



EPD OPTIMIZATION REPORT

LEED Credit: LEED v4.1 MRc2 — Environmental Product Declarations, Option 2 (Optimization Assessment)

Product:	Manufacturer:
HT Blend - OWC Blend	Union Cement Company
Issue Date:	Expiry Date:
26-Mar-2026	25-Mar-2031

EPD Reference and Optimization Basis



شركة أسمنت الاتحاد (ش.م.خ.)
UNION CEMENT COMPANY (Pr.J.S.C)

Product: HT Blend - Oil Well Cement Blend
Declared Unit: 1 metric ton
System Boundary: Cradle-to-gate with options (A1-A4, C1-D)
Manufacturer: Union Cement Company (Pr.J.S.C), UAE
Program Operator: International Climate Intelligence System (ICIS)
EPD Number: ICIS-202603-130
Issue Date: 26-Mar-2026
Expiry Date: 25-Mar-2031



Basis of Assessment

- Baseline EPD: HT Blend - Oil Well Cement Blend EPD (ICIS-202603-130).
- Same product optimization; no third-party manufacturer EPDs used.
- System boundary: cradle-to-gate (A1–A3); declared unit: 1 metric ton.
- Modeled optimization scenario corresponding to an indicative 6–8% reduction in A1–A3 GWP.
- Improvements limited primarily to raw material blend optimization in A1 and manufacturer-controlled process parameters in A3, with unchanged production technology.

Purpose

The purpose of this report is to assess potential cradle-to-gate (A1–A3) environmental impact reduction opportunities for Union Cement Company’s HT Blend - Oil Well Cement Blend through a modeled optimization scenario, in accordance with the requirements of LEED v4.1 MRc2 – Environmental Product Declarations (Option 2).

Methodology

The optimization assessment was conducted using a life cycle assessment-based approach consistent with EN 15804+A2 and ISO 14025 principles, aligned with the requirements of LEED v4.1 MRc2 Option 2.

The current HT Blend – Oil Well Cement Blend EPD (ICIS-202603-130) was used as the baseline. A modeled optimization scenario was developed for the same product by adjusting selected parameters within the cradle-to-gate (A1–A3) system boundary, while keeping the declared unit, production route, and system boundaries unchanged.

The methodology focuses on identifying realistic improvement levers within the A1 (raw material supply) and A3 (manufacturing) stages, including blend composition optimization and process efficiency improvements in material handling and blending operations. No changes were made to product classification, functional performance, or downstream life cycle stages.

Environmental impacts were evaluated using the same impact assessment method applied in the baseline EPD to ensure consistency and comparability between the baseline and modeled optimization scenario.

As the optimization scenario is modeled for the same product and manufacturer using identical declared unit, system boundaries, and impact assessment method, the baseline and optimization results are directly comparable.

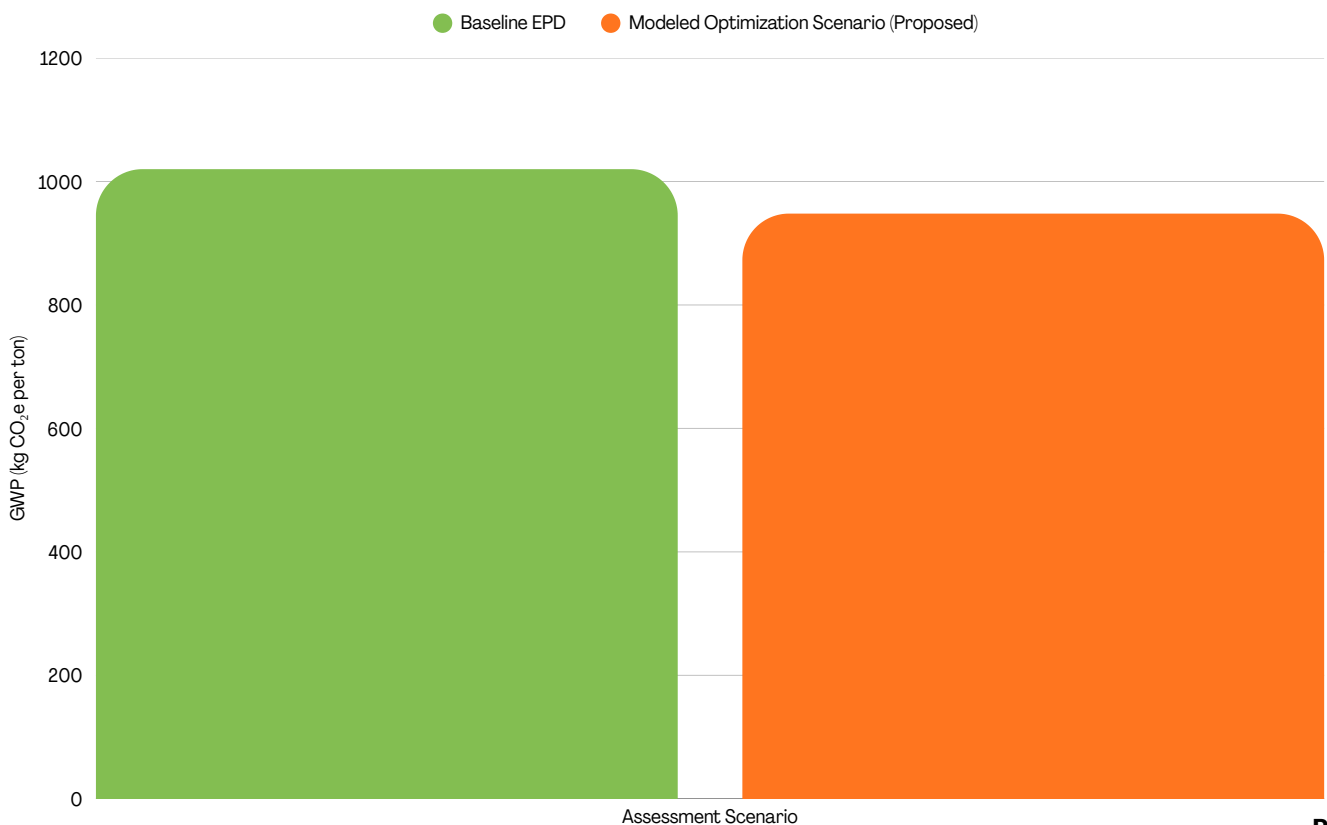
Results

The cradle-to-gate (A1–A3) Global Warming Potential (GWP) results for the baseline EPD and the modeled optimization scenario are summarized below.

Scenario	A1-A3 GWP (kg CO ₂ e / ton)
Baseline EPD	1020
Modeled Optimization Scenario (proposed)	~938-959

The modeled optimization scenario represents a proposed potential reduction of approximately 6-8% in A1–A3 GWP relative to the baseline EPD, subject to implementation of the identified optimization measures.

Indicative A1-A3 GWP Comparison: Baseline EPD and Proposed Optimization Scenario



Key Optimization Opportunities (A1 & A3)

A2 – Raw Material Transportation (Blend composition & Inputs)

- Optimize blend composition through precise control of Oil Well Cement and silica proportions within defined performance limits to reduce embodied carbon.
- Prioritize lower-carbon Oil Well Cement through plant-specific emission optimization and improved upstream manufacturing efficiency.
- Improve sourcing of silica flour with lower embodied emissions and optimized processing routes.
- Enhance material efficiency through precise dosing and reduced variability in blend composition.
- Optimize packaging materials and upstream inputs to reduce embodied impacts within the A1 boundary.

A3 – Manufacturing (Blending & Handling Operations)

- Improve energy efficiency in material handling, dosing, and blending systems to reduce electricity consumption.
- Optimize process control in blending operations to ensure consistent product quality with minimal energy use.
- Reduce auxiliary energy consumption across storage, conveying, and packing systems.
- Improve operational efficiency to minimize material losses during blending and transfer.
- Enhance plant-level energy management to reduce overall electricity intensity per ton of product.

Key Findings

- The optimization assessment indicates that measurable reductions in A1–A3 GWP are achievable for HT Blend through targeted improvements in raw material blend composition and upstream input efficiency within defined system boundaries.
- A1 remains the dominant contributor to total GWP, with reductions primarily driven by optimization of Oil Well Cement usage and improved upstream material performance.
- A3 contributes marginally to reductions through improved energy efficiency in blending, handling, and packing operations.
- A2 contribution is negligible, and therefore reduction potential is primarily governed by raw material composition rather than transport or manufacturing processes.
- The identified measures focus on material and process efficiency without altering product composition beyond defined performance limits, functional performance, or underlying production technology.
- The reduction potential reflects realistic improvements aligned with current HT Blend formulation and blending-based manufacturing practices.
- Overall, the results potentially demonstrate a credible and technically achievable pathway for 6–8% reduction in cradle-to-gate GWP through controlled blend optimization and operational efficiency measures.

Limitations & Assumptions

This optimization assessment is based on a modeled scenario and represents indicative reduction potential rather than verified or achieved performance. The assessment is limited to cradle-to-gate (A1–A3) life cycle stages and Global Warming Potential (GWP) only; other impact categories and downstream life cycle stages are not evaluated. The modeled optimization assumes implementation of the identified improvement measures, primarily related to blend composition control and manufacturing process efficiency, without changes to product classification, functional performance, or declared unit. Results are intended solely for LEED v4.1 MRc2 Option 2 documentation purposes.



Alan Beski Christopher

Sustainability Manager
GCAS Quality Certifications

Office no. 110, National Insurance Building
Sheikh Zayed Road
P.O. Box 65561
Dubai, UAE
www.gcasquality.com | info.dubai@gcasquality.com



GCAS Quality Certifications - ECO Platform member
