



## Low-Carbon Cement Protocol Workgroup Meeting Notes and Takeaways

**Workgroup Meeting Date:** 4/19/2023

**Link to review recording:**

[https://us06web.zoom.us/rec/share/JhOOjY6izy1EQCnAH7bSLPQMYTQV5nLxNCEIGqsWUNB\\_bcvQf-fhlrOAxHK42zsK.nTJwego15VrJwEXh](https://us06web.zoom.us/rec/share/JhOOjY6izy1EQCnAH7bSLPQMYTQV5nLxNCEIGqsWUNB_bcvQf-fhlrOAxHK42zsK.nTJwego15VrJwEXh)

**Workgroup Members in attendance:**

| Name                     | Organization                                     | Present (P)/Absent (A) |
|--------------------------|--|------------------------|
| Adam Swercheck           | Lehigh Hanson (Secondary)                        | P                      |
| Christina Theodoridi     | NRDC   | A                      |
| Danny Gray               | ECO Materials                                    | P                      |
| David Bangma             | Ash Grove  | P                      |
| David Perkins            | Lehigh Hanson                                    | A                      |
| Eric Giannini            | Portland Cement Association (Secondary)          | P                      |
| Dale Prentis             | Institute for Carbon management UCLA (Secondary) | P                      |
| James Carusone           | <del>Salt River Minerals</del> Eco Materials     | A                      |
| James Salazar (Concrete) | Athena Institute (Secondary)                     | A                      |
| Jamie Farny              | Portland Cement Association                      | A                      |
| Jamie Meil (Cement)      | Athena Institute                                 | P                      |
| Jimmy Knowles            | SEFA Group                                       | A                      |
| Kayla Carey              | ClimeCo (Secondary)                              | P                      |
| Lauren Kubiak            | NRDC (Secondary)                                 | A                      |
| Lauren Mechak            | ClimeCo  | P                      |
| Matthew Lemay            | National Ready Mix Concrete Association          | A                      |
| Miguel Angel Freyermuth  | Ruby Canyon Environmental                        | P                      |
| Ram Verma                | California Department of Water Resources         | A                      |
| Seth Baruch              | Carbonomics                                      | A                      |
| Thomas Van Dam           | Nichols Consulting Engineers (NCE)               | A                      |

## Agenda:

### - Quantification:

- **Baseline Emissions:** We have reviewed the baseline emission approaches and would like to further discuss the use of emission factors from Environmental Product Declarations (EPD) or national datasets. It has been proposed that we could potentially use the EPD emission factor for PC to determine a project baseline. However, we would like to further discuss the EPD process to determine how we can review and confirm various emission factors and calculations to determine an overall baseline emission factor. Additionally, we would like to further review the EPD boundary against our proposed GHG Assessment Boundary to discuss how additional data beyond the EPD would be collected and assessed. *We kindly ask for your review of our proposed hierarchy for baseline data and your comparison of the EPD vs. our quantification methods. Additionally, we are proposing using PC for the baseline without Portland limestone cement but would like to review our reasoning and potential next steps for your review and comment.*
- **Project Emissions:** *For a final review of project emission calculations, we kindly ask that you review 1) the types of emissions (CO<sub>2</sub>, CH<sub>4</sub>, etc); 2) the emission factors for fuel and electricity consumption; and 3) addition of end-of-life waste.*

### - Monitoring, Reporting and Verification (MRV):

- **Attestation form:** To support that the SCM/ACM has successfully displaced PC and provided an emission reduction at the concrete facility, we are proposing the development and use of an attestation form or list of questions that can be completed by the purchaser. This form can be used to provide the verification body with assurances that the product was used at the correct tonnage to replace/displace Portland cement, and that the quality of the product met standards / the purchaser's needs, etc. *We kindly ask for your thoughts regarding this type of form or list of questions and if/how it would best fit in the cement/concrete supply chain process.*

### - Follow-up Items:

- **ASTM Standards:** We are proposing a table to organize the associated ASTM standards in relation to their associated SCM/ACM that could be eligible under the protocol. *We kindly ask for your review of these and your thoughts as to how we can best handle SCMs/ACMs without ASTM standards.*
- **Performance Standard Test:** We have proposed, based on the NRMCA Regional Benchmarking data, a performance standard test of 5% or under compared to PC. However, the product would pass the performance standard test if it is not present in the market or shown to be 0%. *We kindly ask for your review and comment of this developed performance standard test (Slide 35). Additionally, we welcome any additional reference information to demonstrate silica fume and/or ACM products in the market.*
- **Crediting period – legally required:** We have drafted a legal requirement test and suggested some limitations with credit generation relative to potential legal policies. *We ask for your review and comment on the legal requirements (SCM/ACM production vs. SCM/ACM use) and proposed ineligibility of a projects based on these requirements or changes in regulations (Slides 33 & 34).*

- **Leakage:** We have drafted a section on Mitigating Leakage (5.1.2) for your review and comment. Although there are no perceived leakage risks for increased SCM/ACM production, there are potential leakage risks if the SCM/ACM fails to displace PC. We have proposed the use of an attestation and/or proof of sale and use to provide reasonable assurance this leakage did not occur. *Please review this new section of the protocol to provide your thoughts and comments.*
- **CO<sub>2</sub> removals:** For the time being, we have decided to exclude CO<sub>2</sub> removals from CO<sub>2</sub> mineralization, etc. This is based on the scope of work and similarities to biochar (which currently has its own protocol under development at our organization). *We will walk through these changes and provide the opportunity for your questions, comments, and recommendations.*
- **Location:** Early on in our Workgroup process, we decided to keep the jurisdictional scope of the protocol to the United States. We have received a number of questions and comments asking why we have limited the scope of the project and imports to the United States. *We will review our process and decision as it relates to location to allow time for your questions, comments, and discussion.*

### Main Points of Discussion and Decisions Made in Meeting:

- **GHG Boundary**
  - **Revised boundary to align with Portland cement EPD boundary, but need to determine whether SSR10 also needs to be added since we don't know where new SCM/ACM facilities will be located**
    - Assumption is that they'll try to collocate with ready-mix sites but don't have supporting evidence for that assumption, so SSR10 must be included for conservatives.
    - At SSR11, we feel comfortable saying that the mixing process is largely the same across SCM/ACMs so differences in emissions profiles can be considered de minimus and be excluded from the GHG boundary.
    - If SSR10 data isn't included in the EPD, are there conservative averages we can use to estimate the Portland cement baseline transport emissions? And could we assume SCM producers would be able to access the transport emissions for SCMs?
    - For SCMs, the NRMCA should actually easily be able to provide that information
      - It is based on LCA accounting (so beyond just the CO<sub>2</sub> emissions), so parsing that out could potentially pose an issue.
      - Reserve to follow up with Matt LeMay/ NRMCA.
    - Comparing an SCM plant to a cement plant, there are so many modes of transport you could be comparing so it will be hard to do an apples to apples comparison with so much noise in the data. It might make it really cumbersome to try and include SSR10 in this case.
    - General consensus is that we're okay with including SSR10 as long as it is apples to apples comparison across scenarios and if there's good data available—might need to do a case study.
      - Action Item for Reserve: Provide Workgroup with case-study/example of how SSR10 would be included in quantification.
    - Will also be including SSR8 (end of life waste) in the project boundary to align with EPD.

- **GHG Gases accounted for in the project**
  - The only gases included in the current emissions profile is CO<sub>2</sub>—are there other gases that should be included?
  - In the EPD, CO<sub>2</sub>E is reported so the other gases are picked up that way and could be appropriate here.
  - Original draft protocol also used CO<sub>2</sub>E to include any/all significant gases.
  - Reserve will revise the protocol to make sure that use of CO<sub>2</sub>E is clear and consistent.
  
- **Quantification:**
  - **Baseline emissions**
    - There are cases where the same facility/entity could be producing both Portland and SCM production and therefore use facility-specific baseline emissions. However, it is more likely that the SCM and PC will be at two different facilities with two different owners. In that situation, how will SCM producers be able to quantify the baseline/what data could they use if they don't have access to historical data?
      - Proposed to use industry-wide EPD across the US for Portland cement to construct a baseline emission factor(s). Reserve is still reviewing information to see if the EPD aligns with our accounting methodologies.
        - Reserve has not accepted Emissions Factors (EFs) at the national level. Need to conduct a more detailed review the EPD inputs.
      - What granularity does the EPD offer and how could it feed the quantification requirements? Is this information confidential?
      - Workgroup commented that EPDs have been used in other registries and encouraged the Reserve to dive into the data further.
    - Next item asked the Workgroup if SCMs replace PLC (Portland Limestone Cement) at the same rate as they will replace PC (Portland Cement)? If not, should PLC be included in the baseline (i.e. using a weighted average)? Should we instead focus on updating the baseline in time as PLC grows in the market?
      - Workgroup commented that this information would be known at a facility level with use of historical data.
      - However, the Workgroup also noted that with a national EPD it would not be appropriate to include PLC in the baseline it is the clinker in the PC that is being replaced by SCMs/ACMs and data for PLC across the U.S. is not available.
      - Agreed that as PLC becomes more prevalent in the market, the baseline should be adjusted in future iterations of the protocol.
  - **Emission factors:**
    - Are there regional datasets for project mining emissions that would be more appropriate than the national level data/emission factors (EFs) used in this equation that are used by the industry? Or are the EPA EFs the correct EFs to be used?
      - Facility/regional utility level data are acceptable and could be more accurate, but eGrid sub-region EFs are seen as the standard
      - Need to add language to explain the process for EFs that differ from the eGRID values.
      - End of life waste emission factors—where could these come from/recommended sources?

- ClimeCo recommends using EcolInvest and LCA Commons dataset, and these should also use CO2E. These are used in the industry commonly.
  - Workgroup agrees with use of these EFs.
- **Proof of Purchase and Use**
  - Without having to go too far into the cement/concrete production pathway, how can we verifiably demonstrate that an SCM will displace PC clinker?
  - Proposed: a document with template language to attest that the purchaser is meeting QAQC standards and will be using the SCM/ACM product in place of Portland cement.
  - Additional documentation requirements:
    - Sales receipts
    - Bill of Landing (weight of SCM sold)
    - Project timelines
  - Workgroup does not have objections with the attestation approach.
  - When should this happen? At every point of sale? Every year? Every purchase? Every verification? Also, does this need to be a form created by the Reserve or should we provide template language that producers could embeds into their own documents?
    - Workgroup would like flexibility – provide attestation and template language but allow for other documents to suffice depending on verification.
    - The Reserve will draft a protocol section and/or template form to attest that the SCM/ACM is meeting QAQC standards and will be used in place of Portland cement.
- **ASTM standards:**
  - Is the list of relevant standards complete and correct?
    - 989 standard for slag needs to be included for some SCM/ACMs are approved as 989 products. Would fit best under manufactured ACM product category.
    - C595 and 1157 should be included for limestone cement products.
    - C618 needs to be updated from fly ash to coal ash throughout the protocol
  - List of ASTM standards that could work ACMs without their own ASTM standards— Is the list of relevant standards complete and correct? Are there other lists of requirements they need to meet?
    - For ternary blends, blended cements that include eligible products should all be eligible instead of specifically ternary/3-ingredient blends. Then they could just meet 595 and C1157.
  - Idea right now is to gain QA/QC assurances through purchase attestation documents. Are there any other ideas on ways to check for quality assurance of SCMs without an ASTM standard?
    - Performance standards are being developed for novel SCMs. Reserve is encouraged to participate in development of performance standard for other SCMs and include in future protocol updates.
    - All requirements could probably meet C465 or C595 as an alternative option.
    - Reserve will add language to the quality standards section of the protocol for process additions.

- **Crediting period/legal requirement test**
  - Workgroup suggested limiting the legal requirement test to the production of SCMs, not the inclusion of SCMs.
    - North Carolina harvesting of coal ash requirement is an ineligibility example.
  - Additionality- legal requirement test.
    - North Carolina is the only legal requirement that would exclude projects (specifically fly ash beneficiation/use) so far.
  - In the next protocol draft, Reserve will clarify that the legal requirement test is focused on production and use of SCMs with specific state level examples.
- **Additionality – Performance Standard Test**
  - Reserve needs to clarify some of the additionality thresholds.
    - Need to correct 5% Performance Standard Test threshold to be against all cement not just PC.
- **Leakage:**
  - Section added, asking Workgroup to review.
- **CO2 removals**
  - Will be excluded from this protocol as the Reserve is proposing additional methodology development under a next version of this protocol or as an individual carbon capture protocol in the future.
- **Location**

This version of the protocol will be limited to US, but may expand to new jurisdictions in future versions.

#### **Pending Questions for the Workgroup:**

- Workgroup to review new Leakage section in protocol draft.
- Final comments/feedback on v4 draft due by end of the month.

#### **Action Items for the Reserve:**

- Follow up with NRMCA regarding conservative averages that can be used to estimate the Portland cement baseline transport emissions.
- Include SSR10 in GHG boundary as long as it is apples to apples comparison across scenarios. Reserve will conduct a case study/provide an example of what data could be used for this scenario.
- Reserve will revise draft protocol to clearly explain that sub regional eGRID factors are best but that facility/regional utility level data could be used but will require justification during verification.
- Reserve will draft protocol section and/or template form to attest that the purchaser is meeting QAQC standards and will be used in place of Portland cement.
- Reserve will revise the protocol to make sure CO<sub>2</sub> is written in equivalents (vs. CO<sub>2</sub>) to be clear and consistent that all sources of emissions are included where appropriate.
- Continue reviewing national Portland Cement EPD for alignment with offset accounting principles at the Reserve.
- Reserve will add the following ASTM standards
  - 989 standard for slag needs to be included for SCM/ACMs are approved as 989 products
  - C595 and 1157 should be included for limestone cement products
  - C618 needs to be updated from fly ash to coal ash throughout the protocol.
- Reserve will revise quality standards section of the protocol to include ASTM standards that are relevant for process additions.
- In the next protocol draft, Reserve will clarify that the legal requirement test is focused on production and use of SCMs, with specific state level examples.
- Final protocol draft will be circulated for final comment as soon as possible.