



# Industry-Wide Environmental Product Declaration (EPD) and Baselines for Environmental Impacts of Concrete

## Background

LEED v4, Architecture 2030 Challenge for Products and the International Green Construction Code require building product manufacturers to submit Environmental Product Declarations (EPDs) to demonstrate environmental performance of their products. The green building industry continues to grow at a rapid pace, and according to McGraw-Hill, is expected to make up 48-55% of the non-residential building market and 29-38% of the residential building market by 2016. The wood industry has already published industry average EPDs. The steel and asphalt industry are working on EPDs.

LEED v4 provides 2 points for a project that can document: 1) having 20 products and materials with EPDs and 2) having 50% of the products by cost demonstrating lower impacts than industry baselines through EPDs. LEED v4 values different types of EPDs as follows:

- Self declared EPDs are worth 1/4 value (not third party verified)
- Industry average EPDs are worth 1/2 value (third party verified)
- Plant specific verified EPDs are worth full value (third party verified)

This NRMCA sponsored project will help NRMCA member producers meet the requirements of LEED v4 by providing producers with an industry-wide EPD and industry baselines to compare their environmental impacts. NRMCA solicited proposals from six pre-qualified consulting firms and received four excellent proposals ranging in defined scope, methodology, qualifications and cost. After a lengthy and rigorous evaluation process, NRMCA identified Athena Sustainable Materials Institute as the consultant that best meets the needs of the ready mixed concrete industry in terms of defined scope, methodology, qualifications and cost.

## Project Detail

The project will be conducted in two phases as follows:

**Phase 1:** A cradle to gate Life Cycle Assessment (LCA) for ready mixed concrete would be conducted and an industry average EPD would be produced. The LCA and EPD will encompass concrete for a variety of applications, strengths, durability classes and slumps (or slump flows), and regions so that a producer could use the industry average EPD during the submittal process for a project requiring an EPD. The EPD will represent concrete typically used on a variety of projects from homes to high rises in different climate zones and different markets.

For the EPD to meet the requirements of LEED v4 for submittal on a project, a concrete producer must participate in providing data to the LCA and be listed in the EPD. This will involve considerable survey



time and effort to solicit input from a significant number of producers, possibly hundreds. The consultant will develop the survey questions necessary to gather data needed to conduct the LCA. RMCREF and NRMCA will assist in surveying concrete producers via e-mail. The consultant will collect and analyze survey results and include pertinent data in the LCA. Individual survey data would remain confidential. Aggregated data will be published in the LCA and EPD as necessary and summarized in a report.

**Phase 2:** Using data collected in Phase 1, the consultant will establish industry baselines for all environmental impacts listed in LEED v4. A number of baselines would be established at the national and regional levels. The baselines would encompass mix designs with 100% portland cement to high volume replacement of portland cement with supplementary materials representing a variety of applications and exposure conditions.

### **Benefits of the Project**

- An industry average EPD will allow concrete to remain competitive in LEED projects. Without an EPD, concrete may not be considered on a project. The wood industry has already published industry average EPDs for their products. The steel and asphalt industries are working on theirs.
- Establishing industry baselines for concrete will allow concrete producers to compare their products with these baselines. By producing their own plant specific EPDs; they could compete for a second point within LEED v4 EPD credit.
- By producing an industry average EPD and industry baselines, the concrete industry will demonstrate leadership in sustainable manufacturing and transparency.
- By producing an industry average EPD, the industry can potentially delay the need for plant specific EPDs for several years. This is a positive since plant specific EPDs are time consuming and expensive at a time when the industry is only beginning to recover from the biggest economic downturn in its history.

### **Project Schedule**

The project was started in December 2013 and will be completed in November 2014.