CARBON CALCULATOR METHODOLOGY

How the calculator estimates CO_2e savings.

This document covers the LCA factors, sensitivity convention, equivalence factors, and verification limits used by the **www.deltaelnile.com/carbon-calculator.html** tool.

01 · LCA factors

The calculator uses two emission factors. Each has a central value (based on the most widely-cited recent reference) and a published range observed across regional studies and process variants:

Factor	Central value	Published range	Source
Virgin PET	2.34 kg CO_2e/kg	2.0–2.7 kg/kg	Plastics Europe Eco-profile, 2024 dataset
Mechanically recycled rPET	0.60 kg CO_2e/kg	0.45–0.85 kg/kg	European PET Bottle Platform / Petcore Europe LCA, 2022 update

02 · Sensitivity convention

The **sensitivity range** output applies **±15%** symmetrically to both LCA factors above, producing low/high estimates that approximate the bounds of the published ranges. The convention is deliberately simple — for first-pass procurement decisions, not for verified disclosure.

For example, with a 50% rPET program saving 100 tonnes CO_2e (central estimate), the calculator would show: **~85 – 115 t/yr** (±15% range). The low estimate reflects best-case grid mix and recycling process; the high estimate reflects worst-case conditions.

03 · Equivalence factors

The equivalence outputs (passenger cars off road, mature trees) translate tonnes of CO_2e into more intuitive units:

Equivalence	Value	Source
Passenger car	4.6 t CO_2e/year	EPA US, average vehicle
Mature tree CO_2 absorption	22 kg CO_2e/year	US Forest Service

04 · Verification limits

The calculator produces first-pass estimates for procurement decision-making. The numbers are deliberately conservative and transparent — every input is visible, every factor is sourced. But they are not a verified emissions disclosure.

A verified disclosure for ISO 14067 / EN 15804 / or customer-specific Scope 3 reporting requires supplier-specific LCA data: actual electricity grid intensity at the manufacturing site, transport stages, packaging configuration, and end-of-life treatment for the specific market.

Delta El Nile provides verified per-program LCA disclosure as part of every rPET program. The calculator's role is to help you size the opportunity before that verified work begins.

05 · What this calculator does not include

For transparency, the following are not currently included in the calculator's central estimate. They are typically handled in the verified per-program LCA stage:

- Transport emissions from preform manufacturing to the bottling line
- Bottle blow-molding energy consumption (varies by customer site)
- Filling-line energy and water use
- Distribution emissions from bottling to retail
- End-of-life pathway emissions (recycled vs landfill vs incineration mix)
- Avoided emissions from packaging displacement (e.g., glass → PET)
- Refill / closed-loop cycle multipliers for 5-gallon programs

Each of these can be material — typically additive to the savings — and they are quantified in the verified per-program LCA work that follows the calculator's first-pass estimate.

CONTACT

Request a verified disclosure.

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This methodology PDF is auto-generated from Delta El Nile's carbon-calculator constants on 2026-06-16. The LCA factors, ranges, and sensitivity convention here match the live calculator at www.deltaelnile.com/carbon-calculator.html. If a discrepancy exists, please notify salesteam@deltaelnile.com.