Annex 2 Waste Worksheets (all Waste Worksheets are shown here for completeness.)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste Category</th>
<th>Biological Treatment of Solid Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category Code</td>
<td>4B</td>
<td></td>
</tr>
<tr>
<td>Sheet</td>
<td>1 of 1</td>
<td></td>
</tr>
</tbody>
</table>

Estimation of CH₄ emissions from Biological Treatment of Solid Waste

<table>
<thead>
<tr>
<th>Biological Treatment System</th>
<th>Waste Category/Types of Waste¹</th>
<th>STEP 1</th>
<th>STEP 2</th>
<th>STEP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Annual amount treated by biological treatment facilities² (Gg)</td>
<td>Emission Factor (g CH₄/kg waste treated)</td>
<td>Gross Annual Methane Generation (Gg CH₄)</td>
<td>Recovered/flared Methane per Year (Gg CH₄)</td>
</tr>
<tr>
<td>Composting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaerobic digestion at biogas facilities²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
C = (A \times B) \times 10^{-3}
\]

\[
E = (C - D)
\]

1. Information on the waste category should include information of the origin of the waste (MSW, Industrial, Sludge or Other) and type of waste (Food waste or Garden and Park Waste).
2. If anaerobic digestion involves recovery and energy use of the gas, the emissions should be reported in the Energy Sector.
3. Information on whether the amount treated is given as wet or dry weight should be given.
<table>
<thead>
<tr>
<th>Biological Treatment System</th>
<th>Waste Category / Types of Waste</th>
<th>STEP 1</th>
<th>STEP 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaerobic digestion at biogas facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Annual amount treated by biological treatment facilities&lt;sup&gt;3&lt;/sup&gt; (Gg)</td>
<td>Emission Factor (g N&lt;sub&gt;2&lt;/sub&gt;O/kg waste treated)</td>
<td>Net Annual Nitrous Oxide Emissions (Gg N&lt;sub&gt;2&lt;/sub&gt;O)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C = (A x B) x10&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Information on the waste category should include information of the origin of the waste (MSW, Industrial, Sludge or Other) and type of waste (Food waste or Garden and Park Waste).


2. If anaerobic digestion involves recovery and energy use of the gas, the emissions should be reported in the Energy Sector.

3. Information on whether the amount treated is given as wet or dry weight should be given.
<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Amount of Waste Incinerated (Wet Weight)</td>
<td>(Gg Waste)</td>
<td>Dry Matter Content ¹</td>
<td>Fraction of Carbon in Dry Matter ²</td>
<td>Fraction of Fossil Carbon in Total Carbon ³</td>
<td>Oxidation Factor</td>
<td>Conversion Factor</td>
<td>Fossil CO₂ Emissions</td>
</tr>
<tr>
<td></td>
<td>(Gg Waste)</td>
<td>(fraction)</td>
<td>(fraction)</td>
<td>(fraction)</td>
<td>(fraction)</td>
<td>(fraction)</td>
<td>(Gg CO₂)</td>
</tr>
<tr>
<td>Municipal Solid Waste (MSW) ⁴  ⁵</td>
<td>G = A x B x C x D x E x F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composition ⁴ ⁵</td>
<td>Plastics</td>
<td>Textiles</td>
<td>Rubber</td>
<td>Nappies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial solid waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewage sludge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ For default data and relevant equations on the dry matter content in MSW and other types of waste, see Section 5.3.3 in Chapter 5.
² For default data and relevant equations on the fraction of carbon, see Section 5.4.1.1 in Chapter 5.
³ For default data and relevant equations on the fraction of fossil carbon, see Section 5.4.1.2 in Chapter 5.
⁴ Users may either enter all MSW incinerated in the MSW row or the amount of waste by composition by adding the appropriate rows.
⁵ All relevant fractions of fossil C should be included. For consistency with the CH₄ and N₂O sheets, the total amount incinerated should be reported here. However the fossil CO₂ emissions from MSW should be reported either for total MSW or its components.
### Sector Waste

**Category**: Open Burning of Waste  
**Category Code**: 4C2

#### Sheet 1 of 1: Estimation of total amount of waste open-burned

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Region, city, etc.</strong></td>
<td>Population</td>
<td>Fraction of Population Burning Waste</td>
<td>Per Capita Waste Generation</td>
<td>Fraction of the waste amount burned relative to the total amount of waste treated</td>
<td>Number of days by year</td>
</tr>
<tr>
<td>P (Capita)</td>
<td>P fraction</td>
<td>MSW capita/day</td>
<td>B frac</td>
<td>Number of days by year</td>
<td>MSW E (Gg/yr)</td>
</tr>
</tbody>
</table>

**Sum of regions, cities, etc. (Total amount of MSW open-burned in the country)**

<table>
<thead>
<tr>
<th><strong>Total</strong></th>
</tr>
</thead>
</table>

1 When all the amount of waste is burned B frac could be considered equal 1. When a substantial quantity of waste in open dumps is burned, a relatively large part of waste is left unburned. In this situation, B frac should be estimated using survey or research data available or expert judgement.
<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Amount of Fossil Liquid Waste Incinerated (Weight)</td>
<td>Fossil Carbon Content of Fossil Liquid Waste</td>
<td>Oxidation Factor for Fossil Liquid Waste of type i</td>
<td>Conversion Factor</td>
<td>Fossil CO₂ Emissions (Gg CO₂)</td>
</tr>
<tr>
<td>Lubricants</td>
<td>Gg Waste</td>
<td>CL (fraction)</td>
<td>OF (fraction)</td>
<td>44/12</td>
<td>E=A×B×C×D</td>
</tr>
<tr>
<td>Solvents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Sheet 1 of 1 Estimation of CO₂ emissions from Open Burning of Waste

#### STEP 1

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Amount of Waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>open-burned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Wet Weight)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Matter Content 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gg Waste)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction of Carbon in Dry Matter 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Matter 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dm (fraction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction of Fossil Carbon in Total Carbon 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxidation Factor 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversion Factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fossil CO₂ Emissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ F = A \times B \times C \times D \times E \times 10^{-6} \]

\[ L = F \times G \times H \times I \times J \times K \]

#### STEP 2

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Solid Waste (MSW) 5,6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>comes from previous table</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Composition 5,6

- Plastics
- Textiles
- Rubber
- Nappies
- etc

Other (specify)

- add as needed

**Total**

---

1. For default data and relevant equations on the dry matter content in MSW and other types of waste, see Section 5.3.3 in Chapter 5.
2. For default data and relevant equations on the fraction of carbon, see Section 5.4.1.1 in Chapter 5.
3. For default data and relevant equations on the fraction of fossil carbon, see Section 5.4.1.2 in Chapter 5.
4. The amount MSW can be calculated in the previous sheet “Estimation of Total Amount of Waste Open-burned”. See also Equation 5.7.
5. Users may either enter all MSW incinerated in the MSW row or the amount of waste by composition by adding the appropriate rows.
6. All relevant fractions of fossil C should be included. For consistency with the CH₄ and N₂O sheets, the total amount open-burned should be reported here. However, the fossil CO₂ emissions from MSW should be reported either for total MSW or its components.
<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>Amount of Waste Incinerated (Wet Weight)</th>
<th>Methane Emission Factor (kg CH(_4)/Gg Wet Waste)</th>
<th>Methane Emissions (Gg CH(_4))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Solid Waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial solid waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewage sludge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. If the total amount of waste is expressed in terms of dry waste, the CH\(_4\) emission factor needs to refer to dry waste instead.
2. \(10^6\) converts result into Gg.
<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Open Burning of Waste</td>
</tr>
<tr>
<td>Category Code</td>
<td>4C2</td>
</tr>
</tbody>
</table>

**Sheet 1 of 1 Estimation of CH₄ emissions from Open Burning of Waste**

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Amount of Waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-burned (Wet Weight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gg Waste)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methane Emission Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(kg CH₄/Gg Wet Waste)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methane Emissions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gg CH₄)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H = F x G x 10⁻⁶</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Total amount of MSW open-burned is obtained by estimates in the Worksheet “Total amount of waste open-burned”.
2. If the total amount of waste is expressed in term of dry waste, the CH₄ emission factor needs to refer to dry waste instead.
3. 10⁻⁶ converts result into Gg.
<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Waste Incineration</td>
</tr>
<tr>
<td>Category Code</td>
<td>4C1</td>
</tr>
</tbody>
</table>

Sheet 1 of 1  Estimation of N\textsubscript{2}O emissions from Incineration of Waste

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>A (Total Amount of Waste Incinerated (Wet Weight \textsuperscript{1}) (Gg Waste))</th>
<th>B (Nitrous Oxide Emission Factor (kg N\textsubscript{2}O/Gg Wet Waste) \textsuperscript{1})</th>
<th>C (Nitrous Oxide Emissions (Gg N\textsubscript{2}O))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Solid Waste</td>
<td></td>
<td></td>
<td>C= A x B x 10\textsuperscript{-6} \textsuperscript{2}</td>
</tr>
<tr>
<td>Industrial solid waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewage sludge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total |                               |                                 |                                                 |

\textsuperscript{1} If the total amount of waste is expressed in terms of dry waste, the N\textsubscript{2}O emission factor needs to refer to dry waste instead.

\textsuperscript{2} 10\textsuperscript{-6} converts result into Gg.
<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>F (Total Amount of Waste Open-burned (Dry Weight))</th>
<th>G (Nitrous Oxide Emission Factor (kg N₂O/Gg Dry Waste))</th>
<th>H (Nitrous Oxide Emissions (Gg N₂O))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Solid Waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These data are given by multiplying columns F and G in sheet 1 of 1 “Estimation of CO₂ emissions from Open Burning of Waste” in page A1.7.

10⁻⁶ converts result into Gg
<table>
<thead>
<tr>
<th>Region or City</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>(P)</td>
<td>Degradable organic component (BOD) (kg BOD/cap/yr)</td>
<td>Correction factor for industrial BOD discharged in sewers (I)</td>
<td>Organically degradable material in wastewater (TON) (kg BOD/yr)</td>
</tr>
<tr>
<td></td>
<td>cap</td>
<td></td>
<td></td>
<td>D = A x B x C</td>
</tr>
</tbody>
</table>

1. \( g \text{ BOD/cap/day} \times 0.001 \times 365 = \text{kg BOD/cap/yr} \)
2. Correction factor for additional industrial BOD discharged into sewers, (for collected the default is 1.25, for uncollected the default is 1.00) (see page 6.14).
<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Domestic Wastewater Treatment and Discharge</td>
</tr>
<tr>
<td>Category Code</td>
<td>4D1</td>
</tr>
<tr>
<td>Sheet</td>
<td>2 of 3</td>
</tr>
<tr>
<td>Estimation of CH₄ emission factor for Domestic Wastewater</td>
<td></td>
</tr>
</tbody>
</table>

**STEP 2**

<table>
<thead>
<tr>
<th>Type of treatment or discharge</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum methane producing capacity (Bᵢ) (kg CH₄/kgBOD)</td>
<td>Methane correction factor for each treatment system (MCFᵢ)</td>
<td>Emission factor (EFᵢ) (kg CH₄/kg BOD)</td>
</tr>
<tr>
<td></td>
<td>C = A x B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

add as needed
<table>
<thead>
<tr>
<th>Income group</th>
<th>Type of treatment or discharge pathway</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fraction of population</td>
<td>Degree of utilization</td>
<td>Emission Factor</td>
<td>Organically degradable material</td>
<td>Sludge removed</td>
<td>Methane recovered and flared</td>
<td>Net methane emissions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>income group</td>
<td>(U_i)</td>
<td>(T_i)</td>
<td>in wastewater</td>
<td>(S)</td>
<td>(R)</td>
<td>(CH_4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(fraction)</td>
<td>(fraction)</td>
<td>(kg CH_4/kg BOD)</td>
<td>(kg BOD/yr)</td>
<td>(kg BOD/yr)</td>
<td>(kg CH_4/yr)</td>
<td>(kg CH_4/yr)</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td></td>
<td>Sheet 2 of 3</td>
<td>Sheet 1 of 3</td>
<td></td>
<td></td>
<td></td>
<td>G = [(A x B x C) x (D - E)] - F</td>
</tr>
<tr>
<td>Urban high income</td>
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<tr>
<td>Urban low income</td>
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<tr>
<td>Industry Sectors</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>----------------------------------</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Total industry product</td>
<td>Wastewater generated</td>
<td>Chemical Oxygen Demand</td>
<td>Total organic degradable material in wastewater for each industry sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(P₁) (t \text{ product/yr})</td>
<td>(W) (m³/t \text{ product})</td>
<td>(COD) (kgCOD/m³)</td>
<td>(TOW) (kgCOD/yr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial sector 1</td>
<td></td>
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<tr>
<td>Industrial sector 2</td>
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<tr>
<td>Industrial sector 3</td>
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</tbody>
</table>

add as needed

Total

\[ D = A \times B \times C \]
<table>
<thead>
<tr>
<th>Type of treatment or discharge</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Methane Producing Capacity (B₁) (kg CH₄/kg COD)</td>
<td>Methane Correction Factor for the Treatment System (MCFᵢ) (-)</td>
<td>Emission Factor (EFᵢ) (kg CH₄/kg COD)</td>
<td></td>
</tr>
<tr>
<td>C = A x B</td>
<td></td>
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</tbody>
</table>

add as needed
<table>
<thead>
<tr>
<th>Industrial sector</th>
<th>Type of treatment or discharge pathway</th>
<th>A (TOMi) (kg COD/yr)</th>
<th>B (Si) (kg COD/yr)</th>
<th>C (EFi) (kg CH₄/kg COD)</th>
<th>D (Ri) (kg CH₄/yr)</th>
<th>E (CH₄i) (kg CH₄/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sheet 1 of 3</td>
<td>Sheet 2 of 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial sector 1</td>
<td></td>
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</tr>
<tr>
<td>Industrial sector 2</td>
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</tr>
<tr>
<td>Industrial sector 3</td>
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<tr>
<td>add as needed</td>
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</tbody>
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**Total**
<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Domestic Wastewater Treatment and Discharge</td>
</tr>
<tr>
<td>Category Code</td>
<td>4D1</td>
</tr>
<tr>
<td>Sheet</td>
<td>1 of 2</td>
</tr>
</tbody>
</table>

**Estimation of nitrogen in effluent**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (P)</td>
<td>Per capita protein consumption (Protein)</td>
<td>Fraction of nitrogen in protein (F_{\text{NPR}})</td>
<td>Fraction of non-consumption protein (F_{\text{NON-CON}})</td>
<td>Fraction of industrial and commercial co-discharged protein (F_{\text{IND-COM}})</td>
<td>Nitrogen removed with sludge (N_{\text{SLUDGE}})</td>
<td>Total nitrogen in effluent (N_{\text{EFFLUENT}})</td>
</tr>
<tr>
<td>units (people)</td>
<td>(kg/person/year)</td>
<td>(kg N/kg protein)</td>
<td>(-)</td>
<td>(-)</td>
<td>(kg)</td>
<td>kg N/year)</td>
</tr>
</tbody>
</table>

\[ H = (A \times B \times C \times D \times E) - F \]

**Total**
### Estimation of emission factor and emissions of indirect N₂O from Wastewater

<table>
<thead>
<tr>
<th>Sector</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Domestic Wastewater Treatment and Discharge</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen in effluent (NEFFLUENT) (kg N/year)</td>
<td>Emission factor (kg N₂O-N/1kg N)</td>
<td>Conversion factor of kg N₂O-N into kg N₂O (44/28)</td>
<td>Emissions from Wastewater plants (default = zero) (kg N₂O/year)</td>
<td>Total N₂O emissions (kg N₂O/year)</td>
</tr>
<tr>
<td>(kg N/year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E = (A x B x C) – D