SAMPLE - injection-moulded enclosure

Prepared for Illustrative sample. Masses are a template, not a real product. - Source file: moulder-template.csv - Issued 2026-09-30

Total product carbon footprint

0.9304 kg CO2e per product

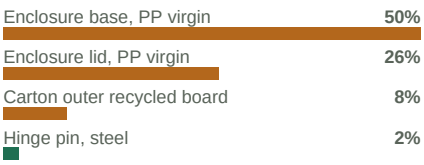
90% interval 0.9019 - 0.9599 kg CO2e, propagated from the provenance tiers this assessment actually carries rather than a fixed ratio.

At 50,000 units a year that is 46.5 tonnes CO2e - the per-unit figure multiplied by the volume you gave, carrying the same uncertainty and assuming the volume applies to this specification.

PROVISIONAL. 4 of 5 lines fed this total; 1 was excluded and are itemised below. A partial figure is not a smaller figure - it is an incomplete one, and it should not be compared against a complete assessment of anything else.

Scope: carbon only (GWP), cradle-to-gate, UK. Source: UK Government GHG Conversion Factors 2026, 2026, licence OGL v3.0. Inbound freight at 300 km. Electricity on the United Kingdom grid.

Where the carbon sits



Enclosure base, PP virgin is the hotspot. These lines are 86% of the footprint; the rest is process and freight, broken out by stage below.

What the number rests on



100% of the total is traced to a published figure. Each line carries its own tier below.

How firm the figure is



0.930 kg CO2e 90% interval spans x1.1

Widest contribution to the spread: Conversion energy (16% of the band, derived).

Where the carbon sits

Enclosure base, PP virgin - 50.4% [hotspot]

0.46870 kg CO2e = 0.0001820 t x 2,575.253 kg CO2e/t [traced]

Source cell: Material use - Plastic: Plastics: PP (incl. forming) - Primary material production

Enclosure lid, PP virgin - 26.0% [hotspot]

0.24207 kg CO2e = 0.00009400 t x 2,575.253 kg CO2e/t [traced]

Source cell: Material use - Plastic: Plastics: PP (incl. forming) - Primary material production

Carton outer recycled board - 7.7% [hotspot]

0.07128 kg CO2e = 0.00006500 t x 1,096.628 kg CO2e/t [traced]

Source cell: Material use - Paper: Paper and board: board - Closed-loop source

Hinge pin, steel - 1.8%

0.01717 kg CO2e = 0.000006000 t x 2,861.583 kg CO2e/t [traced]

Source cell: Material use - Metal: Metal: steel cans - Primary material production

By stage

Material production: 0.79922 kg CO2e (85.9%)

Process scrap: 0.03741 kg CO2e (4.0%)

Conversion energy: 0.08302 kg CO2e (8.9%)

Inbound transport: 0.01078 kg CO2e (1.2%)

Manufacturing energy and process losses

1.632 kWh per kg of product across 1 step, at 0.1844 kg CO2e/kWh once fuel production and distribution losses are added to the published combustion factor.

Injection moulding - Grid electricity (UK average)

1.632 kWh/kg product - 5.0% scrap - 0.0526 kg extra material bought per kg shipped

Specific energy from the published band; scrap from the published band. Basis: 1.55 kWh/kg - midpoint of a 0.6-2.5 screening band for injection moulding. Scrap 5.0% - midpoint of a 2-8% band.

Excluded from the total, and why

Gasket, TPE - no factor resolved - the matcher declined to guess

What to do about it

Switch Enclosure base, PP virgin to PP (incl. forming) - closed-loop (recycled) -24.7% (-0.23023 kg CO2e)

Cost: Commercial effect depends on your supply agreement.

Process: Re-qualify the material against your product specification before switching.

Effort 3/5, 3-6 months. Computed: 0.0001820 t x (1,310.253 - 2,575.253) kg CO2e/t, both cells read from Material use - Plastic: Plastics: PP (incl. forming) - Primary material production.

Switch Enclosure lid, PP virgin to PP (incl. forming) - closed-loop (recycled) -12.8% (-0.11891 kg CO2e)

Cost: Commercial effect depends on your supply agreement.

Process: Re-qualify the material against your product specification before switching.

Effort 3/5, 3-6 months. Computed: 0.00009400 t x (1,310.253 - 2,575.253) kg CO2e/t, both cells read from Material use - Plastic: Plastics: PP (incl. forming) - Primary material production.

Move the plant's electricity to a contracted renewable supply -8.9% (-0.08302 kg CO2e)

Cost: A tariff decision rather than an engineering one, so it is the fastest large move available - but it buys a reporting position, not a physical reduction.

Process: Nothing changes on the shop floor. Note that this saving only exists under market-based accounting: a customer applying a location-based method will still see the grid figure, so keep both and expect to be asked for both.

Effort 2/5, 1-3 months. Computed: the whole 0.08302 kg CO2e conversion-energy term at a market-based factor of zero. A convention, not a physical claim.

Bring injection moulding energy from 1.55 to 0.6 kWh/kg -3.9% (-0.03614 kg CO2e)

Saving: about £3,450 a year. At £0.250/kWh - midpoint of an indicative £0.18-0.32/kWh band for UK industrial supply.

Cost: Directly proportional to the electricity bill for this line. Payback depends on whether the gap is tuning (weeks, near-free) or machine replacement (capital).

Process: Hydraulic machines sit at the top of the band; all-electric and well-tuned hot-runner tools sit near the bottom. Thin-wall and long cycle-time parts both push it up.

Effort 4/5, 6-12 months. Computed: 1.55 -> 0.6 kWh/kg over 0.276 kg at 0.13096 kg CO2e/kWh. Current figure is a band midpoint - meter the line before committing spend.

Cut injection moulding scrap from 5.0% to 2% -2.7% (-0.02471 kg CO2e)

Saving: about £750 a year. At £1300/t - midpoint of an indicative 1100-1500 £/t band. Replace it with your own price; resin moves too fast for a table to be trusted. At £0.250/kWh - midpoint of an indicative £0.18-0.32/kWh band for UK industrial supply.

Cost: The clearest money in the list: scrap is material you already paid for, plus the energy spent forming it, plus the cost of

handling it back. It lands on the material line, not an environmental one.

Process: Scrap comes from start-up and changeover losses, drift during a run, and rejects at inspection, and each has a different fix. Log it by cause for a few weeks before choosing where to act.

Effort 3/5, 3-6 months. Computed: input ratio 1.053 -> 1.020 per kg of product, priced at the intensity of the material this step acts on (2575 kg CO2e/t) and 1.55 kWh/kg at 0.13096 kg CO2e/kWh. Current rate is a band midpoint, not your figure - meter it before acting.

Take 5% mass out of Enclosure base, PP virgin -2.5% (-0.02343 kg CO2e)

Saving: about £592 a year. At £1300/t - midpoint of an indicative 1100-1500 £/t band. Replace it with your own price; resin moves too fast for a table to be trusted.

Cost: Material cost falls roughly in proportion; set against tooling amortisation and a qualification run, which is where the payback period actually comes from.

Process: Wall-thickness reduction changes cooling time and part stiffness. Expect a new mould or insert and a drop-test re-qualification - this is a project, not a setting change.

Effort 4/5, 6-12 months. Assumption: Screening assumption of 5% mass reduction applied to the dominant line (50% of the total). The percentage is an assumption, not a target - replace it with your own once tooling has been scoped.

Recover injection moulding scrap as in-house regrind -0.8% (-0.00748 kg CO2e)

Saving: about £755 a year. At £1300/t - midpoint of an indicative 1100-1500 £/t band. Replace it with your own price; resin moves too fast for a table to be trusted.

Cost: Granulator capital against material no longer bought twice. Usually the shortest payback on this list at any meaningful scrap rate.

Process: Regrind carries heat history, so melt-flow drifts and the tolerated ratio is set by your specification - food contact and clarity requirements bite hardest. Contamination control at the granulator is the practical constraint.

Effort 3/5, 3-6 months. Computed: 80% of 5.3% wasted mass recovered, priced at the intensity of the material this step acts on. Recovery rate is an assumption, not a measurement.

Switch Hinge pin, steel to steel cans - closed-loop (recycled) -0.7% (-0.00624 kg CO2e)

Cost: Commercial effect depends on your supply agreement.

Process: Re-qualify the material against your product specification before switching.

Effort 3/5, 3-6 months. Computed: 0.000006000 t x (1,821.583 - 2,861.583) kg CO2e/t, both cells read from Material use - Metal: Metal: steel cans - Primary material production.

What to measure next

One answer moves this most: Conversion energy. Getting it takes the band from +/-3.2% to +/-2.9%. Answering all 2 would reach +/-2.9%, and none of them close the 1 line still outside the total.

NARROWS THE BAND - ranked by how much of the interval each input owns, which is not the same as how big the line is. The largest line is frequently already traced, and measuring it again buys nothing.

Meter Injection moulding (1.55 kWh/kg assumed) over a representative run, or read the kWh off the machine's own counter. These are running on library defaults rather than your draw.

Owns 16% of the band while carrying 9% of the footprint, because it is derived. Band: +/-3.2% -> +/-2.9%.

Enter your actual scrap rate for Injection moulding (5.0% assumed). You already know it, and a book yield is multiplied through every material upstream of the step, because scrap compounds backwards along a route.

Owns 3% of the band while carrying 4% of the footprint, because it is derived. Band: +/-3.2% -> +/-3.1%.

BRINGS MASS INSIDE THE BOUNDARY - a different currency. These move the total rather than narrowing it, and in a direction nobody can predict, so they are not added to the figures above.

Weigh the Gasket, TPE and add it, or say explicitly that it is out of scope.

0.00800 kg of stated mass that no factor could be found for, so it is outside the total rather than inside it at zero.

If you are asked for a Carbon Reduction Plan

A Carbon Reduction Plan is an organisational footprint, not a product one. Of the 8 things it requires, this product can contribute to 3; 3 are carbon work over a boundary it does not model, and 2 are not carbon work at all. Budget for that before the tender deadline rather than after it.

Applies to public contracts with an estimated value above £5 million per year including VAT, under the Procurement Act 2023, where relevant and proportionate to the contract.

Confirm the current threshold and its VAT treatment from the PPN itself before relying on it, and confirm whether a framework or dynamic market you are bidding into is in scope.

THIS ASSESSMENT CONTRIBUTES TO

All Scope 2 emissions - purchased electricity, heat and steam.

The closest overlap. This product already distinguishes market-based from location-based electricity accounting and holds both, which is the distinction a CRP reviewer looks for and the one most suppliers collapse.

You must supply: Annual purchased kWh per site, and the supply contract - a REGO-backed tariff changes the market-based figure and leaves the location-based one alone.

GHG Protocol Corporate Accounting and Reporting Standard, with UK Government conversion factors for company reporting.

The same published UK conversion factors this product reads for materials and energy are the ones a CRP requires, and every figure here carries the table and row it came from.

You must supply: An organisational boundary decision - control or equity - stated once and applied consistently. The standard requires it; no tool can choose it for you.

Environmental management measures already completed, with the emissions saved, and the measures that will be in effect during the contract.

This is where a product assessment earns its place. The opportunities this product computes are quantified, costed and carry their arithmetic - which is exactly the shape this section asks for, and is stronger evidence than the prose most plans contain.

You must supply: Which measures are actually done versus planned, and the dates. A completed measure and an intention are assessed differently.

CARBON WORK OVER A DIFFERENT BOUNDARY

All Scope 1 emissions - fuel burned in assets the organisation controls.

This product models the energy a PROCESS draws per kilogram of product, not the fuel an organisation burned in a year. The two are related and are not the same number: one is an intensity, the other is a total over an entity.

You must supply: Gas, oil and fuel consumption for the reporting year, from meters and invoices, for every site and vehicle the organisation controls.

Five Scope 3 categories, and only these five: Upstream transportation and distribution; Waste generated in operations; Business travel; Employee commuting; Downstream transportation and distribution.

This product prices inbound freight for a product, which informs upstream transportation but is not it - a CRP wants the organisation's whole year across every product, plus four categories this product does not touch at all.

You must supply: Freight records, waste transfer notes, expensed travel, and a commuting survey or a stated methodology for estimating it. Employee commuting is the category most often missed.

The seven Kyoto greenhouse gases, reported in tonnes of CO2 equivalent.

The factor libraries here are overwhelmingly single-indicator GWP. A figure that is already CO2e satisfies the unit, but this product cannot demonstrate that all seven gases were swept, because it never saw the organisation's activity data.

You must supply: Confirmation that refrigerant losses and any process gases are included - these are where the non-CO2 gases usually hide.

NOT CARBON WORK AT ALL

A stated organisational commitment to achieving Net Zero by 2050 at the latest.

A commitment, not a calculation. Nothing computes it.

You must supply: The commitment, in the words the template asks for.

Board approval, sign-off by a named director with job title and date, publication on the organisation's UK website with a prominent link from the homepage, and annual review within six months of financial year-end.

None of this is carbon work, and it is where plans most often fail - a correct footprint in an unpublished document does not satisfy

the condition of participation.

You must supply: A board minute, a named signatory, a published URL, and a diary entry for the annual refresh.

Method and limits

This is a screening assessment, not a certified or third-party-verified one, and it is not an EPD. It covers carbon only, cradle-to-gate: raw material production, conversion energy and process scrap where a process was described, and inbound freight where stated. It excludes use phase and end of life. Where no process was described, the figure is material-only and understates a converter's footprint by the whole of its operation.

Every material figure is a direct cell read from the source named above. Where a line could not be resolved to a factor with confidence, it was not guessed - it was either put to you as a question or excluded and listed. Where you could not supply a figure, the substitution made is named in the assumptions section with the reasoning attached, so a reviewer can disagree with it on substance.

It contains no compliance verdict. Whether this product or its packaging meets any particular regulatory obligation is a separate question requiring the actual instrument and, usually, professional advice.