Cement Production

Subpart H, Greenhouse Gas Reporting Program

OVERVIEW

Subpart H of the Greenhouse Gas Reporting Program (GHGRP) (40 CFR 98.80 – 98.88) applies to any facility that contains a cement production process and meets the Subpart H source category definition. Some subparts have thresholds that determine applicability for reporting, and some do not. To decide whether your facility must report under this Subpart, please refer to 40 CFR 98.81 and the GHGRP Applicability Tool.

This Information Sheet is intended to help facilities reporting under Subpart H understand how the source category is defined, what greenhouse gases (GHGs) must be reported, how GHG emissions must be calculated and shared with EPA, and where to find more information.

How is This Source Category Defined?

The cement production source category consists of each kiln and each in-line kiln integrated with the raw mill (in-line kilns/raw mills) at any portland cement manufacturing facility, including alkali bypasses and kilns and in-line kilns/raw mills that burn hazardous waste.

What GHGs Must Be Reported?

Cement production facilities must report the following emissions:

- Carbon dioxide (CO_2) process emissions from calcination in each kiln.
- CO_2 combustion emissions from each kiln.
- Nitrous oxide (N_2O) and methane (CH_4) combustion emissions from each kiln. Report these emissions under 40 CFR Part 98 Subpart C (General Stationary Fuel Combustion Sources). The Information Sheet on General Stationary Fuel Combustion Sources summarizes the rule requirements for calculating and reporting emissions from these units.
- CO_2, N_2O, and CH_4 emissions from each stationary combustion unit other than kilns. Report these emissions under 40 CFR Part 98 Subpart C (General Stationary Fuel Combustion Sources).

If multiple Greenhouse Gas Reporting Program (GHGRP) source categories are co-located at a facility, the facility may also need to report greenhouse gas (GHG) emissions under a different subpart. Please refer to the relevant information sheet for a summary of the rule requirements for any other source categories located at the facility.

How Must GHG Emissions Be Calculated?

Any portland cement manufacturing facility meeting the criteria of 40 CFR 98.2(a)(1) through (3) must monitor and report GHG emissions in accordance with the methods specified in Subpart H. Cement production facilities must calculate and report CO_2 emissions from each kiln using one of the following two methods:

- For kilns that meet the requirements in 40 CFR 98.33(b)(4)(ii) or (b)(4)(iii) for continuous emission monitoring systems (CEMS), the owner or operator must calculate and report under Subpart H the combined process and combustion CO_2 emissions by operating and maintaining a CEMS to measure CO_2 emissions in accordance with the Tier 4 Calculation Methodology of 40 CFR Part 98 Subpart C.
- For other kilns, owners or operators can either:
    - Operate and maintain a CEMS to measure combined process and combustion CO_2 emissions according to the Tier 4 Calculation Methodology specified in 40 CFR 98.33(a)(4), and report these emissions under Subpart H, or
    - Calculate and report under Subpart H annual process CO_2 emissions as the sum of annual clinker emissions and annual raw material emissions:
        - Annual clinker emissions from each kiln are calculated using:
            - Monthly clinker production (measurement required).
            - A monthly kiln-specific clinker emission factor (EF) calculated from the monthly carbonate (CO_3^{2-}) and non-CO_3^{2-} content of the clinker (measurement required).
            - Quarterly cement kiln dust (CKD) not recycled (i.e., discarded) (measurement required).
            - A quarterly kiln-specific CKD EF for CKD not recycled to the kiln (measurement or default values).
        - Annual raw material emissions from each kiln are calculated using:
            - The annual consumption of raw materials or raw kiln feed.
            - The organic carbon content of the raw material or raw kiln feed (or a default value of 0.2% of total raw material weight may be used).

A checklist for data that must be monitored is available here: Subpart H Monitoring Checklist.

What Information Must Be Reported?

In addition to the information required by the General Provisions in Subpart A, found at 40 CFR 98.3(c), the following must be reported under the circumstances indicated:

- If a CEMS is used to measure CO_2 emissions, report under this subpart the relevant information required by 40 CFR 98.36 for the Tier 4 Calculation Methodology and the following information:
    - Monthly clinker production from each kiln.
    - Annual cement production.
    - Number of kilns and number of operating kilns.
    - Annual arithmetic average of total calcium oxide (CaO) content of clinker at the facility, mass fraction (wt-fraction).
    - Annual arithmetic average of non-calcined CaO content of clinker at the facility (wt-fraction).
    - Annual arithmetic average of total magnesium oxide (MgO) content of clinker at the facility (wt-fraction).
    - Annual arithmetic average of non-calcined MgO content of clinker at the facility (wt-fraction).
    - Annual facility CKD not recycled to the kiln(s) (tons).
- If a CEMS is not used to measure CO_2 emissions, report the following information for each kiln:

- Kiln identification number.
- Annual cement production.
- Number of kilns and number of operating kilns.
- Method used to determine non-calcined CaO and non-calcined MgO in clinker.
- Method used to determine non-calcined CaO and non-calcined MgO in CKD.
- Quarterly kiln-specific CKD CO_2 EFs for each kiln (metric tons CO_2/metric tons CKD produced).
- Name of raw kiln feed or raw material.
- Number of times missing data procedures were used to determine the following information:
  - Clinker production (number of months).
  - CO_3^{2-} contents of clinker (number of months).
  - Non-calcined content of clinker (number of months).
  - CKD not recycled to kiln (number of quarters).
  - Non-calcined content of CKD (number of quarters).
  - Organic carbon (C) contents of raw materials (number of times).
  - Raw material consumption (number of months).
- Method used to determine the monthly clinker production from each kiln.
- Annual clinker production (metric tons).
- Annual average clinker CO_2 EF for the facility, averaged across all kilns (metric tons CO_2/metric tons clinker produced).
- Annual average CKD CO_2 EF for the facility, averaged across all kilns (metric tons CO_2/metric tons CKD produced).
- Annual arithmetic average of total CaO content of clinker at the facility (wt-fraction).
- Annual arithmetic average of non-calcined CaO content of clinker at the facility (wt-fraction).
- Annual arithmetic average of total MgO content of clinker at the facility (wt-fraction).
- Annual arithmetic average of non-calcined MgO content of clinker at the facility, wt-fraction.
- Annual arithmetic average of total CaO content of CKD not recycled to the kiln(s) at the facility (wt-fraction).
- Annual arithmetic average of non-calcined CaO content of CKD not recycled to the kiln(s) at the facility (wt-fraction).
- Annual arithmetic average of total MgO content of CKD not recycled to the kiln(s) at the facility (wt-fraction).
- Annual arithmetic average of non-calcined MgO content of CKD not recycled to the kiln(s) at the facility (wt-fraction).
- Annual facility CKD not recycled to the kiln(s) (tons).
- The amount of raw kiln feed consumed annually at the facility (tons) (dry basis).

What Records Must Be Maintained?

Reporters are required to retain records that pertain to their annual GHGRP report for at least three years after the date the report is submitted. Please see the Subpart A Information Sheet and 40 CFR 98.3(g) for general recordkeeping requirements. Specific recordkeeping requirements for Subpart H are listed at 40 CFR 98.87.

When and How Must Reports Be Submitted?

Reporters must submit their annual GHGRP reports for the previous calendar year to the EPA by March 31st, unless the 31st falls on a Saturday, Sunday, or federal holiday, in which case reports are due on the next business day. Annual reports must be submitted electronically using the electronic Greenhouse Gas Reporting Tool (e-GGRT), the GHGRP's online reporting system.

Additional information on setting up user accounts, registering a facility, and submitting annual reports is available on the GHGRP Help webpage.

When Can a Facility Stop Reporting?

A facility may discontinue reporting under several scenarios, which are summarized in Subpart A (found at 40 CFR 98.2(i)) and the Subpart A Information Sheet.

For More Information

For additional information on Subpart H, please visit the Subpart H webpage. For additional information on the GHGRP, please visit the GHGRP website, which includes additional information sheets, data previously reported to the GHGRP, training materials, and links to Frequently Asked Questions (FAQs). For questions that cannot be answered through the GHGRP website, please contact us at: GHGreporting@epa.gov.

This Information Sheet is provided solely for informational purposes. It does not replace the need to read and comply with the regulatory text contained in the rule. Rather, it is intended to help reporting facilities and suppliers understand key provisions of the GHGRP. It does not provide legal advice; have a legally binding effect; or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits with regard to any person or entity.