METHODOLOGY FOR THE DISTRIBUTION OF ONTARIO EMISSION ALLOWANCES FREE OF CHARGE

December 12, 2016

(This document amends and replaces the Methodology for the Distribution of Ontario Emission Allowances Free of Charge document dated May 16, 2016)

Ontario

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1.0 Introduction

This methodology document is incorporated by reference into the Cap and Trade Program regulation, O. Reg. 144/16 (reference to be added upon filing of the regulation) and should be read in conjunction with the rules and requirements in the Regulation, including the application eligibility requirements in s.85.

The applicant shall collect and quantify the information that is required in respect of an application under s. 86 of the Regulation using applicable methods that are consistent with methods set out in the Guideline (under the Reporting Regulation) and the requirements about those methods in the Reporting Regulation, where the information is not otherwise required to be reported in a 2015 EPA Report, a 2016 EPA Report or a report under the Reporting Regulation. The application form that will be available from the Ministry will provide direction to potential eligible applicants in respect of the Methods in this document.

Where the Methods in this document set out the specific name of a facility or a specific corporate owner or operator, what is most relevant to identifying the facility for the purpose of the Methods is the ID number of the facility and the location of the facility, where the location is set out in more detail in Table 7 in respect of a facility's ID number. This approach is intended to recognize that the ownership or the name of a facility may change.

1.1 Definitions

In this Methodology document,

"a facility with no access to natural gas" means a 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 for the supply of natural gas;

"biomass fuel" means biomass that is used as fuel at a facility;

"distributor" means a distributor, as defined in the Ontario Energy Board Act, 1998, S.O. c.26, Schedule B, that is licensed by the Ontario Energy Board under that Act;

"distribution system" has the same meaning as in the Ontario Energy Board Act, 1998, S.O. c.26, Schedule B;

"dolomite lime" means dolomite lime produced by a lime kiln at the facility;

"double burnt lime" means high density dolomite lime produced at the facility and used for production of refractory bricks;

"energy input" means the amount of energy that is generated from the combustion of fuels or other combustible material;

"grey cement" means clinker produced from a cement kiln at the facility, blended with limestone and gypsum at the facility;

"Guideline" has the same meaning as in the Reporting Regulation;

"high calcium lime" means high calcium lime produced by a lime kiln at the facility, excluding Cal 85.

"hydrogen produced" means hydrogen produced at the facility using steam hydrocarbon reforming, partial oxidation or other transformation of the hydrocarbon and does not include molecular hydrogen that is in the feedstock to a steam hydrocarbon reforming, partial oxidation or other transformation processes;

"IESO-controlled grid" means the transmission systems with respect to which, pursuant to agreements, the IESO has authority to direct operations;

"institution" means a facility that provides Educational Services as classified using Code 61 of the NAICS or Health Care and Social Assistance as classified using Code 62 of NAICS;

"t" means the year for which Ontario emission allowances are being distributed, which is the year after the year in which an application under section 85of the Regulation is made;

"t-2" means two years before the year for which Ontario emission allowances are being distributed;

"thermal energy sold" means useful thermal output from the district energy system at facility ID 1039 and at facility ID 1040;

"indirect useful thermal energy" means thermal energy that is used at one facility and generated at another;

"Regulation means The Cap and Trade Program regulation, O. Reg. 144/16, as amended from time to time, made under *The Climate Change Mitigation and Low-carbon Economy Act, 2016*;

"Reporting Regulation" means the Quantification, Reporting and Verification of Greenhouse Gas Emissions regulation, O. Reg. 143/16, as amended from time to time, made under *The Climate Change Mitigation and Low-carbon Economy Act, 2016*;

"Useful thermal output" means the thermal energy produced through cogeneration and used for a purpose other than electricity generation;

"white cement" means clinker produced from a cement kiln at the facility, blended with limestone and gypsum to produce white cement at the facility.

Where a term in this document is not defined, the definitions in the Reporting Regulation, the Guideline and the Regulation, as amended from time to time, apply.

2.0   Methods for Distributing Ontario Emission Allowances

Methods A through E set out in this document will be used by the Minister to determine the number of Ontario emission allowances that will be distributed free of charge by the Minister to eligible participants who are capped participants, in accordance with the Regulation. For greater certainty, the Minister may use more than one applicable Method to calculate the number of Ontario emission allowances.

The number of Ontario emission allowances that will be distributed by the Minister free of charge will be determined by the Minister as follows:

(a) A base number of Ontario emission allowances that is set out or that will be calculated under each of the Methods.

(b) A cap adjustment factor and the assistance factor will then be applied to the base number under each of the Methods except under Formula 2.2.1-2 in Section 2.2 of Method B, where only the assistance factor will be applied.

(c) The total number of Ontario emission allowances that will be distributed free of charge by the Minister under the Regulation for the year t will be determined by adding the sum of the results of the calculations in Methods A, B, C, D, E and F for the year t together with the production adjustment calculation made under Section 3.2.

2.1   Method A: Product Output Benchmark Method

Method A will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge by the Minister in accordance with the Regulation to eligible applicants who are capped participants in respect of:

(a) A facility engaged in a specified GHG activity or a component of a specified GHG activity set out in Column 1 of Table 1a that produces a product that is set out opposite that activity or component set out in Column 2 of the Table.

(b) A facility engaged in a specified GHG activity or a component of a specified GHG activity set out in Column 1 of Table 1b that uses a product that is set out opposite that activity or component in Column 2 of the Table.

(c) A facility engaged in a specified GHG activity or component of a specified GHG activity set out in Column 1 of Table 1c that has a process parameter that is set out opposite that activity or component set out in Column 2 of the Table.

2.1.1 Base Number – Product Output Benchmark

The base number of Ontario emission allowances under this Method is the number of allowances calculated for the year t for a facility before applying the cap adjustment factor and the assistance factor. The base number of Ontario emission allowances will be calculated in accordance with Formulae 2.1.1 – 1 and 2.1.1- 2 below:

$$B_{bpt} = \sum_{i}^{n} \left[Product_{i\_t-2} \times BM_{p\_i} \right]$$
Formula 2.1.1 – 1

$$B_{bct} = \sum_{i}^{n} \left[Product_{i\_t-2} \times BM_{c\_i} \right]$$
Formula 2.1.1 – 2

Where:

B_{bpt} = the base number of emission allowances for the year t under Method A in respect of a facility's fixed process emissions.

B_{bct} = the base number of emission allowances for the year t under Method A in respect of a facility's combustion emissions.

i = a product or process parameter that is set out in Column 2 of Tables 1a, 1b or 1c, where the product or process parameter is set out opposite the specified GHG activity or component of the activity in Column 1.

Product $_{i\_t-2}$ = the amount for the year t-2 of

(a) Product i produced if the product is set out n Column 2 of Table 1a,

(b) Product i used if the product is set out in Column 2 of Table 1b; or

(c) Process parameter i if the process parameter is set out in Column 2 of Table 1c.

BM_{p_i} = the benchmark for fixed process emissions i set out in Column 4 of Tables 1a and 1b and Column 3 of Table 1c for the product or process parameter i that is set out opposite the benchmark.

BM_{c_i} = the benchmark for combustion emissions set out in Column 5 of Tables 1a and 1b and Column 4 of Table 1c for product or process parameter i that is out opposite the benchmark.

2.1.2 Product Output Benchmark Method with the Cap Adjustment and the Assistance Factor

The cap adjustment and the assistance factor will be applied to the base number (Section 2.1.1) using the Formula 2.1.2 -1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{pbt} = AF_t \times \left(B_{bpt} \times C_{pt} + B_{bct} \times C_{at} \right)$$

Formula 2.1.2 – 1

Where:

A_{pbt} **=** the number of Ontario emission allowances under Method A for the year t after applying the cap adjustment factor and the assistance factor to the base number of Ontario emission allowances calculated under Section 2.1.1.

AF_t = the assistance factor for year t; AF_t is equal to 1 for each year in the first compliance period (2017-2020).

C_{pt} = the cap adjustment factor for year t for fixed process emissions is the number set out in Table 5 for that year.

C_{at} = the cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A.

B_{bpt} and B_{bct} are as defined in Section 2.1.1.

2.2 Method B: Energy Use Based Method

Subject to the rules set out in Section 2.2.2., Method B will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge in accordance with the Regulation to eligible applicants who are capped participants in respect of the energy used at the facility.

2.2.1 Base Number–Energy Use

The base number of Ontario emission allowances is the number of allowances calculated for the year t for a facility under this Method before applying the cap adjustment factor and the assistance factor. The base number of Ontario emission allowances in respect of energy use at a facility will be calculated by using Formula 2.2.1-1 and Formula 2.2.1-2.

$$B_{et} = (B_1 - B_2) + (B_3 - B_4)$$

Formula 2.2.1-1

$$B_{biot} = \sum_{i=1}^{n} \left(EI_{biomass\_i} \times EF_{biomass\_CH4\_i} \times 0.000021\right) + \left(EI_{biomass\_i} \times EI_{biomass\_N2O\_i} \times 0.000310\right)$$

Formula 2.2.1-2

Where:

B_{et} = the base number of Ontario emission allowances for the year t in respect of a facility's use of non-biomass fuels for a specified GHG activity or a component of a specified GHG activity.

B_{biot} = the base number of Ontario emission allowances for the year t in respect of a facility's methane and nitrous oxide emissions from the use of biomass fuel in a specified GHG activity or a component of a specified GHG activity.

$(B_1 - B_2)$ = The number of Ontario emission allowances in respect of a facility that has access to natural gas for the operation of combustion equipment minus Ontario emission allowances associated with electricity transferred to the IESO-controlled grid or to a distribution system of a distributor.

$(B_3 - B_4)$ = The number of Ontario emission allowances in respect of a facility that has no access to natural gas for the operation of combustion equipment minus Ontario emission allowances associated with electricity transferred to the IESO-controlled grid or to a distribution system of a distributor.

$EI_{biomass\_i}$ = the total amount of energy input from biomass fuel i used at the facility in a specified GHG activity or a component of a specified GHG activity in year t-2 expressed in GJ.

$EF_{biomass\_CH4\_i}$ = the default CH_4 emission factor for the biomass fuel i used at the facility in a specified GHG activity or a component of a specified GHG activity in the

year t-2, expressed as g per GJ for the fuel type set out in Tables 20-2 and 20-7 of the Guideline (Reporting Regulation).

EF$_{biomass\_N2O\_i}$ = the default N_2O emission factor for the biomass fuel i used at the facility in a specified GHG activity or a component of a specified GHG activity in year t-2 expressed as g per GJ for the fuel type set out in the Tables 20-2 and 20-7 in the Guideline (Reporting Regulation).

The amounts for B_1 through B_4 are calculated as follows:

2.2.1.1　　　B_1 Calculated

$$B_1 = \left(EI_{total\_t-2} \times EF_{NG}\right)$$

Formula 2.2.1-3

Where:

EI_{total_t-2} is

(a) 0 if the facility has no access to natural gas; or
(b) if the facility has access to natural gas, the amount of energy input used in year t-2 in a specified GHG activity or a component of a specified GHG activity at the facility, expressed in GJ, and excluding energy input from biomass fuel.

EF$_{NG}$ = 0.049317

2.2.1.2　　　B_2 Calculated

$$B_2 = \left(EI_{BMG\_t-2} \times EF_{NG}\right) \times \frac{\left(Elec_{sold\_t-2} \times CF\right)}{\left(E_{heat\_t-2} + Elec_{gen\_t-2} \times CF\right)}$$

Formula 2.2.1-4

Where:

EI_{BMG_t-2} is

a) 0 if the facility has no access to natural gas; or,

b) if the facility has access to natural gas, the amount of energy input used in year t-2 in electricity generation at the facility, expressed in GJ, and excluding energy input from biomass fuel.

Elec$_{sold\_t-2}$ = total electricity generated at a facility from the combustion of fuels, as measured by a revenue grade or equivalent meter, expressed in MWh and transmitted to the IESO controlled grid or to a distribution system of a distributor.

CF = 3.6

Elec$_{gen\_t-2}$ = Electricity generated at the facility from combustion of fuel at the facility in the year t-2 expressed in MWh.

E$_{heat\_t-2}$ = Total useful thermal output from cogeneration at the facility in the year t-2, expressed in GJ.

2.2.1.3   B₃ Calculations

$$B_3 = \sum_{i=1}^{n} \left[\left(EI_{total\_no\_gas\_t-2} \right)_i \times \left(EF_{CO2\_i} \times 0.001 + EF_{CH4\_i} \times 0.000021 + EF_{N2O\_i} \times 0.000310 \right) \right]$$

Formula 2.2.1-5

Where:

EI$_{total\_no-gas\_i\_t-2}$ is

a)   0 if the facility has access to natural gas; or,
b)   if the facility does not have access to natural gas, the amount of energy input from fuel i (i=1, 2…n), expressed in GJ, used in a specified GHG activity or a component of a specified GHG activity and excluding energy input from biomass fuel at the facility in year t-2.

EF$_{CO2\_i}$ = the default CO_2 emission factor for the fuel i used at the facility expressed as kg per GJ, and set out in Tables 20-1a, 20-2, 20-5 and 20-7 in the Guideline (Reporting Regulation) for the fuel type.

EF$_{CH4\_i}$ = the default CH_4 emission factor for the fuel i, expressed as g per GJ, set out in Tables 20-2, 20-6* and 20-7 in the Guideline (Reporting Regulation) for the fuel type. (*where the fuel i is set out in Table 20-6 (coal), refer to Table 20-1 to convert to g/GJ (HHV for fuels listed in Table 20-6).

EF_{N2O_i} = the default N_2O emission factor for the fuel i used at the facility, expressed as g per GJ, set out in Tables 20-2, 20-6* and 20-7 in the Guideline (Reporting Regulation) for the fuel type. (*where the fuel i is set out in Table 20-6 (coal), refer to Table 20-1 to convert to g/GJ (HHV for fuels listed in Table 20-6).

0.001 = CO_2 GWP divided by 10^3.

0.000021 = CH_4 GWP divided by 10^6.

0.000310 = N_2O GWP divided by 10^6.

2.2.1.4 B_4 Calculation

Formula 2.2.1-6

$$B_4 = \sum_{i=1}^{n} \left[\left(EI_{BMG\_no\_gas\_i\_t-2}\right) \times \left(EF_{CO2\_i} \times 0.001 + EF_{CH4\_i} \times 0.000021 + EF_{N2O\_i} \right. \right.$$
$$\left. \left. \times 0.000310\right) \times \left(\frac{Elec_{sold\_t-2} \times CF}{\left(E_{heat\_t-2} + Elec_{gen\_t-2} \times CF\right)}\right) \right]$$

Where:

$EI_{BMG\_no\_gas\_i\_t-2}$ is

a) 0 if the facility has access to natural gas; or,
b) If the facility does not have access to natural gas, the amount of energy input used in year t-2 in electricity generation at the facility, expressed in GJ, and excluding energy input from biomass fuel.

2.2.2 Energy Input Limitation Rules

The following are excluded from the calculation of the number of Ontario emission allowances for distribution for the year t for a facility under Method B:

(a) The energy input from the use of the following fuels:

(1) Coal used in a coke oven to produce coke.

(2) Coal, coke and other carbon material charged into the blast furnace as a reductant.

(3) Coke oven gas and blast furnace gas and basic oxygen furnace gas used in a specified GHG activity or component of a specified GHG activity.

(4) Coal or coke or other carbon material charged into the electric arc furnace or natural gas used for shell cooling in a basic oxygen furnace or electric arc furnace.

(b) The energy input from fuels used in the following activities:

(1) Item 12 of Schedule 2 of the Reporting Regulation – Hydrogen Production.

(2) Item 21 of Schedule 2 of the Reporting Regulation - Petroleum Refining.

(3) Item 25 of Schedule 2 of the Reporting Regulation – Refinery Fuel Gas Use.

(c) The energy input from fuels used at the following facilities:

(1) A facility producing grey cement or beer.

(2) A facility set out in Table 3.

(3) A facility set out in Table 4a, or 4c.

(4) A facility that is an institution.

(5) A facility whose primary activity is incineration of municipal or hazardous waste as those wastes are defined in O. Reg. 347 made under the *Environmental Protection Act*, R.S.O. 1990, c-19*.*

(d) The energy input from fuels used at the following facilities:

(1) A facility set out in Table 2a or 2b subject to the following exceptions with respect to fuel use:

(i) The facility with the ID number 1137 identified in Table 2a, other than the facility's use of natural gas in the specified GHG activities of ammonia production and nitric acid production.

(ii) The facility with the ID number 1042 identified in Table 2a, other than fuel that is used at the facility, provided that the fuel is not a fuel set out in paragraph a of Section 2.2.2 for producing:

(A) products set out in Column 2 of Table 1a; or

(B) products set out in Column 4 of Table 2a.

2.2.3 Energy Use Based Method with the Cap Adjustment and the Assistance Factor

The cap adjustment and the assistance factor will be applied to the base number (Section 2.2.1) using Formula 2.2.3-1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{et} = AF_t[(B_{et} \times C_{at}) + B_{biot}]$$ **Formula 2.2.3 -1**

Where:

A_{et} = the number of Ontario emission allowances in respect of the facility for the year t under the energy use method after applying the cap adjustment factor and the assistance factor to the base number of Ontario emission allowances calculated under Section 2.2.1.

AF_t = the assistance factor for year t; AF_t is equal to 1 for each year in the first compliance period (2017-2020).

C_{at} = the cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A.

B_{et} and B_{biot} are as defined in Section 2.2.1.

2.3 Method C: History Based Method

Method C includes the following two sub-methods that will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge in accordance with the Regulation to eligible applicants who are capped participants:

(a) The Historical absolute emissions based Method under Section 2.3.1 (Method C1): This Method will only be applied to facilities described in Table 3.

(b) The Historical emissions intensity based Method under Section 2.3.2 (Method C2): This Method will only be applied to facilities described in Table 2a or 2b.

2.3.1 Method C1 - Base Number– Historical Absolute

The base number of Ontario emission allowances under this Method for the year t for a facility is the number in Table 3 set out opposite the facility, before applying the cap adjustment factor and the assistance factor.

B_{hpt} is the base number of Ontario emission allowances for year t for a facility in respect of the fixed process emission at the facility and is set out in Column 4 of Table 3, opposite the description of the facility.

B_{hct} is the base number of emission allowances for year t for a facility in respect of combustion emission at the facility and is set out in Column 5 of Table 3, opposite the description of the facility.

2.3.2   Method C2 - Base Number– Historical Emissions Intensity

The base number of Ontario emission allowances is the number of allowances calculated for the year t for a facility under this Method before applying the cap adjustment factor and the assistance factor. The base number of Ontario emission allowances for fixed process emission under Method C2 for a facility described in Table 2 a or 2b for year t, will be calculated using the following formulae. The base number for a facility will be calculated in relation to the years set out in Column 6 set out opposite the facility. The formulae do not apply where there are no years set out for the facility in Column 6 of Table 2a or b.

$$B_{hpit} = \sum_i^n \left[Product_{i\_t-2} \times EI_{p\_i} \right]$$

Formula 2.3.2 -1

Where:

B_{hpit} = the base number of Ontario emission allowances for year t under Method C2 in respect of a facility's fixed process emissions.

$Product_{i\_t-2}$ = the amount for the year t-2 of

(a) product i produced if the product is set out in Column 4 of Table 2 a, opposite the description of the facility, or

(b) process parameter i if the process parameter is set out in Column 4 of Table 2b, opposite the description of the facility.

EI_{p_i} = historical fixed process emissions intensity shall be determined by the Minister by applying the following formula

$$EI_{p\_i} = \frac{\sum_j^n E_{fp\_ij}}{\sum_j^n Product_{ij}}$$

Formula 2.3.2 -2

Where:

E_{fp_ij} is the fixed process emissions for product i for the year j specified in Column 6 of Table 2a or 2b of the Method and set out opposite the description of facility and the specified GHG activity or component of the specified GHG activity.

The fixed process emissions for each of the years specified in Column 6 of Table 2a or 2b is the number of fixed process emissions determined by the

Minister based on the emissions information provided to the Ministry before the Regulation is filed by the owner or operator or a previous owner or operator

Product $_{ij}$ is the:

(a) total amount of the product i set out Column 4 of Table 2a that was produced at the facility for the year j specified in Column 6 of Table 2a and set out opposite each of the facility described in Column 1; or

(b) total amount of the process parameter i set out in Column 4 of Table 2b for the year j specified in Column 6 of Table 2b, set out opposite the description of the facility in Column 1.

> The amount of product or process parameter i for each of the years specified in Column 6 of Table 2a or 2b is the amount determined by the Minister based on the production or process parameter information provided to the Ministry before the Regulation is filed by the owner or operator or a previous owner or operator.

The base number of Ontario emission allowances for a facility for year t for combustion emissions under Method C2 shall be calculated according to the formula below:

$$B_{hcit} = \sum_{i}^{n} \left[Product_{i\_t-2} \times EI_{c\_i} \right]$$

Formula 2.3.2-3

Where:

B$_{hcit}$ = the base number of Ontario emission allowances for the year t under Method C2 in respect of a facility's combustion emissions.

Product$_{i\_t-2}$ = the amount for the year t-2 of

(a) product i produced if the product is set out in Column 4 of Table 2a set out opposite the description of the facility, or

(b) process parameter i if the process parameter is set out in Column 4 of Table 2b, set out opposite the description of the facility.

EI$_{c\_i}$ = historical combustion emissions intensity shall be determined by the Minister by applying the following formula.

$$EI_{c\_i} = \frac{(\sum_j^n E_{c\_ij})}{\sum_j^n Product_{ij}}$$

Formula 2.3.2-4

Where:

E_{c_ij} is the combustion emissions of the product i for the year j set out in Column 7 of Table 2a or 2b of the Method set out opposite the description of the facility and the specified GHG activity or component of the specified GHG activity.

The combustion emissions for each of the years specified in Column 7 of Table 2a or 2b is the amount of combustion emissions determined by the Minister, based on emissions information before the Regulation is filed provided by the owner or operator or a previous owner or operator to the Ministry.

Product$_{ij}$ is the:

(a)   total amount of the product i set out in Column 4 of Table 2a that was produced in the year j specified in Column 7 of Table 2a set out opposite the description of the facility; or

(b)   total amount of the process parameter i set out in Column 4 of Table 2b for the year j specified in Column 7 of Table 2b set out opposite the description of the facility.

The amount of product or process parameter i for each of the years specified in Column 7 of Table 2a or 2b is the amount determined by the Minister based on the production or process parameter information provided to the Ministry before the Regulation is filed by the owner or operator or a previous owner or operator.

2.3.3   History Based Method with the Cap Adjustment and the Assistance Factor

The cap adjustment and the assistance factor will be applied to the base number (Sections 2.3.1 and 2.3.2) using Formula 2.3.3-1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{ht} = AF_t \times \left[(B_{hpt} + B_{hpit}) \times C_{pt} + (B_{hct} + B_{hcit}) \times C_{at} \right]$$

Formula 2.3.3-1

Where:

A$_{ht}$ **=** the number of Ontario emission allowances under Method C for the year t after applying the cap adjustment factor and the assistance factor to the base number of Ontario emission allowances calculated under Sections 2.3.1 and 2.3.2.

AF$_t$ = the assistance factor for year t; AF$_t$ is equal to 1 for each year in the first compliance period (2017-2020).

C$_{at}$ = the cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A.

C$_{pt}$ = the cap adjustment factor for year t for fixed process emissions is the number set out in Table 5 for the year t.

B$_{hpt}$ and **B**$_{hct}$ are as defined in Section 2.3.1.

B$_{hpit}$ and **B**$_{hcit}$ are as defined in Section 2.3.2.

2.4   Method D – Direct Method

Method D will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge in accordance with the Regulation to eligible applicants who are capped participants in respect of the following facilities:

(a) A facility that is set out in Table 4a or 4b or 4c; or

(b) A facility that is not set out in Table 4a or 4b or 4c and that meets one of the following criteria:

> (1) The facility is an institution; or

> (2) The facility whose primary activity is incineration of municipal or hazardous waste, as those wastes are defined in O. Reg. 347 made under the under the *Environmental Protection Act.* R.S.O. 1990, c.E-19.

2.4.1   Base Number – Direct Method D

The base number of Ontario emission allowances for the year t for a facility under this Method before applying the cap adjustment factor and the assistance factor is set out below:

B$_{dct}$ is the base number of Ontario emission allowances for a facility for year t under Method D for combustion emissions, excluding CO_2 emissions from biomass fuel use, and is one of the following:

B$_{dct}$ is

(a) the combustion emissions for year t-2 for the product iron coated lime, excluding CO_2 emissions from biomass fuel use, set out in Column 3 of Table 4a for the facility ID 1021 identified in Table 4a.;

(b) for any other facility set out in Table 4a, facility emissions, excluding CO_2 emissions from biomass fuel use, described in Column 3 of Table 4a for year t-2; or,

(c) for any other facility not set out in the table 4a, 4b or 4c and described in paragraph b of Section 2.4 facility emissions, excluding CO_2 emissions from biomass fuel use, as reported and verified for year t-2 with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.

B$_{dnft}$ = process emissions (non-fixed) for nitric acid production as described in Column 3 of Table 4b for the year t-2 for the facility described opposite.

B$_{dpt}$ = the fixed process emissions for iron coated lime production described in Column 3 of Table 4c for the year t-2 for the facility described opposite.

2.4.2 Direct Method with the Cap Adjustment and the Assistance Factor

The cap adjustment and the assistance factor will be applied to the base number (Section 2.4.1) using Formula 2.4.2.-1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{dt} = AF_t\left(B_{dct} \times C_{cdt} + B_{dpt} \times C_{pt} + B_{dnft} \times C_{cdt}\right)$$ **Formula 2.4.2-1**

A$_{dt}$ = the number of Ontario emission allowances under Method D in respect of a facility for the year t after applying the cap adjustment factor and the assistance factor to the base number of Ontario emission allowances calculated under Section 2.4.1.

AF$_t$ = the assistance factor for year t; AF_t is equal to 1 for each year in the first compliance period (2017-2020).

C$_{cdt}$ is one of the following:

a) 1 if the facility is:

(1) Identified in Table 4a, excluding the facilities identified as ID 1021 or 1029;

(2) An institution; or,

(3) A facility whose primary activity is incineration of municipal or hazardous waste as those wastes are defined in O. Reg. 347 under the *Environmental Protection Act,* R.S.O., 1990, c.E-19; and that generates electricity.

b) The cap adjustment factor for year t with adjustment based on biomass fuel use calculated by applying the formula in Schedule A, for all other facilities.

C_{pt} = the cap adjustment Factor for year t for fixed process emissions is the number set out in Table 5 for year t.

B_{dct}, B_{dnft} and B_{dpt} are as defined in Section 2.4.1.

2.5 Method E: Indirect Useful Thermal Energy Method

Method E will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge in accordance with the Regulation to eligible applicants who are capped participants in respect of indirect useful thermal energy. .

2.5.1 Base Number – Indirect Useful Thermal Energy

The base number of Ontario emission allowances is the number of Ontario allowances calculated for the year t for a facility under this Method before applying the cap adjustment factor and the assistance factor. The base number of Ontario emission allowances for a facility for the year t will be calculated under Method E as follows:

$$B_{iute} = Heat_{imported\_t-2} \times NBF_{import\_t-2} \times EF_{NGB}$$

Formula 2.5.1-1

Where:

B_{iute} = the base number of Ontario emission allowances for the year t in respect of a facility that uses useful thermal energy that is generated at another facility

$Heat_{imported\_t-2}$ = the amount of useful thermal energy used at the facility but generated at another facility in year t-2, expressed in GJs. $NBF_{imported\ t-2}$ = the non-biomass fraction of energy input into combustion equipment at the facility that generates the useful thermal energy under $Heat_{imported\_t-2}$ calculated by dividing the GJs of non-biomass fuel used, by the total GJs of all fuels used in the combustion equipment at the facility.

EF_{NGB} = 0.061646.

2.5.2 Indirect Useful Thermal Energy Method with the Cap Adjustment and the Assistance Factor

A cap adjustment and an assistance factor will be applied to the base number (Section 2.5.1) using Formula 2.5.2-1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{it} = AF_t \times B_{iute} \times C_{it}$$

Formula 2.5.2-1

Where:

B_{iute} is as defined in Section 2.5.1

C_{it} is one of the following:

a) 1 if the facility is

  (1) an institution; or

  (2) The facility whose primary activity is incineration of municipal or hazardous waste, as those wastes are defined in O. Reg. 347 made under the under the *Environmental Protection Act*. R.S.O. 1990, c.E-19 and generates electricity

    OR

b) the cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A for facilities that are not a facility described in a).

AF_t = the assistance factor for year t; AF_t is equal to 1 for each year in the first compliance period (2017-2020).

2.5.3 Limitation Rule

Method E does not apply to a facility that receives and uses useful thermal energy from another facility that is eligible to receive Ontario emission allowances under another method for that useful thermal energy.

2.6 Method F: Bilateral Electricity

Method F will be used by the Minister in the determination of the number of Ontario emission allowances that will be distributed free of charge in accordance with the Regulation to eligible applicants who are capped participants, in respect of facilities that purchase electricity from a facility that is generating electricity, and the electricity is not:

- transferred from the IESO controlled grid; or
- transferred from a distribution system of a distributor.

2.6.1 Base Number – Bilateral Electricity

The base number of Ontario emission allowances is the number of Ontario emission allowances calculated for the year t for a facility under this Method before applying the cap adjustment factor and the assistance factor. The base number of Ontario emission allowances for a facility for the year t will be calculated under Method F as follows:

$$B_{bet} = Elec_{bilateral\_t-2} \times EF_{bilateral\_t-2} \times NBF_{bilateral\_t-2}$$

Formula 2.6.1-1

Where:

$Elec_{bilateral\_t-2}$= Electricity generated, from the combustion of fuel and purchased from a facility generating electricity, where the amount of electricity purchased has been measured by a revenue grade or equivalent meter and is expressed in MWh and that is not transferred from the IESO controlled grid or from a distribution system of a distributor.

$EF_{bilateral\_t-2}$ = 0.2219

$NBF_{bilateral\_t-2}$ = the non-biomass fraction of energy input into electricity generation at a facility that supplies electricity under $Elec_{bilateral}$ from fuel used in the year t-2 at that facility, calculated by dividing the gigajoules of non-biomass fuel by the total gigajoules of all fuels used in electricity generation.

2.6.2 Bilateral Electricity Method with the Cap Adjustment and the Assistance Factor

A cap adjustment and an assistance factor will be applied to the base number (Section 2.6.1) using Formula 2.6.2-1 set out below in order to calculate the number of Ontario emission allowances in respect of a facility for the year t under this Method.

$$A_{bet} = AF_t \times B_{bet} \times C_{bet}$$

Formula 2.6.2-1

Where:

B_{bet} is as defined in Section 2.6.1.

C_{bet} is one of the following:

a) 1 if the facility is

    (1) an institution; or

    (2) the facility whose primary activity is incineration of municipal or hazardous waste, as those wastes are defined in O. Reg. 347 made under the under the *Environmental Protection Act.* R.S.O. 1990, c.E-19 and generates electricity.

OR,

b) the cap adjustment factor for year t with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A if the facility is not a facility described in a).

AF_t = the assistance factor for year t; AF_t is equal to 1 for each year in the first compliance period (2017-2020).

2.6.3 Limitation Rule

Method F does not apply to a facility that purchases electricity from a facility that is generating electricity, and the facility that is generating the electricity is eligible to receive Ontario emission allowances under another method for generation of that electricity.

3.0 Determining Total Number of Allowances to be Distributed

The total number of Ontario emission allowances to be distributed free of charge by the Minister under the Regulation for the year t will be determined by adding:

(a) the sum of the results of the calculations made under the applicable Methods A, B, C, D, E and F for the year t; and

(b) the production adjustment calculation made under Section 3.2 for the year t.

3.1 Sum of the Results of Methods A, B, C, D, E and F (Without Production Adjustment)

The sum of the results of the calculations of Methods A, B, C, D, E and F is determined by the following:

$$A_t = A_{pbt} + A_{et} + A_{ht} + A_{dt} + A_{it} + A_{bet}$$

Formula 3.1-1

Where:

A$_t$ = The number of Ontario emission allowances for the year t based on applying the applicable methods A, B, C, D, E and F without the production adjustment.

A$_{pbt}$, **A**$_{et}$, **A**$_{ht}$, **A**$_{dt}$, **A**$_{it}$ and **A**$_{bet}$ are as defined in Sections 2.1.2, 2.2.3, 2.3.3, 2.4.2 2.5.2 and 2.6.2 respectively.

3.2   Production Adjustment (B$_{adj\_t}$)

The production adjustment, **B**$_{adj\_t}$ will be calculated using the Formula 3.2-1.

Formula 3.2-1 does not apply to a facility described in Table 3.

For all other facilities, Formula 3.2-1 will only apply to applications under s. 85 of the Regulation beginning in 2018, where t is 2019 or later.

General Rule:

Formula 3.2-1 applies to applications for allowances to be distributed for free under s. 85 of the Regulation if allowances were distributed to the applicant free of charge in the year t-2.

One time Exception:

Applicants to whom s. 31.1 of the Regulation applies may also use formula 3.2-1 even if allowances were not distributed to them free of charge in 2017. (i.e. this exception only applies to applicants to whom s. 31.1 applies where t=2019).

$$B_{adj_t} = AF_{t-2} \times [(B_{bpt} + B_{hpit} + B_{dpt}) \times C_{p_{t-2}} + (B_{bct} + B_{hcit} + B_{et} +) \times C_{a_{t-2}} + (B_{dct} + B_{dnft})$$
$$\times C_{cd_{t-2}}) + (B_{bet} \times C_{be_{t-2}}) + (B_{iute} \times C_{i_{t-2}}) + B_{biot}] - A_{t-2}$$

Formula 3.2-1

Where:

B$_{adj\_t}$ = production adjustment of Ontario emission allowances for the year "t" for the facility calculated using Formula 3.2-1.

AF$_{t-2}$ = the assistance factor for year t-2; AF$_{t-2}$ is equal to 1 for the years t-2 (2017 to 2020).

C$_{p\_t-2}$ = the cap adjustment factor for year t-2 for fixed process emissions is the number set out in Table 5 for the year t-2.

C$_{a\_t-2}$ = the cap adjustment factor for year t-2 with adjustment based on biomass fuel use as calculated by applying the formula in Schedule A.

C$_{cd\_t-2}$ = the cap adjustment factor for combustion emissions under Method D for the year t-2 as calculated under Section 2.4.2.

C$_{it\_t-2}$ = the cap adjustment factor for combustion emissions under Method E for the year t-2 as calculated under Section 2.5.2.

C$_{be\_t-2}$ = the cap adjustment factor for combustion emissions under Method F for the year t-2 as calculated under Section 2.6.2.

A$_{t-2}$ = the number of Ontario emission allowances determined for the year t-2 under Section 3.1.

B$_{bpt}$ and **B$_{bct}$** are as defined in Section 2.1.1.

B$_{et}$ and **B$_{biot}$** are as defined in Section 2.2.1.

B$_{hpit}$ and **B$_{hcit}$** are as defined in Section 2.3.2.

B$_{dpt}$, **B$_{dnft}$** and **B$_{dct}$** are as defined in Section 2.4.1.

B$_{iute}$ is as defined in Section 2.5.1.

B$_{bet}$ is as defined in Section 2.6.1.

3.3   Total Number of Ontario Emission Allowances to be Distributed

The total number of Ontario emission allowances that will be distributed by the Minister free of charge to a facility in accordance with the Regulation for the year t will be determined as follows:

$$A_{pt} = A_t + B_{adj\_t}$$

Formula 3.3-1

Where:

A_{pt} = the total number of Ontario emission allowances that will be distributed free of charge for the year t to the facility. A_{pt} will be rounded down to the nearest whole number.

B_{adj_t}= total production adjustment for the facility for the year t calculated according to formula 3.3-1.

A_t is determined according to the Formula 3.1-1.

Table 1a: Method A - Product Output Benchmarks for Product Produced

Item	Column 1 Specified GHG activity or component of a specified GHG activity	Column 2 Product produced	Column 3 Product produced units	Column 4 Benchmark for fixed process emissions (BM_{p_i})	Column 5 Benchmark for combustion emissions (BM_{c_i})	Column 6 Benchmark units
1	Cement production -grey cement Production	Grey cement	Tonnes	0.487	0.316	Emission allowances per tonne of grey cement produced
2	General stationary combustion - beer production	Beer	Hundred Litres	0	0.007	Emission allowances per hundred litres of beer produced
3	Hydrogen production	Hydrogen	Tonnes	5.5	4.15	Emission allowances per tonne of hydrogen produced
4	Iron and steel production	Liquid iron	Tonnes	1.034	0.396	Emission allowances per tonne of liquid iron produced
5	Iron and steel production	BOF steel	Tonnes	0.147	0	Emission allowances per tonne of BOF Steel produced
6	Iron and steel production	EAF steel	Tonnes	0.067	0	Emission allowances per tonne of EAF Steel produced
7	Iron and steel production	Coke	Tonnes	0	0.522	Emission allowances per tonne of coke produced

Table 1b: Method A - Product Output Benchmarks for Product Used

Item	Column 1 Activity and sub-activity	Column 2 Product used	Column 3 Product produced units	Column 4 Benchmark for fixed process emissions (BM_{p_i})	Column 5 Benchmark for combustion emissions (BM_{c_i})	Column 6 Benchmark units
1	Iron and steel production	Limestone	Tonnes	0.44	0	Emission allowances per tonne of limestone used
2	Iron and steel production	Dolomite	Tonnes	0.48	0	Emission allowances per tonne of dolomite used

Table 1c: Method A - Product Output Benchmarks for Process Parameter

Item	Column 1 Activity and Sub-activity	Column 2 Process parameter	Column 3 Benchmark for Fixed Process Emissions (BM_{p_i})	Column 4 Benchmark for Combustion Emissions (BM_{c_i})	Column 5 Benchmark Units
1	Petroleum refining	CAN-CWB	0	0.0047	Emission allowances per Complexity-Weighted Barrel

Table 2a: Method C - Historical Facility Emissions Intensity for Product Produced

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1017	Cabot Canada Limited - Cabot Canada Limited	Sarnia	Petrochemical production - carbon black production	Carbon black	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of carbon black produced
1018	Canadian Gypsum Company - CGC Hagersville Plant	Hagersville	General stationary combustion	Gypsum panel	MSF (Thousand square feet)	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per MSF gypsum panel produced
1020	Carmeuse Lime Canada - Beachville Operation	Ingersoll	Lime production - high calcium lime production	High calcium lime	Tonnes	Historical 2010-2012 (inclusive) high calcium lime process emissions intensity	Historical 2010-2012 (inclusive) high calcium lime combustion emissions intensity.	Emission allowances per tonne of high calcium produced
1021	Carmeuse Lime Canada - Dundas Operations	Dundas	Lime production - dolomite lime production	Dolomite lime	Tonnes	Historical 2010-2012 (inclusive) dolomite lime process emissions intensity	Historical 2010-2012 (inclusive) dolomite lime combustion emissions intensity.	Emission allowances per tonne of dolomite lime produced
1021	Carmeuse Lime Canada - Dundas Operations	Dundas	Lime production	Double burnt lime	Tonnes	Historical 2010-2012 (inclusive) double burnt lime process emissions intensity	Historical 2010-2012 (inclusive) double burnt lime combustion emissions intensity.	Emission allowances per tonne of double burnt lime produced
1022	Carmeuse Lime Canada - Northern Lime Limited	Blind River	Lime production - high calcium lime production	High calcium lime	Tonnes	Historical 2010-2012 (inclusive) high calcium lime process emissions intensity	Historical 2010-2012 (inclusive) high calcium lime combustion emissions intensity.	Emission allowances per tonne of high calcium lime produced

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1024	CertainTeed Gypsum Canada, Inc. - Toronto Board Plant	Mississauga	General stationary combustion	Gypsum panel	MSF (Thousand square feet)	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per MSF gypsum panel produced
1030	Columbian Chemicals Canada Ltd. - Hamilton	Hamilton	Petrochemical production - carbon black production	Carbon black	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of carbon black produced
1039	Enwave Energy Corporation - Pearl Street Steam Plant	Toronto	General stationary combustion	Useful thermal energy sold	GJ	Not applicable	Historical 2010-2014 (inclusive) general stationary combustion emissions intensity of the Walton St., Pearl St. and Queen's Park Enwave Steam Plants	Emission allowances per GJ of useful thermal energy sold
1040	Enwave Energy Corporation - Walton Street Steam Plant	Toronto	General stationary combustion	Useful thermal energy sold	GJ	Not applicable	Historical 2010-2014 (inclusive) general stationary combustion emissions intensity of the Walton St., Pearl St. and Queen's Park Enwave Steam Plants.	Emission allowances per GJ of useful thermal energy sold
1042	Essar Steel Algoma Inc. - Essar Steel Algoma Inc.	Sault Ste. Marie	Lime production - high calcium lime production	High calcium lime	Tonnes	Historical 2010-2012 (inclusive) high calcium lime process emissions intensity	Historical 2010-2012 (inclusive) high calcium lime combustion emissions intensity.	Emission allowances per tonne of high calcium lime produced
1042	Essar Steel Algoma Inc. - Essar Steel Algoma Inc.	Sault Ste. Marie	Lime production - dolomite lime production	Dolomite lime	Tonnes	Historical 2010-2012 (inclusive) dolomite lime process emissions intensity	Historical 2010-2012 (inclusive) dolomite lime combustion emissions intensity.	Emission allowances per tonne of dolomite lime produced

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1045	Federal White Cement Ltd. - Woodstock Plant	Woodstock	Cement production	White cement	Tonnes	Historical 2010-2012 (inclusive) white cement process emissions intensity	Historical 2010-2012 (inclusive) white cement combustion emissions intensity.	Emission allowances per tonne of white cement
1054	Gerdau Ameristeel Corporation - Cambridge Mill	Cambridge	General stationary combustion	EAF steel	Tonnes	Not applicable	Historical 2010-2014 (inclusive) EAF steel combustion emissions intensity.	Emission allowances per tonne of EAF steel
1054	Gerdau Ameristeel Corporation - Cambridge Mill	Cambridge	General stationary combustion	Hot rolled steel	Tonnes	Not applicable	Historical 2013-2014 (inclusive) hot rolled steel combustion emissions intensity.	Emission allowances per tonne of hot rolled steel
1055	Gerdau Ameristeel Corporation - Whitby Mill	Whitby	General stationary combustion	EAF steel	Tonnes	Not applicable	Historical 2010-2014 (inclusive) EAF steel combustion emissions intensity.	Emission allowances per tonne of EAF steel
1055	Gerdau Ameristeel Corporation - Whitby Mill	Whitby	General stationary combustion	Hot rolled steel	Tonnes	Not applicable	Historical 2010-2014 (inclusive) hot rolled steel combustion emissions intensity.	Emission allowances per tonne of hot rolled steel
1060	Greenfield Specialty Alcohols Inc. - Chatham Plant	Chatham	General Stationary Combustion - Industrial Ethanol	Fuel ethanol	LABS (liter of absolute alcohol)	Not applicable	Historical 2010-2014 (inclusive) intensity based on combustion emissions for fuel ethanol.	Emission allowances per LABS of fuel ethanol
1060	Greenfield Specialty Alcohols Inc. - Chatham Plant	Chatham	General Stationary Combustion - Industrial Ethanol	Industrial ethanol	LABS (liter of absolute alcohol)	Not applicable	Historical 2010-2014 (inclusive) intensity based on general stationary combustion and electricity generation emissions excluding emissions for fuel ethanol.	Emission allowances per LABS of industrial ethanol

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1163	Greenfield Specialty Alcohols Inc. - Tiverton Plant	Tiverton	General stationary Combustion – Total ethanol Production	Total ethanol	LABS (liter of absolute alcohol)	Not applicable	Historical 2011-2014 (inclusive) general stationary combustion emissions excluding emissions for generation of steam sold.	Emission allowances per LABS of industrial ethanol.
1073	Imperial Oil - Sarnia Chemical Plant	Sarnia	Petrochemical production - all chemicals from ethylene cracking unit	All chemicals from ethylene cracking unit	Tonnes	Not applicable	Historical 2010 – 2013 ethylene cracking unit emissions intensity.	Emission allowances per tonne of all chemicals produced from the ethylene cracking unit
1073	Imperial Oil - Sarnia Chemical Plant	Sarnia	Petrochemical production - all chemicals other than those produced from the ethylene cracking unit	Chemicals other than those produced from the ethylene cracking unit	Tonnes	Not applicable	Historical 2010 – 2013 emissions intensity excluding the emissions from the ethylene cracking unit.	Emission allowances per tonne of chemicals other than those produced from the ethylene cracking unit
1084	Ivaco Rolling Mills (2004) L.P. - Ivaco Rolling Mills	L'Orignal	General stationary combustion	EAF steel	Tonnes	Not applicable	Historical 2010-2014 (inclusive) EAF steel combustion emissions intensity.	Emission allowances per tonne of EAF steel
1084	Ivaco Rolling Mills (2004) L.P. - Ivaco Rolling Mills	L'Orignal	General stationary combustion	Hot rolled steel	Tonnes	Not applicable	Historical 2010-2014 (inclusive) hot rolled steel combustion emissions intensity.	Emission allowances per tonne of hot rolled steel

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1169	Magellan Aerospace Limited - Haley Industries Limited	Haley	Magnesium production	Melted magnesium alloy	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of melted magnesium alloy produced
1100	NOVA Chemicals (Canada) Ltd. - Corunna Site	Corunna	Petrochemical production - ethylene production	Ethylene	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of ethylene produced
1101	NOVA Chemicals (Canada) Ltd. - Moore Township Site	Mooretown	Petrochemical production - polyethylene	Polyethylene	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of polyethylene produced
1102	NOVA Chemicals (Canada) Ltd. - St. Clair River Site	Corunna	Petrochemical production - polyethylene production	Polyethylene	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of polyethylene produced
1103	O-I Canada Corp. - Plant #31 Brampton	Brampton	Glass production	Glass bottles and jars	Tonnes	Historical 2010-2013 (inclusive) glass production process emissions intensity	Historical 2010-2013 (inclusive) combustion emissions intensity.	Emission allowances per tonne of glass bottles and jars produced
1118	Redpath Sugar Ltd - Toronto Refinery	Toronto	General stationary combustion	Raw sugar	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of raw sugar produced

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Product produced	Column 5 Product produced units	Column 6 Historical fixed process emissions intensity (EI_{p_i})	Column 7 Historical combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1132	Styrolution Canada Ltd. - Sarnia Site	Sarnia	Petrochemical production - styrene production	Styrene	Tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonne of styrene produced
1137	Terra International (Canada) Inc. - CF Industries Courtright Nitrogen Complex	Courtright	Ammonia production	Ammonia	Tonnes	Historical 2010-2014 (inclusive) ammonia production process emissions intensity	Historical 2010-2014 (inclusive) ammonia production combustion emissions intensity.	Emission allowances per tonne of ammonia produced
1137	Terra International (Canada) Inc. - CF Industries Courtright Nitrogen Complex	Courtright	Nitric acid production	Nitric acid	Tonnes	Historical 2010-2014 (inclusive) nitric acid reductant use and methane slip emissions intensity	Not applicable	Emission allowances per tonne of nitric acid produced

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Table 2b: Method C - Historical Facility Emissions Intensity for Process Parameter

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Process parameter in tonnes	Column 5 Process parameter units	Column 6 Historical average fixed process emissions intensity (EI_{p_i})	Column 7 Historical average combustion emissions intensity (EI_{c_i})	Column 8 Intensity units
1111	Petro-Canada Lubricants Inc. - Mississauga Lubricant Centre	Mississauga	Petrochemical production	Refinery feed	Kilolitre	Not applicable	Historical 2010, 2012 and 2014 total facility emissions intensity (excluding the emissions from hydrogen production).	Emission allowances per kilolitres of refinery feed processed
1166	Ruetgers Canada Inc. - Ruetgers Canada Inc.	Hamilton	General stationary combustion	Coal tar	tonnes	Not applicable	Historical 2010-2014 (inclusive) total facility emissions intensity.	Emission allowances per tonnes of coal tar processed

Table 3: Method C - Historical Absolute

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Historical average fixed process emission allocations (B_{hp})	Column 5 Historical average combustion emission allocations (B_{hc})
1006	Atlantic Packaging Products Ltd. - 111 Progress	111 Progress Avenue	Pulp and paper production	0 tonnes	45,616 tonnes
1138	AV Terrace Bay Inc. - AV Terrace Bay	Terrace Bay	Pulp and paper production	0 tonnes	140,530 tonnes
1011	Brampton Brick Limited - Brampton Brick	Brampton	General stationary combustion and carbonate use - brick making	28,957 tonnes	31,438 tonnes
1023	Cascades Canada ULC. - Norampac Trenton Division	Trenton	Pulp and paper production	0 tonnes	43,977 tonnes
1032	Domtar Inc. - Dryden Mill	Dryden	Pulp and paper production	0 tonnes	87,886 tonnes
1033	Domtar Inc. - Espanola Mill	Espanola Mill	Pulp and paper production	0 tonnes	176,136 tonnes
1080	Dunn Paper Inc. - St. Catharines Paper Facility	St. Catharines	Pulp and paper production	0 tonnes	27,393 tonnes
1046	Flakeboard Company Limited - Flakeboard Company Limited	Sault Ste. Marie	Pulp and paper production	0 tonnes	38,163 tonnes
1066	Forterra Brick - Forterra Brick, Burlington	Burlington	General stationary combustion and carbonate use - brick making	14,821 tonnes	26,265 tonnes
1158	Glencore Canada Corporation - Sudbury Nickel Smelter Complex	Falconbridge	Copper and nickel production -mining, base metal smelting, refining	86,464 tonnes	36,405 tonnes
1163	Greenfield Specialty Alcohols Inc. - Tiverton Plant	Tiverton	General stationary combustion	0 tonnes	10,608 tonnes
1078	Innophos Canada Inc. - Port Maitland Plant	Lowbanks	General stationary combustion and carbonate use - phosphate product production	12,056 tonnes	19,985 tonnes
1083	Irving Tissue Corporation - Weston Plant	Weston Plant	Pulp and paper production	0 tonnes	51,920 tonnes
1094	New Forest Paper Mills LP - New Forest Paper Mills	333 Progress Avenue	Pulp and paper production	0 tonnes	55,323 tonnes
1120	Resolute Forest Products Canada Inc. - Thunder Bay Operations	Thunder Bay, ON	Pulp and paper production	0 tonnes	214,792 tonnes
1121	Roxul Inc. - Roxul Inc.	Milton	Glass production - mineral wool insulation production	0 tonnes	73,348 tonnes
1127	Sonoco Canada Corporation - Trent Valley Mill	Trenton, ON	Pulp and paper production	0 tonnes	40,293 tonnes
1131	Strathcona Paper GP Inc. - Strathcona Paper LP	Napanee	Pulp and paper production	0 tonnes	30,567 tonnes
1135	Tembec - Kapuskasing Operations	Kapuskasing	Pulp and paper production	0 tonnes	36,207 tonnes

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Specified GHG activity or component of a specified GHG activity	Column 4 Historical average fixed process emission allocations (B_{hp})	Column 5 Historical average combustion emission allocations (B_{hc})
1168	Vale Canada Limited - Copper Cliff Mining, Smelting and Refining Complex	Sudbury	Copper and nickel production - mining, base metal smelting, refining,	104,158 tonnes	299,292 tonnes

Table 4a: Method D – Direct Method - Combustion Emissions

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Reported Emissions
1013	Brock University - University/Power Generation Facility	St. Catharines	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1021	Carmeuse Lime Canada - Dundas Operations	Dundas	Combustion Emissions, excluding CO_2 emissions from biomass fuel use, for iron coated lime production in lime production in year t-2 as submitted with the application or as reported and verified with a positive or qualified positive verification statement for a report under the Reporting Regulation.
1029	Clean Harbors Canada, Inc. - Clean Harbors Canada, Inc.	Corunna	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1003	Emerald Energy from Waste Inc. - Emerald Energy from Waste Inc.	Brampton	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1063	Hamilton Health Sciences Corp. - McMaster University Medical Centre Co-generation Plant	Hamilton	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1090	London Health Science Centre - Victoria Hospital	London	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1117	Queen's University - Kingston Main Campus	Kingston	Facility emissions, excluding CO_2 emissions from biomass fuel use for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1151	University of Guelph - Guelph Campus	Guelph	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Reported Emissions
1152	University of Toronto - St. George Campus	Toronto	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1153	University of Western Ontario - London Main Campus	London	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1165	University of Windsor - University of Windsor	Windsor	Facility emissions, excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.
1159	York University - Keele Campus	Toronto	Facility emissions , excluding CO_2 emissions from biomass fuel use, for year t-2 as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.

Table 4b: Method D - Direct Method - Non Fixed process Emissions

ID	Column 1 Company Name and Facility Name	Column 3 Facility City	Column 3 Reported Emissions
1137	Terra International (Canada) Inc. - CF Industries Courtright Nitrogen Complex	Courtright	N_2O process Emissions (in CO2e) for year t-2 for nitric acid production, as reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation..

Table 4c: Method D - Direct Method - Fixed process Emissions

ID	Column 1 Company Name and Facility Name	Column 2 Facility City	Column 3 Reported Emissions
1021	Carmeuse Lime Canada - Dundas Operations	Dundas	Lime production process emissions as reported for the year t-2 for iron coated lime production in lime manufacturing emission as submitted with application or reported and verified with a positive or qualified positive verification statement for the 2015 EPA Report, 2016 EPA Report or a report under the Reporting Regulation.

Table 5: Cap Adjustment Factor for Fixed process emissions (C_{pt})

Year	2017	2018	2019	2020
Cap adjustment factor for fixed process emissions	1	1	1	1

Table 6: Cap Adjustment Factor for Combustion Emissions without Adjustment for Biomass Fuel Use (C_{ct})

Year	2017	2018	2019	2020
Cap adjustment factor for combustion emissions without adjustment for biomass fuel (C_{ct})	1	0.9543	0.9086	0.8629

Table 7: Facility Physical Address and ID

ID	Company Name and Facility Name	Facility Address	Facility City or Town	Facility Postal Code
1006	Atlantic Packaging Products Ltd. - 111 Progress	111 Progress Avenue	Scarborough	M1P2Y9
1138	AV Terrace Bay Inc. - AV Terrace Bay	21 Mill Road	Terrace Bay	P0T2W0
1011	Brampton Brick Limited - Brampton Brick	225 Wanless Drive	Brampton	L7A1E9
1013	Brock University - University/Power Generation Facility	500 Glenridge Avenue	St. Catharines	L2S3A1
1017	Cabot Canada Limited - Cabot Canada Limited	800 Tashmoo Avenue	Sarnia	N7T7N4
1018	Canadian Gypsum Company - CGC Hagersville Plant	55 Third Line Road	Hagersville	N0A1H0
1020	Carmeuse Lime Canada - Beachville Operation	374681 Oxford County 6 Road	Ingersoll	N5C3K5
1021	Carmeuse Lime Canada - Dundas Operations	600 Highway #5 West	Dundas	L9H3S9
1022	Carmeuse Lime Canada - Northern Lime Limited	17 Highway East	Blind River	P0R1B0
1023	Cascades Canada ULC. - Norampac Trenton Division	300 Marmora Street	Trenton	K8V5R8
1024	CertainTeed Gypsum Canada, Inc. - Toronto Board Plant	2424 Lakeshore Road West	Mississauga	L5J1K4
1029	Clean Harbors Canada, Inc. - Clean Harbors Canada, Inc.	4090 Telfer Road	Corunna	N0N1G0
1030	Columbian Chemicals Canada Ltd. - Hamilton	755 Parkdale Avenue North	Hamilton	L8H7N5
1032	Domtar Inc. - Dryden Mill	1 Duke Street	Dryden	P8N2Z7
1033	Domtar Inc. - Espanola Mill	1 Station Road	Espanola	P5E1R6
1080	Dunn Paper Inc. - St. Catherines Paper Facility	45 Merritt Street	St. Catharines	L2T1J4
1039	Enwave Energy Corporation - Pearl Street Steam Plant	120 Pearl Street	Toronto	M5H1L2
1040	Enwave Energy Corporation - Walton Street Steam Plant	95 Walton Street	Toronto	M5G1H9
1042	Essar Steel Algoma Inc. - Essar Steel Algoma Inc.	105 West Street North	Sault Ste. Marie	P6A7B4
1045	Federal White Cement Ltd. - Woodstock Plant	355151 35th Line	Woodstock	N0J1J0
1046	Flakeboard Company Limited - Flakeboard Company Limited	657 Baseline Road	Sault Ste. Marie	P6A5K6
1066	Forterra Brick - Forterra Brick, Burlington	5155 Dundas Street	Burlington	L7R3Y2
1054	Gerdau Ameristeel Corporation - Cambridge Mill	160 Orion Place	Cambridge	N1T1R9
1055	Gerdau Ameristeel Corporation - Whitby Mill	1801 Hopkins Street South	Whitby	L1N5T1
1158	Glencore Canada Corporation - Sudbury Nickel Smelter Complex	1 Longyear Drive	Falconbridge	P0M1S0
1060	Greenfield Specialty Alcohols Inc. - Chatham Plant	275 Bloomfield Road	Chatham	N7M5J5
1163	GreenField Specialty Alcohols Inc. - Tiverton Plant	98 Walker Drive	Brampton	L6T4H6
1063	Hamilton Health Sciences Corp. - McMaster University Medical Centre Co-generation Plant	1200 Main Street West	Hamilton	L8S4J9
1073	Imperial Oil - Sarnia Chemical Plant	602 Christina Street South	Sarnia	N7T7M5

ID	Company Name and Facility Name	Facility Address	Facility City or Town	Facility Postal Code
1083	Irving Tissue Corporation - Weston Plant	1551 Weston Road	Toronto	M6M4Y4
1084	Ivaco Rolling Mills (2004) L.P. - Ivaco Rolling Mills	1040 County Road 17	L'Orignal	K0B1K0
1090	London Health Science Centre - Victoria Hospital	800 Commissioners Road East	London	N6A5W9
1169	Magellan Aerospace Limited - Haley Industries Limited	634 Magnesium Road East	Haley	K0J1Y0
1094	New Forest Paper Mills LP - New Forest Paper Mills	333 Progress Avenue	Scarborough	M1P2Z7
1100	NOVA Chemicals (Canada) Ltd. - Corunna Site	785 Petrolia Line	Corunna	N0N1G0
1101	NOVA Chemicals (Canada) Ltd. - Moore Township Site	510 Moore Line	Mooretown	N0N1M0
1102	NOVA Chemicals (Canada) Ltd. - St. Clair River Site	285 Albert Street	Corunna	N0N1G0
1103	O-I Canada Corp. - Plant #31 Brampton	100 West Drive	Brampton	L6T2J5
1111	Petro-Canada Lubricants Inc. - Mississauga Lubricant Centre	385 Southdown Road	Mississauga	L5J2Y3
1117	Queen's University - Kingston Main Campus	207 Stuart Street	Kingston	K7L3N6
1118	Redpath Sugar Ltd - Toronto Refinery	95 Queen's Quay East	Toronto	M5E1A3
1120	Resolute Forest Products Canada Inc. - Thunder Bay Operations	2001 Neebing Avenue	Thunder Bay	P7E6S3
1121	Roxul Inc. - Roxul Inc.	805 Steeles Avenue East	Milton	L9T5H3
1166	Ruetgers Canada Inc. - Ruetgers Canada Inc.	725 Strathearne Avenue,	Hamilton	L8H5L3
1127	Sonoco Canada Corporation - Trent Valley Mill	5 Bernard Long Road	Trenton	K8V5P6
1131	Strathcona Paper GP Inc. - Strathcona Paper LP	77 County Road 16	Napanee	K7R3L6
1132	Styrolution Canada Ltd. - Sarnia Site	872 Tashmoo Avenue	Sarnia	N7T8A3
1135	Tembec - Kapuskasing Operations	1 Government Road	Kapuskasing	P5N2Y2
1137	Terra International (Canada) Inc. - CF Industries Courtright Nitrogen Complex	161 Bickford Line	Courtright	N0N1H0
1151	University of Guelph - Guelph Campus	50 Stone Road East	Guelph	N1G2W1
1152	University of Toronto - St. George Campus	27 King's College Circle Road	Toronto	M5S1A1
1153	University of Western Ontario - London Main Campus	1151 Richmond Street	London	N6A3K7
1165	University of Windsor - University of Windsor	401 Sunset Avenue	Windsor	N9B3P4
1168	Vale Canada Limited - Copper Cliff Mining, Smelting and Refining Complex	18 Rink Street	Copper Cliff	P0M1N0
1159	York University - Keele Campus	4700 Keele Street	Toronto	M3J1P3

Schedule A: Calculation of C_{at}

Step 1:

$$F_{bt} = 1 - \left(\frac{EI_{biomass\_t-2}}{EI_{total\_t-2}} \right)$$

Step 2:

$$C_{at} = 1 - (1 - C_{ct}) \times F_{bt}$$

Where:

C_{at} = the cap adjustment factor for year t with adjustment based on biomass fuel use.

$EI_{biomass\_t-2}$ = energy input from biomass fuel at the facility in year "t-2".

EI_{total_t-2} = total energy input from all fuel, including biomass fuel, at the facility in year "t -2"

C_{ct} = the cap adjustment factor for combustion emissions without adjustment based on biomass fuel use set out in Table 6 for the year t.