CleanBC Industrial Incentive Program
Wood Products Sector Guidance

This guidance applies to reporting operations with primary NAICS codes as follows:

NAICS – 321***: Wood Product Manufacturing

<table>
<thead>
<tr>
<th>Sub-Sector</th>
<th>CIIP Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawmills</td>
<td>Wood products – lumber</td>
</tr>
<tr>
<td>Veneer and plywood mills</td>
<td>Wood products – plywood</td>
</tr>
<tr>
<td>Particle board and fibreboard mills</td>
<td>Wood products – veneer</td>
</tr>
<tr>
<td></td>
<td>Wood products – medium density fibreboard</td>
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<tr>
<td></td>
<td>Wood products – wood pellets</td>
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<tr>
<td></td>
<td>Wood products – wood chips</td>
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In addition to this guidance document, to assist in calculating inputs for the CleanBC Industrial Incentive Program (CIIP) application process, the ministry provides a spreadsheet with the appropriate calculation formulas built in (available via e-mail and webpage).

Quantification and Reporting of Emissions and Related Information

Unless explicitly stated otherwise in the 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 wood product manufacturing reporting operations include, but may not be limited to, the following:

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

In addition to the information required in the GGERR, applicants to CIIP must also report the GHG emissions associated with purchased grid electricity and heat.

- Grid electricity emissions are quantified by multiplying the published electricity emission intensity factor for grid-connected entities $E_{\text{Grid, Electr.}}$ for the applicable reporting year by the amount of purchased grid electricity $Q_{\text{Electr.}}$ in GWh:

$$E_{\text{Grid, Electr.}} = E_{\text{Grid, Electr.}} \cdot Q_{\text{Electr.}}$$
Purchased heat emissions are quantified by multiplying a BC-specific industrial heat emission intensity factor $E_{IF}^{Heat}$ by the amount of purchased heat $Q_{Purchased}^{Heat}$ in GJ:

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

where

$$E_{IF}^{Heat}$$

is 0.063 tCO2e/GJ.

Emissions associated with self-generated electricity sold to the grid or with heat sold to a different industrial operation must be excluded from the reporting operation’s emissions total for CIIP purposes. Therefore, to calculate the emissions total for CIIP purposes, emissions associated with sold electricity or heat must be subtracted from the total emissions that were reported in the Single Window Reporting System.

These emissions must be quantified in the following manner:

1) **Partitioning all emissions associated with self-generated electricity and heat between emissions due to generated electricity and emissions due to generated heat**

**NOTE:** In the case of pure electricity generation (not a combined heat and power unit) there is no partitioning between generated electricity and heat; proceed to the next step.

In the case of combined heat and power (CHP) generation (co-generation), select one of the three methodologies for allocating emissions listed in the WRI/WBCSD’s Allocation of GHG Emissions from a Combined Heat and Power (CHP) Plant document: 1) the efficiency method; 2) the energy content method, or 3) the Work Potential method.

It is recommended that the efficiency method be used (see methodology below). For guidance on using other methodologies, please see the document listed above.

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

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

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)

$E_{EL+H}$ are the emissions allocated to all self-generated energy (tCO2e)
$P_{EL}$ is total produced electricity (GJ; 1 MWh = 3.6 GJ)

$P_H$ is total produced heat (steam) (GJ)

$e_{EL}$ is efficiency of electricity generation (default value = 0.35)

$e_H$ is efficiency of heat (steam) generation (default value = 0.80)

In the absence of actual efficiency values for the specific CHP unit(s) in place, reporting operations must use the default values for the efficiencies of steam and electricity production as stated above. If efficiency values are available and sufficient justification is provided to the ministry, they must be reported and used in place of the default values.

2) Determining emission intensity of self-generated electricity and heat

Emissions intensity must be provided in tCO2e/GWh. GJs can be converted to GWh by dividing GJs by 3600. The Emission Intensity of self-generated electricity, in tCO2e/GWh, is:

$$EI_{EL} = \frac{E_{EL}}{P_{EL}}$$

The Emission Intensity of self-generated heat, in tCO2e/GJ, is:

$$EI_H = \frac{E_H}{P_H}$$

3) Allocating emissions to sold electricity and sold heat

Emissions associated with sold electricity are quantified as follows:

$$E_{EL}^{sold} = EI_{EL} * P_{EL}^{sold}$$

where:

$P_{EL}^{sold}$ is the amount, in GWh, of produced electricity sold to the grid (1 GWh = 3600 GJ).

Emissions associated with sold heat are quantified as follows:

$$E_{H}^{sold} = EI_H * P_{H}^{sold}$$

where:

$P_{H}^{sold}$ is the amount, in GJ, of produced heat sold.

Therefore, the emissions total for CIIP purposes is:

$$E^{CIIP} = E_{Onsite} + E_{Grid}^{Electr.} + E_{Purchased}^{Heat} - E_{EL}^{sold} - E_{H}^{sold}$$
where \( E_{\text{Onsite}} \) is the reporting operation’s emissions total as required to be reported under GGIRCA and submitted in the Single Window Reporting System.

Reporting operations 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.

**Reporting of Energy**

Applicants to the CIIP must also report annual amounts of heat and electricity. In the application, electricity must be reported in GWh (1 GWh = 3600 GJ).

- Generated on site – electricity in GWh and heat in GJ;
- Purchased – electricity in GWh and heat in GJ;
- Sold – electricity in GWh and heat in GJ;

For the purposes of CIIP it is assumed that:

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

In the CIIP application, purchased electricity, self-generated electricity and heat and sold electricity are reported under the ‘Production’ tab.

To report purchased energy, from the ‘Product or Service’ dropdown menu, select ‘Purchased Electricity’ or ‘Purchased Heat’ as applicable; enter the amount of electricity purchased (in gigawatt hours) or heat purchased (in gigajoules) and the emissions associated with the purchased electricity or heat. To report energy generated on site, select ‘Generated Electricity’ or ‘Generated Heat’ as applicable; enter the amount of electricity (in gigawatt hours) or heat generated (in gigajoules) and the associated emissions. To report self-generated electricity sold to the grid or heat sold to another operation, select ‘Sold Electricity’ or ‘Sold Heat’ as applicable and enter the amount (in gigawatt hours or gigajoules) and associated emissions.

Applicants to the CIIP must also calculate annual amount of expended (i.e. – consumed) input energy in GJ, by the operation and by each processing unit if needed in the allocation of emissions described below.

This is calculated as follows:

\[
EN_{RO/PU} = \sum_{i=1}^{N} \left[ Q_{\text{Fuel}_i} \times HHV_{\text{Fuel}_i} \times EF_{\text{Fuel}_i} \right] + Q_{\text{Electr Grid}}^{\text{RO/PU}} + Q_{\text{Heat}}^{\text{RO/PU}} - Q_{\text{Sold EL}}^{\text{RO/PU}} - Q_{\text{Sold H}}^{\text{RO/PU}}
\]

where
\( EN_{RO/PU} \) is the expended input energy, in GJ, of either the reporting operation (RO) or a specific processing unit (PU);

\( Q_{Fuel_i} \) is the amount of combusted \( Fuel_i \), in appropriate units;

\( HHV_{Fuel_i} \) is the HHV of combusted \( Fuel_i \) (actual value if measured, or default value from Table 20-1 of WCI.020 if not), in appropriate units;

\( N \) is the total number of fuels combusted;

\( Q_{ElectrGrid}^{RO/PU} \) is the purchased electrical energy, in GJ, for either the reporting operation or a specific processing unit;

\( Q_{Heat}^{RO/PU} \) is the purchased heat, in GJ, for either the reporting operation or a specific processing unit;

\( Q_{Sold EL}^{RO/PU} \) is the sold electrical energy, in GJ, for either the reporting operation or a specific processing unit;

\( Q_{Sold H}^{RO/PU} \) is the sold heat, in GJ, for either the reporting operation or a specific processing unit;

\( EF_{Fuel} \) is the emission factor, in tonnes of carbon dioxide equivalent per GJ of energy from table 20-2 of WCI.020

**Quantification of Production**

Applicants to the CIIP must report annual production in the appropriate unit of salable product from the table below.

<table>
<thead>
<tr>
<th>CIIP Product</th>
<th>Unit of production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber</td>
<td>cubic metres (m³)</td>
</tr>
<tr>
<td>Plywood</td>
<td>cubic metres (m³)</td>
</tr>
<tr>
<td>Veneer</td>
<td>cubic metres (m³)</td>
</tr>
<tr>
<td>Medium density fiberboard (MDF)</td>
<td>cubic metres (m³)</td>
</tr>
<tr>
<td>Wood pellets</td>
<td>tonnes (t)</td>
</tr>
<tr>
<td>Wood chips</td>
<td>cubic metres (m³)</td>
</tr>
</tbody>
</table>

Wood chips is also considered to include hog fuel that is sold as a product.
For the purposes of CIIP, reporting operations must use the following conversion factors for the calculation of emissions intensity:

<table>
<thead>
<tr>
<th>Product</th>
<th>Metric</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber</td>
<td>1 m³</td>
<td>0.424 mfbm (thousand board feet)</td>
</tr>
<tr>
<td>Panels:</td>
<td>1 m³</td>
<td>0.565 msf (thousand square feet) at 3/4” thickness</td>
</tr>
<tr>
<td>MDF, Plywood and Veneer</td>
<td>1 m³</td>
<td>1.130 msf (thousand square feet) at 3/8” thickness</td>
</tr>
<tr>
<td></td>
<td>1 m³</td>
<td>3.390 msf (thousand square feet) at 1/8” thickness</td>
</tr>
<tr>
<td>Wood pellets</td>
<td>1 tonne</td>
<td>1.56 m³ (cubic metre)</td>
</tr>
</tbody>
</table>

The term “salable” means products produced with the intention of being sold. This includes all salable product produced during the reporting year, regardless of whether it is sold during the year or added to inventory. It does not include salable product sold from a previous year’s production.

Production must not include any waste products.

**Emission Allocation between Products**

Applicants to CIIP must allocate GHG emissions between products. For single product operations, this is not required as all facility emissions are attributed to the production of that single product.

In multi-product operations, this is accomplished through the allocation of the emissions associated with the energy consumed in the production pathway of a salable product. The term “production pathway” refers to the collection of processing units needed to create or assemble the salable product from the input of materials to finished product.

1) For each type of product, determine the processing units (PU) that comprise its entire production pathway;

2) Classify all processing units in the reporting operation into two types: shared (SPU—a processing unit shared by two or more products) and exclusive (EPU—a process unit involved in the production pathway of a single product);

3) For each SPU and EPU, determine their fraction of emissions by their share of expended input energy out of the total for the reporting operation:

\[
E_{SPU/EPU} = \left(\frac{EN_{SPU/EPU}}{EN_{RO}}\right) \times E^{CIIP}
\]

4) For each SPU, further determine the fraction of emissions to assign to each of its products by the quantity fraction of each product sharing the SPU:

\[
E_{P,SPU} = \left(\frac{P}{\sum P}\right) \times E_{SPU}
\]
5) Finally, calculate the emissions attributable to each product:

\[ E_P = \sum_{k=1}^{B} \left( \frac{P}{\sum P} \right) * E_{SPU_k} + \sum_{m=1}^{C} E_{EPU_m} \]

where

- \( B \) is the total number of SPUs in the production pathway of product \( P \);
- \( C \) is the total number of EPUs in the production chain of product \( P \);
- \( P \) is either Lumber \( P_{lum} \), Plywood \( P_{ply} \), Veneer \( P_{ven} \), Medium density fiberboard \( P_{MDF} \), Wood Chips \( P_{chips} \) or Wood Pellets \( P_{pellets} \).

The applicant must add all emissions from generated electricity and/or heat to the products produced at the facility and/or to sold electricity.

The applicant must add all emissions from generated electricity and/or heat must be allocated to the products produced at the facility and/or to sold electricity.

**Emission Intensity**

For the purposes of CIIP:

- The Emission Intensity of lumber \( EI_{lum} \) will be calculated as:

\[ EI_{lum} = \frac{E_{P_{lum}}}{P_{lum}} \]

- The Emission Intensity of plywood \( EI_{ply} \) will be calculated as:

\[ EI_{ply} = \frac{E_{P_{ply}}}{P_{ply}} \]

- The Emission Intensity of veneer \( EI_{ven} \) will be calculated as:

\[ EI_{ven} = \frac{E_{P_{ven}}}{P_{ven}} \]

- The Emission Intensity of medium density fiber board \( EI_{MDF} \) will be calculated as:

\[ EI_{MDF} = \frac{E_{P_{MDF}}}{P_{MDF}} \]
The Emission Intensity of wood chips $E_{I_{chips}}$ will be calculated as:

$$E_{I_{chips}} = \frac{E_{P_{chips}}}{P_{chips}}$$

The Emission Intensity of wood pellets $E_{I_{pellets}}$ will be calculated as:

$$E_{I_{pellets}} = \frac{E_{P_{pellets}}}{P_{pellets}}$$