

CleanBC Industrial Incentive Program

Greenhouse Sector Guidance

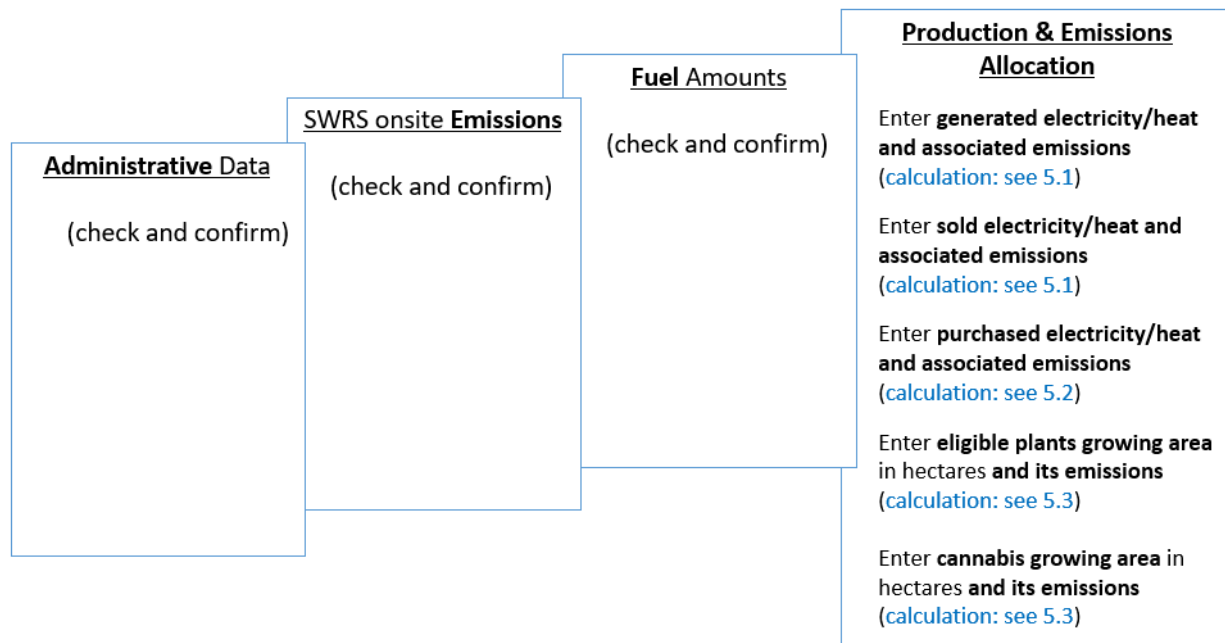
1. Applicable NAICS codes:

- NAICS – 111412: Cannabis Grown Under Cover
- NAICS – 111419: Other Food Crops Grown Under Cover

Sub-Sector	CIIP Product
Greenhouses	Eligible plants – growing area
	Cannabis – growing area

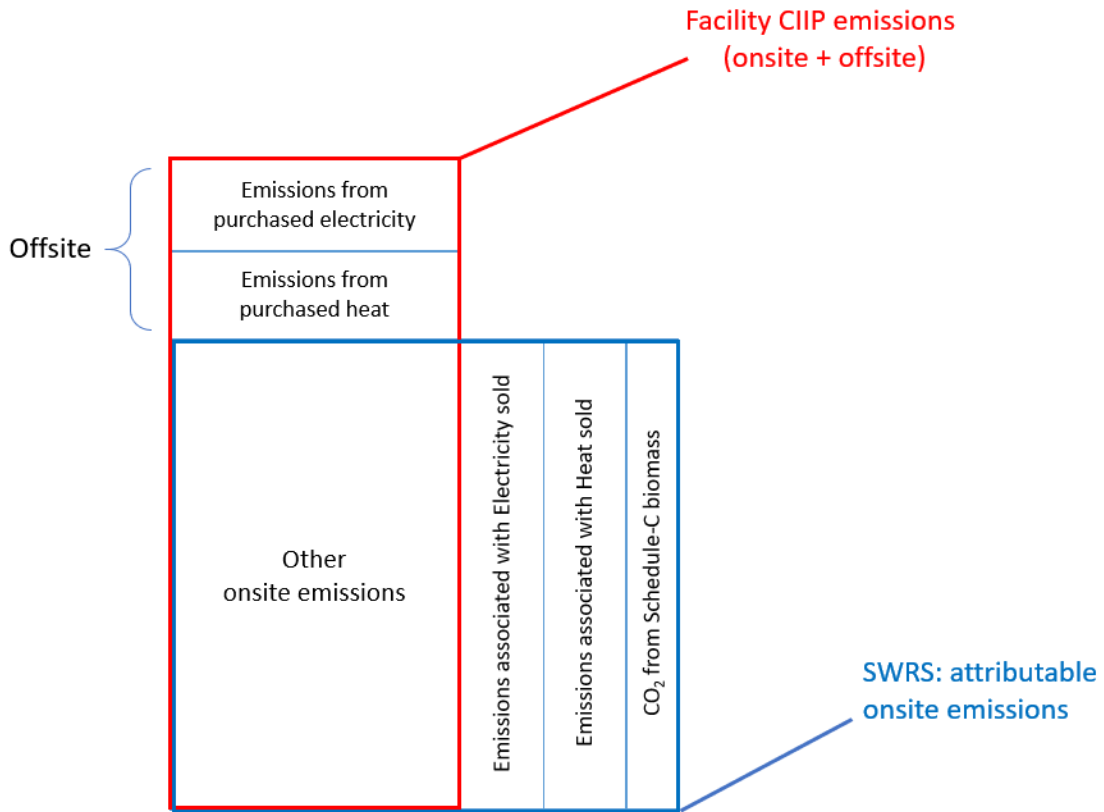
2. Quick Summary – Main Steps in CIIP application

- 2.1 Complete and submit a facility emission report in the Single Window Reporting System (SWRS)
- 2.2 Complete and submit a CIIP application (it is pre-filled with SWRS data where applicable)



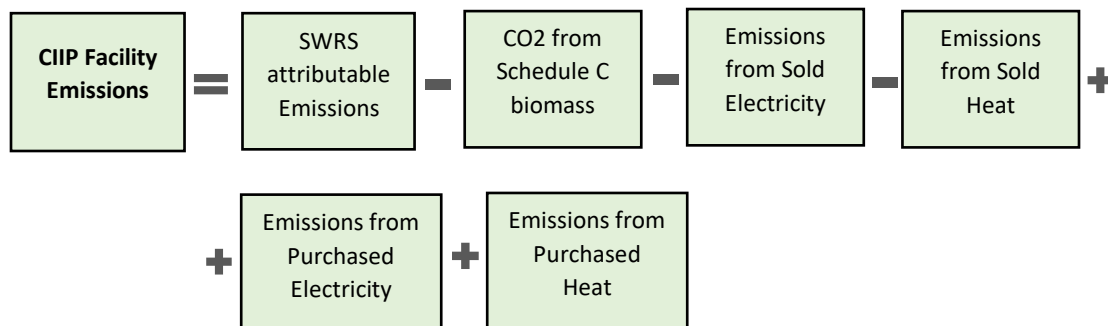
(calculation) steps are detailed in section 5. **Calculation Methodologies** below.

3. Facility Emissions for CIIP purposes



For the Facility emission total for CIIP purposes:

- Facility onsite emissions CO₂ from Schedule C biomass are excluded,
- Facility emissions associated with sold electricity and/or heat are excluded,
- Facility offsite emissions from purchased electricity and/or heat are included.



Or, equivalently,

$$E_{Facility}^{CIIP} = E_{Attr.}^{SWRS} - E_{CO2bioC}^{SWRS} - E_{Sold}^{Electr.} - E_{Sold}^{Heat} + E_{Purchased}^{Electr.} + E_{Purchased}^{Heat}$$

Facility onsite emissions are pre-filled in the CIIP application with data submitted through the SWRS system.

Facility emissions associated with sold electricity and/or heat must be calculated from total and sold electricity/heat amounts and emissions. Facility offsite emissions associated with purchased electricity and/or heat must be calculated from electricity/heat amounts purchased.

All electricity/heat amounts and emissions are entered in the *Production and Emissions Allocation* section of the CIIP application.

4. Completing a CIIP Application

The CIIP application has four sections. Where possible, the *Administrative*, *SWRS Onsite Emissions* and *Fuels* sections are pre-populated with data reported through the SWRS system. Applicants must review, confirm, and, if applicable, update this information and also enter production and emissions allocation information in the *Production and Emissions Allocation* section.

Administrative Data

Most information in the administrative section will be pre-populated from SWRS.

- Review pre-populated data for accuracy
- Enter the BC Corporate Registry number as it appears on orgbook.gov.bc.ca

NOTE: The BC Corporate Registry number and the operator's legal name on the CIIP application must match the entry on OrgBook. The incentive payment will be issued to the legal business name as it appears on the CIIP application.

- Please ensure all mailing addresses follow the [Canada Post address format](#)
- Enter at least one application contact. The Primary Application Contact field will be pre-populated based on the user who starts an application; please confirm or edit as applicable. This will be the primary contact CAS will use for all application-related correspondence: questions, application status changes, review results, etc. A Secondary Application Contact can be added, if applicable. Please note that automated system messages such as application status updates will only be sent to the primary contact.
- Choose the primary NAICS code that the facility operates under from the available list. The NAICS codes in the pre-populated list reflect the sectors eligible to apply for CIIP. You will not be

able to enter a NAICS code that is not on the list. The production information required to be entered in the *Production and Emissions Allocation* section will depend on the NAICS code selection

If you believe your facility's sector is eligible but your NAICS code is not on the list, please contact the CIIP team at GHGRegulator@gov.bc.ca.

SWRS Onsite Emissions

This section is pre-filled with data from the facility's SWRS report. Please review and confirm. If the information needs updating, this likely means that the SWRS report has to be updated first.

Fuels

This section is pre-filled with data from the facility's SWRS report. Please review and confirm. If the information needs updating, this likely means that the SWRS report has to be updated first.

Production & Emissions Allocation

NOTE: The ministry provides a calculator spreadsheet with the appropriate calculation formulas built in, to assist in calculations at this step of the CIIP application process (available [at this link](#)).

NOTE: To enter data as required in this section, first select 'Generated Electricity', then 'Generated Heat', then 'Excluded Emissions: Sold electricity', then 'Excluded Emissions: Sold heat', then 'Offsite Emissions: Purchased Electricity', then 'Offsite Emissions: Purchased Heat', and finally the appropriate products, as applicable, from the 'Product or Service' dropdown menu.

NOTE: For the purposes of CIIP it is assumed that:

- All energy generated on-site but not sold is used for production;
- All sold energy was generated on-site.

Allocating CIIP Facility emissions

CIIP facility emissions, calculated as shown in section 3 using the calculator, must be allocated between the '**Eligible plants - growing area**' and '**Cannabis - growing area**' products.

- If only one of the above products is reported, its product emissions are equal to CIIP facility emissions;
- If both products are reported, CIIP facility emissions are allocated, using the calculator, between the two reported products:

$$E_{Facility}^{CIIP} = E_{Elig.Plants} + E_{Cannabis}$$

In the CIIP application enter the following information:

Select '**Generated Electricity**'

- Enter total generated electricity (in GWh). Enter 0 if not applicable.
- Calculate and enter the emissions associated with generated electricity, using the calculator (see section 5.1 below for details)

Select '**Generated Heat**'

- Enter total generated heat (in GJ). Enter 0 if not applicable.
- Calculate and enter the emissions associated with generated heat, using the calculator (see section 5.1 below for details)

Select '**Excluded Emissions: Sold electricity**'

- Enter sold electricity (in GWh). Enter 0 if not applicable.
- Calculate and enter the emissions associated with sold electricity, using the calculator (see section 5.1 below for details)

Select '**Excluded Emissions: Sold heat**'

- Enter sold heat (in GJ). Enter 0 if not applicable.
- Calculate and enter the emissions associated with sold heat, using the calculator (see section 5.1 below for details)

Select '**Offsite Emissions: Purchased Electricity**'

- Enter purchased electricity (in GWh). Enter 0 if not applicable.
- Calculate and enter the emissions associated with purchased electricity, using the calculator (see section 5.2 below for details).

Select '**Offsite Emissions: Purchased Heat**'

- Enter purchased heat (in GJ). Enter 0 if not applicable.
- Calculate and enter the emissions associated with purchased heat, using the calculator (see section 5.2 below for details)

Select '**Eligible plants - growing area**'

- Enter total growing area in hectares for eligible plants

The growing area is the eligible production and propagation area, i.e. the heated commercial greenhouse space used to grow either eligible plants (cucumbers, peppers, tomatoes, and their respective seedlings) or cannabis plants (from seed/seedling to flower harvesting). Facility space used for non-eligible activities (for example, office, residential, storage, equipment, packing, packaging) or to grow non-eligible crops or plants must not be allocated to either product. No reporting operations in B.C. currently warehouses plants. If an operation commences warehousing, that area must not be allocated to the growing area for either eligible plants or cannabis plants.

- Calculate and enter the emissions associated with eligible plants, using the calculator (see section 5.3 below for details)

Select 'Cannabis - growing area'

- Enter total growing area in hectares for cannabis plants
- Calculate and enter the emissions associated with cannabis plants, using the calculator (see section 5.3 below for details)

Summary

Review your application for accuracy, review the terms and conditions, and submit the application.

The system will automatically perform some checks for consistency. If inconsistencies are found, the application will show a warning message, highlighting the issue requiring attention. To address any highlighted inconsistencies, you must go back to the relevant application section/tab and either correct the reported values or provide an explanation by entering a comment in the relevant section.

Additionally, the system may detect errors in your application, such as missing data. These errors must be corrected in order to submit an application. In certain exceptional cases when the issue cannot be addressed through the application system, you will have the ability to override the error message by providing an explanation and then submit the application.

Any unresolved warnings or errors may delay the processing of your application.

5. Calculation Methodologies

Unless explicitly stated otherwise in CIIP guidance, quantification and reporting of greenhouse gas emissions and related information under CIIP must comply with the *Greenhouse Gas Industrial Reporting and Control Act* (GGIRCA) and the Greenhouse Gas Emission Reporting Regulation (GGERR), including with the referenced in GGERR Western Climate Initiative (WCI) quantification methodologies.

The [WCI methodologies](#) typically applicable to greenhouse reporting operations are:

- WCI.020 General Stationary Combustion
- WCI.040 Electricity Generation
- WCI.280 Mobile Equipment at Facilities

A CIIP applicant must first submit an emission report in SWRS (SWRS report) complying with GGIRCA and GGERR and using the WCI methodologies. A CIIP application is then pre-filled where possible with applicable information from the SWRS report.

5.1 Calculating emissions associated with generated and with sold electricity and heat

In the case of combined heat and power (CHP) generation (co-generation), the ministry provides a calculator spreadsheet with the appropriate calculation formulas built in, to assist in calculations at this step of the CIIP application process (available [at this link](#)).

NOTE: In the case of pure electricity generation (not a combined heat and power unit) there is no partitioning between generated electricity and heat; use the calculator but enter '0' for heat generated and heat sold.

NOTE: CIIP applicants must demonstrate that the total amount of sold energy does not exceed that which is allowable under a fully executed purchase agreement. Records evidencing such agreements must be kept in accordance with GGERR.

In the calculator, in the blue cells enter:

- Emissions attributable to all self-generated energy (electricity and heat). This should correspond to the total emissions entered in SWRS under the 'Electricity Generation' activity
- Total amount of electricity generated, and electricity sold, in GWh (column F). The calculator will automatically convert these to units of GJ and display the results in column G
- Total amount of heat generated, and heat sold, in GJ (column G)
- Electricity and heat generation efficiencies. Use default generation efficiency values unless actual efficiency values for specific CHP units are available and sufficient justification is provided to the ministry.

At this time the calculator will automatically allocate and display:

- The emissions associated with generated electricity
- The emissions associated with generated heat

(The sum of these two will equal the emissions attributable to all self-generated energy)

- The emissions associated with sold electricity
- The emissions associated with sold heat

An example:

Input		Electricity in GWh	Amount	Units
Emissions attributable to all self-generated energy	E_{EL+H}		20,000.00	tCO ₂ e
Total electricity generated	P_{EL}	800.00	2,880,000	GJ
Electricity generation efficiency	e_{EL}		0.35	Default = 0.35
Total heat (steam) generated	P_H		14,040,000	GJ
Heat generation efficiency	e_H		0.80	Default = 0.80
Total electricity sold	P_{EL_SOLD}	200.00	720,000	GJ
Total heat sold	P_{H_SOLD}		1,000,000	GJ

Emissions attributable to all self-generated electricity	E_{EL}		6,384.04	tCO ₂ e
Emissions attributable to all self-generated heat (steam)	E_H		13,615.96	tCO ₂ e

Emissions associated with sold electricity	E_{EL_SOLD}		1,596.01	tCO₂e
Emissions associated with sold heat	E_{H_SOLD}		969.80	tCO₂e



The calculator allocates these emissions according to the following methodology:

$$E_{EL} = \left[\frac{P_{EL}}{\left(\frac{e_{EL}}{e_H}\right) P_H + P_{EL}} \right] * E_{EL+H}$$

$$E_H = E_{EL+H} - E_{EL}$$

Where:

- E_{EL} are the emissions allocated to all self-generated electricity (tCO₂e)
- E_H are the emissions allocated to all self-generated heat (steam) (tCO₂e)
- E_{EL+H} (input) are the emissions allocated to all self-generated energy (tCO₂e)
- P_{EL} (input) is total generated electricity (GJ; 1 GWh = 3600 GJ)
- P_H (input) is total generated heat (steam) (GJ)
- e_{EL} (input) is efficiency of electricity generation (default value = 0.35)
- e_H (input) is efficiency of heat (steam) generation (default value = 0.80)

And

$$E_{EL_sold} = \left(\frac{P_{EL_sold}}{P_{EL}} \right) * E_{EL}$$

$$E_{H_sold} = \left(\frac{P_{H_sold}}{P_H} \right) * E_H$$

where:

- E_{EL_sold} are the emissions associated with sold electricity (tCO₂e)

E_{H_sold} are the emissions associated with sold heat (tCO₂e)

P_{EL_sold} (input) is sold electricity (GJ; 1 GWh = 3600 GJ)

P_{H_sold} (input) is sold heat (steam) (GJ)

5.2 Calculating emissions associated with purchased grid electricity and purchased heat

The ministry provides a calculator spreadsheet with the appropriate calculation formulas built in, to assist in calculations at this step of the CIIP application process (available [at this link](#)).

In the calculator, in the section on Purchased Electricity and Heat, subsection ‘Purchased Electricity’, select the applicable electrical grid (Integrated or Fort Nelson) from the pulldown menu in cell E32. This will cause the appropriate electricity intensity factor in tCO₂e/GWh to be displayed in cell G32.

In the blue cell, enter the amount of purchased electricity (in GWh).

Emissions associated with purchased grid electricity are then automatically calculated and displayed in cell G34, in tonnes CO₂e. For example:

Purchased Electricity and Heat

INPUT each variable listed below:

Purchased Electricity

	Electrical Grid:	Amount	Units
Emissions Intensity Factor of Grid	Integrated Grid	EIF _{El Grid} 11.3	tCO ₂ e/GWh
Amount of electricity purchased		Q _{EL PURCHASED}	GWh
Emissions associated with Purchased Electricity		E_{EL PURCHASED}	tCO₂e

Enter the amount of emissions from purchased grid electricity in the CIIP application.

In the calculator, in the subsection on Purchased Heat, in the blue cell, enter the amount of purchased heat (in GJ).

Emissions associated with purchased heat are then automatically calculated and displayed in cell G43, in tonnes CO₂e. For example:

Purchased Heat

		Amount	Units
Emissions Intensity Factor of Purchased heat		EIF _{BC Heat} 0.063	tCO ₂ e/GJ
Amount of heat purchased		Q _{H PURCHASED} 10,000.00	GJ
Emissions associated with Purchased Heat		E_{BC Heat} 630.00	tCO₂e

Enter the amount of emissions from purchased heat in the CIIP application.

The calculator uses the following methodology to determine emissions associated with purchased grid electricity:

If

$EIF^{El-Grid}$ (selection) is the grid electricity emission factor for the selected grid and applicable year, in tCO₂e/GWh;

$Q_{Purchased}^{Electr}$ (input) is the quantity of purchased grid electricity, in GWh;

$E_{Purchased}^{Electr}$ are the emissions associated with purchased grid electricity, in tCO₂e.

Then

$$E_{Purchased}^{Electr} = EIF^{El-Grid} * Q_{Purchased}^{Electr}$$

where $EIF^{El-Grid}$ data comes from the published [electricity emission intensity factor for grid-connected entities](#) for the selected grid for applicable year.

The calculator uses the following methodology to determine emissions associated with purchased heat:

If

0.063 is the BC-specific heat emission factor, in tCO₂e/GJ;

$Q_{Purchased}^{Heat}$ (input) is the quantity of purchased heat, in GJ;

$E_{Purchased}^{Heat}$ are the emissions associated with purchased heat, in tCO₂e.

Then

$$E_{Purchased}^{Heat} = 0.063 * Q_{Purchased}^{Heat}$$

5.3 Reporting production and allocating emissions

The ministry provides a calculator spreadsheet with the appropriate calculation formulas built in, to assist in calculations at this step of the CIIP application process (available [at this link](#)).

In the calculator, in the section ‘Production and Emissions Allocation’, subsection ‘Production’, in the blue cells:

- Enter the total growing area for eligible plants, in hectares
- Enter the total growing area for cannabis plants, in hectares

NOTE: Growing area in square feet or in acres has to be converted to hectares first¹. Use the calculator’s conversion tool. For example:

Do not leave blank - enter zero if needed

Eligible Plants - Growing Area*	4.86	hectares (ha)
Cannabis Plants - Growing Area*	3.73	hectares (ha)

*If needed, first convert from acres to hectares (ha) :	12.0	acres =	4.86	ha
*If needed, first convert from sq.ft. to hectares (ha) :	400,000	sq.ft. =	3.72	ha

Next, in the calculator, in the subsection ‘CIIP Facility Emissions’, in the blue cells:

- Enter SWRS attributable onsite emissions, including from Schedule C biomass (tonnes CO₂e)
- Enter CO₂ emissions from combustion of Schedule-C biomass, in tCO₂e

Using this emissions information and the previously calculated emissions associated with sold and purchased electricity and heat, the calculator determines the CIIP facility emissions in cell D69.

For example:

CIIP Facility Emissions

	Emission Sources	Emissions	Units
	Onsite attributable emissions from SWRS report	30,000.00	tCO ₂ e
--	CO ₂ emissions from combustion of Schedule-C biomass	100.00	tCO ₂ e
--	Emissions associated with sold electricity	4,976.24	tCO ₂ e
--	Emissions associated with sold heat	2,267.82	tCO ₂ e
+	Emissions associated with purchased electricity	2,910.00	tCO ₂ e
+	Emissions associated with purchased heat	6,300.00	tCO ₂ e
	CIIP Facility Emissions	31,865.94	tCO₂e

¹ One acre is exactly 43,560 square feet. One square foot is exactly 0.09290304 square meters.

Next, for each product, determine the processing units (PU(s)) (i.e. emission sources) that comprise its entire production pathway. NOTE: The term “production pathway” refers to the collection of processing units needed to grow either product.

Then classify all PU(s) in the reporting operation into three types:

- exclusive PU (a PU involved in only one product)
- shared PU with sub-metering (a PU shared by both products, but with separate metering).
- shared PU without sub-metering (a PU shared by both products and no separate metering).

For all the exclusive PU(s) and the shared PU(s) with sub-metering, directly allocate emissions to either eligible plants or cannabis plants using that metering information, as applicable.

NOTE: This applies to any facility emissions: purchased electricity/heat, stationary or mobile combustion, electricity generation.

In the calculator, in the subsection ‘Emissions Allocation’, in the blue cells:

- Enter total emissions directly allocated to eligible plants, in tCO₂e
- Enter total emissions directly allocated to cannabis plants, in tCO₂e

Using this emissions information and the previously entered and calculated emissions, the calculator then determines the partitioning of the remaining facility emissions from the shared PU(s) without sub-metering based on growing area fraction.

Finally, using all the above entered and calculated information, the calculator allocates the CIIP facility emissions to eligible plants and to cannabis plants. For example:

CIIP Facility Emissions	31,865.94	tCO₂e
--------------------------------	------------------	-------------------------

Emissions Allocation

Do not leave blank - enter zero if needed

Emission Allocation	Emissions	Units
Exclusive PU(s) and direct sub-metering Shared PU(s)		
Directly Allocated to Eligible Plants :	8,000.00	tCO ₂ e
Directly Allocated to Cannabis Plants :	4,000.00	tCO ₂ e
Remaining unallocated emissions after direct allocation:	19,865.94	tCO ₂ e
No-sub-metering Shared PU(s)		
Growing area-based Allocation to Eligible Plants :	11,239.64	tCO ₂ e
Growing area-based Allocation to Cannabis Plants :	8,626.30	tCO ₂ e
Total Emissions allocated to Eligible Plants :	19,239.64	tCO₂e
Total Emissions allocated to Cannabis Plants :	12,626.30	tCO₂e

Enter the total production growing areas and respective allocated emissions for each applicable product in the CIIP application.

The calculator uses the following methodology to determine emission allocation for shared PU(s) with no sub-metering:

If

- $P_{Elig. Plants}$ (input) is total eligible plants – growing area (ha)
- $P_{Cannabis}$ (input) is total cannabis plants – growing area (ha)
- $E_{no-sub-metering}^{SPU}$ are the emissions for a shared PU with no sub-metering (tCO₂e)
- $E_{Elig. Plants}^{SPU}$ are the emissions allocated to eligible plants for that SPU (tCO₂e)
- $E_{Cannabis}^{SPU}$ are the emissions allocated to cannabis plants for that SPU (tCO₂e)

Then

$$E_{Elig. Plants}^{SPU} = \left(\frac{P_{Elig. Plants}}{P_{Elig. Plants} + P_{Cannabis}} \right) * E_{no-sub-metering}^{SPU}$$

$$E_{Cannabis}^{SPU} = \left(\frac{P_{Cannabis}}{P_{Elig. Plants} + P_{Cannabis}} \right) * E_{no-sub-metering}^{SPU}$$

Incentive Adjustment Factor for eligible plants

After the incentive payment has been determined for eligible plants, an adjustment factor will be applied in order to recognize that a portion of the carbon tax is already reimbursed through the Carbon Tax Relief Grant Program. No adjustment factor will be applied to incentives for cannabis plants.