

Why Scalable Environmental Product Labeling is Key to a Sustainable Economy

How Central Concrete Leads the Nation

Environmental Product Declarations

The most fundamental metric in business is measuring and reporting product performance characteristics. Yet the environmental performance of products is seldom acknowledged or reported. Product labeling is important in that it enables manufacturers to design and build sustainable products and empowers customers to make sustainable product choices, paving the way for a sustainable economy. An Environmental Product Declaration (EPD) is a standardized (ISO 14025/TR) - label designed to communicate the environmental impacts of a product in a scientifically-sound, streamlined and comparable way. EPDs typically include information on the environmental impact of a product, throughout its lifecycle, from raw material extraction, production and packaging to distribution, end use and disposal, including energy use and efficiency, emissions to air, soil and water and waste generation, as well as product and company information. In many ways EPDs mimic the nutrition label on food in that they provide the facts and the transparency needed to make an informed purchasing decision, but don't offer any judgment as to the "greenness" of the product. However, with lack of experience, the process for creating and verifying an EPD has been labor intensive, costly and not scalable, rendering EPDs difficult to implement.

EPD Implementation Challenges

Owing to challenges with manual assessment of large amounts of detail data, other industry leading companies have opted to produce EPDs at the product category level. The general practice has been to laboriously create six to ten EPDs to cover clusters of products. While this represents a significant step forward, it only provides a snapshot of the product group and ignores individual product information, disregarding the customer's need for individualized data and transparency. It's akin to placing identical labels on all soft drinks bottles or on all gas-powered lawnmowers made by a single manufacturer. How effective is that to an end user? The bottom line is that labeling product groups in lieu of individual products will ultimately render EPDs useless. Creating a sustainable economy, driven by consumer choice, requires cost-effective methods for producing and verifying (auditing) millions of labels.

Achieving EPD Success

Climate Earth's systems-based solution, implemented by Central Concrete, delivered a new path to EPD implementation. This system delivered timely, meaningful EPDs at the product level.

Recognizing that the concrete industry produces 5% of all US greenhouse gas emissions, and with government pressure and buyer concern, Central Concrete (a U.S. Concrete Company, in San Jose, California) has responded to the market with leadership and vision. Central Concrete has led the market through its investments in advanced low carbon concrete technology, resulting in thousands of low CO₂ mixes. In addition, Central Concrete is the first concrete company in the United States to adopt EPDs and sign on to the 2030 Challenge for Products. This has led to Central's commitment to producing low carbon concrete and labeling those mixes to clearly quantify the positive environmental impact.

Central Concrete made two fundamental decisions about communicating the environmental benefits of the new low carbon mixes. First, that product labels must give specific quantified environmental impact, because simply labeling the new mixes

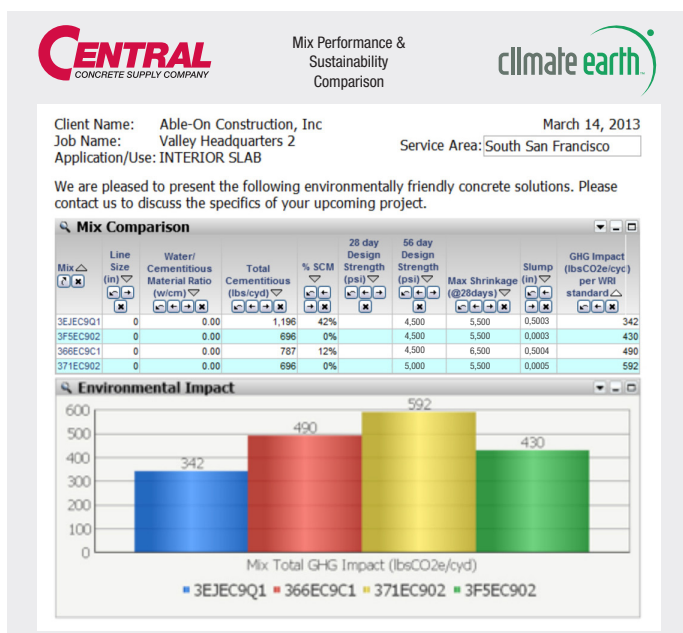


Figure 1: Central Concrete's Mix Performance and Sustainability Calculator enables engineers and architects to consider both performance and environmental impact in the mix selection process.



as “green” would not have any value to the buyer. Second, they decided it would not be acceptable to their customers to cluster mixes into groups and provide 6-10 EPDs for approximately 1,400 mixes.

Architects, engineers and contractors are very specific about the mix performance criteria. If an engineer is designing the piers to hold up a bridge, they specify and expect 8,000 pounds per square inch (psi) compressive strength concrete; 6,000 psi does not qualify. Similarly, Central Concrete felt that the market would demand specific standards for environmental performance just as they demand specific standards for structural performance.

Snapshot of Environmental Product Label results for		environmental metrics (per m ³)	
Central Concrete Mix Code 450PB501 San Jose Plant 100% Cem Gen Use 4" Line Perf 5000		Global warming potential	509 kg CO ₂ -eq
		Ozone depletion	1.49×10 ⁻⁵ kg CFC-11-eq
		Acidification	2.30 kg SO ₂ -eq
		Eutrophication	0.37 kg N-eq
		Photochemical oxidation	22.7 kg O ₃ -eq
		Primary energy consumption	5,329 MJ
performance metrics		Batch freshwater consumption	17.8 gal
28-day compressive strength	5,000 psi	Process freshwater consumption	3.69 gal
Slump	4.0 in		

Figure 2: Central Concrete's verified EPD's document and verify the environmental performance of every mix.

Scalable EPDs: Industry First

Climate Earth worked closely with Central Concrete (www.centralconcrete.com) to produce scalable EPDs. This critical scalability was achieved by combining and implementing Climate Earth's big data and systems expertise with life cycle analysis (LCA) expertise, to successfully produce a label for every one of Central Concrete's mixes – more than 1,400 in total.

As a result Central Concrete is now the first company in the nation to produce integrated EPDs available on-line, in real time for *every single* product. A sample EPD is available here: (<http://goo.gl/zueJx>).

The Central EPDs are ISO 14025 compliant and they conform fully to the Product Category Rules (PCR) developed through an intense stakeholder process led by the Carbon Leadership Forum (<http://goo.gl/VbaFo>) at the University of Washington. The PCR provides guidelines that ensure all labels from any manufacturer are comparable. Central Concrete's EPDs are fully integrated with the company's product performance information systems. The product labels are available to architects, engineers and contractors on-line, in real time.

Working with Central Concrete sales consultants, the labels enable these key purchasers to select concrete based on both the product performance and the products environmental performance. Central Concrete can enter product performance needs (strength, shrinkage, slump, water content, and environmental impact parameters) and the system will output mixes that meet all business requirements, and generate an integrated EPD specifying both environmental and traditional mix performance data for any one of the 1,400 or so mixes.

The decision to adopt EPDs was part of Central Concrete's strategy to lead the industry in the production of cleaner, greener, and stronger concrete mixes.