



Low-Carbon Cement Protocol Workgroup Meeting Notes and Takeaways

Workgroup Meeting Date: 1/20/2023

Link to review recording:

<https://us06web.zoom.us/rec/play/T8R6SBuzvO7oINXZhCBCJhGDjLuEQWWqslI3M1eSXk8tT6lWchlwe2ugoKiMxIEbdzsWTmEFcy2Z4Nph.gg4cL-woSb4zwvl6?autoplay=true&startTime=1674237380000>

Workgroup Members in attendance:

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

Agenda:

- **Project Definition:** I have revised our project definition terminology based on recommendations at our first meeting. I have replaced the term Ordinary Portland Cement with Portland Cement. I have also included the term ACM with SCM to remain product agnostic. Slide 6 provides an overview of our proposed end-uses for SCM/ACM products. We are proposing that it is key that the product is displacing clinker in Portland cement, but that this can happen at the cement facility or the ready-mix concrete facility. Is this correct? Are there any end uses that should be ineligible?
- **Project Eligibility:**
 - **Slide 7:** Following our discussion regarding ash products and follow-up comments from stakeholders, we believe it will be best to focus our attention on product ineligibility vs. product eligibility. We are proposing a series of questions on slide 7 to show two 'goal posts' that would exclude a product from being eligible under the protocol. These goal posts are additionality and viability. The proposed approach would therefore be to create a negative list of products that are not additional or not viable to determine what is ineligible under the protocol.
 - **Slide 8:** I've attempted to summarize our previous discussion by outlining definitions for fresh and beneficiated ash. I will be posing the question to the group as to how to define ineligible fresh fly ash vs. eligible beneficiated ash. We are proposing this would be defined by a minimum list of processes to be considered 'upgraded' and a minimum set of time and/or minimum list of processes to be considered 'harvested'. We ask the workgroup members to come prepared to provide their thoughts on these definitions and/or raise other definitions that need to be discussed.
 - **Slide 9:** I am currently reviewing the ASTM standards for cement and concrete in more detail. We are proposing that the protocol reference these standards as the quality requirements to meet eligibility. Are there specific ASTM standards that should or should not be included? Are there other relevant cement or concrete standards that should be reviewed and potentially included?
 - **Slide 10:** The final slide of this section lists all potential products currently reviewed for the protocol and proposes a classification (eligible or ineligible) for your review and comment. Do you agree with the approach to create a negative list of ineligible products? Do you agree that any novel product could be eligible if it meets additionality and quality standards, or should we have a specific list of eligible products? Should any of the potential products listed be ineligible? If so, why? Are there other products missing that we should discuss?
- **Product Ownership:** We are proposing that the owner of the credits generated under this protocol be the SCM/ACM manufacturer since they are facing the main barriers to increase production of these products. To ensure clarity and avoid double counting, contractual agreements are being proposed to include chain of ownership with GHG reduction claims. We are also proposing that purchase orders could be used to confirm displacement of clinker in Portland cement. Please review to provide your support or concern with this approach. Should aggregation of products be eligible and, if so, under what conditions?

- **Location:** We are currently proposing that the protocol be eligible for projects in the U.S. However, several stakeholders have commented that the cement industry is very integrated across North America with significant trade and business across borders. Is there a need to expand the jurisdictional scope of the proposed protocol to Canada and/or Mexico and, if so, what is the urgency for this inclusion. Would it be reasonable to complete the protocol for application in the U.S. and then work to include other jurisdictions at a later date or should they be included in this current development process?
- **Regulatory Compliance:** We are unaware of any regulations specific to SCM/ACM production so the project activity would strictly need to be in compliance with any associated or relevant laws or regs i.e. water, air, safety, etc. Is this accurate? We are proposing that regulatory compliance would be achieved by having the project developer sign an attestation of regulatory compliance to meet this requirement which is similar to our other protocols.

Main Points of Discussion and Decisions Made:

- **Project Definition:**
 - CAR will remove “clinker” from our project definition and use “cement” instead of “Portland Cement” in order to include all cement products.
 - Add both Supplementary Cementitious Materials (SCM) and Alternative Cementitious Materials (ACM) to definitions for eligible product types under this protocol.
 - Use the ASTM C150 standard to define Portland Cement.
 - The group accepts the agnostic approach for end uses, and that no other end uses need to be excluded for now.
 - If there are state preferences/requirements for using SCMs/ACMs, projects will have to use amounts above and beyond those preferences/legal requirements.
- **Project Eligibility:**
 - Preference to focus on products’ potential to be scalable in the US (not have super niche applications nor truly unavoidable barriers to scaling) rather than current scalability.
 - Magnitude of GHG reduction potential for products should be added as an eligibility factor.
 - ASTM standards compliance will play a key role in product eligibility.
 - Drawing the line around fly ash eligibility:
 - Timeline doesn’t seem to be a feasible path forward based on industry practices,
 - Fly ash could be included as eligible, but fresh fly ash that already meets ASTM C1618 specs will be **ineligible without exception**.
 - Beneficiated ashes that are upgraded in order to meet ASTM C618 standards could be eligible, but we need to look into beneficiation processes in more depth to determine whether there any other

- ineligible activities for beneficiation (i.e. if it's at all common practice in the market to beneficiate and repurpose coal ash).
 - Understanding what the actual economic barrier is to beneficiating the ash and bringing it up to standard will be key for drawing this line.
 - CAR will follow up with industry associates to better understand beneficiation processes.
 - Putting a pin in defining eligible beneficiated ash.
- Reserve needs review the AASHTO1095 standards against the ASTM C618 standards to see if there are any key differences between them (though they should be fairly harmonious), and the Reserve will begin identifying and incorporating other ASTM key standards and definitions into the protocol, as well as DOT/State standards as well for specifications that may need to be considered for determining SCM replacement thresholds.
 - Not being common practice, meeting performance and quality standards, entering the market and replacing Portland cement all seem to be our key criteria for product eligibility.
 - Limestone calcined clay cement, calcinated clays and ternary blend products should be moved to eligible product list from ineligible list and additional products will be considered.
- **Project Ownership:**
 - Two predominant views on credit ownership:
 - Credits by default should belong to the SCM producer because the offsets are needed to offset the costs of bringing SCMs to market, but contractual ownership agreements could be used for an alternative ownership arrangement.
 - Other view is that credits should by default go to cement/concrete producers because Portland cement is actually displaced at that point, not at the SCM facility.
 - Additionally, more than just sales receipts/purchase orders may be needed to illustrate that Portland cement has been displaced.
 - CAR's initial position is to limit aggregation/not allow it but instead allow projects under common ownership to use joint verification.
 - No objections, but will need to be discussed at next meeting.
 - **Location:**
 - No workgroup objections to keeping the protocol limited to the U.S. at this time, will move forward with a U.S.-specific protocol.

Pending Questions for the Workgroup:

- How can we define eligible beneficiated ash? What criteria could be used?
- Where should the GHG project boundary end? Does it need to end at the point that Portland Cement Clinker is actually displaced? How does this impact the default ownership of emission reductions?
- What will quantification of the baseline scenario require, regarding the use of site-specific data versus an EPD?
- Should aggregation be allowed in this protocol?

Action Items for the Reserve:

- Change OPC to Portland cement in the protocol to be consistent with the ASTM C150 standard definition.
- Include “or ACMs” in the project definition (as opposed to SCMs).
- Fresh fly ash meeting ASTM C1618 specs will be ineligible, harvested ashes could be eligible, but we need to look into beneficiation processes in more depth to determine whether there are any other ineligible activities. Timeline requirement for fly ash disposal doesn't seem to be a feasible path forward based on industry practices.
 - CAR will follow up with industry associates to better understand beneficiation processes and barriers to beneficiation that could make harvested fly ash/coal ash eligible under the protocol.
- Review the AASHTO standards against the ASTM standards to see if there are any key differences and bring them back to the work group for confirmation. Start incorporating relevant standards to the protocol. We'll also research and include DOT/State standards as well for specifications that products have to meet to be eligible for certain end-uses.
- Limestone calcined clay cement, calcinated clays and ternary blend products should be moved to eligible list, as well as natural and ground glass pozzolans. Fresh fly ash and slag should remain ineligible. Silica fume still needs further review since it isn't scalable but common practice in niche areas.