

# **GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit**

OCTOBER 2021

# GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit

Ministry of the Environment, Conservation and Parks

**Methodology Version October 2021.** This Methodology is only available in English.

Cette publication hautement spécialisée *GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit* n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la *Loi sur les services en français*. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère de l'Environnement, de la Protection de la nature et des Parcs par courriel à [EPShelp@ontario.ca](mailto:EPShelp@ontario.ca).

## Table of Contents

1	Introduction .....	4
2	Definitions .....	4
3	Total Annual Emissions Limit .....	5
3.1	Annual Activity Emissions Limits .....	5
3.1.1	Method A: Sector Performance Standard .....	6
3.1.2	Method B: Electricity Generation Sector Performance Standard .....	10
3.1.3	Method C: Thermal Energy Sector Performance Standard .....	12
3.1.4	Method D: Cogeneration Sector Performance Standard .....	14
3.1.5	Method E: Facility Specific Performance Standard.....	16
3.1.6	Method F: Historical Facility Emissions Limit Standard .....	23
3.1.7	Method G: Energy Use Standard.....	24
3.1.8	Method H: Mobile Equipment Operation Standard .....	27
4	Calculation of Stringency Factor (SF) .....	29
4.1	Fixed Process Emissions Stringency Factor .....	29
4.2	Non-Fixed Process Emissions Stringency Factor .....	29
4.3	Ratio of Electrical Output to Total Energy Input for Cogeneration Systems ....	30
5	Partial Year Adjustment to Annual Activity Emission Limits .....	31
5.1	Partial Year Adjustment Criteria .....	31
5.2	Partial Year Adjustment Method .....	31
	Appendix A.....	32

## 1 Introduction

This Methodology is incorporated by reference into O. Reg 241/19 Greenhouse Gas Emissions Performance Standards (the Regulation). The Methodology must be read in conjunction with the requirements set out in Part III of the Regulation (Compliance).

Part III of the Regulation requires the calculation of the Total Annual Emissions Limit (TAEL) in respect of each covered facility owned or operated by the owner or operator. The calculation must be done in accordance with this Methodology. Section 3 of this Methodology sets out the calculations that must be used by the owner or operator in the calculation of the TAEL of a covered facility.

Where the Methods in this document set out the GHG ID or GHGRP ID number of a facility, see Table A.1 in Appendix A for details on how to determine GHG ID, GHGRP ID, Company Name, Facility Name, Facility Address, Facility City or Town, and Facility Postal Code.

## 2 Definitions

For the purposes of this Methodology:

“**Covered facility**” has the same meaning as in the Regulation.

“**Facility**” means a covered facility.

“**Facility with no access to natural gas**” means a covered facility that is located in a geographic area, whether in a municipality or an unorganized territory, that is not covered by a certificate of public convenience and necessity under the *Municipal Franchises Act* for the supply of natural gas.

“**GHG ID**” means the number assigned to a covered facility, or a site that forms part of the facility, by the Ministry for the purposes of reporting greenhouse gas emissions.

“**GHGRP ID**” means the number assigned to a covered facility, or a site that forms part of the facility, by Environment and Climate Change Canada for the purposes of reporting greenhouse gas emissions to the federal government.

“**Guideline**” has the same meaning as in the Reporting Regulation.

“**Methodology**” has the same meaning as in the Regulation.

“**Ministry**” means the Ministry of Environment, Conservation and Parks.

“**Regulation**” means Ontario Regulation 241/19 (Greenhouse Gas Emissions Performance Standards), made under the *Environmental Protection Act*.

“**Reporting Regulation**” means Ontario Regulation 390/18 (Greenhouse Gas Emissions: Quantification, Reporting and Verification) made under the *Environmental Protection Act*.

Where a term is not defined in this **Methodology**, the definition in the **Regulation**, **Reporting Regulation** or **Guideline** applies.

### 3 Total Annual Emissions Limit

The owner or operator shall calculate the TAEI for a covered facility using Formula 3-1. For any Annual Activity Emissions Limit (AAEL) that is calculated using a Method that the owner or operator is not permitted to use or where the Method is permitted to be used and the owner or operator has not used the method, the value shall be 0.

If the number that results from the application of Formula 3-1 is not a whole number, the TAEI shall be the number that results from the application of Formula 3-1 rounded down to the nearest whole number.

$$TAEI = \left( \frac{AAEL_A + AAEL_B + AAEL_C + AAEL_D + AAEL_E + AAEL_F + AAEL_G + AAEL_H}{8} \right)$$

**Formula 3-1**

Where:

**AAEL<sub>A</sub>** = Annual Activity Emissions Limits calculated using Method A in accordance with section 3.1.1

**AAEL<sub>B</sub>** = Annual Activity Emissions Limits calculated using Method B in accordance with section 3.1.2

**AAEL<sub>C</sub>** = Annual Activity Emissions Limits calculated using Method C in accordance with section 3.1.3

**AAEL<sub>D</sub>** = Annual Activity Emissions Limits calculated using Method D in accordance with section 3.1.4

**AAEL<sub>E</sub>** = Annual Activity Emissions Limits calculated using Method E in accordance with section 3.1.5

**AAEL<sub>F</sub>** = Annual Activity Emissions Limits calculated using Method F in accordance with section 3.1.6

**AAEL<sub>G</sub>** = Annual Activity Emissions Limits calculated using Method G in accordance with section 3.1.7

**AAEL<sub>H</sub>** = Annual Activity Emissions Limits calculated using Method H in accordance with section 3.1.8

#### 3.1 Annual Activity Emissions Limits

The owner or operator of a covered facility shall calculate the AAELs for the covered facility in respect of a compliance period using all methods that are required to be used and such methods that the owner or operator elects to use (where a method is

permitted to be used), as set out in subsections 3.1.1 to 3.1.8 below (Methods A through H).

If Section 5.1 applies to the owner or operator of the covered facility, the owner or operator of the covered facility shall calculate the AAELs for the covered facility in respect of the covered facility’s first compliance period using the substitutions permitted in Section 5.2.

### 3.1.1 Method A: Sector Performance Standard

The owner or operator of a covered facility at which an Industrial Activity set out in Column 1 of Table A and a Sub-activity set out in Column 2 of Table A is engaged in shall use Formula 3.1.1-1 to calculate the facility AAEL<sub>A</sub>, in respect of each Sub-activity, unless one of the following applies:

1. The Sub-activity is producing steel in an electric arc furnace and the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
  - a. 1055
  - b. 1084
2. The Sub-activity is producing gold and the facility, or a site that forms part of the facility, is not identified with one of the following GHG IDs:
  - a. 1056
  - b. 1193
  - c. 1198

$$AAEL_{A,y} = \sum_{i=1}^n [(PS_{A,i,y,FPE} + PS_{A,i,y,nonFPE}) \times Production_{i,y}]$$

**Formula 3.1.1-1**

Where,

**n** = the number of production parameters set out in column 3 of Table A that apply to the covered facility

**i** = a production parameter set out in column 3 of Table A for the Sub-activity in column 2 of Table A in respect of the Industrial Activity in column 1 of Table A

**y** = year of the compliance period

**PS<sub>A,i,y,FPE</sub>** = Fixed Process Emissions Sector Performance Standard for the production parameter “i” in year “y” expressed in tonnes of CO<sub>2</sub>e per unit of production calculated in accordance with Formula 3.1.1-2

**PS<sub>A,i,y,nonFPE</sub>** = Non-Fixed Process Emissions Sector Performance Standard for the production parameter “i” in year “y” expressed in tonnes of CO<sub>2</sub>e per unit of production calculated in accordance with Formula 3.1.1-3

**Production<sub>i,y</sub>** = Annual production of Production Parameter ‘i’ in year ‘y’ reported in accordance with the Reporting Regulation and Guideline

**Table A**

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Industrial Activity	Sub-activity	Production Parameter	BEI <sub>A,FPE</sub>	BEI <sub>A,nonFPE</sub>	BEI Units
Producing cement from clinker. (Item 8 of Schedule 2 of the Regulation)	Producing intermediate clinker	Tonnes of Intermediate Clinker produced	0.533	0.355	t CO <sub>2</sub> e/t intermediate clinker
Producing cement from clinker. (Item 8 of Schedule 2 of the Regulation)	Producing grey cement from clinker produced at the covered facility  For greater certainty, a tonne of clinker that is counted as production of intermediate clinker, shall not be counted again as part of the production of grey cement, even when the grey cement is produced in a different compliance period	Tonnes of Grey Cement produced from clinker produced at the covered facility	0.490	0.326	t CO <sub>2</sub> e/t grey cement
Petroleum refining through,  i. the distillation of crude oil, or  ii. cracking, rearranging or reforming unfinished petroleum derivatives.  (Item 4 of Schedule 2 of the Regulation)	Refining crude oil, including bitumen, heavy crude oil, light crude oil and synthetic crude oil	CAN-CWB	0	0.0046	t CO <sub>2</sub> e/ CAN-CWB

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Industrial Activity	Sub-activity	Production Parameter	BEI <sub>A,FPE</sub>	BEI <sub>A,nonFPE</sub>	BEI Units
Producing iron or steel from smelted iron ore or producing metallurgical coke. (Item 17 of Schedule 2 of the Regulation)	Producing metallurgical coke in a coke oven battery	Tonnes of Coke produced from Coke Oven	0	0.491	t CO2e/t coke
Producing iron or steel from smelted iron ore or producing metallurgical coke. (Item 17 of Schedule 2 of the Regulation)	Producing iron from smelted iron ore	Tonnes of Iron produced from blast furnace	1.034	0.324	t CO2e/t liquid iron
Producing iron or steel from smelted iron ore or producing metallurgical coke. (Item 17 of Schedule 2 of the Regulation)	Producing steel in a basic oxygen furnace (BOF)	Tonnes of Steel produced from BOF	0.149	0	t CO2e/ t BOF steel
Producing steel from feedstock that comes primarily from iron or scrap steel. (Item 16 of Schedule 2 of the Regulation)	Producing of steel in an electric arc furnace (EAF)	Tonnes of Steel produced from EAF	0.0844	0	t CO2e/t EAF steel
Petroleum refining through, <ul style="list-style-type: none"> <li>i. the distillation of crude oil, or</li> <li>ii. cracking, rearranging or reforming unfinished petroleum derivatives.</li> </ul> (Item 4 of Schedule 2 of the Regulation)	Producing hydrogen using steam hydrogen carbon reforming or partial oxidation of hydrocarbon at a petroleum refinery.	Tonnes of Hydrogen produced	5.5 x (1-SF <sub>y,nonFPE</sub> )	0	t CO2e/t hydrogen

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Industrial Activity	Sub-activity	Production Parameter	BEI <sub>A,FPE</sub>	BEI <sub>A,nonFPE</sub>	BEI Units
Producing hydrogen gas using steam hydrocarbon reforming or partial oxidation of hydrocarbons. (Item 7 of Schedule 2 of the Regulation)	Producing hydrogen gas at a facility dedicated to the production of hydrogen gas, and not at a covered facility that carries out the activity described in paragraphs 4, 13 and 24 of Schedule 2 of the Regulation	Tonnes of Hydrogen produced	5.5	5.4	t CO2e/t hydrogen
Producing metal or diamonds from the mining or milling of ore or kimberlite. (Item 20 of Schedule 2 of the Regulation)	Producing gold	Kg of Gold produced	0	7.21	t CO2e/kg gold
Producing nitric acid by the catalytic oxidation of ammonia. (Item 23 of Schedule 2 of the Regulation)	Producing nitric acid	Tonnes of Nitric Acid produced	0.0239	0.289	t CO2e/t nitric acid
Producing anhydrous ammonia or aqueous ammonia by the steam reforming of a hydrocarbon. (Item 24 of Schedule 2 of the Regulation)	Producing anhydrous ammonia or aqueous ammonia	Tonnes of Ammonia produced	1.28	0.438	t CO2e/t ammonia
Producing anhydrous ammonia or aqueous ammonia by the steam reforming of a hydrocarbon. (Item 24 of Schedule 2 of the Regulation)	Producing urea liquor at facilities that produce ammonia	Tonnes of Urea produced	0	0.123	t CO2e/t urea

$$PS_{A,i,y,FPE} = BEI_{A,i,FPE} \times SF_{y,FPE}$$

**Formula 3.1.1-2**

Where,

**i** = a production parameter set out in column 3 of Table A for the Sub-activity in column 2 of Table A in respect of the Industrial Activity in column 1 of Table A

**y** = year of the compliance period

**BEI<sub>A,i,FPE</sub>** = Fixed Process Baseline Emissions Intensity for the Sub-activity for production parameter ‘i’ expressed in tonnes of CO<sub>2</sub>e per unit of production as set out in column 4 of Table A

**SF<sub>y,FPE</sub>** = Fixed Process Emissions Stringency Factor for the Industrial Activity in year ‘y’ as determined in accordance with Section 4.1

$$PS_{A,i,y,nonFPE} = BEI_{A,i,nonFPE} \times SF_{y,nonFPE}$$

### Formula 3.1.1-3

Where,

**i** = a production parameter set out in column 3 of Table A for the Sub-activity in column 2 of Table A in respect of the Industrial Activity in column 1 of Table A

**y** = year of the compliance period

**BEI<sub>A,i,nonFPE</sub>** = Non-Fixed Process Baseline Emissions Intensity for the Sub-activity for production parameter ‘i’ in tonnes of CO<sub>2</sub>e per unit of production as set out in column 5 of Table A

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year ‘y’ as determined in accordance with Section 4.2

### 3.1.2 Method B: Electricity Generation Sector Performance Standard

Subject to what is set out below following paragraph 4, an owner or operator of a covered facility engaging in the Industrial Activity of Generating Electricity Using Fossil Fuels may use Formula 3.1.2-1 to calculate the AAEL<sub>B</sub>, unless any of the following applies:

1. The owner or operator used Formula 3.1.4-1 in respect of the electricity generation from a cogeneration system at the facility.
2. The owner or operator engaged in the Sub-activity of producing gold set out in Column 2 of Table A and the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
  - a. 1056
  - b. 1193
  - c. 1198
3. The owner or operator engaged in one of the following Sub-activities set out in Column 2 of Table A

- a. producing grey cement from clinker
  - b. producing intermediate clinker
4. The covered facility, or a site that forms part of the facility, is one set out in Table E or F unless the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
- a. 1060
  - b. 1075
  - c. 1076
  - d. 1079
  - e. 1081
  - f. 1082
  - g. 1085

Despite paragraph 1, the owner or operator may use Formula 3.1.2-1 in respect of the amount of electricity generated (in GWh) at the facility that the owner or operator has not included in the electricity generation from the cogeneration system ( $EO_{elec,y}$ ) entered in Formula 3.1.4-3 or in any other Formula.

$$AAEL_{B,y} = \sum_{i=1}^n PS_{B,i,y} \times Production_{B,i,y}$$

**Formula 3.1.2-1**

Where,

**n** = the number of applicable combustion devices that generate electricity at the covered facility

**i** = an applicable combustion device that generates electricity

**y** = year of the compliance period

**PS<sub>B,i,y</sub>** = Electricity Generation Sector Performance Standard expressed in tonnes of CO<sub>2</sub>e per Gigawatt hour (tCO<sub>2</sub>e/GWh) of electricity generated from the combustion device “i” in year “y”, calculated in accordance with Formula 3.1.2-2

**Production<sub>B,i,y</sub>** = Annual electricity generated from the combustion device “i” for the production of electricity in year “y” expressed in Gigawatt hours (GWh), reported in accordance with the Reporting Regulation and Guideline

$$PS_{B,i,y} = BEI_B \times NBF_{i,y} \times SF_{y,nonFPE}$$

**Formula 3.1.2-2**

Where,

**i** = an applicable combustion device that generates electricity

**y** = year of the compliance period

**BEI<sub>B</sub>** = 370 tonnes of CO<sub>2</sub>e per Gigawatt hour (tCO<sub>2</sub>e/GWh)

**NBF<sub>i,y</sub>** = the non-biomass, non-coke oven gas and non-blast furnace gas, fraction of the total energy input into the combustion device “i” that generates the electricity, calculated by dividing the Gigajoules (GJ) of non-biomass fuel input into the combustion device by the total GJ of all fuels input into the combustion device

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

### 3.1.3 Method C: Thermal Energy Sector Performance Standard

Subject to what is set out below following paragraph 4, an owner or operator of a covered facility engaging in one of the following Industrial Activities:

1. Producing hydrogen gas using steam hydrocarbon reforming or partial oxidation of hydrocarbons;
2. Producing grain ethanol for use in an industrial or fuel application;
3. Generating electricity using fossil fuels;

and engaging in the generation and transfer of useful thermal energy may use Formula 3.1.3-1 to calculate the AAEL<sub>C</sub>, unless any of the following applies:

1. The owner or operator used Formula 3.1.4-1 in respect of the useful thermal energy generated from a cogeneration system at the facility.
2. The owner or operator engaged in one of the following Sub-activities set out in Column 2 of Table A:
  - a. producing grey cement from clinker;
  - b. producing intermediate clinker;
  - c. refining crude oil, including bitumen, heavy crude oil, light crude oil and synthetic crude oil;
  - d. producing hydrogen using steam hydrogen carbon reforming or partial oxidation of hydrocarbon at a petroleum refinery;
  - e. producing nitric acid;
  - f. producing anhydrous ammonia or aqueous ammonia;
  - g. producing urea liquor at a facility that produces ammonia.

3. The owner or operator engaged in the Sub-activity of producing gold set out in Column 2 of Table A and the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
  - a. 1056
  - b. 1193
  - c. 1198
4. The covered facility, or a site that forms part of the facility, is one set out in Table E or F unless the facility, or a site that forms part of the facility, is identified with the GHG IDs:
  - a. 1081
  - b. 1082
  - c. 1163.

Despite paragraph 1, the owner or operator may use Formula 3.1.3-1 in respect of the amount of useful thermal energy generated at the facility and transferred (in GJ) where the owner or operator has not:

1. included the amount of useful thermal energy output from the cogeneration system ( $EO_{\text{therm},i,y}$ ) in Formula 3.1.4-3;
2. used formula 3.1.2-1 in respect of the combustion device that is generating the useful thermal energy;
3. included the energy or processes where the emissions are already accounted for in the setting of the sector performance standard or facility specific performance standard; and
4. included the useful thermal energy in any other Formula.

$$AAEL_{C,y} = \sum_{i=1}^n PS_{C,i,y} \times Production_{C,i,y}$$

**Formula 3.1.3-1**

Where,

**n** = the number of applicable combustion devices that generate useful thermal energy at the covered facility

**i** = an applicable combustion device that generates useful thermal energy

**y** = year of the compliance period

**PS<sub>c,i,y</sub>** = Thermal Energy Sector Performance Standard expressed in tonnes of CO<sub>2</sub>e per Gigajoule (tCO<sub>2</sub>e/GJ) of useful thermal energy transferred from the combustion device “i” in year “y”, calculated in accordance with Formula 3.1.3-2

**Production<sub>c,i,y</sub>** = Annual useful thermal energy that is generated from a combustion device “i” and transferred to any other covered facility or non-covered facility in year “y” expressed in Gigajoules (GJ), reported in accordance with the Reporting Regulation and Guideline.

$$PS_{c,i,y} = BEI_C \times NBF_{i,y} \times SF_{y,nonFPE}$$

### Formula 3.1.3-2

Where,

**i** = an applicable combustion device that generates useful thermal energy

**y** = year of the compliance period

**BEI<sub>c</sub>** = 0.063 tonnes of CO<sub>2</sub>e per Gigajoule (tCO<sub>2</sub>e/GJ)

**NBF<sub>i,y</sub>** = the non-biomass, non-coke oven gas and non-blast furnace gas, fraction of the total energy input into the combustion device “i” that generates the thermal energy, calculated by dividing the Gigajoules (GJ) of non-biomass fuel input into the combustion device by the total GJ of all fuels input into the combustion device

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

### 3.1.4 Method D: Cogeneration Sector Performance Standard

Subject to what is set out below following paragraph 4, an owner or operator of a covered facility at which a cogeneration system is used may use Formula 3.1.4-1 to calculate the AAEL<sub>D</sub>, unless any of the following applies:

1. The owner or operator used Formula 3.1.2-1 in respect of the electricity generation at the facility or the owner or operator used Formula 3.1.3-1 in respect of the thermal energy generation at the facility.
2. The owner or operator engaged in one of the following sub-activity set out in Column 2 of Table A:
  - a. producing grey cement from clinker;
  - b. producing intermediate clinker;
3. The covered facility, or a site that forms part of the facility, is one that is set out in Table E or F unless the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
  - a. 1060

- b. 1075
  - c. 1076
  - d. 1079
  - e. 1081
  - f. 1082
  - g. 1085
4. The owner or operator engaged in the Sub-activity of producing gold and the facility, or a site that forms part of the facility, is identified with one of the following GHG IDs:
- a. 1056
  - b. 1193
  - c. 1198

Despite paragraph 1, the owner or operator may use Formula 3.1.4-1 in respect of:

1. the amount of electricity generation if the owner or operator has not used Formula 3.1.2-1 for the combustion device; and,
2. the amount of useful thermal energy generated and transferred that the owner or operator has not included in **Production<sub>c,i,y</sub>** (Annual useful thermal energy transferred) in Formula 3.1.3-1 or any other Formula.

$$AAEL_{D,y} = \sum_{i=1}^n PS_{D,i,y} \times Production_{D,i,y}$$

**Formula 3.1.4-1**

Where,

**n** = the number of applicable cogeneration systems at the covered facility

**i** = an applicable cogeneration system

**y** = year of the compliance period

**PS<sub>D,i,y</sub>** = Cogeneration Performance Standard expressed in tonnes of CO<sub>2</sub>e per Gigajoule (tCO<sub>2</sub>e/GJ) of total energy (electricity plus thermal energy) generated from the cogeneration system “i” in year “y”, calculated in accordance with Formula 3.1.4-2

**Production<sub>D,i,y</sub>** = Annual total energy output from the cogeneration system “i” in year “y” expressed in Gigajoules (GJ), calculated in accordance with Formula 3.1.4-3

$$PS_{D,i,y} = BEI_D \times NBF_{i,y} \times SF_{y,nonFPE}$$

**Formula 3.1.4-2**

Where,

**i** = an applicable cogeneration system

**y** = year of the compliance period

**BEI<sub>D</sub>** = 0.063 tonnes of CO<sub>2</sub>e per Gigajoule (tCO<sub>2</sub>e/GJ)

**NBF<sub>i,y</sub>** = the non-biomass, non-coke oven gas and non-blast furnace gas fraction of the total energy input into the combustion device associated with cogeneration system “i” in year “y”, calculated by dividing the Gigajoules (GJ) of non-biomass fuel input into the combustion device by the total GJ of all fuels input into the combustion device

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

$$Production_{D,i,y} = EO_{elec,i,y} + EO_{therm,i,y}$$

**Formula 3.1.4-3**

Where,

**EO<sub>elec,y</sub>** = Annual electrical energy output from the cogeneration system “i” in year “y” expressed in Gigajoules (GJ), reported in accordance with the Reporting Regulation and Guideline

**EO<sub>therm,y</sub>** = Useful thermal energy output from the cogeneration system “i” in year “y” expressed in Gigajoules (GJ), reported in accordance with the Reporting Regulation and Guideline

### 3.1.5 Method E: Facility Specific Performance Standard

The owner or operator of a covered facility, or a site that forms part of the facility, set out in Table E shall use Formula 3.1.5-1 to calculate the AAEL<sub>E</sub>.

$$AAEL_{E,y} = \sum_{i=1}^n [(PS_{E,i,y,FPE} + PS_{E,i,y,nonFPE}) \times Production_{E,i,y}] - (TET_y \times 0.063) \times SF_{y,nonFPE}$$

**Formula 3.1.5-1**

Where,

**y** = year of the compliance period

**n** = the number of production parameters set out in column 2 of Table E that apply to the covered facility, or a site that forms part of the facility

**i** = a production parameter set out in column 2 of Table E

**PS<sub>E,i,y,FPE</sub>** = Fixed Process Emissions Facility Performance Standard for the production parameter “i” in year “y” expressed in tonnes of CO<sub>2</sub>e per unit of production calculated in accordance with Formula 3.1.5-2

**PS<sub>E,i,y,nonFPE</sub>** = Non-Fixed Process Emissions Sector Performance Standard for the production parameter “i” in year “y” expressed in tonnes of CO<sub>2</sub>e per unit of production calculated in accordance with Formula 3.1.5-3

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

**Production<sub>E,i,y</sub>** = Annual production of production parameter “i” in year “y” expressed in the units set out in column 3 of Table E reported in accordance with the Reporting Regulation and Guideline

**TET<sub>y</sub>** = any thermal energy transferred in year “y” from any other covered facility or non-covered facility to the covered facility; or from a cogeneration system to the production processes for all production parameters “i” within the same facility. This applies to a facility, or a site that forms part of the facility, that is identified with one of the following GHG IDs:

- 1) 1060
- 2) 1073
- 3) 1075
- 4) 1076
- 5) 1079
- 6) 1081
- 7) 1082
- 8) 1085
- 9) 1132

For any other facilities, the thermal energy transfer (**TET<sub>y</sub>**) shall be zero.

$$PS_{E,i,y,FPE} = BEI_{E,i,FPE} \times SF_{y,FPE}$$

**Formula 3.1.5-2**

Where,

**i** = a production parameter set out in column 2 of Table E

**BEI<sub>E,i,FPE</sub>** = Fixed Process Baseline Emissions Intensity for the facility, or a site that forms part of the facility, for the production parameter “i” as set out in a

notice by the Director given to the owner or operator of the facility on or before March 31, 2022, which amount is calculated based on emissions information, energy use information, and production parameter information for the years set out in column 4 of Table E, which information has been provided to the Ministry by the owner or operator of the facility on or before May 31, 2019 or obtained by the Ministry from publicly available information on or before that date.

**SF<sub>y,FPE</sub>** = Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.1

$$PS_{E,i,y,nonFPE} = BEI_{E,i,nonFPE} \times SF_{y,nonFPE}$$

### Formula 3.1.5-3

Where,

**i** = a production parameter set out in column 2 of Table E

**BEI<sub>E,i,nonFPE</sub>** = Non-Fixed Process Baseline Emissions Intensity for the facility, or a site that forms part of the facility, for the production parameter “i” as set out in a notice by the Director given to the owner or operator of the facility on or before March 31, 2022, which amount is calculated based on emissions information, energy use information, and production parameter information for the years set out in column 4 of Table E, which information has been provided to the Ministry by the owner or operator of the facility on or before May 31, 2019 or obtained by the Ministry from publicly available information on or before that date. Two per cent of biomass combustion CO<sub>2</sub> emissions has been included in the **BEI<sub>E,i,nonFPE</sub>** of the facility, or site that forms part of the facility, as identified in column 5 of Table E.

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

**y** = year of the compliance period

**Table E**

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID /GHGRP ID	Production Parameter	Production Parameter Units	FPE and Non-FPE Intensity years	BEI <sub>E,i,nonFPE</sub> adjusted for biomass combustion CO <sub>2</sub> emissions
1001	Finished Oilseed Product(s) produced	Tonnes	2015 to 2017	
1006	Finished product(s) produced	Tonnes	2016 to 2018	

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID /GHGRP ID	Production Parameter	Production Parameter Units	FPE and Non-FPE Intensity years	BEI <sub>E,i,nonFPE</sub> adjusted for biomass combustion CO <sub>2</sub> emissions
1011	Brick or other products made from clay or shale using a kiln	Tonnes	2015 to 2017	
1016	Beans and Seeds Crushed	Tonnes	2015 to 2017	
1017	Carbon Black produced	Tonnes	2015 to 2017	
1018	Gypsum panels produced	Thousand square feet	2015 to 2017	
1020	High Calcium Lime produced	Tonnes	2015 to 2017	
1020	Cal-85 produced	Tonnes	2015 to 2017	
1020	Lime Kiln Dust + Waste Lime produced	Tonnes	2015 to 2017	
1021	Dolomitic Lime produced	Tonnes	2015 to 2017	
1021	Double Burnt Lime produced	Tonnes	2015 to 2017	
1021	Iron Coated Dolime produced	Tonnes	2015 to 2017	
1021	Lime Kiln Dust + Waste Lime produced	Tonnes	2015 to 2017	
1022	High Calcium Lime produced	Tonnes	2015 to 2017	
1022	Lime Kiln Dust + Waste Lime produced	Tonnes	2015 to 2017	
1023	Finished product(s) produced	Tonnes	2016 to 2018	
1024	Gypsum panels produced	Thousand square feet	2015 to 2017	
1030	Carbon Black produced	Tonnes	2015 to 2017	
1032	Finished product(s) produced	Tonnes	2016 to 2018	Yes
1033	Finished product(s) produced	Tonnes	2016 to 2018	Yes
1042	Dolomitic Lime produced	Tonnes	2015 to 2017	
1042	High Calcium Lime produced	Tonnes	2015 to 2017	
1045	White Cement produced from clinker produced at the covered facility	Tonnes	2015 to 2017	

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID /GHGRP ID	Production Parameter	Production Parameter Units	FPE and Non-FPE Intensity years	BEI <sub>E,i,nonFPE</sub> adjusted for biomass combustion CO <sub>2</sub> emissions
1054	Hot rolled steel produced	Tonnes	2014, 2015, 2017	
1055	Steel produced from electric arc furnace	Tonnes	2014 to 2017	
1055	Hot rolled steel produced	Tonnes	2014 to 2017	
1060	Fuel ethanol produced	Kilolitres of absolute ethanol	2016 to 2017	
1060	Industrial ethanol produced	Kilolitres of absolute ethanol	2016 to 2017	
1061	Fuel ethanol produced	Kilolitres of absolute ethanol	2014 to 2016	
1065	Brick or other products made from clay or shale using a kiln	Tonnes	2015 to 2017	
1066	Brick or other products made from clay or shale using a kiln	Tonnes	2015 to 2017	
1068	Beverage Ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1073	Products from Steam Cracker	Tonnes	2015 to 2017	
1073	Products not from Steam Cracker	Tonnes	2015 to 2017	
1075	Corn milled and corn germ processed	Tonnes (air dried)	2018	
1076	Corn milled	Tonnes (air dried)	2015 to 2017	
1079	Fuel ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1080	Finished product(s) produced	Tonnes	2015 to 2017	
1081	Nylon Resins produced	Tonnes	2015 to 2017	
1081	Nylon Fibres produced	Tonnes	2015 to 2017	
1082	MPMD produced	Tonnes	2016 to 2017	
1083	Finished product(s) produced	Tonnes	2016 to 2018	

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID /GHGRP ID	Production Parameter	Production Parameter Units	FPE and Non-FPE Intensity years	BEI <sub>E,i,nonFPE</sub> adjusted for biomass combustion CO <sub>2</sub> emissions
1084	Steel produced from an electric arc furnace	Tonnes	2016 to 2018	
1084	Hot rolled steel produced	Tonnes	2016 to 2018	
1085	Corn milled	Tonnes	2016 to 2018	
1085	Citric acid produced	Tonnes	2016 to 2018	
1094	Finished product(s) produced	Tonnes	2015 to 2017	
1100	Ethylene produced	Tonnes	2014 to 2016	
1101	Polyethylene produced	Tonnes	2014 to 2016	
1102	Polyethylene produced	Tonnes	2014 to 2016	
1103	Glass produced	Tonnes	2015 to 2017	
1111	Refinery Feed	Kilolitres	2015 to 2017	
1113	Propane and Butane produced	Cubic metres	2015 to 2017	
1118	Raw Sugar Processed	Tonnes	2015 to 2017	
1120	Finished product(s) produced	Tonnes	2015 to 2017	Yes
1121	Mineral wool insulation produced	Tonnes	2015 to 2017	
1122	Used Oil Feed produced	Kilolitres	2015 to 2017	
1126	Finished product(s) produced	Tonnes	2015 to 2017	
1127	Finished product(s) produced	Tonnes	2015 to 2017	
1131	Finished product(s) produced	Tonnes	2015 to 2017	
1132	Styrene produced	Tonnes	2015 to 2017	
1134	Fuel ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1135	Finished product(s) produced	Tonnes	2016 to 2018	Yes
1136	Seamless steel tubes produced	Tonnes	2015 to 2017	
1138	Finished product(s) produced	Tonnes	2016 to 2018	Yes

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID /GHGRP ID	Production Parameter	Production Parameter Units	FPE and Non-FPE Intensity years	BE <sub>E,i,nonFPE</sub> adjusted for biomass combustion CO <sub>2</sub> emissions
1147	Megawatt hours of work produced	Megawatt hours	2014 to 2016	
1163	Fuel ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1163	Industrial ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1167	Fuel ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1175	Malic Acid produced	Tonnes	2015 to 2017	
1175	Fumaric Acid produced	Tonnes	2015 to 2017	
1207	Beverage Ethanol produced	Kilolitres of absolute ethanol	2015 to 2017	
1234	Finished product(s) produced	Tonnes	2016 to 2018	
1252	Finished product(s) produced	Tonnes	2016 to 2018	
1261	Glass produced	Tonnes	2015 to 2017	
1263	Glass produced	Tonnes	2015 to 2017	
1406	Glass produced	Tonnes	2015 to 2017	
1432	Megawatt hours of work produced	Megawatt hours	2015 to 2017	
1417	Nepheline syenite produced	Tonnes	2015 to 2017	
1418	Mined material	Megatonnes	2015 to 2017	

### 3.1.6 Method F: Historical Facility Emissions Limit Standard

The owner or operator of a covered facility, or a site that forms part of the facility, set out in Table F shall use Formula 3.1.6-1 to calculate the AAEL<sub>F</sub>.

$$AAEL_{F,y} = BL_{F,FPE} \times SF_{y,FPE} + BL_{F,nonFPE} \times SF_{y,nonFPE}$$

**Formula 3.1.6-1**

Where,

**BL<sub>F,FPE</sub>** = Baseline fixed process emissions for the facility, or a site that forms part of the facility, as set out in column 3 of Table F

**SF<sub>y,FPE</sub>** = Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.1

**BL<sub>F,nonFPE</sub>** = Baseline Non-Fixed Process Emissions for the facility, or a site that forms part of the facility, as set out in column 4 of Table F

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

**y** = year of the compliance period

**Table F**

Column 1	Column 2	Column 3	Column 4	Column 5
GHG ID	Industrial Activity	BL <sub>F,FPE</sub>	BL <sub>F,nonFPE</sub>	Units
1168	Smelting or refining, from feedstock that comes primarily from ore, of at least one of the following metals: nickel, copper, zinc, lead, or cobalt. (Item 1 of Schedule 2)	102,804	352,132	Tonnes CO2e
1189	Smelting or refining, from feedstock that comes primarily from ore, of at least one of the following metals: nickel, copper, zinc, lead, or cobalt. (Item 1 of Schedule 2)	5,081	12,256	Tonnes CO2e
1158	Smelting or refining, from feedstock that comes primarily from ore, of at least one of the following metals: nickel, copper, zinc, lead, or cobalt. (Item 1 of Schedule 2)	90,964	35,837	Tonnes CO2e

### 3.1.7 Method G: Energy Use Standard

Subject to what is set out below following paragraph 3 the owner or operator of a covered facility may use Formula 3.1.7-1 to calculate the  $AAEL_G$  for fuel use at the covered facility other than use in mobile equipment operation, unless any of the following applies:

1. The fuel is one of the following fuels and is used as follows:
  - a. Coal used in a coke oven battery to produce coke
  - b. Coal, coke or other carbon material charged into a blast furnace as a reductant
  - c. Coke oven gas and blast furnace gas and basic oxygen furnace gas used in an industrial activity
  - d. Coal, coke or other carbon material charged into an electric arc furnace or natural gas used for shell cooling in a basic oxygen furnace or electric arc furnace
  - e. Natural gas used in a Steam Methane Reformer (SMR) to produce hydrogen
2. The fuel is used in one of the following Industrial Activities at the facility:
  - a. Petroleum refining through,
    - i. the distillation of crude oil, or
    - ii. cracking, rearranging or reforming unfinished petroleum derivatives.
  - b. Producing cement from clinker.
  - c. Producing lime from limestone using a kiln.
  - d. Producing 2-methylpenta-methylenediamine (MPMD).
  - e. Producing resins or fibres of Nylon 6 or Nylon 6,6.
3. The covered facility, or a site that forms part of the facility, is one of the following:
  - a. A facility, or a site that forms part of the facility, set out in Table F
  - b. A facility, or a site that forms part of the facility, set out in Table E that is not identified with one of the following GHG IDs:
    - i. 1020
    - ii. 1021
    - iii. 1022
    - iv. 1042
    - v. 1081

- vi. 1082
- c. A facility, or a site that forms part of the facility, with GHG IDs:
  - i. 1056
  - ii. 1137
  - iii. 1193
  - iv. 1198

$$AAEL_{G,y} = G_{1,y} + G_{2,y}$$

**Formula 3.1.7-1**

Where:

**G<sub>1,y</sub>** = Calculation of Annual Activity Emissions Limit under Method G for covered facilities with access to natural gas in year “y” calculated in accordance with Formula 3.1.7-2

**G<sub>2,y</sub>** = Calculation of Annual Activity Emissions Limit under Method G for covered facilities with no access to natural gas as defined in Section 2, in year “y” calculated in accordance with Formula 3.1.7-3

$$G_{1,y} = EI_{total,y} \times EF_{NG} \times SF_{y,nonFPE}$$

**Formula 3.1.7-2**

Where:

**EI<sub>total,y</sub>** is

- 1) 0 if the facility, or a site that forms part of the facility, is one with no access to natural gas as defined in Section 2; or
- 2) if the facility, or a site that forms part of the facility, is one with access to natural gas, the amount of energy input used in year “y”, expressed in GJ, and excluding energy:
  - a. used in electricity generation or in a cogeneration system;
  - b. used in a combustion device associated with useful thermal energy transferred; or
  - c. from biomass fuel.

**EF<sub>NG</sub>** = 0.0504 tonnes CO<sub>2</sub>e/GJ energy input

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

$$G_{2,y} = \sum_{i=1}^n [Fuel_{i,y} \times EF_i] \times SF_{y,nonFPE}$$

**Formula 3.1.7-3**

Where:

**n** = the number of applicable fuel types set out in column 1 of Table G that are used at the covered facility

**i** = an applicable fuel type set out in column 1 of Table G that is used at the covered facility

**Fuel<sub>i,y</sub>** is

- 1) 0 if the facility, or a site that forms part of the facility, is one with access to natural gas; or
- 2) if the facility, or a site that forms part of the facility, is one with no access to natural gas as defined in Section 2, the amount of fuel “i” used in year “y”, expressed in units of fuel as set out in column 3 of Table G, and excluding fuel:
  - a. used in electricity generation or in a cogeneration system;
  - b. used in a combustion device associated with useful thermal energy transferred; or
  - c. from biomass fuel.

**EF<sub>i</sub>** = the emission factor for fuel “i” used at the facility expressed in tonnes of CO<sub>2</sub>e per unit of fuel as set out in column 2 of Table G

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

**y** = year of the compliance period

**Table G**

Column 1	Column 2	Column 3
Fuel Type	EF – Tonnes of CO <sub>2</sub> e/Unit of Fuel	Unit of Fuel
<b>Ethane, Propane and Butane</b>	<b>tCO<sub>2</sub>e/kL</b>	<b>-</b>
Ethane	1.019	kL
Propane/liquefied petroleum gas used in:	-	-
General stationary combustion	1.548	kL
Mobile equipment operation	1.557	kL
Butane	1.780	kL
<b>Refined Petroleum Products</b>	<b>tCO<sub>2</sub>e/kL</b>	<b>-</b>
Diesel used in:	-	-
General stationary combustion	2.804	kL
Mobile equipment operation, <19kW	2.689	kL
Mobile equipment operation, >=19kW	2.751	kL
Gasoline used in:	-	-
General stationary combustion	2.315	kL
Mobile equipment operation	2.576	kL
Light Fuel Oil used in:	-	-
General stationary combustion	2.762	kL
Heavy Fuel Oil used in:	-	-
General stationary combustion	3.178	kL
Kerosene used in:	-	-
General stationary combustion	2.569	kL
<b>Other Mobile Equipment Sources</b>	<b>tCO<sub>2</sub>e/kL</b>	<b>-</b>
Natural Gas Vehicles	0.0021	kL
Railways	-	-
Diesel Train	2.983	kL

### 3.1.8 Method H: Mobile Equipment Operation Standard

The owner or operator of a covered facility may use Formula 3.1.8-1 to calculate the AAEL<sub>H</sub> for fuel that is used in on-site transportation equipment, unless the facility is one of the following:

1. A covered facility, or a site that forms part of the facility, set out in Table E identified with one of the following GHG ID numbers:

- a. 1054
  - b. 1055
  - c. 1084
  - d. 1417
  - e. 1418
2. A covered facility, or a site that forms part of the facility, set out in Table F
  3. A covered facility, or a site that forms part of the facility, identified with one of the following GHG ID numbers:
    - a. 1056
    - b. 1137
    - c. 1193
    - d. 1198

$$AAEL_{H,y} = \sum_{i=1}^n [Fuel_{i,y} \times EF_i] \times SF_{y,nonFPE}$$

**Formula 3.1.8-1**

Where,

**n** = the number of applicable fuel types set out in column 1 of Table G that are used at the covered facility

**i** = an applicable fuel type set out in column 1 of Table G that is used at the covered facility

**Fuel<sub>i,y</sub>** = the amount of fuel “i” used in on-site transportation equipment in year “y”, expressed in units of fuel as set out in column 3 of Table G and excluding any amount of biomass fuel

**EF<sub>i</sub>** = the emission factor for fuel “i” used at the facility expressed in tonnes of CO<sub>2</sub>e per unit of fuel as set out in column 2 of Table G

**SF<sub>y,nonFPE</sub>** = Non-Fixed Process Emissions Stringency Factor for the Industrial Activity in year “y” as determined in accordance with Section 4.2

**y** = year of the compliance period

## 4 Calculation of Stringency Factor (SF)

### 4.1 Fixed Process Emissions Stringency Factor

An owner or operator of a covered facility at which an Industrial Activity set out in Column 1 of Table 4.1 is engaged in shall use the Fixed Process Emissions Stringency Factor in year “y” ( $SF_{y,FPE}$ ) that is set out in Table 4.1,

Where,

$y$  = year of the compliance period (2022)

**Table 4.1**

Column 1	Column 2
<b>Industrial Activity</b>	<b>SF<sub>2022,FPE</sub></b>
All Industrial Activities	1.0

### 4.2 Non-Fixed Process Emissions Stringency Factor

An owner or operator of a covered facility at which an Industrial Activity set out in Column 1 of Table 4.2 is engaged in shall use Formula 4.2-1 to calculate the Non-Fixed Process Emissions Stringency Factor in year “y” ( $SF_{y,nonFPE}$ ).

$$SF_{y,nonFPE} = 1 - (1 - SF_{base,y}) \times NBF_y$$

**Formula 4.2-1**

Where:

**SF<sub>base,y</sub>** = the base non-fixed process emissions stringency factor without adjustment based on biomass fuel use as set out in Table 4.2 for the year “y”

$y$  = year of the compliance period (2022)

**NBF<sub>y</sub>** = non-biomass fraction in year “y” calculated in accordance with Formula 4.2-2

$$NBF_y = 1 - \left( \frac{EI_{biomass,y}}{EI_{AllFuels,y}} \right)$$

**Formula 4.2-2**

Where:

**EI<sub>biomass,y</sub>** = energy input from biomass fuel at the covered facility in year “y” expressed in Gigajoules (GJ)

$EI_{AllFuels,y}$  = total energy input from all fuel, including biomass fuel, at the covered facility in year “y” expressed in Gigajoules (GJ)

**Table 4.2**

Column 1	Column 2
<b>Industrial Activity</b>	<b>SF<sub>2022,FPE</sub></b>
Transmitting natural gas. (Item 6 of Schedule 2 of the Regulation)	0.80
Generating electricity using fossil fuels. (Item 38 of Schedule 2 of the Regulation) when the SF <sub>y,nonFPE</sub> is used in: <ul style="list-style-type: none"> <li>• Formula 3.1.2-2 under Method B, or</li> <li>• Formula 3.1.4-2 under Method D and the ratio of electrical output to total energy input, determined in accordance with Section 4.3, is greater than or equal to 0.1</li> </ul>	1.0
Generating electricity using fossil fuels. (Item 38 of Schedule 2 of the Regulation) when the SF <sub>y,nonFPE</sub> is used in: <ul style="list-style-type: none"> <li>• Formula 3.1.4-2 under Method D and the ratio of electrical output to total energy input, determined in accordance with Section 4.3, is less than 0.1</li> </ul>	0.92
All other Industrial Activities	0.92

### 4.3 Ratio of Electrical Output to Total Energy Input for Cogeneration Systems

An owner or operator of a covered facility at which Method D is used shall use Formula 4.3-1 to calculate the ratio of electrical output to total energy input in year “y” (**Ratio<sub>elec,y</sub>**) for the cogeneration system:

$$Ratio_{Elec,y} = \frac{EO_{elec,y}}{EI_{total,y}}$$

**Formula 4.3-1**

Where,

**EO<sub>elec,y</sub>** = Annual electrical energy output from the cogeneration system in year “y” expressed in Gigajoules (GJ) reported in accordance with the Reporting Regulation and Guideline

**EI<sub>total,y</sub>** = Annual total energy input to the cogeneration system in year “y” expressed in Gigajoules (GJ) reported in accordance with the Reporting Regulation and Guideline

**y** = year of the compliance period (2022)

Where there is insufficient data to determine the **Ratio<sub>elec,y</sub>**, **Ratio<sub>elec,y</sub>** shall be 0.

## **5 Partial Year Adjustment to Annual Activity Emission Limits**

### **5.1 Partial Year Adjustment Criteria**

This section applies to the owner or operator of a covered facility that received notice of registration as a registered emitter issued under subsection 64 (2) of the *Greenhouse Gas Pollution Pricing Act (Canada)* from the Minister of National Revenue and the effective date of the notice is after January 1 in the first compliance period that applies to the facility.

### **5.2 Partial Year Adjustment Method**

An owner or operator that meets the criteria in 5.1 shall apply the following substitutions in calculating the AAELs for the covered facility's first compliance period under Sections 3.1.1 to 3.1.8:

1. All production parameters values used in the formulas under Methods A to H shall be the values from the period starting from the effective date of the notice referred to in 5.1 through to December 31 of the year of the effective date of the notice.
2. Calculate all AAEL values for Methods A to H using the calculation methods and formulas in Sections 3.1.1 to 3.1.8 substituting production parameters in those calculations and formulas with the values referred to in paragraph 1 above.

## Appendix A

Where the GHGID/GHGRP ID number set out in Column 1 of Table A.1 does not accord with the Company Name, Facility/Site Name, Facility/Site Address, Facility/Site City or Town, Facility/Site Postal Code set out in columns 2 through 6, the GHG ID or GHGRP ID prevails. This approach is intended to recognize that the information set out in columns 2 and 3 that is intended to identify a covered facility, or a site that forms part of the covered facility, may change while the GHGID/GHGRP ID and address information will not change.

**Table A.1**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>	<b>Column 5</b>	<b>Column 6</b>
<b>GHG ID /GHGRP ID</b>	<b>Company Name</b>	<b>Facility/Site Name</b>	<b>Facility/Site Address</b>	<b>Facility/Site City or Town</b>	<b>Facility/Site Postal Code</b>
1001	ADM Agri-Industries Company	ADM AGRI-INDUSTRIES - ADM Windsor	5550 Maplewood Drive	Windsor	N9C 0B9
1001	ADM Agri-Industries Company	ADM AGRI-INDUSTRIES - ADM Windsor	5551 Maplewood Drive	Windsor	N9C 0B9
1006	Atlantic Packaging Products Ltd.	111 Progress	111 Progress Avenue	Scarborough	M1P 2Y9
1011	Brampton Brick Limited	Brampton Brick Limited	225 Wanless Drive	Brampton	L7A 1E9
1016	Bunge Canada	Bunge Canada - Hamilton	515 Victoria Avenue North	Hamilton	L8N 3K7
1017	Cabot Canada Limited	Cabot Canada Limited	800 Tashmoo Avenue	Sarnia	N7T 7N4
1018	CGC Inc.	CGC Hagersville Plant	55 Third Line Road	Hagersville	N0A 1H0
1020	Carmeuse Lime Canada	Beachville Operation	374681 Oxford County 6 Road	Ingersoll	N5C 3K5
1021	Carmeuse Lime Canada	Dundas Operations	600 Highway # 5 Highway	Dundas	L9H 3S9
1022	Carmeuse Lime Canada	Northern Lime Limited	17 Highway 17 East	Blind River	P0R 1B0

GHG Emissions Performance Standards Methodology  
October 2021 Version

1023	Cascades Canada ULC	Cascades Containerboard Packaging, A Division of Cascades Canada ULC.	300 Marmora Street	Trenton	K8V 5R8
1024	CertainTeed Gypsum Canada, Inc.	Toronto Board Plant	2424 Lakeshore Road West	Mississauga	L5J 1K4
1030	Birla Carbon Canada Ltd.	Birla Carbon Canada Ltd.	755 Parkdale Avenue North	Hamilton	L8H 7N5
1032	Domtar Inc.	Dryden Mill	1 Duke Street	Dryden	P8N 2Z7
1033	Domtar Inc.	Espanola Mill	1 Station Road	Espanola	P5E 1R6
1042	Algoma Steel Inc.	Algoma Steel Inc.	105 West Street	Sault Ste. Marie	P6A 7B4
1045	Federal White Cement Ltd.	Woodstock Plant	355151 35th Line	Woodstock	N0J 1J0
1054	Gerdau Ameristeel Corporation	Gerdau Ameristeel Corporation, Cambridge Mill	160 Orion Place	Cambridge	N1T 1R9
1055	Gerdau Ameristeel Corporation	Gerdau Ameristeel Corporation, Whitby Mill	1 Gerdau Court	Whitby	L1N 5T1
1056	GOLDCORP CANADA LTD	Musselwhite Mine	N/A	Kenora District	P7B 4A3
1060	Greenfield Global Inc.	Chatham	275 Bloomfield Road	Chatham	N7M 5J5
1061	Greenfield Global Inc.	Johnstown	141 Commerce Drive	Johnstown	K0E 1T0
1065	Meridian Brick	Meridian Brick - Aldershot	1570 Yorkton Court	Aldershot	L7P 5B7
1066	Meridian Brick	Meridian Brick - Burlington	5155 Dundas Street	Burlington	L7R 3Y2
1068	Hiram Walker & Sons Ltd.	Walkerville	2072 Riverside Drive East	Windsor	N8Y 4S5
1073	Imperial Oil	Sarnia Chemical Plant	602 Christina Street South	Sarnia	N7T 7M5

GHG Emissions Performance Standards Methodology  
October 2021 Version

1075	Ingredion Canada Corporation	Ingredion Canada Corporation	4040 James Street	Cardinal	K0E 1E0
1076	Ingredion Canada Corporation	Ingredion Canada Incorporated - London Plant	1100 Green Valley Road	London	N6N 1E3
1079	IGPC Ethanol Inc.	IGPC Ethanol Inc.	89 Progress Drive	Aylmer	N5H 2R9
1080	Interlake Acquisition Corporation Limited	Dunn Paper	45 Merritt Street	St. Catharines	L2T 1J4
1081	INVISTA (Canada) Company	INVISTA (Canada) Company	455 Front Road	Kingston	K7L 4Z6
1082	INVISTA (Canada) Company	INVISTA (Canada) Company-Maitland Site	1400 County #2 Road	Maitland	K0E 1P0
1083	Irving Consumer Products Limited	Irving Consumer Products Limited	1551 Weston Road	Toronto	M6M 4Y4
1084	Ivaco Rolling Mills 2004 L. P.	Ivaco Rolling Mills	1040 County Rd 17 Road	L'Orignal	K0B 1K0
1085	Jungbunzlauer Canada Incorporated	Jungbunzlauer Canada Inc.	1555 Elm Street	Port Colborne	L3K 5V5
1094	New Forest Paper Mills LP	New Forest Paper Mills LP	333 Progress Avenue	Scarborough	M1P 2Z7
1100	NOVA Chemicals Corporation	Corunna Site	785 Petrolia Line	Corunna	N0N 1G0
1101	NOVA Chemicals Corporation	Moore Site	510 Moore Line	Mooretown	N0N 1M0
1102	NOVA Chemicals Corporation	St. Clair River Site	285 Albert Street	Corunna	N0N 1G0
1103	O-I Canada Corp.	Plant #31 Brampton	100 West Drive	Brampton	L6T 2J5
1111	Petro-Canada Lubricants Inc.	Mississauga Lubricants Centre	385 Southdown Road	Mississauga	L5J 2Y3
1113	Plains Midstream Canada	Sarnia Fractionation Plant	1182 Plank Road	Sarnia	N7T 7H9
1118	Redpath Sugar Ltd	Toronto Refinery	95 Queen's Quay East	Toronto	M5E 1A3
1120	Resolute FP Canada Inc.	Resolute Forest Products - Thunder Bay Operations	2001 Neebing Avenue	Thunder Bay	P7E 6S3

GHG Emissions Performance Standards Methodology  
October 2021 Version

1121	ROXUL Inc.	ROXUL Inc.	805 Steeles Avenue East	Milton	L9T 5H3
1122	Safety-Kleen Canada Inc.	Oil Recovery Division	300 Woolwich Street South	Breslau	N0B 1M0
1126	Sonoco Canada Corporation	Sonoco Brantford	33 Park Avenue	Brantford	N3T 5T5
1127	Sonoco Canada Corporation	Sonoco - Trent Valley Mill	5 Bernard Long Road	Trenton	K8V 5P6
1131	Strathcona Paper GP Inc.	Strathcona Paper LP	77 County Road 16, RR 7	Napanee	K7R 3L2
1132	INEOS Styrolution Canada Ltd.	INEOS Styrolution	872 Tashmoo Avenue	Sarnia	N7T 7H5
1134	Suncor Energy Inc.	St. Clair Ethanol Plant	535 Rokeby Line	Mooretown	N0N 1M0
1135	Rayonier A.M. Canada G.P.	Kapuskasing Operations	1 Government Road	Kapuskasing	P5N 2Y2
1136	Algoma Tubes Inc.	Tenaris Algoma Tubes	547 Wallace Terrace	Sault Ste. Marie	P6C 1L5
1137	Terra International (Canada) Inc.	CF Industries Courtright Nitrogen Complex	161 Bickford Line	Courtright	N0N 1H0
1138	AV Terrace Bay Inc.	AV Terrace Bay	21 Mill Road	Terrace Bay	P0T 2W0
1147	TransCanada PipeLines Ltd.	TransCanada Pipeline, Ontario	1644 Veterans Drive	Kenora	P9N 0C1
1158	Glencore Canada Corporation	Sudbury Integrated Nickel Operations Smelter	2 Longyear Drive	Falconbridge	P0M 1S0
1163	Greenfield Global Inc.	Tiverton	99 Farrell Drive	Tiverton	N0G 2T0
1167	Kawartha Ethanol Inc.	Kawartha Ethanol Inc.	6830 7 Highway	Havelock	K0L 1Z0
1168	Vale Canada Limited	Copper Cliff Mining, Smelting and Refining Complex	18 Rink Street	Copper Cliff	P0M 1N0
1175	Bartek Ingredients Inc.	Plant #1	421 Seaman Street	Stoney Creek	L8E 3J4
1189	Vale Canada Limited	Port Colborne Refinery	187 Davis Street	Port Colborne	L3K 5W2

GHG Emissions Performance Standards Methodology  
October 2021 Version

1193	Red Lake Gold Mines Partnership	Red Lake Gold Mines	10 Mine Road	Balmertown	P0V 1C0
1198	GOLDCORP CANADA LTD	Porcupine Gold Mines	4315 Gold Mine Road	South Porcupine	P0N 1H0
1207	Sazerac Distillers of Canada Inc.	Collingwood Distillery	202 MacDonald Road	Collingwood	L9Y 4J2
1234	Kimberly-Clark Inc.	Kimberly Clark, Huntsville Mill	570 Ravenscliffe Road	Huntsville	P1H 2A1
1252	Hartmann Canada Inc.	Hartmann North America	58 Frank Street	Brantford	N3T 5T6
1261	Owens Corning Insulating Systems Canada LP	Toronto Plant	3450 McNicoll Avenue	Toronto	M1V 1Z5
1263	Owens Corning Composite Materials Canada LP	Guelph Glass Plant	247 York Road	Guelph	N1H 6P6
1406	Ottawa Fibre LP	CertainTeed Insulation Ottawa	3985 Belgreen Drive	Ottawa	K1G 3N2
1417/G10920	Covia Canada Limited	Nepheline Syenite Operations	260 Unimin Road	Havelock	K0L 1Z0
1418/G10765	Kirkland Lake Gold Inc	Detour Lake Project	End of Highway 652	Cochrane	P0L 1C0
1432	Enbridge Gas Inc.	Enbridge Gas Inc.	500 Consumers Road	North York	M2J 1P8