EPD OPTIMIZATION REPORT

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

Product:	Manufacturer:
NanoGrout GP50	CONMIX Ltd.
Issue Date:	**Expiry Date:**
20-Mar-2026	19-Mar-2031

EPD Reference and Optimization Basis

Product: NanoGrout GP50
Declared Unit: 1 kilogram
System Boundary: Cradle-to-gate with options (A1-A4, C1-D)
Manufacturer: CONMIX Ltd., United Arab Emirates
Program Operator: International Climate Intelligence System (ICIS)
EPD Number: ICIS-202603-117
Issue Date: 20-Mar-2026
Expiry Date: 19-Mar-2031

Basis of Assessment

- Baseline EPD: NanoGrout GP50 EPD (ICIS-202603-117).
- Same product optimization; no third-party manufacturer EPDs used.
- System boundary: cradle-to-gate (A1–A3); declared unit: 1 kilogram.
- Modeled optimization scenario corresponding to an indicative 10-12% reduction in A1–A3 GWP.
- Improvements limited to manufacturer-controlled parameters in A1 and 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 CONMIX's NanoGrout GP50 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 NanoGrout GP50 EPD (ICIS-202603-117) was used as the baseline. A modeled optimization scenario was developed for the same product by adjusting selected, manufacturer-controlled 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 binder composition optimization (cement reduction and efficient use of mineral fillers) and manufacturing energy efficiency. No changes were made to product specifications, 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.

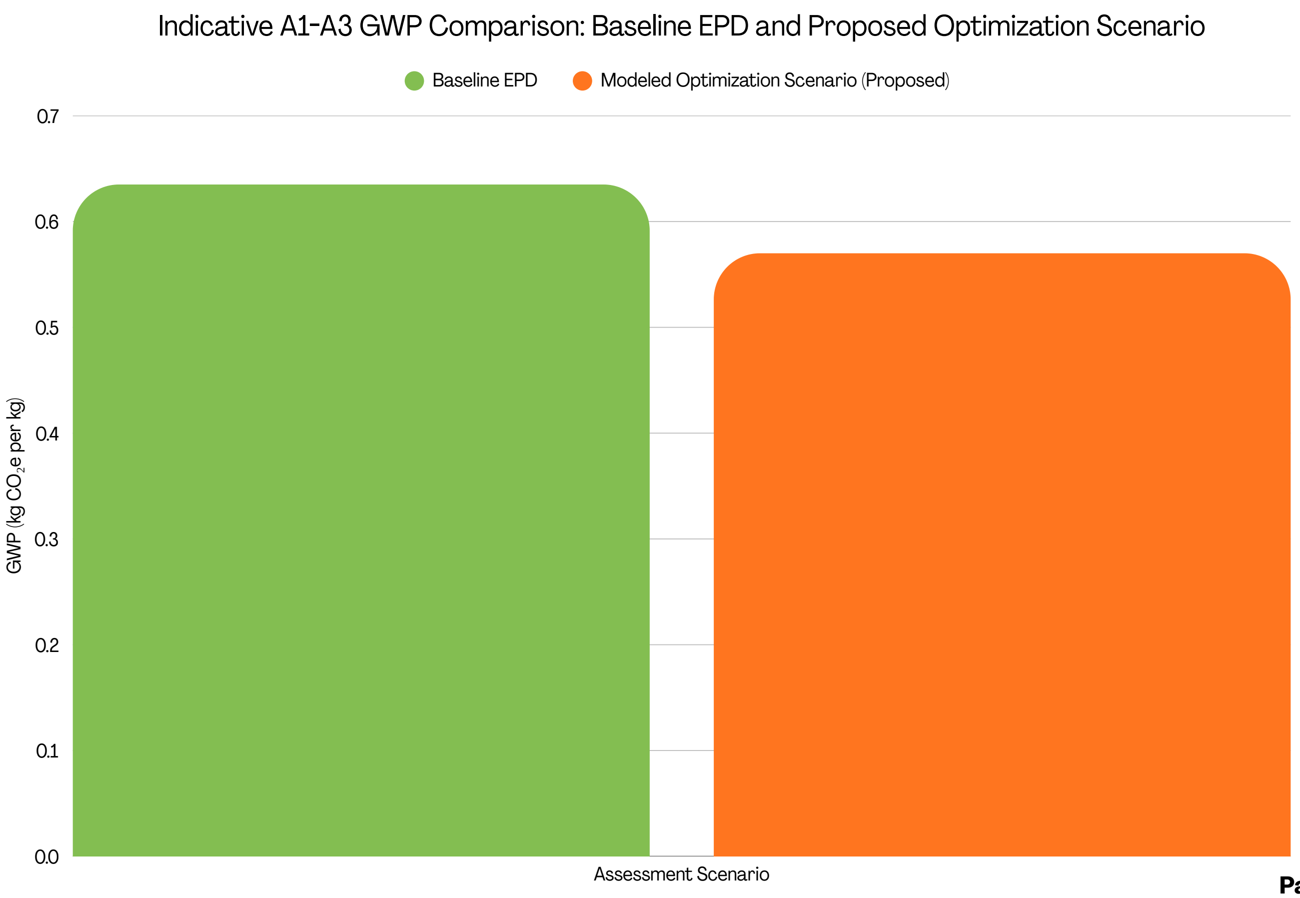
As the optimization scenario is modeled for the same product and manufacturer using identical declared unit, system boundaries, and impact assessment method, the baseline and optimization results are directly comparable.

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_2e / kg)**
Baseline EPD	0.635
Modeled Optimization Scenario (proposed)	~0.56-0.57

The modeled optimization scenario represents a proposed potential reduction of approximately 10–12% in A1–A3 GWP relative to the baseline EPD, subject to implementation of the identified optimization measures.



Key Optimization Opportunities (A1 & A3)

A1 – Raw Material Supply (Binder & Inputs)

- Optimize binder formulation through incremental reduction of OPC from the current composition (~40%), supported by efficient use of mineral fillers.
- Prioritize procurement of lower-clinker, lower-carbon cement from existing suppliers.
- Improve cement efficiency by optimizing water-to-powder ratio and admixture performance to reduce binder demand.
- Use supplier-specific EPDs or verified emissions data for cement and key inputs instead of generic datasets.
- Review raw material transport efficiency through route planning and load optimization, recognizing its relatively minor contribution.

A3 – Manufacturing (Dry-Mix Production)

- Improve mixing and material handling efficiency to reduce electricity consumption.
- Optimize plant operations through equipment efficiency and process control improvements.
- Increase share of low-carbon or renewable electricity where feasible.
- Reduce material losses through improved batching accuracy and quality control.
- Monitor and benchmark specific energy consumption (kWh/t) against best-practice levels.

Key Findings

The results of the optimization assessment indicate that meaningful reductions in cradle-to-gate (A1–A3) Global Warming Potential (GWP) are potentially achievable for NanoGrout GP50 through targeted improvements within manufacturer-controlled processes. The modeled scenario demonstrates that the A1 and A3 life cycle stages represent the primary levers for reducing embodied carbon, with A1 driven by binder composition and A3 by electricity use in dry-mix production.

The identified optimization opportunities highlight that further reductions are primarily driven by improvements in cement efficiency and binder-related inputs (A1) and manufacturing energy optimization (A3), without changes to product specifications, functional performance, or production technology. These findings confirm that the proposed reduction potential is realistic and attributable to material and energy-related measures within the defined system boundary. In addition, the results demonstrate that NanoGrout GP50 incorporates a cement-intensive formulation, indicating that the product has a higher baseline carbon contribution compared to lower-binder cementitious systems.

Overall, the interpretation supports the suitability of NanoGrout GP50 for LEED v4.1 MRc2 Option 2, demonstrating a clear and credible pathway for proposed cradle-to-gate impact reduction, with the identified improvements representing incremental, performance-aligned optimization measures subject to implementation.

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 binder composition and manufacturing energy use, without changes to product specifications, functional performance, or declared unit. Results are intended solely for LEED v4.1 MRc2 Option 2 documentation purposes.

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