Part 3A – Indirect GHG from Cement Manufacturing

Calculation of Greenhouse Gas (GHG) Inventory for Indonesia Cement Industries
Indirect Emission

- Indirect GHG emissions are emissions that are a consequence of the operations of the reporting entity, but occur at sources owned or controlled by another entity. Cement production is associated with indirect greenhouse gas emissions from various sources. Key examples include the CO2 emissions from:
  - External production of electricity consumed by cement producers;
  - Production of clinker bought from other producers and interground with own production;
  - Production and processing of conventional and alternative fuels by third parties;
  - Transport of inputs (raw materials, fuels) and outputs (cement, clinker) by third parties.
Data on indirect emissions as follows:

- **CO₂ from external electricity production** shall be calculated based on the measured delivery of grid electricity and, preferentially, emission factors obtained from the electricity supplier (default = 891 kg CO₂/MWh).

- Alternatively it is recommended to use governmental data for the national power grid (default = 770 kg CO₂/MWh).

- Such factors are based on IEA data which are updated annually, (see [www.ghgprotocol.org/standard/tools.htm](http://www.ghgprotocol.org/standard/tools.htm) for the latest update). In accordance with requirements of the revised
Accounting for the Indirect GHG Emission with Purchased Electricity

Accounting for the indirect GHG emissions associated with purchased electricity
CO2 from production of bought clinker

- Shall be calculated based on the net clinker transfer (bought clinker minus sold clinker plus internal clinker transfer) of the reporting entity, and the emission factor of the clinker.

- With respect to clinker transfers within the company, the real emission factor of the sending plant should be used. If clinker is bought externally, this value is usually not available (865 kg CO2/t Cli).

- In this case a default value from the GNR website shall be used (see www.wbcsdcement.org, look for Getting the Numbers Right, GNR). These values are updated regularly by the CSI.
Please note that the default emission factor of 865 kg CO2/t Cli should only be used for calculating the indirect emissions impact associated with net clinker purchases.

The same default emission factor should not be used for calculating the gross and net direct emissions of the reporting company.
• The approaches for calculating these two types of indirect emissions are summarized in Table 2. Quantification of other indirect emissions is not required by this protocol.
• This applies, in particular, for indirect emissions related to transports.
Table 2: Parameters and data sources for calculation of indirect $\text{CO}_2$ emissions as required by this protocol

<table>
<thead>
<tr>
<th>Emission</th>
<th>Parameters</th>
<th>Units</th>
<th>Source of parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO$_2$ from external power prod.</td>
<td>Power bought from external grid</td>
<td>GWh</td>
<td>Measured at plant level</td>
</tr>
<tr>
<td>(indirect emission)</td>
<td>Emission factor excl. T&amp;D losses</td>
<td>t CO$_2$/GWh</td>
<td>Supplier-specific value or country grid factor</td>
</tr>
<tr>
<td>CO$_2$ from clinker bought</td>
<td>Net clinker purchases</td>
<td>t cli</td>
<td>Measured at plant level</td>
</tr>
<tr>
<td>(indirect emission)</td>
<td>Emission factor</td>
<td>t CO$_2$/t cli</td>
<td>(bought minus sold clinker + internal clinker transfer)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default factor (from GNR data base)</td>
</tr>
</tbody>
</table>