

Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012 (Text with EEA relevance)

## ANNEX IV

**Activity-specific monitoring methodologies related to installations (Article 20(2))**

## 9. PRODUCTION OF CEMENT CLINKER AS LISTED IN ANNEX I TO DIRECTIVE 2003/87/EC

A. **Scope**

The operator shall include at least the following potential sources of CO<sub>2</sub> emissions: calcination of limestone in the raw materials, conventional fossil kiln fuels, alternative fossil-based kiln fuels and raw materials, biomass kiln fuels (biomass wastes), non-kiln fuels, organic carbon content of limestone and shales and raw materials used for waste gas scrubbing.

B. **Specific monitoring rules**

Emissions from combustion shall be monitored in accordance with section 1 of this Annex. Process emissions from raw meal components shall be monitored in accordance with section 4 of Annex II based on the carbonate content of the process input (calculation Method A) or on the amount of clinker produced (calculation Method B). In case of Method A, carbonates to be taken into account shall at least include CaCO<sub>3</sub>, MgCO<sub>3</sub> and FeCO<sub>3</sub>. In case of Method B, the operator shall take into account at least CaO and MgO, and shall provide evidence to the competent authority as to which extent further carbon sources have to be taken into account.

CO<sub>2</sub> emissions related to dust removed from the process and organic carbon in the raw materials shall be added in accordance with subsections C and D of this section of Annex IV.

**Calculation Method A: Kiln Input Based**

Where cement kiln dust (CKD) and bypass dust leave the kiln system the operator shall not consider the related raw material as process input, but calculate emissions from CKD in accordance with subsection C.

Unless the raw meal is characterised, the operator shall apply the uncertainty requirements for activity data separately to each of the relevant carbon-bearing kiln inputs, avoiding double counting or omissions from returned or by-passed materials. Where activity data is determined based on the clinker produced, the net amount of raw meal may be determined by means of a site-specific empirical raw meal/clinker ratio. That ratio shall be updated at least once per year applying industry best practice guidelines.

**Calculation Method B: Clinker Output Based**

The operator shall determine activity data as the clinker production [t] over the reporting period in one of the following ways:

- (a) by direct weighing of clinker;
- (b) based on cement deliveries, by material balance taking into account dispatch of clinker, clinker supplies as well as clinker stock variation, using the following formula:

$$\begin{array}{l} \text{clinker} \\ \text{produced} \\ \text{[t]} \end{array} = ((\text{cement deliveries [t]} - \text{cement stock variation [t]}) \times \text{clinker / cement ratio [t clinker / t cement]}) - (\text{clinker supplied [t]}) + (\text{clinker dispatched [t]}) - (\text{clinker stock variation [t]}).$$

The operator shall either derive the clinker / cement ratio for each of the different cement products based on the provisions of Articles 32 to 35 or calculate the ratio from the difference of cement deliveries and stock changes and all materials used as additives to the cement including by-pass dust and cement kiln dust.

By way of derogation from section 4 of Annex II, tier 1 for the emission factor shall be defined as follows:

**Tier 1:** The operator shall apply an emission factor of 0,525 t CO<sub>2</sub>/t clinker.

#### C. Emissions Related to Discarded Dust

The operator shall add CO<sub>2</sub> emissions, from bypass dust or cement kiln dust (CKD) leaving the kiln system, corrected for a partial calcination ratio of CKD calculated as process emissions in accordance with Article 24(2). By way of derogation from section 4 of Annex II, tiers 1 and 2 for the emission factor shall be defined as follows:

**Tier 1:** The operator shall apply an emission factor of 0,525 t CO<sub>2</sub>/t dust.

**Tier 2:** The operator shall determine the emission factor (EF) at least once annually following Articles 32 to 35 and using the following formula:

$$EF_{CKD} = \left( \frac{EF_{CKD}}{1 + EF_{CKD}} \times d \right) / \left( 1 - \frac{EF_{CKD}}{1 + EF_{CKD}} \times d \right)$$

Where:

$EF_{CKD}$	= Emission factor of partially calcined cement kiln dust [t CO <sub>2</sub> /t CKD];
$EF_{CKD}$	= Installation-specific emission factor of clinker [t CO <sub>2</sub> /t clinker];
$d$	= Degree of CKD calcination (released CO <sub>2</sub> as % of total carbonate CO <sub>2</sub> in the raw mix).

Tier 3 for the emission factor is not applicable.

#### D. Emissions from non-carbonate carbon in raw meal

The operator shall determine the emissions from non-carbonate carbon at least from limestone, shale or alternative raw materials (for example, fly ash) used in the raw meal in the kiln in accordance with Article 24(2).

The following tier definitions for the emission factor shall apply:

**Tier 1:** The content of non-carbonate carbon in the relevant raw material shall be estimated using industry best practice guidelines.

**Tier 2:** The content of non-carbonate carbon in the relevant raw material shall be determined at least annually following the provisions of Article 32 to 35.

The following tier definitions for the conversion factor shall apply:

**Tier 1:** A conversion factor of 1 shall be applied.

**Tier 2:** The conversion factor shall be calculated applying industry best practice.