Methodology

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For procurement / ESG diligence dossiers

PromoTrace calculates the cradle-to-gate-plus-logistics carbon footprint of promotional products using ISO 14044 screen-level LCA principles. Every saved calculation is stamped with the methodology revision that produced it, so historical reports remain reproducible across data updates.

CURRENT METHODOLOGY

v1.2.0 released 6 June 2026

Multi-country Scope 2 grid factors — IEA 2024 lookup per site country (drops UK-only hardcoding).

Sources & scope

MATERIALS

Idemat 2024

TU Delft, peer-reviewed industrial material database. Primary source for plastic, metal, paper, textile EFs.

STAINLESS STEEL

worldstainless 2025

Industry LCA report from the International Stainless Steel Forum. Used for stainless variants including recycled content.

TRANSPORT

GLEC Framework v3.1

Smart Freight Centre. Sea 0.012, air 0.602, road 0.062 $kgCO_2e$/tonne-km. Curated distance tables for canonical lanes.

ENERGY

IEA 2022 grid intensity

Country-level $kgCO_2e$/kWh for the manufacturing energy term. Multiplier vs the global average drives the grid pill on each calculation.

CROSS-CHECK

DEFRA 2024

UK government published EFs used as a sanity check for material values. Not the primary source — Idemat takes precedence.

STANDARD

ISO 14044

Screen-level life-cycle assessment. Cradle-to-gate plus logistics plus end-of-life disposal. Use-phase emissions are out of scope.

Revisions changelog

v1.2.0 CURRENT

released 6 June 2026

Multi-country Scope 2 grid factors — IEA 2024 lookup per site country (drops UK-only hardcoding).

PromoTrace methodology v1.2.0

Released 6 June 2026.

Minor revision — Sustainability Hub gains country-aware Scope 2 electricity grid intensity.

What changed

The Scope 2 calculation was hardcoded to the UK grid (0.207 kg CO_2e/kWh, IEA 2024) since v1.0.0. Multi-country customers (Greek HQ + Berlin office + Tokyo subsidiary, etc.) were getting numbers computed against the wrong grid.

v1.2.0 introduces a country lookup table covering ~37 ISO 3166-1 alpha-3 codes. Each site's `country` field resolves to the right IEA 2024 grid factor at save time:

Region	Examples	kg CO_2e/kWh
Hydro / nuclear heavy	NOR / CHE / SWE / FRA	0.029 – 0.057
Wind & mixed	DNK / AUT / ESP / IRL	0.171 – 0.295
Average western	GBR / DEU / ITA / USA	0.207 – 0.380
Coal-heavy	POL / IND / IDN / ZAF	0.692 – 0.860
World fallback	(country unknown)	0.475

Renewable share still applies

The `renewable_electricity_pct` field still reduces the emitting kWh portion linearly under GHG Protocol Scope 2 Guidance market-based method. So a Berlin site with 100% Ökostrom (renewable=100) gets Scope 2 = 0 regardless of the German grid factor (0.380).

District heating

Kept the EU-25 average (0.170 kg CO_2e/kWh) for now — per-country district heating factors vary 0.07 to 0.30 but the data layer is sparser than electricity grids. Per-country override is a future enhancement.

Year view

The year detail page now prints the resolved grid factor + country label inline so a reviewer can verify which factor produced Scope 2 for that site.

Back-compat

Existing v1.1.0 saves keep their stored numbers — historical snapshots are immutable per audit trail integrity. New saves use the country-aware factor and stamp ef_rev='1.2.0'.

v1.1.0

released 6 June 2026

Sustainability Hub expansion — new EFs (LPG, heating oil, refrigerants, district heating) + new input categories (boundary, business volume, waste breakdown, evidence URLs, targets).

PromoTrace methodology v1.1.0

Released 6 June 2026.

Minor revision driven by the Sustainability Data Hub expansion (Batches 1+2).

New emission factors

- **LPG** — 0.00214 tCO_2e/kg + 13.6 kWh/kg net calorific value (DEFRA 2024)
- **Heating oil** — 0.00267 tCO_2e/L + 10.35 kWh/L (DEFRA 2024)
- **Biomass** — biogenic CO_2, excluded from Scope 1 totals per GHG Protocol; 4.4 kWh/kg net calorific value used for total-energy reporting (DEFRA 2024)
- **District heating** — 0.170 $kgCO_2e$/kWh purchased (DEFRA 2024 UK average); counted as Scope 2 alongside electricity
- **Generator diesel** — same EF as vehicle diesel (0.00268 tCO_2e/L); separated from vehicle fuels for boundary clarity

Refrigerant leakage (new Scope 1 path)

Leakage in kg × GWP100 (IPCC AR5) ÷ 1000 = tCO_2e:

Refrigerant	GWP100
R-410A	1,924
R-32	675
R-134a	1,300
R-404A	3,922
CO_2 / R-744	1
Other (conservative default)	1,500

New input categories

These expand the methodology footprint but do not change existing calculation outputs:

- **Reporting boundary** — sites covered, countries, calendar vs fiscal period, coverage %, narrative scope description
- **Business volume** — annual revenue (EUR) + orders processed; drives intensity ratios (tCO_2e per €M revenue, tCO_2e per order)
- **Waste treatment breakdown** — landfill / incineration / energy recovery / recycling / composting / WEEE / batteries. Recycling rate auto-aggregates from breakdown when any field is filled

- **Evidence URLs** — per-input source documents (utility bill / REGO certificate / contractor PDF) for audit-trail credibility
- **Per-section data quality flag** — actual / estimated / partial / mixed
- **Targets entity** — quantitative reduction or growth commitments with baseline + target year/value + live progress tracking

Scope and back-compat

Cradle-to-gate plus logistics plus end-of-life disposal (unchanged from v1.0.0). All sustainability_hub_years rows and product calculations rows stamped v1.0.0 retain their v1.0.0 figures; v1.1.0 stamps apply only to new saves from this date onward.

v1.0.0

released 23 April 2026

PromoTrace baseline methodology — Idemat 2024, worldstainless 2025, GLEC v3.1, IEA 2022.

PromoTrace methodology v1.0.0

Released 23 April 2026.

First public version of the PromoTrace methodology, deployed for the v15 calculator and the auth app.

Sources

- **Materials** — Idemat 2024 (TU Delft, peer-reviewed) for primary materials; worldstainless 2025 industry report for stainless steel; DEFRA 2024 for additional cross-checks.
- **Transport** — GLEC Framework v3.1 (Smart Freight Centre). Sea freight 0.012 kgCO_2e/tonne-km, air freight 0.602 kgCO_2e/tonne-km, road freight 0.062 kgCO_2e/tonne-km.
- **Manufacturing energy** — IEA 2022 country grid intensity (kg CO_2e per kWh).
- **Distance tables** — curated GLEC reference values for shipping lanes; OSRM road routing for road-mode legs; canal-aware great-circle for sea legs through Suez/Panama/Gibraltar.

Scope

Cradle-to-gate plus logistics plus end-of-life disposal. ISO 14044 screen-level LCA methodology. Use-phase emissions are out of scope (determined by the end user, not the product).

Confidence ratings

- **HIGH** — full bill-of-materials with verified origins.
- **MED** — standard category defaults applied for at least one input.
- **LOW** — significant assumptions (e.g. transport route inferred from origin country alone).

Reproducibility — each saved calculation in PromoTrace cites the revision that produced it. Auditors verifying a historical report should match the cited rev to the entry on this page.