Verification Report: Climate Earth Enterprise EPD Generator for Ready Mix Concrete

ASTM International commissioned Industrial Ecology Consultants to perform an external independent verification of the Climate Earth Enterprise (CEE) Environmental Product Declaration (EPD) Generator for Ready Mix Concrete in accordance with:


The independent verification was conducted by:

- Thomas P. Gloria, Ph.D.
  Founder, Chief Sustainability Engineer
  Industrial Ecology Consultants
REVIEW SCOPE
The CEE EPD Generator has the capacity to generate self-declared EPD results for ready mixed concrete based on user provided technosphere and emission flows, in accordance with the NSF PCR for concrete. The scope of this review included reviewing the general system documentation (software calculation methodology, EPD template, user interface, and verification tool), the master life cycle project report and sample EPD generator results.

REVIEW PROCESS
The review involved the creation and application of two review matrices based on the requirements set forth by the applicable standards, NSF International PCR, and ASTM International GPIs. The first review matrix was used to assess the life cycle assessment calculation system, and the other to verify the system generated EPD output by way of examining seven sample EPDs. The two review matrices served as documentation that all requirements had been identified and addressed upon completion of this review. As per ISO 14025, Clause 8.1.4, this report shall be made available to any interested party upon request. The review also included access to the CEE test server (http://test.epdcalc.climateearth.com/), providing EPD generation review of a sample cement company, Stoneway Plant, Seattle, WA, via seven test case EPDs.

Supporting drafts and final documents reviewed include the following:


<table>
<thead>
<tr>
<th>Stoneway Plant EPD</th>
<th>Item Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verification EPD 1</td>
<td>This EPD was calculated using industry average cement data. Cement LCA impacts can vary depending upon manufacturing process efficiency and fuel source by as much as 50% for some environmental impact categories.</td>
</tr>
<tr>
<td>Verification EPD 2 &amp; 3</td>
<td>This EPD was calculated using manufacturer specific cement data that represents X% of the total cement used in this mix.</td>
</tr>
<tr>
<td>Verification EPD 4</td>
<td>XXX Plant is a truck (transit) mixing plant. A portion of mixing truck (fleet) energy has been allocated to module A3</td>
</tr>
<tr>
<td>Verification EPD 5</td>
<td>If plant is a central mix plant no message will display</td>
</tr>
<tr>
<td>Verification EPD 6</td>
<td>XXX Plant is a truck (transit) mixing plant, 30% of all mixing truck (fleet) energy has been allocated to module A3</td>
</tr>
<tr>
<td>Verification EPD 7</td>
<td>If no cement is in the mix, no message will display</td>
</tr>
</tbody>
</table>
The review covered more than 400 identified requirements specified by the PCR, GPIs, and applicable ISO standards. All items were checked and determined to be satisfied. Moreover, considerable effort went into verifying that when used properly, the EPD generator system and associated databases generate consistent and plausible results for clinker, cements and concrete products as well as conform to the applicable PCR.

VERIFICATION STATEMENT

Based on the independent verification objectives, the Climate Earth Enterprise (CEE) Environmental Product Declaration (EPD) Generator for Ready Mix Concrete was determined to be in conformance with ASTM International’s General Program Instructions, core and subcategory product category rules and applicable ISO standards. The plausibility, quality, and accuracy of the LCA-based data and supporting information as captured in the generator tool are confirmed.

I confirm that I have sufficient knowledge and experience of cement and concrete products, the relevant core PCR, subcategory PCR for cement, ISO standards and the geographical areas intended to generate EPDs to carry out this verification.

Sincerely,

Thomas P. Gloria, Ph.D.
Founder, Chief Sustainability Engineer
Industrial Ecology Consultants