

Draft Quantification Protocol for Fly Ash Substitution in Cement Blends

October 20, 2008 Technical Review Meeting (1:00 pm MDT) Meeting and Teleconference

Summary of Changes/Issues

Change 1: Review SSR descriptions to account for all activities associated with “Cement Use”

Change 2: Remove “blended” from “blended cement product” on Page 18.

Change 3: Update wording in the scope to include oil and gas applications.

Issue 1: Baseline process flow diagrams do not illustrate historical use of fly ash.

Issue 2: Expand description on the fly ash to cement displacement ratio (Equivalence Factor).

Attendees:

Name	Organization
Jamie Callendar	Blue Source
Jessica Goforth	Blue Source
Kinga Uto	EPCOR
Simona Mitova	TransAlta
Dwight Redden	Ashcor Technologies
Walter Dobslaw	Lehigh Inland Cement Limited
Dawn Kern	ATCO Power
Nathan Maycher	TransAlta
Ken Omotani	TransAlta
Derek Hollman	EPCOR
Ed Kalis	Alberta Ready Mix Concrete Association (ARMCA)
Dr. Nabil Bouzoubaa	Natural Resources Canada CANMET Mining and Mineral Sciences Laboratories
Anne Weir	Canadian Industries Recycling Coal Ash (CIRCA)
Amanda Stuparyk	Climate Change Central

Invitees not in attendance:

Name	Organization
Pierre Boucher	Lafarge
Dale Dusterhoft	Trican
Dr. Ramesh Joshi	University of Calgary
Dr. Vivek Bindiganavile	University of Alberta
George Venta	Cement Association of Canada (CAC)
Doug Panagapko	Natural Resources Canada
Michael Clapham	Natural Resources Canada

Meeting Minutes

- 1. Introductions:** Jamie Callendar, Blue Source
- 2. Why we are here, Alberta Policy Context:** Amanda Stuparyk, Climate Change Central
 - Alberta Regulatory Framework
 - Offsets – Market in AB
 - Projects start after Jan 1, 2002
 - Real (one of 21 main IPCC recognized GHGs), demonstrable, quantifiable
 - Not regulated by law
 - Clearly defined ownership (verifier will seek clear ownership)
 - Generated in Alberta - **investment** / project **undertaken** in Alberta
 - Not double counted (only serialize on one system)
 - Verified by 3rd party (chartered account/certified engineer)
 - Ex Poste Verification
 - The Protocols are based on the ISO 14064 Part 2 Standard
- 3. Principles to Guide Protocol Decisions/Development:** Climate Change Central
 - Environmental Integrity
 - Usability/Practicability
 - Adapting Precedents
 - Life Cycle
- 4. Overview of Protocol Development Process:** Climate Change Central
 - There are 11 steps in the soon-to-be released guide.
 - We are currently at Step 7: First Round of Technical Review
 - The next step is to submit the protocol to AENV / C3 for the Second Round of Technical Review
 - Finally the protocol will be publicly posted for comments.

Jamie: Please note that the protocol distributed to the group used the Alberta Environment (AENV) Specified Gas Emitters Regulation template. This was an oversight, as the protocol has not yet been reviewed or approved by AENV and the logos do not reflect the endorsement of AENV. Please discard any copies with the SGER or AENV logo and refer to the new version of the draft distributed without the AENV insignia.

- 5. Introduction to Protocol:** Jamie Callendar

Section 1.0: Scope and Description

- Review Figures 1.1 and 1.2

- Ideally these cover the scope of any project
- Baseline is defined as no fly ash being used
- Applicability review.
- Flexibility mechanism is to provide alternative means of quantification for special cases
- Definitions review.

Section 2.0: Quantification Development and Justification

- Start broad (with all the SSRs) and narrow down from there.
- Please provide comments (written if necessary) on the SSR descriptions.
- The baseline condition is a similar approach to the project condition.
- Relevant SSRs are selected. SSRs are usually excluded because they are functionally equivalent (no change) or are conservative (less in project condition).
- Quantification is essentially the cement plant emissions.
- Data quality section provides procedures for ensuring data quality and contingent procedures.

Appendix A: Flexibility Mechanism

- Guidance on how to calculate site specific emission factors.
- This doesn't apply as much in Alberta, since we are fortunate that all cement plants in Alberta are regulated under SGER, thus good quality data is available.
- This flexibility mechanism is more for use in other jurisdictions looking to use the approved protocol as a precedent.

Dwight: How often will the protocol be reviewed?

Jamie: The protocol, as approved, will be valid for the 8 year crediting period, but subject to periodic review by AENV.

Amanda: AENV will review and update the protocol every 5 years.

6. Detailed Review of Protocol

7. Scope: Jamie Callendar

- The scope is designed to be broad to accommodate all types of supply chain configurations.
- The issue of ownership of credits is up to the users to resolve.
- The key concept is the displacement of an equivalent amount of cement due to the use of fly ash.

- The project proponent must show where / how this displacement occurs and where the protocol is applied.
- Process emissions from cement plants are not regulated (ie. They are not subject to a 12% reduction). These emissions are included in the protocol.

8. Approach: Jamie Callendar

- Emission reductions are due to an amount of cement replaced by fly ash.
- The emission intensity is based on the average emission intensity of cement plants in Alberta. These numbers have been reported to AENV and verified by a 3rd party.
- To demonstrate incrementality, the project must discount the amount of fly ash being used prior to the project start date (Jan. 1, 2002)

Dwight: What is the definition of a project? Can it be anything from the generating plants to ready-mix?

Jamie: That was the intent. The project could lie anywhere in the supply chain. It will likely be based on who holds the necessary data.

Dwight: A change or increase in fly ash use could happen for any reason.

Jamie: That is the reason for discounting the amount of fly ash used prior to 2002. Records must be available to substantiate these numbers.

Nabil: The baseline should be based on 1999 – 2001 data. We want to show an increase in fly ash use, so projects must use more than the baseline.

Jamie: Yes, business as usual fly ash usage is defined as the average of 1999 – 2001, but will be specific to each project proponent who will have to define their historic fly ash use/sales to a verifier to apply the protocol. We didn't define the average historical fly ash usage rate for all of Alberta since that would vary significantly from user to user and might penalize individuals who didn't use much fly ash historically and are therefore making a larger incremental change.

Simona: This system helps smaller projects not be scared away from offsets.

Nabil: Will the small projects see the benefit? This can be discussed later.

Ed: Is the protocol written to include Ready-Mix facilities? What about the fly ash used at cement plants?

Jamie: Yes it is intended to be inclusive, but more input from the Ready-Mix facilities would be helpful. Comments are welcome.

The applicability point #2 (page 9) addresses double counting issues of fly ash used at cement plants. Essentially, project proponents must show that fly ash is not being counted under the SGER reporting process such that the GHG benefit has been realized by the cement plant already. So this means the portion of fly ash used at ready mix plants and other users would be the eligible part for offsets and not the portion used at cement plants regulated under the SGER

Anne: A project can be defined in many ways. The project proponent could be the Ready-Mix plant or the guy pouring the basement, correct? It is an issue of ownership.

Jamie: Yes, but the project proponent must have access to the relevant data. Ownership will be assessed during the project verification. It is an issue that may be difficult for people applying this protocol. Double-counting needs to be avoided.

Ed: What about cement imported into Alberta?

Jamie: You should be able to get credits from any cement displacement that occurs in Alberta, since the quantification is based on the tonnes of fly ash used, not the source of the cement displaced. The baseline factors were established using Alberta emissions intensity data from cement plants.

9. Process Flow Diagrams: Jamie Callendar

- Please submit comments on the process flow diagrams.
- The upper portion is essentially cement production. The lower portion is the fly ash production.

Nabil: The process flow diagram is missing the advantage of increased durability of a product made with fly ash and the lower concrete maintenance.

Change 1: Review SSR descriptions to account for all activities associated with “Cement Use”

Jamie: This would be hard to quantify due to the long timelines involved.

Anne: Is there no time value associated with site decommissioning? What is the longevity of the life cycle.

Simona: How would the avoided emissions be quantified?

Jamie: It is consistent with ISO 14064-2 to identify these SS's so it is good that you brought this up. Suggest to add this to the diagram for thoroughness, but not for quantification.

No objections.

Nabil: The baseline process flow diagram does not illustrate previous use of fly ash.

Jamie: This will be flagged as an issue to be addressed in order to be consistent with the baseline definition.

Issue 1: Baseline process flow diagrams do not illustrate historical use of fly ash.

10. Definitions: Jamie Callendar

- Please review and submit comments based on industry definitions.

11. Identification of the Baseline: Jamie Callendar

- Is the equivalence factor of 0.88 appropriate given technical properties as compared to industry practices?

Nabil: The report from which this number was taken is confidential. The number is derived from lab results and 30 years of experience with fly ash concrete. The value is based on 28 day strength and similar workability. The ratio could be higher than 1:1 for 100 year durability. Data were received from BC and Alberta. Ready-Mix validated the number. The scope is based on concrete statistics in Canada.

Dwight: There is the issue of oil and gas field use. Feedback from customers is that fly ash has a low specific gravity and can have a ratio to cement greater than 1.

Jamie: It is conservative to keep it at 0.88, but we should discuss whether we need several values depending on the application of fly ash use?

Issue 2: Expand description on the fly ash to cement displacement ratio (Equivalence Factor).

Ed: Most producers are on a 1:1 ratio, some may be even higher. More often now the 56 day strength is used, which means more fly ash and a higher ratio.

Nabil: The US did a similar study. The replacement ratio varies per the properties of the fly ash and the cement requirements. They accepted a 1:1 ratio. This report should be publicly available. The value of 0.88 was proposed to Environment Canada. The document was confidential, but will inquire if a copy can be made available.

Anne: Need to remove the word “blended” from “blended cement product”
(*Note: Page 18, Paragraph 3, Line 5*)

Change 2: Remove “blended” from “blended cement product” on Page 18.

Dwight: The scope wording needs to be changed to include oil and gas applications.

Change 3: Update wording in the scope to include oil and gas applications.

12. Quantification Review:

- The emission factor is not included in the draft protocol yet because not all the data has been received.
- The protocol requires tonnes of fly ash from each truck load be used.
- What types of data actually exist to track fly ash from production at the coal power plant to the end user?
- Would truck weigh scales be the likely measurement approach and is each load measured?

Walter: Each load is measured and yes truck weigh scales are used.

Derek Hollman departs the teleconference.

Anne: Where are the records for historical data?

Jamie: It will be up to the project proponent to justify these numbers.

- We have a good set of emissions data because it was 3rd party verified and encompasses 3 years of operations after 2002, which is the offset system start date, which is why we chose a static baseline emission factor.
- This emission factor will likely apply until 2010, when further updated data will probably be available as mentioned in the protocol on Page 18.

Walter: Cement production emission intensity will go down with the use of more limestone.

13. Data Management: Jamie Callendar

- How carefully is fly ash usage tracked?

Nabil: The challenge is for the concrete producers to say how much fly ash was used.

Ed: Does not foresee a problem.

Jamie: So you can say for a particular project proponent that they would know the exact tonnes were used?

Ed: The percent blended is not tracked for each particular project site

Nabil: What if the project proponent is a builder?

Jamie: The mass of fly used is the important parameter, not the blending %. The verifier would need to make sure the fly ash was not double-counted.

Dwight: We track the tonnes of fly ash to each customer, in Alberta and exported.

14. Flexibility Mechanism: Jamie Callendar

- Closely follows the California Climate Action Registry (CCAR) Cement Reporting Protocol and World Resource Institute Cement sector guidance.
- There is good agreement in other documents on what to include.
- The two challenges are the use of alternative fuels (such as biomass) and the mass balance using cement kiln dust.
- The unit of production includes clinker and additives.

Nabil: Why isn't the unit of production just the tonnes of cement produced?

Jamie: This was the definition used by AENV and WRI so we tried to be consistent.

- The other issue is the emission factors from fuel use. Currently they are all in units of emissions per unit of energy (of the fuel). We would like feedback from the cement industry on whether this is consistent with your practices.

Walter: Would have to check with Brent if we measure this.

Jamie: Site specific emission factors are likely better than generic for this purpose.

Dwight: When will this flexibility mechanism be used?

Jamie: Mostly for other jurisdictions. We didn't want to limit the protocol applicability if the Alberta SGER data were not already available. If someone doesn't have access to this form of aggregated emissions data, then they would need to use the Flexibility Mechanism.

Dwight: But we will set a number in this protocol? What about imported cement?

Jamie: Yes. It will not include cement produced outside Alberta, but the emission factors are consistent with other jurisdictions reviewed.

- Specifically the cement plant operators should review this flexibility mechanism to see how it compares with the SGER approach.
- Any project proponent who chooses to use this flexibility mechanism will need to have access to these data to create a factor.

15. Next Steps: Jamie Callendar

- This is the first review of three.
- The main criterion from this review is that there are no sustained objections to any part of the protocol.
- All points brought up today have been noted.
- Further time is allowed for any additional written comments to be submitted to Blue Source by Monday October 27th.
- Another draft incorporating all the comments and changes will be distributed to the group.
- The final version approved by the group and all associated documentation will be delivered to AENV.

Amanda: The call for protocols is November 15th. Any issues need to be resolved by the group before then.

Thank you everyone for participating. Meeting adjourned.