# California
# Climate Action Registry

## Cement Certification Protocol

# Cement Certification Protocol

## Guidance for Certifying Entity-Wide Greenhouse Gas Emissions Produced by Cement Companies

# Introduction

The Cement Certification Protocol (CCP) is an appendix to the California Climate Action Registry's (Registry) General Certification Protocol (GCP). The GCP provides comprehensive instructions on the Registry's certification process, including guidance on preparing for certification, core certification activities, and completing the review. The CCP complements the GCP by describing the core certification activities in the context of a cement company. Certification of a cement company's greenhouse gas (GHG) emissions report submitted to the Registry must be conducted in accordance with both the GCP and the CCP.

The purpose of certification is to provide an independent review of data and information used to produce a GHG emissions report. It aims to ensure that a participant's emissions report meets the following quality criteria: completeness, consistency, accuracy, comparability and transparency. The intended audience of the CCP is approved cement sector certifiers. However, cement companies may also find it useful to review this document to develop a better understanding of the certification activities associated with cement sector reporting to the Registry.

All Registry members report using the General Reporting Protocol (GRP) and, where available, any industry-specific protocols such as the Cement Protocol. Certifiers of cement companies must read and be familiar with the following Registry reporting tools:

General Reporting Protocol,
General Certification Protocol,
Cement Protocol,
Cement Certification Protocol, and
Climate Action Registry Reporting Online Tool (CARROT).

The Registry's general and industry-specific reporting and certification protocols are designed to be compatible with each other and are available on the Registry's website at www.climateregistry.org.

**Please Note**: Only State- and Registry-approved cement sector certifiers are eligible to certify a cement company's emissions report. State- and Registry- approved certifiers under the Registry's General Reporting Protocol are not automatically approved to certify cement sector reports. To become an approved cement sector certifier, a general certifier must successfully complete a cement sector-specific application process. The complete list of cement sector certifiers and information on the application process will be available at www.climateregistry.org/certifiers.

## *Standard of Certification for a Cement Company's GHG Inventory*

The Registry's standard for cement sector certification is its GRP and Cement Protocol. Together, these protocols form a complete set of guidance documents for

cement companies reporting to the Registry. Certifiers should only apply the certification guidance in the GCP and the CCP to the standards described in the GRP and the Cement Protocol when assessing a cement company's annual GHG inventory. A cement company's emission report will consist of two main parts: required and optional information.

### Required Reporting Elements

A certified emission report must include all of a cement company's significant emissions within the following categories:

Direct Emissions
- Mobile Combustion Emissions
- Stationary Combustion Emissions
- *Process Emissions from the calcination of raw material to produce clinker*
- Fugitive Emissions

Indirect Emissions
- Purchased electricity, heat and steam for own consumption

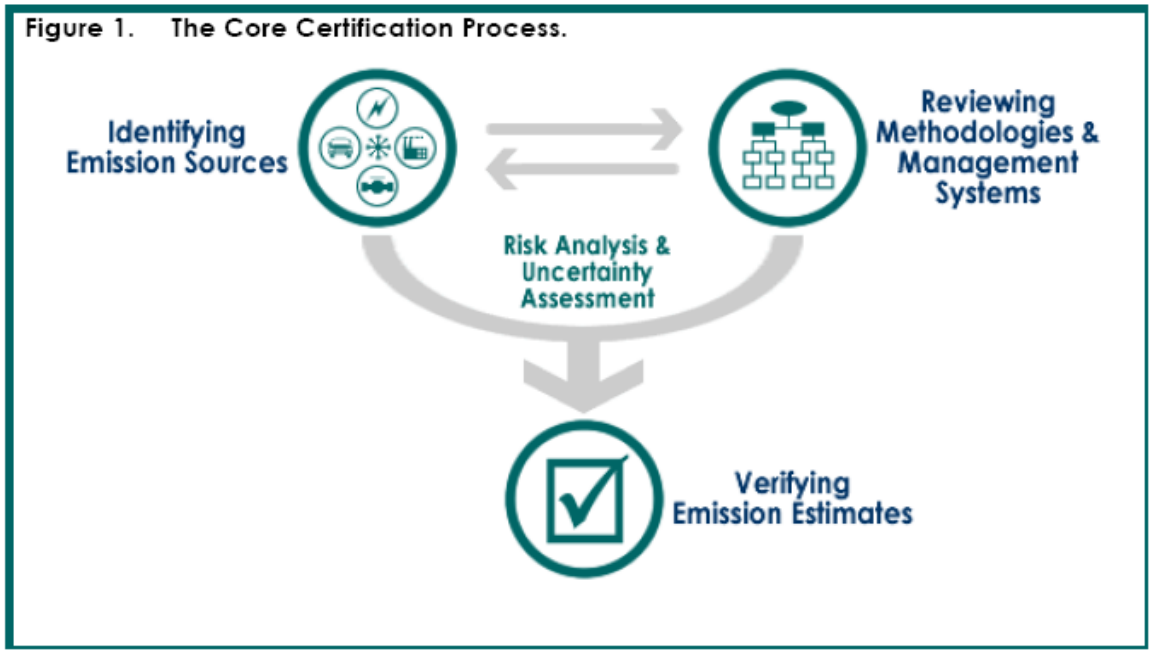
Industry-Specific Metrics
- $CO_2$ emissions per ton of cementious product

### Optional Reporting Elements

An annual GHG emission report may also contain additional optional information. This could include, for instance, information about a company's environmental policies and goals, renewable energy certificate purchases, purchase power contracts, additional metrics, etc. All non-required GHG data is optional, and does not require certification. Optional information should not be considered in assessing the quality of the required emissions information. Optional information will be clearly distinguished from required information in the CARROT.

## Core Certification Activities: Cement Companies

The Registry's core certification activities are a risk assessment and data sampling effort developed to ensure that no material sources are excluded and that the risk of a reporting error is assessed and addressed through appropriate sampling and review. An illustration of the core certification process is provided in Figure 1, and a description of the three-step procedure is provided below.




Registry certifiers apply certification procedures consistently for all participants. However, based on the size and complexity of participants' operations and management systems, certification activities and the duration of the process may vary. The documents that will need to be reviewed during certification will also vary depending on the nature of the emission sources contained in the participant's emissions report.

Although the Registry's Cement Protocol provided explicit guidance on calculating process $CO_2$ emissions associated with the calcination of raw materials to produce clinker, the focus of the CCP is on the procedure certifiers will follow to undertake a review and verification of a cement company's emission report. Thus, the scope of this document includes guidance for mobile and stationary combustion, fugitive, and indirect GHG emission sources, in addition to process emissions.

To confirm that a cement company's GHG emissions have been reported accurately, certifiers should review appropriate data sources, examples of which are included in Table 1. Note that the documentation list in Table 1 is provided by core certification activity as a reference for both the certifier and the cement company. Prior to the first meeting with the cement company, certifiers should review and identify the documents to expedite the certification process. Certifiers are free to request additional documents not included on this list.

Table 1. Documents for review during certification activities

| Certification Topic | Activity Data or Emissions Source Documents |
|---|---|
| **Step 1: Identifying Emission Sources** | |
| **Emission Source Inventory** | CARROT Report<br>Facility Inventory<br>List of Facility Permits<br>Facility Plot Plans Showing Direct Emission Sources<br>Process Flow Diagrams<br>Fuel Purchases Records, by fuel type<br>State Emission Inventory Reports<br>EPA Acid Rain Reports |
| **Organizational, Operational and Geographic Boundaries** | List of Emission Sources, including:<br>• Stationary Sources<br>• Mobile Sources<br>• Fugitive Sources<br>• Process Emission Sources<br>Security and Exchange Commission Forms<br>Corporate Annual Reports<br>Map of Operations |
| **Step 2: Understanding Management Systems and Methodologies** | |
| **Data Management Systems** | Location of Data Collection System (centralized or decentralized)<br>Type of Management System and Parameters Tracked<br>Data Acquisition and Handling System |
| **Responsibilities for Implementing GHG Management Plan** | Entity Organization Chart<br>Greenhouse Gas Management Plan<br>Documentation and Retention Plan |
| **Training** | Training Manual<br>Procedures Manual<br>Consultant Qualifications Statement<br>Monitoring Plan |
| **Methodologies** | Any Protocols and Emission Factors Used (in addition to GRP and Cement Protocol)<br>Clinker or Cement Production Tracking Systems<br>Quality Assurance/Quality Control Plans for Continuous Emissions Monitoring Systems |
| **Step 3: Verifying Emission Estimates** | |
| **Direct Emissions from Stationary Combustion** | Fuel Purchase Records<br>Electronic Data Reports<br>Data Acquisition and Handling System<br>Relative Accuracy Test Audit results<br>Accuracy Test Results for Fuel Flow Monitors<br>Fuel Meter Data<br>Fuel Meter Calibration and Maintenance Records<br>Inventory of Stationary Combustion Facilities<br>Electric Generation Data (MWh)<br>Steam Generation Data (Mlbs)<br>Air Permits<br>State and Federal Inventory Reports<br>Any Protocols and Emission Factors Used (in addition to GRP) |
| **Direct Emissions from Mobile Combustion** | Fuel Purchase Records, Fuel in Stock, Vehicle Miles Traveled, Inventory of Vehicles<br>Any Protocols and Emission Factors Used (in addition to GRP) |

| Certification Topic | Activity Data or Emissions Source Documents |
|---|---|
| **Direct Emissions from Process Activities (*the calcination of raw materials to produce clinker*)** | PCA Annual Energy and Labor Survey<br>Internal Clinker and Cement Production Records<br>Clinker and Cement Sales Records<br>Clinker Stock Changes<br>Raw Material Input Data<br>Regulatory Air Quality Compliance Documents |
| **Direct Fugitive Emissions from Air Conditioning and Refrigeration Systems (Stationary and Mobile)** | Refrigerant Purchase Records<br>Refrigerant Sales Records<br>Any Protocols and Emission Factors Used (in addition to GRP) |
| **Direct Fugitive Emissions from Fire Suppression Equipment** | Fire Suppression Purchase Records<br>Refrigerant Sales Records<br>Any Protocols and Emission Factors Used (in addition to GRP) |
| **Direct Fugitive Emissions from Handling and Storage of Solid Fuels** | Coal Purchase Records<br>Biomass Purchase Records<br>Any Protocols and Emission Factors Used (in addition to the Cement Protocol) |
| **Indirect Emissions from Electricity Use** | Monthly Electric Utility Bills<br>Emission Factors (if not default) |
| **Indirect Emissions associated with Cogeneration** | Monthly Utility Bills<br>Fuel and Efficiency Data from Supplier Emission Factors (if not default) |
| **Indirect Emissions associated with Imported/Exported Steam** | Monthly Utility Bills<br>Fuel and Efficiency Data from Supplier Emission Factors (if not default) |
| **Indirect Emissions associated with District Heating** | Monthly Utility Bills<br>Fuel and Efficiency Data from Supplier Emission Factors (if not default) |
| **Indirect Emissions associated with District Cooling** | Monthly Utility Bills<br>Fuel and Efficiency Data from Supplier Emission Factors (if not default) |

## Step 1: Identifying Emission Sources

Certifiers should review each cement company's reported emission source inventories (facility, source, and fuel) to ensure that all significant sources are identified. Certifiers should then determine the GHGs that will result from the identified sources and estimate their magnitude. GHGs that are not required to be reported can be disregarded. Finally, certifiers should rank by the total annual emissions the remaining reported emissions by $CO_2e$ to assess the environmental risk associated with the emissions.

After a cement company has conducted an emission inventory, certifiers should review the GHG emission report and document answers to the following questions, to assess if the emission report in CARROT reflects the geographic, organizational, and operational scope of the cement company:

1. Does the GHG emission report include all non *de minimis* facilities and sites under the ownership or management control of the participant?[1]
2. Does the report include all non *de minimis* sources of GHG emissions within the geographic and organizational boundaries of the participant?

[1] For information on *de minimis* emissions and facilities see the GRP and the GCP.

3. Does the report include all applicable types of GHGs from each emission source within the geographic and organizational boundaries of the participant?
4. Has the participant specified a baseline or baselines?
    a. If so, have any mergers, acquisitions, or divestitures occurred during the current reporting year?
    b. Have any significant activities been outsourced in the current year?
    c. If so, has the baseline been adjusted to reflect any structural changes?

After these questions have been answered, certifiers will be able to determine if the GHG emission report accurately reflects the geographic, organizational, and operational scope of the participant.

## Step 2: Reviewing GHG Management Systems and Estimation Methodologies

After the scope and comprehensiveness of the participant's emission sources has been confirmed, certifiers should review the methodologies and management systems that the cement company used to calculate their emissions.

This is principally a risk assessment exercise, in which the certifier must weigh the relative complexity of the scope of the participant's emissions, the participant's methodologies and management systems used to prepare the GHG emission report, and the risk of calculation error as a result of reporting uncertainty or misstatement. Through these steps, the certifier should determine the appropriateness of the management systems to provide required data to the Registry.

A certifier's review of a participant's GHG management systems should document answers to the following questions:

1. Are calculation methodologies/procedures used to manage GHG emissions data at the unit and/or the facility level?
2. Are the methodologies/procedures appropriate given the uncertainty and the relative quantity of $CO_2e$ associated with the emissions?
3. Are methods used to manage and implement entity-wide GHG emissions reporting programs appropriate for the size and complexity of the organization?
4. If the participant has more than one facility, are the emissions data correctly aggregated at the entity level?
5. Is an individual responsible for managing and reporting GHG emissions? Is this individual qualified to perform this function?
6. Is appropriate training provided to personnel assigned to GHG emissions reporting duties?
7. If the participant relies on external staff to perform required activities, are the contractors qualified to undertake such work? Is there internal oversight to assure quality of the contractor's work?
8. Are appropriate documents created to support and/or substantiate activities related to GHG emissions reporting activities, and is such documentation retained appropriately? For example, is such documentation maintained through reporting plans or procedures, fuel purchase records, etc.?

9. Are the mechanisms used to measure and review the effectiveness of GHG emissions reporting programs appropriate for this purpose? For example, are policies, procedures, and practices evaluated and updated at appropriate intervals?

Certifiers should also consider how participants' management systems are designed to support reporting five categories of emission sources (indirect, mobile, stationary, process and fugitive). Consequently, in reviewing a participant's total emissions report, certifiers should document answers to the following questions:

1. Does the management system capture the diversity of the sources that comprise each emission category? For example, are there multiple types of stationary combustion sources that require different emission estimation methodologies?
2. Does the system capture all the GHGs emitted from each emission source category?
3. Has the participant used the emission factors and standardized estimation methods in the GRP and Cement Protocol to calculate emissions in each source category?
    a. If not, has the participant or its technical assistance provider developed estimation methods independently?
    b. If the participant uses alternative emission factors, are they documented and explained appropriately?
    c. Are these acceptable to the certifier and Registry?
4. Does the participant's GHG management system appropriately track emissions in all of the emission source categories?

Once the certifier has assessed the overall risk of misstatement associated with the management systems, those risks should be assessed in conjunction with the weighted $CO_2e$ estimates determined in Step 1 (Identifying Emission Sources).

Certifiers should then identify the areas with the greatest potential for material misstatements (either based on volume of emissions, lack of management systems, or both) to determine the best risk-based strategy to identify a representative sample of emissions to recalculate in Step 3 below.

## Step 3: Verifying Emission Estimates

The final step in completing the core certification activities is to verify the emission estimates. To do so, certifiers re-calculate a subset of the cement company's emissions and compare the sub-sample re-calculated results with the cement company's calculated results from the same sources to determine if the GHG emissions inventory is free of material misstatements.[2] It is possible that during the certification process differences will arise between the emissions estimated by the participant and those estimated by the certifier. Differences of this nature may be classified as either material (significant) or immaterial (insignificant). A discrepancy is considered to be material if the overall

[2] Based on a participant's identified emission sources, management systems, and corresponding risk profile of GHG emissions, certifiers should select a representative sample of calculations to verify and sites to visit.

reported emissions differ from the overall emissions estimated by the certifier by 5% or more. A difference is immaterial if this difference is less than 5%.

Similar to Step 2, this procedure is a risk assessment exercise, in which the certifier weighs the relative complexity of the scope and diversity of the cement company's GHG emissions, the appropriateness of the calculation methodologies and GHG management systems used to prepare the annual inventory report, along with the risk of calculation or reporting error to determine the best risk-based strategy to identify a representative sample to sample and re-calculate. Certifiers must compare the emissions data and re-calculations to the cement company's emissions data and calculations for the same sources, and complete the following tasks:

1. Assess the areas of greatest impact and uncertainty in the emissions profile.
2. Select a representative sample of data to recalculate and sources to visit.
3. Develop and implement a strategy to recalculate the GHG emissions and visit the sources in the sample.
4. Assess the cement company's data collection.
5. Compare your estimated GHG emissions to those of the cement company to determine if any material misstatements exist.

As described in the GCP, the Registry does not expect nor require certifiers to review *all* of the participants' documents and recheck *all* their calculations. Certifiers should concentrate their activities in the areas that have the greatest uncertainty and amount of emissions. The verification of emissions estimates should document the answers to the following questions:

1. Have you documented your process for determining the appropriate sampling plan?
2. Is the reported total stationary combustion fuel use by fuel type consistent with the fuel use records? Or does the participant use an approved CEMs configuration to report stationary combustion emissions?[3]
    a. Is this the first year that a participant is reporting $CO_2$ emissions to the Registry using CEMs? If so, does the fuel based calculations corroborate the $CO_2$ emissions reported?
    b. Has the $CO_2$ emission rate (lbs $CO_2$/MWh) changed by 10% or more from the previous year at a unit that CEMs is used to report emissions? If so, do the fuel-based calculations corroborate this change?
3. Is the reported total consumption of fuels in motor vehicles consistent with available documentation and by vehicle type? If the entity calculates transportation emissions based on vehicle mileage, is the reported vehicle mileage consistent with vehicle mileage records?
4. Are the reported process and fugitive emissions consistent with activity data, maintenance records, or purchase and sales records?
5. Are the emission factors used by the participant appropriate?

[3] If a cement company uses CEMS data to report stationary combustion emissions, certifiers should refer to the Power/Utility Certification Protocol for guidance.

    a. If Registry default factors are not used, do the alternative emission factors provide increased accuracy?
    b. Is their derivation and explanation of increased accuracy properly documented and reasonable?
6. Are the reported electricity, steam, and district heating and cooling use consistent with utility bills?
7. Does a sample of the participant's calculations agree with your re-calculated direct (mobile, stationary, process & fugitive) & indirect emissions estimates?
8. Have you performed data triangulations where reasonable?
9. Are all significant GHG emissions included? Are all emissions that are considered de minimis emissions documented as such?
10. Are the current year's reported emissions significantly different from the prior year's emission levels? If so, do you understand the reasons for the changes, and to the best of your knowledge, do they explain the differences in emissions?
11. Are any discrepancies between your emissions estimates and the participant's material?
    a. If so, have you addressed those discrepancies with the participant?
    b. Has the Total Emissions Summary in CARROT been adjusted and reviewed?

## Completing the Certification Process

The Registry's GCP provides instructions for certifiers to finalize the certification process. It describes completing a Certification Report, preparing a Certification Opinion, conducting an Exit Meeting with the Registry participant, and notifying the Registry of the participant's certified status. Furthermore, certifiers should refer to the GCP for information on the Certification Activities Log.