Specified Gas Reporting Standard

Specified Gas Reporting Regulation

APRIL 2020 | VERSION 12.1

Alberta

Alberta Environment and Parks, Government of Alberta

April 2020

Specified Gas Reporting Standard, Specified Gas Reporting Regulation

Summary of Revisions

Version	Date	Summary of Revisions
12.1	April 2020	• Extend reporting deadline for 2019 reporting year to July 31, 2020. This is a temporary extension for the 2019 reporting year only due to the State of Public Health Emergency in Alberta.
12.0	March 2020	• Updates to requirements for facility boundary (geospatial) files; • Updates to quantification methodology requirements as prescribed under the Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation; and • Requirement to report Alberta specific quantification methodologies, where applicable, in SWIM. • Updates to the definition of negligible emissions.
11.0	March 2019	• Quantification methodology requirements were updated to include tier 1 methods in Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation. • Reporting requirements have been added for production information, marked and unmarked fuels used for on site transportation, acid gas in CO_2 sent off site and received on site, and facility boundary information. • References and definitions were updated to align with Environment and Climate Change Canada (ECCC) and Carbon Competitiveness Incentive Regulation (CCIR).

10.0	May 2018	• A definition for threshold emissions has been added in order to distinguish it from the broader definition of direct emissions. • The definitions of leakage and waste emissions were updated to align with ECCC exclusion of biological emissions from Agricultural operations. • The definition of industrial product use emissions was updated to align with ECCC definition, which excludes certain PFC & HFC emissions, including those associated with refrigeration and air conditioning.
9.0	March 2018	• The reporting threshold is dropped from 50,000 to 10,000 tonnes CO_2e per annum for all facilities to align with ECCC Greenhouse Gas Emissions Reporting Program. • Biomass CO_2 emissions, and CO_2 sent off site have been removed from direct emissions. • More detailed emissions data and supporting information are collected for Cement manufacturing, Lime manufacturing, Iron and Steel manufacturing and Aluminium manufacturing to align with ECCC's Greenhouse Gas Reporting Program. • Mandatory reporting requirements for Carbon Capture Transportation and Geological Storage (CCTS) to align with ECCC's Greenhouse Gas Reporting Program. • Updated references to ECCC's GHG Emissions Reporting Program proposed expansion. • ECCC's GHG quantification requirements must be followed as referred to in this standard and Alberta's GHG Standard Quantification Methodology should be used as a guideline for 2017 emissions reporting and will be required for 2018 emissions reporting.

		• The requirement for net specified gases less offsets or emission reduction equivalencies, and specified gas intensity has been removed. The section previously titled Additional Specified Gas Reporting Information has been deleted, and unique requirements have been transferred to the section Mandatory Specified Gas Emissions Information.
8.0	March 2014	• The global warming potentials (Section 2(2)) have been updated to those established in 2007 by the Intergovernmental Panel on Climate Change. This maintains alignment with Environment Canada's reporting program and National Inventory Report. • Requiring the specified gas reporter to be the person responsible for the facility, as defined in the Specified Gas Reporting Regulation (Section 3(2)). • Additional data on greenhouse gas intensive inputs and outputs is now being collected (Sections 5(1) and 6(1)): • the net electricity imported or exported for the facility; • the amount of net heat imported or exported for the facility; and, • the amount of net H_2 imported or exported (excluding trace H_2 in fuels). • Cogeneration data is now being collected (Section 6(1) and Appendix A). • For quantification of area fugitive emissions from mine faces and tailings ponds, oil sands facilities must use the Guidance for the Quantification of Area Fugitive Emissions at Oil Sands Mines (Section 7(1)).
7.0	March 2013	*Specified Gas Reporting Standard*

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1 Definitions

1(1) In this Standard,

(a) "the Act" means the *Emissions Management and Climate Resilience Act*;

(b) “biomass” means plant materials, animal waste or any product made of either of these and includes without limitation wood and wood products, charcoal, agricultural residues and wastes including organic material above and below ground, both living and dead, such as trees, crops, grasses, tree litter, roots, municipal and industrial wastes where the organic material is biological in origin, landfill gas, bio-alcohols, black liquor, sludge gas, and animal-or plant-derived oils;

(c) “biomass CO_2 emissions” means all emissions of carbon dioxide released from sources located at a facility as a result of the decomposition or combustion of biomass;

(d) “CO_2 capture” means the capture of carbon dioxide at a facility that would otherwise be released to atmosphere;

(e) “CO_2 geologically-injected on site” means carbon dioxide that has been injected into a geological formation from an injection point within the facility including without limitation carbon dioxide injected for enhanced oil or gas recovery, acid gas disposal, or CO_2 storage;

(f) “CO_2 received on site” means carbon dioxide that has been received at a facility from an off-site location;

(g) “CO_2 sent off site” means carbon dioxide that has not been released to the atmosphere and has been sent from a facility to an off-site location, including CO_2 sent off site as waste, or sold as a product, but does not include trace carbon dioxide in products;

(h) “CO_2 storage” means a long-term geological formation where carbon dioxide is stored;

(i) “CO_2 transport system” means transport of captured carbon dioxide by any mode;

(j) “CO_2e” means the 100-year time horizon global warming potential of a specified gas expressed in terms of equivalency to carbon dioxide as published by the Intergovernmental Panel on Climate Change;

(k) “cogeneration emissions” means direct emissions from cogeneration at a facility;

(l) “direct emissions” means all specified gases released from sources located at a facility, not including biomass CO_2 emissions, expressed in tonnes on a CO_2e basis;

(m) “emission factor” means the representative value that relates the rate or quantity of a specified gas released to the atmosphere with an activity associated with the release of that specified gas;

(n) “emission factor estimation” means a type of emissions estimation method that uses an emission factor that is average, general, or technology specific;

(o) “engineering estimate” means a type of emissions estimation method involving engineering principles and judgment that uses knowledge of the chemical and physical processes involved at the emissions source, the design features of the emissions source, and an understanding of the applicable physical and chemical laws;

(p) “first year of commercial operation” in respect of a facility means the year in which the facility first produces a product;

(q) “flaring emissions” means direct emissions from the controlled combustion of a gas or liquid stream produced on site, used for routine or emergency disposal of a hazardous stream, where the main purpose is not energy production, including emissions from waste petroleum incineration, hazardous emissions prevention systems (whether in pilot or active mode), well testing, natural gas gathering systems, processing plant operations, crude oil production, pipeline operations, petroleum refining, chemical fertilizer production, steel production and flare purge gas, but not including emissions from combustion of landfill gas;;

(r) “formation CO_2” means carbon dioxide from an underground reservoir that is recovered or is recoverable, including vented carbon dioxide emissions from natural gas processing;

(s) “fugitive (leakage) emissions” means direct emissions from accidental releases and leaks from any of the following:

 (i) fossil fuel production and processing, transmission and distribution;

 (ii) iron and steel manufacturing;

 (iii) CO_2 capture;

 (iv) CO_2 geologically-injected on site;

 (v) CO_2 transport system;

(vi) CO_2 storage; or

(vii) mine faces; or

(viii) tailings ponds

but does not include agricultural emissions from enteric fermentation, manure management, agricultural soils, crop residue burning, or application of fertilizers (e.g. liming, urea application and other carbon-containing fertilizers);

(t) “global warming potential” means the relative measure of the warming effect that the emission of a specified gas has on the Earth’s atmosphere calculated as the ratio of the 100-year time-integrated radiative forcing that would result from the emission of one kilogram of a given specified gas relative to that from the emission of one kilogram of carbon dioxide;

(u) “industrial process emissions” means direct emissions from

(i) an industrial process involving chemical or physical reactions other than combustion, where the primary purpose of the industrial process is not energy production,

(ii) the unavoidable combustion of carbon black in the production of carbon black, and

(iii) the unavoidable combustion of ethylene in the production of ethylene oxide;

(v) “industrial product use emissions” means direct emissions from the use of a product that does not react in a facility’s production processes, including direct emissions of:

(i) Sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs) or perfluorocarbons (PFCs) from the use of SF_6, HFCs or PFCs as cover gases, and

(ii) HFCs or PFCs from the use of HFCs or PFCs in foam blowing,

but not including direct emissions of

(iii) PFCs or HFCs from the use of PFCs or HFCs in refrigeration, air conditioning, semiconductor manufacturing, fire extinguishing, solvents, aerosols or

(iv) SF_6 from the use of SF_6 in explosion protection, leak detection, electronic applications and fire extinguishing;

(w) “marked fuel” means marked fuel as defined in the *Fuel Tax Act*;

(x) “mass balance” means a type of emissions estimation method that involves the application of the law of conservation of mass to a facility, process or piece of equipment;

(y) “monitoring or direct measurement” means a type of emissions estimation method using meters, fuel sampling, or source testing;

(z) “negligible emission sources” are emission sources at a facility that result in total direct emissions

(i) less than 1% of the facility’s threshold emissions not to exceed 1,000 tonnes of CO_2e emissions for a facility with threshold emissions less than 1 million tonnes of CO_2e or not to exceed 10,000 tonnes of CO_2e emissions for a facility with threshold emissions equal to or greater than 1 million tonnes CO_2e emissions;

(ii) for a renewable electricity facility, less than 1% of 0.37 tonnes of CO_2e per megawatt hour multiplied by that facility’s annual electricity exports in megawatt hours not to exceed 1,000 tonnes of CO_2e emissions;

(aa) “on-site transportation emissions” means direct emissions resulting from fuel combustion in machinery and mobile equipment used for on-site transportation of products and materials integral to the production process of a facility and any other form of transportation taking place within the facility boundary;

(bb) “product” means product as defined in the Carbon Competitiveness Incentive Regulation;

(cc) “Regulation” means the Specified Gas Reporting Regulation;

(dd) “specified gas” means specified gas as defined in the Carbon Competitiveness Incentive Regulation;

(ee) "the Standard" means the Specified Gas Reporting Standard.

(ff) “stationary fuel combustion emissions” means direct emissions from devices that combust solid, liquid, or gaseous fuel, generally for the purposes of providing useful heat or energy for industrial, commercial, or institutional use;

(gg) “SWIM system” means the federal Single Window Information Management system, which is a one-window secure online electronic data reporting system accessible at: https://ec.ss.ec.gc.ca/;

(hh) "threshold emissions" means the threshold emissions of a facility determined in accordance with section 2(2);

(ii) "threshold emissions source category" means a threshold emissions source category in column 1 of Table 2;

(jj) "venting emissions" means direct emissions from the controlled release of

- (i) carbon dioxide associated with carbon capture, transport, injection and storage, or
- (ii) a process gas or waste gas, including releases:
  - (A) from hydrogen production associated with fossil fuel production and processing;
  - (B) of casing gas;
  - (C) of gases associated with a liquid or a solution gas;
  - (D) of treater, stabilizer or dehydrator off-gas;
  - (E) of blanket gases;
  - (F) from pneumatic devices which use natural gas as a driver;
  - (G) from compressor start-ups, pipelines and other blowdowns; and,
  - (H) from metering and regulation station control loops.

(kk) "waste emissions" means direct emissions from waste disposal sources, including but not limited to on-site waste disposal, fermentation, decomposition, landfilling of solid waste, flaring of landfill gas and waste incineration, but not including burning of agricultural crop residues;

(ll) "wastewater emissions" means direct emissions from wastewater and wastewater treatment at a facility; and

(mm) "year" means a calendar year unless otherwise specified.

(2) Terms that are defined in the Act and Regulation are incorporated and become part of this Standard.

(3) Where this Standard uses a term defined in the SWIM system that has a meaning that is different, the term is deemed to have the meaning set out in this Standard.

1.1 In the event of a conflict

If there is any conflict between this Standard and the Act or the Regulation, the Act or the Regulation prevails over this standard.

1.2 Specified Gas Reporter

For the purposes of this Standard, the specified gas reporter for a facility for a year is the person responsible for the facility on December 31 of that year.

2 Specified Gas Reporting Threshold

2(1) The level prescribed for the purposes of section 3(1) of the Regulation is 10,000 tonnes of threshold emissions released from the facility.

(2) For the purposes of subsection (1), the specified gas reporter for a facility shall determine the threshold emissions of the facility for a year in accordance with the following formula:

$$\mathrm{TE} = \sum_{i=1}^{n} [(E_{CO_2\,i} \times GWP_{CO_2}) + (E_{CH_4\,i} \times GWP_{CH_4}) + (E_{N_2O\,i} \times GWP_{N_2O}) + (E_{SF_6\,i} \times GWP_{SF_6})$$
$$+ \sum_{v=1}^{m} (E_{PFC\,i,v} \times GWP_{PFCv}) + \sum_{q=1}^{p} (E_{HFC\,i,q} \times GWP_{HFCq})]$$

where:

TE	is the threshold emissions of the facility for the year in tonnes of CO_2e;
i	is a threshold emissions source category listed in Table 2 that exists at the facility;
n	is the number of threshold emissions source categories listed in Table 2 that are at the facility;
$E_{CO2\,i}$	is the emissions of carbon dioxide (CO_2e) for the facility for the year for threshold emissions source category i in tonnes of CO_2;
GWP_{CO2}	is the global warming potential of CO_2 as specified in Table 1;
$E_{CH4\,i}$	is the emissions of methane (CH_4) for the facility for the year, for threshold emissions source category i in tonnes of CH_4;

GWP_{CH4}	is the global warming potential of CH_4 as specified in Table 1;
$E_{N2O\ i}$	is the emissions of N_2O for the facility for the year, for threshold emissions source category i in tonnes of N_2O;
GWP_{N2O}	is the global warming potential of N_2O as specified in Table 1;
$E_{SF6\ i}$	is the emissions of SF_6 for the facility for the year, for threshold emissions source category i in tonnes of SF_6;
GWP_{SF6}	is the global warming potential of SF_6 as specified in Table 1;
v	is each perfluorocarbon (PFC) species listed in Table 1 that is at the facility;
m	is the number of PFC species listed in Table 1 that are released from sources located at the facility;
$E_{PFC\ i,v}$	is the emissions of each PFC species v for the facility for the year, for threshold emissions source category i in tonnes of each PFC species v;
$GWP_{PFC\ v}$	is the global warming potential of each PFC species v specified in Table 1;
q	is each hydrofluorocarbon (HFC) species listed in Table 1 that is at the facility;
p	is the number of HFC species listed in Table 1 that are released from sources located at the facility;
$E_{HFC\ i,q}$	is the emissions of each HFC species q for the facility for the year, for threshold emissions source category i in tonnes of each HFC species q;
$GWP_{HFC\ q}$	is the global warming potential of each HFC species q specified in Table 1.

Table 1: Global warming potentials for specified gases

Specified Gas	Chemical Formula	Global Warming Potentials
Carbon dioxide	CO_2	1
Methane	CH_4	25
Nitrous oxide	N_2O	298
Sulphur hexafluoride	SF_6	22800
HFC-23	CHF_3	14800
HFC-32	CH_2F_2	675
HFC-41	CH_3F	92
HFC-43-10mee	$C_5H_2F_{10}$	1640
HFC-125	C_2HF_5	3500
HFC-134	$C_2H_2F_4$	1100
HFC-134a	CH_2FCF_3	1430
HFC-143	$C_2H_3F_3$	353
HFC-143a	$C_2H_3F_3$	4470
HFC-152	CH_2FCH_2F	53
HFC-152a	$C_2H_4F_2$	124
HFC-161	CH_3CH_2F	12
HFC-227ea	C_3HF_7	3220
HFC-236cb	$CH_2FCF_2CF_3$	1340
HFC-236ea	CHF_2CHFCF_3	1370
HFC-236fa	$C_3H_2F_6$	9810
HFC-245ca	$C_3H_3F_5$	693
HFC-245fa	$CHF_2CH_2CF_3$	1030
HFC-365mfc	$CH_3CF_2CH_2CF_3$	794
Perfluoromethane	CF_4	7390
Perfluoroethane	C_2F_6	12200
Perfluorocyclopropane	c-C_3F_6	17340
Perfluoropropane	C_3F_8	8830

Perfluorobutane	C_4F_{10}	8860
Perfluorocyclobutane	$c\text{-}C_4F_8$	10300
Perfluoropentane	C_5F_{12}	9160
Perfluorohexane	C_6F_{14}	9300
Perfluorodecalin	$C_{10}F_{18}$	7500
Nitrogen Trifluoride	NF_3	17200

Table 2: Threshold emissions source categories and typical specified gas types

Column 1: Threshold Emissions Source Category	Column 2: Specified Gas Type
Stationary Fuel Combustion Emissions	CO_2, CH_4, N_2O
Industrial Process Emissions	CO_2, CH_4, N_2O, SF_6, HFC & PFC by species
Venting Emissions	CO_2, CH_4, N_2O
Flaring Emissions	CO_2, CH_4, N_2O
Fugitive (Leakage) Emissions	CO_2, CH_4, N_2O
On-Site Transportation Emissions from Marked Fuels and Unmarked Fuels	CO_2, CH_4, N_2O
Waste Emissions	CO_2, CH_4, N_2O
Wastewater Emissions	CO_2, CH_4, N_2O
Industrial Product Use Emissions	SF_6, HFC & PFC by species
Formation CO_2	CO_2

3 Specified Gas Report Submission

3(1) The specified gas reporter for a facility shall submit a specified gas report in respect of the releases of specified gases at the facility:

(a) for the year 2019, on or before July 31, 2020; and
(b) for the year 2020 or a subsequent year, on or before June 1 of the following year.

(2) The specified gas reporter for a facility shall submit the specified gas report for the facility to the Director electronically through the SWIM system.

4 Specified Gas Reporter and Facility Information

4(1) The specified gas reporter for a facility shall include all of the following information in the specified gas report for the facility:

(a) the specified gas reporter's company legal name, company business number, telephone number and address;

(b) the six-digit North American Industry Classification System (NAICS) code for the facility;

(c) the most specific available North American Product Classification System (NAPCS) codes for the facility's products;

(d) the National Pollutant Release Inventory (NPRI) identification number for the facility, if applicable;

(e) the facility name;

(f) the location of the facility;

(g) the facility boundaries provided in a geospatial file having a file format of.kmz or .kml.. Additional guidance on creating geospatial files is provided at this link: https://www.alberta.ca/assets/documents/sgrr-steps-to-creating-a%20-facility-boundary-map.pdf;

(h) if the facility is owned by a subsidiary of a parent company:

  (i) the name of all parent companies of the subsidiary;

  (ii) the address of all parent companies of the subsidiary;

  (iii) the city of all parent companies of the subsidiary; and

  (iv) the percentage ownership of the subsidiary by each parent company.

(i) the name, position, address and telephone number of the specified gas reporter, certifying official, and, if applicable, public contact for the facility's specified gas report submission;

(j) the number of all approvals and registrations issued under the *Environmental Protection and Enhancement Act* with respect to the facility, if applicable; and

(k) the first year of commercial operation of the facility.

5 Mandatory Specified Gas Emissions Information

5(1) The specified gas reporter for a facility shall include all of the following information in the specified gas report for the facility for a year:

(a) the amount of emissions, expressed in tonnes, of each of the specified gases listed in Column 2 of Table 3 released from sources located at the facility for each reported emissions category applicable to the facility listed in Column 1 of Table 3;

(b) the amount of direct emissions of each of the specified gases listed in Column 2 of Table 3 for each reported emissions category applicable to the facility listed in Column 1 of Table 3;

(c) the total electricity generated at the facility (net of station loads), expressed in megawatt-hour (MWh);

(d) the total electricity consumed at the facility, expressed in MWh;

(e) the total electricity imported to the facility, expressed in MWh;

(f) the total electricity exported from the facility, expressed in MWh;

(g) the total hydrogen imported to the facility (excluding trace hydrogen in fuels), expressed in tonnes;

(h) the total hydrogen exported at the facility (excluding trace hydrogen in fuels), expressed in tonnes;

(i) the total heat imported to the facility, expressed in gigajoules (GJ);

(j) the total heat exported from the facility, expressed in GJ;

(k) the total cogeneration emissions from the facility, expressed in tonnes on a CO_2e basis;

(l) the total heat production from cogeneration, expressed in GJ:

(m) the deemed specified gas emissions from heat production in tonnes of CO_2e from the cogeneration facility (detailed calculations for cogeneration information can be found in Appendix A);

(n) the total production amounts and units for any products produced at the facility that are listed in Appendix B Table 4, expressed in the units specified in the most up to date version of the *Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation*. https://open.alberta.ca/publications/9781460140406

(o) the reporting data required by ECCC's *Notice with respect to reporting of greenhouse gases (GHGs) for* http://gazette.gc.ca/rp-pr/p1/2020/2020-02-01/html/sup1-eng.html#S91;

(p) identification of which of the following methodology types was used in calculating or determining (a) and (b):

(i) monitoring or direct measurement;

(ii) mass balance;

(iii) emission factor estimation; or

(iv) engineering estimate; and

(q) Where applicable on the SWIM system, indicate the Alberta-specific quantification methodologies that are applicable for the emissions being reported

Table 3: Reported emissions categories and specified gas types

Column 1: Reported Emissions Categories	Column 2: Specified Gas Type
Stationary Fuel Combustion Emissions	CO_2, CH_4, N_2O
Industrial Process Emissions	CO_2, CH_4, N_2O, SF_6, HFC & PFC by species
Venting Emissions	CO_2, CH_4, N_2O
Flaring Emissions	CO_2, CH_4, N_2O
Fugitive (Leakage) Emissions	CO_2, CH_4, N_2O
On-Site Transportation Emissions from Marked Fuels and Unmarked Fuels	CO_2, CH_4, N_2O
Waste Emissions	CO_2, CH_4, N_2O
Wastewater Emissions	CO_2, CH_4, N_2O
Biomass CO_2 Emissions	CO_2
CO_2 Sent Off Site as Acid Gas	CO_2
CO_2 Sent Off Site not as Acid Gas	CO_2
CO_2 Geologically-Injected On Site	CO_2
CO_2 Received On Site as Acid Gas	CO_2
CO_2 Received On Site not as Acid Gas	CO_2
Formation CO_2 Emissions	CO_2
Industrial Product Use Emissions	SF_6, HFC & PFC by species

6 Quantification Methodologies

6(1) For the purposes of sections 2 and 5, the specified gas reporter shall use quantification methodologies, emission factors, equations and calculations that are:

(a) consistent with, at minimum, tier 1 quantification methodologies prescribed in Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation. In cases where only one method is provided for an emission type, that method is applicable to all tiers. Alternative methods may be used to quantify negligible emission sources;

(b) consistent with Canada's Greenhouse Gas Quantification Requirements (Greenhouse Gas Reporting Program, December 2019) provided at this link: http://publications.gc.ca/collections/collection_2020/eccc/En81-28-2019-eng.pdf;

(c) Where quantification methodologies are not prescribed in the Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation or Canada's Greenhouse Gas Quantification Requirements, the specified gas reporter shall use quantification methodologies, emission factors, equations and calculations that are consistent with the guidelines approved for use by the United Nations Framework Convention on Climate Change (UNFCCC) for the Preparation of National Greenhouse Gas Emission Inventories by Annex 1 Parties (Decision 18/CP.8), and the annex to that decision contained in FCCC/CP/2002/8,

(2) For the purposes of sections 2 and 5, the specified gas reporter for an oil sands mine facility must use the Guidance for the Quantification of Area Fugitive Emissions at Oil Sands Mines. Version 2.1,September 2019 (found at https://open.alberta.ca/publications/9781460145814) to quantify area fugitive (leakage) emissions from mine faces and tailings ponds.

(3) Where a facility is unable to meet a mandatory quantification requirement, the facility should submit a record of deviation from the mandatory emissions estimation methodologies with their specified gas report. A blank record of deviation can be found at this link: https://www.alberta.ca/specified-gas-reporting-regulation.aspx

Any comments or questions regarding the content of this document may be directed to:

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Appendix A Cogeneration Calculations

(a) Total cogeneration emissions at a facility are calculated like other stationary fuel combustion sources. Fuel used for cogeneration needs to be clearly separated from other fuel use at the facility. Note that biomass CO_2 emissions are not included in the cogeneration emissions calculations.

(b) Total cogeneration electricity generation is the net electricity that crosses the cogeneration boundary (exported to the host facility and/or the electricity grid) and is net of station loads (i.e. loads integral to the function of the cogeneration unit).

(c) Deemed heat emissions from heat production are calculated according to the following methodology:

i. The total heat production from cogeneration is calculated based on the difference between the total energy content of the heat product streams leaving the cogeneration boundary and the total energy content of the thermal streams entering the cogeneration boundary (these values would be aggregated over the reporting period to calculate a total net heat):

$$H = \sum_{i=1}^{n} \{h(out)_i \times M(out)_i\} - \sum_{i=1}^{m} \{h(in)_i \times M(in)_i\}$$

where:

H	=	Heat produced by the cogeneration facility	[kJ]
$h(out)_i$	=	Enthalpy of i stream of heat product exported to the host facility	[kJ/kg]
$h(in)_i$	=	Enthalpy of i thermal stream (i.e. condensate) returned to the cogeneration unit	[kJ/kg]
$M(out)_i$	=	Mass flow of i stream of heat product	[kg]
$M(in)_i$	=	Mass flow of i thermal stream (i.e. condensate) returned to the cogeneration unit	[kg]

n	=	Total number of streams of heat product exported
m	=	Total number of input thermal streams (i.e. condensate) returned to the cogeneration unit

ii. Deemed heat emissions from heat production are determined from the input energy attributed to heat production based on a boiler thermal efficiency of 80 per cent on a higher heating value basis. This input energy is the energy derived from fuel combustion that is attributable to useable heat production:

$$E_H = \frac{H}{0.8}$$

where:

E_H	=	Deemed input energy attributed to heat production	[GJ]
H	=	Total heat produced within the cogeneration boundary during the year	[GJ]

iii. To calculate the fuel required to generate the deemed input energy:

$$M_H = \frac{E_H}{V}$$

where:

E_H	=	Deemed input energy attributed to heat production	[GJ]
M_H	=	Mass/volume of fuel deemed to be used to produce heat	[units of fuel used]
V	=	Fuel Higher Heating Value	[GJ/units of fuel used]

Where multiple fuel sources are used, each source should be apportioned a fraction of the deemed input heat equal to the fraction of total fuel heat provided by the fuel source on a higher heating value basis.

iv. The deemed heat emissions allocated to heat production are calculated according to:

$$D_H = F \times M_H$$

where:

D_H	=	Deemed heat emissions from heat production	[tonnes CO_2e]
F	=	Emission factor for the fuel used in the stand-alone boiler facility	[tonnes CO_2e/units of fuel used]
M_H	=	Mass/volume of fuel deemed to be used to produce heat	[units of fuel used]

Appendix B Production data required to be reported

Table 4: Sectors and products that compete directly with facilities regulated by CCIR

Sector	Product	North American Product Classification System
Agroindustry	Crude Canola Oil	182133
Agroindustry	Refined Canola Oil	182133
Agroindustry	Biodiesel Fuel	2612221
Agroindustry	Distilled Liquor	21113
Agroindustry/Chemical	Ethanol (Denatured)	2711314
Chemical	Carbon Black	2711251
Chemical	Ethanol Fuel	261213
Chemical	Ethylene	2632111
Chemical	Ethylene Glycol	2711315
Chemical	Hydrogen Peroxide	2711284
Chemical	Iso-octane	2632131
Chemical	Linear Alpha Olefins	2632131
Chemical	Pentane	2632131
Chemical	Styrene Monomer	2632121
Chemical	Calcined Coke	2611112
Chemical	Hydrogen	2711115
Chemical	Methanol	2711315
Chemical	Polyethylene	2811121
Coal Mines	Bituminous Coal	144112
Coal Mines	Sub-bituminous Coal	144121
Fertilizer	Ammonia	2721122
Fertilizer	Ammonium Nitrates	2721122
Fertilizer	Ammonium Phosphate	2721131

Fertilizer	Ammonium Sulphate	2721122
Fertilizer	Urea	2721111
Fertilizer	Urea Ammonium Nitrate	2721141
Food Processing	Live Weight of Cattle	1111111
Forest Products	Pulp	25112
Metals	Cobalt	1552321
Metals	Nickel	1531111
Mineral	Cement	465111
Mineral	Lime	4651311
Mineral	Magnesium Oxide	2911441
Natural Gas Processing	Natural Gas[1]	142
Natural Gas Processing	Natural Gas Liquids[1]	143
Oil Sands	Bitumen	141121
Power Plant	Electricity	146111
Refining	Refined Petroleum Products	261
Upgrading	Synthetic crude oil	14113

Notes:

Table 4 was taken from the Standard for Establishing and Assigning Benchmarks v2.2.

Table 4 may be updated from time to time as more facilities become subject to the CCIR and new products become covered under the Regulation.

[1] Conventional oil and gas facilities exempt from the carbon levy under section 15(1)(d) of the Climate Leadership Act will not be permitted to opt-in. See section 2.2.3 for further details.

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X

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