraph must inform the Minister of the conviction without delay, and the registration, designation or authorization of that natural person, account representative or account viewing agent will be terminated or revoked.

The emission allowances recorded in the account of a participant whose registration is terminated pursuant to the second paragraph are recovered by the Minister who allocates them as follows:

(1) the emission units are paid into the auction account to be sold at a later date;

(2) the early reduction credits are paid into the retirement account to be extinguished;

(3) the offset credits are paid into the environmental integrity account.

This section applies to any conviction in any foreign court for a criminal offence or offence referred to in the first paragraph that, had it been committed in Canada, could have led to criminal or penal proceedings.

O.C. 1297-2011, s. 13; O.C. 1184-2012, s. 10; O.C. 1125-2017, s. 16.

14. When an application for registration meets the requirements of sections 7 to 13 that apply to it, the Minister opens, in the electronic system,

(1) for each emitter or participant, a general account in which the emission allowances that may be traded are recorded; and

(2) for each emitter, a compliance account in which the emission allowances used to cover the GHG emissions of its covered establishments at the end of a compliance period must be recorded.

O.C. 1297-2011, s. 14; O.C. 1184-2012, s. 10; O.C. 902-2014, s. 11; O.C. 1125-2017, s. 17.

14.1. Any change to the information and documents provided pursuant to subparagraph 6 of section 10 or to section 11 must be communicated to the Minister without delay and, in the case of those provided pursuant to sections 7, 7.2, 8, 9 and 9.1, subparagraphs 1 to 5 and subparagraph 7 of section 10 or section 12, within 30 days from this amendment.

O.C. 1184-2012, s. 10; O.C. 902-2014, s. 12; O.C. 1125-2017, s. 18.

14.2. A participant whose account no longer contains any emission allowances may request that the Minister close the participant's general account and cancel the participant's registration by providing the following information:

(1) the participant's name and contact information;

(2) the participant's account number;

(3) the participant's signature or, if the participant is not a natural person, the signature of one of the participant's account representatives, of a director or any other officer, or a resolution of its board of directors, with the date of the request.

When the Minister notes, in the enterprise register, that a participant's registration has been cancelled for at least 3 years, the Minister notifies the participant that, after 30 days, the Minister may close the participant's account and terminate the participant's registration if the participant provides no valid reason for maintaining the account. When the account is closed, if it still contains emission allowances, the Minister may, as the case may be, recover them

(1) by transferring the emission units in the account to the auction account;

(2) by transferring the offset credits and early reduction credits to the retirement account; and

(3) by transferring the reserve units to the reserve account.

O.C. 1184-2012, s. 10; O.C. 1125-2017, s. 19.

15. The Minister may close an emitter's compliance account and transfer the emission allowances recorded in it to the emitter's general account

(1) if the emitter has not been required to cover the GHG emissions of any of its establishments pursuant to section 19 or, as the case may be, section 19.1, the emitter has met all the requirements of Chapter III, and

the offset credits placed in the account by a partner entity and used by the emitter to cover its GHG emissions can no longer be cancelled;

(2) if the covered establishment is no longer operated by the emitter, the emitter operates no other covered establishments, and the emitter meets the conditions of section 17; or

(3) if the emitter is closing a covered establishment, operates no other covered establishments, meets the conditions of section 18, has met all the requirements of Chapter III, and the offset credits placed in the account by a partner entity and used by the emitter to cover its GHG emissions can no longer be cancelled.

The emitter then becomes a participant for the purposes of this Regulation.

O.C. 1297-2011, s. 15; O.C. 1125-2017, s. 20.

16. When a participant's general account has been inactive for at least 6 years, the Minister notifies the participant of the situation and of the fact that the Minister may, after 30 days, close the account and terminate the participant's registration if no emission allowance is placed in the account during that period or if the participant provides no valid reason for maintaining the account.

When the participant's general account still contains emission allowances, the Minister may, when closing the account, as the case may be, recover the allowances

(1) by transferring the emission units in the account to the auction account;

(2) by transferring the offset credits and early reduction credits to the retirement account; and

(3) by transferring the reserve units to the reserve account.

O.C. 1297-2011, s. 16; O.C. 1125-2017, s. 21.

17. When the operator of a covered establishment changes during a year, the emitter who previously operated the establishment must so notify the Minister as soon as possible.

The new operator becomes an emitter to which this Regulation applies and must, within 30 days of the change of operator, register for the system in accordance with this Chapter.

The new operator is required, in place of the former operator, to meet all the requirements that applied to the former operator pursuant to this Regulation.

O.C. 1297-2011, s. 17; O.C. 1125-2017, s. 22.

18. An emitter that is permanently closing a covered establishment must, within 45 days of the date of the last emissions report filed in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), surrender to the Minister,

(1) in accordance with section 46.10 of the Environment Quality Act (chapter Q-2), the same number of emission units as the number allocated without charge pursuant to Division II of Chapter II of Title III and issued on the basis of the estimated GHG emissions of the covered establishment, for the period after the operation of the covered establishment ceased, the surrendered units, if they have a vintage, must be of the year on which they were allocated or from previous years; and

(2) any emission allowance needed to cover the GHG emissions of the covered establishment for the period during which it was operated.

For that purpose, the emitter must transfer into the emitter's compliance account the emission units referred to in subparagraph 1 of the first paragraph to allow them to be paid into the Minister's auction

account and the emission allowances referred to in subparagraph 2 of the first paragraph to allow them to be deducted by the Minister and paid into the retirement account to be extinguished.

If the emitter fails to surrender emission allowances in accordance with this section,

(1) if they are emission units referred to in subparagraph 1 of the first paragraph, the Minister deducts them from the emitter's accounts; and

(2) if they are emission allowances referred to in subparagraph 2 of the first paragraph, the Minister recovers them in accordance with section 22 and applies the administrative sanction provided for in that section.

O.C. 1297-2011, s. 18; O.C. 1184-2012, s. 11; O.C. 902-2014, s. 13.

CHAPTER II.1

REGISTRATION OF CLEARING HOUSES

O.C. 1089-2015, s. 9.

18.1. A clearing house for derivatives having an establishment in Canada, recognized by a regulatory authority responsible for supervising financial markets in Canada, may register for the system in order to clear transactions involving emission allowances. For that purpose, it must provide the Minister with the following information and documents:

(1) its name and contact information, and the date and place of its constitution;

(2) a list of its directors and officers and their work contact information;

(3) a list of its subsidiaries or parent legal persons with a diagram representing the relations between those entities, including the control percentage between each entity;

(4) a document issued by the regulatory authority supervising the clearing house confirming that fact and giving the date on which supervision started and the rules to be followed by the clearing house;

(5) a declaration signed by a director or any other officer, or a resolution of the board of directors of the clearing house including an undertaking to comply with the conditions of this Regulation and attesting that the information and documents provided are valid and that consent has been given to their communication when necessary for the purposes of this Regulation or the corresponding regulations of a partner entity.

O.C. 1089-2015, s. 9; O.C. 1125-2017, s. 23.

18.2. When registering for the system, the clearing house must also designate account representatives in accordance with section 11 that applies, with the necessary modifications.

It may also designate account viewing agents in accordance with section 12 that applies, with the necessary modifications.

Section 8.1 and subparagraphs 1, 2 and 2.1 of the first paragraph of section 9 also apply to the clearing house and sections 10 and 13 apply to its account representatives and account viewing agents, with the necessary modifications.

O.C. 1089-2015, s. 9.

18.3. When an application for registration meets the requirements of sections 18.1 and 18.2, the Minister opens a clearing house account for the clearing house in the electronic system.

O.C. 1089-2015, s. 9.

18.4. Any change to the information and documents provided under section 18.1 must be communicated to the Minister within 30 days and, if provided under section 18.2, immediately.

In addition, the clearing house must notify the Minister immediately if its activities are suspended by the regulatory authority that supervises it, or if supervision ceases. No transaction may be carried out in the account of the clearing house until the suspension has been lifted by the regulatory authority or until new supervision is established by the regulatory authority. If emission allowances are recorded in its account when supervision is suspended or ceases, they are returned to the emitter or participant who transfered them into the account.

O.C. 1089-2015, s. 9.

18.5. A clearing house may request the closure of its clearing house account in accordance with section 14.2, with the necessary modifications.

Section 16 also applies to an inactive clearing house account, with the necessary modifications.

O.C. 1089-2015, s. 9.

CHAPTER III

COVERAGE OF GREENHOUSE GAS EMISSIONS

19. Every emitter referred to in section 2 is required, in accordance with the terms and conditions of this Chapter, to cover each metric tonne CO_2 equivalent of the verified emissions from an establishment or, if applicable, an enterprise referred to in the same section when its GHG emissions are equal to or exceed the emissions threshold, until 31 December following the third consecutive emissions report for which the emissions from the establishment or enterprise are below the emissions threshold or, where applicable, following the permanent closure of the establishment or the permanent stop in production of a reference unit if the emissions attributable to the other activities of the establishment have been below the emissions threshold for the last 3 years.

As for emitters referred to in subparagraph 2 of the second paragraph of section 2, they are bound by the obligation provided for in the first paragraph until 31 December of the first year covered by an enterprise's verified emissions report, sent to the Minister, in which the enterprise's GHG emissions are equal to zero.

The emitter is required to comply with the first paragraph

(1) beginning with the compliance period starting on 1 January 2013, in the case of an emitter that on 1 January 2012 operates an establishment or, if applicable, an enterprise for which the reported emissions for 2009, 2010 or 2011, attributable to activities other than those referred to in subparagraph 2 of this paragraph, are equal to or exceed the emissions threshold;

(2) beginning with the compliance period starting on 1 January 2015, in the case of the activities of an emitter referred to in subparagraph 2 of the second paragraph of section 2 whose verified emissions in connection with the fuel distributed for 2013 are equal to or exceed the emissions threshold;

(2.1) beginning on 1 January 2016, in the case of an emitter for whom emissions attributable to fuel distribution activities in 2014 are equal to or exceed 25,000 metric tonnes CO_2 equivalent;

(2.2) beginning on 1 January 2016, in the case of an emitter for whom emissions attributable to fuel distribution activities in 2015 are equal to or exceed 25,000 metric tonnes CO_2 equivalent;

(2.3) beginning on 1 January 2016, in the case of an emitter who distributed 200 litres or more of fuel in 2015 but whose corresponding declared emissions are lower than 25,000 metric tonnes CO_2 equivalent;

(3) in the case where an emitter's verified emissions are equal to or greater than the emissions threshold during a year after the year mentioned in subparagraph 1, beginning on 1 January of the year following the year in which the first report for emissions equal to or greater than the threshold, and for the years that follow 2020, beginning on 1 January of the year in which an emitter's verified emissions are equal to or exceed the threshold;

(3.1) beginning on 1 January of the year concerned, in the case where fuel distribution activities of an emitter are equal to or exceed the emissions threshold for 2016 or a subsequent year;

(4) beginning in the year in which it becomes operational, in the case of a new facility referred to in subparagraph *a* of paragraph 11 of section 3.

When the operator of a covered establishment changes, the new operator is required, in place of the former operator, to cover all the GHG emissions from the establishment that have not been covered in accordance with this Chapter.

Notwithstanding subparagraphs 1 and 2 of the second paragraph, an emitter that ceases its activities permanently in the year preceding the year in which the compliance period referred to in those subparagraphs begins is not required to cover the emitter's GHG emissions, provided it notifies the Minister in writing not later than 6 months following the start date of the period.

O.C. 1297-2011, s. 19; O.C. 1184-2012, s. 12; O.C. 1138-2013, s. 4; O.C. 902-2014, s. 14; O.C. 1089-2015, s. 10; O.C. 1125-2017, s. 24.

19.0.1. An emitter referred to in section 2.1 is bound, in accordance with the terms and conditions in this Chapter, to cover each tonne CO_2 equivalent of the verified emissions of an establishment referred to in that section, as the case may be,

(1) until 31 December of the last year of the compliance period during which the emitter informs the Minister, not later than 1 September of that last year, of its intent to request that the Minister cancel its registration in the system;

(2) until 31 December of the year following the year during which GHG emissions are equal to or exceed the emissions threshold;

(3) until 31 December following the third consecutive emissions reporting for which the emissions of that establishment are below the reporting threshold referred to in section 6.1 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15).

The emitter is bound by the obligation provided for in the first paragraph as of the following dates:

(1) where the emitter's registration in the system is done on or before 1 September of a given year, as of 1 January following that date;

(2) where the emitter's registration in the system is done after 1 September of a given year, as of 1 January of the second year following the year of registration in the system.

O.C. 1125-2017, s. 25.

19.1. Where, on 1 August following the end of a compliance period, the verification report on the emissions report for 1 or more years of that compliance period does not allow to confirm in whole or in part the quantities of GHG emissions reported in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) and the relative importance threshold referred to in subparagraph 1 of the first paragraph of section 6.7 of that Regulation is reached, the emitter is required for those years to cover the increased quantity of GHG emissions as follows:

Total increased quantity of GHG emissions = total GHG emissions reported × (1+ RUGHG)

Where

RUGHG = Relative uncertainty of GHG emissions reported, calculated in accordance with paragraph 7.5 of section 6.9 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere.

Even if the emitter submits a verification report confirming compliance of the emissions report with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere after the date provided for in the first paragraph, the emission allowances corresponding to the difference between the total increased quantity of GHG emissions and the total quantity of GHG emissions verified once again may not be recovered.

O.C. 1089-2015, s. 11.

20. To be valid for the purpose of covering GHG emissions, the emission allowances used to cover GHG emissions must meet the requirements of section 37 and must not have been issued for a year after the compliance period, except for offset credits, which may be used if they were issued in the first year following the year of expiry of the compliance period.

In addition, the total quantity of offset credits that the emitter may use to cover the GHG emissions of its covered establishment cannot exceed 8% of the GHG emissions to be covered for the compliance period.

O.C. 1297-2011, s. 20; O.C. 1184-2012, s. 13; O.C. 902-2014, s. 15.

21. On 1 November following expiry of a compliance period or, if that day is not a business day, on the first following business day, at 8:00 p.m., every emitter must have at least as many emission allowances in its compliance account as its verified emissions and, where applicable, as the emissions increased in accordance with the first paragraph of section 19.1 for every covered establishment during the compliance period or, where applicable, during the years following the last compliance period for which emissions coverage was required.

The Minister deducts the required emission allowances in chronological order, from the least recent to the most recent according to their year of issue and vintage, in the following order:

(1) offset credits, up to the limit provided for in the second paragraph of section 20;

(1.1) emissions units from the Minister's reserve account, using units from categories C, B and A, in that order;

(2) early reduction credits;

(3) emission units other than units referred to in subparagraph 1.1.

The emission allowances deducted by the Minister in accordance with this section are placed in the Minister's retirement account and are extinguished.

O.C. 1297-2011, s. 21; O.C. 1184-2012, s. 14; O.C. 1138-2013, s. 5; O.C. 902-2014, s. 16; O.C. 1089-2015, s. 12.

22. A failure by an emitter to cover the GHG emissions of a covered establishment on the expiry of the compliance deadline leads to the suspension of its general account and the application of an administrative sanction equal to 3 emission units or early reduction credits for each missing emission allowance needed to complete the coverage.

The Minister recovers the missing emission allowances by deducting an equivalent number of valid emission allowances from the emitter's general account in the manner provided for in the second paragraph of section 21.

The Minister also recovers the emission units and early reduction credits required for the administrative sanctions referred to in the first paragraph in the following manner and order, until all the units have been recovered:

(1) the Minister deducts 3 valid emission units or early reduction credits from the emitter's general account for each missing emission allowance using reserve units from categories C, B and A, early reduction credits and units identified by vintage from the least recent to the most recent, in that order;

(2) the Minister deducts 3 emission units issued for a year following the compliance period, from the most recent to the least recent, from the emitter's compliance account for each missing emission allowance;

(3) the Minister deducts 3 emission units issued for a year following the compliance period, from the most recent to the least recent, from the emitter's general account for each missing emission allowance.

When the emitter's accounts do not contain enough emission allowances to recover all or part of the missing emission allowances as well as emission units and early reduction credits required for the application of the administrative sanction, the Minister notifies the emitter, who must surrender them within 30 days from the failure to provide coverage.

Upon a failure to comply, if the emitter is eligible for the allocation without charge of emission units, the Minister removes a quantity equivalent to the emission allowances, emission units and early reduction credits referred to in the fourth paragraph from the quantity that would normally have been allocated to the emitter without charge for the following compliance period pursuant to Division II of Chapter II of Title III.

O.C. 1297-2011, s. 22; O.C. 1184-2012, s. 15; O.C. 902-2014, s. 17.

23. Every missing emission allowance, recovered and deducted in accordance with section 22, is placed in the Minister's retirement account to be extinguished.

The emission units deducted following the application of the administrative sanction provided for in that section are placed in the Minister's auction account to be auctioned at a later date, and early reduction credits deducted are placed in the Minister's retirement account to be extinguished.

Once these actions have been taken, the suspension of the emitter's general account is lifted.

O.C. 1297-2011, s. 23; O.C. 902-2014, s. 18; O.C. 1089-2015, s. 13.

23.1. An emitter who, in accordance with section 6.5 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), communicates a notice of correction to raise the quantity of GHG emissions reported in an emissions report filed in the previous 7 years must, for every compliance period that includes one of those years and for which the compliance deadline has expired, cover the GHG emissions that have not been covered by an equivalent number of additional emission allowances if the situation corresponds to one of the following criteria:

Criterion 1

$[(GHG_{corr} - Allowances_{surrendered})/ Allowances_{surrendered}] \geq 0.05$

Criterion 2

$(GHG_{corr} - Allowances_{surrendered}) \geq 5\ 000$ metric tonnes CO_2 equivalent

Where:

GHG_{corr} = Corrected GHG emissions, in metric tonnes CO_2 equivalent;

$Allowances_{surrendered}$ = Quantity of emission allowances surrendered for the compliance period to which the correction applies, expressed in metric tonnes CO_2 equivalent.

Not later than 8:00 p.m. on the 180th day following the notice of correction or, if that day is not a business day, on the first following business day, the emitter must transfer into its compliance account the additional emission allowances, which must meet the following conditions:

(1) emission allowances identified by vintage must be from the current year or a previous year;

(2) the offset credits used, along with the offset credits already deducted for the compliance period during which the correction is recorded, must not exceed 8% of the GHG emissions to be covered for that period.

The Minister deducts the additional emission allowances required in the manner provided for in the second paragraph of section 21 and places them in the Minister's retirement account to be extinguished.

If the additional emission allowances are not surrendered by the emitter in the time prescribed in the second paragraph, the provisions of sections 22 and 23 apply, with the necessary modifications.

No emission allowances will be reimbursed in the case of a notice of correction whose purpose is to reduce the emissions referred to in the first paragraph.

O.C. 902-2014, s. 19.

CHAPTER IV

TRANSACTIONS OF EMISSION ALLOWANCES

O.C. 1297-2011, c. IV; O.C. 1184-2012, s. 16.

24. An emission allowance may be traded only between emitters, participants and clearing houses registered with the Minister or a partner entity.

An emitter or a participant may only hold emission allowances for their own use and not on behalf of another person having an interest in or control the emission allowances.

In addition, only emission allowances recorded in a general account may be traded. Subject to section 15, once recorded in a compliance account, emission allowances may only be used to cover GHG emissions.

O.C. 1297-2011, s. 24; O.C. 1184-2012, s. 17; O.C. 1089-2015, s. 14.

25. Every emitter or participant who wishes to trade emission allowances with another emitter or participant must follow the procedure established in section 26 and send the Minister a transaction request containing the following information:

(1) the general account number of the seller;

(2) the general account number of the buyer;

(3) the quantity, type and, where applicable, vintage of the emission allowances to be traded;

(4) the settlement price of each type and, where applicable, each vintage of emission allowances, as well as the method used to determine the settlement price;

(5) the type of emissions trading agreement, the date of signing of the agreement and the agreed upon trading date;

(6) where applicable, all other transactions or products covered by the agreement, a description of those transactions or products, and the name and contact information of the other parties involved.

Despite subparagraph 4 of the first paragraph, an emitter or participant is not required to disclose the settlement price of the emission allowances when the transaction is between related entities or is a bundled transfer.

O.C. 1297-2011, s. 25; O.C. 1184-2012, s. 18; O.C. 1138-2013, s. 6; O.C. 902-2014, s. 20; O.C. 1125-2017, s. 26.

26. A transaction request for emission allowances must be proposed by one of the seller's account representatives.

The transaction request is then submitted to all the seller's other account representatives, for confirmation by one of them within 2 days of being submitted.

When the transaction request is confirmed, a notice is sent to all the seller's account representatives and the request is submitted to the buyer's account representatives, for acceptance by one of them within 3 days of the proposal of the transaction request.

Unless otherwise indicated by one of the account representatives or if the Minister has serious grounds to believe that an offence under this Regulation has been committed, once the transaction request has been accepted the emission allowances concerned by the request are transferred from the seller's to the buyer's general account.

At each step in the transaction request, the account representative concerned must attest to holding due authorization to complete the transaction for the emitter or participant, and that the information contained in the transaction request is true, accurate and complete.

The account representatives involved in the transaction of emission allowances must provide the Minister, on request and as soon as possible, with any additional information concerning the transaction.

O.C. 1297-2011, s. 26; O.C. 1184-2012, s. 18; O.C. 902-2014, s. 21.

26.1. Every emitter or participant who wishes to transfer emission allowances to a clearing house must, in accordance with the second paragraph, send the Minister a transaction request for the clearing house containing the following information:

(1) the general account number of the seller;

(2) the account number of the clearing house;

(3) the quantity, type and, where applicable, vintage of the emission allowances to be traded;

(4) the settlement price of each type and, where applicable, each vintage of emission allowances;

(5) the type of emission allowances trading agreement and the transaction date scheduled;

(6) where applicable, the codes of the exchange and of the contract.

The transaction request must be sent in accordance with the procedure established in section 26, with the necessary modifications, subject to the acceptance provided for in the third paragraph of that section which does not apply to that type of transaction.

O.C. 1089-2015, s. 15.

26.2. A clearing house that wishes to use emission allowances to compensate for a transaction must, in accordance with the procedure established in section 26.3, send the Minister an application for compensation containing the following information:

(1) the account number of the clearing house;

(2) the general account number of the emitter or participant who is compensated;

(3) the quantity, type and, where applicable, vintage of the emission allowances used for compensation;

(4) the settlement price of each type and, where applicable, each vintage of emission allowances;

(5) the type of emission allowances trading agreement and the transaction date scheduled;

(6) where applicable, the codes of the exchange and of the contract.

O.C. 1089-2015, s. 15.

26.3. An application for compensation must be proposed by one of the clearing house's account representatives.

The application for compensation is then submitted to all the other account representatives at the clearing house for confirmation by one of them.

Once the application is confirmed, a notice to that effect is sent to all the account representatives and the emission allowances are transferred to the general account of the emitter or participant who is compensated.

The account representatives involved in an application for compensation of emission allowances must provide the Minister, on request and as soon as possible, with any additional information concerning the compensation.

O.C. 1089-2015, s. 15.

26.4. Emission allowances transferred to a clearing house account that are not used within 5 days for a transaction by an emitter or participant are returned to the seller.

O.C. 1089-2015, s. 15.

27. Every emitter who wishes to transfer emission allowances from the emitter's general account to the emitter's compliance account, or every emitter or participant who wishes to retire from the system emission allowances recorded in the emitter's general account must send to the Minister a request including

(1) the emitter's or participant's general, and where applicable, compliance account number;

(2) the quantity, type and, where applicable, vintage of the emission allowances to be transferred or retired.

An emitter or a participant may retire no more than 10,000 emission units per year.

O.C. 1297-2011, s. 27; O.C. 1184-2012, s. 18; O.C. 1138-2013, s. 7; O.C. 1125-2017, s. 27.

27.1. A transfer or retirement request for emission allowances must be proposed by an account representative.

The transfer or retirement request is then submitted to all the other account representatives, for confirmation by one of them within 2 days of being submitted.

When the transfer or retirement request is confirmed, a notice is sent to all the emitter's or participant's account representatives.

Unless otherwise indicated by one of the account representatives or if the Minister has serious grounds to believe that an offence under this Regulation has been committed, once the transfer or retirement request has been confirmed the emission allowances concerned by the request are transferred from the emitter's general account to the emitter's compliance account, or from the emitter's or participant's general account to the Minister's retirement account, where they are extinguished.

Account representatives who have sent a transfer or retirement request for emission allowances must provide the Minister, on request and as soon as possible, with any additional information concerning transfer or the retirement.

O.C. 1184-2012, s. 18; O.C. 1138-2013, s. 8; O.C. 902-2014, s. 22.

27.2. When a transaction cannot be completed because of an error or omission in connection with the information included in the request, because the request does not meet the requirements of one of sections 25 to 27.1, because an account does not contain enough emission allowances or because of any other reason, a notice is sent to the parties concerned within 5 working days following the failure to complete the transaction.

O.C. 1184-2012, s. 18; O.C. 1138-2013, s. 9; I.N. 2016-01-01 (NCCP).

28. No person holding privileged information on an emission allowance may trade that emission allowance, disclose the information or recommend that another person trade the emission allowance, except if the person has reason to believe that the information is known to the public or to the other party in the transaction.

However, the person may disclose the information or recommend that another person trade the emission allowance, if the person is required to disclose the information in the course of business, and if nothing leads the person to believe that the information will be used or disclosed in contravention of this section or section 29.

O.C. 1297-2011, s. 28.

29. No person prevented from trading an emission allowance pursuant to section 28 may use the privileged information in any other way, unless the person has reason to believe that the information is known to the public. In particular, the person may not carry out operations on futures contracts or other derivatives within the meaning of the Derivatives Act (chapter I-14.01) involving an emission allowance.

O.C. 1297-2011, s. 29.

30. A person with knowledge of material order information may not carry out or recommend that another person carry out a transaction involving an emission allowance, or disclose the information to any other person, except if

(1) the person has reason to believe that the other person is already aware of the information;

(2) the person must disclose the information in the course of business, and nothing leads the person to believe that it will be used or disclosed in contravention of this section;

(3) the person carries out a transaction involving the emission allowances concerned by the information in order to perform a written obligation that the person contracted before becoming aware of the information.

For the purposes of this section, material order information is any information concerning an order to buy or an order to sell an emission allowance that could have a major impact on the price of an emission allowance.

O.C. 1297-2011, s. 30.

31. No person may disclose false or misleading information or information that must be filed pursuant to this Regulation, before it is filed, in order to carry out a transaction, in particular when it could influence the price of an emission allowance.

For the purposes of this section, false or misleading information is any information likely to mislead on an important fact, as well as the simple omission of an important fact; an important fact is any fact that may reasonably be believed to have a significant impact on the price or value of an emission allowance.

O.C. 1297-2011, s. 31.

32. The total number of emission units of the current or prior vintage, of emission units from the reserve account and of early reduction credits that an emitter or a participant may hold in its general account and, where applicable, its compliance account is subject to the holding limit calculated using equation 32-1:

Equation 32-1

$HL_i = 0.1 \times Baseline + 0.025 \times (C_i - Baseline)$

Where:

HL_i = Holding limit for year *i*;

0.1 = Maximum proportion of the number of emission units constituting the Baseline that an emitter or a participant may hold;

Baseline = 25,000,000;

0.025 = Maximum proportion of the number of emission units in excess of the Baseline that an emitter or a participant may hold;

C_i = Sum of the annual cap of emission units for year *i* set by order in accordance with section 46.7 of the Environment Quality Act (chapter Q-2) and the cap set by a partner entity;

i = Current year.

The total number of emission units of a vintage subsequent to the current year that an emitter or participant may hold in its general account and, where applicable, its compliance account is subject to the holding limit calculated using equation 32-2:

Equation 32-2

$HL_j = 0.1 \times Baseline + 0.025 \times (C_j - Baseline)$

Where:

HL_j = Holding limit for an emission unit of vintage *j*;

0.1 = Maximum proportion of the number of emission units constituting the Baseline that an emitter or participant may hold;

Baseline = 25,000,000;

0.025 = Maximum proportion of the number of emission units in excess of the Baseline that an emitter or participant may hold;

C_j = Sum of the annual cap of emission units for year *j* set by order in accordance with section 46.7 of the Environment Quality Act and of the cap set by a partner entity;

j = Year subsequent to the current year.

Despite the first paragraph, the emission units and early reduction credits recorded in the compliance account of an emitter and needed to cover estimated GHG emissions for the current year or emissions for preceding years are not subject to the holding limit.

Furthermore, an emitter or a participant that reaches or exceeds one-half of its holding limit must, at the Minister's request, explain its strategy and the reason for holding the emission units concerned.

Every transaction request for emission units that would cause the buyer's holding limit to be exceeded will be refused by the Minister.

When the holding limited is exceeded, the emitter or participant must, within 5 business days after the limit is exceeded, divest itself of the excess emission allowances, pay into its compliance account the emissions units or early reduction credits needed to cover its emissions for the current year or preceding years or, in the case of related entities, amend the distribution of the overall holding limit determined in accordance with section 33 in order to become compliant. Upon a failure to comply, the Minister takes back a quantity of emission units equivalent to the excess emission allowances in the following order:

(1) the emission units from the Minister's reserve account;

(2) the early reduction credits;

(3) the other emission units, chronologically, from the least recent to the most recent, according to their vintage.

The units referred to in subparagraphs 1 and 3 of the sixth paragraph are transferred to the Minister's auction account and the early reduction credits are transferred to the Minister's retirement account.

O.C. 1297-2011, s. 32; O.C. 1184-2012, s. 19; O.C. 1138-2013, s. 10; O.C. 902-2014, s. 23; O.C. 1125-2017, s. 28.

33. For the purposes of the holding limit referred to in section 32, related entities are considered to be a single entity with an overall holding limit that they must distribute among themselves by allotting percentage shares.

The distribution must be disclosed to the Minister when the related entities register for the system in accordance with subparagraph 3 of the first paragraph of section 9 or, in the case of a new business relationship within the meaning of subparagraph 1 of the second paragraph of that section, within 30 days from the creation of that relationship. The information must, however, be sent to the Minister not more than 40 days before an auction when one of the related entities wishes to be registered as a bidder.

O.C. 1297-2011, s. 33; O.C. 1184-2012, s. 20.

34. The Minister may, on the Minister's own initiative, correct any material error that occurs in an account in the system. The Minister must inform the parties concerned as soon as possible, stating the reasons for the correction.

O.C. 1297-2011, s. 34; O.C. 1089-2015, s. 16.

35. The Minister posts, at least once every year, on the website of the department, a list of all emitters, participants and clearing houses registered for the system as well as a summary of transactions conducted the previous year.

O.C. 1297-2011, s. 35; O.C. 1184-2012, s. 21; O.C. 902-2014, s. 24; O.C. 1089-2015, s. 17.

TITLE III

EMISSION ALLOWANCES

CHAPTER I

GENERAL

36. Emission allowances are issued in electronic form and identified in a way that allows them to be differentiated, in particular by type.

Reserve emission units are also identified according to the categories provided for in the first paragraph of section 58, whereas other emission units as well as offset credits are also identified by vintage.

O.C. 1297-2011, s. 36; O.C. 1184-2012, s. 22; O.C. 902-2014, s. 25.

37. The following emission allowances may be traded through the system and used for compliance purposes:

(1) every emission unit and early reduction credit referred to in this Title;

(2) every offset credit issued by the Minister pursuant to subparagraph 2 of the first paragraph of section 46.8 of the Environment Quality Act (chapter Q-2);

(3) every emission allowance issued by a partner entity, according to the rules for the equivalent types of emission allowances issued under this Regulation, as indicated in Appendix B.1

Despite the first paragraph, the following emission allowances may not be traded or used for compliance purposes:

(1) any emission allowance that has been suspended, cancelled or extinguished by the Minister or by a partner entity;

(2) any emission allowance that has been used for compliance purposes under another cap-and-trade system for GHG emission allowances or GHG emissions reduction program.

O.C. 1297-2011, s. 37; O.C. 1184-2012, s. 23.

CHAPTER II

GREENHOUSE GAS EMISSION UNITS

DIVISION I

GENERAL

38. Based on the cap on emission units set by order in accordance with section 46.7 of the Environment Quality Act (chapter Q-2), the Minister places in the Minister's reserve account a quantity of emission units that may be used in adjusting the allocation made without charge in accordance with Division II or may be sold by mutual agreement in accordance with Division IV of this Chapter.

The quantity of emission units represents

(1) 1% of the emission units available under the cap set for the years 2013 and 2014;

(2) 4% of the emission units available under the cap set for the years 2015 to 2017;

(3) 7% of the emission units available under the cap set for the years 2018 to 2020; and

(4) 4% of the emission units available under the cap set for the years 2021 and following.

The Minister places the unreserved emission units in the Minister's allocation account. The units may be allocated without charge in accordance with Division II of this Chapter.

The emission units in excess of the total estimated quantities that may be allocated without charge for a given year are placed in the Minister's auction account to be sold in accordance with Division III of this Chapter.

O.C. 1297-2011, s. 38.

DIVISION II

ALLOCATION

39. An emitter operating a covered establishment and pursuing an activity referred to in Table A of Part I of Appendix C is eligible for the allocation of emission units without charge.

O.C. 1297-2011, s. 39.

40. The Minister estimates annually the total quantity of emission units that may be allocated without charge to an eligible emitter.

The estimated total quantity is calculated in accordance with Part II of Appendix C using, depending on the year concerned, equation 1-1 or 7-1, and replacing

(1) the factors "$P_{Ri\ j}$", "P_{Ri}", "$P_{R\ cu\ I}$", "$P_{R\ RSM\ i}$ and "$P_{R\ cath\ I}$" in equations 2-1, 2-9, 3-1, 3-10, 4-1, 4-8, 4-9, 4-15, 4-25, 4-31, 5-1, 5-2, 5-3, 6-2, 6-7, 6-8, 6-9, 6-10.1, 6-10.2, 6-10.5, 6-10.9, 6-12 to 6-16, 8-1, 9-1, 10-1, 11-1, 13-1 and 14-1 by the factors "$P_{Ri\ j\ -2}$", "P_{Ri-2}", "$P_{R\ cu\ i-2}$", "$P_{R\ RSM\ i-2}$" and "$P_{R\ cath\ i-2}$" which correspond to the total quantity of reference units produced or used in the year 2 years before the allocation year;

(2) the factors "$EC_{TOTAL\ I}$", "$GHG_{FP\ I}$" and "$GHG_{O\ I}$" in equations 4-21, 4-37, 5-3, 6-10.1, 6-14, 6-15, 11-5 and 14-5 by the factors "$EC_{TOTAL\ i-2}$", "$GHG_{FP\ i-2}$", "$GHG_{FP\ cu\ i-2}$" and "$GHG_{O\ i-2}$", which correspond respectively to the energy consumption, fixed process emissions and other emissions in the year 2 years before the allocation year;

(3) the factors "$EC_{NF\ TOTAL\ I}$", "$GHG_{NF\ FP\ I}$" and "$GHG_{NF\ O\ I}$" in equations 6-10.3 and 6-10.4 by the factors "$EC_{NF\ TOTAL\ i-2}$", "$GHG_{NF\ FP\ i-2}$" and "$GHG_{NF\ O\ i-2}$", which correspond respectively to the energy consumption, fixed process emissions and other emissions at the new facility in the year 2 years before the allocation year;

(4) the factor "$H_{2,\ I}$" of equation 6-10.2 by factor "$H_{2,i-2}$", which corresponds to the hydrogen consumption in the year 2 years before the allocation year;

(5) the factor "$A_{recycl,i}$" in equations 6-12, 6-13 and 6-14 by the factor "$A_{recycl,i-2}$", which corresponds to GHG emissions attributable to the carbon content of recycled secondary materials introduced into the process materials in the year 2 years before the allocation year.

Despite equations 4-1 to 4-8 in Part II of Appendix C, if the only data available are data on emissions for the year in which an establishment became operational, the Minister uses those data to estimate the emission units allocated without charge for the first year.

On 1 May 2013 and on 14 January of every following year, or, if that day is not a working day, on the first following working day, the Minister issues the emission units corresponding to 75% of the total estimated quantity of emission units that may be allocated without charge, calculated in accordance with this section.

When the operator of a covered establishment changes before 14 January of a given year, the emission units referred to in the fourth paragraph are allocated to the new operator if, not later than the business day immediately before that date, the former operator notified the Minister of the change pursuant to the first paragraph of section 17.

O.C. 1297-2011, s. 40; O.C. 1184-2012, s. 24; O.C. 1138-2013, s. 11; I.N. 2016-01-01 (NCCP); O.C. 1125-2017, s. 29.

41. After the filing of the emissions report for the year during which the issue referred to in the fourth paragraph of section 40 is made, an adjustment is made to the remaining 25% of the total estimated quantity of emission units that may be allocated without charge.

The Minister calculates the adjustment by subtracting the quantity of emission units issued from the actual total quantity of emission units that may be allocated without charge to an eligible emitter for the year covered by the emissions report, determined in accordance with Part II of Appendix C.

On 14 September of each year beginning in 2014 or, if that day is not a working day, on the first following working day, the Minister places, in the emitter's general account, the quantity of emission units corresponding to any positive result of the adjustment calculation.

When the result of the adjustment calculation is negative, the Minister notifies the emitter who must, within 30 working days, place in its compliance account a quantity of emission units, of the vintage of the year for which the allocation referred to in the fourth paragraph of section 40 was made or of a prior vintage, equal to the excess quantity issued following the estimate made in accordance with that section; upon a failure to comply, the emission units are taken from the emitter's general account. The emission units are then transferred to the Minister's reserve account when units are required to be surrendered in accordance with the third paragraph of section 42, or transferred to the Minister's auction account.

Upon a failure by the emitter to place the emission units in its compliance account within the time provided for in the fourth paragraph or to have enough emission units in the emitter's general account, the Minister reduces the following allocation free of charge by an equivalent quantity of emission units.

When the operator of a covered establishment changes before 14 September of a given year, the new operator receives the allocation provided for in the third paragraph or, where applicable, meets the requirements of the fourth paragraph, if, not later than the business day immediately preceding that date, the former operator has notified the Minister of the change pursuant to the first paragraph of section 17.

O.C. 1297-2011, s. 41; O.C. 1184-2012, s. 25; O.C. 1089-2015, s. 18; I.N. 2016-01-01 (NCCP); O.C. 1125-2017, s. 30.

41.1. An emitter who, in accordance with section 6.5 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), communicates a notice of correction to raise the number of reference units reported in an emissions report filed for a year in the current compliance period is allocated, during the next allocation of emission units, additional units equal to the difference between the quantity calculated for the first emissions report and the quantity calculated for the corrected emissions report in accordance with Part II of Appendix C.

No additional emission units are allocated for a notice of correction to an emissions report for a year in a compliance period for which the compliance deadline has expired.

O.C. 902-2014, s. 26.

41.2. Where, on 1 August following the end of a compliance period, the verification report on the emissions report for 1 or more years of that compliance period does not allow to confirm in whole or in part the quantity of reference units reported in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) and the relative importance threshold referred to in subparagraph 2 of the first paragraph of section 6.7 of that Regulation is reached, the

total allowance free of charge for those years is based on the adjusted value of the reported quantity of reference units, calculated as follows:

Total adjusted quantity of reference units = Total reported reference units × (1- RURU)

Where

RURU = Relative uncertainty of reported reference units, calculated in accordance with paragraph 7.5 of section 6.9 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere.

Even if the emitter submits a verification report confirming compliance of the quantity of reported reference units with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere after the date provided for in the first paragraph, no emission unit will be allocated for a difference between the total adjusted quantity of reference units and the total quantity of reference units verified once again.

O.C. 1089-2015, s. 19.

42. The emission units allocated without charge in accordance with this Division are placed in the general account of the emitter.

The units come from the allocation account of the Minister or, if that account does not contain enough units, from the Minister's reserve account using, in order, the Class C, B and A emission units as determined in section 58.

In the case of emission units from the reserve account referred to in the second paragraph, the category of emission unit is replaced by the same vintage of the allocation year. In addition, the reserve account is replenished using the emission units in excess of the total estimated quantity that may be allocated free of charge for a year that may be sold in accordance with Division III of this Chapter. The emission units paid into the reserve account in this way are identified as belonging to the category replenished.

O.C. 1297-2011, s. 42; O.C. 1184-2012, s. 26; O.C. 902-2014, s. 27.

43. The Minister may suspend the allocation of emission units without charge to any emitter that fails to comply with the provisions of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or with the provisions of this Regulation.

O.C. 1297-2011, s. 43.

44. *(Revoked).*

O.C. 1297-2011, s. 44; O.C. 1184-2012, s. 27; O.C. 1125-2017, s. 31.

DIVISION III

AUCTION

45. The Minister auctions emission units in a specific place or online, at most 4 times per year.

At least 60 days before an auction, the Minister publishes a notice of auction on the website of the Ministère du Développement durable, de l'Environnement et des Parcs and, if the Minister considers it appropriate, in a newspaper or other publication, stating the rules set out in this Regulation and including, in particular, the following information:

(1) the place or Internet address, the date and the time of the auction;

(2) the terms and conditions for registering as a bidder;

(3) the form of a bid, and the procedure for submitting a bid;

(4) the procedure for the auction;

(5) the number and vintage of the emission units to be auctioned and the composition of each lot;

(6) the minimum settlement price for the units, set in accordance with the third paragraph of section 49 and, in the case of a joint auction with a partner entity, the minimum price set by that entity and the procedure used to set a joint minimum price set out in subparagraph 2 of the fourth paragraph of section 49.

O.C. 1297-2011, s. 45; O.C. 1184-2012, s. 28.

46. Every emitter or participant registered in the system, except an emitter or a participant whose accounts have been suspended or revoked for a reason other than a failure to cover the GHG emissions of a covered establishment, may take part in an auction of emission units.

For that purpose, the emitter or participant must, at least 30 days before the date of the auction in which the emitter or participant wishes to take part, register with the Minister as a bidder by submitting the following information and documents:

(1) the emitter or participant's name, contact information and general account number;

(2) if the emitter or participant is not a natural person, the names of its account representatives;

(3) if the participant is a natural person, the person's social insurance number;

(4) the form of the financial guarantee that will be submitted pursuant to section 48.

In all cases, an emitter or a participant must, at least 40 days before the date of each auction, send the Minister an update of the following information:

(1) all information or documents required under section 7 or 7.2 concerning the identity, ownership, administration and structure of the emitter's or participant's establishment or enterprise;

(2) the existence of any business relationship referred to in section 9;

(3) the allocation of the purchasing limit among the related entities;

(4) the allocation of the holding limit among the related entities.

Any change made to the information referred to in subparagraphs 3 and 4 of the fourth paragraph less than 30 days before the date of the auction, results in the the emitter or participant being refused participation in the auction.

O.C. 1297-2011, s. 46; O.C. 1184-2012, s. 29; O.C. 902-2014, s. 28; O.C. 1089-2015, s. 20; O.C. 1125-2017, s. 32; I.N. 2017-12-31.

47. The Minister may refuse to register an emitter or a participant for any auction if, when applying for registration for the system or for a previous auction or sale by mutual agreement, the emitter or participant provided false or misleading information, omitted to disclose information required by this Regulation, or contravened a rule of procedure for the auction or sale by mutual agreement.

O.C. 1297-2011, s. 47.

48. Every bidder must, at least 12 days before the date of the auction, submit a financial guarantee to the Minister.

The guarantee must be valid for a period of at least 26 days following the date of the auction and must be provided in the form of

(1) bank transfer;

(1.1) an irrevocable letter of credit issued by a bank constituted under the Bank Act or by a financial services cooperative constituted under the Act respecting financial services cooperatives;

(2) a letter of guarantee issued by a bank constituted under the Bank Act or by a financial services cooperative constituted under the Act respecting financial services cooperatives;

(3) *(subparagraph revoked);*

(4) *(subparagraph revoked)*.

The guarantee must be submitted in Canadian dollars. However, in the case of an auction for which the required guarantee is held jointly with a partner entity in the United States, the guarantee may also be submitted in US dollars.

If the Minister has delegated the administration of the financial services for the system in accordance with section 46.13 of the Environment Quality Act (chapitre Q-2), the financial guarantee must be made out to the delegatee and or, where applicable, the delagatee's financial institution, and deposited with the delagatee or the financial institution.

O.C. 1297-2011, s. 48; O.C. 1184-2012, s. 30; O.C. 1138-2013, s. 12; O.C. 902-2014, s. 29; O.C. 1089-2015, s. 21; O.C. 488-2017, s. 26.

49. The auction of emission units consists of a single round of bidding, using sealed bids.

Except for the last lot of emission units, which may consist of a lesser quantity, the emission units are auctioned in lots of 1,000 emission units of the same vintage when the units belong to the vintage for a subsequent year, and in lots of 1,000 emission units of various vintages when the units belong to the vintage for the current or a previous year and are sold in accordance with section 54.

The minimum price of the emission units is set

(1) at $10 per emission unit, for auctions conducted in 2012;

(2) for auctions conducted in any year after 2012, the price is set annually using the minimum price set for the previous year increased by 5% and adjusted in the manner provided for in section 83.3 of the Financial Administration Act (chapter A-6.001), as per the equation below:

$MP_t = MP_{(t-1)} \times (1 + 0.05 + Ir)$

Where:

MP_t = Minimum price set for a year;

$MP_{(t-1)}$ = Minimum price set for the previous year;

Ir = Indexation rate.

If the auction is conducted jointly with a partner entity,

(1) the lots may contain emission units from each of the partner entities;

(2) the joint minimum price of the emission units is the higher, on the day of the auction, of the price set under the third paragraph and the price set by the partner entity, at the daily average exchange rate published on the website of the Bank of Canada on the day prior to the sale.

A bid submitted at less than the minimum price set in accordance with the third and fourth paragraphs will be refused.

O.C. 1297-2011, s. 49; O.C. 1184-2012, s. 31; O.C. 1138-2013, s. 13; O.C. 902-2014, s. 30; O.C. 1125-2017, s. 33.

50. During an auction, the account representative of a bidder may submit more than one bid, subject to the terms and conditions specified in the notice published in accordance with the second paragraph of section 45, stating the quantity of lots requested and the price offered per emission unit in dollars and whole cents, provided the maximum amount of all the bidder's bids does not exceed the amount of the guarantee submitted in accordance with section 48.

For the purposes of the first paragraph, the maximum amount of all a bidder's bids is calculated as follows:

(1) by determining, for each bid submitted by the bidder, the value of a lot by multiplying the price offered for the lot by the total quantity of bids submitted at that price or at a higher price;

(2) the maximum amount of a bidder's bids corresponds to the maximum value of the lots calculated under subparagraph 1.

The total quantity of emission units of the current or a prior vintage or of a vintage subsequent to the current year that may be purchased by the same bidder at each auction is, however, limited to:

(1) 25% of the units to be auctioned in the case of an emitter; and

(2) 4% of the units to be auctioned in the case of a participant.

Bidders that are related entities have an overall purchasing limit. However, the purchasing limit for a group of participants related to an emitter may not exceed 4%.

In accordance with subparagraph 3 of the first paragraph of section 9, the related entities must indicate to the Minister the allocation of the overall purchasing limit among the related entities, by percentage.

If the auction is conducted jointly with a partner entity, the bids must be submitted in the same currency as the financial guarantee submitted in accordance with section 48.

O.C. 1297-2011, s. 50; O.C. 1184-2012, s. 32; O.C. 1138-2013, s. 14; O.C. 902-2014, s. 31.

51. A bidder or participant must not disclose whether or not it is taking part in an auction, or any other confidential information relating to its participation in an auction, including:

(1) its identity;

(2) its bidding strategy;

(3) the amount of its bids and the quantity of emission units concerned;

(4) the financial information submitted to the Minister.

In addition, a bidder that retains the services of an advisor to develop its bidding strategy must ensure that the advisor does not disclose any of the information listed in the first paragraph and does not coordinate the bidding strategy of any other bidder.

O.C. 1297-2011, s. 51; O.C. 902-2014, s. 32; O.C. 1125-2017, s. 34.

52. At the close of the auction, when the total bids submitted by a bidder exceed that bidder's holding limit determined in accordance with sections 32 and 33 or its purchase limit determined in accordance with section 50, the Minister removes from the bidder's bids the quantity of excess lots, beginning with the lots awarded at the lowest price.

Notwithstanding the first paragraph, when an emitter's total bid exceeds its holding limit but the number of emission units and early reduction credits in its compliance account is below the quantity referred to in the third paragraph of section 32, the emitter's bids are accepted up to that quantity.

When a bid submitted by a bidder takes the maximum value of the bidder's bids to beyond the amount of its financial guarantee submitted in accordance with section 48, the Minister removes the excess lots from the bid.

The lots removed pursuant to the third paragraph are then re-evaluated based on the prices offered in the bids submitted by all the bidders, by descending value, beginning with the price immediately below the price in the bid that exceeded the bidder's guarantee. The lots are considered by the Minister to be new bids submitted by the bidder when, at a given price, the re-evaluation means that their maximum value does not exceed the amount of the financial guarantee submitted.

The Minister then awards emission units, beginning with the bidders that submitted the highest bids, until all available units have been awarded.

The final sale price per emission unit is, for all the emission units put up for auction, the lowest price bid for which the Minister awards units.

When more than 1 bid has been submitted at that price, and the total quantity of the bids is greater than the quantity of emission units available, the Minister divides the emission units between the bidders at that price

(1) by establishing the share of each bidder by dividing the quantity of emission units requested by each bidder by the total quantity of units bid at that price;

(2) by determining the number of emission units to be awarded to each bidder by multiplying the bidder's share by the quantity of emission units available, rounding down to the nearest whole number;

(3) when emission units remain to be awarded, by assigning a random number to each bidder and by awarding 1 emission unit per bidder, in ascending order of the numbers assigned, until all the emission units have been awarded.

When the auction is a joint auction, the final sale price is rounded off to the nearest cent of the reference currency used by the partner entities, using the application conversion rate.

O.C. 1297-2011, s. 52; O.C. 1184-2012, s. 33; O.C. 1138-2013, s. 15; O.C. 902-2014, s. 33.

53. Within 7 days after the results of the auction are sent to the bidders, every winning bidder must pay in full, by transfer, for the emission units awarded in accordance with section 52. If the financial guarantee has been submitted in the form provided for in subparagraph 1 of the second paragraph of section 48, the payment is withheld from the guarantee.

If the emission units are not paid for in full in the time prescribed under the first paragraph, the Minister withholds the amount owed from the financial guarantee provided in accordance with section 48. When more than one type of guarantee has been provided, the Minister uses the guarantees in the order set out in the second paragraph of that section.

Upon receiving payment from a winning bidder, made out to the Minister of Finance, or after applying all or part of a winning bidder's guarantee used, the Minister records the emission units awarded in the bidder's

general account and, in the case referred to in the second paragraph of section 52, in the winning bidder's compliance account.

All or part of a guarantee provided in accordance with section 48 that has not been used for the purposes of an auction is returned to the bidder.

The amounts collected during the auction are paid into the Green Fund established under the Act respecting the Ministère du Développement durable, de l'Environnement et des Parcs (chapter M-30.001).

O.C. 1297-2011, s. 53; O.C. 1184-2012, s. 34; O.C. 1138-2013, s. 16; O.C. 902-2014, s. 34; S.Q. 2017, c. 4, s. 265.

54. Emission units of the vintage of the current or a previous year that remain unsold after an auction may be put up for sale as soon as the final sale price of the emission units has been above the minimum price for 2 auctions.

Emission units of the vintage of a year subsequent to the year of the auction are put up for sale again when their vintage becomes the vintage of the current year.

However, the quantity of emission units put up for sale again in accordance with the first paragraph cannot exceed 25% of the quantity of emission units initially planned for the auction.

O.C. 1297-2011, s. 54; O.C. 1184-2012, s. 34; O.C. 902-2014, s. 35.

55. The Minister publishes a summary of the auction within 45 days on the website of the Ministère du Développement durable, de l'Environnement et des Parcs, including the following information:

(1) the names of the persons registered as bidders;

(2) the settlement price of the emission units;

(3) the total quantity and distribution of the units sold, in non-nominative form.

O.C. 1297-2011, s. 55.

DIVISION IV

SALE BY MUTUAL AGREEMENT

56. Only emitters registered in the system in accordance with this Regulation, having a covered establishment in Québec and not holding emission units in their general account that can be used to cover GHG emissions for the current compliance period are eligible for a sale of emission units by mutual agreement in accordance with this Division.

O.C. 1297-2011, s. 56; O.C. 1184-2012, s. 35.

57. The Minister organizes a sale of emission units by mutual agreement in a determined place or online, at most 4 times per year.

At least 60 days before a sale by mutual agreement, the Minister publishes a notice of sale by mutual agreement on the website of the Ministère du Développement durable, de l'Environnement et des Parcs and, if the Minister considers it appropriate, in a newspaper or other publication, including the following information:

(1) the place or Internet address, the date and the time of the sale by mutual agreement;

(2) the terms and conditions for registering as a purchaser;

(3) the form of an offer, and the procedure for submitting an offer;

(4) the procedure for the sale by mutual agreement;

(5) the number of emission units available for sale for each category;

(6) the settlement price for the units.

O.C. 1297-2011, s. 57; O.C. 1184-2012, s. 36.

58. Until 31 December 2020, the emission units placed in the reserve account are divided equally into 3 categories and are sold at the following prices, increased annually by 5% since 2014 and adjusted from that date in the manner provided for in section 83.3 of the Financial Administration Act (chapter A-6.001):

(1) for reserve emission units in Category A, $40 per emission unit;

(2) for reserve emission units in Category B, $45 per emission unit;

(3) for reserve emission units in Category C, $50 per emission unit.

As of 1 January 2021, the emission units referred to in the first paragraph form a single category and for the year 2021, their price is calculated as per the equation below:

$$PR_{2021} = PM_{2021} + M_{2021}$$

Where:

PR_{2021} = Price of the emission units of the reserve for 2021;

PM_{2021} = Minimum price of the emission units that are auctioned for the year 2021;

M_{2021} = Fixed amount for the year 2021, calculated according to the equation in the third paragraph.

The fixed amount referred to in the equation in the second paragraph is calculated according to the following equation:

$$M_{2021} = (PR_{c,\ 2020} - PM_{2020}) \times (1 + T_{i2021})$$

Where:

M_{2021} = Fixed amount for the year 2021;

$PR_{c,\ 2020}$ = Price of the emission units in the category C reserve, for the year 2020;

PM_{2020} = Minimum price of the emission units auctioned for the year 2020;

T_{i2021} = Annual adjustment rate for the year 2021, calculated in the manner set out in section 83.3 of the Financial Administration Act (chapter A-6.001).

As of 1 January of the year 2022, the price of emission units in the reserve is calculated according to the following equation:

$$PR_t = PM_t + M_{t-1} \times (1+T_i)$$

Where:

PR_t = Price of the emission units in the reserve for the year *t*;

t = Current year;

PM_t = Minimum price of the emission units auctioned for the year *t*;

M_{t-1} = Fixed amount of the year preceding year *t*, calculated using the equation provided for in the fifth paragraph;

T_i = Annual adjustment rate for the current year, calculated in the manner set out in section 83.3 of the Financial Administration Act (chapter A-6.001).

The fixed amount referred to in the equation provided for in the fourth paragraph is calculated using the following equation:

$$M_{t-1} = (PR_{t-1} - PM_{t-1}) \times (1 + T_i)$$

Where:

M_{t-1} = Fixed amount for the year preceding year *t*;

T = Current year;

PR_{t-1} = Price of the emission units in the reserve for the year *t*-1;

PM_{t-1} = Price of the emission units auctioned for the year *t*-1;

T_i = Annual adjustment rate for the current year, calculated in the manner set out in section 83.3 of the Financial Administration Act (chapter A-6.001).

Despite the second and fourth paragraphs, beginning on 1 January 2021, the emission units are not necessarily sold at the price calculated pursuant to those paragraphs, but at the higher of the price set by partner entities and the price calculated pursuant to those paragraphs, according to the daily average exchange rate of the Bank of Canada published on its website, in force on the fifth business day preceding the date of publication of that price on the Department's website. That publication is done yearly on the first business day of December.

O.C. 1297-2011, s. 58; O.C. 902-2014, s. 36; O.C. 1125-2017, s. 35.

59. Every emitter that wishes to purchase emission units at a sale by mutual agreement must, at least 30 days before the sale, register with the Minister as a purchaser by submitting the following information and documents:

(1) the emitter's name, contact information and compliance account number;

(2) the names of the emitter's account representatives;

(3) a financial guarantee in Canadian dollars, valid for a period of at least 26 days following the date of the sale, in one of the forms referred to in the second paragraph of section 48.

In all cases, an emitter must, at least 40 days before the date of each sale by mutual agreement, send the Minister an update of the following information:

(1) all information or documents required under section 7 or 7.2 concerning the identity, ownership, administration and structure of the emitter's establishment or enterprise;

(2) the existence of any business relationship referred to in section 9;

(3) the allocation of the holding limit among the related entities.

Any change is made to the information referred to in subparagraph 3 of the third paragraph less than 30 days before the date of the sale by mutual agreement, results in the the emitter being refused participation in the sale.

O.C. 1297-2011, s. 59; O.C. 1184-2012, s. 37; O.C. 1138-2013, s. 17; O.C. 902-2014, s. 37; O.C. 1089-2015, s. 22; O.C. 1125-2017, s. 36.

60. The Minister may refuse to register an emitter for a sale by mutual agreement if, when applying for registration for the system or for a previous sale by mutual agreement or auction, the emitter provided false or misleading information, omitted to disclose information required by this Regulation, or contravened a rule of procedure for the sale by mutual agreement or auction.

O.C. 1297-2011, s. 60.

60.1. The sale by mutual agreement takes place in a single round, using sealed offers.

The emission units are put on sale in lots of 1,000 units of the same category.

During a sale by mutual agreement, an emitter's account representative may submit more than 1 offer, in Canadian dollars and in the form and using the procedure set out in the notice published in accordance with the second paragraph of section 57, indicating the number of lots requested in each category.

When the total offers submitted by a purchaser exceed the quantity of emission units put on sale or the purchaser's holding limit determined in accordance with sections 32 and 33 or exceed the value of the financial guarantee submitted in accordance with subparagraph 3 of the first paragraph of section 59, the Minister removes from the purchaser's offers the quantity of excess lots, beginning with the offers made at the lowest price.

O.C. 1184-2012, s. 38; O.C. 1138-2013, s. 18.

61. At the close of the sale by mutual agreement, the Minister sells the reserve emission units by allocating the units from categories A, B and C, in that order.

When the total number of offers to purchase for a category of reserve emission units is equal to or below the quantity of emission units available, the Minister allocates the emission units among the purchasers based on the offers received.

However, when the total of the offers to purchase for a given category is in excess of the quantity of emission units available, the Minister allocates the emission units

(1) by establishing the share of each purchaser by dividing the quantity of emission units requested in their offer to purchase by the total of the offers to purchase for that category; and

(2) by determining the number of emission units to be assigned to each purchaser by multiplying each purchaser's share by the quantity of emission units available, rounding down to the nearest whole number;

(3) when emission units remain to be awarded, by assigning a random number to each purchaser and by awarding 1 emission unit per purchaser, in ascending order of the numbers assigned, until all the emission units have been awarded.

O.C. 1297-2011, s. 61; O.C. 1184-2012, s. 39; O.C. 902-2014, s. 38.

62. Within 7 days after the results of the sale are sent to the purchasers, every purchaser must pay in full, by transfer, for the emission units awarded in accordance with section 61. If the financial guarantee submitted in accordance with subparagraph 3 of the first paragraph of section 59 was in the form provided for in subparagraph 1 of the second paragraph of section 48, the payment is withheld from the guarantee.

If the emission units are not paid for in full in the time prescribed under the first paragraph, the Minister withholds the amount owed from the financial guarantee provided in accordance with subparagraph 3 of the first paragraph of section 59. When more than one type of guarantee has been provided, the Minister uses the guarantees in the order set out in the second paragraph of section 48.

Upon receiving payment from a purchaser, made out to the Minister of Finance, or after applying all or part of a purchaser's guarantee, the Minister records the emission units sold in the purchaser's compliance account.

The amounts collected during a sale by mutual agreement are paid into the Green Fund established under the Act respecting the Ministère du Développement durable, de l'Environnement et des Parcs (chapter M-30.001).

O.C. 1297-2011, s. 62; O.C. 1184-2012, s. 40; O.C. 1138-2013, s. 19; S.Q. 2017, c. 4, s. 266.

63. All or part of a guarantee provided in accordance with subparagraph 3 of the first paragraph of section 59 that has not been used for the purposes of a sale by mutual agreement is returned to the purchaser.

O.C. 1297-2011, s. 63; O.C. 1184-2012, s. 41.

64. Emission units that remain unsold after a sale by mutual agreement are retained for a sale at a later date.

O.C. 1297-2011, s. 64.

64.1. The Minister publishes a summary of the sale by mutual agreement within 45 days on the website of the Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs, including the following information:

(1) the names of the persons registered as purchasers;

(2) the settlement price of the emission units;

(3) the total quantity and distribution of the units sold, in non-nominative form.

O.C. 1138-2013, s. 20.

CHAPTER III

EARLY REDUCTION CREDITS

65. Reductions in GHG emissions made during the eligibility period starting on 1 January 2008 and ending on 31 December 2011 are eligible for early reduction credits.

The period during which the reductions are recorded, hereafter referred to as the reduction period, must correspond to the 4 full calendar years of the eligibility period or must have started on 1 January 2009, 2010 or 2011 and ended without interruption on 31 December 2011.

The reference period used to determine reductions in GHG emissions runs from 1 January 2005 to 31 December 2007, inclusively.

O.C. 1297-2011, s. 65.

66. Every emitter referred to in the first paragraph of section 2 that is required to cover its GHG emissions starting with the compliance period starting on 1 January 2013 is eligible for early reduction credits if the reductions

(1) result directly from an action or decision of the emitter and began during the eligibility period determined in the first paragraph of section 65;

(2) are made in one of the emitter's covered establishments;

(3) reduce the GHG emissions that the emitter is required to cover pursuant to section 19;

(4) belong to and can be demonstrated by the emitter;

(5) are calculated using the same calculation method and the same factors for each of the years 2005 to 2011;

(6) represent at least 1 metric tonne CO_2 equivalent;

(7) do not result from a decrease in production or the closure of an establishment, or from an increase in GHG emissions at another establishment located in Québec or elsewhere;

(8) are voluntary, meaning that they were not made in response to a legislative or regulatory provision, a permit or another type of authorization;

(9) are permanent and irreversible;

(10) are additional, meaning that they meet the following conditions:

(a) the average annual GHG emissions of the establishment during the reduction period are below those of the reference period;

(b) the average intensity compared to at least 1 reference unit referred to in Table B of Part I of Appendix C during the reduction period, calculated using equation 66-1 below, is below the average intensity for the reference period, calculated using equation 66-2:

Equation 66-1

$$I_{\text{Reduction } j} = \frac{\sum_{i=n}^{2011} GHG_{ij}}{\sum_{i=n}^{2011} P_{ij}}$$

Equation 66-2

$$I_{\text{Re}\,ference\ j} = \frac{\sum_{i=2005}^{2007} GHG_{i\,j}}{\sum_{i=2005}^{2007} P_{i\,j}}$$

Where:

$I_{Reduction\ j}$ = Average intensity of GHG emissions for reference unit *j* during the reduction period;

$I_{Reference\ j}$ = Average intensity of GHG emissions for reference unit *j* during the reference period;

j = Reference unit for the establishment referred to in Table B of Part I of Appendix C;

GHG_{ij} = GHG emissions of the establishment, relating to the production or use of reference unit *j* for year *i*, in metric tonnes CO_2 equivalent;

i = Year;

n = First year of the reduction period;

P_{ij} = Annual quantity of reference units *j* produced or used by the establishment for year *i*;

(11) are verifiable; and

(12) have not been credited or financed, in whole or in part, under another cap-and-trade system for GHG emission allowances or a reduction program for GHG emissions.

However, reductions in GHG emissions resulting from on-site transportation activities and the sequestration of GHG emissions are not eligible for early reduction credits.

O.C. 1297-2011, s. 66; O.C. 1184-2012, s. 42.

67. In addition to the conditions set out in sections 65 and 66, to be eligible for early reduction credits, a reduction resulting from a project to substitute a low-GHG fuel for a fuel must also meet one of the following conditions:

(1) the average purchase cost of the substitute fuel or combustible paid by the emitter during the reduction period must be higher than the average cost of the fuel substituted during the reduction period;

(2) the emitter must have made an investment, other than an equipment maintenance investment, to modify or replace equipment in order to substitute the fuel during the eligibility period.

O.C. 1297-2011, s. 67.

68. An emitter that wishes to be issued early reduction credits must send the Minister, not later than 31 May 2013, an application containing the following information and documents:

(1) the emitter's name, contact information and account numbers;

(2) a description of the activities pursued at the emitter's establishment where the reductions have occurred;

(3) a description of the reduction project and proof that it meets the conditions set out in sections 65 to 67;

(4) the dates of the reduction period during which the reductions in GHG emissions occurred;

(5) the quantity of the GHG emission reduction, in metric tonnes CO_2 equivalent, calculated using one of the following methods:

(a) one of the calculation methods provided for in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

(b) a mass balance calculation method, or a method recognized by the industry and meeting the requirements of the ISO 14064-2 standard;

(6) all the information and documents used to calculate GHG emissions in accordance with paragraph 5;

(7) a verification report on the project and the reductions, carried out by an organization accredited to ISO 14065 by a member of the International Accreditation Forum under an ISO 17011 program, confirming a reasonable level of assurance under the ISO 14064-3 standard that the reduction meets the conditions of this Chapter;

(8) the information needed to calculate the maximum quantity of early reduction credits provided for in section 69;

(9) the signature of the chief officer of the emitter and the date of the application.

O.C. 1297-2011, s. 68; O.C. 1184-2012, s. 43.

69. The maximum quantity of early reduction credits that may be issued to an emitter that meets the requirements of this Chapter is calculated using equations 69-1 to 69-5:

Equation 69-1

$$ERC_{\max} = N_Y \times \sum_{j=1}^{k} ((E_{\text{Re}\,ference(j)} - E_{\text{Re}\,duction(j)}) \times P_j)$$

Where:

ERC_{max} = Maximum quantity of early reduction credits that may be issued;

N_Y = Number of calendar years included in the reduction period;

k = Total number of reference units of the establishment referred to in Table B of Part I of Appendix C;

j = Reference unit;

$E_{Reference\ (j)}$ = Average annual GHG emissions resulting from the production or use of reference unit *j* during the reference period, calculated using equation 69-2, in metric tonnes CO_2 equivalent;

$E_{Reduction\ (j)}$ = Average annual GHG emissions resulting from the production or use of reference unit *j* during the reduction period, calculated using equation 69-3, in metric tonnes CO_2 equivalent;

P_j = - 1 if $P_{Reference\ (j)} \leq P_{Reduction\ (j)}$;

- ($P_{Reduction\ (j)}$ /$P_{Reference\ (j)}$ if $P_{Reference\ (j)} > P_{Reduction\ (j)}$;

Where: $P_{Reference\ (j)}$ = Average annual quantity of reference units *j* produced or used during the reference period, calculated using equation 69-4;

$P_{Reduction\ (j)}$ = Average annual quantity of reference units *j* produced or used during the reduction period, calculated using equation 69-5.

Equation 69-2

$$E_{\text{Re}\,ference_{(j)}} = \frac{\sum_{i=2005}^{2007} E_{ij}}{3}$$

Where:

$E_{Reference\ (j)}$ = Average annual GHG emissions resulting from the production or use of reference unit *j* during the reference period, in metric tonnes CO_2 equivalent;

$E_{i\,j}$ = GHG emissions resulting from the production or use of reference unit *j* for year *i*, in metric tonnes CO_2 equivalent;

j = Reference unit;

i = Each year included in the reference period, namely 2005, 2006 or 2007;

Equation 69-3

$$E_{\mathrm{Re}duction(j)} = \frac{\sum_{i=m}^{2011} E_{ij}}{n}$$

Where:

$E_{Reduction\ (j)}$ = Average annual GHG emissions resulting from the production or use of reference unit *j* during the reduction period, in metric tonnes CO_2 equivalent;

$E_{i\,j}$ = GHG emissions resulting from the production or use of reference unit *j* for year *i*, in metric tonnes CO_2 equivalent;

i = Each year included in the reduction period, namely 2008, 2009, 2010 and 2011;

j = Reference unit;

m = Year in which the reduction period begins;

n = Number of consecutive years in the reduction period;

Equation 69-4

$$P_{\mathrm{Re}\,ference_{(j)}} = \frac{\sum_{i=2005}^{2007} P_{ij}}{3}$$

Where:

$P_{Reference\ (j)}$ = Average annual quantity of reference units produced or used during the reference period;

$P_{i\,j}$ = Quantity of reference units produced or used during year *i*;

i = Each year included in the reference period, namely 2005, 2006 or 2007;

j = Reference unit;

Equation 69-5

$$P_{\text{Reduction}(j)} = \frac{\sum_{i=m}^{2011} P_{ij}}{n}$$

Where:

$P_{Reduction\ (j)}$ = Average annual quantity of reference units produced or used during the reduction period;

$P_{i\ j}$ = Quantity of reference units produced or used during year *i*;

i = Each year included in the reduction period, namely 2008, 2009, 2010 or 2011;

j = Reference unit;

m = Year in which the reduction period begins;

n = Number of consecutive years in the reduction period.

O.C. 1297-2011, s. 69.

70. The Minister issues, to every emitter that meets the conditions of this Chapter, a quantity of early reduction credits corresponding to the lesser of

(1) the quantity calculated in accordance with section 69; and

(2) the quantity corresponding to the reductions that meet the conditions of this Chapter.

The credits are issued to the emitter's general account by the Minister not later than 14 January 2014.

O.C. 1297-2011, s. 70; O.C. 1184-2012, s. 44.

CHAPTER IV

OFFSET CREDITS

O.C. 1184-2012, s. 45.

70.1. The Minister keeps and publishes, on the website of the Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs, a public register of registered offset credit projects that contains the names and professional contact information of promoters, the name of the promoter's enterprise, information related to the project submitted with the application for registration, project reports and verification reports submitted in accordance with this Chapter, and information on project status.

O.C. 1138-2013, s. 21; O.C. 902-2014, s. 39.

70.2. GHG emission reduction projects referred to in a protocol appearing in Appendix D, that began on or after 1 January 2007, are eligible for the issue of offset credits.

Only projects implemented in Québec are eligible for the issue of offset credits under the first paragraph, except if otherwise provided for in a protocol.

Subject to any specific period provided for in a protocol, an offset credit project must be conducted during a period of not more than 10 consecutive years. The period constitutes, for the purposes of this Chapter, a crediting period for the issue of offset credits, also called a "crediting period" , during which the project remains eligible until the expiry of the period.

At the expiry of that period, the promoter may, in accordance with this Chapter, request the renewal of the offset credit project, for the period applicable to this type of project, when the project still meets the conditions of section 70.3.

For the purposes of this Chapter, an offset credit project is considered to begin on the date of the first reductions in GHG emissions resulting from the project.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 40; O.C. 1125-2017, s. 37.

70.3. An offset credit project must meet the following conditions:

(1) it must be carried out by a promoter registered for the system in accordance with section 70.4, and the reductions in GHG emissions must result directly from an action or decision by the promoter;

(2) it must be carried out in accordance with the applicable protocol appearing in Appendix D and meet the specified conditions;

(3) the reductions in GHG emissions resulting from the project must belong to the promoter, and the promoter must be able to demonstrate that fact;

(4) the reductions in GHG emissions must occur only within the boundaries of the project site and with regard to the GHG sources, sinks and reservoirs targeted by the project;

(5) the reductions in GHG emissions must be permanent and irreversible;

(6) the reductions in GHG emissions must be additional, that is that they meet the following conditions:

(a) they must result from a project that is voluntary, that is that it is not being carried out, at the time or registration of renewal, in response to a legislative or regulatory provision, a permit or other type of authorization, an order made under an Act or regulation, or a court decision;

(b) they must result from a project that goes beyond the current practices described in the applicable protocol for the project;

(7) the reductions in GHG emissions for which offset credits are requested have not already received credit under this Regulation or another GHG emission reduction program;

(8) the project must take place in a territory and geographic zone covered by the applicable protocol;

(9) the GHG emission reductions must amount to at least 1 metric tonne CO_2 equivalent;

(10) the GHG emission reductions must be calculated in accordance with the methods prescribed in the applicable protocol listed in Appendix D, taking into account all adjacent GHG sources, sinks and reservoirs;

(11) the GHG reductions resulting from the project must not be wholly or partly compensated by increases in GHG emissions occurring outside the boundaries of the project;

(12) the reduced GHG emissions must be verifiable, that is that they can be objectively assessed by a verifier in accordance with this Chapter;

(13) the activities carried out under the project must meet all the applicable requirements for the type of project and the place where it is carried out.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 41.

70.4. Only an emitter or participant person domiciled in Québec, in the case of a natural person, or having an establishment in Québec, in other cases, may act as the promoter of an offset credit project.

O.C. 1184-2012, s. 45.

70.5. A promoter wishing to be issued offset credits for a project must, not later than 18 months after the project begins but not exceeding the date of submission of the first report for the project referred to in the

third paragraph, apply to the Minister for the project to be registered in the register of offset credit projects by submitting the promoter's name and professional contact information, the name of the promoter's enterprise, the promoter's account numbers and the following project information:

(1) where applicable, the name and contact information of the person responsible for the promoter's activities;

(2) the title and a summary description of the project;

(3) the protocol applicable to the project, referred to in Appendix D;

(4) if the application is for a new project or is an application for renewal;

(5) if the application is for a single project and, if so, the location of the project site;

(6) if the application is for an aggregation of projects and, if so, the number of projects involved;

(7) an estimate of the annual and total GHG emissions to be reduced in accordance with this Regulation and the applicable protocol, in metric tonnes CO_2 equivalent;

(8) the duration of the project and the estimated project commencement date;

(9) the signature of the promoter and the date of the application for registration as well as a declaration attesting that the information provided is accurate.

In the case of a project to reduce GHG emissions that began before a protocol applicable to that type of project was included in Appendix D, the promoter must send an application for registration to the Minister in the 3 years following the date of coming into force of such a protocol.

Not later than 18 months after the project begins, the promoter must submit a first project report to the Minister covering the first project year, complying with sections 70.14 to 70.19 and including, in addition to those stipulated in section 70.14, the following information and documents:

(1) *(subparagraph revoked);*

(2) the title and a detailed description of the project;

(3) the protocol applicable to the project, listed in Appendix D;

(4) *(subparagraph revoked);*

(5) a description of the places where the project is carried out, including the geographic boundaries and the latitude and longitude of each project site;

(6) for each site, the GHG sources, sinks and reservoirs targeted by the project;

(7) when the environmental impacts have been assessed, a copy of the assessment and its conclusions;

(8) *(subparagraph revoked);*

(9) a copy of any authorization required for the project;

(10) a demonstration that the project meets the conditions of section 70.3, including a copy of any relevant document;

(11) *(subparagraph revoked);*

(12) a data surveillance and management plan meeting the requirements of the protocol applicable to the project;

(13) a description of the measures taken to ensure compliance with the requirements of this Regulation;

(14) *(subparagraph revoked);*

(15) *(subparagraph revoked)*.

In the case of a promoter referred to in the second paragraph, the first project report under the third paragraph must be sent to the Minister within 6 months from the date of registration and must cover the whole period that began on or after 1 January 2007 and ended on the date of registration.

O.C. 1184-2012, s. 45; O.C. 1138-2013, s. 22; O.C. 902-2014, s. 42; O.C. 1125-2017, s. 38.

70.6. *(Revoked).*

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 43; O.C. 1125-2017, s. 39.

70.7. A promoter may carry out an aggregation of the projects of the same type on several sites for various members of the aggregation when each project meets the conditions of sections 70.2 and 70.3 and of the protocol applicable to the project.

The application for registration referred to in the first paragraph of section 70.5 must, in such a case, also include the list of members of the aggregation for which the project is carried out and their contact information, and the first project report for the aggregation of offset credit projects must include

(1) for each project, the information and documents referred to in the third paragraph of section 70.5;

(2) *(subparagraph revoked);* and

(3) a declaration signed by each member party to the aggregation attesting that the promoter is duly designated to carry out the project and authorizing the issue of the offset credits to the promoter for the aggregation.

The project commencing first is considered to be the reference project for the application, to the aggregation of projects, of the time limits for renewal set out in section 70.10 and for the project report referred to in section 70.14.

The provisions of this Regulation concerning offset credit projects apply, with the necessary modifications, to an aggregation of projects.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 44; O.C. 1125-2017, s. 40.

70.8. A promoter may add a project to an aggregation of projects after it has been registered if the project meets the conditions set out in the first paragraph of section 70.7. The promoter must, in such as case, submit to the Minister the information and documents referred to in the second paragraph of that section that relate to the additional project, and the project report submitted immediately after the project is added must include, for the added project, the information and documents referred to in the third paragraph of section 70.5.

Every project added to an aggregation of projects is subject to the same time limits as those determined for the aggregation in accordance with the third paragraph of section 70.7 with respect to renewal and the project report.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 45; O.C. 1125-2017, s. 41.

70.9. *(Revoked).*

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 46.

70.10. Every promoter wishing to renew an offset credit project must, not more than 18 months prior to the end date for the current project but not less than 9 months prior to that date, send to the Minister an application for renewal including the information and documents referred to in sections 70.3 to 70.8.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 47.

70.11. Where an application for registration is submitted for a project in accordance with the first paragraph of section 70.5, the Minister registers the project in the register of offset credit projects.

O.C. 1184-2012, s. 45; O.C. 1138-2013, s. 23; O.C. 902-2014, s. 48.

70.12. Subject to any specific period prescribed in a protocol appearing in Appendix D, the reductions in GHG emissions resulting from an offset credit project must begin not later than 2 years after the project is registered, on pain of removal from the register.

The promoter must implement the offset credit project in accordance with this Regulation, the applicable protocol listed in Appendix D and the first project report submitted in accordance with the third paragraph of section 70.5.

The promoter must also use any device, system or other equipment required under the protocol applicable to the project, and ensure that they are maintained in good working order, work reliably for the duration of the project, and are calibrated in the manner and at the frequency specified by the equipment manufacturer or, where applicable, by the protocol applicable to the project.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 49; O.C. 1125-2017, s. 42.

70.13. Every promoter must also, for each project, record the following information annually in a register:

(1) the information referred to in the first paragraph of section 70.14;

(2) any information concerning the geographic boundaries of the project and any GHG source, sink or reservoir concerned by the project;

(3) a calculation of emissions under the baseline scenario for the project, emissions during project implementation and emission reductions, along with the related documentation;

(4) the quantity and type of fuels used and any data measured, sampled or used to calculate emissions under the baseline scenario for the project, emissions during project implementation and emission reductions, for each emission source, and the type of process and equipment used;

(5) where applicable, the point of origin and chain of traceability of the documents required by the protocol applicable to the project;

(6) information concerning any chemical analysis conducted, any results, and any documentation relating to the testing of any equipment and sources used to calculate emissions under the baseline scenario, emissions during project implementation and emission reductions from the project;

(7) any data or documentation that must be recorded under the protocol applicable to the project.

O.C. 1184-2012, s. 45; O.C. 1125-2017, s. 43.

70.13.1. Every promoter must, when forwarding the first project report provided for in the third paragraph of section 70.5, send the first issuance request for offset credits to the Minister.

The promoter may then ask the Minister to issue offset credits at any time during the crediting period. The promoter must, however, send the application not later than 6 months following the end of the issuance period concerned.

Every issuance request for offset credits must include all the information and documents required by the protocol applicable to the project. In addition, it must include a declaration from the promoter attesting

(1) that the promoter is the sole owner of the GHG emission reductions resulting from the project; if several parties are involved in the project, a copy of an agreement indicating that the parties have transferred their rights with respect to the reductions to the promoter must be included; and

(2) that the promoter has not applied for credits for the GHG emission reductions targeted by the project under another GHG emission reduction program, and will not make such an application once the project is registered.

The term "issuance period" means the period of time during a crediting period when the promoter may apply for the issue of offset credits for which such an application has not yet been made.

O.C. 1125-2017, s. 44.

70.14. Every issuance request for offset credits must be submitted with a project report covering the most recent issuance period and include the following information and documents:

(1) the promoter's name and contact information and, where applicable, the names and contact information of the members party to the aggregation;

(2) the start and end dates for the issuance period covered by the report;

(3) the quantity of GHG emission reductions during the issuance period, calculated using the methods set out in the applicable protocol, in metric tonnes CO_2 equivalent, and all the information and documents used for the calculation;

(4) the calculation, surveillance and monitoring methods for the data used, and the data monitored;

(5) the quantity of GHG emission reductions eligible for the issue of offset credits according to the conditions of this Regulation and the protocol applicable to the project, in metric tonnes CO_2 equivalent;

(6) information or document required by the protocol applicable to the project;

(7) a demonstration that the project has been carried out in accordance with this Regulation;

(8) a declaration signed by the promoter attesting that

(a) the project is still being carried out in conformity with the rules applicable to the type of project and the place where it is carried out;

(b) the promoter still owns the GHG emission reductions for which the offset credits are requested;

(c) the GHG emission reductions have not been used to apply for credits under another program; and

(d) the information and documents provided are complete and accurate;

(8.1) any information relating to financial assistance received for the project under a GHG emission reduction program;

(9) a comparison with the previous project report and, where applicable, a description of any changes made;

(10) the date of the report.

In the case of an aggregation of offset credit projects, a single project report may be submitted by the promoter, but the report must contain the information and documents referred to in the second paragraph for each project.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 50; O.C. 1125-2017, ss. 45 and 65; I.N. 2017-12-31.

70.15. Every project report referred to in section 70.14 must be accompanied by a verification report conducted by a verification organization accredited under ISO 14065 by a member of the International Accreditation Forum in Canada or the United States and according to an ISO 17011 program, with respect to the sector of activity for the project.

In addition, the promoter must entrust the verification of the project report to a verification organization and a verifier designated by that organization that, in addition,

(1) has not acted, in the 3 preceding years, as a consultant for the purpose of developing the project or calculating the reductions in GHG emissions attributable to the project for the promoter or, as applicable, for one of the member parties to the aggregation;

(2) *(subparagraph revoked);*

(3) has not verified more than 6 consecutive project reports for the project on behalf of the promoter; and

(4) when the promoter wishes to have the project report verified by a verification organization or a verifier other than one that verified the report for the preceding year, the organization or verifier must not have verified the report for the project during the 3 previous years.

For the verification, the promoter and, as applicable, the members party to the aggregation must give the verifier access to all the information needed and to the places where the project is carried out.

Despite the first paragraph, until 31 December 2017, a verification report of a project report may be conducted by a verification organization in the process of being accredited, on the condition that the organization receives accreditation in the year following the verification of the project.

If the organization fails to receive accreditation within the time prescribed in the fourth paragraph, the promoter must, not later than 6 months after the end of the prescribed time, send the Minister a new verification report on its project report, conducted by an accredited organization in accordance with the first paragraph.

No offset credits may be issued for the year covered by a verification report of a project report until the organization has been accredited.

O.C. 1184-2012, s. 45; O.C. 1138-2013, s. 24; O.C. 902-2014, s. 51.

70.15.1. In addition to the requirements of the standards ISO 14064- 3 and ISO 14065 concerning conflicts of interest, the promoter must ensure that none of the following situations exists between the promoter, its officers, the verification organization and the members of the verification team:

(1) during the 3 years preceding the year of issue, one of the members of the verification team was employed by the promoter;

(2) a member of the verification team or a close relative of that member has personal ties with the promoter or one of its officers;

(3) during the 3 years preceding the year of issue, one of the members of the verification team or one of the subcontractors who took part in the verification provided the promoter with one of the following services:

(a) the design, development, commissioning or maintenance of a data inventory or data management system for GHG emissions from the establishment or facility of the promoter or, where applicable, for data on electricity or fuel transactions;

(b) the development of GHG emission factors or other data that were used for quantification or for the issuance request for offset credits under this Regulation;

(c) consultation concerning GHG emissions reductions, and in particular the design of an energy efficiency or renewable energy project and the assessment of assets relating to greenhouse gas sources;

(d) the preparation of manuals, guides or procedures connected with the promoter's GHG emissions reports under the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

(e) consultation in connection with a greenhouse gas emission allowances market, including

i. brokerage, with or without registration, while acting as a promoter or subscriber on behalf of the promoter;

ii. advice concerning the suitability of a GHG emissions transaction;

iii. the holding, purchase, sale, negotiation or withdrawal of emission allowances referred to in the second paragraph of section 46.6 of the Environment Quality Act (chapter Q-2);

(f) a consultation in the field of health and safety and environmental management, including the consultation leading to ISO 14001 certification;

(g) actuarial consulting, bookkeeping or other consulting services relating to accounting documents or financial statements;

(h) a service connected with the management systems of data related to an offset credit project covered by the GHG emissions verification process used in an offset credit project;

(i) an internal audit of GHG emissions;

(j) a service provided in connection with litigation or an inquiry into GHG emissions;

(k) a consultation for a GHG emissions reduction project in accordance with this Regulation, including any notice concerning the project's regulatory compliance;

(4) the person at the verification organization responsible for carrying out an internal review of the verification process, in accordance with the standards ISO 14065 and ISO 14064-3, has previously provided a verification or other service referred to in subparagraph 3 to the promoter during the issue year or the current year.

The existence of one of the situations described in the first paragraph is considered to be a conflict of interest that invalidates the verification report.

For the purposes of this section, a close relative of a member of the verification team is that person’s spouse, child, spouse’s child, mother or father, mother’s or father’s spouse, child’s spouse or spouse’s child’s spouse.

O.C. 1125-2017, s. 46.

70.16. The verification of the project report must

(1) be conducted in accordance with ISO 14064-3 and according to procedures that allow a reasonable assurance level within the meaning of that standard to be obtained; and

(2) include at least one project site visit, confirming the implementation of the project and the proper operation of the measurement and monitoring instruments, by the verifier designated by the verification organization and accompanied by the promoter and, where applicable, the member party to the aggregation concerned, during each verification for each place concerned by the project.

O.C. 1184-2012, s. 45; O.C. 1125-2017, s. 47.

70.17. In addition to the information prescribed by ISO 14064-3 and ISO 14065, the verification report referred to in section 70.15 must include the following information and documents:

(1) the name and contact information of the verification organization and of the verifier designated by the organization to conduct the verification and, where applicable, of the members of the verifier's team;

(2) the name and contact information of the member of the International Accreditation Forum that accredited the verification organization, and the date of the accreditation;

(2.1) a description of the activities executed by the verifier to ensure the project complies with this Regulation, along with the verification plan and all the exchanges of information between the promoter and the verifier for project verification purposes;

(3) the dates of the periods during which the verification was conducted, and the date of any project site visits;

(4) an assessment of the accuracy, completeness and conformity of the project report;

(5) a list of any errors, omissions or inaccuracies noted by the verifier at the time of the project verification or project report or relating to the data, information or methods used, including the following elements:

(a) the date on which the promoter was informed of the errors, omissions or inaccuracies;

(b) a description of any errors, omissions or inaccuracies;

(c) where applicable, a description of the action taken by the promoter to correct any errors, omissions or inaccuracies and the date on which the action was taken;

(d) for errors, omissions or inaccuracies that cannot be corrected, an assessment of the impact of each of them on the quantity of GHG emission reductions eligible for the issue of offset credits;

(6) *(paragraph revoked);*

(7) where applicable, any correction made to the project report following the verification;

(8) the total quantity of CO_2 equivalent GHG emission reductions over the period of the project report and the quantity of GHG emission reductions eligible for the issue of offset credits under the conditions of this Regulation and the protocol applicable to the project, in metric tonnes CO_2 equivalent;

(9) the conclusions of the verification concerning the accuracy and reliability of the project report and its conformity with the conditions of this Regulation;

(10) a declaration by the verification organization and the verifier that the verification was conducted in accordance with this Regulation.

In the case of an aggregation of offset credit projects, a single verification report may be submitted by the promoter, but the report must contain the information and documents referred to in the first paragraph for each project, and the verification of each project.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 52; O.C. 1125-2017, s. 48.

70.18. The promoter must, before submitting a project report to the Minister in accordance with section 70.14, correct any error, omission or inaccuracy identified during the verification, if correction is possible.

O.C. 1184-2012, s. 45; O.C. 1125-2017, s. 49.

70.19. A verification report of a project report is deemed positive if the verifier can attest with reasonable assurance that the project has been implemented in accordance with this Regulation.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 53; O.C. 1125-2017, s. 50.

70.20. Subject to any specific provision set out in a protocol appearing in Appendix D, following the receipt of an issuance request along with of a project report that has a positive verification result and meets the conditions of this Regulation, the Minister places in the general account of the promoter of the project an offset credit for each metric tonne CO_2 equivalent of 97% of the eligible GHG emission reductions reported in accordance with subparagraph 5 of the first paragraph of section 70.14 for the issuance period, rounded down to the nearest whole number.

The offset credits corresponding to the remainder of the GHG emission reductions for the issuance period are placed in the Minister's environmental integrity account.

If the verification report is negative or the project is not in conformity with the conditions of this Regulation, no offset credit is issued to the promoter by the Minister for the issuance period.

O.C. 1184-2012, s. 45; O.C. 1138-2013, s. 25; O.C. 902-2014, s. 54; O.C. 1125-2017, ss. 51 and 65; I.N. 2017-12-31.

70.21. The Minister may require the promoter to replace any offset credit issued for a project under the first paragraph of section 70.20 in the following cases:

(1) where, because of omissions, inaccuracies or false information in the information and documents provided by the promoter, the GHG emission reductions for which the offset credits were issued were not eligible;

(2) where offset credits were applied for under another program for the same reductions as those covered by the application for credits under this Regulation;

(3) where the project was not carried out in accordance with the provisions of this Regulation.

The Minister notifies the promoter who must, within 30 days of receiving the notice, place in its general account an emission allowance for each illegitimate offset credit that must be replaced.

The Minister, after being notified that the promoter has placed the credits in the general account, deducts the replacement emission allowances designated by the promoter and places them in the invalidation account to be extinguished. The Minister also transfers the number of offset credits paid into the environmental integrity account for the project under the second paragraph of section 70.20, in proportion to the number of offset credits replaced by the promoter, into the invalidation account to be extinguished.

Without prejudice to the Minister's other recourses against the promoter, if the promoter has failed to surrender the replacement emission allowances on the expiry of the 30-day period, the Minister replaces the illegitimate offset credits by withdrawing an equivalent number of credits from the environmental integrity account and placing them in the invalidation account to be extinguished.

When the promoter fails to replace illegitimate offset credits, the project is removed from the register of offset credit projects.

O.C. 1184-2012, s. 45; O.C. 902-2014, s. 55; O.C. 1089-2015, s. 23; O.C. 1125-2017, s. 52.

70.21.1. If a partner entity cancels offset credits held in the account of an emitter or a participant registered pursuant to this Regulation, the Minister notifies the emitter or participant of his intention to cancel the offset credits, in accordance with the second paragraph of section 46.12 of the Environment Quality Act (chapter Q-2). After the offset credits concerned have been cancelled, they are transferred into the Minister's invalidation account to be surrendered to the partner entity.

If a partner entity cancels offset credits that were used for emitter compliance purposes, the Minister notifies the emitter, who must, within 6 months after receiving the notice, replace the cancelled offset credits by placing an equivalent number of emission allowances in its compliance account. The emission allowances are deducted in the order prescribed in section 21 and placed in the Minister's retirement account to be extinguished. The cancelled offset credits recorded in the Minister's retirement account are transferred into the Minister's invalidation account and surrendered to the partner entity.

If the emission allowances required under the second paragraph are not surrendered by the emitter within the prescribed time, the provisions of sections 22 and 23 apply, with the necessary modifications, and the year of issue of the emission allowances is not taken into account.

O.C. 902-2014, s. 56.

70.22. Any change to the information and documents provided in accordance with this Chapter must be communicated to the Minister within 10 days.

O.C. 1184-2012, s. 45.

TITLE IV

ADMINISTRATIVE PROVISIONS, OFFENCES AND FINAL PROVISIONS

O.C. 1297-2011, title IV; O.C. 1184-2012, s. 46.

CHAPTER I

MONETARY ADMINISTRATIVE SANCTIONS

O.C. 1297-2011, c. I; O.C. 1184-2012, s. 47.

71. A monetary administrative sanction of $500 in the case of a natural person and $2,500 in all other cases may be imposed on any person who

(1) contravenes section 4, 8, 9, 11 or 12, the second paragraph of section 13, section 14.1, the second paragraph of section 18, section 18.1, 18.2 or 18.4, the second paragraph of section 19, the second paragraph of section 19.0.1, the sixth paragraph of section 26, the fourth paragraph of section 26.3, the fifth paragraph of section 27.1, the second paragraph of section 33 or 51, section 53, 62, 70.5 or 70.13, the first and second paragraphs of section 70.13.1, section 70.14, the first, third or fifth paragraph of section 70.15 or section 70.22;

(2) in contravention of this Regulation, refuses or neglects to send notification or provide any other information, study, research or expertise, information, report, summary, plan or other document, or who fails

to comply with the time limits for providing such documents, in cases where no monetary administrative sanction is otherwise provided for.

O.C. 1297-2011, s. 71; O.C. 1184-2012, s. 47; O.C. 1138-2013, s. 26; O.C. 902-2014, s. 57; O.C. 1089-2015, s. 24; O.C. 1125-2017, s. 53.

72. A monetary administrative sanction of $1,000 in the case of a natural person and $5,000 in all other cases may be imposed on any person who contravenes subparagraph 1 of the first paragraph of section 18, section 32, the second or third paragraph of section 50 or 70.12, or the second paragraph of section 70.15.

O.C. 1297-2011, s. 72; O.C. 1184-2012, s. 47; O.C. 902-2014, s. 58.

73. A monetary administrative sanction of $2,500 in the case of a natural person and $10,000 in all other cases may be imposed on any person who

(1) contravenes section 7 or 17, the first or third paragraph of section 19, the first paragraph of section 19.0.1, section 19.1 or 20, the first paragraph of section 21, the first or second paragraph of section 23.1 or section 24, section 28, 29, 30 or 31, the second paragraph of section 37, the first paragraph of section 51 or the second paragraph of section 70.21 or 70.21.1;

(2) fails to place emission allowances or emission units pursuant to subparagraph 2 of the first paragraph of section 18, or the fourth paragraph of section 22 or 41, in cases where no other administrative sanction may be applied.

O.C. 1184-2012, s. 47; O.C. 902-2014, s. 59; O.C. 1089-2015, s. 25; O.C. 1125-2017, s. 54.

CHAPTER I.1

OFFENCES

O.C. 1184-2012, s. 47.

74. A person who contravenes section 4, 8, 9, 11 or 12, the second paragraph of section 13, section 14.1, the second paragraph of section 18, section 18.1, 18.2 or 18.4, the second paragraph of section 19, the second paragraph of section 19.0.1, the sixth paragraph of section 26, the fourth paragraph of section 26.3, the fifth paragraph of section 27.1, the second paragraph of section 33 or 51, section 53, 62, 70.5, 70.13 or 70.14, the first, third or fifth paragraph of section 70.15 or section 70.22 is guilty of an offence and is liable,

(1) in the case of a natural person, to a fine of $3,000 to $100,000; and

(2) in other cases, to a fine of $10,000 to $600,000.

A person who contravenes any other requirement of this Regulation is guilty of an offence and liable, in cases where no penalty is otherwise provided for in this Chapter or in the Environment Quality Act (chapter Q-2), in the case of a natural person, to a fine of $3,000 to $100,000 and, in other cases, to a fine of $10,000 to $600,000.

O.C. 1297-2011, s. 74; O.C. 1184-2012, s. 47; O.C. 1138-2013, s. 27; O.C. 902-2014, s. 60; O.C. 1089-2015, s. 26; O.C. 1125-2017, s. 55.

75. A person who contravenes subparagraph 1 of the first paragraph of section 18, section 32, the second or third paragraph of section 50 or 70.12 or the second paragraph of section 70.15 is guilty of an offence and is liable,

(1) in the case of a natural person, to a fine of $6,000 to $250,000; and

(2) in other cases, to a fine of $25,000 to $1,500,000.

O.C. 1297-2011, s. 75; O.C. 1184-2012, s. 47; O.C. 902-2014, s. 61.

75.1. A person who contravenes section 7 or 17, the first or second paragraph of section 24, the second paragraph of section 37, the fourth paragraph of section 41, the first paragraph of section 51 or the second paragraph of section 70.21 is guilty of an offence and is liable,

(1) in the case of a natural person, to a fine of $10,000 to $500,000 or, despite article 231 of the Code of Penal Procedure (chapter C-25.1), to imprisonment for a maximum term of 18 months; and

(2) in other cases, to a fine of $40,000 to $3,000,000.

O.C. 1184-2012, s. 47; O.C. 902-2014, s. 62; O.C. 1089-2015, s. 27.

75.2. A person who communicates false or misleading information to the Minister for the purposes of this Regulation is guilty of an offence and is liable,

(1) in the case of a natural person, to a fine of $5,000 to $500,000 or, notwithstanding article 231 of the Code of Penal Procedure (chapter C-25.1), to imprisonment for a maximum term of 18 months; and

(2) in other cases, to a fine of $15,000 to $3,000,000.

O.C. 1184-2012, s. 47.

75.3. A person who contravenes section 28, 29, 30 or 31 or who directly or indirectly engages or participates in any transaction, series of transactions or trading method relating to an emission allowance, or in any act, practice or course of conduct is guilty of an offence if the person knows, or ought reasonably to know, that the transaction, series of transactions, trading method, act, practice or course of conduct

(1) creates or contributes to create a misleading appearance of trading activity in, or an artificial price for, an emission allowance; or

(2) perpetrates a fraud on any person.

A person referred to in the first paragraph is liable,

(1) in the case of a natural person, to a fine of $10,000 to 500,000 or, despite article 231 of the Code of Penal Procedure (chapter C-25.1), to imprisonment for a maximum term of 18 months; and

(2) in other cases, to a fine of $40,000 to $3,000,000.

O.C. 1184-2012, s. 47; O.C. 902-2014, s. 63.

75.4. An emitter who fails to cover GHG emissions in accordance with subparagraph 2 of the first paragraph of section 18, the first or third paragraph of section 19, the first paragraph of section 19.0.1, section 19.1 or 20, the first paragraph of section 21, the fourth paragraph of section 22, the first or second paragraph of section 23.1 or the second paragraph of section 70.21.1 is guilty of an offence for each metric tonne of GHG not covered and is liable, for each metric tonne, to a fine of $3,000 to $600,000.

O.C. 1184-2012, s. 47; O.C. 902-2014, s. 64; O.C. 1089-2015, s. 28; O.C. 1125-2017, s. 56.

CHAPTER I.2

OTHER SANCTIONS

O.C. 1125-2017, s. 57.

75.5. The Minister may suspend or cancel the registration for the system of a person other than an emitter referred to in section 2, when the Minister has reasonable grounds to believe that the integrity of the system is threatened.

O.C. 1125-2017, s. 57.

CHAPTER II

FINAL

76. *(Omitted).*

O.C. 1297-2011, s. 76.

APPENDIX A

(s. 2)

Sectors of activity targeted by the cap-and-trade system for greenhouse gas emission allowances

Sector	Type of activity	6-digit NAICS* code beginning with:
Mining, quarrying and oil and natural gas extraction	Extraction of naturally occurring minerals	21
Electric power generation, transmission and distribution	Generation of bulk electric power, transmission from generating facilities to distribution centres, and/or distribution to end users	2211
Natural gas distribution	Distribution, through a system of mains, of natural or synthetic gas to consumers, also including the trade of the sale of natural gas by marketers and brokers, that arrange the sale of natural gas over distribution systems operated by others	2212 488990 (natural gas regasification or liquefaction)
Steam and airconditioning production for industrial purposes	Production and distribution of steam and heated or cooled air for industrial purposes	22133
Manufacturing	Mechanical or physical transformation of materials or substances into new products	31, 32 or 33
Pipeline transportation	Transportation of crude oil, refined products and natural gas, gas fields, processing plants and local distribution systems	486 488990 (natural gas regasification or liquefaction)

* The numbers indicated for each category of industrial or commercial activity mentioned in Appendices A and C correspond to the codes assigned by the North American Industry Classification System (**NAICS**). The description of each category of activity found in the document “North American Industry Classification

System, Canada 2007" published by Statistics Canada (Catalogue no. 12-501-XIE2007001, 2007, ISBN 0-662-44519-8) applies for the purposes of this Regulation.

O.C. 1297-2011, Sch. A; O.C. 1184-2012, s. 48; O.C. 1089-2015, s. 29; O.C. 1125-2017, s. 58.

APPENDIX B

(Revoked)

O.C. 1297-2011, Sch. B; O.C. 1184-2012, s. 49.

APPENDIX B.1

(s. 37)

Partner entities

(1) State of California

The emission allowances issued by the State of California pursuant to the document California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, Title 17, California Code of Regulations, Sections 95800 and seq. are deemed to be equivalent to the emission allowances issued pursuant to this Regulation, based on the correspondence indicated in the following table for each type of emission allowance:

	Québec	**California**
Types of emission allowance (each having a value corresponding to 1 metric tonne CO_2 equivalent)	Emission unit	California Greenhouse Gas Emissions Allowance (CA GHG Allowance)
	Early reduction credot	
	Offset credit	- ARB Offset Credit
		- Early Action Offset Credit

(2) Province of Ontario

The emission allowances issued by the Province of Ontario pursuant to the document O. Reg. 144/16: The Cap and Trade Program, are deemed to be equivalent to the emission allowances issued pursuant to this Regulation, based on the correspondence indicated in the following table for each type of emission allowance:

	Québec	**Ontario**
Types of emission allowance (each having a value corresponding to 1 metric tonne CO_2 equivalent)	Emission unit	Ontario emission allowance
	Early reduction credit	Ontario early reduction credit
	Offset credit	Ontario offset credit

D. 1184-2012, a. 50; D. 1137-2013, a. 1; D. 1181-2013; O.C. 1125-2017, s. 59.

APPENDIX C

(ss. 39, 40 and 41)

Part I

Table A Activities eligible for the allocation without charge of greenhouse gas emission units

Activity	6-digit NAICS* code beginning with
Mining and quarrying (except oil and gas)	212
Electric power generation sold under a contract signed prior to 1 January 2008, that has not been renewed or extended after that date, in which the sale price is fixed for the duration of the contract, with no possibility of adjusting the price to take into account the costs relating to the implementation of a cap-and-trade system for greenhouse gas emission allowances	2211
Acquisition, for the consumption of the enterprise or for sale in Québec, of power generated in another Canadian province or territory or in a state in which the government has established a cap-and-trade system for greenhouse gas emission allowances targeting power generation, but has not signed an agreement referred to in section 46.14 of the Environment Quality Act (chapter Q-2)	
Steam and air-conditioning supply for industrial purposes	22133
Manufacturing	31, 32 or 33

Table B Reference units[1]

Sector of activity of the establishment	**Type of activity**	**Reference unit**
Aluminum	Baked cathode production	Metric tonne of baked cathodes removed from furnace
Aluminum	Aluminum production	Metric tonne of liquid aluminum (leaving potroom)
Aluminum	Baked anode production	Metric tonne of baked anodes removed from furnace
Aluminum	Aluminum hydroxide production and secondary activities	Metric tonne of aluminum hydroxide hydrate expressed as AI_2O_3 equivalent calculated at the precipitation stage
Aluminum	Calcinated coke production	Metric tonne of calcinated coke
Other[2]	Dismembering	Metric tonne of treated matter
Other[2]	Beer production	Hectolitre of beer
Other[2]	Alcohol production	Kilolitre of alcohol
Other[2]	Graphite electrode manufacturing	Metric tonne of graphite electrodes
Other[2]	Gypsum panel manufacturing	Cubic metre of gypsum panel
Other[2]	Sugar production	Metric tonne of sugar
Other[2]	Glass container manufacturing	Metric tonne of glass
Other[2]	Steam production (for sale to a third person)	Metric tonne of steam

Other[2]	Production of semi-conductors and other electronic components	Square metre of silicon substrate associated with deep reactive ion etching Square metre of silicon substrate associated with an etching process other than deep reactive ion etching Square metre of silicon substrate associated with plasma enhanced chemical vapor deposition
Other[2]	Carbone dioxide production	Metric tonne of carbon dioxide
Other[2]	Oilseed processing	Metric tonne of processed oilseeds
Lime	Lime production	Metric tonne of calcic lime and metric tonne of calcic lime kiln dust sold Metric tonne of dolomitic lime and metric tonne of dolomitic lime kiln dust sold
Chemical	Ethanol production	Kilolitre of ethanol
Chemical	Tire production	Metric tonne of tires
Chemical	Fabrication of rigid foamed insulation	Board foot of rigid insulation
Chemical	Production of titanium dioxide ($Ti O_2$)	Metric tonne of titanium pigment equivalent (raw material)
Chemical	Production of linear alkylbenzene (LAB)	Metric tonne of LAB
Chemical	Production of catalyzer	Metric tonne of catalyzer (including additives)

Chemical	Production of hydrogen	Metric tonne of hydrogen
Chemical	Production of purified terephtalic acid (PTA)	Metric tonne of PTA
Chemical	Production of paraxylene	Metric tonne of xylene and toluene Metric tonne of steam sold to a third person
Chemical	Production of sodium silicate	Metric tonne of sodium silicate
Chemical	Production of sulphur (refinery gas)	Metric tonne of sulphur
Chemical	Polyethylene terephthalate (PET) production	Metric tonne of polyethylene therephthalate (PET)
Cement	Cement production	Metric tonne of clinker and metric tonne of mineral additives (gypsum and limestone) added to the clinker produced
Electricity	Electricity production	Megawatt-hour (MWH)
Electricity	Acquisition of electricity produced outside Québec for the consumption of the enterprise or for sale in Québec	Megawatt-hour (MWH)
Electricity	Steam production (except steam produced by cogeneration)	Metric tonne of steam
Metallurgy	Steel production (steelworks)	Metric tonne of steel (slabs, pellets or ingots)
Metallurgy	Wrought steel production	Metric tonne of wrought steel
Metallurgy	Steel pellet or slab rolling	Metric tonne of rolled steel
Metallurgy	Copper anode production	Metric tonne of copper anodes

		Metric tonne of recycled secondary materials
Metallurgy	Copper cathode production	Metric tonne of recycled secondary materials
Metallurgy	Iron ore concentrate pellet reduction	Metric tonne of reduced iron pellets
Metallurgy	Copper cathode production	Metric tonne of copper cathodes
Metallurgy	Ferrosilicon production	Metric tonne of ferrosilicon (50% and 75% concentration)
Metallurgy	Lead production	Metric tonne of lead
Metallurgy	Metal powder manufacturing	Metric tonne of saleable iron powder and steel powder
Metallurgy	Titanium dioxide (TiO_2) slag manufacturing	Metric tonne of TiO_2 slag cast at the reduction furnaces
Metallurgy	Silicon metal production	Metric tonne of silicon metal
Metallurgy	Zinc production	Metric tonne of iron load Metric tonne of cathodic zinc
Mining and pelletization	Pellet production	Metric tonne of flux pellets Metric tonne of standard pellets Metric tonne of low silica flux pellets Metric tonne of direct reduction pellets Metric tonne of blast furnace pellets Metric ton of intermediate

		pellets
Mining and pelletization	Iron concentrate production	Metric tonne of iron concentrate
Mining and pelletization	Nickel concentrate production	Metric tonne of nickel produced
Mining and pelletization	Nickel concentrate and copper concentrate production	Metric tonne of nickel and copper produced
Pulp and paper	Pulp and paper production	Metric tonne of various air-dried saleable products
Pulp and paper	Production of wood-fibre based products	Metric tonne of various air-dried saleable products
Pulp and paper	Production of pulp and paper and wood-fibre based products	Metric tonne of various air-dried saleable products
Pulp and paper	Steam production	Metric tonne of saleable various air-dried products of each of the establishments common to a steam network
Refining	Oil refining	Kilolitre of total crude oil refinery load

[1] An establishment pursuing a type of activity that is not listed in this table must use the reference unit declared in its emissions report under the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15).

[2] These reference units must be used when the type of activity is not exercised in another sector of activity specifically referred to in this Table.

Part II

Calculation methods for the allocation of emission units without charge

(A) Definition

For the purposes of the calculation methods,

(1) “covered establishment as of 2013” means an establishment for which the GHG reported emissions for 2009, 2010 or 2011 are equal to or exceed the emissions threshold;

(2) “covered establishment after 2013” means an establishment for which the verified GHG emissions for 2012, 2013, 2014 or 2015 are equal to or exceed the emissions threshold;

(3) “covered establishment as of 2018” means an establishment for which the verified GHG emissions for 2016, 2017 or 2018 are equal to or exceed the emissions threshold;

(4) “establishment covered prior to 2021” means an establishment referred to in paragraph 1, 2 or 3, or an establishment referred to in section 2.1 before 2021 that is still targeted by the system in 2021;

(5) “covered establishment as of 2021” means an establishment for which the verified GHG emissions for 2019 or for any of the subsequent years are equal to or exceed the emissions threshold.

(B) Categories of GHG emissions by origin

GHG emissions are divided into 3 categories on the basis of their origin: fixed process emissions, combustion emissions and other emissions.

Fixed process emissions are the CO_2 emissions resulting from a fixed chemical reaction process for production purposes that generates CO_2, from chemically-bonded carbon in the raw material, or from the carbon used to remove an undesirable component from the raw material where there is no substitutable raw material.

Combustion emissions are the emissions resulting from the exothermic reaction of any fuel, except CO_2 emissions attributable to the combustion of biomass or biomass fuels.

Other emissions are the emissions that do not meet the criteria for fixed process emissions or combustion emissions.

(C) Establishments and new facilities considered on a sectoral basis for the allocation of emission units without charge

For the purpose of calculating the number of emission units that may be allocated without charge to an emitter, establishments and new facilities pursuing the following activities are considered on a sectoral basis:

(1) lime production;

(2) cement production;

(3) prebaked anode production and aluminum production using prebaked anode technologies until 2020;

(4) prebaked anode production and aluminum production using prebaked anode technologies except a side-worked prebaked anode technology as of 2021.

(D) Calculation methods

For the application of the methods set out in this Part, the result of an emission intensity calculation is rounded off to four significant figures and the result of an emission unit allocation calculation is rounded up to the nearest whole number.

For the application of the calculation methods set out in this Part, the GHG emissions data used are

(1) for the years 2007 to 2011, the data for reported emissions, minus the emissions referred to in the second paragraph of section 6.6 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15)

(2) for the years 2012 and following, the verified emissions.

Subject to the fifth paragraph, the total quantity of GHG emission units allocated without charge to an emitter referred to in section 2 is calculated in accordance with the following methods:

(1) in the case of an establishment covered as of 2013 that is not considered on a sectoral basis and that possesses GHG emissions data for 2007-2010, using equations 1-1 and 2-1 to 2-9;

(1.1) in the case of an establishment covered as of 2013 that is not considered on a sectoral basis and that does not possess GHG emissions data for 2007-2010, using equations 1-1 and 4-1 to 4-8;

(2) in the case of an establishment covered as of 2013 that is considered on a sectoral basis and that possesses GHG emissions data for 2007-2010, using equations 1-1 and 3-1 to 3-10;

(2.1) in the case of an establishment covered as of 2013 that is considered on a sectoral basis and that does not possess GHG emissions data for 2007-2010, using equations 1-1, 5-1 and 5-2;

(3) in the case of an establishment covered after 2013 that is not considered on a sectoral basis, using equations 1-1 and 4-1 to 4-8;

(4) in the case of an establishment covered after 2013 that is considered on a sectoral basis, using equations 1-1 and 5-1 for the years 2013 to 2014, using equation 5-2 for the years 2015 to 2017 and using equation 5-3 for the years 2018 to 2020;

(5) in the case of a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses all the GHG emissions data for years d-2 to d, using equations 1-1 and 4-9 to 4-14;

(6) in the case of a covered establishment as of 2018 that is not considered on a sectoral basis, that does not possess all the GHG emissions data for years d-2 to d, and for which, as the case may be,
(a) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are all available, using equations 1-1 and 4-15 to 4-20;
(b) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are not all available, using equations 1-1, 4-21 and 4-22, until the data are all available;

(7) in the case of a covered establishment as of 2018 that is not considered on a sectoral basis, that does not possess a determined reference unit, and for which, as the case may be,
(a) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are all available, using equations 1-1 and 4-23 and 4-24;
(b) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are not all available, using equations 1-1, 4-21 and 4-22, until those data are all available;

(8) in the case of an establishment covered prior to the year 2021 that is not considered on a sectoral basis, using equations 7-1 and 8-1 to 8- 10 for the years 2021 to 2023;

(9) in the case of an establishment covered prior to the year 2021 that produces cement, prebaked anodes or aluminum by using a prebaked anode technology other than the side-worked prebaked anode technology, using equations 7-1 and 9-1 for the years 2021 to 2023;

(10) in the case of a covered establishment as of 2021 that is not considered on a sectoral basis and that possesses all the GHG emissions data for years d-2 to d, using equations 7-1 and 10-1 to 10-4;

(11) in the case of a covered establishment as of 2021 that is not considered on a sectoral basis, that does not possess all the GHG emissions data for years d-2 to d, and for which, as the case may be,
(a) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are all available, using equations 7-1 and 11-1 to 11-4;
(b) the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the year in which the establishment became operational, are not all available, using equations 7-1, 11-5 and 11-6, until the data are all available;

(12) in the case of a covered establishment as of 2021 that does not possess a determined reference unit and for which, as the case may be,
(a) the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are all available, using equations 7-1, 12-1 and 12-2;
(b) the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are not all available, using equations 7-1, 11-5 and 11-6, until the data are all available;

(13) in the case of an establishment that produces liquid aluminum by using a side-worked prebaked anode technology, using equations 7-1 and 8-1 to 8-7 for the years 2021 to 2023;

(14) in the case of an establishment in the lime sector, using equations 7-1 and 8-11 to 8-20 for the years 2021 to 2023;

(15) in the case of an establishment that produces steel (slabs, pellets or ingots), metallic silicon, ferrosilicon, reduced iron pellets or titanium dioxide (TiO_2), using equations 7-1 and 6-15 for the years 2021 to 2023;

(16) in the case of a copper refinery, using equations 7-1 and 6-16 for the years 2021 to 2023.

Subject to the fifth paragraph, the total quantity of GHG emission units allocated without charge to an emitter referred to in section 2.1 is calculated in accordance with the following methods:

(1) in the case of a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and that possesses all the GHG emissions data for years *e*-3 to *e*-1, using equations 1-1 and 4-25 to 4-30 for the years 2018 to 2020;

(2) in the case of a covered establishment referred to in section 2.1 that is not considered on a sectoral basis, that does not possess all the GHG emissions data for years *e*-3 to *e*-1 and for which, as the case may be,
(a) the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equations 1-1 and 4-31 to 4-36 for the years 2018 to 2020;
(b) the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equations 1-1 and 4-37 and 4-38 for the years 2018 to 2020, until the data are all available;

(3) in the case of a covered establishment referred to in section 2.1 that does not possess a determined reference unit, that is not considered on a sectoral basis and for which, as the case may be,
(a) the GHG emissions data, for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equations 1-1, 4-39 and 4-40 for the years 2018 to 2020;
(b) the GHG emissions data, for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equations 1-1 and 4-37 and 4-38 for the years 2018 to 2020, until the data are all available;

(4) in the case of a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and that possesses all the GHG emissions data for years *e*-3 to *e*-1, using equations 7-1 and 13-1 to 13-4 for the years 2021 to 2023;

(5) in the case of a covered establishment referred to in section 2.1 that is not considered on a sectoral basis, that does not possess all the GHG emissions data for years *e*-3 to *e*-1 and for which, as the case may be,
(a) the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equations 7-1 and 14-1 to 14-4 for the years 2021 to 2023;
(b) the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equations 7-1, 14-5 and 14-6 for the years 2021 to 2023, until the data are all available;

(6) in the case of a covered establishment referred to in section 2.1 that does not possess a determined reference unit and for which, as the case may be,
(a) the GHG emissions data, for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equations 7-1, 15-1 and 15-2 for the years 2021 to 2023;

(b) the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equations 7-1, 14-5 and 14-6 for the years 2021 to 2023, until the data are all available;

In the special cases provided for below, the emission units allocated without charge to an emitter are calculated:

(1) in the case of an establishment producing aluminum anodes using Söderberg anode technology after 2014, using equation 2-9 but replacing the factor "$I2020_i$" by the factor "$I2020_{sod}$" calculated using equation 6-1;

(2) in the case of an establishment producing alumina from bauxite, using equation 6-2;

(3) in the case of an establishment producing rigid foamed insulation, using equation 2-1 for 2013 and 2014, calculating the factor "I_{2013}" using equations 6-3 to 6-6, and using equation 6-7 for 2015 to 2020;

(4) in the case of an establishment producing zinc and generally using hydrogen as a fuel to supply its furnaces, using equations 6-8 to 6-10 for the years 2013 to 2020 and using equations 6-10.1 and 6-10.2 for the years 2021 to 2023;

(5) in the case of a new facility and the production of a new reference unit, using the methods in subdivision 6.5;

(6) in the case of an establishment covered after 2013 whose production replaces all or part of the production of another establishment or facility of the same emitter in Québec that closed after 1 January 2008, using the methods in subdivision 6.6;

(7) in the case of an enterprise who acquires, for the consumption of the enterprise or for sale in Québec, power generated in another Canadian province or territory or in a state in which the government has established a cap-and-trade system for greenhouse gas emission allowances targeting power generation, but has not signed an agreement referred to in section 46.14 of the Environment Quality Act (chapter Q-2), using equation 6-11 for the years 2013 to 2020 and using equation 6-11.1 for the years 2021 to 2023;

(8) in the case of a copper foundry, using equations 6-12 and 6-13 for the years 2013 to 2020 and using equation 6-14 for the years 2021 to 2023.

To be considered in the calculation of emission units allocated without charge, any change to the information provided for in subparagraph 4 of the first paragraph of section 7 and provided by the emitter when registering for the system must be sent to the Minister, together with any supporting document, not later than 1 June following the end of the compliance period affected by the change.

Any change sent to the Minister within the time limit prescribed in the fifth paragraph applies from the beginning of the compliance period referred to in that paragraph.

1. Calculation of the total quantity of GHG emission units allocated without charge for an establishment for the years 2013 to 2020

Equation 1-1 Calculation of the total quantity of GHG emission units allocated without charge for an establishment

$$A_{establishment\ i\ j} = \sum_{j=1}^{m} A_{i\ j}$$

Where:

$A_{establishment\ i\ j}$ = Total quantity of GHG emission units allocated without charge for an establishment for year *i* for all types of activities *j* in Table B of Part I of this Schedule for that establishment;

i = Each year included in the period 2013 to 2020;

j = Each type of activity at the establishment;

m = Total number of types of activity at the establishment;

$A_{i\ j}$ = Number of GHG emission units allocated without charge by type of activity *j* for year *i*, calculated using equations 2-1, 2-9, 3-1, 3-10, 4-1, 4-8, 4-9, 4-15, 4-21, 4-23, 4-25, 4-31, 4-37, 4-39, 5-1, 5-2, 5-3, 6-2, 6-7, 6-8, 6-9 and 6-10.3.

2. Covered establishment as of 2013 that is not considered on a sectoral basis

(2.1) Calculation method for the years 2013 and 2014

Equation 2-1 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment that is not considered on a sectoral basis for the years 2013 and 2014

$$A_{ij} = I2013_j \times P_{Rij}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge for type of activity *j* at an establishment for year *i*;

i = Each year included in the first compliance period, namely 2013 and 2014;

j = Type of activity;

$I2013_j$ = Intensity target of GHG emissions attributable to the type of activity at the establishment for the years 2013 and 2014 calculated using equation 2-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 2-2 Calculation of the intensity target of GHG emissions by type of activity at an establishment that is not considered on a sectoral basis for the years 2013 and 2014

$$I2013_j = I_{FPav\,j} + RxI_{Cav\,j} + I_{Oav\,j}$$

Where:

$I2013_j$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for the years 2013 and 2014, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

$I_{FPav\ j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* at the establishment for the period 2007-2010, calculated using equation 2-3, in metric tonnes CO_2 equivalent per reference unit;

R = Multiplication factor for GHG combustion emissions intensity at the establishment calculated using equations 2-4 and 2-5 or, in the case of an establishment producing pulp and paper described by NAICS code 3221 or 321216, a value of 1;

$I_{Cav\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for the period 2007-2010, calculated using equation 2-6, in metric tonnes CO_2 equivalent per reference unit;

$I_{O\ av\ j}$ = Average intensity of other GHG emissions attributable to type of activity *j* at the establishment for the period 2007-2010, calculated using equation 2-7, in metric tonnes CO_2 equivalent per reference unit.

Equation 2-3 Average intensity GHG fixed process emissions by type of activity at an establishment that is not considered on a sectoral basis for the period 2007-2010

$$I_{FP\,av\,j} = \frac{\sum_{i=2007}^{2010} GHG\ FP_{i\,j}}{\sum_{i=2007}^{2010} P_{Ri\,j}}$$

Where:

$I_{FPav\ j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* at the establishment for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

i = Each year included in the period 2007-2010;

j = Type of activity;

GHG $FP_{i\ j}$ = GHG fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 2-4 Calculation of the intensity multiplication factor for combustion emissions at an establishment that is not considered on a sectoral basis

$$R = 0.80 \times GFR + (1\text{-}GFR)$$

Where:

R = Multiplication factor for GHG combustion emissions intensity at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at the establishment, calculated using equation 2-5.

Equation 2-5 Calculation of the GFR ratio for an establishment that is not considered on a sectoral basis

$$GFR = \frac{\sum_{i=2007}^{2010} GHG\ GFR_i}{\sum_{i=2007}^{2010} GHG\ C_i}$$

Where:

GFR = Ratio between total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at the establishment;

i = Each year included in the period 2007-2010;

GHG GFR $_{i}$ = GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C *i* = Total GHG combustion emissions attributable to the use of fuel at the establishment during year *i*, in metric tonnes CO_2 equivalent.

Equation 2-6 Average intensity of GHG combustion emissions by type of activity at an establishment that is not considered on a sectoral basis for the period 2007-2010

$$I_{C\,av\,j} = \frac{\sum_{i=2007}^{2010} GHG\,C_{i\,j}}{\sum_{i=2007}^{2010} P_{Ri\,j}}$$

Where:

$I_{Cav\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

GHG C*i j* = GHG combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 2-7 Average intensity of other GHG emissions by type of activity at an establishment that is not considered on a sectoral basis for the period 2007-2010

$$I_{O\,av\,j} = \frac{\sum_{i=2007}^{2010} GES\ O_{i\,j}}{\sum_{i=2007}^{2010} P_{Ri\,j}}$$

Where:

$I_{O\ av\ j}$ = Average intensity of other GHG emissions attributable to type of activity *j* at the establishment for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

i = Each year included in the period 2007-2010;

j = Type of activity;

GHG $O_{\ i\ j}$ = Other GHG emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 2-8 Calculation of the intensity target of GHG emissions by type of activity at an establishment that is not considered on a sectoral basis for year 2020

$$I_{2020\,j} = I_{FP\ 2020\,j} + I_{C\ 2020\,j} + I_{O\ 2020\,j}$$

Where:

$I_{2020\ j}$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for year 2020, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

$I_{FP\ 2020\ j}$ = Intensity of fixed process emissions calculated for year 2020 for type of activity *j*, using equation 2-8.1;

$I_{C\ 2020\ j}$ = Intensity of combustion emissions calculated for year 2020 for type of activity *j*, using equation 2-8.2;

$I_{O\ 2020\ j}$ = Intensity of other emissions calculated for year 2020 for type of activity *j*, using equation 2-8.3.

Equation 2-8.1 Calculation of the intensity target of fixed process emissions by type of activity at an establishment that is not considered on a sectoral basis for year 2020

$$I_{FP\ 2020\,j} = I_{FP\ av\,j}$$

Where:

$I_{FP\ 2020\ j}$ = Intensity of fixed process emissions calculated for year 2020 for type of activity *j*;

j = Type of activity;

$I_{FP\ av\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for the period 2007-2010, calculated using equation 2-3, in metric tonnes CO_2 equivalent per reference unit.

Equation 2-8.2 Calculation of the intensity target of combustion emissions by type of activity at an establishment that is not considered on a sectoral basis for year 2020

$$I_{C\ 2020\,j} = R \times min[(0.95)I_{C\ min\,j};\ (0.90)I_{C\ av\,j}]$$

Where:

$I_{C\ 2020\ j}$ = Intensity of combustion emissions calculated for year 2020 for type of activity *j*;

j = Type of activity;

R = Intensity multiplication factor for combustion emissions at the establishment calculated using equations 2-4 and 2-5 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

min = Minimum value, representing the lesser of the 2 elements calculated;

0.95 = Proportion corresponding to 95% of the minimum intensity of combustion emissions;

$I_{C\ min\ j}$ = Minimum annual intensity of combustion emissions attributable to type of activity *j* at the establishment for the years 2007 to 2010 inclusively, in metric tonnes CO_2 equivalent per reference unit;

0.90 = Proportion corresponding to 90% of the average intensity of combustion emissions;

$I_{C\ av\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for the years 2007 to 2010, calculated using equation 2-6, in metric tonnes CO_2 equivalent per reference unit.

Equation 2-8.3 Calculation of the intensity target of other emissions by type of activity at an establishment that is not considered on a sectoral basis for the year 2020

$$I_{O\ 2020\ j} = min[(0.95)I_{O\ min\ j};\ (0.90)I_{O\ av\ j}]$$

Where:

$I_{O\ 2020\ j}$ = Intensity of other emissions calculated for the year 2020 for type of activity *j*;

j = Type of activity;

min = Minimum value, representing the lesser of the 2 elements calculated;

0.95 = Proportion corresponding to 95% of the minimum intensity of other emissions;

$I_{O\ min\ j}$ = Minimum annual intensity of other emissions attributable to type of activity *j* at the establishment for the years 2007 to 2010 inclusively, in metric tonnes CO_2 equivalent per reference unit;

0.90 = Proportion corresponding to 90% of the average intensity of other emissions;

$I_{O\ av\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for the years 2007 to 2010, calculated using equation 2-7, in metric tonnes CO_2 equivalent per reference unit.

(2.2) Calculation method for the years 2015-2020

Equation 2-9 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment that is not considered on a sectoral basis for the years 2015-2020

$$A_{i\ j} = \frac{(6 - x)\ I2013_j + xI2020_j}{6} \times P_{Ri\ j}$$

Where:

$A_{i\,j}$= Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the second and third compliance periods, namely 2015, 2016, 2017, 2018, 2019 and 2020;

j = Type of activity;

6 = 6 years in the linear regression, namely 2015, 2016, 2017, 2018, 2019 and 2020;

x = (*i* – 2015) + 1;

$I2013_j$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for the years 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per reference unit;

$I2020_j$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for the year 2020, calculated using equation 2-8, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* for year *i*.

3. Covered establishment as of 2013 that is considered on a sectoral basis

(3.1) Calculation method for the years 2013 and 2014

Equation 3-1 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment that is considered on a sectoral basis for the years 2013 and 2014

$$A_{i\,j} = max(I2013_j; I2020s_j) \times P_{Ri\,j}$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the first compliance period, namely 2013 and 2014;

j = Type of activity;

max = Maximum value, representing the greater of the values $I2013_j$ and $I2020s_j$;

$I2013_j$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for the years 2013 and 2014 calculated using equation 2-2, in metric tonnes CO_2 equivalent per reference unit;

$I2020s_j$ = Intensity target of GHG emissions attributable to type of activity *j* in the sector for the year 2020, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$ = Total quantity of reference units produced or used for type of activity *j* at the establishment for year *i*.

Equation 3-2 Calculation of the intensity target of GHG emissions by type of activity at an establishment that is considered on a sectoral basis for the year 2020

$$I2020s_j = I_{FPav(S)\,j} + R_s \times min[(0.95)I_{Cmin(S)\,j}; (0.90)I_{Cav(S)j}] + min[(0.95)I_{Omin(S)\,j}; (0.90)I_{O\,av(S)\,j}]$$

Where:

$I2020s_j$ = Intensity target of GHG emissions attributable to type of activity *j* in the sector for the year 2020, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

$I_{FPav(S)\,j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* in the sector for the period 2007-2010, calculated using equation 3-3, in metric tonnes CO_2 equivalent per reference unit;

R_s = Sectoral multiplication factor for the intensity of GHG combustion emissions calculated using equations 3-4 and 3-5;

min = Minimum value, representing the lesser of the 2 elements calculated;

0.95 = Proportion corresponding to 95% of the minimum intensity of combustion emissions or of the minimum intensity of other GHG emissions;

$I_{Cmin(S)\,j}$ = Minimum annual average intensity of GHG combustion emissions attributable to type of activity *j* in the sector for the years 2007 to 2010 inclusively, calculated using equation 3-6, in metric tonnes CO_2 equivalent per reference unit;

0.90 = Proportion corresponding to 90% of the average intensity of combustion emissions or the average intensity of other GHG emissions;

$I_{Cav(S)j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* in the sector for the period 2007-2010, calculated using equation 3-7, in metric tonnes CO_2 equivalent per reference unit;

$I_{Omin(S)\,j}$ = Minimum annual average intensity of other GHG emissions attributable to type of activity *j* in the sector for the years 2007 to 2010 inclusively, calculated using equation 3-8, in metric tonnes CO_2 equivalent per reference unit;

$I_{O\ av(S)\,j}$ = Average intensity of other GHG emissions attributable to type of activity *j* in the sector for the period 2007-2010, calculated using equation 3-9, in metric tonnes CO_2 equivalent per reference unit.

Equation 3-3 Average intensity of GHG fixed process emissions attributable to the type of activity in the sector for the period 2007-2010

$$I_{FPav(S)_j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{1} GHGFP_{i,j,k}}{\sum_{i=2007}^{2010} \sum_{k=1}^{1} P_{R\,i,j,k}}$$

Where:

$I_{FPav(S)\,j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* in the sector for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

l = Number of covered establishments as of 2013 in the sector;

GHG $FP_{i\,jk}$ = GHG fixed process emissions attributable to type of activity *j* at establishment *k* for year *i*, in metric tonnes CO_2 equivalent;

k = Covered establishment as of 2013 in the sector;

$P_{Ri\,jk}$ = Total quantity of reference units produced or used at establishment *k* for type of activity *j* for year *i*.

Equation 3-4 Calculation of the combustion intensity multiplication factor at an establishment that is considered on a sectoral basis

$$R_s = 0.80\ X\ GFR_s + (1 - GFR_s)$$

Where:

R_s = Sectoral multiplication factor for the intensity of GHG combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFRs ratio;

GFR_s = Ratio between the total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at establishments in the sector, calculated using equation 3-5.

Equation 3-5 Calculation of the GFRs ratio for an establishment that is considered on a sectoral basis

$$GFRs = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{I} GHG\ GFR_{sik}}{\sum_{i=2007}^{2010} \sum_{k=1}^{I} GHG\ C_{sik}}$$

Where:

GFR_s = Ratio between the total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at establishments in the sector;

i = Each year included in the period 2007-2010;

l = Number of establishments in the sector covered as of 2013;

k = Establishment in the sector covered as of 2013 in the sector;

GHG $GFR_{si\,k}$ = GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment *k* during year *i*, in metric tonnes CO_2 equivalent;

GHG $C_{si\,k}$ = Total GHG combustion emissions attributable to the use of fuel at establishment *k* for year *i*, in metric tonnes CO_2 equivalent.

Equation 3-6 Calculation of the minimum average annual intensity of GHG combustion emissions attributable to the type of activity in the sector for 2007 to 2010

$$I_{C\min(s)\,j} = \min\left[\frac{\sum_{k=1}^{I} GHG\,C_{2007\,jk}}{\sum_{k=1}^{I} P_{2007\,jk}}; \frac{\sum_{k=1}^{I} GHG\,C_{2008\,jk}}{\sum_{k=1}^{I} P_{2008\,jk}}; \frac{\sum_{k=1}^{I} GHG\,C_{2009\,jk}}{\sum_{k=1}^{I} P_{2009\,jk}}; \frac{\sum_{k=1}^{I} GHG\,C_{2010\,jk}}{\sum_{k=1}^{I} P_{2010\,jk}}\right]$$

Where:

$I_{Cmin(s)j}$ = Minimum average annual intensity of GHG combustion emissions attributable to type of activity *j* in the sector for the years 2007 to 2010 inclusively, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

min = Minimum value, representing the lesser of the intensity values for the years 2007, 2008, 2009 and 2010;

l = Number of establishments covered as of 2013 in the sector;

GHG $C_{i\,jk}$ = GHG combustion emissions attributable to type of activity *j* at establishment *k* during the years *i* corresponding to 2007, 2008, 2009 and 2010, in metric tonnes CO_2 equivalent;

k = Establishment in the sector covered as of 2013;

$P_{i\,jk}$ = Total quantity of reference units produced or used at establishment *k* for type of activity *j* during the years *i* corresponding to 2007, 2008, 2009 and 2010.

Equation 3-7 Average intensity of GHG combustion emissions attributable to a type of activity in the sector for the period 2007-2010

$$I_{Cav(S)_j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{I} GHGC_{i\,jk}}{\sum_{i=2007}^{2010} \sum_{k=1}^{I} P_{Ri\,jk}}$$

Where:

$I_{Cav(S)\,j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* in the sector for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

l = Number of covered establishments as of 2013 in the sector;

GHG $C_{i\,jk}$ = GHG combustion emissions attributable to type of activity *j* at establishment *k* for year *i*, in metric tonnes CO_2 equivalent;

k = Covered establishment as of 2013 in the sector;

$P_{Ri\,jk}$ = Total quantity of reference units produced or used at establishment *k* for type of activity *j* for year *i*.

Equation 3-8 Calculation of the minimum average annual intensity of other GHG emissions attributable to a type of activity in the sector for 2007 to 2010

$$I_{O\min(s)j} = \min\left[\frac{\sum_{k=1}^{l} GHG\,O_{2007\,jk}}{\sum_{k=1}^{l} P_{2007\,jk}}; \frac{\sum_{k=1}^{l} GHG\,O_{2008\,jk}}{\sum_{k=1}^{l} P_{2008\,jk}}; \frac{\sum_{k=1}^{l} GHG\,O_{2009\,jk}}{\sum_{k=1}^{l} P_{2009\,jk}}; \frac{\sum_{k=1}^{l} GHG\,O_{2010\,jk}}{\sum_{k=1}^{l} P_{2010\,jk}}\right]$$

Where:

$I_{Omin(s)\ j}$ = Minimum average annual intensity of other GHG emissions attributable to type of activity *j* in the sector for 2007 to 2010 inclusively, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

min = Minimum value, representing the lesser of the intensity values for the years 2007, 2008, 2009 and 2010;

l = Number of establishments covered as of 2013 in the sector;

GHG $O_{i\ jk}$ = Other GHG emissions attributable to type of activity *j* at establishment *k* for the years *i* corresponding to 2007, 2008, 2009 and 2010, in metric tonnes CO_2 equivalent;

k = Establishment covered in the sector beginning in 2013;

$P_{i\ jk}$ = Total quantity of reference units produced or used at establishment *k* for type of activity *j* during the years *i* corresponding to 2007, 2008, 2009 and 2010.

Equation 3-9 Average intensity of other GHG emissions attributable to a type of activity in the sector for the period 2007-2010

$$I_{Qav(S)_j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{I} GHG\ O_{ijk}}{\sum_{i=2007}^{2010} \sum_{k=1}^{I} P_{Rijk}}$$

Where:

$I_{O\ av(S)\ j}$ = Average intensity of other GHG emissions attributable to type of activity *j* in the sector for the period 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

l = Number of covered establishments as of 2013 in the sector;

GHG $O_{i\ jk}$ = GHG other emissions attributable to type of activity *j* at establishment *k* for year *i*, in metric tonnes CO_2 equivalent;

k = Covered establishment as of 2013 in the sector;

P_{Rijk} = Total quantity of reference units produced or used by establishment *k* for to type of activity *j* for year *i*.

(3.2) Calculation methods for the years 2015 to 2020

Equation 3-10 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment that is considered on a sectoral basis for the years 2015 to 2020

$$A_{i\ j} = \max\left|\frac{(6 - x)\ I2013_j + xI2020s_{\ j}}{6};I2020s_{\ j}\right| \times P_{Ri\ j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the second and third compliance periods, namely 2015, 2016, 2017, 2018,2019 and 2020;

j = Type of activity;

max = Maximum value, representing the greater of the 2 intensity values calculated;

6 = 6 years in the linear regression, namely 2015, 2016, 2017, 2018, 2019 and 2020;

x = (*i* – 2015) + 1;

$I2013_j$ = Intensity target of GHG emissions attributable to type of activity *j* at the establishment for the years 2013 and 2014 calculated using equation 2-2, in metric tonnes CO_2 equivalent per reference unit;

$I2020s_{\ j}$ = Intensity target of GHG emissions attributable to type of activity *j* in the sector for the year 2020, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

4. Covered establishment as of 2013 that does not possess GHG emissions data for 2007-2010, covered establishment after 2013, covered establishment as of 2018 and covered establishment referred to in section 2.1 that is not considered on a sectoral basis

(4.1) Calculation method for the years 2013 and 2014

Equation 4-1 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment covered as of 2013 and without data for 2007-2010 or after 2013 that is not considered on a sectoral basis for the years 2013 and 2014

$A_{i\,j} = Idep_j \times P_{Ri\,j}$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the first compliance period, namely 2013 and 2014;

j = Type of activity;

$Idep_j$ = Intensity target of GHG emissions attributable to type of activity *j* at an establishment, calculated using equation 4-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$= Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-2 Calculation of the intensity target of GHG emissions for the years 2013 and 2014 by type of activity at a covered establishment covered as of 2013 and without data for 2007-2010 or after 2013

$Idep_j = I_{FPdep\,j} + (R \times I_{Cdep\,j}) + I_{Odep\,j}$

Where:

$Idep_j$= Intensity target of GHG emissions attributable to type of activity *j* at an establishment, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

$I_{FPdep\,j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-3, in metric tonnes CO_2 equivalent per reference unit;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

R = Multiplication factor for GHG combustion emissions at the establishment calculated using equations 4-6 and 4-7 or, in the case of an establishment producing pulp and paper described by NAICS code 3221 or 321216, a value of 1;

$I_{Cdep\,j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-4, in metric tonnes CO_2 equivalent per reference unit;

$I_{Odep\ j}$= Average intensity of other GHG emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-5, in metric tonnes CO_2 equivalent per reference unit.

Equation 4-3 Average intensity of GHG fixed process emissions by type of activity at a covered establishment covered as of 2013 and without data for 2007-2010 or after 2013 for the reference years *d*-2 to *d*+1

$$I_{FPdep_j} = \frac{\sum_{i=(d-2)}^{d+1} GHGFP_{ij}}{\sum_{i=(d-2)}^{d+1} P_{Ri_j}}$$

Where:

$I_{FPdep\ j}$ = Average intensity of GHG fixed process emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Years *d*-2, *d*-1, *d* and *d*+1, when available, excluding the year in which the establishment is brought into service;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

GHG $FP_{i\ j}$ = GHG fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-4 Average intensity of GHG combustion emissions by type of activity for a covered establishment covered as of 2013 and without data for 2007-2010 or after 2013 for the reference years *d*-2 to *d*+1

$$I_{Cdep_j} = \frac{\sum_{i=(d-2)}^{d+1} GHG\ C_{ij}}{\sum_{i=(d-2)}^{d+1} P_{Ri_j}}$$

Where:

$I_{Cdep\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Years *d*-2, *d*-1, *d* and *d*+1, when available, excluding the year in which the establishment is brought into service;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

GHG $C_{i\ j}$ = GHG combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-5 Average intensity of other GHG emissions by type of activity for a covered establishment covered as of 2013 and without data for 2007-2010 or after 2013 for the reference years *d*-2 to *d*+1

$$I_{O\,depj} = \frac{\sum_{i=(d-2)}^{d+1} GHG\ O_{ij}}{\sum_{i=(d-2)}^{d+1} P_{Rij}}$$

Where:

$I_{Odep\ j}$ = Average intensity of other GHG emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Years *d*-2, *d*-1, *d* and *d*+1, when available, excluding the year in which the establishment is brought into service;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

GHG $O_{i\ j}$ = GHG other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-6 Calculation of the intensity multiplication factor for combustion emissions at an establishment covered as of 2013 and without data for 2007-2010 or covered after 2013 that is not considered on a sectoral basis

$$R = 0.80 \times GFR + (1 - GFR)$$

Where:

R = Intensity multiplication factor for GHG combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between the total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at the establishment, calculated using equation 4-7.

Equation 4-7 Calculation of the GFR ratio for an establishment covered as of 2013 and without data for 2007-2010 or covered after 2013 that is not considered on a sectoral basis

$$GFR = \frac{\sum_{i=(d-1)}^{(d+1)} GHG\ GFR_i}{\sum_{i=(d-1)}^{(d+1)} GHG\ C_i}$$

Where:

GFR = Ratio between the total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total GHG combustion emissions at the establishment;

i = Years *d*-2, *d*-1, *d* and *d*+1, when available, excluding the year in which the establishment is brought into service;

GHG GFR_i = GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C_i = Total GHG combustion emissions attributable to the use of fuel at the establishment for year *i*, in metric tonnes CO_2 equivalent.

(4.2) Calculation method for the years 2015 to 2020 for covered establishments as of 2013 and for covered establishments after 2013

Equation 4-8 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment covered as of 2013 and without data for 2007-2010 or covered after 2013 that is not considered on a sectoral basis for the years 2015 to 2020

$$A_{i\,j} = [I_{FPdep\,j} + (R)(0.99)^n\, I_{Cdep\,j} + (0.99)^n\, I_{Odep\,j}] \times P_{Ri\,j}$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* for an establishment for year *i*;

j = Type of activity;

i = Each year in the period 2015-2020 for which the emitter is required to cover GHG emissions;

$I_{FPdep\ j}$ = Average intensity of the GHG fixed process emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-3, in metric tonnes CO_2 equivalent per reference unit;

R = Multiplication factor for GHG combustion emissions at the establishment calculated using equations 4-6 and 4-7 or, in the case of an establishment producing pulp and paper described by NAICS code 3221 or 321216, a value of 1;

0.99 = Proportion corresponding to an annual improvement of 1% in the intensity factor;

n = *i* - (*d* + 2);

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$I_{Cdep\ j}$ = Average intensity of the GHG combustion emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-4, in metric tonnes CO_2 equivalent per reference unit;

$I_{Odep\,j}$ = Average intensity of the other GHG emissions attributable to type of activity *j* at the establishment for the years *d*-2 to *d*+1, when available, excluding the year in which the establishment is brought into service, calculated using equation 4-5, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(4.3) Calculation method for the years 2018 to 2020 for covered establishments as of 2018

(4.3.1) Covered establishment as of 2018 that is not considered on a sectoral basis for the years 2018 to 2020 and that possesses all the GHG emissions data for years *d*-2 to *d*

Equation 4-9 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis for the years 2018 to 2020 and that possesses GHG emissions data for years *d*-2 to *d*

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + R \times I_{C\ dep\ j} \times a_{c,i} + I_{O\ dep\ j} \times a_{O,i}] \times P_{Ri\ j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 4-10, in metric tonnes CO_2 equivalent per reference unit;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold; in the case of a dismembering establishment covered as of 2018, *d* corresponds to the year 2016;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

R = Intensity multiplication factor for combustion emissions at the establishment, calculated using equation 4-11 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 4-13, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year -*i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 4-14, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-10 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses GHG emissions data for years *d*-2 to *d*

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ FP_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-11 Calculation of the intensity multiplication factor for combustion emissions at a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses GHG emissions data for years *d*-2 to *d*

$$R = 0.80 \times GFR + (1 - GFR)$$

Where:

R = Intensity multiplication factor for combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment, calculated using equation 4-12.

Equation 4-12 Calculation of the GFR ratio for a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses GHG emissions data for years *d*-2 to *d*

$$GFR = \frac{\sum_{i=(d-2)}^{(d)} GHG\ GFR_i}{\sum_{i=(d-2)}^{(d)} GHG\ C_i}$$

Where:

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG GFR_i = Combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C_i = Total combustion emissions attributable to the use of fuel at the establishment during year *i*, in metric tonnes CO_2 equivalent.

Equation 4-13 Calculation of the intensity of combustion emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses GHG emissions data for years *d*-2 to *d*

$$I_{C\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ C_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-14 Calculation of the intensity of other emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that possesses GHG emissions data for years *d*-2 to *d*

$$I_{O\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ O_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(4.3.2) Covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are all available, using equation 4-15;

(2) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are not all available, using equation 4-21.

Equation 4-15 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis for the years 2018 to 2020 and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + R \times I_{C\ dep\ j} \times a_{c,i} + I_{O\ dep\ j} \times a_{O,i}\ ] \times P_{Ri\ j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 4-16, in metric tonnes CO_2 equivalent per reference unit;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

R = Intensity multiplication factor for combustion emissions at the establishment calculated using equation 4-17 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 4-19, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 4-20, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-16 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ FP_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ FP_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-17 Calculation of the intensity multiplication factor for combustion emissions at a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$R = 0.80 \times GFR + (1 - GFR)$$

Where:

R = Intensity multiplication factor for combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment, calculated using equation 4-18.

Equation 4-18 Calculation of the GFR ratio for a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$GFR = \frac{\sum_{i=(d)}^{(d+2)} GHG\ GFR_i}{\sum_{i=(d)}^{(d+2)} GHG\ C_i}$$

Or

$$GFR = \frac{\sum_{i=(d+1)}^{(d+3)} GHG\ GFR_i}{\sum_{i=(d+1)}^{(d+3)} GHG\ C_i}$$

Where:

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG GFR_i = Combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C_i = Total combustion emissions attributable to the use of fuel at the establishment during year *i*, in metric tonnes CO_2 equivalent.

Equation 4-19 Calculation of the intensity of combustion emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{C\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ C_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{C\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ C_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$PR_{i\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-20 Calculation of the intensity of other emissions by type of activity at a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{O\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ O_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{O\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ O_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-21 Calculation of the number of GHG emission units allocated without charge for a covered establishment as of 2018 that is not considered on a sectoral basis for the years 2018 to 2020 and that does not possess all the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$A_i = (EC_{TOTAL\ i} \times EF \times a_{c,i}) + (GHG_{FP\ i} \times a_{FP,i}) + (GHG_{O\ i} \times a_{O,i})$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover GHG emissions;

$EC_{TOTAL\ i}$ = Energy consumption in year *i*, calculated using equation 4-22, in GJ;

EF= Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$GHG_{FP\ i}$ = Fixed process emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$GHG_{O\ i}$ = other emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2).

Equation 4-21.1 Calculation of the emission factor for natural gas

$$EF = ((EF_{CO2} \times 1{,}000) + (EF_{CH4} \times GWP_{CH4}) + (EF_{N2O} \times GWP_{N2O})) \times 0.000001$$

Where:

EF_{CO2} = Emission factor of CO_2 for natural gas taken from Table 1-4 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), in kilograms of CO_2 per GJ;

1,000 = Conversion factor, kilograms to grams;

EF_{CH4} = Emission factor of CH_4 for natural gas, for industrial uses, taken from Table 1-7 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), in grams of CH_4 per GJ;

GWP_{CH4} = Global warming potential of CH_4 taken from Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

EF_{N2O} = Global warming potential of N_2O taken from Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

GWP_{N2O} = Global warming potential of N_2O taken from Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15);

0.000001 = Conversion factor, grams to metric tonnes;

Equation 4-22 Calculation of energy consumption for year *i* of a covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d* to *d*+2

$$EC_{TOTAL\,i} = \sum_{k=1}^{n} Fuel_k \times HHV_k$$

Where:

$EC_{TOTAL\ i}$ = Energy consumption in year *i* in GJ;

i = Each year of the period 2018-2020 for which the emitter is required to cover GHG emissions;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(4.3.3) Covered establishment as of 2018 that is not considered on a sectoral basis and that does not possess a determined reference unit

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are all available, using equation 4-23;

(2) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are not all available, using equation 4-21.

Equation 4-23 Calculation of the number of GHG emission units allocated without charge for the years 2018 to 2020 for a covered establishment as of 2018 that does not possess a determined reference unit and that possesses all the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$A_i = [(EC_{TOTAL,av} \times EF \times a_{c,i}) + (GHG_{FP,av} \times a_{FP,i}) + (GHG_{O,av} \times a_{O,i})]$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover GHG emissions;

$EC_{TOTAL,av}$ = Average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 4-24, in GJ;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

GHG_{FPav} = Average fixed process emissions at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$GHG_{O,av}$ = Average other emissions at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2).

Equation 4-24 Calculation of average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, for a covered establishment as of 2018 that possesses all the GHG emissions data for those years

$$EC_{TOTAL,av} = \sum_{d}^{d+2} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Or

$$EC_{TOTAL,av} = \sum_{d+1}^{d+3} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Where:

$EC_{TOTAL,av}$ = Average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in GJ;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(4.4) Calculation method for the years 2018 to 2020 for the covered establishments referred to in section 2.1.

(4.4.1) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

Equation 4-25 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2018 to 2020 and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$A_{ij} = [I_{FPdep\,j} \times a_{FP,i} + R \times I_{c\ dep\,j} \times a_{c,i} + I_{O\ dep\,j} \times a_{O,i}] \times P_{Ri\,j}$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\,j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 4-26, in metric tonnes CO_2 equivalent per reference unit;

e = Year of application for registration for the system;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

R = Intensity multiplication factor for combustion emissions at the establishment calculated using equation 4-27 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 4-29, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 4-30, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-26 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ FP_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-27 Calculation of the intensity multiplication factor for combustion emissions for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$R = 0.80 \times GFR + (1 - GFR)$$

Where:

R = Intensity multiplication factor for GHG combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment, calculated using equation 4-28.

Equation 4-28 Calculation of the GFR ratio for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$GFR = \frac{\sum_{i=(e-3)}^{(e-1)} GHG\ GFR_i}{\sum_{i=(e-3)}^{(e-1)} GHG\ C_i}$$

Where:

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment;

e = Year of registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG GFR_i = combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C_i = Total combustion emissions attributable to the use of fuel at the establishment during year *i*, in metric tonnes CO_2 equivalent.

Equation 4-29 Calculation of the intensity of combustion emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{C\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ C_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-30 Calculation of the intensity of other emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{O\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ O_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG O_{ij} = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(4.4.2) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equation 4-31;

(2) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equation 4-37.

Equation 4-31 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2018 to 2020 and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + R \times I_{C\ dep\ j} \times a_{C,i} + I_{O\ dep\ j} \times a_{O,i}\ ] \times P_{Ri\ j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 4-32, in metric tonnes CO_2 equivalent per reference unit;

e = Year of application for registration for the system;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

R = Intensity multiplication factor for combustion emissions at the establishment calculated using equation 4-33 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 4-35, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 4-36, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-32 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ FP_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ FP_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$PR_{i\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-33 Calculation of the intensity multiplication factor for combustion emissions for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$R = 0.80 \times GFR + (1 - GFR)$$

Where:

R = Intensity multiplication factor for combustion emissions at the establishment;

0.80 = Proportion corresponding to 80% of the GFR ratio;

GFR = Ratio between the total GHG combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment, calculated using equation 4-34.

Equation 4-34 Calculation of the GFR ratio for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$GFR = \frac{\sum_{i=(e-1)}^{(e+1)} GHG\ GFR_i}{\sum_{i=(e-1)}^{(e+1)} GHG\ C_i}$$

Or

$$GFR = \frac{\sum_{i=(e)}^{(e+2)} GHG\ GFR_i}{\sum_{i=(e)}^{(e+2)} GHG\ C_i}$$

Where:

GFR = Ratio between the total combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, and total combustion emissions at the establishment;

e = Year of registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG GFR_i = Combustion emissions attributable to the use of natural gas, gasoline, diesel, heating oil, propane, petroleum coke and coal, excluding refinery fuel gas, at the establishment during year *i*, in metric tonnes CO_2 equivalent;

GHG C_i = Total combustion emissions attributable to the use of fuel at the establishment during year *i*, in metric tonnes CO_2 equivalent.

Equation 4-35 Calculation of the intensity of combustion emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{C\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ C_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{C\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ C_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-36 Calculation of the intensity of other emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{O\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ O_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{O\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ O_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 4-37 Calculation of the number of GHG emission units allocated without charge for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2018 to 2020 and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available

$$A_i = (EC_{TOTAL\ i} \times EF \times a_{c,i}) + (GHG_{FP\ i} \times a_{FP,i}) + (GHG_{O\ i} \times a_{O,i})$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover its GHG emissions;

$EC_{TOTAL\ i}$ = Average energy consumption for year *i*, calculated using equation 4-38, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$GHG_{FP\ i}$ = Fixed process emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$GHG_{O\ i}$ = Average other emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1).

Equation 4-38 Calculation of average energy consumption for years *e* and *e*+1 of an establishment for the years 2018 to 2020 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available

$$n$$

$$EC_{TOTAL\,i} = \sum_{k=1} Fuel_k \times HHV_k$$

Where:

$EC_{TOTAL\,i}$ = Energy consumption for year *i*, in GJ;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(4.4.3) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis and that does not possess a determined reference unit

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equation 4-39;

(2) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equation 4-37.

Equation 4-39 Calculation of the number of GHG emission units allocated without charge for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2018 to 2020, that does not possess a determined reference unit and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available

$$A_i = [(EC_{TOTAL,av} \times EF \times a_{c,i}) + (GHG_{FP,av} \times a_{FP,i}) + (GHG_{O,av} \times a_{O,i})]$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2018-2020 for which the emitter is required to cover its GHG emissions;

$EC_{TOTAL,av}$ = Average energy consumption for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 4-40, in GJ;

e = Year of application for registration for the system;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$GHG_{FP,av}$ = Average fixed process emissions at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1);

$GHG_{O,av}$ = Average other emissions at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, where n=*i*-(*e*+1).

Equation 4-40 Calculation of average energy consumption for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis, that does not possess a determined reference unit,

and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available

$$EC_{TOTAL,av} = \sum_{e-1}^{e+1} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Or

$$EC_{TOTAL,av} = \sum_{e}^{e+2}\left(\sum_{k=1}^{n} Fuel_k \times HHV_k\right) \div 3$$

Where:

$EC_{TOTAL,av}$ = Average energy consumption for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in GJ;

e = Year of application for registration for the system;

k = Type of fuel;

n = Total number of types of fuel used;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

5. Covered establishment as of 2013 that does not possess GHG emissions data for 2007-2010 and covered establishment after 2013 that is considered on a sectoral basis

(5.1) Calculation method for the years 2013 and 2014

Equation 5-1 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment covered as of 2013 and without data for 2007-2010 or covered after 2013 that is considered on a sectoral basis for the years 2013 and 2014

$$A_{ij} = max(Idep_j; I2020s_j) \times P_{Rij}$$

Where:

A_{ij} = Total number of GHG emission units allocated without charge by type of activity *j* for the establishment for year *i*;

i = Each year in the first compliance period, namely 2013 and 2014;

j = Type of activity;

max = Maximum value, representing the greater of the intensity values $I_{dep\,j}$ and $I2020s_j$;

$Idep_j$ = Intensity target of the GHG emissions attributable to type of activity *j* at an establishment, calculated using equation 4-2, in metric tonnes CO_2 equivalent per reference unit;

$I2020s_j$ = Intensity target of GHG emissions attributable to type of activity *j* in the sector for the year 2020, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(5.2) Calculation method for the years 2015 to 2020

(5.2.1) Establishment considered on a sectoral basis for the years 2015 to 2017 and establishment considered on a sectoral basis that possesses all the GHG emissions data for years *d* to *d*+2, or *d* to *d*+1 where *d* is the year in which the establishment became operational for the years 2018 to 2020

Equation 5-2 Calculation of the number of GHG emission units allocated without charge by type of activity for an establishment covered as of 2013 and without data for 2007-2010 or covered after 2013 that is considered on a sectoral basis for the years 2015 to 2020

$$A_{i\,j} = \max\left(\left[\frac{\overline{m}\ Idep_{\,j} + (n - m)I2020S_{\,j}}{n};\ \overline{I2020S_{\,j}}\right] \times P_{Ri\,j}\right)$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* for the establishment for year *i*;

i = Each year in the period 2015-2020 for which the emitter is required to cover GHG emissions;

j = Type of activity;

max = Maximum value, representing the greater of the intensity values calculated;

m = 2020 – *i*;

n = Minimum, representing the lesser of 6 and (2020 – (*d*+1));

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold.

$Idep_{\,j}$ = Intensity target of the GHG emissions attributable to type of activity *j* at an establishment, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$I2020S_j$ = Intensity target of GHG emissions attributable to type of activity *j* in the sector for the year 2020, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(5.2.2) Establishment considered on a sectoral basis that does not possess all the GHG emissions data for years *d* to *d*+2, or *d* to *d*+1 where *d* is the year in which the establishment became operational for the years 2018 to 2020

Equation 5-3 Calculation of the total quantity of GHG emission units allocated free of charge by type of activity at an establishment covered from 2018 that is considered on a sectoral basis for the years

2018 to 2020 and that does not possess all the GHG emissions data for the years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$A_i = max\left(\sum_{j=1}^{m} I_{2020S} \times P_{R\,ij}\ ;\ \frac{p}{q} \times \left[\left(EC_{TOTAL\,i} \times EF \times a_{C,i}\right) + \left(GHG_{FP\,i} \times a_{FP,i}\right) + \left(GHG_{O\,i} \times a_{O,i}\right)\right]\right)$$

Where:

A_i = Total number of GHG emission units allocated free of charge for an establishment for year *i*;

i = Each year of the period 2018-2020 for which the emitter is required to cover GHG emissions;

max = Maximum value between the 2 calculated values;

j = Type of activity;

m = Total number of type of activities of the establishment;

I_{2020S} = Target intensity for GHG emissions attributable to type of activity *j* of the sector for the year 2020, calculated using equation 3-2, in metric tonnes CO_2 equivalent per reference unit;

$P_{Ri\,j}$ = Total quantity of reference units produced or used by the establishment for the type of activity *j* during year *i*;

p = 2020-*i*;

q = Maximum value between 1 and p;

$EC_{TOTAL\,i}$ = Energy consumption of year *i*, calculated using equation 4-22, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2/GJ equivalent, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, with n=*i*-(*d*+2);

d = First year for which the establishment's GHG emissions are equal to or exceed the emissions threshold;

$GHG_{FP\,i}$ = Fixed process emissions of the establishment for year *i*, in metric tonnes equivalent CO_2;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishment covered between 2018 and 2020, as defined in Table 4 of this Appendix, with n=*i*-(*d*+2);

$GHG_{O\,i}$ = other emissions of the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2018 and 2020, as defined in Table 4 of this Appendix, with n=*i*-(*d*+2).

6. Special cases

(6.1) Establishment producing aluminum using Söderberg anode technology after 2014

Equation 6-1 Calculation of the intensity target of GHG emissions for year 2020 at an establishment producing aluminum using Söderberg anode technology after 2014

$$I_{2020\ sod} = I_{2020s\ electrolysis} + (I_{2020s\ baked\ anode} \times 0.55)$$

Where:

$I_{2020\ sod}$ = Intensity target of GHG emissions for year 2020 at an establishment producing aluminum using Söderberg anode technology after 2014, in metric tonnes CO_2 equivalent per metric tonne of liquid aluminum;

$I_{2020s\ electrolysis}$ = Intensity target of GHG emissions for year 2020 in the aluminum sector for the type of activity "aluminum production", calculated using equation 3-2 based on data from establishments using prebaked anode technology, in metric tonnes CO_2 equivalent per metric tonne of liquid aluminum;

$I_{2020s\ baked\ anode}$ = Intensity target of GHG emissions for year 2020 in the aluminum sector for the type of activity "baked anode production", calculated using equation 3-2 based on data from establishments using prebaked anode technology, in metric tonnes CO_2 equivalent per metric tonne of baked anodes;

0.55 = Ratio between consumed baked anode production and aluminum production, in metric tonnes of baked anodes per metric tonne of liquid aluminum.

(6.2) Establishment producing alumina from bauxite

Equation 6-2 Calculation of the total quantity of GHG emission units allocated without charge for an establishment producing alumina from bauxite for 2013 to 2020

$$A_i = 0.40 \times P_{Ri}$$

Where:

A_i = Total quantity of GHG emission units allocated without charge for an establishment producing alumina from bauxite for year *i*;

i = Each year included in the period 2013-2020;

0.40 = Intensity target of GHG emissions attributable to the production of alumina from bauxite for 2013 to 2020, in metric tonnes CO_2 equivalent per metric tonne of aluminum hydrate ($AI_2O_3 \times 3\ H_2O$) expressed as alumina (AI_2O_3) equivalent, 1 metric tonne of aluminum hydrate in alumina equivalent corresponding to 0.6536 metric tonnes aluminum hydrate;

P_{Ri} = Total quantity of aluminum hydrate expressed as alumina (Al_2O_3) equivalent produced at the establishment in year *i*, in metric tonnes.

(6.3) Establishment producing rigid foamed insulation

The total quantity of GHG emission units allocated without charge for an establishment producing rigid foamed insulation is calculated, for 2013 and 2014, using equation 2-1, where "I2013" is calculated using equations 6-3 to 6-6 and, for 2015 to 2020, using equation 6-7:

Equation 6-3 Calculation of the intensity target of GHG emissions attributable to an establishment producing rigid foamed insulation for 2013 and 2014

$$I\ 2013 = I_{FP} + (R \times I_C) + I_O$$

Where:

I 2013 = Intensity target of GHG emissions at the establishment for 2013 and 2014, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

I_{FP} = Intensity of GHG fixed process emissions at the establishment for year 2010, calculated using equation 6-4, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

R = Multiplication factor for GHG combustion emissions intensity at the establishment, calculated using equations 4-6 and 4-7;

I_C = Intensity of GHG combustion emissions at the establishment for year 2010, calculated using equation 6-5, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

I_O = Intensity of other GHG emissions at the establishment for year 2010, calculated using equation 6-6, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation.

Equation 6-4 Intensity of GHG fixed process emissions at an establishment producing rigid foamed insulation for year 2010

$$I_{FP} = \frac{GHG\ FP_{2010}}{P_{R2010}}$$

Where:

I_{FP} = Intensity of GHG fixed process emissions at the establishment for year 2010, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

GHG FP_{2010} = GHG fixed process emissions at the establishment for year 2010, in metric tonnes CO_2 equivalent;

P_{R2010} = Total quantity of rigid foamed insulation produced at the establishment in year 2010, in board feet of rigid foamed insulation.

Equation 6-5 Intensity of GHG combustion emissions at an establishment producing rigid foamed insulation for year 2010

$$I_C = \frac{GHG\ C_{\ 2010}}{P_{R\ 2010}}$$

Where:

I_C = Intensity of GHG combustion emissions at theestablishment for year 2010, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

GHG $C_{\ 2010}$ = GHG combustion emissions at the establishment for year 2010, in metric tonnes CO_2 equivalent;

$P_{R\ 2010}$ = Total quantity of rigid foamed insulation produced at the establishment in year 2010, in board feet of rigid foamed insulation.

Equation 6-6 Intensity of other GHG emissions at an establishment producing rigid foamed insulation for year 2010

$$I_O = \frac{GHG\ O_{\ 2010}}{P_{R\ 2010}}$$

Where:

I_O = Intensity of other GHG emissions at the establishment for year 2010, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

GHG O_{2010} = Other GHG emissions at the establishment for year 2010, in metric tonnes CO_2 equivalent;

$P_{R\ 2010}$ = Total quantity of rigid foamed insulation produced at the establishment in year 2010, in board feet of rigid foamed insulation.

Equation 6-7 Calculation of the total quantity of GHG emission units allocated without charge for an establishment producing rigid foamed insulation for 2015 to 2020

$$A_i\ [I_{FP} + R(0.99)^n\ I_C + (0.99)^n\ I_O] \times P_{Ri}$$

Where:

A_i = Total quantity of GHG emission units allocated without charge for an establishment producing rigid foamed insulation for year *i*;

i = Each year included in the period 2015-2020 for which the emitter is required to cover its GHG emissions;

I_{FP} = Intensity of GHG fixed process emissions at the establishment for year 2010, calculated using equation 6-4, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

R = Multiplication factor for GHG combustion emissions intensity at the establishment, calculated using equations 4-6 and 4-7;

0.99 = Proportion corresponding to an annual improvement of 1% of the intensity factor;

n = *i* – 2015+1;

I_C = Intensity of GHG combustion emissions at the establishment for year 2010, calculated using equation 6-5, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

I_O = Intensity of other GHG emissions at the establishment for year 2010, calculated using equation 6-6, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation;

P_{Ri} = Total quantity of rigid foamed insulation produced at the establishment in year *i*, in board feet of rigid foamed insulation.

Equation 6-7.1 Calculation of the intensity target of fixed process emissions at an establishment fabricating rigid foamed insulation

$$I_{FP2020j} = I_{FP}$$

Where:

$I_{FP2020j}$ = Intensity of fixed process emissions calculated for year 2020 for type of activity *j*;

j = Type of activity, namely the fabrication of rigid foamed insulation;

I_{FP} = Intensity of fixed process emissions at the establishment for year 2010, calculated using equation 6-4, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation.

Equation 6-7.2 Calculation of the intensity target for combustion emissions at an establishment fabricating rigid foamed insulation

$$I_{C2020j} = R \times 0.9415 \times I_C$$

Where:

I_{C2020j} = Intensity of combustion emissions calculated for year 2020 for type of activity *j*;

j = Type of activity, namely the fabrication of rigid foamed insulation;

R = Intensity multiplication factor for combustion emissions at the establishment, calculated using equations 4-6 and 4-7;

0.9415 = Proportion corresponding to an annual improvement of 1% in the intensity factor during years 2015 to 2020;

I_C = Intensity of combustion emissions at the establishment for year 2010, calculated using equation 6-5, in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation.

Equation 6-7.3 Calculation of the intensity target of other emissions at an establishment fabricating rigid foamed insulation

$$I_{O2020j} = 0.9415 \times I_O$$

Where:

I_{O2020j} = Intensity of other emissions calculated for year 2020 for type of activity *j*;

j = Type of activity, namely the fabrication of rigid foamed insulation;

0.9415 = Proportion corresponding to an annual improvement of 1% in the intensity factor during years 2015 to 2020;

I_O = Intensity of fixed process emissions at the establishment for year 2010, calculated using equation 6-6 in metric tonnes CO_2 equivalent per board foot of rigid foamed insulation.

(6.4) Establishment producing catalytic zinc and using hydrogen as a fuel to supply its furnaces

The total quantity of GHG emission units allocated without charge for an establishment producing zinc and using hydrogen as a fuel to supply its furnaces is calculated using equation 6-8 for 2013 and 2014, using Equation 6-9 for 2015 to 2020 and using equation 6-10.1 for 2021 to 2023:

Equation 6-8 Calculation of the total quantity of GHG emission units allocated without charge to an establishment producing cathodic zinc and using hydrogen as a fuel to supply its furnaces for 2013 and 2014

$$A_{ij} = (I2013_j + F_{Hi}) \times P_{Rij}$$

Where:

$A_{i\,j}$ = Total quantity of GHG emission units allocated without charge for cathodic zinc production at the establishment for year *i*;

i = Each year included in the first compliance period, namely 2013 and 2014;

j = Type of activity, namely cathodic zinc production;

$I2013_j$ = Intensity target of GHG emissions attributable to the production of cathodic zinc at the establishment for 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of cathodic zinc;

$F_{H\,i}$ = Adjustment factor for the partial or total loss of hydrogen supply for year *i*, calculated using equation 6-10;

$P_{Ri\,j}$ = Total quantity of cathodic zinc produced at the establishment in year *i*, in metric tonnes of cathodic zinc.

Equation 6-9 Calculation of the total quantity of GHG emission units allocated without charge to an establishment producing cathodic zinc and using hydrogen as a fuel to supply its furnaces for 2015 to 2020

$$A_{ij} = \left(\frac{(6 - x)\, I2013_j + x\, I2020_j}{6} + F_{Hi} \right) \times P_{Rij}$$

Where:

$A_{i\,j}$ = Total quantity of GHG emission units allocated without charge for cathodic zinc production at the establishment for year *i*;

i = Each year included in the second and third compliance periods, namely 2015, 2016, 2017, 2018, 2019 and 2020;

j = Type of activity, namely cathodic zinc production;

6 = Six years in the linear regression, namely 2015, 2016, 2017, 2018, 2019 and 2020;

x = (*i* – 2015) + 1;

$I2013_j$ = Intensity target of GHG emissions attributable to the production of cathodic zinc at the establishment for 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of cathodic zinc;

$I2020_j$ = Intensity target of GHG emissions attributable to the production of cathodic zinc at the establishment for year 2020, calculated using equation 2-8, in metric tonnes CO_2 equivalent per metric tonne of cathodic zinc;

$F_{H\,i}$ = Adjustment factor for the partial or total loss of hydrogen supply for year *i* calculated using equation 6-10;

$P_{Ri\,j}$ = Total quantity of cathodic zinc produced at the establishment for year *i*, in metric tonnes of cathodic zinc.

Equation 6-10 Calculation of the adjustment factor for the partial or total loss of hydrogen supply

$$F_{Hi} = \left[0.060 - \frac{H_{2,i}}{P_{Ri\,j}}\right] \times 0.3325 \times 1.889 \times 0.80 \times (0.99)^n \quad when \quad \left[\frac{H_{2,i}}{P_{Ri\,j}}\right] \leq 0.060$$

$$F_{Hi} = 0 \; when \; \left[\frac{H_{2,i}}{P_{ri\,j}}\right] > 0.060$$

>

Where:

F_{Hi} = Adjustment factor for the partial or total loss of hydrogen supply for year *i*;

i = Each year included in the period 2013-2020 for which the emitter is required to cover its GHG emissions;

0.060 = Minimum ratio between the annual consumption of hydrogen and the annual production from 2007 to 2010, in cubic kilometres of hydrogen per metric tonne of cathodic zinc;

$H_{2,i}$ = Hydrogen consumption for year *i*, in cubic kilometres;

$P_{Ri\ j}$ = Total quantity of cathodic zinc produced at the establishment for year *i*, in metric tonnes of cathodic zinc;

0.3325 = Volume equivalency factor for hydrogen and natural gas, in cubic kilometres of natural gas per cubic kilometre of hydrogen;

1.889 = Emission factor for natural gas, in metric tonnes CO_2 equivalent par cubic kilometre of natural gas;

0.80 = Proportion corresponding to 80% combustion emission intensity;

0.99 = Proportion corresponding to an annual improvement of 1% of the intensity factor;

n = Value of 0 for 2013 and 2014, or (*i*-2015 +1) for 2015 to 2020.

Equation 6-10.1 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment producing cathodic zinc and using hydrogen as a fuel to supply its furnaces for the years 2021 to 2023

$$A_{i\,j} = [(\ I_{C\ stan\ j} \times a_{C,i} + I_{O\ stan\ j} \times a_{O,i} + F_{Hi}) \times P_{Ri,j} + \max(GHG_{FP\ i,j};\ I_{FP\ stan\ j} \times P_{R\ i,j}) \times a_{FP,i}] \times AF_{i,j}$$

Where:

$A_{i\ j}$ = Total quantity of GHG emission units allocated without charge for the production of cathodic zinc at the establishment for year *i*;

i = Each year included in the period 2021 to 2023;

j = Type of activity, namely the production of cathodic zinc;

$I_{C\ stan\ j}$ = Standard intensity of combustion emissions attributable to the production of cathodic zinc at the establishment for the years 2021 to 2023, calculated using equation 8-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{O\ stan\ j}$ = Standard intensity of other emissions attributable to the production of cathodic zinc at the establishment for the years 2021 to 2023, calculated using equation 8-6, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 5 of this Appendix;

$F_{H\ i}$ = Adjustment factor for the partial or total loss of hydrogen supply for year *i*, calculated using equation 6-10.2;

max = Maximum value between $GHG_{FP\ i,j}$ and $I_{FP\ stan\ j} \times P_{Ri,j}$;

$GHG_{FP\ I,j}$ = Fixed process emissions attributable to the type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$I_{FP\ stan\ j}$ = Standard intensity of fixed process emissions attributable to the production of cathodic zinc at the establishment for the years 2021 to 2023, calculated using equation 8-26, in metric tonnes CO_2 equivalent per reference unit;

$P_{R\ i\ j}$ = Total quantity of cathodic zinc produced at the establishment in year *i*, in metric tonnes of cathodic zinc;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$AF_{i,j}$ = Assistance factor for the production of cathodic zinc for year *i*, as defined in Table 7 of this Appendix.

Equation 6-10.2 Calculation of adjustment factor for the partial or total loss of hydrogen supply

$$F_{H\,i} = \left[0.065\ - \frac{H_{2,i}}{P_{Ri\,j}}\right] \times 0.3325 \times 1.889 \times 0.95 \times a_{C,i}\ \textit{where}\ \left[\frac{H_{2,i}}{P_{Ri\,j}}\right] \leq 0.065$$

and

$$F_{H\,i} = 0\ \textit{where}\ \left[\frac{H_{2,i}}{P_{Ri\,j}}\right] > 0.065$$

Where:

$F_{H\,i}$ = Adjustment factor for the partial or total loss of hydrogen supply for year *i*;

i = Each year included in the period 2021 to 2023;

0.065 = Ratio between the annual consumption of hydrogen and the annual production during the year used to calculate the minimum annual intensity of combustion emissions, in cubic kilometres of hydrogen per metric tonne of cathodic zinc;

$H_{2,i}$ = Hydrogen consumption for year *i*, in cubic kilometres;

$P_{Ri\,j}$ = Total quantity of cathodic zinc produced at the establishment in year *i*, in metric tonnes of cathodic zinc;

0.3325 = Volume equivalency factor for hydrogen and natural gas, in cubic kilometres of natural gas per cubic kilometre of hydrogen;

1.889 = Emission factor for natural gas, in metric tonnes CO_2 equivalent per cubic kilometre of natural gas;

0.95 = Proportion corresponding to 95% of the minimum intensity of combustion emissions;

$a_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix.

6.5 New facility or production of a new reference unit

An emitter must, as soon as possible, notify the Minister of any new facility on the site of one of the emitter's covered establishments or of the production of any new reference unit by submitting the following information:

(1) the name and contact information of the enterprise and of the establishment where the new facility is located or where the new reference unit is produced;

(2) the business number assigned to the emitter pursuant to the Act respecting the legal publicity of enterprises (chapter P-44.1), along with the identification number assigned under the National Pollutant Release Inventory of the Government of Canada, if any;

(3) where production at the new facility replaces all or some production at one of the emitter's establishments or facilities in Québec that closed after 1 January 2008, the name and contact information of the establishment or facility that closed;

(4) the average annual quantity of reference units produced or used, by type of activity, at the closed establishment or facility during the 3 complete years preceding its closure.

(6.5.1) New facility at which production does not replace production at another establishment or facility

(1) Until 31 December 2017, the quantity of GHG emission units allocated without charge to an emitter to take into account a new facility located on the site of one of the emitter's covered establishments at which production does not replace production at another establishment or facility is calculated

(a) in the case of a facility that is not considered on a sectoral basis, using equations 4-1 to 4-8;

(b) in the case of a facility that is considered on a sectoral basis, using equations 5-1 and 5-2.

(2) For the years 2018 to 2020, the quantity of GHG emission units allocated without charge to an emitter for a new facility located on the site of one of the emitter's covered establishments at which production does not

replace production at another establishment or facility must be calculated using Equation 6.10-3 for the period where the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are not all available.

Equation 6-10.3 Calculation of the number of GHG emission units allocated without charge for a new facility at a covered establishment for the period where the GHG emissions data for years *d* to *d*+2, or *d* +1 to *d*+3 where *d* is the year in which the new facility became operational, are not all available

$$A_{NF\,i} = ((EC_{NF\,TOTAL\,i} \times EF \times a_{C,i}) + (GHG_{NF\,FP\,i} \times a_{FP,i}) + (GHG_{NF\,O\,i} \times a_{O,i}))$$

Where:

$A_{NF\,i}$ = Total number of GHG emission units allocated without charge for a new facility for year *i*;

i = Each year in the period for which the emitter is required to cover GHG emissions;

$EC_{NF\,TOTAL\,i}$ = Energy consumption of the new facility in year *i*, calculated using equation 6-10.4, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

d = First year for which the GHG emissions of the new facility are equal to or exceed the emissions threshold;

$GHG_{NF\,FP\,i}$ = Fixed process emissions of the new facility for year *i*, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2);

$GHG_{NF\,O\,i}$ = Other emissions of the new facility for year i, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 4 of this Appendix, where n=*i*-(*d*+2).

Equation 6-10.4 Calculation of the energy consumption for year *i* of a new facility at a covered establishment for the period where the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are not all available

$$EC_{NF\,TOTAL\,i} = \sum_{k=1}^{n} (Fuel_k \times HHV_k)$$

Where:

$EC_{NF\,TOTAL\,i}$ = Energy consumption of the new facility in year *i*, in GJ;

i = Each year in the period for which the emitter is required to cover its GHG emissions;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned, expressed

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(3) For the years 2021 to 2023, the quantity of GHG emission units allocated without charge to an emitter for a new facility situated on the site of a covered establishment that is not considered on a sectoral basis must be calculated

(a) for the period where the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are not all available, using equation 6-10.3;

(b) for the period where the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available, using equations 6-10.5 and 7-1.

Equation 6-10.5 Calculation of the number of GHG emission units allocated without charge by type of activity at a new facility of a covered establishment that is not considered on a sectoral basis for the years 2021 to 2023 during the period where the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available

$$A_{NF\ i\ j} = (I_{FP\ stan\ NF\ j} \times a_{FP,i} + I_{C\ stan\ NF\ j} \times a_{C,i} + I_{O\ stan\ NF\ j} +\times a_{O,i}) \times P_{R\ i,j} \times AF_{i,j}$$

Where:

$A_{NF\ i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at a new facility for year *i*;

i = Each year included in the period 2021 to 2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ stan\ NF\ j}$ = Standard intensity of fixed process emissions attributable to type of activity *j* of the new facility using equation 6-10.7, in metric tonnes CO_2 equivalent per reference unit;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix for a new facility covered prior to 2021 and in Table 6 of this Appendix for a new facility covered as of 2021, where n=*i*-(*d*+2);

$I_{C\ stan\ NF\ j}$ = Standard intensity of GHG combustion emissions attributable to type of activity *j* at the new facility using equation 6-10.7, in metric tonnes CO_2 equivalent per reference unit;

$a_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year i, as defined in Table 5 of this Appendix for a new facility covered prior to 2021 and in Table 6 of this Appendix for a new facility covered as of 2021, where n=*i*-(*d*+2);

d = First year for which the GHG emissions of the new facility are equal to or exceed the emissions threshold;

$I_{O\ stan\ NF\ j}$ = Standard intensity of other emissions attributable to type of activity *j* at the new facility calculated using equation 6-10.8, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 5 of this Appendix for a new facility covered prior to 2021 and in Table 6 of this Appendix for a new facility covered as of 2021, where n=*i*-(*d*+2);

$P_{R\ i,j}$ = Total quantity of reference units produced or used by the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 6-10.6 Calculation of the standard intensity of fixed process emissions by type of activity at a new facility of a covered establishment that is not considered on a sectoral basis for the period in which

the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available

$$I_{FP\ stan\ NF\ j} = \frac{\sum_{i=(d)}^{d+2} GHG_{FP\ NF\ i\ j}}{\sum_{i=(d)}^{d+2} P_{R\ i\ j}}$$

Or

$$I_{FP\ stan\ NF\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG_{FP\ NF\ i\ j}}{\sum_{i=(d+1)}^{d+3} P_{R\ i\ j}}$$

Where:

$I_{FP\ stan\ NF\ j}$ = Standard intensity of fixed process emissions attributable to the type of activity *j* of the new facility for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, in metric tonnes CO_2 equivalent per reference unit;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational;

j = Type of activity;

d = First year for which the GHG emissions of the new facility are equal to or exceed the emissions threshold;

$GHG_{FP\ NF\ i\ j}$ = Fixed process emissions attributable to type of activity *j* at the new facility for year *i*, in metric tonnes CO_2 equivalent;

$P_{R\ i,j}$ = Total quantity of reference units produced or used by the establishment for type of activity *j* during year *i*.

Equation 6-10.7 Calculation of the standard intensity of combustion emissions by type of activity at a new facility of a covered establishment that is not considered on a sectoral basis for the period where

the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available

$$I_{C\ stan\ NF\ j} = \frac{\sum_{i=(d)}^{d+2} GHG_{C\ NF\ i\ j}}{\sum_{i=(d)}^{d+2} P_{R\ i\ j}}$$

Or

$$I_{C\ stan\ NF\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG_{C\ NF\ i\ j}}{\sum_{i=(d+1)}^{d+3} P_{R\ i\ j}}$$

Where:

$I_{C\ stan\ NF\ j}$ = Standard intensity of GHG combustion emissions attributable to type of activity *j* at the new facility for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, in metric tonnes CO_2 equivalent per reference unit;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational;

j = Type of activity;

d = First year for which the GHG emissions of the new facility are equal to or exceed the emissions threshold;

$GHG_{C\ NF\ i\ j}$ = Combustion emissions attributable to type of activity *j* at the new facility for year *i*, in metric tonnes CO_2 equivalent;

$P_{R\ i,j}$ = Total quantity of reference units produced or used by the establishment for type of activity *j* during year *i*.

Equation 6-10.8 Calculation of the standard intensity of other emissions by type of activity at a new facility of a covered establishment that is not considered on a sectoral basis for the period where the

GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available

$$I_{O\ stan\ NF\ j} = \frac{\sum_{i=(d)}^{d+2} GHG_{O\ NF\ i\ j}}{\sum_{i=(d)}^{d+2} P_{R\ i\ j}}$$

Or

$$I_{O\ stan\ NF\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG_{O\ NF\ i\ j}}{\sum_{i=(d+1)}^{d+3} P_{R\ i\ j}}$$

Where:

$I_{O\ stan\ NF\ j}$ = Standard intensity of other emissions attributable to type of activity j at the new facility for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, in metric tonnes CO_2 equivalent per reference unit;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational;

j = Type of activity;

d = First year for which the GHG emissions of the new facility are equal to or exceed the emissions threshold;

$GHG_{O\ NF\ i\ j}$ = Other emissions attributable to type of activity *j* at the new facility for year *i*, in metric tonnes CO_2 equivalent;

$P_{R,ij}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(4) For the years 2021 to 2023, the quantity of GHG emission units allocated without charge to an emitter for a new facility situated on the site of a covered establishment that is considered on a sectoral basis must be calculated

(a) for the period during which GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are not all available, using equation 6-10.3;

(b) for the period during which GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the new facility became operational, are all available, using equations 6-10.9 and 7.1.

Equation 6-10.9 Calculation of the number of GHG emission units allocated without charge by type of activity at a new facility at a covered establishment that is considered on a sectoral basis for the years 2021 to 2023

$$A_{NF\ i\ j} = I_{(S\ NF)i,j} \times P_{R\ i,j} \times AF_{i,j}$$

Where:

$A_{NF\ i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at a new facility for year *i*;

i = Each year included in the period 2021 to 2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{(S\ NF)\ i,j}$ = Intensity of GHG emissions attributable to type of activity *j* at new facilities in the sector for year *i*, determined in accordance with Tables 1 to 2 of this Appendix, in metric tonnes CO_2 equivalent per reference unit;

$P_{R\ i,j}$ = Total quantity of reference units produced or used by the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

(6.5.2) New facility of an emitter at which production replaces all or some production at another of the emitter's establishments or facilities in Québec that closed after 1 January 2008

The quantity of GHG emission units allocated without charge to an emitter to take into account a new facility located on the site of one of the emitter's covered establishments at which production replaces all or some production at another of the emitter's establishments or facilities in Québec that closed after 1 January 2008 is calculated.

(1) for any annual quantity of reference units produced or used by the new facility not exceeding the average annual quantity of reference units produced or used, by type of activity, at the closed establishment or facility during the 3 complete years preceding its closure:

(a) in the case of a facility that is not considered on a sectoral basis, using equations 1-1 and 2-1 to 2-9 and applying equations 2-2 to 2-8 based on data from the closed establishment or facility;

(b) in the case of a facility considered on a sectoral basis, using equations 1-1 and 3-1 to 3-10 and applying equations 3-2 to 3-9 based on data from the closed establishment or facility;

(2) for any annual quantity of reference units produced or used by the new facility that exceeds the average annual quantity of reference units produced or used, by type of activity, at the closed establishment or facility during the 3 complete years preceding its closure:

(a) in the case of a facility that is not considered on a sectoral basis, using equations 4-1 to 4-8;

(b) in the case of a facility considered on a sectoral basis, using equations 5-1 and 5-2.

(6.5.3) Production of a new reference unit

(1) until 2020, the quantity of GHG emission units allocated without charge to an emitter for the production of a new reference unit by one of its covered establishments must be calculated using equation 4-21 for the period during which the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the first year of production of the new reference unit, are not all available;

(2) for the years 2021 to 2023, the quantity of GHG emission units allocated without charge to an emitter for the production of a new reference unit by a covered establishment must be calculated

(a) in the case of an establishment that is not considered on a sectoral basis, for the period during which the GHG emissions data for years d to d+2, or d+1 to d+3 where d is the first year of production of the new reference unit, are not all available, using equation 11-5;

(b) in the case of an establishment that is not considered on a sectoral basis, for the period during which GHG emissions data for years d to d+2, or d+1 to d+3 where d is the first year of production of the new reference unit, are all available, using equations 11-1 to 11-4, which apply from 2018;

(c) in the case of an establishment that is considered on a sectoral basis, for the period during which GHG emissions data for years d to d+2, or d+1 to d+3 where d is the first year of production of the new reference unit, are not all available, using equation 11-5;

(d) in the case of an establishment that is considered on a sectoral basis, for the period during which GHG emissions data for years d to d+2, or d+1 to d+3 where d is the first year of production of the new reference unit, are all available, using equation 9-1.

(6.6) Establishment covered after 2013, but prior to 2021, at which production replaces all or some production at one of the emitter's establishments or facilities in Québec that closed after 1 January 2008

Every emitter, at one of whose establishments covered after 2013 production replaces all or some production at another of the emitter's establishments or facilities in Québec that closed after 1 January 2008, must, as soon as possible, notify the Minister by submitting the following information:

(1) the name and contact information of the enterprise and the establishment;

(2) the business number assigned to the emitter pursuant to the Act respecting the legal publicity of enterprises (chapter P-44.1), along with the identification number assigned under the National Pollutant Release Inventory of the Government of Canada, if any;

(3) the name and contact information of the replaced establishment or facility;

(4) the quantity, by type of activity, of reference units produced or used at the closed establishment or facility.

The quantity of GHG emission units allocated without charge to the emitter for the establishment is calculated

(1) for any annual quantity of reference units produced or used at the establishment not exceeding the average annual quantity of reference units produced or used, by type of activity, at the closed establishment or facility during the 3 complete years preceding its closure:

(a) in the case of an establishment that is not considered on a sectoral basis, using equations 1-1 and 2-1 to 2-9 and applying equations 2-2 to 2-8 based on data from the closed establishment or facility;

(b) in the case of an establishment that is considered on a sectoral basis, using equations 1-1 and 3-1 to 3-10 and applying equations 3-2 to 3-9 based on data from the closed establishment or facility;

(2) for any annual quantity of reference units produced or used at the establishment that exceeds the average annual quantity of reference units produced or used, by type of activity, at the closed establishment or facility during the 3 complete years preceding its closure:

(a) in the case of an establishment that is not considered on a sectoral basis, using equations 4-1 to 4-8;

(b) in the case of an establishment that is considered on a sectoral basis, using equations 5-1 and 5-2.

(**6.7**) **Enterprise that acquires, for consumption of the enterprise or for sale in Québec, power generated in another Canadian province or territory or in a US state where a system covering electricity production in particular has been established by an entity that is not a partner entity**

(1) Until 2020, the quantity of GHG emission units allocated without charge to an emitter for an enterprise that acquires, for consumption of the enterprise or for sale in Québec, power generated in another Canadian province or territory or in a US state where a system covering electricity production in particular has been established by an entity that is not a partner entity must be calculated using equation 6-11.

(2) For the years 2021 to 2023, the quantity of GHG emission units allocated without charge to an emitter for an enterprise that acquires, for consumption of the enterprise or for sale in Québec, power generated in another Canadian province or territory or in a US state where a system covering electricity production in particular has been established by an entity that is not a partner entity must be calculated using equation 6-11.1.

Equation 6-11 Calculation of the total GHG emission units allocated free of charge to an enterprise that acquires, for consumption of the enterprise or for sale in Québec, power generated in another Canadian province or territory or in a US state where a system covering electricity production in particular has been established by an entity that is not a partner entity

$$A_i = \frac{P_i^{Non\text{-}WCI}}{P_i^{WCI}} \times E_i^{Non\text{-}WCI}$$

Where:

A*i* = Number of emission units allocated free of charge for year *i*;

$P_i^{Non\text{-}WCI}$ = Weighted average sale price of emission allowances of year *i* at an auction held during year *i* by other Canadian provinces or territories or by US states where a system covering electricity production in particular has been established by an entity that is not a partner entity, in US dollars;

P_i^{WCI} = Weighted average sale price of emission allowances of year *i* at an auction held during year *i* by Québec or other Canadian provinces or territories or by US states where a system covering electricity production in particular has been established by a partner entity, in US dollars;

$E_i^{Non\text{-}WCI}$ = Annual GHG emissions for year *i* relating to the production of electricity acquired from another Canadian province or territory or from a US state where producers are subject to a system established by an entity that is not a partner entity, in metric tonnes CO_2 equivalent;

i = Each year of the 2013-2020 period for which the emitter is required to cover its emissions.

For the purposes of this equation, where the sale price of the emission allowances that is used for calculation is only available in Canadian dollars, the price must be converted in US dollars at the official conversion rate of the Bank of Canada at noon on the date of the auction.

Equation 6-11.1 Calculation of the total quantity of GHG emission units allocated without charge to an enterprise that acquires, for consumption of the enterprise or for sale in Québec, power generated in

another Canadian province or territory or in a US state where a system covering electricity production in particular has been established by an entity that is not a partner entity

$$A_i = \frac{P_i^{Non-WCI}}{P_i^{WCI}} \times E_i^{Non-WCI}$$

Where:

A_i = Total quantity of GHG emission units allocated without charge for year *i*;

$P_i^{Non\text{-}WCI}$ = Weighted average sale price of emission allowances of year *i* at an auction held during year *i* by other Canadian provinces or territories or by US states where a system covering electricity production has been established by an entity that is not a partner entity, in US dollars;

P_i^{WCI} = Weighted average sale price of emission allowances of year *i* at an auction held during year *i* by Québec or other Canadian provinces or territories or by US states where a system covering electricity production in particular has been established by a partner entity, in US dollars;

$E_i^{Non\text{-}WCI}$ = Annual GHG emissions for year *i* relating to the production of electricity acquired from another Canadian province or territory or from a US state where producers are subject to a system established by an entity that is not a partner entity, taking into account the new GWP values determined in Addendum III to the document "Report of the Conference of the Parties on its nineteenth session, held in Warsaw from 11 to 23 November 2013", FCCC/CP/2013/10/Add.3, (new GWP values), in metric tonnes CO_2 equivalent;

i = Each year in the period 2021-2023 for which the emitter is required to cover its emissions.

(6.8) Copper foundry.

The total quantity of GHG emission units allocated free of charge to a copper foundry is calculated using equation 6-12 for years 2013 and 2014, using equation 6-13 for the years 2015 to 2020, and using equation 6-14 for the years 2021 to 2023:

Equation 6-12 Calculation of the total quantity of GHG emission units allocated free of charge to a copper foundry for years 2013 and 2014

$$A_i = (I2013_{cu} \times P_{R\,cu,i}) + (I2013_{RMS} \times P_{R\,RSM,i}) + A_{recycl,i}$$

Where:

A_i = Total quantity of GHG emission units allocated free of charge for the production of copper anodes at the establishment for year *i*;

i = Each year included in the first compliance period, namely 2013 and 2014;

$I2013_{cu}$ = Intensity target of GHG emissions attributable to the production of copper anodes at the establishment for years 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of copper anodes;

$P_{Ri,cu}$ = Total quantity of copper anodes produced by the establishment during year *i*, in metric tonnes of copper anodes;

$I2013_{RSM}$ = Intensity target for GHG emissions attributable to the treatment of gas from the recycling of secondary materials at the establishment for 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of recycled secondary materials;

$P_{R\,RSM,i}$ = Total quantity of secondary materials recycled at the establishment in year *i*, in metric tonnes of recycled secondary materials;

$A_{recycl,i}$ = GHG emissions attributable to the carbon content of recycled secondary materials introduced into the process materials for year *i*, in metric tonnes CO_2 equivalent;

Equation 6-13 Calculation of the total quantity of GHG emission units allocated free of charge to a copper foundry for years 2015 to 2020

$$A_i = \left[\left(\frac{(6-x)\, I2013_{cu} + x\, I2020_{cu}}{6}\right) \times P_{R\ cu,i}\right] + \left[\left(\frac{(6-x)\, I2013_{RSM} + x\, I2020_{RSM}}{6}\right) \times P_{R\ RSM,i}\right] + A_{recycl,i}$$

Where:

A_i = Total quantity of GHG emission units allocated free of charge for the production of copper anodes at the establishment for year *i*;

i = Each year included in the second and third compliance periods, namely 2015, 2016, 2017, 2018, 2019 and 2020;

6 = Six years in the linear regression, namely 2015, 2016, 2017, 2018, 2019 and 2020;

x = (*i* – 2015) + 1;

$I2013_{cu}$ = Intensity target of GHG emissions attributable to the production of copper anodes at the establishment for years 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of copper anodes;

$I2020_{cu}$ = Intensity target of GHG emissions attributable to the production of copper anodes, calculated using equation 2-8, in metric tonnes CO_2 equivalent per metric tonne of copper anodes;

$P_{Ri,cu,\ i}$ = Total quantity of copper anodes produced by the establishment during year *i*, in metric tonnes of copper anodes;

$I2013_{RSM}$ = Intensity target for GHG emissions attributable to gas from the recycling of secondary materials at the establishment for 2013 and 2014, calculated using equation 2-2, in metric tonnes CO_2 equivalent per metric tonne of recycled secondary materials;

$I2020_{RSM}$ = Intensity target for GHG emissions attributable to the treatment of gas from the recycling of secondary materials, calculated using equation 2-8, in metric tonnes CO_2 per metric tonne of recycled secondary materials;

$P_{R\ RSM,i}$ = Total quantity of secondary materials recycled at the establishment in year *i*, in metric tonnes of recycled secondary materials;

$A_{recycl,i}$ = GHG emissions attributable to the carbon content of recycled secondary materials introduced in the process materials for year *i*, in metric tonnes CO_2 equivalent.

For the application of equations 6-12 and 6-13, recycled secondary materials used in a process at a copper foundry are deemed to be all materials used in the process other than fuel, ore, reducing agents, materials used for slag purification, carbonated reactants and carbon electrodes.

Equation 6-14 Calculation of the total quantity of GHG emission units allocated free of charge for a copper foundry for the years 2021 to 2023

$$A_i = [(I_{C\ stan\ cu} \times a_{C,i} \times P_{cu,i}) + [\max (GHG_{FP\ cu,i}; I_{FP\ stan\ cu} \times P_{R\ cu,i})] \times a_{FP,i}] \times AF_{cu,i} + [(I_{C\ stan\ RSM} \times a_{C,i} \times P_{RSM,i}) + A_{recycl,i}] \times AF_{RSM,i}$$

Where:

A_i = Total quantity of GHG emission units allocated free of charge for the production of copper anodes at the establishment for year *i*;

$I_{C\ stan\ cu}$ = Standard intensity of combustion emissions attributable to the production of copper anodes at the establishment for the years 2021 to 2023, calculated using equation 8-2, in metric tonnes CO_2 equivalent per metric tonne of copper anodes;

$a_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$P_{R\ cu,i}$ = Total quantity of copper anodes produced by the establishment during year *i*, in metric tonnes of copper anodes;

max = Maximum value between $GHG_{FP\ cu,i}$ and $I_{FP\ stan\ cu}$ x $P_{cu,i}$;

$GHG_{FP\ CU,i}$ = Fixed process emissions attributable to the production of copper anodes at the establishment for year *I*, in metric tonnes CO_2 equivalent;

$I_{FP\ stan\ cu}$ = Standard intensity of fixed process emissions attributable to the production of copper anodes at the establishment for the years 2021 to 2023, calculated using equation 8-6, in metric tonnes CO_2 equivalent per metric tonne of copper anodes;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$AF_{cu,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{C\ stan\ RSM}$ = Standard intensity of combustion emissions attributable to the treatment of gas from the recycling of secondary materials at the establishment for the years 2021 to 2023, calculated using equation 8-2, in metric tonnes CO_2 equivalent per metric tonne of recycled secondary materials;

$P_{R\ RSM,i}$ = Total quantity of secondary materials recycled at the establishment in year *i*, in metric tonnes of recycled secondary materials;

$A_{recycl,i}$ = GHG emissions attributable to the carbon content of recycled secondary materials introduced into the process for year *i*, in metric tonnes CO_2 equivalent;

$AF_{RSM,i}$ = Assistance factor for the treatment of gas from the recycling of secondary materials in year *i*, as defined in Table 7 of this Appendix.

For the application of Equation 6-14, recycled secondary materials used in a process at a copper foundry are deemed to be all materials used in the process other than fuel, ore, reducing agents, materials used for slag purification, carbonated reactants and carbon electrodes.

Equation 6-15 Calculation of the total quantity of GHG emission units allocated free of charge for the production of steel (slabs, billets or ingots), metallic silicon, ferrosilicon, reduced iron pellets or titanium dioxide (TiO_2) for the years 2021 to 2023

$$A_{i,j} = [(I_{C\ stan\ j} \times a_{C,i} + I_{O\ stan\ j} \times a_{O,i}) \times P_{R\ i,j} + \max(GHG_{FP\ i,j}; I_{FP\ stan\ j} \times P_{R\ i,j}) \times a_{FP,i}] \times AF_{i,j}$$

Where:

$A_{i,j}$ = Total quantity of GHG emission units allocated free of charge by type of activity *j* for year *i*;

i = Each year included in the period from 2021 to 2023 for which the emitter is required to cover GHG emissions;

j = Type of activity, namely the production of steel (slabs, billets or ingots) or the production of metallic silicon or the production of ferrosilicon, reduced iron pellets or titanium dioxide (TiO_2);

$I_{C\ stan\ j}$ = Standard intensity of combustion emissions attributable to type of activity *j* at the establishment for the years 2021 to 2023, calculated using equation 8-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{O\ stan\ j}$ = Standard intensity of other emissions attributable to type of activity *j* at the establishment for the years 2021 to 2023, calculated using equation 8-6, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 5 of this Appendix;

$P_{Ri,j}$ = Total quantity of reference units produced or used by the establishment for the type of activity *j* during year *i*;

max = Maximum value between $GHG_{FPi,j}$ and $I_{FP\ stan\ j} \times P_{R\ i,j}$;

$GHG_{FPi,j}$ = Fixed process emissions attributable to the type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$I_{FP\ stan\ j}$ = Standard intensity of fixed process emissions attributable to the type of activity *j* at the establishment for the years 2021 to 2023, calculated using equation 8-2, in metric tonnes CO_2 equivalent per reference unit;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$AF_{i,j}$ = Assistance factor for the type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 6-16 Calculation of the total quantity of GHG emission units allocated free of charge to a copper refinery for the years 2021 to 2023

$$A_i = [(I_{C\ stan\ cath} \times a_{C,i}) + (I_{FP\ stan\ cath} \times a_{FP,i})] \times P_{R\ cath,i} \times AF_{cath,i} + [(GHG_{C,i\ RSM} \times a_{C,i})] \times AF_{RSM,i}$$

Where:

A_i = Total quantity of GHG emission units allocated free of charge for the production of copper cathodes at the establishment for year *i*;

$I_{C\ stan\ cath}$ = Standard intensity of combustion emissions attributable to the production of copper cathodes at the establishment for the years 2021 to 2023, calculated using equation 8-2, in metric tonnes CO_2 equivalent per metric tonne of copper cathodes;

$a_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{FP\ stan\ cath}$ = Standard intensity of fixed process emissions attributable to the production of copper cathodes at the establishment for the years 2021 to 2023, calculated using equation 8-6, in metric tonnes CO_2 equivalent per metric tonne of copper anode;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$P_{R\ cath,i}$ = Total quantity of copper cathodes produced at the establishment for year *i*, in metric tonnes of copper anodes;

$AF_{cath,i}$ = Assistance factor for the production of copper cathodes for year *i*, as defined in Table 7 of this Appendix;

$GHG_{C,i\ RSM}$ = GHG combustion emissions attributable to the treatment of recycled secondary materials for year *i*, in metric tonnes CO_2 equivalent;

$AF_{RSM,i}$ = Assistance factor for the treatment of recycled secondary materials for year *i*, as defined in Table 7 of this Appendix.

(7) Calculation of the total quantity of GHG emission units allocated without charge to an establishment for the years 2021 to 2023

Equation 7-1 Calculation of the total quantity of GHG emission units allocated without charge to an establishment for the years 2021 to 2023

$$A_{establishment\ i} = \sum_{j=1}^{m} A_{i,j}$$

Where:

$A_{establishment\ i}$ = Total quantity of GHG emission units allocated without charge to an establishment for year *i* for all types of activity *j* of the establishment listed in Table B of this Appendix;

i = Each year included in the period 2021 to 2023 for which the emitter is required to cover GHG emissions;

m = Total number of types of activity at the establishment;

j = Each type of activity at the establishment;

$A_{i,\ j}$ = Number of GHG emission units allocated without charge by type of activity *j* for year *i*, calculated using equations 8-1, 8-1.1, 9-1, 10-1, 11-1, 11-5, 12-1, 13-1, 14-1, 14-5, 15-1, 6-10.1, 6-10.5, 6-10.9, 6-11.1, 6-14, 6-15 or 6-16.

(8) Establishment covered prior to 2021 that is not considered on a sectoral basis or establishment producing lime or liquid aluminum using a side-worked prebaked anode technology

Equation 8-1 Calculation of the number of GHG emission units allocated without charge by type of activity for the years 2021 to 2023 at an establishment covered prior to 2021 that is not considered on a sectoral basis or an establishment producing lime or liquid aluminum using a side-worked prebaked anode technology

$$A_{i\,j} = (I_{FP\ stan\ j} \times a_{FP,i} + I_{C\ stan\ j} \times a_{C,i} + I_{O\ stan\ j} \times a_{O,i}) \times P_{R\ i,j} \times AF_{i,j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the period 2021 to 2023 for which the emitter is required to cover GHG emissions;

j = Type of activity;

$I_{FP\ stan\ j}$ = Standard intensity of fixed process emissions attributable to type of activity *j* at the establishment for the years 2021 to 2023 using equation 8-2, 8-8 or equation 8-11, in metric tonnes CO_2 equivalent per reference unit;

$A_{c,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{C\ stan\ j}$ = Standard intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for the years 2021 to 2023, calculated using, as the case may be, equation 8-4, 8-9 or 8-13, or, in the case of an establishment producing alumina from bauxite, having a value of 0.4, in metric tonnes CO_2 equivalent per reference unit;

$A_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$I_{O\ stan\ j}$ = Standard intensity of other emissions attributable to type of activity *j* at the establishment for the years 2021 to 2023 using equation 8-6, 8-10 or 8-17, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 5 of this Appendix;

$P_{Ri,j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 8-1.1 Calculation of the number of GHG emission units allocated free of charge per type of activity for the years 2021 to 2023 at an establishment covered prior to 2021 that is not considered on a sectoral basis and does not possess a determined reference unit

$$A_i = [(EC_{TOTAL,av} \times EF \times a_{C,i}) + (GHG_{FP,av} \times a_{FP,i}) + (GHG_{O,av} \times a_{A,i})] \times AF_{i,j}$$

Where:

A_i = Total number of GHG emission units allocated free of charge for year *i*;

i = Each year included in the period 2021 to 2023 for which the emitter is required to cover GHG emissions;

$EC_{TOTAL,av}$ = Average energy consumption for the reference years, calculated, as the case may be, using equation 4-24 or 4-40, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2/GJ equivalent, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i*, as defined in Table 5 of this Appendix;

$GHG_{FP,av}$ = Average fixed process emissions at the establishment for the reference years, in metric tonnes CO_2 equivalent, calculated using the new GWP values;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i*, as defined in Table 5 of this Appendix;

$GHG_{O,av}$ = Average other emissions at the establishment for the reference years, in metric tonnes CO_2 equivalent, calculated using the new GWP values;

$a_{o,i}$ = Cap adjustment factor for the allocation of other emissions for year *i*, as defined in Table 5 of this Appendix;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

(8.1) Calculation method for standard intensities for an establishment using GHG emissions data for the years 2007 to 2010

Equation 8-2 Calculation of the standard intensity of fixed process emissions by type of activity at an establishment that is not considered on a sectoral basis or an establishment producing liquid aluminum using a side-worked prebaked anode technology for the years 2021 to 2023 and using GHG emissions data for the years 2007 to 2010

$$I_{FP\ stan\ j} = C_{FP\ j} \times I_{FP2020\ j}$$

Where:

$I_{FP\ stan\ j}$ = Standard intensity of fixed process emissions for the period 2021-2023 for type of activity *j*;

$C_{FP\ j}$ = Correction factor for the intensity of fixed process emissions for type of activity *j*, calculated using equation 8-3;

$I_{FP2020\ j}$ = Intensity of fixed process emissions calculated for year 2020 for type of activity *j*, using equation 2-8.1, or using equation 6-7.1 in the case of the fabrication of rigid foamed insulation, using the old GWP values.

Equation 8-3 Calculation of correction factor for fixed process emissions to take into account the new GWP values

$$C_{FP\ j} = av \quad \left[\frac{GHG_{FP\ j2013}\ (new\ GWP)}{GHG_{FP\ j2013}\ (old\ GWP)} ; \frac{GHG_{FP\ j2014}\ (new\ GWP)}{GHG_{FP\ j2014}\ (old\ GWP)} ; \frac{GHG_{FP\ j2015}\ (new\ GWP)}{GHG_{FP\ j2015}\ (old\ GWP)} \right]$$

Where:

$C_{FP\ j}$ = Correction factor for the intensity of fixed process emissions for type of activity *j*;

j = Type of activity;

av = Average fixed process emissions for the years 2013, 2014 and 2015;

$GHG_{FP\ j}$ = Fixed process emissions for type of activity *j* at the establishment for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting the mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or the new GWP values, in metric tonnes CO_2 equivalent, excluding unusable years;

Equation 8-4 Calculation of the standard intensity of combustion emissions by type of activity at an establishment that is not considered on a sectoral basis or an establishment producing liquid aluminum using a side-worked prebaked anode technology and using GHG emissions data for the years 2007 to 2010

$$I_{C\ stan\ j} = C_{C\ j} \times I_{C2020\ j} \times C_{cR}$$

Where:

$I_{C\ stan\ j}$ = Standard intensity of combustion emissions for the period 2021-2023 for type of activity *j*;

$C_{C\ j}$ = Correction factor for the intensity of combustion emissions for type of activity *j*, calculated using equation 8-5;

$I_{C2020\ j}$ = Intensity of combustion emissions calculated for year 2020 for type of activity *j*, using equation 2-8.2, or using equation 6-7.2 in the case of the fabrication of rigid foamed insulation, using the old GWP values;

C_{cR} = Correction factor of the multiplication factor of the intensity of combustion emissions at the establishment, calculated using equation 8-4.1.

Equation 8-4.1 Calculation of the correction factor of the multiplication factor of combustion emissions at the establishment

$$C_{cR} = \max[1;\ 0.85/R]$$

Where:

C_{cR} = Correction factor of the multiplication factor of the intensity of combustion emissions at the establishment;

max = Maximum value between 1 and 0.85/R;

R = Intensity multiplication factor for GHG emissions, calculated using equation 2-4, 4-6, 4-11, 4-17, 4-27 or 4-33 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1.

Equation 8-5 Calculation of correction factor for combustion emissions by type of activity to take into account the new GWP values

$$C_{FP\,j} = av \quad \left[\frac{GHG_{FP\,j2013}\ (new\ GWP)}{GHG_{FP\,j2013}\ (old\ GWP)} ; \frac{GHG_{FP\,j2014}\ (new\ GWP)}{GHG_{FP\,j2014}\ (old\ GWP)} ; \frac{GHG_{FP\,j2015}\ (new\ GWP)}{GHG_{FP\,j2015}\ (old\ GWP)} \right]$$

Where:

$C_{FP\,j}$ = Correction factor for the intensity of combustion emissions for type of activity *j*;

j = Type of activity;

av = Average combustion emissions for the years 2013, 2014 and 2015;

$GHG_{FP\,j}$ = Combustion emissions for type of activity *j* at the establishment for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting the mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) (old GWP values) or the new GWP values in metric tonnes CO_2 equivalent, excluding unusable years.

Equation 8-6 Calculation of the standard intensity of other emissions by type of activity at an establishment that is not considered on a sectoral basis or an establishment producing liquid aluminum using a side-worked prebaked anode technology for the years 2021 to 2023 using GHG emissions data for the years 2007 to 2010

$$I_{O\ stan\ j} = C_{O\,j} \times I_{O2020\,j}$$

Where:

$I_{O\ stan\ j}$ = Standard intensity of other emissions for the period 2021-2023 for type of activity *j*;

j = Type of activity;

$C_{O\ j}$ = Correction factor for the intensity of other emissions for type of activity *j*, calculated using equation 8-7;

$I_{O2020\ j}$ = Intensity of other emissions calculated for year 2020 for type of activity *j*, using equation 2-8.3, or using equation 6-7.3 For the fabrication of rigid foamed insulation, using the old GWP values.

Equation 8-7 Calculation of the correction factor for other emissions by type of activity to take into account the new GWP values

$$C_{O\,j} = av \quad \left[\frac{GHG_{O\,j2013}\ (new\ GWP)}{GHG_{O\,j2013}\ (old\ GWP)} ; \frac{GHG_{O\,j2014}\ (new\ GWP)}{GHG_{O\,j2014}\ (old\ GWP)} ; \frac{GHG_{O\,j2015}\ (new\ GWP)}{GHG_{O\,j2015}\ (old\ GWP)} \right]$$

Where:

$C_{O\ j}$ = Correction factor for the intensity of other emissions for type of activity *j*;

j = Type of activity;

av = Average of other emissions for the years 2013, 2014 and 2015;

$GHG_{O\ j}$ = Other emissions for type of activity *j* at the establishment for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or the new GWP values, in metric tonnes CO_2 equivalent, excluding unusable years.

(8.2) Calculation method for standard intensities for an establishment using no GHG emissions data for the years 2007 to 2010

Equation 8-8 Calculation of the standard intensity of fixed process emissions by type of activity at an establishment that is not considered on a sectoral basis for the years 2021 to 2023 and using no emissions data for the years 2007 to 2010

$$I_{FP\ stan\ j} = I_{FP\ dep\ j}$$

Where:

$I_{FP\ stan\ j}$ = Average standard intensity of fixed process emissions attributable to type of activity *j* at the establishment for the reference years, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for the reference years, calculated using, as the case may be, equation 4-3, 4-10, 4-16, 4-26 or 4-32, in metric tonnes CO_2 equivalent per reference unit, using the new GWP values.

Equation 8-9 Calculation of the standard intensity of combustion emissions by type of activity at an establishment that is not considered on a sectoral basis and using no GHG emissions data for the years 2007 to 2010

$$I_{C\ stan\ j} = R \times 0.99^{n} \times I_{C\ dep\ j} \times C_{cR}$$

Where:

$I_{C\ stan\ j}$ = Average standard intensity of combustion emissions attributable to activity *j* at the establishment for the reference years, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

R = Intensity multiplication factor for combustion emissions at the establishment, calculated using equation 4-6, 4-11, 4-17, 4-27 or 4-33 or, in the case of an establishment producing pulp and paper described by NAICS code 3221, having a value of 1;

n = i – (d+2);

d = First year for which the GHG emissions at the establishment are equal to or exceed the emissions threshold;

i = Year 2020;

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for the reference years, calculated using, as the case may be, equation 4-4, 4-13, 4-19, 4-29 or 4-35, in metric tonnes CO_2 equivalent per reference unit, using the new GWP values;

C_{cR} = Correction factor of the multiplication factor of the intensity of combustion emissions at the establishment, calculated using equation 8-4.1.

Equation 8-10 Calculation of standard intensity of other emissions by type of activity at an establishment that is not considered on a sectoral basis and using no emissions data for the years 2007 to 2010 for the years 2021 to 2023

$$I_{O\ stan\ j} = 0.99^{n} \times I_{O\ dep\ j}$$

Where:

$I_{o\ stan\ j}$ = Average standard intensity of other emissions attributable to type of activity *j* at the establishment for the reference years, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

n = *i* – (*d*+2);

d = First year for which GHG emissions of the establishment are equal to or exceed emissions threshold;

i = Year 2020;

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for the reference years, calculated, as the case may be, using equation 4-5, 4-14, 4-20, 4-30 or 4-36, in metric tonnes CO_2 equivalent, using the new GWP values.

(8.3) Calculation method for standard intensities for an establishment producing lime

Equation 8-11 Calculation of the standard intensity of fixed process emissions by type of activity at an establishment in the lime sector

$$I_{FP\ stan\ j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{l} C_{FP\ jk} . GHG_{FP\ ijk}}{\sum_{i=2007}^{2010} \sum_{k=1}^{l} P_{R\ ijk}}$$

Where:

$I_{FP\ stan\ j}$ = Standard intensity of fixed process emissions in the lime sector for the period 2021-2023 for type of activity *j*;

j = Type of activity;

i = Each year included in the period 2007-2010;

k = Covered establishment in the lime sector;

l = Number of covered establishment from 2013 in the lime sector;

$C_{FP\ jk}$ = Correction factor for the intensity of fixed process emissions for type of activity *j* at establishment *k*, calculated using equation 8-12;

$GHG_{FP\ ijk}$ = Fixed process emissions for type of activity *j* at establishment *k* during years *i*, in metric tonnes CO_2 equivalent;

$P_{R\ ijk}$ = Total quantity of reference units produced or used by establishment *k* for type of activity *j* during year *i*.

Equation 8-12 Calculation of correction factor for fixed process emissions to take into account the new GWP values

$$C_{FP\,jk} = av \quad \left[\frac{GHG_{FP2013\,jk}\,(new\ GWP)}{GHG_{FP2013\,jk}\,(old\ GWP)} ; \frac{GHG_{FP2014\,jk}\,(new\ GWP)}{GHG_{FP2014\,jk}\,(old\ GWP)} ; \frac{GHG_{FP2015\,jk}\,(new\ GWP)}{GHG_{FP2015\,jk}\,(old\ GWP)} \right]$$

Where:

$C_{FP\ jk}$ = Correction factor for the intensity of fixed process emissions for type of activity *j* at establishment *k*;

j = Type of activity;

k = Covered establishment in the lime sector;

av = Average of fixed process emissions for the years 2013, 2014 and 2015;

$GHG_{FP\ jk}$ = Fixed process emissions for type of activity *j* at establishment *k* for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or the new GWP values, in metric tonnes CO_2 equivalent, excluding years that are not usable.

Equation 8-13 Calculation of the standard intensity of combustion emissions by type of activity at an establishment in the lime sector

$$I_{C\ stan\ j} = R_S.\ min\{0.95.I_{C\ stan\ min\ j}\ ;\ 0.90.I_{C\ stan\ av\ j}\}$$

Where:

$I_{C\ stan\ j}$ = Standard intensity of combustion emissions in the lime sector for the period 2021-2023 for type of activity *j*;

j = Type of activity;

R_s = Sectoral intensity multiplication factor for combustion emissions calculated using equations 3-4 and 3-5;

min = Minimum value between the 2 calculated elements;

0.95 = Proportion corresponding to 95% of the minimum intensity of combustion emissions;

$I_{C\ stan\ min\ j}$ = Minimum annual intensity of combustion emissions for type of activity *j* for the years 2007-2010, calculated using equation 8-14, in metric tonnes CO_2 equivalent per reference unit;

0.90 = Proportion corresponding to 90% of the average intensity of combustion emissions;

$I_{C\ stan\ av\ j}$ = Average intensity of combustion emissions for type of activity *j* for the years 2007-2010, calculated using equation 8-15, in metric tonnes CO_2 equivalent per reference unit.

Equation 8-14 Calculation of the minimum intensity of combustion emissions by type of activity at an establishment in the lime sector

$$I_{C\,ref\,\min\,j} = min\left[\frac{\sum_{k=1}^{l} C_{C\,jk}.GHG_{C\,2007\,jk}}{\sum_{k=1}^{l} P_{R\,2007\,jk}}; \frac{\sum_{k=1}^{l} C_{C\,jk}.GHG_{C\,2008\,jk}}{\sum_{k=1}^{l} P_{R\,2008\,jk}}; \frac{\sum_{k=1}^{l} C_{C\,jk}.GHG_{C\,2009\,jk}}{\sum_{k=1}^{l} P_{R\,2009\,jk}}; \frac{\sum_{k=1}^{l} C_{C\,jk}.GHG_{C\,2010\,jk}}{\sum_{k=1}^{l} P_{R\,2010\,jk}}\right]$$

Where:

$I_{C\ ref\ min\ j}$ = Minimum annual intensity of combustion emissions for type of activity *j* for the years 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

min = Minimum value of annual intensities of combustion emissions for the years 2007-2010;

k = Covered establishment in the lime sector;

I = Number of covered establishments from 2013 in the lime sector;

$C_{C\ jk}$ = Correction factor for the intensity of combustion emissions for type of activity *j* at establishment *k*, calculated using equation 8-16;

$GHG_{C\ jk}$ = Combustion emissions for type of activity *j* of establishment *k* during years 2007 to 2010, in metric tonnes CO_2 equivalent;

$P_{R\ jk}$ = Total quantity of reference units produced or used by establishment *k* for type of activity *j* during years 2007 to 2010.

Equation 8-15 Calculation of the average intensity of combustion emissions by type of activity at an establishment in the lime sector

$$I_{C\ stan\ av\ j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{l} C_{C\ jk} . GHG_{C\ ijk}}{\sum_{i=2007}^{2010} \sum_{k=1}^{l} P_{R\ ijk}}$$

Where:

$I_{C\ stan\ av\ j}$ = Average intensity of combustion emissions for type of activity *j* for the years 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

k = Covered establishment in the lime sector;

I = Number of covered establishments from 2013 in the lime sector;

$C_{C\ jk}$ = Correction factor for the intensity of combustion emissions for type of activity *j* at establishment *k*, calculated using equation 8-16;

$GHG_{C\ ijk}$ = Combustion emissions for type of activity *j* at establishment *k* during year *i*, in metric tonnes CO_2 equivalent;

$P_{R\ ijk}$ = Total quantity of reference units produced or used by establishment *k* for type of activity *j* during year *i*.

Equation 8-16 Calculation of the correction factor for combustion emissions by type of activity to take into account the new GWP values

$$C_{C\,jk} = av \quad \left[\frac{GHG_{C2013\,jk}\,(new\ GWP)}{GHG_{C2013\,jk}\,(old\ GWP)} ; \frac{GHG_{C2014\,jk}\,(new\ GWP)}{GHG_{C2014\,jk}\,(old\ GWP)} ; \frac{GHG_{C2015\,jk}\,(new\ GWP)}{GHG_{C2015\,jk}\,(old\ GWP)} \right]$$

Where:

$C_{C\ jk}$ = Correction factor for the intensity of combustion emissions for type of activity *j* of establishment *k*;

j = Type of activity;

k = Covered establishment in the lime sector;

av= Average of the combustion emissions for the years 2013, 2014 and 2015;

$GHG_{C\ jk}$ = Combustion emissions for type of activity *j* at establishment *k* for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or the new GWP values, in metric tonnes CO_2 equivalent, excluding years that are not usable.

Equation 8-17 Calculation of the standard intensity of other emissions by type of activity at an establishment in the lime sector

$$I_{O\ stan\ j} = min\{0.95.I_{o\ stan\ min\ j}\ ;\ 0.90.I_{o\ stan\ av\ j}\}$$

Where:

$I_{O\ stan\ j}$ = Standard intensity of other emissions in the lime sector for the period 2021-2023 for type of activity *j*;

j = Type of activity;

R_s = Sectoral intensity multiplication factor of other emissions calculated using equations 3-4 and 3-5;

min = Minimum value between the 2 calculated elements;

0.95 = Proportion corresponding to 95% of the minimum intensity of other emissions;

$I_{O\ stan\ min\ j}$ = Minimum annual intensity of other emissions for type of activity *j* for the years 2007-2010, calculated using equation 8-18, in metric tonnes CO_2 equivalent per reference unit;

0.90 = Proportion corresponding to 90% of the average intensity of other emissions;

$I_{O\ stan\ av\ j}$ = Average intensity of other emissions for type of activity *j* for the years 2007-2010, calculated using equation 8-19, in metric tonnes CO_2 equivalent per reference unit.

Equation 8-18 Calculation of the minimum intensity of other emissions by type of activity at an establishment in the lime sector

$$I_{O\ stan\ min\ j} = min\left[\frac{\sum_{k=1}^{l} C_{Ojk}.GHG_{O\ 2007\ jk}}{\sum_{k=1}^{l} P_{2007\ jk}}; \frac{\sum_{k=1}^{l} C_{O\ jk}.GHG_{O\ 2008\ jk}}{\sum_{k=1}^{l} P_{2008\ jk}}; \frac{\sum_{k=1}^{l} C_{O\ jk}.GHG_{O\ 2009\ jk}}{\sum_{k=1}^{l} P_{2009\ jk}}; \frac{\sum_{k=1}^{l} C_{O\ jk}.GHG_{O\ 2010\ jk}}{\sum_{k=1}^{l} P_{2010\ jk}}\right]$$

Where:

$I_{O\ stan\ min\ j}$ = Minimum annual intensity of other emissions for type of activity *j* for the years 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

min = Minimum value of annual intensities of other emissions for the years 2007-2010;

k = Covered establishment in the lime sector;

I = Number of covered establishments from 2013 in the lime sector;

$C_{O\ jk}$ = Correction factor for the intensity of other emissions for type of activity *j* at establishment *k*, calculated using equation 8-20;

$GHG_{O\ jk}$ = Other emissions for type of activity *j* at establishment *k* during years 2007 to 2010, in metric tonnes CO_2 equivalent;

$P_{R\ jk}$ = Total quantity of reference units produced or used by establishment *k* for type of activity *j* during years 2007 to 2010.

Equation 8-19 Calculation of the average intensity of other emissions by type of activity at an establishment in the lime sector

$$I_{O\ stan\ av\ j} = \frac{\sum_{i=2007}^{2010} \sum_{k=1}^{l} C_{O\ k}.GHG_{O\ ijk}}{\sum_{i=0}^{n} \sum_{i=0}^{n} P_{R\ ijk}}$$

Where:

$I_{O\ stan\ av\ j}$ = Average intensity of other emissions for type of activity *j* for the years 2007-2010, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

i = Each year included in the period 2007-2010;

k = Covered establishment in the lime sector;

I = Number of covered establishments from 2013 in the lime sector;

$C_{O\ jk}$ = Correction factor for the intensity of other emissions for type of activity *j* of establishment *k*, calculated using equation 8-20;

$GHG_{O\ ijk}$ = Other emissions for type of activity *j* at establishment *k* during year *i* in metric tonnes CO_2 equivalent;

$P_{R\ ijk}$ = Total quantity of reference units produced or used by establishment *k* for type of activity *j* during year *i*.

Equation 8-20 Calculation of the correction factor for other emissions by type of activity to take into account new GWP values

$$C_{O\,jk} = av \quad \left[\frac{GHG_{O2013\,jk}\,(new\ GWP)}{GHG_{O2013\,jk}\,(old\ GWP)} ; \frac{GHG_{O2014\,jk}\,(new\ GWP)}{GHG_{O2014\,jk}\,(old\ GWP)} ; \frac{GHG_{O2015\,jk}\,(new\ GWP)}{GHG_{O2015\,jk}\,(old\ GWP)} \right]$$

Where:

$C_{O\ jk}$ = Correction factor for the intensity of other emissions for type of activity *j* at establishment *k*;

j = Type of activity;

k = Covered establishment in the lime sector;

moy = Average of the other emissions for the years 2013, 2014 and 2015;

$GHG_{O\ jk}$ = Other emissions for type of activity *j* at establishment *k* for the years 2013, 2014 and 2015, calculated using the old GWP values, determined in Schedule A.1 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15) or the new GWP values, in metric tonnes CO_2 equivalent, excluding years that are not usable.

(9) Establishment producing cement, prebaked anodes or aluminum by using a prebaked anode technology other than the side-worked technology, covered prior to 2021 that is considered on a sectoral basis for the years 2021 to 2023

Equation 9-1 Calculation of the number of GHG emission units allocated without charge by type of activity at an establishment producing cement, prebaked anodes or aluminum using a prebaked anode technology other than the side-worked technology, covered prior to 2021 that is considered on a sectoral basis for the years 2021 to 2023

$$A_{i\,j} = I_{(S)i,j} \times P_{R\,i,j} \times AF_{i,j}$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year included in the period 2021 to 2023;

j = Type of activity;

$I_{(S)\,i,j}$ = Intensity of GHG emissions attributable to type of activity *j* in the sector for year *i*, determined in accordance with Tables 1 and 2 of this Appendix, in metric tonnes CO_2 equivalent per reference unit;

$P_{R\,i,j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

(9.1) Sectoral intensities in the aluminum sector

Table 1 : Sectoral intensities in the aluminum sector

Year	Intensity of GHG emissions for liquid aluminum production using a prebaked anode technology other than the side-worked technology (leaving the electrolysis hall)	Intensity of GHG emissions for the production of baked anodes removed from furnace
2021	1.787	0.3129
2022	1.777	0.3102
2023	1.767	0.3074

(9.2) Sectoral intensities in the cement sector

Table 2 : Sectoral intensities in the cement sector

Year	Intensity of GHG emissions for the production of clinker and the mineral additives added to the clinker produced
2021	0.7814
2022	0.7767
2023	0.7721

(10) Covered establishment as of 2021 that is not considered on a sectoral basis and that possesses all the GHG emissions data for years *d*-2 to *d*

Equation 10-1 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis for the years 2021 to 2023 and that possesses GHG emissions data for years *d*-2 to *d*

$$A_{ij} = [I_{FP\,dep\,j} \times a_{FP,i} + I_{C\,dep\,j} \times a_{C,i} + I_{O\,dep\,j} \times a_{O,i}] \times P_{Ri\,j} \times AF_{i,j}$$

Where:

$A_{i\,j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 10-2, in metric tonnes CO_2 equivalent per reference unit;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$I_{C\ dep\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 10-3, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, calculated using equation 10-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 10-2 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ FP_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 10-3 Calculation of the intensity of combustion emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis

$$I_{C\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ C_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$PR_{i\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 10-4 Calculation of the intensity of other emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis

$$I_{O\ dep\ j} = \frac{\sum_{i=(d-2)}^{d} GHG\ O_{ij}}{\sum_{i=(d-2)}^{d} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d*-2 to *d*, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d*-2, *d*-1 and *d*;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(11) Covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are all available, using equation 11-1;

(2) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are not all available, using equation 11-5.

Equation 11-1 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis for the years 2021 to 2023 and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + I_{C\ dep\ j} \times a_{C,i} + I_{O\ dep\ j} \times a_{O,i}] \times P_{Ri\ j} \times AF_{i,j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 11-2, in metric tonnes CO_2 equivalent per reference unit;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 11-3, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 11-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 11-2 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ FP_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{FP\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ FP_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 11-3 Calculation of the intensity of combustion emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{C\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ C_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{C\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ C_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 11-4 Calculation of the intensity of other emissions by type of activity at a covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d*-2 to *d*

$$I_{O\ dep\ j} = \frac{\sum_{i=(d)}^{d+2} GHG\ O_{ij}}{\sum_{i=(d)}^{d+2} P_{Rij}}$$

Or

$$I_{O\ dep\ j} = \frac{\sum_{i=(d+1)}^{d+3} GHG\ O_{ij}}{\sum_{i=(d+1)}^{d+3} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

i = Years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 11-5 Calculation of the number of GHG emission units allocated without charge for a covered establishment as of 2021 that is not considered on a sectoral basis for the years 2021 to 2023 and that does not possess all the GHG emissions data for the years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$A_i = ((EC_{TOTAL\ i} \times EF \times a_{C,i}) + (GHG_{FP\ i} \times a_{FP,i}) + (GHG_{O\ i} \times a_{O,i})) \times AF_{i,j}$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

$EC_{TOTAL\ i}$ = Energy consumption in year *i*, calculated using equation 11-6, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$GHG_{FP\ i}$ = Fixed process emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$GHG_{O\ i}$ = Other emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 11-6 Calculation of energy consumption for a year at a covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess all the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$EC_{TOTAL\,i} = \sum_{k=1}^{n} (Fuel_k \times HHV_k)$$

Where:

$EC_{TOTAL\,i}$ = Energy consumption in year *i*, in GJ;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(12) Covered establishment as of 2021 that is not considered on a sectoral basis and that does not possess a determined reference unit

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are all available, using equation 12-1;

(2) in the case of an establishment for which the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, are not all available, using equation 11-5.

Equation 12-1 Calculation of the number of GHG emission units allocated without charge for an establishment covered as of 2021 that is not considered on a sectoral basis for the years 2021 to 2023, that does not possess a determined reference unit and that possesses all the GHG emissions data for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational

$$A_i = [(EC_{TOTAL,av} \times EF \times a_{C,i}) + (GHG_{FP,av} \times a_{FP,i}) + (GHG_{O,av} \times a_{O,i})] \times AF_{ij}$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

$EC_{TOTAL,av}$ = Average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, calculated using equation 12-2 in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$GHG_{FP,av}$ = Average fixed process emissions at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

$GHG_{O,av}$ = Average other emissions at the establishment for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*d*+2);

AF_{ij} = Maximum of assistance factors for each type of activity *j* at the establishment for year *i*, as defined in Table 7 of this Appendix.

Equation 12-2 Calculation of average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, at a covered establishment as of 2021 that is not considered on a sectoral basis and that possesses all the GHG emissions data for those years

$$EC_{TOTAL,av} = \sum_{d}^{d+2} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Or

$$EC_{TOTAL,av} = \sum_{d+1}^{d+3} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Where:

$EC_{TOTAL,av}$ = Average energy consumption for years *d* to *d*+2, or *d*+1 to *d*+3 where *d* is the year in which the establishment became operational, in GJ;

d = First year for which the GHG emissions of the establishment are equal to or exceed the emissions threshold;

k = Type of fuel;

n = Total number of types of fuel used;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(13) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis for which the GHG emissions data for years *e*-3 to *e*-1 are all available

Equation 13-1 Calculation of the number of GHG emission units allocated without charge by type of activity for year 2021 to 2023 at an establishment that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + I_{C\ dep\ j} \times a_{C,i} + I_{O\ dep\ j} \times a_{O,i}\ ] \times P_{Ri\ j} \times AF_{i,j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 13-2, in metric tonnes CO_2 equivalent per reference unit;

e = Year of application for registration for the system;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 13-3, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, calculated using equation 13-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 13-2 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ FP_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 13-3 Calculation of the intensity of combustion emissions for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{C\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ C_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 13-4 Calculation of the intensity of other emissions for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are all available

$$I_{O\ dep\ j} = \frac{\sum_{i=(e-3)}^{e-1} GHG\ O_{ij}}{\sum_{i=(e-3)}^{e-1} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-3 to *e*-1, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-3, *e*-2 and *e*-1;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

(14) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equation 14-1;

(2) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equation 14-5.

Equation 14-1 Calculation of the number of GHG emission units allocated without charge by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2021 to 2023 and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$A_{ij} = [I_{FP\ dep\ j} \times a_{FP,i} + I_{C\ dep\ j} \times a_{C,i} + I_{O\ dep\ j} \times a_{O,i}\ ] \times P_{Ri\ j} \times AF_{i,j}$$

Where:

$A_{i\ j}$ = Total number of GHG emission units allocated without charge by type of activity *j* at an establishment for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

j = Type of activity;

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 14-2, in metric tonnes CO_2 equivalent per reference unit;

e = Year of application for registration for the system;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n =*i*-(*e*+1);

$I_{C\ dep\ j}$ = Average intensity of combustion emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 14-3, in metric tonnes CO_2 equivalent per reference unit;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 14-4, in metric tonnes CO_2 equivalent per reference unit;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*;

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 14-2 Calculation of the intensity of fixed process emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ FP_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{FP\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ FP_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{FP\ dep\ j}$ = Average intensity of fixed process emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $FP_{i\ j}$ = Fixed process emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$PR_{i\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 14-3 Calculation of the intensity of combustion emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{C\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ C_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{C\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ C_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{C\ dep\ j}$ = Average intensity of GHG combustion emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $C_{i\ j}$ = Combustion emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 14-4 Calculation of the intensity of other emissions by type of activity at a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-3 to *e*-1 are not all available

$$I_{O\ dep\ j} = \frac{\sum_{i=(e-1)}^{e+1} GHG\ O_{ij}}{\sum_{i=(e-1)}^{e+1} P_{Rij}}$$

Or

$$I_{O\ dep\ j} = \frac{\sum_{i=(e)}^{e+2} GHG\ O_{ij}}{\sum_{i=(e)}^{e+2} P_{Rij}}$$

Where:

$I_{O\ dep\ j}$ = Average intensity of other emissions attributable to type of activity *j* at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent per reference unit;

j = Type of activity;

e = Year of application for registration for the system;

i = Years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational;

GHG $O_{i\ j}$ = Other emissions attributable to type of activity *j* at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$P_{Ri\ j}$ = Total quantity of reference units produced or used at the establishment for type of activity *j* during year *i*.

Equation 14-5 Calculation of the number of GHG emission units allocated without charge for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2021 to 2023 and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available

$$A_i = ((EC_{TOTAL\ i} \times EF \times a_{C,i}) + (GHG_{FP\ i} \times a_{FP,i}) + (GHG_{O\ i} \times a_{O,i})) \times AF_{i,j}$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

$EC_{TOTAL\ i}$ = Energy consumption in year *i*, calculated using equation 14-6, in GJ;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

e = Year of application for registration for the system;

$GHG_{FP\ i}$ = Fixed process emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$GHG_{O\ i}$ = Other emissions at the establishment for year *i*, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$AF_{i,j}$ = Assistance factor for type of activity *j* for year *i*, as defined in Table 7 of this Appendix.

Equation 14-6 Calculation of energy consumption in year *i* for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis and for which the GHG emissions data for years *e*-

1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available

$$EC_{TOTAL\,i} = \sum_{k=1}^{n} (Fuel_k \times HHV_k)$$

Where:

$EC_{TOTAL\,i}$ = Energy consumption in year *i*, in GJ;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(15) Covered establishment referred to in section 2.1 that is not considered on a sectoral basis and that does not possess a determined reference unit

The total quantity of GHG emission units allocated without charge to an emitter is calculated in accordance with the following methods:

(1) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available, using equation 15-1;

(2) in the case of an establishment for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are not all available, using equation 14-5.

Equation 15-1 Calculation of the number of GHG emission units allocated without charge for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis for the years 2021 to 2023, that does not possess a determined reference unit and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available

$$A_i = [(EC_{TOTAL,av} \times EF \times a_{C,i}) + (GHG_{FP,av} \times a_{FP,i}) + (GHG_{O,av} \times a_{O,i})] \times AF_{i,j}$$

Where:

A_i = Total number of GHG emission units allocated without charge for year *i*;

i = Each year in the period 2021-2023 for which the emitter is required to cover its GHG emissions;

$EC_{TOTAL,av}$ = Average energy consumption for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, calculated using equation 15-2, in GJ;

e = Year of application for registration for the system;

EF = Emission factor for natural gas, in metric tonnes CO_2 equivalent/GJ, calculated using equation 4-21.1;

$a_{C,i}$ = Cap adjustment factor for the allocation of combustion emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$GHG_{FP,av}$ = Average fixed process emissions at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{FP,i}$ = Cap adjustment factor for the allocation of fixed process emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

GHG_{Oav} = Average other emissions at the establishment for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in metric tonnes CO_2 equivalent;

$a_{O,i}$ = Cap adjustment factor for the allocation of other emissions for year *i* for establishments covered between 2021 and 2023, as defined in Table 6 of this Appendix, where n=*i*-(*e*+1);

$AF_{i,j}$ = Maximum of assistance factors for each type of activity *j* at the establishment for year *i*, as defined in Table 7 of this Appendix.

Equation 15-2 Calculation of average energy consumption for a covered establishment referred to in section 2.1 that is not considered on a sectoral basis, that does not possess a determined reference unit and for which the GHG emissions data for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, are all available

$$EC_{TOTAL,av} = \sum_{e-1}^{e+1} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Or

$$EC_{TOTAL,av} = \sum_{e}^{e+2} \left(\sum_{k=1}^{n} Fuel_k \times HHV_k \right) \div 3$$

Where:

$EC_{TOTAL,av}$ = Average energy consumption for years *e*-1 to *e*+1, or *e* to *e*+2 where *e*-1 is the year in which the establishment became operational, in GJ;

e = Year of application for registration for the system;

n = Total number of types of fuel used;

k = Type of fuel;

$Fuel_k$ = Mass or volume of fuel burned:

(a) in dry metric tonnes, where the quantity is expressed as a mass;

(b) in thousands of cubic metres at standard conditions, where the quantity is expressed as a volume of gas;

(c) in kilolitres, where the quantity is expressed as a volume of liquid;

HHV_k = High heat value for measurement period *i*, expressed

(a) in GJ per dry metric tonne, in the case of fuels whose quantity is expressed as a mass;

(b) in GJ per thousand cubic metres, in the case of fuels whose quantity is expressed as a volume of gas;

(c) in GJ per kilolitre, in the case of fuels whose quantity is expressed as a volume of liquid.

(16) Allocation cap adjustment factors

(16.1) Covered establishment as of 2018 for the period 2018-2020

Table 4 : Allocation cap adjustment factors for a covered establishment as of 2018 for the period 2018-2020

Year *i*	$A_{FP,i}$	$A_{C,i}$	$a_{O,i}$
2018	1.00	$(0.99)^n$	$(0.99)^n$
2019	1.00	$(0.99)^n$	$(0.99)^n$
2020	1.00	$(0.99)^n$	$(0.99)^n$

(16.2) Establishment covered prior to 2021 for the period 2021-2023

Table 5 : Allocation cap adjustment factors for an establishment covered prior to 2021 for the period 2021-2023

Year *i*	$A_{FP,i}$	$A_{C,i}$	$a_{O,i}$
2021	0.995	0.985	0.970
2022	0.990	0.970	0.940
2023	0.985	0.955	0.910

(16.3) Covered establishment as of 2021 for the period 2021-2023

Table 6 : Allocation cap adjustment factors for a covered establishment as of 2021 for the period 2021-2023

Year *i*	$A_{FP,i}$	$A_{C,i}$	$a_{O,i}$
2021	1-(0.005*n)	1-(0.015*n)	1-(0.03*n)
2022	1-(0.005*n)	1-(0.015*n)	1-(0.03*n)
2023	1-(0.005*n)	1-(0.015*n)	1-(0.03*n)

(17) Assistance factors

Table 7 : Assistance factor defined for a reference unit by compliance period

Sector	Reference unit	Assistance factor 2021-2023
Aluminium	metric tonne of liquid aluminum (leaving the electrolysis hall)	1.00
	metric tonne of baked anodes removed from furnace	1.00
	metric tonne of baked cathodes removed from furnace	1.00
	metric tonne of calcinated coke	1.00
	metric tonne of aluminum hydroxide expressed as Al2O3 equivalent calculated at the precipitation stage	1.00
Other	metric tonne of sugar	1.00
	metric tonne of glass	1.00
	metric tonne of processed oilseeds	1.00
	tmetric tonne of carbon dioxide	1.00
	cubic metre of gypsum products	1.00
Lime	metric tonne of calcic lime and metric tonne of calcic lime kiln dust sold	1.00
	metric tonne of dolomitic lime and metric tonne of dolomitic lime kiln dust sold	1.00
Chemical	board foot of rigid insulation	0.95
	metric tonne of xylene and toluene	1.00
	metric tonne of steam sold to a third person	1.00
	metric tonne of titanium pigment equivalent (raw material)	1.00
	metric tonne of PTA	1.00
	metric tonne of LAB	1.00
	kilolitre of ethanol	1.00
	metric tonne of hydrogen	1.00
	kilolitre of alcohol	0.90
	metric tonne of catalyzer (including additives)	1.00
	metric tonne of tires	0.90
Cement	metric tonne of clinker and metric tonne of additives (gypsum and limestone) added to the clinker produced	1.00
Electricity	megawatt-hour	0.60
	metric tonne of steam	0.60

Metallurgy	metric tonne of reduced iron pellets	1.00
	metric tonne of steel (slabs, pellets or ingots)	1.00
	metric tonne of rolled steel	1.00
	metric tonne of Ti O2 slag cast at the reduction furnaces	1.00
	metric tonne of silicon metal	1.00
	metric tonne of ferrosilicon (50% and 75% concentration)	1.00
	metric tonne of copper anodes	1.00
	metric tonne of recycled secondary materials	1.00
	metric tonne of copper cathodes	1.00
	metric tonne of lead	1.00
	metric tonne of wrought steel	1.00
	metric tonne of iron powder and steel powder at bagging, after additives	1.00
	metric tonne of cathodic zinc	0.95
	metric tonne of iron load	0.95
Mining and pelletization	metric tonne of flux pellets	1.00
	metric tonne of low silica flux pellets	1.00
	metric tonne of direct reduction pellets	1.00
	metric tonne of blast furnace pellets	1.00
	metric tonne of intermediate pellets	1.00
	metric tonne of nickel produced	1.00
	metric tonne of nickel and copper produced	1.00
	metric tonne of iron concentrate	1.00
	metric tonne of standard pellets	1.00
Pulp and paper	metric tonne of various air-dried saleable products	1.00
	metric tonne of various saleable air-dried products of each of the establishments common to a steam network	1.00
Refining	kilolitre of total crude oil refinery load	1.00
	reference unit not determined elsewhere in the table	0.90

O.C. 1297-2011, Sch. C; O.C. 1184-2012, s. 51; O.C. 1138-2013, s. 28; O.C. 902-2014, s. 65; O.C. 1089-2015, s. 30; O.C. 1125-2017, s. 60 to 63.

APPENDIX D

(ss. 70.1 to 70.22)

Note *This Appendix is deemed to be a regulation of the Minister made under the second paragraph of section 46.8 of the Environment Quality Act. (S.Q. 2017, c. 4, s. 285)*

Offset credit protocols

For the purposes of these protocols,

(1) “standard conditions” means a temperature of 20 °C and pressure of 101.325 kPa;

(2) “SSR” means GHG sources, sinks and reservoirs on the project site.

PROTOCOL 1

COVERED MANURE STORAGE FACILITIES – CH_4 DESTRUCTION

Part I

(1) Projects covered

This offset credit protocol covers any project designed to reduce GHG emissions by destroying the CH_4 attributable to the manure of an agricultural operation in Québec raising one of the species of livestock listed in the tables in Part II.

The project involves the installation of a manure storage facility cover and a fixed CH_4 destruction device.

The project must enable to capture and destroy CH_4 that, before the project, was emitted to the atmosphere. The CH_4 must be destroyed on the site of the manure storage facility where the CH_4 was captured, using a flare or any other device.

For the purposes of this protocol, “manure” means livestock waste with liquid manure management within the meaning of the Agricultural Operations Regulation (chapter Q-2, r. 26).

(2) Location

The project must be carried out within the borders of the province of Québec.

(3) Reduction project SSRs

The process flow chart in Figure 3.1 and the table in Figure 3.2 show all the SSRs that must be taken into account by the promoter when calculating the GHG emission reductions attributable to the project.

All the SSRs within the dotted line must be counted for the purposes of this protocol.

Figure 3.1. Flowchart for the reduction project process

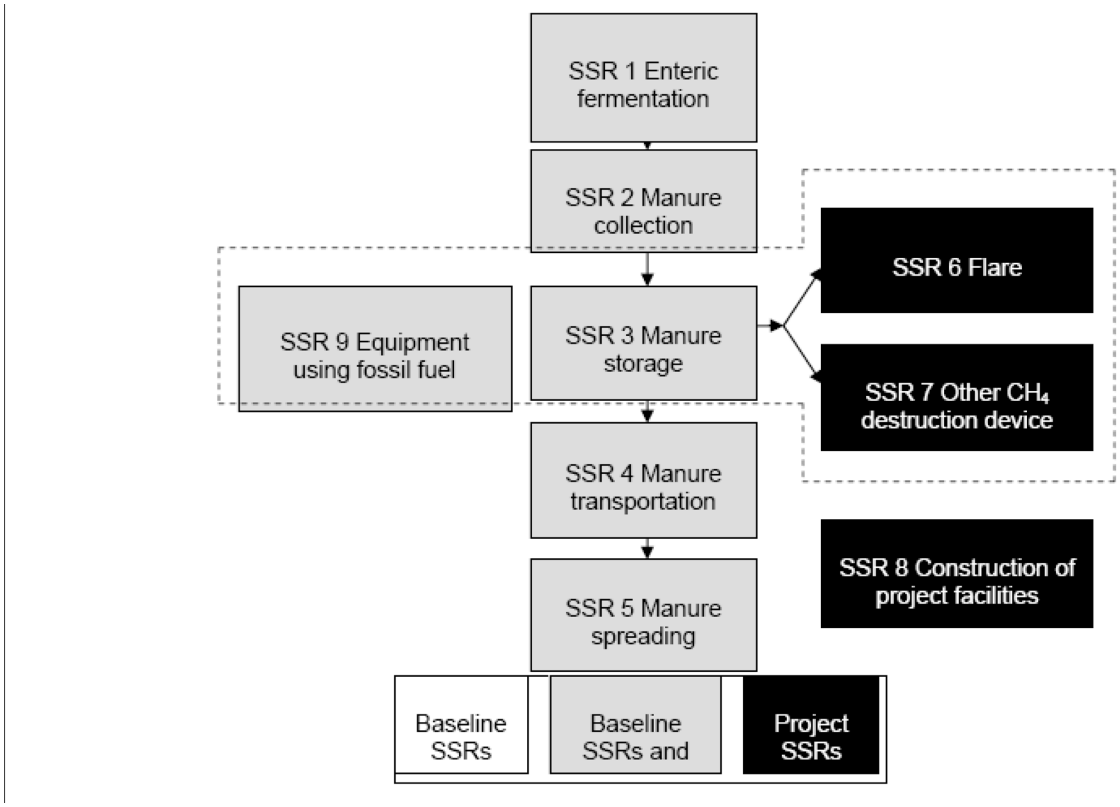

Figure 3.2. Reduction project SSRs

SSR #	Description	GHG	Relevant to project baseline scenario (B) and/or Project (P)	Included or Excluded
1	Enteric fermentation	CH_4	B, P	Excluded
2	Manure collection	CH_4		Excluded
		CO_2	B, P	Excluded
		N_2O		Excluded
3	Manure storage	CH_4		Included
		CO_2	B, P	Excluded
4	Manure transportation	CH_4		Excluded
		CO_2	B, P	Excluded
		N_2O		Excluded
5	Manure spreading	CH_4		Excluded
		CO_2	B, P	Excluded
		N_2O		Excluded
6	Flare	CH_4		Included
		CO_2	P	Excluded
		N_2O		Included
7	Other CH_4 destruction device	CH_4		Included
		CO_2	P	Excluded
		N_2O		Included
8	Construction of project facilities	CH_4		Excluded
		CO_2	P	Excluded
		N_2O		Excluded
9	Equipment using fossil fuel	CH_4		Included
		CO_2	B, P	Included
		N_2O		Included

(4) Calculation method for the GHG emission reductions attributable to the project

The promoter must calculate the quantity of GHG emission reductions attributable to the project using equation 1:

Equation 1

$$ER = GHG_{project} - \Delta GHG_{fossil}$$

Where:

ER = Reductions in GHG emissions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

$GHG_{project}$ = Gross reduction in GHG emissions from the project during the issuance period, calculated using equation 2, in metric tonnes CO_2 equivalent;

ΔGHG_{fossil} = Differential between GHG emissions in the baseline scenario and GHG emissions for the project attributable to the fossil fuels consumed in the operation of equipment within the project SSRs, during the issuance period, calculated using equation 9, in metric tonnes CO_2 equivalent.

(4.1) Calculation method for gross GHG emission reductions

The promoter must calculate the quantity of gross GHG emission reductions attributable to the project using equations 2 to 8:

Equation 2

$$GHG_{project} = GHG_{dest\ flare} - GHG_{combustion\ flare} + GHG_{dest\ other} - GHG_{combustion\ other}$$

Where:

$GHG_{project}$ = Gross reduction in GHG emissions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

$GHG_{dest\ flare}$ = Lesser of the CH_4 emissions destroyed at flare during the issuance period and 90% of the emissions from an uncovered manure storage facility, calculated using equation 3, in metric tonnes CO_2 equivalent;

$GHG_{combustion\ flare}$ = N_2O emissions attributable to combustion of captured gas at flare during the issuance period, calculated using equation 6, in metric tonnes CO_2 equivalent;

$GHG_{dest\ other}$ = Lesser of the CH_4 emissions destroyed by a destruction device other than a flare during the issuance period and 90% of the emissions from an uncovered manure storage facility, calculated using equation 7, in metric tonnes CO_2 equivalent;

$GHG_{combustion\ other}$ = N_2O emissions attributable to combustion of captured gas by a destruction device other than a flare during the issuance period, calculated using equation 8.1, in metric tonnes CO_2 equivalent;

Equation 3

$$GHG_{dest\ flare} = Min\ [GHG_{flare};\ GHG_{EF}]$$

Where:

$GHG_{dest\ flare}$ = Lesser of the CH_4 emissions destroyed at flare during the issuance period and 90% of the emissions from an uncovered manure storage facility, in metric tonnes CO_2 equivalent;

Min = Lesser of the 2 elements calculated;

GHG_{flare} = CH_4 emissions destroyed at flare during the issuance period, calculated using equation 4, in metric tonnes CO_2 equivalent;

GHG_{EF} = 90% of emissions from an uncovered manure storage facility, calculated using equation 5, in metric tonnes CO_2 equivalent;

Equation 4

$$GHG_{flare} = \sum_{j=1}^{n} \left[\left(Q_{gas\ cov} \times EFF_{flare} \right) \times C_{CH4} \right]_j \times 0.667 \times 21 \times 0.001$$

Where:

GHG_{flare} = CH_4 emissions destroyed at flare during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of days on which gas is produced during the issuance period;

j = Day on which gas is produced at the manure storage facility;

$Q_{gas\ cov}$ = Quantity of gas available for burning on day *j* measured at the capture system before delivery to the flare, in cubic metres at standard conditions;

EFF_{flare} = Flare burning efficiency rate, namely:

— for an open flare, a rate of 0.96 when the flare is operated in accordance with the method General control device and work practice requirements in Part 60.18 of Title 40 of the Code of Federal Regulation published by the U.S. Environmental Protection Agency (USEPA), or a rate of 0.5 in other cases;

— for an enclosed flare, a rate of 0.98 when the gas retention time in the stack is at least 0.3 seconds, or a rate of 0.9 in other cases;

C_{CH4} = Average CH_4 content in the gas burned on day *j*, determined in accordance with Part III, in cubic metres of CH_4 per cubic metre of gas;

0.667 = Density of CH_4, in kilograms per cubic metre at standard conditions;

21 = Global Warming Potential factor of CH_4;

0.001 = Conversion factor, kilograms to metric tonnes;

Equation 5

$$GHG_{EF} = \sum_{i=1}^{n} (Nb_i \times EF_i) \times 21 \times 0.001 \times 0.9$$

Where:

GHG_{EF} = 90% of the emissions from a non-covered manure storage facility, in metric tonnes CO_2 equivalent;

n = Number of categories of livestock;

i = Category of livestock listed in the tables in Part II;

Nb_i = Population of category of livestock *i* during the issuance period, in head of livestock;

EF_i = CH_4 emission factor for category of livestock *i*, specified in the tables in Part II, in kilograms of CH_4 per head per year;

21 = Global Warming Potential factor of CH_4;

0.001 = Conversion factor, kilograms to metric tonnes;

0.9 = 90%;

Equation 6

$$GHG_{combustion\quad flare} = \sum_{j=1}^{n} \left[Q_{gas\,\mathrm{cov}} \times EFF_{flare} \times C_{CH4} \right]_j \times (0.049 \times 310) \times 0.000001$$

Where:

$GHG_{combustion\ flare}$ = N_2O emissions attributable to combustion of captured gas at flare during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of days on which gas is produced during the issuance period;

j = Day on which gas is produced at the manure storage facility vent;

$Q_{gas\ cov}$ = Quantity of gas available for burning on day *j* measured at the capture system before delivery to the flare, in cubic metres at standard conditions;

EFF_{flare} = Flare burning efficiency rate, namely:

— for an open flare, a rate of 0.96 when the flare is operated in accordance with the method "General control device and work practice requirements" in Part 60.18 of Title 40 of the Code of Federal Regulations published by the U.S. Environmental Protection Agency (USEPA), or a rate of 0.5 in other cases;

— for an enclosed flare, a rate of 0.98 when the gas retention time in the stack is at least 0.3 seconds, or a rate of 0.9 in other cases;

C_{CH4} = Average CH_4 content in the gas burned on day *j*, determined in accordance with Part III, in cubic metres of CH_4 per cubic metre of gas;

0.049 = N_2O emission factor attributable to flare burning, in grams of N_2O per cubic metre of gas burned;

310 = Global Warming Potential factor of N_2O;

0.000001 = Conversion factor, grams to metric tonnes;

Equation 7

$$GHG_{dest\ other} = Min\ [GHG_{other}\ ;\ GHG_{EF}]$$

Where:

$GHG_{dest\ other}$ = Lesser of CH_4 emissions destroyed by a destruction device other than a flare during the issuance period and 90% of emissions from an uncovered manure storage facility, in metric tonnes CO_2 equivalent;

Min = Lesser of the 2 elements calculated;

GHG_{other} = CH_4 emissions destroyed by the destruction device other than a flare during the issuance period, calculated using equation 8, in metric tonnes CO_2 equivalent;

GHG_{EF} = 90% of the emissions from a non-covered manure storage facility, calculated using equation 5, in metric tonnes CO_2 equivalent;

Equation 8

$$GHG_{other} = Q_{gas\,\mathrm{cov}} \times \left[\left(C_{CH\,4} - C_{dest-CH\,4}\right) \times 0.667 \times 21\right] \times 0.001$$

Where:

GHG_{other} = CH_4 emissions destroyed by a destruction device other than a flare during the issuance period, in metric tonnes CO_2 equivalent;

$Q_{gas\ cov}$ = Quantity of gas available for destruction during the issuance period, measured at the capture system prior to destruction, in cubic metres at standard conditions;

C_{CH4} = Average CH_4 content in the gas before entering the destruction device during the issuance period, determined in accordance with Part III, in cubic metres of CH_4 per cubic metre of gas;

$C_{dest\text{-}CH4}$ = Average CH_4 content in the gas leaving the destruction device during the issuance period, determined in accordance with the method in Part V, in cubic metres of CH_4 per cubic metre of gas;

0.667 = Density of CH_4, in kilograms per cubic metre at standard conditions;

21 = Global Warming Potential factor of CH_4;

0.001 = Conversion factor, kilograms to metric tonnes.

Equation 8.1

$$GHG_{combustion\ other} = Q_{gas\ cov} \times (C_{dest\text{-}N2O} \times 1.84 \times 310) \times 0.001$$

Where:

$GHG_{combustion\ other}$ = N_2O emissions attributable to combustion of captured gas by a destruction device other than a flare during the issuance period, in metric tonnes CO_2 equivalent;

$Q_{gas\ cov}$ = Quantity of gas available for destruction during the issuance period, measured at the capture system prior to destruction, in cubic metres at standard conditions;

$C_{dest\text{-}N2O}$ = Average N_2O content in the gas leaving the destruction device during the issuance period, determined in accordance with the method in Part V, in cubic metres of N_2O per cubic metre of gas;

1.84 = Density of N_2O, in kilograms per cubic metre at standard conditions;

310 = Global Warming Potential factor of N_2O;

0.001 = Conversion factor, kilograms to metric tonnes.

(4.2) Calculation method for GHG emissions attributable to fossil fuels

The promoter must calculate, using equation 9, the differential between the GHG emissions for the baseline scenario and the GHG emissions for the project attributable to fossil fuels using equation 9.

If the GHG emissions for the project are above the GHG emissions for the baseline scenario, the latter are subtracted from the reductions in accordance with equation 1. In other cases, the factor "ΔGHG_{fossil}" for equation 1 is 0.

Equation 9

$$\Delta GHG_{\ fossil} = \sum_{j=1}^{m} \left[\left(C_{project} - C_{SF} \right)_j \times \left(\left(F_{CO2} \times 0.001 \right) + \left(F_{CH4} \times 0.000001 \times 21 \right) + \left(F_{N2O} \times 0.000001 \times 310 \right) \right)_j \right]$$

Where:

ΔGHG_{fossil} = Differential between the GHG emissions for the baseline scenario and the GHG emissions for the project attributable to fossil fuels during the issuance period, in metric tonnes CO_2 equivalent;

m = Number of fossil fuels;

j = Fossil fuel;

$C_{project}$ = Quantity of fossil fuel *j* consumed in the operation of equipment within the project SSRs during the issuance period, expressed

— in kilograms, in the case of fuels whose quantity is expressed as a mass;

— in cubic metres at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in litres, in the case of fuels whose quantity is expressed as a volume of liquid;

C_{SF} = Quantity of fossil fuel *j* consumed in the operation of equipment within the SSRs included in the baseline scenario during the issuance period, expressed

— in kilograms, in the case of fuels whose quantity is expressed as a mass;

— in cubic metres at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in litres, in the case of fuels whose quantity is expressed as a volume of liquid;

F_{CO2} = CO_2 emission factor for fuel *j* specified in tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), expressed

— in kilograms of CO_2 per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in kilograms of CO_2 per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in kilograms of CO_2 per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

0.001 = Conversion factor, kilograms to metric tonnes;

F_{CH4} = CH_4 emission factor for fuel *j* specified in tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, expressed

— in grams of CH_4 per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in grams of CH_4 per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in grams of CH_4 per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

0.000001= Conversion factor, grams to metric tonnes;

21 = Global Warming Potential factor of CH_4;

F_{N2O} = N_2O emission factor for fuel *j* specified in tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, expressed

— in grams of N_2O per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in grams of N_2O per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in grams of N_2O per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

310 = Global Warming Potential factor of N_2O.

(5) Data management and project surveillance

(5.1) Data collection

The project promoter is responsible for collecting the information required for project monitoring.

The promoter must show that the data collected at the agricultural operation are actual and properly represent production during the period covered by each project report. The promoter must also keep a livestock raising register for the agricultural operation.

(5.2) Surveillance plan

The promoter must establish a surveillance plan to measure and monitor project parameters in accordance with Figure 5.1:

Figure 5.1. Project surveillance plan

Parameter	**Factor used in the equations**	**Unit of measurement**	**Method**	**Frequency of measurement**
Average annual population of each category of livestock	Nb	Head	Livestock raising register	At each issuance period
Outdoor temperature	N/A	Degree Kelvin	As measured, or according to Environment Canada	Daily average
Quantity of gas available for destruction during the issuance period	$Q_{gas\ cov}$	Cubic metre	Flow meter	At each issuance period (sum of daily readings)

CH_4 content between the manure storage facility and the destruction device	C_{CH4}	Cubic metre of CH_4 per cubic metre of gas at standard conditions	Sample and analysis	Quarterly, in accordance with Part III
CH_4 content leaving the destruction device (other than a flare)	$C_{dest-CH4}$	Cubic metre of CH_4 per cubic metre of gas at standard conditions	Sample and analysis	Quarterly, in accordance with Part V
N_2O content leaving the destruction device (other than a flare)	$C_{dest-N2O}$	Cubic metre of N_2O per cubic metre of gas at standard conditions	Sample and analysis	Quarterly, in accordance with Part V
Quantity of fossil fuel used to operate equipment within the project SSRs during the issuance period	$C_{project}$	Kilogram (solid) Cubic metre (gas) Litres (liquid)	Purchase invoices	At each issuance period
Quantity of fossil fuel used to operate equipment within the project SSRs for the baseline scenario, during the issuance period	C_{SF}	Kilogram (solid) Cubic metre (gas) Litres (liquid)	Purchase invoices	At each issuance period

The promoter is responsible for operating the project and monitoring project performance. The promoter must use the CH_4 destruction device and the measurement instruments in accordance with the manufacturer's specifications. The promoter must, in particular, use measurement instruments to measure directly

(1) the flow of gas before being delivered to the destruction device, continuously, recorded every 15 minutes or totalized and recorded at least daily, adjusted for temperature and pressure; and

(2) the CH_4 content in the gas entering the destruction device, determined in accordance with the applicable method in Part III;

(3) the CH_4 and N_2O content in the gas leaving the destruction device, determined in accordance with the applicable method in Part V, when a destruction device other than a flare is used.

The promoter must monitor and document the use of the destruction device at least once per day to ensure the destruction of the CH_4. A flare must be equipped with a monitoring device, such as a thermocouple, at its output that certifies correct operation. GHG emission reductions will not be taken into account for the issue of offset credits for periods during which the destruction device is not operating.

When a destruction device or an operation monitoring device, such as a thermocouple on a flare, is not operating, all the CH_4 measured as being delivered to the destruction device must be considered as being emitted to the atmosphere during the period of non-operation. The destruction efficiency of the device must be considered to be zero.

(5.3) CH_4 and N_2O measurement instruments

The promoter must ensure that all gas flow meters and analyzers are

(1) cleaned and inspected on a quarterly basis, except from December to March;

(2) not more than 2 months before the issuance period end date, checked for calibration accuracy by a qualified and independent person, using a portable instrument or manufacturer's specifications, and ensure that the percentage drift is recorded; and

(3) calibrated by the manufacturer or by a third person certified for that purpose, every 5 years or according to the manufacturer's specifications, whichever is more frequent.

When a check on a piece of equipment reveals accuracy outside a ± 5% threshold,

(1) the piece of equipment must be calibrated by the manufacturer, or by a third person certified for that purpose by the manufacturer; and

(2) all the data from the meters and analyzers must be scaled according to the following procedure:

(a) the data must be adjusted for the entire period from the last calibration that confirmed accuracy within the ± 5% threshold until such time as the flow meter and analyzer is correctly calibrated; and

(b) the project promoter must estimate the GHG emission reductions using the lesser of the measured flow values without correction and the measured flow values adjusted based on the greatest calibration drift recorded.

The last calibration confirming accuracy within the ± 5% threshold must not have taken place more than 2 months before the end date for the issuance period.

If a portable instrument is used, such as a handheld CH_4 analyzer, it must be calibrated at least annually by the manufacturer or by an ISO 17025 accredited laboratory.

(5.4) Data management

The data must be of sufficient quality to meet the calculation requirements and be confirmed by the livestock raising registers of the agricultural operation during the verification.

The project promoter must establish written procedures for each task involving measurements, indicating the person responsible, the frequency and time of the measurements, and the place where the registers are kept.

In addition, the registers must be

(1) legible, dated and revised if needed;

(2) kept in good condition; and

(3) kept in a place that is easily accessible for the duration of the project.

(5.5) Missing data – replacement methods

In situations where data on gas flow rates or CH_4 or N_2O content are missing, the promoter must apply the data replacement methods set out in Part VI. Missing data on gas flow rates may be replaced only when a continuous analyzer is used to measure CH_4 and N_2O content. When CH_4 and N_2O content is measured by sampling, no missing data is permissible.

Part II

Emission factors for the management of manure from livestock

Table 1. CH_4 emission factors for the management of manure from dairy and non-dairy cattle

Category	CH_4 emission factor Kilograms of CH_4 / head / year
Dairy cow	27.8
Dairy heifer	19.1
Bull	3.3
Slaughter cow	3.2
Slaughter heifer	2.4
Steer	1.6
Backgrounding cattle	1.8
Dairy calf or dairy heifer calf	1.5

Table 2. CH_4 emission factors for the management of manure from other categories of livestock

Category	CH_4 emission factor Kilograms of CH_4 / head / year

Piglet	1.66
Hog	6.48
Sow	7.71
Boar	6.40

Part III

Determination of the CH_4 content of gas available for burning measured at the capture system before delivery to the flare or other destruction device

When the project is not equipped with a continuous CH_4 analyzer, the promoter must sample the gas sent to the destruction device when the device is in operation during the 4 following periods each year:

Sample 1: April – May

Sample 2: June – July

Sample 3: August – September

Sample 4: October – November

To be representative, each sampling must measure concentration, gas flow rate and air temperature during 8 hours, continuously or over several shorter periods. Enough data must be collected to establish a graph of CH_4 content as a function of temperature.

The graph will be used to determine CH_4 content on days when the gas is not sampled, when the average temperature is known.

The promoter must

(1) sample the gases, measure the gas flow rate and measure the ambient temperature;

(2) produce a graph showing CH_4 content as a function of temperature;

(3) determine the average ambient temperature for a given day;

(4) using the graph, determine CH_4 content as a function of temperature for each operating period of the destruction device; and

(5) complete the monitoring grid in Part IV.

Part IV

Monitoring grid

Date	$Q_{gaz\ cov}$	Ambient	C_{CH4}	GHG_{flare}	$GHG_{combustion\ flare}$

	m^3 measured	temperature measured in Kelvin	in m^3 of CH_4 per m^3 of gas	or GHG_{other} in CO_2 equivalent, using equation 4 or 8	or $GHG_{combustion\ other}$ in CO_2 equivalent, using equation 6 or 8.1

Part V

Determination of the CH_4 and N_2O content of gas leaving a destruction device other than a flare

When the project is not equipped with a continuous CH_4 or N_2O analyzer, the promoter must sample the available gas leaving the destruction device during the 4 following periods each year:

Sample 1: April – May

Sample 2: June – July

Sample 3: August – September

Sample 4: October – November

The promoter must determine the average CH_4 content during the issuance period using equation 10 and the average N_2O content using equation 11:

Equation 10

$$C_{dest-CH4} = \frac{\sum_{i=1}^{n} CS_{CH4,i}}{n}$$

Where:

$C_{dest\text{-}CH4}$ = Average CH_4 content of gas leaving the destruction device during the issuance period, in cubic metres of CH_4 per cubic metre of gas at standard conditions;

n = Number of samples;

i = Sample;

$Cs_{CH4,i}$ = CH_4 content of sample *i*, measured in the gas leaving the destruction device, in cubic metres of CH_4 per cubic metre of gas at standard conditions;

Equation 11

$$C_{dest-N2O} = \frac{\sum_{i=1}^{n} Cs_{N2O,i}}{n}$$

Where:

$C_{dest\text{-}N2O}$ = Average N_2O content of gas leaving the destruction system during the issuance period, in cubic metres of N_2O per cubic metre of gas at standard conditions;

n = Number of samples;

i = Sample;

$Cs_{N2O,i}$ = N_2O content of sample *i*, measured in the gas leaving the destruction system, in cubic metres of N_2O per cubic metre of gas at standard conditions.

Part VI

Missing data – replacement methods

The replacement methods below may be used only

(1) for CH_4 or N_2O content or gas flow rate parameters;

(2) for data gaps on gas flow rates that are discrete, non-chronic and due to unforeseen circumstances;

(3) when the proper functioning of the destruction device can be shown by reading the thermocouple at the flare or other device;

(4) when data on gas flow rate only, or CH_4 or N_2O content only, are missing;

(5) to replace data on gas flow rates when a continuous analyzer is used to measure CH_4 and N_2O content and when it is shown that CH_4 and N_2O content was consistent with normal operations for the time when the data are missing; and

(6) to replace data on CH_4 and N_2O content when it is shown that the gas flow rate was consistent with normal operations for the time when the data are missing.

No offset credit may be issued for periods when the replacement methods cannot be used.

Missing data period	**Replacement method**
Less than 6 hours	Use the average of the 4 hours immediately before and following the missing data period
6 to less than 24 hour	Use the 90% lower or upper confidence limit of the 24 hours prior to and after the missing data period, whichever results in greater conservativeness
1 to 7 days	Use the 95% lower or upper confidence limit of the 72 hours prior to and after the missing data period, whichever results in greater conservativeness

More than 7 days	No data may be replaced and no reduction may be credited

PROTOCOL 2

LANDFILL SITES – CH_4 TREATMENT OR DESTRUCTION

Part I

(1) Projects covered

This offset credit protocol covers any project designed to reduce GHG emissions by treating or destroying the CH_4 captured in a landfill site in Québec.

The project must involve the use of an eligible device to treat or destroy CH_4 captured at a landfill site that meets the following conditions at the time of registration:

(1) on the date of application for registration and for the entire duration of the project, if the site is in operation, it receives less than 50,000 metric tonnes of residual materials annually and has a capacity of less than 1.5 million cubic metres;

(2) on the date of application for registration, in every case, the site has less than 450,000 metric tonnes of residual materials in place, or the CH_4 captured from the LFG has a heat capacity of less than 3 GJ/h.

Eligible treatment or destruction devices are biological oxidation for landfills whose concentration in CH_4 is less than or equal to 20% enclosed flares, open flares, combustion engines, boilers, turbines and CH_4 liquefaction units.

The project must capture and treat or destroy CH_4 that, before the project, was emitted to the atmosphere. The CH_4 may be treated or destroyed on the landfill site or transported and treated or destroyed off-site.

For the purposes of this protocol,

(1) “landfill gas” (LFG) means any gas resulting from the decomposition of residual materials disposed of at a landfill site;

(2) “landfill site” means a place where residual materials is permanently disposed of above or below ground.

The provisions of subparagraph 1 of the second paragraph of this Division and those of Division 1.2 do not apply to a landfill site of a pulp and paper mill, a sawmill or an oriented strandboard manufacturing plant.

(1.1) *(Revoked).*

(1.2) Landfill site that is closed on the date of application for registration

In the case of a landfill site that is closed on the date of application for registration,

(1) *(subparagraph revoked);*

(2) if the site opened or was extended between 2006 and 2008 inclusively, it should have received less than 50,000 tonnes of residual materials annually and should have had a maximum capacity of less than 1,500,000 cubic metres; and

(3) if the site was in operation in 2009 or a subsequent year, the site should have received less than 50,000 metric tonnes of residual materials annually and should have had a maximum capacity of less than 1,500,000 cubic metres.

(2) Location

The project must be carried out within the borders of the province of Québec.

(3) Calculation of CH_4 heat capacity captured from the landfill site

When a site has over 450,000 tonnes of residual materials in place, the promoter must assess the heat capacity of the CH_4 captured, in gigajoules per hour, using the following method:

(1) by calculating the quantity of CH_4 emitted each hour;

(2) by determining the quantity of CH_4 captured each hour by multiplying the quantity of CH_4 emitted each hour by 0.75;

(3) by determining the heat capacity by multiplying the quantity of CH_4 captured each hour by the high heat value of the LFG of the portion of the CH_4 set out in table 1.1 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15).

The promoter must assess the quantity of CH_4 emitted by the landfill site pursuant to Division 3 using the following method:

(1) by determining the quantity of CH_4 generated using the Landgem software of the U.S. Environmental Protection Agency (USEPA), available at http://www.epa.gov/ttncatc1/products.html#software;

(2) by determining the quantity of residual materials disposed of annually using the data available since the opening of the landfill site;

(3) by using, for the parameters “k” and “Lo” of the software referred to in paragraph 1, the most recent parameters from the national inventory report on GHG emissions prepared by Environment Canada;

(4) by using a percentage of 50% as the percentage of CH_4 in LFG;

(5) by using a value of 0.667 kg per cubic metre at standard conditions as the density of CH_4.

(4) Additionnality

For the purposes of subparagraph *b* of paragraph 6 of section 70.3 of this Regulation, the project is considered to go beyond current practice when it meets the conditions in Divisions 1 to 3.

(5) Reduction project SSRs

The reduction project process flowchart in Figure 5.1 and the table in Figure 5.2 show all the SSRs that must be taken into account by the promoter when calculating the GHG emission reductions attributable to the project.

All the SSRs within the dotted line must be counted for the purposes of this protocol.

Figure 5.1. Flowchart for the reduction project process

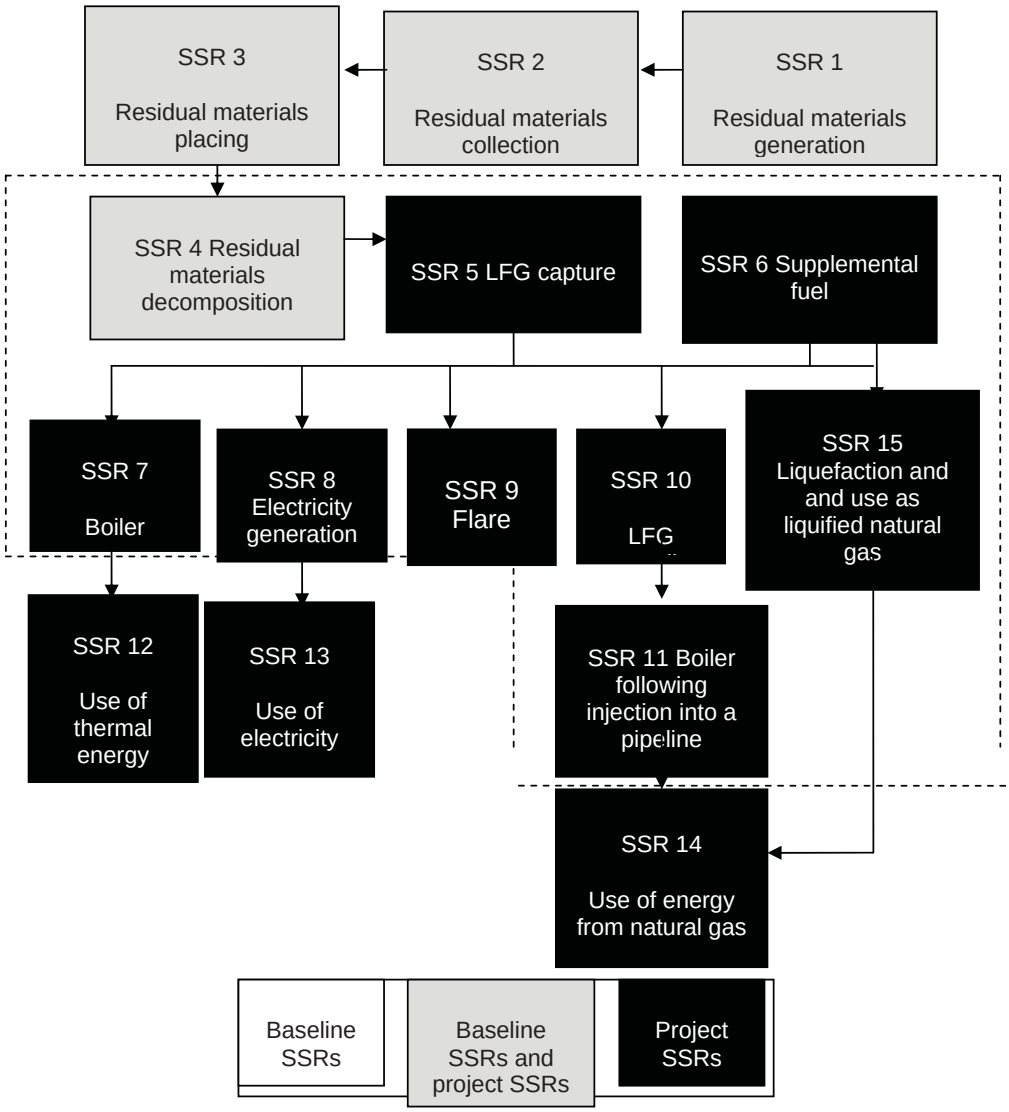

Figure 5.2. Reduction project SSRs

SSR #	Description	GHG	Relevant to project baseline scenario (B) and/or Project (P)	Included or Excluded
1	Residual materials generation	N/A	B, P	Excluded
2	Residual materials collection	CO_2	B, P	Excluded
		CH_4		Excluded
		N_2O		Excluded
3	Residual materials placing activities	CO_2	B, P	Excluded
		CH_4		Excluded
		N_2O		Excluded
4	Decomposition of residual materials in landfill	CO_2	B, P	Excluded
		CH_4		Included
5	LFG capture system	CO_2	P	Included
		CH_4		Excluded
		N_2O		Excluded
6	Supplemental fuel	CO_2	P	Included
		CH_4		Included
		N_2O		Excluded

7	LFG boiler destruction	CO_2	P	Excluded
		CH_4		Included
		N_2O		Excluded
8	Electricity generation from LFG (combustion engine, turbine, fuel cell)	CO_2	P	Excluded
		CH_4		Included
		N_2O		Excluded
9	LFG flare destruction	CO_2	P	Excluded
		CH_4		Included
		N_2O		Excluded
10	LFG upgrading	CO_2	P	Included
		CH_4		Excluded
		N_2O		Excluded
11	Boiler following injection into a pipeline	CO_2	P	Excluded
		CH_4		Included
		N_2O		Excluded
12	Avoided emissions from use of landfill gas project-generated thermal energy to replace energy from a fossil fuel	CO_2	P	Excluded
13	Avoided emissions from use of project-generated electricity to replace energy from a fossil fuel	CO_2	P	Excluded

14	Avoided emissions from use of natural gas energy to replace energy from a fossil fuel	CO_2	P	Excluded
15	Liquefaction of LFG and use as liquefied natural gas	CO_2	P	Excluded
		CH_4		Included
		N_2O		Included

(6) Calculation method for the GHG emission reductions attributable to the project

The promoter must calculate GHG emission reductions attributable to the project using equation 1:

Equation 1

$ER = BE - PE$

Where:

ER = GHG emission reductions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

BE = Baseline scenario emissions during the issuance period, calculated using equation 3, in metric tonnes CO_2 equivalent;

PE = Project emissions during the issuance period, calculated using equation 7, in metric tonnes CO_2 equivalent.

When the flow meter does not correct for the temperature and pressure of the LFG at standard conditions, the promoter must measure LFG pressure and temperature separately and correct the flow values using equation 2. The promoter must use the corrected flow values in all the equations of this protocol.

Equation 2

$$LFG_{i,t} = LFG_{uncorrected} \times \frac{293.13}{T} \times \frac{P}{101.325}$$

Where:

$LFG_{i,t}$ = Corrected volume of LFG sent to treatment or destruction device *i* in time interval *t*, in cubic metres at standard conditions;

i = Treatment or destruction device;

t = Time interval shown in the table in Figure 7.1 for which CH_4 flow and content measurements are aggregated;

$LFG_{uncorrected}$ = Uncorrected volume of LFG captured for the given time interval, in actual cubic metres;

T = Measured temperature of LFG for the given time period, in Kelvin (°C + 273.15);

P = Measured pressure of the LFG for the given time interval, in kilopascals.

(6.1) Calculation method for GHG emissions in the baseline scenario

The promoter must calculate GHG emissions in the baseline scenario using equations 3 to 6.

Equation 3

$$BE = (CH_4DEST_{PR}) \times 21 \times (1 - OX) \times (1 - DF)$$

Where:

BE = Baseline scenario emissions during the issuance period, in metric tonnes CO_2 equivalent;

CH_4Dest_{PR} = Total quantity of CH_4 treated or destroyed by all LFG treatment and destruction devices during the issuance period, calculated using equation 4, in metric tonnes of CH_4;

21 = Global Warming Potential factor of CH_4;

OX = Factor for the oxidation of CH_4 by soil bacteria, using the value established for each of the cases provided for in subparagraphs 1, 2 and 3 below;

DF = Discount factor to account for uncertainties associated with the monitoring equipment for CH_4 content in the LFG, namely a factor of 0 when the CH_4 content in the LFG is measured continuously, and 0.1 in other cases, with measurements made at least weekly;

The factor for the oxidation of CH_4 by soil bacteria is established as follows:

(1) for closed landfill sites with a geomembrane covering the entire area of the landfill, the promoter must use a CH_4 oxidation rate of zero (0%) and show, in the first project report, that the landfill site has a geomembrane that meets the requirements of the Regulation respecting the landfilling and incineration of residual materials (chapter Q-2, r. 19);

(2) for landfills in operation, part of which is filled and covered by a geomembrane, the promoter must use a CH_4 oxidation rate of zero (0%) for the area covered by a geomembrane and a CH_4 oxidation rate of 10% for the area not covered by a geomembrane, and must pro-rate the CH_4 oxidation factor based on areas which are covered and uncovered by a geomembrane using Equation 3.1 (with areas measured in m^2);

(3) for all other landfill sites, the promoter must use a CH_4 oxidation factor of 10%.

In the cases referred to in subparagraphs 1 and 2, the promoter must show, in the project reports, that the landfill site has a geomembrane that meets the requirements of the Regulation respecting the landfilling and incineration of residual materials (chapter Q-2, r. 19). In the case referred to in subparagraph 2, the project report must include the manner used to determine the covered and uncovered areas.

Equation 3.1

$$OX = \frac{(0\% \times AC) + (10\% \times ANC)}{AC + ANC}$$

Where:

OX = Factor for the oxidation of CH_4 by soil bacteria, for the case provided for in subparagraph 2;

AC = Area, in m^2, of the area of the landfill site that is filled and covered by a geomembrane;

ANC = Area, in m^2, of the area of the landfill site that is operating and not covered by the geomembrane under final cover at the start of the reporting period.

Equation 4

$$CH_4Dest_{PR} = \sum_{i=1}^{n} \left(CH_4Dest_i\right) \times \left(0.667 \times 0.001\right)$$

Where:

CH_4Dest_{PR} = Total quantity of CH_4 treated or destroyed by all LFG treatment or destruction devices during the issuance period, in metric tonnes of CH_4;

n = Number of treatment or destruction devices;

i = Treatment or destruction device;

CH_4Dest_i = Net quantity of CH_4 treated or destroyed by treatment or destruction device *i* during the issuance period, calculated using equation 5, in cubic metres of CH_4 at standard conditions;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001= Conversion factor, kilograms to metric tonnes;

Equation 5

$$CH_4Dest_i = Q_i \times DE_i$$

Where:

CH_4Dest_i = Net quantity of CH_4 treated or destroyed by treatment or destruction device *i* during the issuance period, in cubic metres of CH_4 at standard conditions;

Q_i = Total quantity de CH_4 sent to treatment or destruction device *i* during the issuance period, calculated using equation 6, in cubic metres of CH_4 at standard conditions;

DE_i = Default CH_4 treatment or destruction efficiency of destruction device *i*, determined in accordance with Part II or using equation 5.1 for the destruction by biological oxidation;

I = Treatment or destruction device;

Equation 5.1

$$DE_i = (T_{CH4} - T_{dest-CH4}) / T_{CH4}$$

Where:

DE_i = CH_4 destruction efficiency of biological oxidation destruction device, in cubic metres of CH_4 per cubic metre of LFG;

T_{CH4} = Average CH_4 fraction of the gas that entered the destruction device during the issuance period, determined using a continuous CH_4 analyzer, in cubic metres of CH_4 per cubic metre of LFG;

$T_{dest-CH4}$ = Average CH_4 fraction of the gas at the outlet of the destruction device during the issuance period, determined using a continuous CH_4 analyzer, in cubic metres of CH_4 per cubic metre of LFG.

Equation 6

$$Q_i = \sum_{t=1}^{n} \left[LFG_{i,t} \times PR_{CH4,t} \right]$$

Where:

Q_i = Total quantity de CH_4 sent to treatment or destruction device *i* during the issuance period, in cubic metres of CH_4 at standard conditions;

n = Number of time intervals during the issuance period;

t = Time interval shown in the table in Figure 7.1 for which LFG CH_4 flow and content measurements are aggregated;

$LFG_{i,t}$ = Corrected volume of LFG sent to treatment or destruction device *i*, in time interval *t*, in cubic metres at standard conditions;

$PR_{CH4,t}$ = Average CH_4 fraction of the LFG in time interval *t*, in cubic metres of CH_4 per cubic metre of LFG.

(6.2) Calculation method for GHG project emissions

The promoter must calculate the GHG project emissions using equations 7 to 10:

Equation 7

$$PE = FF_{CO2} + EL_{CO2} + NG_{emissions}$$

Where:

PE = Project emissions during the issuance period, in metric tonnes CO_2 equivalent;

FF_{CO2} = Total CO_2 emissions attributable to the use of fossil fuels during the issuance period, calculated using equation 8, in metric tonnes CO_2 equivalent;

EL_{CO2} = Total CO_2 emissions attributable to the consumption of electricity during the issuance period, calculated using equation 9, in metric tonnes CO_2 equivalent;

$NG_{emissions}$ = Total quantity of CH_4 and CO_2 emissions attributable to supplemental natural gas during the issuance period, calculated using equation 10, in metric tonnes CO_2 equivalent;

Equation 8

$$FF_{CO_2} = \frac{\sum_{j=1}^{n} \left(FF_{PR,j} \times EF_{CF,j} \right)}{1{,}000}$$

Where:

FF_{CO2} = Total CO_2 emissions attributable to the use of fossil fuels during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of types of fossil fuel;

j = Type of fossil fuel;

$FF_{PR,j}$ = Annual quantity of fossil fuel *j* consumed in the operation of equipment within the SSRs in the baseline scenario, expressed

— in kilograms, in the case of fuels whose quantity is expressed as a mass;

— in cubic metres at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in litres, in the case of fuels whose quantity is expressed as a volume of liquid;

$EF_{CF,j}$ = CO_2 emission factor for fossil fuel *j* specified in Tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), expressed

— in kilograms of CO_2 per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in kilograms of CO_2 per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in kilograms of CO_2 per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

1,000 = Conversion factor, metric tonnes to kilograms;

Equation 9

$$EL_{CO2} = \frac{EL_{PR} \times EL_{EL}}{1{,}000}$$

Where:

EL_{CO2} = Total CO_2 emissions attributable to the consumption of electricity during the issuance period, in metric tonnes CO_2 equivalent;

EL_{PR} = Total electricity consumed by the project LFG capture and treatment or destruction system during the issuance period, in megawatt-hours;

EF_{EL} = CO_2 emission factor for the consumption of electricity from Québec, according to the most recent National Inventory Report: Greenhouse Gas Sources and Sinks in Canada, Part 3, published by Environment Canada, in kilograms of CO_2 par megawatt-hour;

1,000 = Conversion factor, metric tonnes to kilograms;

Equation 10

$$NG_{emissions} = \sum_{i=1}^{n} \left[NG_i \times NG_{CH_4} \times 0.667 \times 0.001 \times \left[\left((1 - DE_i) \times 21 \right) + \left(DE_i \times \frac{12}{16} \times \frac{44}{12} \right) \right] \right]$$

Where:

$NG_{emissions}$ = Total CH_4 and CO_2 emissions attributable to supplemental natural gas during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of treatment or destruction devices;

i = Treatment or destruction device;

NG_i = Total quantity of supplemental natural gas sent to treatment or destruction device *i* during the issuance period, in cubic metres at standard conditions;

NG_{CH4} = Average CH_4 fraction of the supplemental natural gas, according to the supplier's specifications, in cubic metres of CH_4 at standard conditions per cubic metre of natural gas at standard conditions;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001= Conversion factor, kilograms to metric tonnes;

DE_i = Default CH_4 treatment or destruction efficiency of destruction device *i*, determined in accordance with Part II;

21 = Global Warming Potential factor of CH_4;

12/16 = Molecular mass ratio, carbon to CH_4;

44/12 = Molecular mass ratio, CO_2 to carbon.

(7) Project surveillance

(7.1) Data collection

The promoter is responsible for collecting the information required for project monitoring.

The promoter must show that the data collected are actual and that rigorous supervision and record-keeping procedures are applied at the project site.

(7.2) Surveillance plan

The promoter must establish a monitoring plan to measure and monitor project parameters in accordance with 7.1:

Figure 7.1. Project surveillance plan

Parameter	**Factor used in equations**	**Unit of measurement**	**Method**	**Frequency of measurement**
Capacity and annual residual material tonnage	N/A	Metric tonne	Calculated	Annual or at each issuance period, in accordance with the second paragraph of

				section 1
Operating status of destruction devices	N/A	Degree Celsius or other, in accordance with this Division 7.2	Measured for each destruction device	Hourly
Corrected volume of LFG sent to destruction device *i*, in time interval *t*	$LFG_{i,t}$	Cubic metre at standard conditions	Measured and calculated	Continuous and recorded at least every 15 minutes or totalized and recorded at least daily and adjusted for temperature and pressure
Uncorrected volume of LFG captured for the given interval	$LFG_{uncorrected}$	Cubic metre	Measured	Only when flow data are not adjusted at standard conditions
Discount factor to account for uncertainties associated with the monitoring equipment for CH_4 content in the LFG	DF	0 when the CH_4 content in the LFG is continuously monitored, or 0.1 in other cases		At each issuance period
Total quantity of CH_4 sent to destruction device *i* during the issuance period	Q_i	Cubic metre of CH_4 at standard conditions	Calculated	Daily when the CH_4 is continuously monitored, or weekly if the CH_4 is monitored weekly
Time interval for which LFG CH_4 flow and content measurements are aggregated	t	Week, day, hour or minute	Projects with a continuous CH_4 concentration monitoring system may use the interval used by their data	Continuous, daily or weekly

			acquisition system, provided it is not more than 1 day for the continuous monitoring of CH_4 content and 1 week for the weekly monitoring of CH_4 content		
Average CH_4 fraction of the LFG in time interval *t*	$PR_{CH4,t}$	Cubic metre of CH_4 at standard conditions per cubic metre of LFG at standard conditions	Measured continuously or by portable analyzer	Continuous or weekly	
Total fossil fuels consumed by the capture and destruction system during the issuance period, by type of fuel *j*	$FF_{PR,j}$	Kilogram (solid) Cubic metre at standard conditions (gas) Litre (liquid)	Calculated using fossil fuel purchasing register	At each issuance period	
Total electricty consumed by the LFG capture and destruction system during the issuance period	EL_{PR}	Megawatt-hour	Measured by onsite meter or based on electricity purchasing register	At each issuance period	
Total quantity of supplemental natural gas sent to the destruction device during the issuance period	NG_i	Cubic metre at standard conditions	Measured before being sent to the destruction device	Continuous	
Average CH_4 fraction of the supplemental	NG_{CH4}	Cubic metre of CH_4 at standard conditions per	Based on purchasing register	At each issuance period	

natural gas, according to the supplier's specifications		cubic metre of natural gas at standard conditions			
LFG temperature	T	°C	Measured	Continuous	
LFG pressure	P	kPa	Measured	Continuous	
CH_4 fraction at the inlet of the destruction device	T_{CH4}	In cubic metres of CH_4 per cubic metre of LFG	Measured continuously	Continuous	
CH_4 fraction at the outlet of the destruction device	$T_{dest - CH4}$	In cubic metres of CH_4 per cubic metre of LFG	Measured continuously	Continuous	

The surveillance plan must

(1) specify the methods used to collect and record the data required for all the relevant parameters in the table in Figure 7.1;

(2) specify

(a) the frequency of data acquisition;

(b) the frequency of instrument cleaning, inspection and calibration activities, and of the verification of instrument calibration accuracy; and

(c) the role of the person responsible for each monitoring activity, as well as the quality assurance and quality control measures taken to ensure that data acquisition and instrument calibration are carried out consistently and with precision; and

(3) contain a detailed diagram of the LFG capture and treatment or destruction system, including the placement of all measurement instrument and equipment that affect included SSRs.

The promoter is responsible for carrying out and monitoring project performance. The promoter must use the LFG treatment or destruction device and the measurement instruments in accordance with the manufacturer's specifications. The promoter must, in particular, use measurement instruments to measure directly

(1) the flow of LFG before being delivered to the treatment or destruction device, continuously, recorded every 15 minutes or totalized and recorded at least daily, adjusted for temperature and pressure; and

(2) the CH_4 content of the LFG sent to each treatment or destruction device, continuously, recorded every 15 minutes and totalized as an average at least daily. The CH_4 content may also be determined by daily to weekly measurements using a calibrated portable analyzer and applying a 10% discount to the total quantity of CH_4 captured and eliminated, calculated using equation 4.

Despite the third paragraph, in the case of projects carried out between 1 January 2007 and 31 December 2012, during that period the flow of LFG referred to in subparagraph 1 this paragraph may have been recorded every 60 minutes and the CH_4 content of the LFG referred o in subparagraph 2 of this paragraph may have been recorded every 60 minutes.

When temperature and pressure must be measured to correct flow values at standard conditions, the parameters must be measured continuously.

The operating status of the LFG treatment or destruction device must be monitored and recorded at least hourly.

The operating status of flares is established by thermocouple readings above 260 °C.

For all other treatment or destruction devices, the promoter must show in the project plan that a monitoring device has been installed to verify the operation of the treatment or destruction device. The promoter must also show in each project report that the monitoring device has operated correctly.

GHG emission reductions will not be taken into account for the issue of offset credits for periods during which the treatment or destruction device or the monitoring device for the operation of the treatment or destruction device is not operating.

(7.3) Measurement instruments

The promoter must ensure that all LFG flow meters and CH_4 analyzers are

(1) cleaned and inspected as specified in the project's monitoring plan and at the minimum cleaning and inspection frequency specified by the manufacturer, with all cleaning and inspection activities documented by landfill site personnel;

(2) not more than 2 months before or after the issuance period end date, either

(a) checked for calibration accuracy by a qualified and independent person, using a portable instrument, such as a pito tube, or manufacturer's specifications, and ensure that the percentage drift is recorded; or

(b) calibrated by the manufacturer, or by a third person certified for that purpose by the manufacturer; and

(3) calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer, at the intervals prescribed by the manufacturer or, if the intervals are greater than 5 years, every 5 years.

A calibration certificate or a verification report on calibration accuracy must be produced and included in the project report. The verification provided for in section 70.16 of this Regulation must include confirmation that the person is qualified to verify calibration accuracy.

Flow meter calibrations must be documented to show that the meter was calibrated to a range of flow rates corresponding to the flow rates expected at the landfill site.

CH_4 analyzer calibrations must be documented to show that the calibration was carried out to a range of temperature and pressure conditions corresponding to the range of conditions measured at the landfill site.

The verification of flow meter and analyzer calibration accuracy must show that the instrument provides a reading of volumetric flow or CH_4 content that is within a +/-5% accuracy threshold.

When a verification of the calibration accuracy of a device shows a shift outside the +/- 5% accuracy threshold, the device must be calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer. In addition, for the entire period from the last calibration that confirmed accuracy within the ± 5% threshold until such time as the piece of equipment is correctly calibrated, all the data from the piece of equipment must be corrected according to the following procedure:

(1) when the calibration indicates an under-reporting of flow rates or CH_4 content, the promoter must use the measured values without correction;

(2) when the calibration indicates an over-reporting of flow rates or CH_4 content, the promoter must apply to the measured values the greatest calibration drift recorded at the time of calibration.

The last calibration confirming accuracy within the ± 5% threshold must not have taken place more than 2 months before the end date for the issuance period.

If the promoter uses a portable CH_4 analyzer, it must be maintained and calibrated according to the manufacturer's specifications, and calibrated at least annually by the manufacturer, by a laboratory certified by the manufacturer, or by an ISO 17025 accredited laboratory. The portable analyzer also must be calibrated to a known sample gas prior to each use.

No offset credit may be issued for a issuance period when the calibration or verification of the calibration accuracy of the required instruments has not been correctly carried out and documented.

(7.4) Data management

Information on data procedures and data monitoring must be managed in a way that guarantees the integrity, exhaustiveness, accuracy and validity of the data.

The promoter must keep the following documents and information:

(1) the information required under the monitoring plan;

(2) information on each flow meter, CH_4 analyzer and destruction device used, including type, model number, serial number and manufacturer's maintenance and calibration procedures;

(3) for a portable analyzer, the date, time and place where measurements are taken and, for each measurement, the CH_4 content in the LFG;

(4) the calibration date, time and results for CH_4 analyzers and flow meters, and the corrective measures applied if a piece of equipment fails to meet the requirements of this Regulation;

(5) the maintenance records for capture, destruction and monitoring systems;

(6) operating records showing the quantity of residual material disposed of.

(7.5) Missing data – replacement methods

In situations where data on flow rates or CH_4 content are missing, the promoter must apply the data replacement methods set out in Part III.

Part II

Destruction efficiencies for destruction devices

The promoter must use the destruction efficiency shown in Table 1 or must use the destruction efficiency calculated using equation 5.1 if the CH_4 is destroyed by biological oxidation for the project destruction device.

Table 1. Default destruction efficiencies for destruction devices

Treatment or destruction device	Efficiency

Open flare	0.96
Enclosed flare	0.995
Internal combustion engine	0.936
Boiler	0.98
Microturbine or large gas turbine	0.995
Boiler following upgrade and injection into a pipeline	0.96
CH_4 liquefaction unit	0.95

Part III

Missing data – replacement methods

The replacement methods below may be used only

(1) for CH_4 content or LFG flow rate parameters;

(2) for missing data on gas flow rates that are discrete, non-chronic and due to unforeseen circumstances;

(3) when the proper functioning of the treatment or destruction device can be shown by thermocouple readings at the flare or other device;

(4) when data on LFG flow rate only, or CH_4 content only, are missing;

(5) to replace data on LFG flow rates when a continuous analyzer is used to measure CH_4 content and when it is shown that CH_4 content was consistent with normal operations for the time when the data are missing; and

(6) to replace data on CH_4 content when it is shown that the LFG flow rate was consistent with normal operations for the time when the data are missing.

No offset credit may be issued for periods when the replacement methods cannot be used.

Missing data period	**Replacement method**
Less than 6 hours	Use the average of the 4 hours immediately before and following the missing data period

6 to less than 24 hours	Use the 90% upper or lower confidence limit of the 24 hours prior to and after the missing data period, whichever results in greater conservativeness
1 to 7 days	Use the 95% upper or lower confidence limit of the 72 hours prior to and after the missing data period, whichever results in greater conservativeness
More than 7 days	No data may be replaced and no reduction may be credited

PROTOCOL 3

DESTRUCTION OF OZONE DEPLETING SUBSTANCES CONTAINED IN INSULATING FOAM OR USED AS REFRIGERANTS REMOVED FROM REFRIGERATION, FREEZER AND AIR-CONDITIONING APPLIANCES

Part I

For the purposes of this protocol,

(1) “container” means an air-tight, waterproof unit used for storing or transporting ODS without leakage or escape of ODS into the environment;

(2) “CFC”: chlorofluorocarbons;

(3) “HCFC”: hydrochlorofluorocarbons;

(3.1) “foam”: insulating foam removed from refrigeration or freezer appliances;

(4) “ODS contained in foam”: ozone depleting substances of the following types:

(a) CFC-11;

(b) CFC-12;

(c) HCFC-22;

(d) HCFC-141b;

(5) “ODS used as refrigerants”: ozone depleting substances of the following types:

(a) CFC-11;

(b) CFC-12;

(c) CFC-13;

(d) CFC-113;

(e) CFC-114;

(f) CFC-115;

(6) "ODS": ODS contained in foam and ODS used as refrigerants;

(7) "substitute refrigerants": refrigerants used to replace refrigerants destroyed by a project.

For the purposes of this protocol, chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC) are greenhouse gases.

(1) Projects covered

(1.1) Eligible ODS

This offset credit protocol covers projects for all activities associated with the destruction of ODS contained in foam or used as refrigerants removed from refrigeration, freezer or air-conditioning appliances recovered in Canada.

Ozone depleting substances contained in foam removed from refrigeration or freezer appliances and ODS used as refrigerants removed from equipment, systems or appliances from industrial, commercial, institutional or residential sources or removed from ODS stored by such sources for their future use or their disposal, and used for refrigeration, freezing and air conditioning are admissible for the purposes of this protocol.

When ODS used as refrigerants targeted by a project are removed from refrigeration, freezer or air-conditioning appliances that also contain ODS contained in foam, the project must also, for any destruction activity taking place after 22 October 2016, provide for the extraction and destruction of the ODS contained in the foam in accordance with this protocol.

(1.2) Duration

A project may cover a maximum period of 5 years provided that, during each year following registration,

(1) the extraction and destruction locations and methods are the same;

(2) the types of appliances from which ODS are extracted are the same; and

(3) the project is continuous over the entire period, in other words at least one destruction occurs each year and a project report is submitted.

In other cases, the ODS must be destroyed within 12 months from the project start date. A new project registration application must be made for any ODS destruction activity occurring after that period.

(2) First project report

In addition to the information required under third paragraph of section 70.5 of this Regulation, the first project report must include the following information:

(1) the name and contact information of the facility removing foam or refrigerants or extracting ODS, of the destruction facility and, where applicable, of the enterprise that carries out such activities;

(2) the name and contact information of any technical consultants;

(3) a list of all the points of origin of each type of ODS destroyed under the project, namely the first place where the appliances with ODS are stored, by Canadian province or territory;

(4) a description of the methods used to remove foam or refrigerants from the appliances, extract ODS from the foam and destroy the ODS;

(5) an estimate of the quantity of foam and ODS recovered, by type of ODS and according to whether the ODS are contained in the foam or are used as refrigerants, in metric tonnes.

(3) Location

The ODS contained in the foam must be destroyed in a facility located in Canada or the United States. However, removal of the foam and refrigerants from the appliances and extraction of the ODS from the foam must be carried out in Canada. Foam, ODS and appliances recovered outside Canada are not eligible for the issue of offset credits under this protocol.

(4) Additionnality

For the purposes of subparagraph *b* of paragraph 6 of section 70.3 of this Regulation, the project is considered to go beyond current practice if it meets the conditions in Divisions 1 to 3 of this protocol.

(5) Extraction and destruction

ODS must be extracted and destroyed as follows:

(1) ODS contained in foam must be extracted in concentrated form using a negative pressure process;

(2) all ODS must be collected, stored and transported in hermetically sealed containers;

(3) all ODS must be destroyed in concentrated form in an ODS destruction facility meeting the requirements in Division 10 of this protocol

(6) SSRs within the reduction project boundary

Figures 6.1 to 6.3 show the SSRs that must be taken into account by the promoter when calculating the GHG emission reductions attributable to the project.

All the SSRs within the dotted line must be counted for the purposes of this protocol.

Figure 6.1. Flowchart for the reduction project process for the ODS contained in the foam

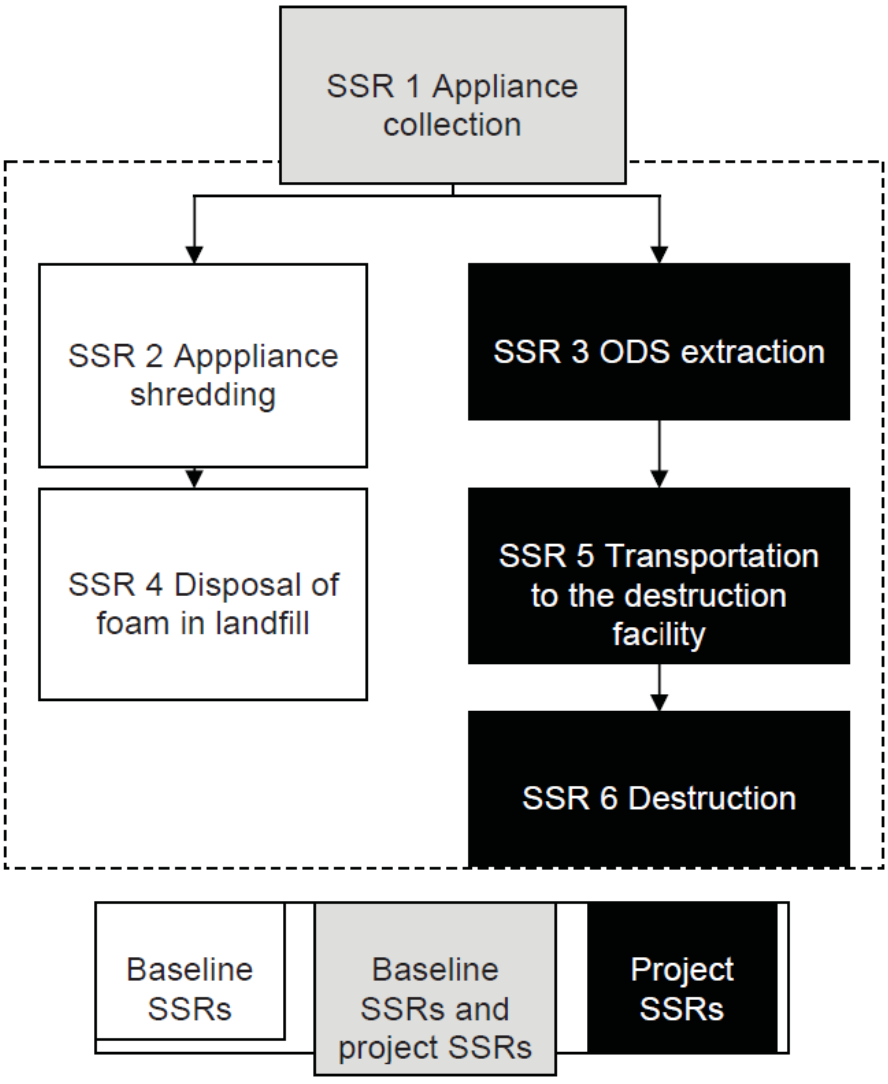

Figure 6.1.1. Chart showing the reduction project process for ODS used as refrigerants

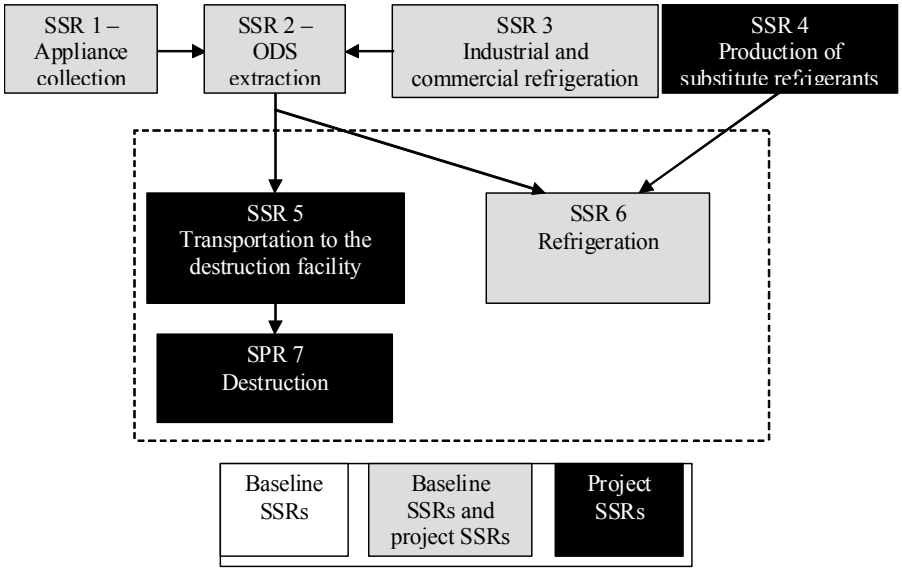

Figure 6.2. Reduction project SSRs targeted in the calculation of GHG emissions under the baseline scenario and project scenario for ODS contained in foam

SSR #	Description	Type of emission	Relevant to project baseline scenario (B) and/or Project (P)	Included or Excluded
1	Appliance collection	Fossil fuel emissions attributable to the collection and transportation of end-of-life appliances	CO_2	B, P	Excluded
			CH_4	B, P	Excluded
			N_20	B, P	Excluded
2	Appliance shredding	Emissions of ODS attributable to the shredding of appliances for materials recovery	ODS	B	Included
3	ODS Extraction	Emissions of ODS attributable to the removal of foam from appliances	ODS	P	Included
4	Disposal of foam in landfill	Emissions of ODS attributable to the disposal of foam at a landfill site	ODS	B	Included
		Emissions of ODS degradation products attributable to foam disposed of at a landfill site	HFC, HCFC	B	Excluded
		Fossil fuel emissions attributable to the transportation of shredded foam and disposal at a landfill site	CO_2	B	Excluded
			CH_4	B	Excluded
			N_2O	B	Excluded
5	Transportation to the destruction facility	Emissions of fossil fuels fossil attributable to the transportation of ODS from the point of origin to the destruction facility	CO_2	P	Included

		Emissions of ODS attributable to incomplete destruction at destruction facility	ODS	P	Included
6	Destruction of ODS	Emissions from the oxidation of carbon contained in the destroyed ODS	CO_2	P	Included
		Fossil fuel emissions attributable to the destruction of ODS in a destruction facility	CO_2	P	Included
			CH_4	P	Excluded
			N_2O	P	Excluded
		Indirect emissions attributable to the use of electricity	CO_2	P	Included
			CH_4	P	Excluded
			N_2O	P	Excluded

Figure 6.3. SSRs targeted in the calculation of GHG emissions under the baseline scenario and project scenario for ODS used as refrigerants

SSR #	Description	Type of emission	Relevant to project baseline scenario (B) and/or Project (P)	Included or Excluded
1	Appliance collection	Fossil fuel emissions attributable to the collection and transportation of end-of-life appliances	CO_2	B, P	Excluded
			CH_4	B, P	Excluded
			N_20	B, P	Excluded
		Emissions of ODS attributable to the extraction and collection of refrigerants	ODS	B, P	Excluded

		from end-of-life equipment or equipment undergoing maintenance			
2	ODS extraction	Fossil fuel emissions attributable to the extraction and collection of refrigerants from end-of-life equipment or equipment undergoing maintenance	CO_2	B, P	Excluded
			CH_4	B, P	Excluded
			N_2O	B, P	Excluded
		ODS emissions attributable to equipment leakage and maintenance	ODS	B, P	Excluded
3	Industrial and commercial refrigeration	Fossil fuel emissions attributable to the operation of refigeration and air - conditioning equipment	CO_2	B, P	Excluded
			CH_4	B, P	Excluded
			N_2O	B, P	Excluded
		Substitute refrigerant emissions during production	CO_2e	P	Excluded
4	Production of substitute refrigerant	Fossil fuel emissions during the production of substitute refrigerants	CO_2	P	Excluded
			CH_4	P	Excluded
			N_2O	P	Excluded
5	Transportation to the destruction facility	Fossil fuel emissions attributable to the transportation of ODS from the point of origin to the destruction facility	CO_2	P	Included
			CH_4	P	Excluded
			N_2O	P	Excluded
		Emissions of ODS attributable to leakage and maintenance during the continuous operation of equipment	ODS	B	Included

		Substitute refrigerant emissions attributable to leakage and maintenance during the continous operation of equipment	CO_2e	P	Included
6	Refrigeration	Indirect emissions attributable to the use of electricity	CO_2	B, P	Excluded
			CH_4	B, P	Excluded
			N_2O	B, P	Excluded
		Emissions of ODS attributable to incomplete destruction at the destruction facility	ODS	P	Included
		Emissions from the oxidation of carbon contained in the destroyed ODS	CO_2	P	Included
7	Destruction	Fossil fuel emissions attributable to the destruction of ODS in a destruction facility	CO_2	P	Included
			CH_4	P	Excluded
			N_2O	P	Excluded
		Indirect emissions attributable to the use of electricity	CO_2	P	Included
			CH_4	P	Excluded
			N_2O	P	Excluded

(7) Calculation method for total GHG emission reductions attributable to a project

In calculating the GHG emission reductions attributable to a project for the destruction of ODS, the promoter must calculate the reductions attributable to the destruction of ODS contained in foam separately from those attributable to the destruction of ODS used as refrigerants.

The promoter must calculate the total GHG emission reductions using equation 1:

Equation 1

$ER_T = ER_F + ER_R$

Where:

ER_T = Total GHG emission reductions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

ER_F = Total GHG emission reductions attributable to the destruction of ODS contained in foam during the issuance period, calculated using equation 2, in metric tonnes CO_2 equivalent;

ER_R = Total GHG emission reductions attributable to the destruction of ODS used as refrigerants during the issuance period, calculated using equation 6.2, in metric tonnes CO_2 equivalent.

For the purposes of the equations, the promoter must use the global warming potential of ODS shown in Figure 7.1:

Figure 7.1. Global warming potential of ODS

Type of ODS	Global warming potential (metric tonnes CO_2 equivalent per metric tonne of ODS)
CFC-11	4,750
CFC-12	10,900
CFC-13	14,400
CFC-113	6,130
CFC-114	10,000
CFC-115	7,370
HCFC-22	1,810
HCFC-141b	725

(7.1) Calculation method for GHG emission reductions under a project for the destruction of ODS contained in foam

The promoter must calculate GHG emission reductions under a project for the destruction of ODS contained in foam using equation 2:

Equation 2

$ER_F = BE_F - PE_F$

Where:

ER_F = Total GHG emission reductions attributable to the project for the destruction of ODS contained in foam during the issuance period, in metric tonnes CO_2 equivalent;

BE_F = Baseline emissions attributable to the destruction of ODS contained in foam during the issuance period, calculated using equation 3, in metric tonnes CO_2 equivalent;

PE_F = GHG emissions under the project for the destruction of ODS contained in foam during the issuance period, calculated using equation 5, in metric tonnes CO_2 equivalent.

(7.1.1) Calculation of GHG emissions under the baseline scenario under a project for the destruction of ODS contained in foam

The promoter must calculate GHG emissions under the baseline scenario attributable to ODS-containing foam using equations 3 and 4:

Equation 3

$$BE_F = \sum_{i=1}^{n} \left[BA_{init,i} \times EF_{F,i} \times GWP_i \right]$$

Where:

BE_F = Baseline emissions attributable to the destruction of ODS contained in foam during the issuance period, in metric tonnes CO_2 equivalent;

i = Type of ODS;

n = Number of types of ODS;

$BA_{init,\ i}$ = Initial quantity of ODS of type *i* contained in foam prior to removal from appliances, calculated using equation 4, in metric tonnes of ODS of type *i*;

$EF_{F,i}$ = GHG emission factor for ODS of type *i* contained in foam, as indicated in the table in Figure 7.2;

GWP_i = Global warming potential of ODS of type *i* as indicated in the table in Figure 7.1, in metric tonnes CO_2 equivalent per metric tonne of ODS of type *i*;

Equation 4

$$BA_{init,i} = BA_{final,i} + \left(BA_{final,i} \times \left(\frac{1 - EE}{EE} \right) \right)$$

Where:

$BA_{init, i}$ = Initial quantity of ODS of type *i* contained in foam prior to removal from appliances, in metric tonnes of ODS of type *i*;

$BA_{final, i}$ = Total quantity of ODS of type *i* extracted and sent for destruction, determined in accordance with Division 9, in metric tonnes of ODS of type *i*;

EE = Extraction efficiency of the ODS extraction process, calculated in accordance with the method in Part II;

i = Type of ODS.

Figure 7.2. Emission factor for each type of ODS contained in foam removed from appliances

Type of ODS	Emission factor for each type of ODS contained in foam removed from appliances ($EF_{F,i}$)
CFC-11	0.44
CFC-12	0.55
HCFC-22	0.75
HCFC-141b	0.50

(7.1.2) Calculation of GHG emissions under a project for the destruction of ODS contained in foam

The promoter must calculate GHG emissions under a project for the destruction of ODS contained in foam using equations 5 to 6.1.

Equation 5

$PE_F = BA_{pr} + (Tr + DEST)_F$

Where:

PE_F = GHG emissions under a project for the destruction of ODS contained in foam during the issuance period, in metric tonnes CO_2 equivalent;

BA_{pr} = Total quantity of ODS contained in foam that are emitted during extraction, calculated using equation 6, in metric tonnes CO_2 equivalent;

$(Tr + DEST)_F$ = GHG emissions attributable to the transportation and destruction of ODS contained in foam, calculated using equation 6.1, in metric tonnes CO_2 equivalent;

Equation 6

$$BA_{pr} = \sum_{i=1}^{n} \left[BA_{init,i} \times (1 - EE_F) \times GWP_i \right]$$

Where:

BA_{pr} = Total emissions attributable to the extraction of ODS contained in foam removed from appliances, in metric tonnes CO_2 equivalent;

i = Type of ODS;

n = Number of types of ODS;

$BA_{init,i}$ = Total quantity of ODS of type *i* contained in foam removed from appliances prior to extraction, calculated using equation 4, in metric tonnes of ODS of type *i*;

EE_F = Extraction efficiency of the extraction process for ODS contained in foam, determined for the project using the method in Part II;

GWP_i = Global warming potential of ODS of type *i* as indicated in the table in Figure 7.1, in metric tonnes CO_2 equivalent per metric tonne of ODS of type *i*;

Equation 6.1

$$(Tr + DEST)_F = BA_{final} \times 7.5$$

Where:

$(Tr + DEST)_F$ = GHG emissions attributable to the transportation and destruction of ODS contained in foam, in metric tonnes CO_2 equivalent;

BA_{final} = Total quantity of ODS contained in foam sent for destruction under the project, calculated using equation 10, in metric tonnes of ODS;

7.5 = Default emission factor for ODS transportation and destruction, in metric tonnes CO_2 equivalent per metric tonne of ODS.

(7.2) Calculation method for total GHG emission reductions under a project for the destruction of ODS used as refrigerants

The promoter must calculate GHG emission reductions under a project for the destruction of ODS used as refrigerants using equation 6.2:

Equation 6.2

$$ER_R = BE_R - PE_R$$

Where:

ER_R = Total GHG emission reductions attributable to the project for the destruction of ODS used as refrigerants during the issuance period, in metric tonnes CO_2 equivalent;

BE_R = Baseline emissions attributable to the destruction of ODS used as refrigerants during the issuance period, calculated using equation 6.3, in metric tonnes CO_2 equivalent;

PE_R =GHG emissions under the project for the destruction of ODS used as refrigerants during the issuance period, calculated using equation 6.4, in metric tonnes CO_2 equivalent.

(7.2.1) Calculation of GHG emissions under the baseline scenario under a project for the destruction of ODS used as refrigerants

The promoter must calculate GHG emissions under the baseline scenario under a project for the destruction of ODS used as refrigerants using equation 6.3:

Equation 6.3

$$BE_R = \sum_{i=1}^{n} (Q_i \times EF_{R,i} \times GWP_i)$$

Where:

BE_R = Emissions under the baseline scenario attributable to the destruction of ODS used as refrigerants during the issuance period, in metric tonnes CO_2 equivalent;

i = Type of ODS;

n = Number of types of ODS;

Q_i = Total quantity of ODS of type *i* used as refrigerants recovered and sent for destruction, determined in accordance with Division 9, in metric tonnes of ODS of type *i*;

$EF_{R,i}$ = GHG emission factor for ODS of type *i* used as refrigerants, as indicated in the table in Figure 7.3;

GWPi = Global warming potential of ODS of type *i* as indicated in the table in Figure 7.1, in metric tonnes CO_2 equivalent per metric tonne of ODS of type *i*;

Figure 7.3. Emission factor for each type of ODS used as a refrigerant

Type of ODS	Emission factor for each type of ODS used as a refrigerant ($EF_{R,i}$)
CFC-11	0.89
CFC-12	0.95
CFC-13	0.61
CFC-113	0.89
CFC-114	0.78
CFC-115	0.61

(7.2.2) Calculation of GHG emissions under a project for the destruction of ODS used as refrigerants

The promoter must calculate total GHG emissions under a project for the destruction of ODS used as refrigerants using equations 6.4 to 6.7:

Equation 6.4

$PE_R = Sub + (Tr + Dest)_R$

Where:

PE_R = GHG emissions under the project for the destruction of ODS used as refrigerants during the issuance period, in metric tonnes CO_2 equivalent;

Sub = Total GHG emissions attributable to substitute refrigerants, calculated using equation 6.5, in metric tonnes CO_2 equivalent;

$(Tr + DEST)_R$ = GHG emissions attributable to the transportation and destruction of ODS used as refrigerants, calculated using equation 6.6, in metric tonnes CO_2 equivalent;

Equation 6.5

$$Sub = \sum_{i=1}^{n} (Q_i \times EFS_i)$$

Where:

Sub = Total GHG emissions attributable to substitute refrigerants, in metric tonnes CO_2 equivalent;

i = Type of ODS;

n = Number of types of ODS;

Q_i = Total quantity of ODS of type *i* used as refrigerants recovered and sent for destruction, determined in accordance with Division 9, in metric tonnes of ODS of type *i*;

EFS_i = Emission factor for substitutes for ODS of type *i* as indicated in the table in Figure 7.4, in metric tonnes CO_2 equivalent per metric tonne of ODS;

Figure 7.4. Emission factors for substitute refrigerants

ODS used as refrigerants	Emission factors for substitute refrigerants (EFS_i)
CFC-11	223
CFC-12	686
CFC-13	7,144
CFC-113	220
CFC-114	659
CFC-115	1,139

Equation 6.6

$(TR + Dest)_R = Q \times 7.5$

Where:

$(Tr + DEST)_R$ = GHG emissions attributable to the transportation and destruction of ODS used as refrigerants, in metric tonnes CO_2 equivalent;

Q = Total quantity of ODS used as refrigerants recovered and sent for destruction, calculated using equation 6.7, in metric tonnes of ODS;

7.5 = Default emission factor for ODS transportation and destruction, in metric tonnes CO_2 equivalent per metric tonne of ODS;

Equation 6.7

$$Q = \sum_{i=1}^{n} Q_i$$

Where:

Q = Total quantity of ODS used as refrigerants recovered and sent for destruction, in metric tonnes of ODS;

i = Type of ODS;

n = Number of types of ODS;

Q_i = Total quantity of ODS of type *i* used as refrigerants recovered and sent for destruction, determined in accordance with Division 9, in metric tonnes of ODS of type *i*.

(8) Data management and project surveillance

(8.1) Data management

The promoter must record the following information in the register referred to in section 70.13, and include it in the project report referred to in the first paragraph of section 70.14, indicating separately the information pertaining to ODS contained in foam and that pertaining to ODS used as refrigerants:

(1) information on the chain of traceability, from point of origin to point of destruction of the ODS;

(2) information on the point of origin, namely the first place of storage for recovered appliances with ODS-containing foam, specifying

(a) the address of each place of storage where recovered appliances are transferred or aggregated;

(b) the name and contact information of each party involved in each stage of the project, and the quantity of materials, whether appliances, foam or ODS, transferred, sold or handled by each party; and

(c) the number of appliances recovered and, for each appliance, the type, size, storage capacity and, if available, serial number;

(3) the serial number or identification number of the containers used for ODS storage and transportation;

(4) any document identifying persons in possession of appliances, foam and ODS at each stage in the project, and showing the transfer of possession and ownership of the appliances, foam and ODS;

(5) information on ODS extraction, specifying

(a) the number of appliances containing foam from which ODS has been extracted;

(a.1) the number of appliances containing refrigerants from which ODS have been extracted;

(b) the name and contact information of the facility where the ODS are extracted;

(c) the name and contact information of the facility where the appliances are recycled, if any; and

(d) processes, training, and quality assurance, quality control and extraction process management processes;

(6) a certificate of destruction for all the ODS destroyed under the project, issued by the facility that destroyed the ODS, by destruction activity, specifying

(a) the name of the project promoter;

(b) the name and contact information of the destruction facilities;

(c) the name and signature of the person responsible for the destruction operations;

(d) the identification number on the certificate of destruction;

(e) the serial, tracking or identification number of all containers for which ODS destruction occurred;

(f) the weight and type of ODS destroyed for each container, including the weigh tickets generated in accordance with Division 9.1;

(g) the destruction start date and time; and

(h) the destruction end date and time;

(7) the surveillance plan referred to in Division 8.2;

(8) the certificate of sampling results issued by the laboratory in accordance with Division 9.1.

All the data referred to in subparagraph 2 of the first paragraph concerning the point of origin must be obtained at the time of recovery from the point of origin.

(8.2) Surveillance plan

The promoter must establish a surveillance plan to measure and monitor project parameters in accordance with the tables in figures 8.1 and 8.2

Figure 8.1. Parameters for the surveillance of a project for the destruction of ODS contained in foam

Parameter	**Factor used in equations**	**Measurement unit**	**Method**	**Measurement frequency**
Total quantity of ODS contained in foam prior to removal from appliances	BA_{init}	Metric tonne of ODS	Calculated	Each issuance period
Initial quantity of ODS of type *i* contained in foam from appliances prior to removal	$BA_{init, i}$	Metric tonne of ODS of type *i*	Calculated	Each issuance period
Recovery efficiency associated with the process for the extraction of ODS contained in foam	RE	$0 \leq 1$	Calculated	Each issuance period
Total quantity of foam removed prior to extraction of ODS	$Foam_{rec}$	Metric tonne of foam	Measured and calculated	Each issuance period
Total emissions	BA_{pr}	Metric	Calculated	Each

attributable to the extraction of ODS from foam removed from appliances		tonne, CO_2 equivalent		issuance period
Total quantity of ODS contained in the foam removed and sent for destruction	BA_{final}	Metric tonne of ODS	Calculated	Each issuance period
Total quantity of ODS of type *i* contained in foam extracted and sent for destruction under the project	$BA_{final, i}$	Metric tonne of ODS of type $_i$	Calculated	Each issuance period
Mass of each container filled with ODS contained in foam	N/A	Metric tonne	Measured	Each issuance period
Mass of each empty container for projects to destroy ODS contained in foam	N/A	Metric tonne	Calculated	Each issuance period
Quantity of ODS contained in foam, in container each	N/A	Metric tonne	Calculated	Each issuance period
Concentration of each type of ODS contained in foam, in each container	N/A	%	Measured	Each issuance period
Quantity of each type of ODS contained in foam, in each container	N/A	Metric tonnes of ODS of type *i*	Calculated	Each issuance period
Emissions attributable to the transportation and destruction of ODS contained in foam	(TR + DEST)	Metric tonne, CO_2 equivalent	Calculated	Each issuance period
Concentration of ODS in foam before extraction from	CBA	Metric tonne of ODS per metric tonne	Calculated	Each issuance period

appliances		of foam		

Figure 8.2. Parameters for the surveillance of a project for the destruction of ODS used as refrigerants

Parameter	**Factor used in equations**	**Measurement unit**	**Method**	**Measurement frequency**
Mass of each container filled with ODS used as refrigerants	N/A	Metric tonne	Measured	Each issuance period
Mass of each empty container for project to destroy ODS used as refrigerants	N/A	Metric tonne	Measured	Each issuance period
Quantity of ODS used as refrigerants, in each container	N/A	Metric tonne	Calculated	Each issuance period
Concentration of each type of ODS used as a refrigerant, in each container	N/A	%	Analysed in a laboratory	Each issuance period
Quantity of each type of ODS used as a refrigerant, in each container	N/A	Metric tonne of ODS of type *i*	Calculated	Each issuance period
Total quantity of ODS of type *i* used as refrigerants removed and sent for destruction	Q*i*	Metric tonne of ODS of type *i*	Calculated	Each issuance period
Total quantity of ODS used as refrigerants removed and sent for destruction	Q	Metric tonne of ODS	Calculated	Each issuance period
Total quantity of GHG emissions from substitute refrigerants	Sub	Metric tonne CO_2 equivalent	Calculated	Each issuance period

Emissions attributable to the transportation and destruction of ODS used as refrigerants	$(Tr + DEST)_R$	Metric tonne CO_2 equivalent	Calculated	Each issuance period	

(9) Extraction and analysis of ODS extracted in concentrated form from foam removed from appliances and of ODS used as refrigerants

In the case of ODS contained in foam, the promoter must use the same procedure during project implementation as that used to calculate extraction efficiency using the method in Part II of this protocol.

For each container, the promoter must use the method in this Division to calculate, on a mass basis, the total quantity of ODS of type *i* sent for destruction under the project, namely the factor $BA_{final,i}$ for projects for the destruction of ODS contained in foam and the factor Q_i for projects for the destruction of ODS used as refrigerants.

(9.1) Determination of the quantity of ODS in each container

The quantity of ODS destroyed must be determined at the destruction facility by an authorized person, by weighing each container when it is full of ODS prior to destruction and after it has been emptied and its contents have been destroyed.

The quantity of ODS is equal to the difference between the mass of the container when full and when empty.

Each ODS container must be weighed at the destruction facility:

(1) using a single scale to generate both full and empty weight tickets;

(2) ensuring that the scale has been calibrated by the manufacturer or by a third person certified for that purpose less than 3 months before the weighing, to an accuracy of ± 5%;

(3) weighing the full container not more than 2 days prior to commencing the destruction of the ODS;

(4) weighing the empty container not more than 2 days after the destruction of the ODS.

Despite the first paragraph, until 31 December 2014, the containers may be weighed in a place other than the destruction facility provided it is less than 5 km from the facility.

Despite subparagraph 2 of the third paragraph, scales used prior to 31 December 2012 and subject to the Weights and Measures Act (R.S.C. 1985, c. W-6) may have been calibrated at the frequency specified by Measurement Canada provided that frequency does not exceed 2 years. However, if the first calibration after a weighing indicates that the weight of the ODS destroyed was overestimated, the promoter must correct the weight by deducting the error percentage recorded during the calibration.

(9.2) Circulation of mixed ODS

For each sample that does not contain over 90% of the same type of ODS, the promoter must, in addition to the conditions provided for in Division 9.1, also meet the following conditions concerning mixed ODS.

The circulation of the ODS mixture must be conducted at the destruction facility or prior to delivery of the ODS to such a facility, by a person who is independent of the promoter and of the destruction facility and who is properly trained to carry out this task.

The promoter must include the procedures used to analyze the ODS mixture in the project report.

Prior to sampling, the ODS mixture must be circulated in a container that meets all of the following conditions:

(1) the container has no solid interior obstructions other than mesh baffles or other interior structures that do not impede circulation;

(2) the container was fully evacuated prior to filling;

(3) the container has ports to sample liquid and gas phase ODS;

(4) the sampling ports are located in the middle third of the container and not at one end or the other;

(5) the container and associated equipment can circulate the mixture through a closed loop system from the bottom to top.

If the original mixed ODS container does not meet these requirements, the mixed ODS must be transferred into a compliant temporary container.

The mass of the ODS mixture transferred into the temporary container must be calculated and recorded. In addition, transfers of ODS between containers must be carried out at a pressure that meets the applicable standards for the place where the project is located.

Once the mixed ODS are in a container that meets the above criteria, they must be circulated as follows:

(1) liquid mixtures must be circulated from the liquid port to the vapour port;

(2) a volume of the mixture equal to 2 times the volume in the container must be circulated;

(3) circulation must occur at a rate of at least 114 litres per minute unless the liquid mixture has been circulating continuously for at least 8 hours;

(4) the start and end times must be recorded.

(**9.3**) **Sampling**

Sampling must be conducted for each ODS container:

(1) in the case of pure ODS, 1 sample must be taken at the destruction facility;

(2) in the case of ODS mixtures that have been circulated at the destruction facility, a minimum of 2 samples must be taken during the last 30 minutes of circulation and the samples must be taken from the bottom liquid port;

(3) in the case of ODS mixtures that have been circulated prior to delivery to the destruction facility, a minimum of 2 samples must be taken in accordance with subparagraph 2, and 1 additional sample must be taken at the destruction facility.

If more than one sample is taken for a single container, the promoter must use the results from the sample with the weighted ODS concentration with the least global warming potential.

The sampling must be conducted in accordance with the following conditions:

(1) the samples must be taken by a person who is independent of the promoter and of the destruction facility and has the necessary training to carry out this task;

(2) the samples must be taken with a clean, fully evacuated sample bottle with a minimum capacity of 0.454 kg;

(3) each sample must be taken in a liquid state;

(4) a minimum sample size of 0.454 kg must be drawn for each sample;

(5) each sample must be individually labeled and tracked according to the container from which it was taken;

(6) the following information must be recorded for each sample:

(a) the time and date of the sample;

(b) the name of the promoter for whom the sampling is conducted;

(c) the name and contact information of the technician who took the sample, and of the technician's employer;

(d) the volume of the container from which the sample was drawn;

(e) the ambient air temperature at the time of sampling;

(f) the chain of traceability of each sample, from the point of sampling to the accredited laboratory.

Despite subparagraph 3 of the first paragraph, in the case of ODS mixtures circulated before 31 December 2012, a minimum of 1 sample must be taken in accordance with subparagraph 2 of the first paragraph and 1 extra sample must be taken at the destruction facility.

(9.4) Analysis of samples

The quantity and type of ODS must be determined by having a sample from each container analyzed by one of the following laboratories:

(1) the Centre d'expertise en analyse environnementale du Québec of the department;

(2) a laboratory that is independent of the promoter and of the destruction facility and accredited for analysis of ODS by the Air-Conditioning, Heating and Refrigeration Institute in accordance with the most recent version of AHRI 700 of that organization.

All the ODS samples for the project must be sampled to determine the following:

(1) the type of each ODS;

(2) the quantity, in metric tonnes, and concentration, in metric tonnes of ODS of type *i* per metric tonne of gas, in each type of ODS in the gas, using gas chromatography;

(3) the moisture content of each sample;

(4) the high boiling residue from the ODS sample, which must be below 10% of the total mass of the sample.

If the moisture content determined under subparagraph 3 of the second paragraph is above 75% of the saturation point for the ODS, the promoter must dry the ODS mixture, conduct the circulation again in accordance with the method provided for in Division 9.2 in the case of mixed ODS, take the sample again and analyze it in accordance with the method in Divisions 9.3 and 9.4, or deduct the weight of the water, which includes the weight of the layer of free water floating on the ODS and the amount of dissolved water in the ODS.

In the case of ODS mixtures, the analysis must determine the weighted concentrations of the ODS on the basis of their global warming potential for samples taken in accordance with subparagraph 2 of the first paragraph of Division 9.3.

A certificate of the sampling results must be issued by the laboratory that conducted the analysis and a copy of the certificate must be included with the project report.

(9.5) Determination of the total quantity of ODS of type *i* contained in foam extracted and sent for destruction ($BA_{final, i}$) and the total quantity of ODS of type *i* used as refrigerants extracted and sent for destruction (Q_i)

Based on the mass of the ODS in each container and the concentration of each sample, the promoter must

(1) calculate the quantity of each type of ODS in each container, by deducting the weight of the water if the moisture content is above 75% of the saturation point and the ODS has not been dried, and deducting the weight of the high boiling residue;

(2) add together the quantities of each type of ODS in each container to obtain the factor $BA_{final, i}$, namely the total quantity of ODS of type *i* contained in the foam, or the factor Q_i, namely the total quantity of ODS of type *i* used as refrigerants extracted and sent for destruction under the project.

(10) Destruction facilities

The operating parameters for the facility during ODS destruction must be monitored and recorded in accordance with the Code of Good Housekeeping approved by the Montréal Protocol.

The verifier must use the data to show that, during the ODS destruction process, the facility was operating in conditions that met the requirements of any authorization necessary to pursue activities at that facility.

The promoter must continuously monitor the following parameters during the entire ODS destruction process:

(1) the ODS feed rate;

(2) the operating temperature and pressure of the destruction facility during ODS destruction;

(3) effluent discharges measured in terms of water and pH levels;

(4) carbon monoxide emissions.

Each stage in a project carried out in the United States must be conducted in accordance with the requirements of the most recent version of the protocol entitled “Compliance Offset Protocol Ozone Depleting Substances Projects: Destruction of U.S. Ozone Depleting Substances Banks” and published by the California Air Resources Board and the California Environmental Protection Agency.

(11) Verification

The verification process must include a visit

(1) of the place where ODS contained in foam are extracted, at least once during the first project verification; and

(2) of each destruction facility for the project, during each project verification.

Part II

Calculation of ODS extraction efficiency in foam removed from appliances

To calculate extraction efficiency in accordance with Division 2, the promoter must first calculate the quantity of ODS contained in foam prior to removal from appliances, based on the storage capacity of the appliances, using equation 7 and the table in Figure 1 of Subdivision 1.1 or using foam samples in accordance with Subdivision 1.2.

(1) Calculation methods for the initial quantity of ODS contained in foam

(1.1) Calculation of the initial quantity of ODS contained in foam based on the storage capacity of the appliances

The promoter may calculate the initial quantity of ODS contained in foam using equation 7 and data from the table in Figure 1:

Equation 7

$$BA_{init} = (N_1 \times M_1) + (N_2 \times M_2) + (N_3 \times M_3) + (N_4 \times M_4)$$

Where:

BA_{init} = Initial quantity of ODS contained in foam prior to removal from appliances, in metric tonnes;

N_1 = Number of appliances of type 1;

N_2 = Number of appliances of type 2;

N_3 = Number of appliances of type 3;

N_4 = Number of appliances of type 4;

M_1 = Metric tonnes of ODS per appliance of type 1;

M_2 = Metric tonnes of ODS per appliance of type 2;

M_3 = Metric tonnes of ODS per appliance of type 3;

M_4 = Metric tonnes of ODS per appliance of type 4.

Figure 1. Quantity of ODS by type of appliance

Type of appliance	Storage capacity (SC)	Metric tonnes of ODS per appliance
Type 1	SC < 180 litres	0.00024
Type 2	180 litres ≤ SC < 350 litres	0.00032
Type 3	350 litres ≤ SC < 500 litres	0.0004
Type 4	SC ≥ 500 litres	0.00048

(1.2) Calculation of the initial quantity of ODS contained in foam based on samples

The initial quantity of ODS contained in foam may be calculated using samples from at least 10 appliances and the following method:

(1) have the initial concentration of ODS in the foam determined by a laboratory independent of the promoter in accordance with Division 9.1 of Part I and in the following manner:

(a) by cutting 4 foam samples from each appliance (left side, right side, top, bottom) using a reciprocating saw, each sample being at least 10 cm^2 and the full thickness of the insulation;

(b) by sealing the cut edges of each foam sample using aluminum tape or a similar product that prevents off gassing;

(c) by individually labelling each sample to record appliance model and site of sample (left, right, top, bottom);

(d) by analyzing the samples using the procedure in paragraph 4; the samples may be analyzed individually (4 analyses per appliance) or a single analysis may be done using equal masses of foam from each sample (1 analysis per appliance);

(e) based on the average concentration of ODS in the samples from each appliance, by calculating the 90% upper confidence limit of the ODS concentration in the foam, and using that value as the "CBA" factor in equation 8 to calculate initial quantity of ODS contained in foam from appliances;

(2) determine the quantity of foam removed from the appliances processed, namely the factor "$Foam_{rec}$" in equation 8, using a default value of 5.85 kg per appliance and multiplying by the number of appliances processed or using the following method:

(a) by separating and collecting all foam residual, which may be in a fluff, power or pelletized form, and documenting the processed to demonstrate that no significant quantity of foam residual is lost in the air or other waste streams;

(b) by separating non-foam components in the residual (such as metal or plastic);

(c) by weighing the recovered foam residual prior to ODS extraction to calculate the total mass of foam recovered;

(3) calculate the initial quantity of ODS contained in foam prior to removal from appliances using equation 8:

Equation 8

$$BA_{init} = Foam_{rec} \times CBA$$

Where:

BA_{init} = Initial quantity of ODS contained in foam prior to removal from appliances, in metric tonnes;

$Foam_{rec}$ = Total quantity of foam recovered prior to ODS extraction, in metric tonnes;

CBA = Concentration of ODS in the foam prior to removal from appliances, in metric tonnes de ODS per metric tonne of foam;

(4) analyze the foam samples from appliance in accordance with the following requirements:

(a) the analysis of the content and mass ratio of the ODS from foam must be done at an independent laboratory in accordance with Division 9.1 of Part I;

(b) the analysis must be done using the heating method to extract ODS from the foam in the foam samples, as described in the article "Release of fluorocarbons from Insulation foam in Home Appliance during Shredding" published by Scheutz, Fredenslund, Kjeldsen and Tant in the Journal of the Air & Waste Management Association (December 2007, Vol. 57, pages 1452-1460), and set out below:

i. each sample must be prepared to a thickness no greater than 1 cm, placed in a 1123 ml glass bottle, weighed using a calibrated scale, and sealed with Teflon-coated septa and aluminum caps;

ii. to release the ODS, the sample must be incubated in an oven for 48 hours at 140 °C;

iii. when cooled to room temperature, gas samples must be redrawn from the headspace and analyzed by gas chromatography in accordance with Division 9.1 of Part I;

iv. the lids must be removed after analysis, and the headspace must be flushed with atmospheric air for approximately 5 minutes using a compressor; afterwards, the septa and caps must be replaced and the bottles subjected to a second 48-hour heating step to drive out the remaining ODS from the sampled foam;

v. when cooled down to room temperature after the second heating step, gas samples must be redrawn from the headspace and analyzed by gas chromatography in accordance with Division 9.1 of Part I;

(c) the quantity of each type of ODS recovered must then de divided by the total mass of the initial foam samples prior to analysis to determine the mass ratio of ODS present, in metric tonnes of ODS per metric tonne of foam.

(2) Calculation methods for extraction efficiency

The promoter must calculate the extraction efficiency using equation 9:

Equation 9

$$EE = \frac{BA_{final}}{BA_{init}}$$

Where:

EE = Extraction efficiency;

BA_{final} = Total quantity of ODS contained in foam removed and sent for destruction, calculated using equation 10, in metric tonnes;

BA_{init} = Initial quantity of ODS contained in foam prior to removal from appliances, calculated using equation 7 or 8, as the case may be, in metric tonnes;

Equation 10

$$BA_{final} = \sum_{i=1}^{n} BA_{final,i}$$

Where:

BA_{final} = Total quantity of ODS contained in foam removed and sent for destruction, in metric tonnes;

i = Type of ODS;

n = Number of types of ODS;

$BA_{final, i}$ = Total quantity of ODS of type *i* extracted and sent for destruction, determined in accordance with Division 9.1 of Part I, in metric tonnes.

PROTOCOL 4

ACTIVE COAL MINES – DESTRUCTION OF CH_4 FROM A DRAINAGE SYSTEM

Part I

(1) Projects covered

This offset credit protocol covers any project designed to reduce GHG emissions by capturing and destroying CH_4 from a CH_4 drainage system at an active underground or surface coal mine, except a mountaintop removal mine.

The project must enable the capture and destruction of CH_4 that, before the project, was emitted to the atmosphere. The CH_4 must be captured within the mine boundaries based on the current mine map and no more than 50 m below the mined seam and, in the case of an underground mine, up to 150 m above that seam. The project must not use CO_2, steam or any other fluid or gas to enhance CH_4 drainage.

The CH_4 must be destroyed on the site of the mine where it was captured using a flare or any other destruction device. Emission reductions following pipeline injection of CH_4 are considered as common practice in the operation of an underground mine and are eligible only for a surface mine.

For the purposes of this protocol,

(1) “room and pillar” means a method of underground mining in which approximately half of the coal is left in place as “pillars” to support the roof of the active mining area while “rooms” of coal are extracted;

(2) “coal” means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite under ASTM D388, entitled Standard Classification of Coals by Rank;

(3) “mine gas” means the untreated gas extracted from within a mine through a CH_4 drainage system that often contains various levels of other components such as nitrogen, oxygen, CO_2 and hydrogen sulfide;

(4) “mine CH_4” means the CH_4 portion of the mine gas contained in coal seams and surrounding strata that is released as a result of mining operations;

(5) “drainage system” means a system installed in a mine to drain CH_4 from coal seams.

(2) First project report

In addition to the information required under the third paragraph of section 70.5 of this Regulation, the first project report must include the following information:

(1) in the case of an underground mine, the mining method employed, such as room and pillar or longwall;

(2) annual coal production, in metric tonnes;

(3) the year of initial mine operation;

(4) the scheduled year of mine closure, if known;

(5) a diagram of the mine site that includes

(a) the location of existing and planned wells and boreholes, specifying whether they were used for premining or post-mining drainage, and whether they are part of the project;

(b) the location of the equipment that will be used to treat or destroy the mine CH_4.

(3) Location

The project must be implemented in Canada.

(4) Reduction project SSRs

The reduction project process flowchart in Figure 4.1 and the table in Figure 4.2 show all the SSRs that must be taken into account by the promoter when calculating the GHG emission reductions attributable to the project.

All the SSRs within the dotted line must be counted for the purposes of this protocol.

Figure 4.1. Flowchart for the reduction project process

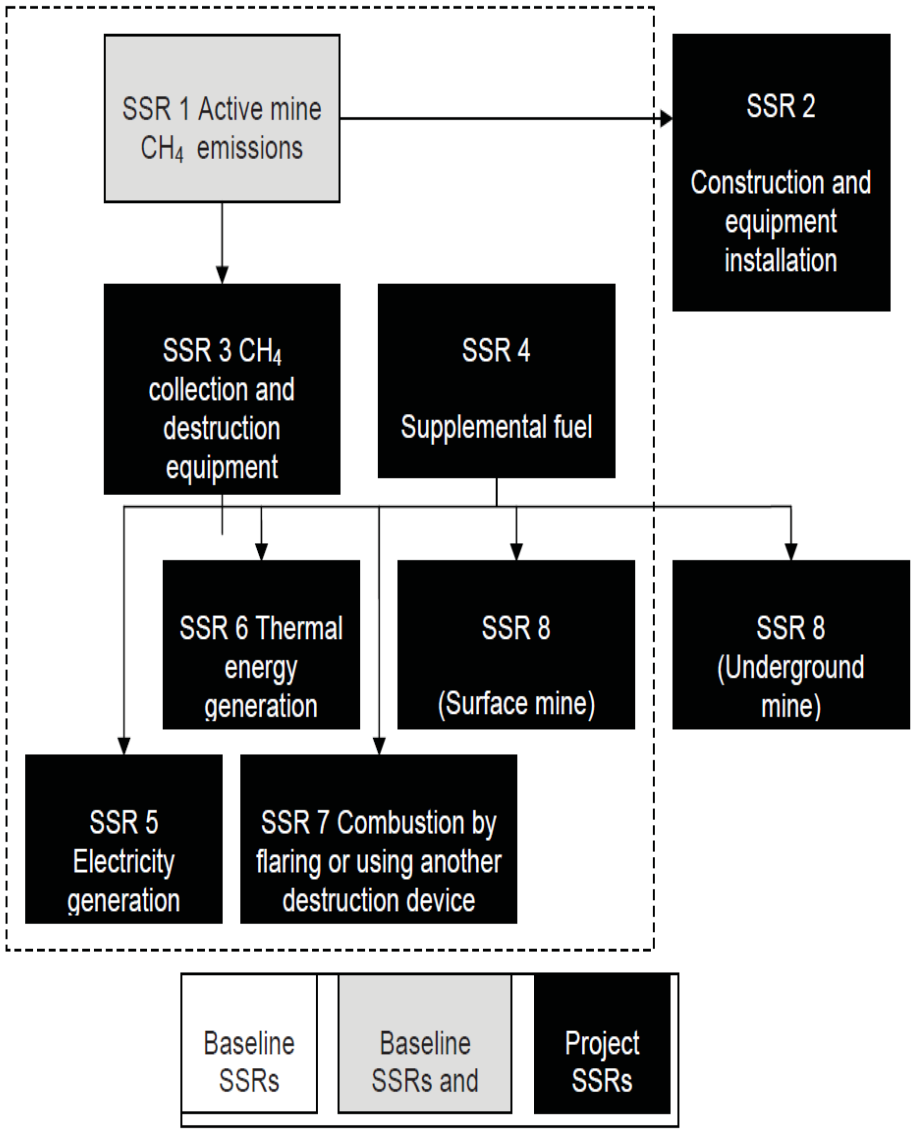

Figure 4.2. Reduction project SSRs

SSR #	Description	GHG	Relevant to Baseline (B) or Project (P)	Included/ Excluded
1	CH_4 emissions from mining activities	CH_4	B, P	Included
2	Emissions from construction and/or installation of new equipment	CO_2	P	Excluded
		CH_4		Excluded
		N_2O		Excluded
3	Emissions resulting from fossil fuels consumed to operate the CH_4 drainage system	CO_2	P	Included
		CH_4		Excluded
		N_2O		Excluded
4	Emissions from the use of supplmental fossil fuels	CO_2	P	Included
		CH_4		Excluded
		N_2O		Excluded
5	Emissions from CH_4 destruction for electricity generation	CO_2	P	Included
		N_2O		Excluded
	Emissions of uncombusted CH_4	CH_4	P	Included
6	Emissions from CH_4 destruction	CO_2	P	Included

	for heat generation	N_2O		Excluded	
	Emissions of uncombusted CH_4	CH_4	P	Included	
7	Emissions from CH_4 destruction using a flare or other device	CO_2	P	Included	
		N_2O		Excluded	
	Emissions of uncombusted CH_4	CH_4	P	Included	
8 (Underground mine)	Pipeline injection	CO_2	P	Excluded	
		N_2O		Excluded	
		CH_4		Excluded	
8 (Surface mine)	Emissions resulting from the combustion of CH_4 injected into a pipeline	CO_2	P	Included	
		N_2O		Excluded	
	Emissions of uncombusted CH_4 injected into a pipeline	CH_4	P	Included	

(5) Calculation method for the GHG emission reductions attributable to the project

The promoter must calculate the quantity of GHG emission reductions attributable to the project using equation 1:

Equation 1

$ER = BE - PE$

Where:

ER = GHG emission reductions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

BE = Emissions under the baseline scenario during the issuance period, calculated using equation 3, in metric tonnes CO_2 equivalent;

PE = Project emissions during the issuance period, calculated using equation 5, in metric tonnes CO_2 equivalent.

When the flow meter does not correct for the temperature and pressure of the mine gas at standard conditions, the promoter must measure mine pressure and temperature separately and correct the flow values using equation 2. The promoter must use the corrected flow values in all the equations of this protocol.

Equation 2

$$MG_{i,t} = MG_{uncorrected} \times \frac{293.15}{T} \times \frac{P}{101.325}$$

Where:

$MG_{i,t}$ = Volume of mine gas sent to destruction device *i* in time interval *t*, in cubic metres at standard conditions;

i = Destruction device;

t = Time interval shown in the table in Figure 6.1 for which CH_4 flow and content measurements are aggregated;

$MG_{uncorrected}$ = Uncorrected volume of mine gas sent to destruction device *i* in time interval *t*, in cubic metres;

293.15 = Reference temperature, in Kelvin;

T = Measured temperature of mine gas for the given time period, in Kelvin (°C + 273.15);

P = Pressure of the mine gas for the given time period, in kilopascals;

101.325 = Standard pressure, in kilopascals.

(5.1) Calculation method for GHG emissions in the baseline scenario

In the baseline scenario, CH_4 sent to a destruction device during the issuance period, except CH_4 captured by a pre-mining surface well used to extract CH_4, must be taken into account.

In the case of a surface well used to extract CH_4 before a mining operation, CH_4 emissions from past periods are considered only during a issuance period when the well is mined through, in other words when one of the following situations occurs:

(1) the well is physically bisected by mining activities;

(2) the well produces elevated amounts of atmospheric gases so that the concentration of nitrogen in the mine gas increases by 5 compared to baseline concentrations according to a gas analysis using a gas chromatograph completed by an ISO 17025 accredited laboratory. To ensure that the elevated nitrogen concentrations are not solely the result of a leak in the well, the oxygen concentration must not have increased by the same proportion as the nitrogen concentration;

(3) in the case of an underground mine, the working face passes less than 150 m below the well;

(4) in the case of an underground mine, the room and pillar method is used and the block of coal that will be left unmined as a pillar is less than 150 m directly below the well.

The promoter must calculate GHG emissions in the baseline scenario using equation 3:

Equation 3

$$BE = \sum_{i=1}^{n} [Q_i] \times 0.667 \times 0.001 \times 21$$

Where:

BE = Baseline scenario emissions during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of destruction devices;

i = Destruction device;

Q_i = Total quantity of CH_4 sent to destruction device *i* during the issuance period, calculated using equation 4, in cubic metres of CH_4 at standard conditions;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001 = Conversion factor, kilograms to metric tonnes;

21 = Global Warming Potential factor of CH_4;

Equation 4

$$Q_i = \sum_{t=1}^{n} \left[MG_{i,t} \times C_{CH4,t} \right]$$

Where:

Q_i = Total quantity of CH_4 sent to destruction device *i* during the issuance period, in cubic metres of CH_4 at standard conditions;

n = Number of time intervals during the issuance period;

t = Time interval shown in the table in Figure 6.1 for which CH_4 flow and content measurements for the mine gas are aggregated;

$MG_{i,t}$ = Volume of mine gas sent to destruction device *i* in time interval *t*, in cubic metres at standard conditions, except mine gas from a surface well that is not yet mined through. Despite the foregoing, if the surface well is mined through during the issuance period, the mine gas sent to a destruction device during the current reporting period and in previous years must be included;

$C_{CH4,t}$ = Average CH_4 content in the mine gas sent to a destruction device during time interval *t*, in cubic metres of CH_4 per cubic metre of mine gas.

(5.2) Calculation method for GHG project emissions

The promoter must calculate the GHG project emissions using equations 5 to 8. The CO_2 emissions attributable to the destruction of CH_4 from a pre-mining surface well used to extract CH_4 during a current issuance period, calculated using equation 7, must be included even if the well has not yet been mined through.

Equation 5

$$PE = FF_{CO2} + DM_{CO2} + UM_{CH4}$$

Where:

PE = Project emissions during the issuance period, in metric tonnes CO_2 equivalent;

FF_{CO2} = Total CO_2 emissions attributable to the consumption of fossil fuel to capture and destroy mine CH_4 during the issuance period, calculated using equation 6, in metric tonnes CO_2 equivalent;

DM_{CO2} = Total CO_2 attributable to the destruction of CH_4 during the issuance period, calculated using equation 7, in metric tonnes CO_2 equivalent;

UM_{CH4} = CH_4 emissions attributable to uncombusted CH_4 during a issuance period, calculated using equation 8, in metric tonnes CO_2 equivalent;

Equation 6

$$FF_{CO2} = \frac{\sum_{j=1}^{n}\left(FF_{PR,j} \times EF_{CF,j}\right)}{1{,}000}$$

Where:

FF_{CO2} = Total CO_2 attributable to the consumption of fossil fuel to capture and destroy mine CH_4 during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of types of fossil fuel;

j = Type of fossil fuel;

$FF_{PR,j}$ = Total quantity of fossil fuel *j* consumed, expressed

— in kilograms, in the case of fuels whose quantity is expressed as a mass;

— in cubic metres at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in litres, in the case of fuels whose quantity is expressed as a volume of liquid;

$EF_{CF,j}$ = CO_2 emission factor for fossil fuel *j* specified in tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), expressed

— in kilograms of CO_2 per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in kilograms of CO_2 per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in kilograms of CO_2 per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

1,000 = Conversion factor, metric tonnes to kilograms;

Equation 7

$$DM_{CO2} = \sum_{i=1}^{n} \left[Q_i \times DE_i \right] \times 1.556 \times 0.001$$

Where:

DM_{CO2} = Total CO_2 attributable to the destruction of CH_4 during a issuance period, in metric tonnes CO_2 equivalent;

n = Number of destruction devices;

i = Destruction device;

Q_i = Total quantity of CH_4 sent to destruction device *i* during the issuance period, calculated using equation 4, in cubic metres of CH_4 at standard conditions;

DE_i = Default CH_4 destruction efficiency of destruction device *i*, determined in accordance with Part II;

1.556 = CO_2 emission factor attributable to the combustion of CH_4, in kilograms of CO_2 per cubic metre of CH_4 combusted;

0.001 = Conversion factor, kilograms to metric tonnes;

Equation 8

$$UM_{CH4} = \sum_{i=1}^{n} \left[Q_i \times \left(1 - DE_i\right) \right] \times 0.667 \times 0.001 \times 21$$

Where:

UM_{CH4} = CH_4 emissions attributable to uncombusted CH_4 during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of destruction devices;

i = Destruction device;

Q_i = Total quantity of CH_4 sent to destruction device *i* during the issuance period, calculated using equation 4, in cubic metres of CH_4 at standard conditions;

DE_i = Default CH_4 destruction efficiency of destruction device *i*, determined in accordance with Part II;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001 = Conversion factor, kilograms to metric tonnes;

21 = Global Warming Potential factor of CH_4.

(6) Project surveillance

(6.1) Data collection

The promoter is responsible for collecting the information required for project monitoring.

The promoter must show that the data collected are actual and that rigorous supervision and record-keeping procedures are applied at the project site.

(6.2) Surveillance plan

The promoter must establish a surveillance plan to measure and monitor project parameters in accordance with Figure 6.1:

Figure 6.1. Project surveillance plan

Parameter	**Factor used in equations**	**Unit of measurement**	**Method**	**Frequency of measurement**
Operating status of destruction device	N/A	Degree Celsius or other, depending on the device installed	Measured for each destruction device	Hourly
Uncorrected volume of mine gas sent to destruction device *i*, in	$MG_{uncorrected}$	Cubic metre	Measured	Only when flow data are not adjusted at standard conditions

time interval *t*					
Volume of mine gas sent to destruction device *i*, in time interval *t*	$MG_{i, t}$	Cubic metre at standard conditions	Measured and calculated	Continuous and recorded at least every 15 minutes to calculate a daily average, and adjusted for temperature and pressure	
Average CH_4 content in the mine gas sent to destruction device during time interval *t*	$C_{CH4, t}$	Cubic metre of CH_4 per cubic metre of gas at standard conditions	Measured continuously	Continuous and recorded at least every 15 minutes to calculate a daily average	
Total quantity of fossil fuels combustibles consumed by the capture and destruction system during the issuance period, by type of fuel *j*	$FF_{PR, j}$	Kilogram (solid) Cubic metre at standard conditions (gas) Litre (liquid)	Calculated using fossil fuel purchasing register	At each issuance period	
Measured temperature of mine gas	T	°C	Measured	Hourly	
Pressure of mine gas	P	kPa	Measured	Hourly	

The surveillance plan must

(1) specify the methods used to collect and record the data required for all the relevant parameters in the table in Figure 6.1;

(2) specify

(a) the frequency of data acquisition;

(b) the frequency of instrument cleaning, inspection and calibration activities, and of the verification of instrument calibration accuracy; and

(c) the role of the person responsible for each monitoring activity, as well as the quality assurance and quality control measures taken to ensure that data acquisition and instrument calibration are carried out consistently and with precision; and

(3) contain a detailed diagram of the mine gas capture and destruction system, including the placement of all measurement instruments and equipment that affect included SSRs.

The promoter is responsible for carrying out and monitoring project performance. The promoter must use the mine gas destruction device and the measurement instruments in accordance with the manufacturer's specifications. The promoter must, in particular, use measurement instruments to measure directly

(1) the flow of mine gas sent to each destruction device, continuously, recorded every 15 minutes and totalized as a daily average, adjusted for temperature and pressure;

(2) the CH_4 content of the mine gas sent to each destruction device, continuously, recorded every 15 minutes and totalized as a daily average.

When temperature and pressure must be measured to correct flow values at standard conditions, the parameters must be measured at least hourly.

The operating status of the mine gas destruction device must be monitored and recorded at least hourly.

For every destruction device, the promoter must show, in the first project report, that a monitoring device has been installed to verify the operation of each destruction device. The promoter must also show, in each subsequent project report, that the monitoring device has operated correctly.

GHG emission reductions will not be taken into account for the issue of offset credits for periods during which the destruction device or the monitoring device for the operation of the destruction device is not operating.

(**6.3**) **Measurement instruments**

The promoter must ensure that all mine gas flow meters and CH_4 analyzers are

(1) cleaned and inspected as specified in the project's surveillance plan and at the minimum cleaning and inspection frequency specified by the manufacturer, with all cleaning and inspection activities documented by personnel;

(2) not more than 2 months before or after the issuance period end date, either

(a) checked for calibration accuracy by a qualified and independent person, using a portable instrument, such as a pitot tube, or in accordance with the manufacturer's specifications, and ensure that the percentage drift is recorded; or

(b) calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer; and

(3) calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer or every 5 years, whichever is more frequent.

A calibration certificate or a verification report on calibration accuracy must be produced and included in the project report. The verification provided for in section 70.16 of this Regulation must include confirmation that the person is qualified to verify calibration accuracy.

Flow meter calibrations must be documented to show that the meter was calibrated to a range of flow rates corresponding to the flow rates expected for the drainage system.

CH_4 analyzer calibrations must be documented to show that the calibration was carried out to a range of temperature and pressure conditions corresponding to the range of conditions measured for the drainage system.

The verification of flow meter and analyzer calibration accuracy must show that the instruments provide a reading of volumetric flow or CH_4 content that is within a +/-5% accuracy threshold.

When a verification of the calibration accuracy of a device shows a shift outside the +/-5% accuracy threshold, the device must be calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer. In addition, for the entire period from the last calibration that confirmed accuracy within the ± 5% threshold until such time as the piece of equipment is correctly calibrated, the promoter must use the more conservative of

(1) the measured values without correction;

(2) the adjusted values based on the greatest calibration drift recorded at the time of calibration.

The last calibration confirming accuracy within the ± 5% threshold must not have taken place more than 2 months before the end date for the issuance period.

No offset credit may be issued for a issuance period when the calibration or verification of the calibration accuracy of the required instruments has not been correctly carried out and documented.

(6.4) Data management

Information on data procedures and data monitoring must be managed in a way that guarantees the integrity, exhaustiveness, accuracy and validity of the data.

The promoter must keep the following documents and information:

(1) the information required under the surveillance plan;

(2) information on each flow meter, CH_4 analyzer and destruction device used, including type, their model number, serial number and manufacturer's maintenance and calibration procedures;

(3) the calibration date, time and results for CH_4 analyzers and flow meters, and the corrective measures applied if a piece of equipment fails to meet the requirements of this Regulation;

(4) the maintenance records for capture, destruction and monitoring systems;

(5) operating records showing annual coal production.

(6.5) Missing data – replacement methods

In situations where data on flow rates or CH_4 content are missing, the promoter must apply the data replacement methods set out in Part III.

Part II

Destruction efficiencies for destruction devices

The promoter must use the destruction efficiency shown in Table 1 for the project destruction device.

Table 1. Default destruction efficiencies for destruction devices

Destruction device	Efficiency
Open flare	0.96
Enclosed flare	0.995
Internal combustion engine	0.936
Boiler	0.98
Microturbine or large gas turbine	0.995
Upgrade and injection into a pipeline (surface mine)	0.96

Part III

Missing data – replacement methods

The replacement methods below may be used only

(1) for missing mine gas flow rate or CH_4 content parameters;

(2) for missing data that are discrete, non-chronic and due to unforeseen circumstances;

(3) when the proper functioning of the destruction device can be shown by thermocouple readings at the flare or at the other devices of the same nature;

(4) to replace data on mine gas flow rates when it is shown that CH_4 content was consistent with normal operations for the time when the data are missing; and

(5) to replace data on CH_4 content when it is shown that the mine gas flow rate was consistent with normal operations for the time when the data are missing.

No offset credit may be issued for periods when the replacement methods cannot be used.

Missing data period	Replacement method
Less than 6 hours	Use the average of the 4 hours immediately before and following the missing data period

6 to less than 24 hours	Use the 90% upper or lower confidence limit of the 24 hours prior to and after the missing data period, whichever results in greater conservativeness
1 to 7 days	Use the 95% upper or lower confidence limit of the 72 hours prior to and after the missing data period, whichever results in greater conservativeness
More than 7 days	No data may be replaced and no reduction may be credited

PROTOCOL 5

ACTIVE UNDERGROUND COAL MINES – DESTRUCTION OF CH_4 FROM VENTILATION AIR

Part I

(1) Projects covered

This offset credit protocol covers any project designed to reduce GHG emissions by capturing and destroying CH_4 from the ventilation system of an active underground coal mine.

The project must enable the capture and destruction of CH_4 that, before the project, was emitted to the atmosphere. The CH_4 must be captured within the mine boundaries based on the current mine map and must be destroyed on the site of the mine where it was captured using a destruction device.

For the purposes of this protocol,

(1) “ventilation air” means air from a mine ventilation system;

(2) “coal” means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite under ASTM D388, entitled Standard Classification of Coals by Rank;

(3) “ventilation air CH_4” means the CH_4 contained in ventilation air.

(2) First project report

In addition to the information required under the third paragraph of section 70.5 of this Regulation, the first project report must include the following information:

(1) the mining method employed, such as room and pillar or longwall;

(2) annual coal production;

(3) the year of initial mine operation;

(4) the scheduled year of mine closure, if known;

(5) a diagram of the mine site that includes

(a) the location of existing and planned ventilation shafts, specifying whether they are part of the project;

(b) the location of the equipment that will be used to treat or destroy ventilation air CH_4.

(3) Location

The project must be implemented in Canada.

(4) Reduction project SSRs

The reduction project process flowchart in Figure 4.1 and the table in Figure 4.2 show all the SSRs that must be taken into account by the promoter when calculating the GHG emission reductions attributable to the project.

All the SSRs within the dotted line must be counted for the purposes of this protocol.

Figure 4.1. Flowchart for the reduction project process

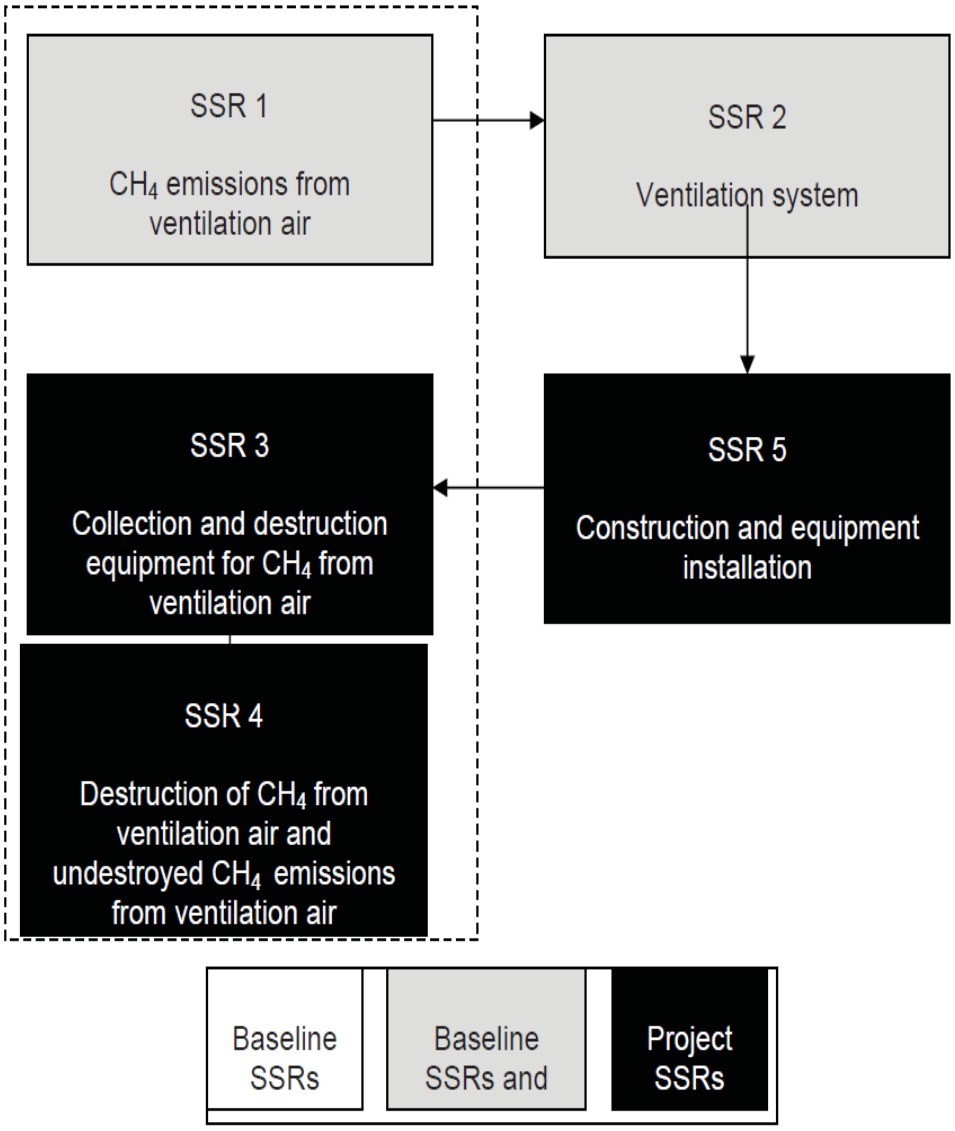

Figure 4.2. Reduction project SSRs

SSR #	Description	GHG	Relevant to Baseline (B) or Project (P)	Included/ Excluded
1	Emissions of ventilation air CH_4	CH_4	B, P	Included
2	Emissions attributable to energy consumed to operate mine ventilation system	CO_2	B, P	Excluded
		CH_4		Excluded
		N_2O		Excluded
3	Emissions attributable to energy consumed to operate equipment to capture and destroy ventilation air CH_4	CO_2	P	Included
		CH_4		Excluded
		N_2O		Excluded
4	Emissions from the destruction of ventilation air CH_4	CO_2	P	Included
		N_2O		Excluded
	Emissions of uncombusted ventilation air CH_4	CH_4	P	Included
5	Emissions from the construction and/or installation of new equipment	CO_2	P	Excluded
		CH_4		Excluded
		N_2O		Excluded

(5) Calculation method for the GHG emission reductions attributable to the project

The promoter must calculate the quantity of GHG emission reductions attributable to the project using equation 1:

Equation 1

$ER = BE - PE$

Where:

ER = GHG emission reductions attributable to the project during the issuance period, in metric tonnes CO_2 equivalent;

BE = Emissions under the baseline scenario during the issuance period, calculated using equation 2, in metric tonnes CO_2 equivalent;

PE = Project emissions during the issuance period, calculated using equation 3, in metric tonnes CO_2 equivalent.

(5.1) Calculation method for GHG emissions in the baseline scenario

The promoter must calculate GHG emissions in the baseline scenario using equation 2:

Equation 2

$$BE = \sum_{t=1}^{n} \left[VA_{Et} \times C_{CH4,t} \right] \times 0.667 \times 0.001 \times 21$$

Where:

BE = Baseline scenario emissions during the issuance period, in metric tonnes CO_2 equivalent;

n = Number of time intervals during the issuance period;

t = Time interval shown in the table in Figure 6.1 for which flow and content measurements of ventilation air CH_4 are aggregated;

VA_{Et} = Volume of ventilation air sent to destruction device during time interval *t*, in cubic metres at standard conditions;

$C_{CH4,t}$ = Average CH_4 content in ventilation air before entering destruction device during time interval *t*, in cubic metres of CH_4 per cubic metre of ventilation air;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001 = Conversion factor, kilograms to metric tonnes;

21 = Global Warming Potential factor of CH_4.

If a mass flow meter is used to monitor gas flow instead of a volumetric flow meter, the volume and density terms must be replaced by the monitored mass value in kilograms. The CH_4 content must be in mass percent.

(5.2) Calculation method for GHG project emissions

The promoter must calculate the GHG project emissions using equations 3 to 7:

Equation 3

$$PE = FF_{CO2} + DM_{CO2} + UM_{CH4}$$

Where:

PE = Project emissions during a issuance period, in metric tonnes CO_2 equivalent;

FF_{CO2} = Total CO_2 attributable to the consumption of fossil fuel to capture and destroy ventilation air CH_4 during a issuance period, calculated using equation 4, in metric tonnes CO_2 equivalent;

DM_{CO2} = Total CO_2 attributable to the destruction of CH_4 during a issuance period, calculated using equation 6, in metric tonnes CO_2 equivalent;

UM_{CH4} = CH_4 emissions attributable to uncombusted CH_4 during a issuance period, calculated using equation 7, in metric tonnes CO_2 equivalent;

Equation 4

$$FF_{CO2} = \frac{\sum_{j=1}^{n} \left(FF_{PR,j} \times EF_{FF,j} \right)}{1{,}000}$$

Where:

FF_{CO2} = Total CO_2 attributable to the consumption of fossil fuel to capture and destroy ventilation air CH_4 during a issuance period, in metric tonnes CO_2 equivalent;

n = Number of types of fossil fuel;

j = Type of fossil fuel;

$FF_{PR,j}$ = Annual quantity of fossil fuel *j* consumed, expressed

— in kilograms, in the case of fuels whose quantity is expressed as a mass;

— in cubic metres at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in litres, in the case of fuels whose quantity is expressed as a volume of liquid;

$EF_{FF,j}$ = CO_2 emission factor for fossil fuel *j* specified in tables 1-3 to 1-8 of QC.1.7 in Schedule A.2 to the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), expressed

— in kilograms of CO_2 per kilogram, in the case of fuels whose quantity is expressed as a mass;

— in kilograms of CO_2 per cubic metre at standard conditions, in the case of fuels whose quantity is expressed as a volume of gas;

— in kilograms of CO_2 per litre, in the case of fuels whose quantity is expressed as a volume of liquid;

1,000 = Conversion factor, metric tonnes to kilograms;

If the volume of ventilation air leaving the destruction device is not measured as specified in Figure 6.1, it must be calculated using equation 5:

Equation 5

$$VA_S = VA_E + CA$$

Where:

VA_S = Volume of ventilation air leaving the destruction device during the issuance period, in cubic metres at standard conditions;

VA_E = Volume of ventilation air sent to a destruction device during the issuance period, in cubic metres at standard conditions;

CA = Volume of cooling air added after the point of metering for the volume of ventilation air sent to the destruction device (VA_E), in cubic metres at standard conditions, or a value of 0 if no cooling air is added;

Equation 6

$$DM_{CO2} = [(VA_E \times C_{CH4}) - (VA_S \times C_{dest\text{-}CH4})] \times 1.556 \times 0.001$$

Where:

DM_{CO2} = Total CO_2 attributable to the destruction of CH_4 during a issuance period, in metric tonnes CO_2 equivalent;

VA_E = Volume of ventilation air sent to a destruction device during the issuance period, in cubic metres at standard conditions;

VA_S = Volume of ventilation air leaving the destruction device during the issuance period, in cubic metres at standard conditions;

C_{CH4} = Average CH_4 content in ventilation air before entering destruction device during the issuance period, in cubic metres of CH_4 per cubic metre of gas;

$C_{dest\text{-}CH4}$ = Average CH_4 content in ventilation air leaving the destruction device during the issuance period, in cubic metres of CH_4 per cubic metre of gas;

1.556 = CO_2 emission factor attributable to the combustion of CH_4, in kilograms of CO_2 per cubic metre of CH_4 combusted;

0.001 = Conversion factor, kilograms to metric tonnes;

Equation 7

$$UM_{CH4} = VA_S \times T_{dest\text{-}CH4} \times 0.667 \times 0.001 \times 21$$

Where:

UM_{CH4} = CH_4 emissions attributable to uncombusted CH_4 during a issuance period, in metric tonnes CO_2 equivalent;

VA_S = Volume of ventilation air leaving the destruction device during the issuance period, in cubic metres at standard conditions;

$T_{dest\text{-}CH4}$ = Average CH_4 content in ventilation air leaving the destruction device during the issuance period, in cubic metres of CH_4 per cubic metre of gas;

0.667 = Density of CH_4, in kilograms of CH_4 per cubic metre of CH_4 at standard conditions;

0.001 = Conversion factor, kilograms to metric tonnes;

21 = Global Warming Potential factor of CH_4.

If a mass flow meter is used to monitor gas flow instead of a volumetric flow meter, the volume and density terms must be replaced by the monitored mass value in kilograms. The CH_4 content must be in mass percent.

(6) Project surveillance

(6.1) Data collection

The promoter is responsible for collecting the information required for project monitoring.

The promoter must show that the data collected are actual and that rigorous supervision and record-keeping procedures are applied at the project site.

(6.2) Surveillance plan

The promoter must establish a surveillance plan to measure and monitor project parameters in accordance with Figure 6.1:

Figure 6.1. Project surveillance plan

Parameter	**Factor used in equations**	**Unit of measurement**	**Method**	**Frequency of measurement**
Operating status of destruction device	N/A	Degree Celsius or other, depending on the device installed	Measured for each destruction device	Hourly
Volume of ventilation air sent to destruction device	VA_E	Cubic metre at standard conditions	Measured and calculated	Continuous and recorded at least every 2 minutes to calculate an hourly average, adjusted for temperature and pressure
Volume of cooling air added	CA	Cubic metre at standard conditions	Measured and calculated	Continuous and recorded at least every 2 minutes to calculate an hourly average, adjusted for temperature and pressure
Volume of ventilation air leaving the destruction device	VA_S	Cubic metre at standard conditions	Measured or calculated	Continuous and recorded at least every 2 minutes to calculate an hourly average, adjusted for temperature and pressure

CH_4 content in ventilation air sent to destruction device during each issuance period	C_{CH4}	Cubic metre of CH_4 per cubic metre of gas at standard conditions	Measured	Continuous and recorded at least every 2 minutes to calculate an hourly average
CH_4 content in ventilation air leaving the destruction device during each issuance period	$C_{Dest-CH4}$	Cubic metre of CH_4 per cubic metre of gas at standard conditions	Measured	Continuous and recorded at least every 2 minutes to calculate an hourly average
Total quantity of fossil fuels consumed by equipment to capture and destroy ventilation air CH_4 during a issuance period, by type of fuel *j*	$FF_{PR, j}$	Kilogram (solid) Cubic metre at standard conditions (gas) Litre (liquid)	Calculated using fossil fuel purchasing register	At each issuance period
Temperature of ventilation air	T	°C	Measured	Hourly
Pressure of ventilation air	P	kPa	Measured	Hourly

The surveillance plan must

(1) specify the methods used to collect and record the data required for all the relevant parameters in the table in Figure 6.1;

(2) specify

(a) the frequency of data acquisition;

(b) the frequency of instrument cleaning, inspection and calibration activities, and of the verification of instrument calibration accuracy; and

(c) the role of the person responsible for each monitoring activity, as well as the quality assurance and quality control measures taken to ensure that data acquisition and instrument calibration are carried out consistently and with precision;

(3) contain a detailed diagram of the ventilation air capture and destruction system, including the placement of all measurement instruments and equipment that affect included SSRs.

The promoter is responsible for carrying out and monitoring project performance. The promoter must use the destruction device for ventilation air CH_4 and the measurement instruments in accordance with the manufacturer's specifications. The promoter must, in particular, use measurement instruments to measure directly

(1) the flow of ventilation air sent to each destruction device, continuously, recorded every 2 minutes and totalized as an hourly average adjusted for temperature and pressure;

(2) the CH_4 content of ventilation air sent to each destruction device, continuously, recorded every 2 minutes and totalized as an hourly average.

When temperature and pressure must be measured to correct flow values at standard conditions, the parameters must be measured at least hourly.

The operating status of destruction device of ventilation air must be monitored and recorded at least hourly.

For every destruction device, the promoter must show in the first project report that a monitoring device has been installed to verify the operation of each destruction device. The promoter must also show in each project report that the monitoring device has operated correctly.

GHG emission reductions will not be taken into account for the issue of offset credits for periods during which the destruction device or the monitoring device for the operation of the destruction device is not operating.

(**6.3**) **Measurement instruments**

The promoter must ensure that all ventilation gas flow meters and CH_4 analyzers are

(1) cleaned and inspected as specified in the project's surveillance plan and at the minimum cleaning and inspection frequency specified by the manufacturer, with all cleaning and inspection activities documented by personnel;

(2) not more than 2 months before or after the issuance period end date, either

(a) checked for calibration accuracy by a qualified and independent person, using a portable instrument, such as a pitot tube, or the manufacturer's specifications, and ensure that the percentage drift is recorded. The CH_4 analyzer must be checked using gas with a CH_4 content of less than 2%;

(b) calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer; and

(3) calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer, according to the manufacturer's specifications or every 5 years, whichever is more frequent.

A calibration certificate or a verification report on calibration accuracy must be produced and included in the project report. The verification provided for in section 70.16 of this Regulation must include confirmation that the person is qualified to verify calibration accuracy.

Flow meter calibrations must be documented to show that the meter was calibrated to a range of flow rates corresponding to the flow rates expected for the ventilation system.

CH_4 analyzer calibrations must be documented to show that the calibration was carried out to a range of temperature, pressure and content conditions corresponding to the range of conditions measured for the mine.

The verification of flow meter and analyzer calibration accuracy must show that the instrument provides a reading of volumetric flow or CH_4 content that is within a +/-5% accuracy threshold.

When a verification of the calibration accuracy of a device shows a shift outside the +/-5% accuracy threshold, the device must be calibrated by the manufacturer or by a third person certified for that purpose by the manufacturer. In addition, for the entire period from the last calibration that confirmed accuracy within the ± 5% threshold until such time as the piece of equipment is correctly calibrated, the promoter must use the more conservative of

(1) the measured values without correction;

(2) the adjusted values based on the greatest calibration drift recorded at the time of calibration.

The last calibration confirming accuracy within the ± 5% threshold must not have taken place more than 2 months before the end date for the issuance period.

No offset credit may be issued for a issuance period when the calibration or verification of the calibration accuracy of the required instruments has not been correctly carried out and documented.

(6.4) Data management

Information on data procedures and data monitoring must be managed in a way that guarantees the integrity, exhaustiveness, accuracy and validity of the data.

The promoter must keep the following documents and information:

(1) the information required under the surveillance plan;

(2) information on each flow meter, CH_4 analyzer and destruction device used, including type, their model number, serial number and manufacturer's maintenance and calibration procedures;

(3) the calibration date, time and results for CH_4 analyzers and flow meters, and the corrective measures applied if a piece of equipment fails to meet the requirements of this Regulation;

(4) the maintenance records for capture, destruction and monitoring systems;

(5) operating records showing annual coal production.

(6.5) Missing data – replacement methods

In situations where data on flow rates or CH_4 content are missing, the promoter must apply the data replacement methods set out in Part II.

Part II

Missing data – replacement methods

The replacement methods below may be used only

(1) for missing ventilation gas flow rate or CH_4 content parameters;

(2) for missing data that are discrete, non-chronic and due to unforeseen circumstances;

(3) when the proper functioning of the destruction device can be shown by thermocouple readings or other devices of the same nature;

(4) to replace data on ventilation gas flow rates when it is shown that CH_4 content was consistent with normal operations for the time when the data are missing; and

(5) to replace data on CH_4 content when it is shown that the ventilation gas flow rate was consistent with normal operations for the time when the data are missing.

No offset credit may be issued for periods when the replacement methods cannot be used.

Missing data period	**Replacement method**
Less than 6 hours	Use the average of the 4 hours immediately before and following the missing data period
6 to less than 24 hours	Use the 90% upper or lower confidence limit of the 24 hours prior to and after the missing data period, whichever results in greater conservativeness
1 to 7 days	Use the 95% upper or lower confidence limit of the 72 hours prior to and after the missing data period, whichever results in greater conservativeness
More than 7 days	No data may be replaced and no reduction may be credited

O.C. 1184-2012, s. 52; O.C. 1138-2013, s. 29; O.C. 902-2014, ss. 66, 67 and 68; O.C. 1089-2015, s. 31; O.C. 1125-2017, ss. 64 and 65.

TRANSITIONAL

2014

(O.C. 902-2014) **SECTION 69**. Every natural person who, on 22 October 2014, obtained, in accordance with section 10 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances (chapter Q-2, r. 46.1), an identifier to have access to the electronic system must send the Minister, not later than 21 November 2014, the declaration provided for in subparagraph *a*.1 of subparagraph 7 of that section, as inserted by subparagraph 2 of section 8 of this Regulation.

SECTION 70. The first paragraph of section 19 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, as amended by paragraphs 1 and 2 of section 14 of this Regulation, also applies to any emitter operating an establishment that permanently ceases the production of a reference

unit prior to 1 January 2014 and for which the emissions attributable to its other activities were below the emissions threshold for the 3 preceding years. The emitter is required to cover its emissions only until 31 December 2013.

SECTION 71. The provisions of Chapter IV of Title III and the protocols in Appendix D concerning the project plan and its validation, as they read on 21 October 2014, continue to apply to any offset credit project for which an application for registration was submitted not later than that date, up to the date on which the project ends.

2012

(O.C. 1184-2012) **SECTION 53**. Every person or municipality that, before 19 December 2012, registered with the Minister as an emitter or participant or was designated as an account representative, alternate account representative or electronic submission agent must, not later than 17 February 2013, send the Minister an update of the information and documents submitted with the registration or designation, in order to comply with the requirements in sections 7 to 13 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowance (chapter Q-2, r. 46.1), as amended by sections 7 to 10 of this Regulation.

Once the information and documents have been updated in accordance with the first paragraph, every person who, on 19 December 2012, was designated an alternate account representative is deemed to be an account representative, and every person who, prior to that date, was designated as an electronic submission agent is deemed to be an account viewing agent.

A person who fails to send the Minister the information and documents required under the first paragraph within the time indicated will be refused access to the electronic system.

UPDATES
O.C. 1297-2011, 2011 G.O. 2, 3655B
O.C. 1184-2012, 2012 G.O. 2, 3485
O.C. 1137-2013, 2013 G.O. 2, 3200
O.C. 1138-2013, 2013 G.O. 2, 3200
O.C. 1181-2013, 2013 G.O. 2, 3389
O.C. 902-2014, 2014 G.O. 2, 2387
O.C. 1089-2015, 2015 G.O. 2, 3280
S.Q. 2016, c. 7, s. 183
S.Q. 2017, c. 4, ss. 265 and 266
O.C. 488-2017, 2017 G.O. 2, 1429
O.C. 1125-2017, 2017 G.O. 2, 3463