CLEAN DEVELOPMENT MECHANISM

**CDM-MP63-A06**

# Draft Large-Scale Methodology

# AM00XX: Emission reduction in cement clinker sector

Version 01.0 – Draft

Sectoral scope(s): 04



United Nations
Framework Convention on
Climate Change

# COVER NOTE

## 1. Procedural background

1. The Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) at its seventy-seventh meeting considered an issue related to the submission of the standardized baseline "PSB0002: Standardized baselines for clinker production in Ethiopia". The Board agreed that, in order to move the consideration of the submission forward, there is a need to develop a new methodology, which should be used in conjunction with the standardized baseline by project participants for their CDM project activities. The Board requested the secretariat and the Methodologies Panel (Meth Panel) to develop this methodology using a top-down approach, in consultation with the Ethiopian designated operational entity (DNA).

## 2. Purpose

2. The objective of this methodology is to provide relevant sections, such as project emissions, leakage and emission reductions for the purpose of calculation of emission reduction of the project activities which uses a standardized baseline in clinker sector that refers to this methodology.

## 3. Key issues and proposed solutions

3. The proposed methodology provides relevant sections, such as project emissions, leakage and emission reductions for the purpose of calculation of emission reduction of the project activity, which uses a standardized baseline in clinker sector that refers to this methodology.

## 4. Impacts

4. The methodology if approved can be used together with any approved standardized baseline by project activities in clinker sector.

## 5. Subsequent work and timelines

5. The Meth Panel, at its 63rd meeting, agreed on the draft methodology. After receiving public inputs on the document, the Meth Panel will continue working on the methodology, at its 64th meeting, for recommendation to the Board at a future meeting of the Board.

## 6. Recommendations to the Board

6. Not applicable (call for public input).

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# 1. Introduction

## 1.1. Background

1. This methodology is developed based on mandate given by the Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) to develop a top-down methodology particularly in the context of submission PSB0002: Standardized baselines for clinker production in Ethiopia" on standardized baseline for clinker production (EB77, paragraph 51). This methodology would apply to any approved standardized baseline for clinker sector that refers to this methodology.

2. The following table describes the key elements of the methodology:

**Table 1. Methodology key elements**

| | |
|---|---|
| **Typical projects** | Mitigation project activities at existing as well at a Greenfield clinker facilities |
| **Type of GHG emissions mitigation action** | • Fuel switch;<br>• Feedstock switch;<br>• Technology switch including energy efficiency;<br>• Combination of all the above |

## 1.2. Objectives



3. The objective of this methodology is to provide relevant sections, such as project emissions, leakage and emission reductions for the purpose of calculation of emission reduction of the project activities which uses a standardized baseline in clinker sector that refers to this methodology.

# 2. Scope, applicability, and entry into force

## 2.1. Scope

4. This methodology is applicable to the CDM project activity that aims to reduce the greenhouse gases (GHG) emissions from clinker production in cement sector. The methodology covers the algorithm, data and description on sections of project boundary, project emissions, leakage emissions and monitoring methodology in order to facilitate the calculation of emission reductions for the project that applies this methodology together with a standardized baseline that refers to this methodology.

## 2.2. Applicability

5. The methodology is applicable to the CDM project activity only together with the approved standardized baseline that refers to this methodology.

6. The applicability conditions contained in the approved standardized baseline that is used together with this methodology shall apply.

### 2.3. Entry into force

7. Not applicable (call for public input).

# 3. Normative references

8. This methodology refers to the latest approved versions of the following methodological tools:

   (a) "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion";

   (b) "Tool to calculate baseline, project and/or leakage emissions from electricity consumption";

   (c) "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

# 4. Definitions

9. The definitions contained in the Glossary of CDM terms shall apply.

# 5. Baseline methodology

### 5.1. Project boundary



10. The spatial extent of the project boundary encompasses the physical, geographical location of each facility used for the determination of the benchmark emission factor based on aggregation criteria.

**Table 2. Emission sources included in or excluded from the project boundary[1]**

| Source | | Gas | Included | Justification/Explanation |
|---|---|---|---|---|
| Project activity | Project industrial facility | $CO_2$ | Yes | Main source of emissions |
| | | $CH_4$ | No | Minor source |
| | | $N_2O$ | No | Minor source |

[1] This table includes the emission sources of project activity only. The baseline emission sources are included in the standardized baseline that refers to this methodology.

## 5.2. Identification of baseline scenario and demonstration of additionality

11. The baseline scenario is standardized based on standardized baseline that refers to this methodology. Baseline scenario represents a scenario that the output will be delivered by a reference clinker facility that has the performance equivalent to standardized baseline applicable to the cement clinker sector of the country/region.

12. The CDM project activity is additional if the additionality criteria (positive list) of the approved standardized baseline that refers to this methodology are met.

## 5.3. Baseline emissions

13. Baseline emissions shall be determined using the following equation:

$$BE_y = EF_{sec,BL} \times Pr_y \quad \text{Equation (1)}$$

Where:

| | | |
|---|---|---|
| $BE_y$ | = | Baseline emissions in year *y* (t $CO_2$) |
| $EF_{sec,BL}$ | = | Standardized baseline emission factor in year y, provided by approved standardized baseline that refers to this methodology (t $CO_2$/t of output) |
| $Pr_y$ | = | Clinker output produced at the project clinker facility in year *y* (t of output) |



14. The standardized emission factor should be derived from the approved standardized baseline.

## 5.4. Project emissions

15. Project emissions result at the project facility from the following sources:

(a) Combustion of fossil fuel;

(b) Use of feedstock;

(c) Generation of electricity either by a captive power plant or by a grid.

16. Project emissions shall be determined using the following equation:

$$PE_y = PE_{fuel,y} + PE_{feedstock,y} + PE_{EC,y} \quad \text{Equation (2)}$$

Where:

| | | |
|---|---|---|
| $PE_y$ | = | Project emissions in year *y* (t $CO_2$) |
| $PE_{fuel,y}$ | = | Project emissions due to the use of fossil fuels (t $CO_2$) |
| $PE_{feedstock,y}$ | = | Project emissions due to the use of feedstock (t $CO_2$) |
| $PE_{EC,y}$ | = | Project emissions due to the generation of electricity (t $CO_2$) |

### 5.4.1. Combustion of fossil fuel

17. Project emissions ($PE_{fuel,y}$) shall be calculated as the $CO_2$ emissions from fossil fuel(s) combustion, using the latest approved version of the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion". The parameter $PE_{fuel,y}$ corresponds to $PE_{FC,j,y}$ in the tool, where *j* is the type of the fossil fuel used in the project facility.

### 5.4.2. Use of feedstock

18. For estimation of $CO_2$ emissions resulting from calcination, the proportion of calcium oxides and magnesium oxides present in the produced clinker will be considered. Measured values of CaO and MgO contents, corrected for the non-carbonate sources (for example, deducting any calcium that comes from use of calcium silicates or fly ash used as raw materials) shall be used. $CO_2$ emissions from calcination with correction for non-carbonate sources shall be determined as follows:

$$PE_{Calcin,y} = 0.785 \times \left(CaO_{CLNK,y} \times PR_y - CaO_{RM,y} \times RM_y\right) + 1.092 \times \left(MgO_{CLNK,y} \times PR_y - MgO_{RM,y} \times RM_y\right) \quad \text{Equation (3)}$$

Where:

| | | |
|---|---|---|
| $PE_{Calcin,y}$ | = | Project emissions from calcination of calcium carbonate and magnesium carbonate in the year *y* (t $CO_2$) |
| 0.785 | = | Stoichiometric emission factor for CaO (t $CO_2$/t CaO) |
| 1.092 | = | Stoichiometric emission factor for MgO (t $CO_2$/t MgO) |
| $CaO_{RM,y}$ | = | Non-carbonated CaO content in the raw materials in the year *y* (t CaO/t raw material) |
| $CaO_{CLNK,y}$ | = | CaO content in the clinker produced in the year *y* (t of CaO/t-clinker) |
| $MgO_{RM,y}$ | = | Non-carbonated MgO content in the raw materials in the year *y* (t MgO/t raw material) |
| $MgO_{CLNK,y}$ | = | Product of the MgO content in the clinker produced in the year *y* (t MgO/t clinker) |
| $RM_y$ | = | Annual consumption of raw materials in the year *y* (t) |
| $PR_y$ | = | Clinker output produced at the project clinker facility in year *y* (t of output) |



### 5.4.3. Consumption of electricity

19. Project emissions ($PE_{EC,y}$) shall be calculated using the latest approved version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".

## 5.5. Leakage

20. The following emission sources shall be considered as leakage under this methodology:

    (a) Transportation, from offsite locations to the project plant site, of alternative raw materials (e.g. blast furnace slag, fly ash, waste ash from fuel combustion in thermal power plants, gypsum and others) that are included in the positive list of standardized baseline that refers to this methodology.

    (b) An increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity, if biomass is included in positive list of fuels of standardized baseline that refers to this methodology. Entire biomass quantity consumed in project plant should be considered for leakage emissions.

21. The leakage from the project activity is expressed as:

$$LE_y = LE_{Trans,y} + LE_{biomass,y} \quad \text{Equation (4)}$$

Where:

| | | |
|---|---|---|
| $LE_y$ | = | $CO_2$ emissions due to leakage during the year *y* (t $CO_2$) |
| $LE_{Trans,y}$ | = | $CO_2$ leakage due to transportation of new alternative raw materials during the year *y* (t $CO_2$) |
| $LE_{biomass,y}$ | = | $CO_2$ leakage due to diversion of biomass residues from other uses during the year *y* (t $CO_2$) |



### 5.5.1. Leakage due to transportation of alternative raw materials ($LE_{Trans}$)

22. Transport-related leakage for alternative raw materials that are included in the positive list of standardized baseline that refers to this methodology shall be accounted only if the distance between the source of a new alternative materials and the project activity plant is more than 100km. Emissions shall be determined as follows:

$$LE_{Trans,y} = \frac{\left[FC_{Trans,i} \times Dist \times NCV_i \times EF_{CO2,i}\right]}{\left(Q_{Trip} \times 1000\right)} \times ALTM_y \quad \text{Equation (5)}$$

Where:

| | | |
|---|---|---|
| $LE_{Trans,y}$ | = | $CO_2$ leakage due to transportation of a new alternative materials during the year *y* (t $CO_2$) |
| $FC_{Trans,i}$ | = | Fuel consumption of the vehicle per kilometer (mass or volume unit of fuel/kilometer) |
| $Dist$ | = | Distance between the source of an alternative materials and the project activity plant (km) |
| $EF_{CO2,i}$ | = | $CO_2$ emission factor for fuel type *i* (t $CO_2$/GJ) |
| $Q_{Trip}$ | = | Quantity of alternative materials carried in one trip per vehicle (t) |

| | | |
|---|---|---|
| $ALTM_y$ | = | Annual consumption of alternative materials in raw materials in year *y* (t) |
| $NCV_i$ | = | Net calorific value of the fuel type *i* (GJ/mass or volume units) |

### 5.5.2. Leakage due to diversion of biomass residues from other uses

23. It is assumed that an equivalent amount of fossil fuels, on energy basis, would be used if biomass residues are diverted from other users.

24. Project participants shall determine leakage emissions as follows:

$$LE_{biomass,y} = EF_{CO2,LE} \times BR_{PJ,y} \times NCV_y \quad \text{Equation (6)}$$

Where:

| | | |
|---|---|---|
| $LE_{biomass,y}$ | = | $CO_2$ leakage due to diversion of biomass residues from other uses during the year *y* (t $CO_2$) |
| $EF_{CO2,LE}$ | = | $CO_2$ emission factor of the most carbon intensive fossil fuel used in the country (t $CO_2$/GJ) |
| $BR_{PJ,y}$ | = | Quantity of biomass residues used under the project activity during the year *y* (tonnes on dry-basis/yr) |
| $NCV_y$ | = | Net calorific value of the biomass residues in year *y* (GJ/ton of dry matter) |



25. This leakage source can be neglected in case the project proponent can demonstrate the biomass residues would have not been used either for energy purposes (e.g. power and/or heat generation).

## 5.6. Emission reductions

26. Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad \text{Equation (7)}$$

Where:

| | | |
|---|---|---|
| $ER_y$ | = | Emission reductions in year *y* (t $CO_2$) |
| $BE_y$ | = | Baseline emissions in year *y* (t $CO_2$) |

$PE_y$ = Project emissions in year *y* (t $CO_2$)

$LE_y$ = $CO_2$ emissions due to leakage during the year *y* (t $CO_2$)

### 5.7. Changes required for methodology implementation in 2nd and 3rd crediting periods

27. Refer to the latest approved version of the methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

### 5.8. Project activity under a programme of activities (PoA)

28. Requirements set out in the latest approved version of the standard for "Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" shall be followed.

### 5.9. Data and parameters not monitored

29. The data and parameter of this section are accounted for in the standardized baseline that shall be used together with this methodology. Therefore no data is required to be described in this section.

## 6. Monitoring methodology



30. Describe and specify in the CDM-PDD all monitoring procedures, including the type of measurement instrumentation used, the responsibilities for monitoring and QA/QC procedures that will be applied. Where the methodology provides different options (e.g. use of default values or on-site measurements), specify which option will be used. All meters and instruments should be calibrated regularly as per industry practices.

31. All data collected as part of monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period. One hundred per cent of the data should be monitored if not indicated differently in the comments in the tables below.

### 6.1. Data and parameters monitored

32. All the data and parameters will be monitored according to the tools referred in this methodology.

**Data / Parameter table 1.**

| **Data / Parameter:** | $\mathbf{EF_{sec,BL}}$ |
|---|---|
| Data unit: | t $CO_2$/t of output |
| Description: | Standardized baseline emission factor in year *y*, provided by approved standardized baseline that refers to this methodology |
| Source of data: | Approved standardized baseline |

| | |
|---|---|
| Measurement procedures (if any): | - |
| Monitoring frequency: | Annually |
| QA/QC procedures: | - |
| Any comment: | - |

**Data / Parameter table 2.**

| **Data / Parameter:** | $\mathbf{Pr_y}$ |
|---|---|
| Data unit: | t |
| Description: | Clinker output produced at the project clinker facility in year *y* |
| Source of data: | Facility records |
| Measurement procedures (if any): | - |
| Monitoring frequency: | Continuously |
| QA/QC procedures: | - |
| Any comment: | - |

**Data / Parameter table 3.**

| **Data / Parameter:** | $\mathbf{CaO_{CLINK,y}}$ |
|---|---|
| Data unit: | t CaO/t clinker) |
| Description: | CaO content in the clinker produced in the year *y* |
| Source of data: | It will be measured as part of laboratory quality control procedure |
| Measurement procedures (if any): | Sampling |
| Monitoring frequency: | Monthly |
| QA/QC procedures: | These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |



**Data / Parameter table 4.**

| **Data / Parameter:** | $\mathbf{CaO_{RM,y}}$ |
|---|---|
| Data unit: | t CaO/t raw material |
| Description: | Non-carbonated CaO content in the raw materials in the year *y* |
| Source of data: | It will be measured as part of laboratory quality control procedure |
| Measurement procedures (if any): | Sampling |
| Monitoring frequency: | Monthly |
| QA/QC procedures: | These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 5.**

| **Data / Parameter:** | **$MgO_{CLNK,y}$** |
|---|---|
| Data unit: | t MgO/t clinker |
| Description: | Product of the MgO content in the clinker produced in the year *y* |
| Source of data: | It will be measured as part of laboratory quality control procedure |
| Measurement procedures (if any): | Sampling |
| Monitoring frequency: | Monthly |
| QA/QC procedures: | These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 6.**

| **Data / Parameter:** | **$MgO_{RM,y}$** |
|---|---|
| Data unit: | t MgO/t raw material |
| Description: | Non-carbonated MgO content in the raw materials in the year *y* |
| Source of data: | It will be measured as part of laboratory quality control procedure |
| Measurement procedures (if any): | Sampling |
| Monitoring frequency: | Monthly |
| QA/QC procedures: | These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |



**Data / Parameter table 7.**

| **Data / Parameter:** | **$RM_y$** |
|---|---|
| Data unit: | t |
| Description: | Annual consumption of non-carbonated raw materials in the year *y* |
| Source of data: | It will be measured with field instruments and checked with inventories control procedure |
| Measurement procedures (if any): | Weighfeeders/Weighbridge/Stockpile control |
| Monitoring frequency: | Monthly |
| QA/QC procedures: | These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 8.**

| **Data / Parameter:** | **$FC_{Trans,i}$** |
|---|---|
| Data unit: | mass or volume unit of fuel/kilometer |
| Description: | Fuel consumption of the vehicle per kilometer |
| Source of data: | Estimated as part of fuel consumption evaluation of logistic department or data from external suppliers |
| Measurement procedures (if any): | Logistic registered data or third part |
| Monitoring frequency: | Annually |
| QA/QC procedures: | These data will be collected as part of normal logistic level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 9.**

| **Data / Parameter:** | **Dist** |
|---|---|
| Data unit: | Km |
| Description: | Distance between the source of an alternative materials and the project activity plant |
| Source of data: | It will be registered on logistic department as part of inventories control |
| Measurement procedures (if any): | Logistic records or purchased tickets |
| Monitoring frequency: | Per trip |
| QA/QC procedures: | These data will be collected as part of normal logistic level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |



**Data / Parameter table 10.**

| **Data / Parameter:** | **$Q_{trip}$** |
|---|---|
| Data unit: | t |
| Description: | Quantity of alternative materials carried in one trip per vehicle |
| Source of data: | It will be registered on logistic department as part of inventories control |
| Measurement procedures (if any): | Weighbridge data and purchase receipts |
| Monitoring frequency: | Per trip |
| QA/QC procedures: | These data will be collected as part of normal logistic level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 11.**

<table>
<tr><td>Data / Parameter:</td><td>$EF_{CO2,i}$</td></tr>
<tr><td>Data unit:</td><td>t $CO_2$/GJ</td></tr>
<tr><td>Description:</td><td>$CO_2$ emission factor for the fossil fuel type i</td></tr>
<tr><td>Source of data:</td><td>The following data sources may be used if the relevant conditions apply:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>(a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr>
<tr><td>(b) Measurements by the project participants</td><td>If (a) is not available</td></tr>
<tr><td>(c) Regional or national default values</td><td>If (a) is not available.<br><br>These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)</td></tr>
<tr><td>(d) IPCC default values at the upper limit of the uncertainty at a 95 per cent confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr>
</table></td></tr>
<tr><td>Measurement procedures (if any):</td><td>For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.<br>For (a): if the fuel supplier does provide the NCV value and the $CO_2$ emission factor on the invoice and these two values are based on measurements for this specific fuel, this $CO_2$ factor should be used. If another source for the $CO_2$ emission factor is used or no $CO_2$ emission factor is provided, Options (b), (c) or (d) should be used</td></tr>
<tr><td>Monitoring frequency:</td><td>For (a) and (b): the emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated.<br>For (c): review appropriateness of the values annually.<br>For (d): any future revision of the IPCC Guidelines should be taken into account</td></tr>
<tr><td>QA/QC procedures:</td><td>-</td></tr>
<tr><td>Any comment:</td><td>-</td></tr>
</table>

**Data / Parameter table 12.**

| **Data / Parameter:** | **$NCV_i$** |
|---|---|
| Data unit: | GJ/mass or volume units |
| Description: | Weighted average net calorific value for fuel type *i* |
| Source of data: | The following data sources may be used if the relevant conditions apply:<br><br>**Data source** / **Conditions for using the data source**<br>(a) Values provided by the fuel supplier in invoices — This is the preferred source<br>(b) Measurements by the project participants — If (a) is not available<br>(c) Regional or national default values — If (a) is not available.<br>These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)<br>(d) IPCC default values at the upper limit of the uncertainty at a 95 per cent confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories — If (a) is not available |
| Measurement procedures (if any): | For (a) and (b): Measurements should be undertaken in line with national or international fuel standards |
| Monitoring frequency: | For (a) and (b): the NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated.<br>For (c): review appropriateness of the values annually.<br>For (d): any future revision of the IPCC Guidelines should be taken into account |
| QA/QC procedures: | Verify if the values under (a), (b) and (c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (a), (b) or (c) should have ISO17025 accreditation or justify that they can comply with similar quality standards |
| Any comment: | Note that for the NCV the same basis (pressure and temperature) should be used as for the fuel consumption |

**Data / Parameter table 13.**

| **Data / Parameter:** | **$ALTM_y$** |
|---|---|
| Data unit: | t |
| Description: | Annual consumption of alternative materials in raw materials in year *y* |
| Source of data: | It will be registered as part of inventories control |
| Measurement procedures (if any): | Weighbridge/Stockpile control data |
| Monitoring frequency: | Per trip |
| QA/QC procedures: | These data will be collected as part of normal logistic level operations. QA/QC requirements according to ISO 9000 or similar quality systems |
| Any comment: | - |

**Data / Parameter table 14.**

| **Data / Parameter:** | **$BR_{PJ,y}$** |
|---|---|
| Data unit: | tonnes on dry-basis |
| Description: | Quantity of biomass residues used under the project activity during the year *y* |
| Source of data: | On-site measurements |
| Measurement procedures (if any): | Use weight meters. Adjust for the moisture content in order to determine the quantity of dry biomass |
| Monitoring frequency: | Data monitored continuously and aggregated as appropriate, to calculate emissions reductions |
| QA/QC procedures: | Cross-check the measurements with an annual energy balance that is based on purchased quantities and stock changes |
| Any comment: | - |



**Data / Parameter table 15.**

| **Data / Parameter:** | **$NCV_y$** |
|---|---|
| Data unit: | GJ/tonnes on dry-basis |
| Description: | Net calorific value of biomass residues in year *y* |
| Source of data: | On-site measurements |
| Measurement procedures (if any): | Measurements shall be carried out at reputed laboratories and according to relevant international standards. Measure the NCV on dry-basis |
| Monitoring frequency: | At least every six months, taking at least three samples for each measurement |
| QA/QC procedures: | Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements. Ensure that the NCV is determined on the basis of dry biomass |
| Any comment: | - |

**Data / Parameter table 16.**

| **Data / Parameter:** | **$EF_{CO2,LE}$** |
|---|---|
| Data unit: | t $CO_2$/GJ |
| Description: | $CO_2$ emission factor of the most carbon intensive fuel used in the country |
| Source of data: | Identify the most carbon intensive fuel type from the national communication, other literature sources (e.g. IEA). Possibly consult with the national agency responsible for the national communication/GHG inventory. If available, use national default values for the $CO_2$ emission factor. Otherwise, IPCC default values may be used |
| Measurement procedures (if any): | - |
| Monitoring frequency: | Annually |
| QA/QC procedures: | - |
| Any comment: | - |

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## Document information

| *Version* | *Date* | *Description* |
|---|---|---|
| Draft 01.0 | 14 May 2014 | MP 63, Annex 6<br>A call for public input will be issued on this draft methodology. |

Decision Class: Regulatory
Document Type: Standard
Business Function: Methodology
Keywords: cement plant