

CO₂ CALCULATION · CRADLE-TO-GATE

How we calculate climate benefit

The methodology, factors and sources behind Rewind's CO₂ reporting. Designed to withstand an audit: avoided CO₂e emissions (gross) minus operational impact, with clear geographical adjustment for the Nordics.

Avoided emissions from new production

When a product is reused, repaired or resold through Rewind's flow, we count it as an equivalent new production being partly or fully avoided. The climate benefit we report is therefore an estimate of the CO₂ burden that would have arisen if the product had been replaced with a new one.

Formulas

By weight: $\text{Gross avoided} = \text{Reused weight (kg)} \times \text{emission factor (kg CO}_2\text{e/kg)}$

Per unit: $\text{Gross avoided} = \text{Quantity} \times \text{emission factor per unit (kg CO}_2\text{e)}$

$\text{Operational impact} = \text{Rewind's electricity (Nordics)} + \text{transport} + \text{manual handling}$

$\text{Net climate benefit} = \text{Gross avoided} - \text{Operational impact}$

Per kg or per unit?

Per unit is used for electronics (mobile phones, computers, tablets, TVs, cameras, white goods, games consoles) where the climate impact of manufacturing dominates and weight varies little between units.

By weight is used for textiles, furniture, household goods, building materials and mixed lots — categories where items vary in size and material.

Scope and conservatism

Scope: Cradle-to-gate (raw materials + production + assembly). We exclude the product's own use phase and transport to the end customer — only the new-production substitution is counted.

Conservatism: Where a source gives a range of values, we always choose the lower/mid level, never the ceiling. We report both gross and net so readers can judge for themselves.

Bra Miljöval § 4.4.2 categories

Six of Rewind's 17 standard categories correspond to the product types that § 4.4.2 of the Swedish Society for Nature Conservation's criteria requires in the annual report. The per-unit model is used for electronics, where the per-kg model under-reports.

CATEGORY	TYPICAL WEIGHT	PER UNIT	PER KG	SOURCES
BMV Mobile phones	0.20 kg	35 kg CO₂e	—	Apple Environmental Reports, Samsung Galaxy LCA
BMV Tablets	0.55 kg	55 kg CO₂e	—	Apple iPad, Samsung Galaxy Tab
BMV Computers / IT	1.5 kg laptop 8 kg desktop	40 kg laptop 90 kg desktop	—	Apple MacBook, Dell XPS, HP, Lenovo
BMV TVs and home electronics	18 kg (50" TV)	170 kg TV 30 kg soundbar 80 kg games console	—	Samsung TV, Sony BRAVIA, LG OLED, PS5/Xbox
BMV Furniture and furnishings	—	—	4.0 kg CO₂e/kg	IKEA Sustainability, IVL furniture LCA, EU PEF Furniture
BMV Bicycles and prams	15 kg bicycle 25 kg e-bike 10 kg pram	50 kg bicycle 120 kg e-bike 25 kg pram	—	Trek Bicycle Sustainability, Specialized, IVL

BMV marking: Six categories are enough to cover all six mandatory § 4.4.2 product types. "Mobile, tablet and IT" comprises three underlying product types in one category.

The other 11 categories

These categories are not mandatory in the § 4.4.2 report but may be included in the partner's annual report after justification to the Swedish Society for Nature Conservation. We measure them using the same methodology.

CATEGORY	PER KG	PER UNIT	SOURCES
Cameras and optics	—	DSLR: 55 kg Compact: 20 kg	Ecoinvent, Sony, Canon
White goods	—	Fridge: 170 kg Washing machine: 120 kg Dishwasher: 95 kg	Electrolux, Bosch, IVL
Household goods	2.5 kg/kg	Steel: 6.0/kg Ceramics: 2.5/kg Glass: 1.5/kg	Ecoinvent materials
Textiles, clothing, shoes	7.5 kg/kg	Shoes: 8 kg/pair	WRAP UK, IVL, Mistra Future Fashion
Accessories, bags, jewellery	5.0 kg/kg	Leather bag: 15/kg Watch: 5/kg Primary gold: 60/kg	EU PEF Leather, Ecoinvent, World Gold Council
Sport and leisure	2.8 kg/kg	Sports garment: 3.5 kg Skis: 11 kg/pair Kayak: 42 kg	Ecoinvent, IVL
Tools, building, garden	1.8 kg/kg	Power tool: 12 kg Lawnmower: 23 kg	Ecoinvent, EU PEF
Musical instruments	—	Acoustic guitar: 10 kg Digital piano: 90 kg Drum kit: 60 kg	Ecoinvent, Yamaha (to be added)
Toys and hobbies	2.0 kg/kg plastic 0.5 kg/kg wood	LEGO box: 1.5 kg	LEGO Group, Ecoinvent
Media and collectables	1.2 kg/kg paper	Book: 0.6 kg Vinyl record: 0.6 kg	Ecoinvent paper, EU PEF

CATEGORY	PER KG	PER UNIT	SOURCES
Other / mixed lots	3.0 kg/kg	—	Conservative standard factor (Ecoinvent/EU PEF averages)

Nordics vs global — when and why

Geographical adjustment is not a dial that lowers every figure by a "Nordic factor". Different parts of the calculation use different geographical standards — otherwise we risk under-reporting our benefit, or persuading ourselves through selective interpretation.

DATA POINT	GEOGRAPHICAL STANDARD	RATIONALE
Avoided emissions (what new production would have emitted)	Global production average	The new production we prevent mostly takes place in Asia, with a dirtier electricity mix. Nordic-adjusting it would under-report.
Rewind's operational impact (our electricity, transport, handling)	Nordic electricity mix + Nordic transport	We operate physically in Sweden. A global average would overstate our footprint.

The Nordic factors we use

ELECTRICITY MIX · G CO₂E/KWH

Swedish production average	20	Energimyndigheten 2024
Nordic NORDEL average	50	IEA Nordic Energy 2024
EU-27 average	245	EEA 2024
Global electricity mix average	460	IEA World Energy 2024
Chinese electricity mix	580	IEA 2024 (relevant for avoided)

TRANSPORT · KG CO₂E/TONNE-KM

Diesel lorry (16–32 t, Sweden)	0.11	Naturvårdsverket NTM 2024
HVO-100 biodiesel lorry	0.019	NTM 2024
Electric lorry (Nordics)	0.008	NTM 2024

Gross vs net — logistics flow, Q3 2025

825 kg of goods reused from a logistics flow. Standard-factor category (other/mixed lots): 3.0 kg CO₂e/kg.

Gross avoided emissions:

$$825 \text{ kg} \times 3.0 \text{ kg CO}_2\text{e/kg} = 2,475 \text{ kg CO}_2\text{e}$$

Rewind's operational impact:

$$\text{Collection, terminal} \rightarrow \text{warehouse: } 0.8 \text{ t} \times 50 \text{ km} \times 0.11 = 4.4 \text{ kg}$$

$$\text{Storage + sorting (Swedish electricity): } 15 \text{ kWh} \times 0.020 = 0.3 \text{ kg}$$

$$\text{Brokering to second-hand: } 0.8 \text{ t} \times 60 \text{ km} \times 0.11 = 5.3 \text{ kg}$$

$$\text{Total} = 10.0 \text{ kg}$$

Net climate benefit:

$$2,475 - 10 = 2,465 \text{ kg CO}_2\text{e} \quad (99.6\% \text{ of gross})$$

In most cases Rewind's operational footprint is less than 1% of the gross saving — new production is so carbon-intensive that operational transport is barely visible. For major losses involving long transport distances (e.g. a major retail loss), the share can rise to 2–5%.

What we do not do

To avoid the greenwashing trap, we clearly declare what we do **not** apply geographical adjustment to:

We do not lower avoided emissions for "Nordic production". Even where a specific product happens to have been manufactured in the Nordics, we use the global standard factor — because we cannot verify origin per item.

We do not adjust the recycling figure downwards for Sweden's good infrastructure. Recycling is reported separately as kg of material, not as CO₂ savings.

We do not use a "Nordic consumer" factor — that belongs in the partner's own CSRD reporting, not in our methodology.

SOURCES AND CAVEATS

Sources used

SOURCE	AREA
Apple Environmental Reports	Smartphones, tablets, laptops, desktop computers
Samsung Sustainability	Smartphones, tablets, TVs
Sony Sustainability	TVs, cameras, games consoles (PS5)
Dell / HP / Lenovo Sustainability	Laptops, desktop computers (Carbon Trust-verified)
Microsoft Sustainability	Games consoles (Xbox), computers
IKEA Sustainability Report	Furniture, furnishings, white goods
Electrolux / Bosch Sustainability	White goods — Environmental Product Declarations
Trek Bicycle Sustainability	Bicycles, e-bikes
LEGO Group Sustainability	Toys (plastic)
WRAP UK "Valuing Our Clothes" (2021)	Textiles, clothing, shoes
Mistra Future Fashion	Textiles (adapted for Sweden)
IVL Svenska Miljöinstitutet	Nordic regional adjustment, furniture, textiles
Naturvårdsverket / NTM Calc	Transport, Swedish electricity mix
Energimyndigheten	Swedish electricity mix (production + imports)
IEA World Energy / Nordic Energy	Global and Nordic electricity-mix statistics
EEA — European Environment Agency	EU-27 averages
World Gold Council	Gold, silver, precious metals
EU Product Environmental Footprint (PEF)	Textiles, furniture, leather — category rules
Ecoinvent v3.9+	Universal industry database (materials + processes)
IPCC AR6	Standardised emission factors

Caveats and uncertainty

These are conservative estimates, not a certified LCA per individual product.

We use industry-standard averages per category — not a product-specific LCA per item.

Where a source gives a range, we choose the mid or low level, never the ceiling.

Geographically: cradle-to-gate values are global averages. Asian production generally carries a higher factor than Nordic production.

Recycling is not counted as CO₂ savings — only as kg of material.

The standard factor of 3.0 kg/kg is used for unidentified goods, and that share is clearly flagged.

This methodology has not been formally verified by an auditor. For official GHG Protocol reporting, an external review is recommended. For the partner's CSRD reporting, refer to: *"based on the supplier's (Rewind's) conservative standard-factor model, formatted for ESRS E1 — for deeper verification, see the methodology's source table"*.

A living document

This methodology evolves as industry data improves and our own measurements mature. The latest version is always available at **rewind.insure/hallbarhet**.

Version history

VERSION	DATE	CHANGE
0.1	2026-04	First draft — 6 categories, weight-based
0.2	2026-05-19	17-category system with BMV flag
0.3	2026-05-20	Product-based factors for electronics, sources per category, standard weights
0.4	2026-05-21	Geographical adjustment Nordics vs global, gross/net reporting

To be completed

- E-bike factor — direct contact with Trek/Crescent/Pure for a specific LCA
- Musical instruments — Yamaha published LCA
- White goods — latest Environmental Product Declarations from Electrolux/Bosch
- Validate against Ecoinvent v3.10 once released
- Verify the transport factor against the logistics partner's actual fleet (growing share of HVO/electric)
- Cradle-to-cradle: add the end-of-life phase for deeper reporting
- Possible external auditor verification (Carbon Trust or equivalent)

Questions or challenges? We welcome technical questions and suggestions for improvement. The latest methodology and underlying quarterly data are published at **rewind.insure/hallbarhet**.