

The Carbon Accounting Dilemma

Optimizing the EPD Scale-up Effort: On Improving Scalability & Decision Relevance

Why current EPD standards inhibit scaling and decision relevance

Bastien Girod
Partner, Strategy & Sustainability
Deloitte

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FROM EXPERT MODELS TO DECISION-GRADE ENVIRONMENTAL DATA

Industry has two users of LCA data: Buyers need fair comparison; producers need scalable footprinting and reduction.

Buyer

"Which product should win?"

Needs:

- Comparable options
- Tender confidence
- No false rankings

Producer

"How do I improve and prove it?"

Needs:

- Fast estimates
- Reduction levers
- Defensible data

Automated LCA
→ Decision-grade
environmental data

Comparable enough to buy.

Actionable enough to reduce.

Transparent enough to challenge.

DEMAND SIGNAL AND EPD-STANDARDS

EPDs are scaling, but the rules only partly meet those needs (They standardize expert LCA; they do not yet standardize hybrid inputs or error bars.)

20k+

PUBLISHED EPDS

3k+

CLIENTS WORLDWIDE

90.3%

CONSTRUCTION SHARE

10.3%

FROM PRE-VERIFIED TOOLS

Representative rule-stack check:

Rule family / layer	Physical / quantity data?	Spend x intensity route?	Clear error-bar indication?
ISO 14025 umbrella EPD standard	Delegates to PCR	No clear route	No
ISO 21930 / EN 15804 construction rules	Yes	No clear route	No
International EPD System construction PCR	Yes	No clear route	No
PEP ecopassport PSR examples	Yes	No clear route	No

3/4 explicit physical-inventory driven

0/4 direct spend-based EPD route

0/4 require an error bar

EPDs are business-critical, but the rule stack still leaves automation and uncertainty gaps. 2/5

RESULTING DATA BOTTLENECK FOR SCALE-UP

Weight-first data collection slows automation. Spend/cost is usually reliable business data; product weight is often missing, estimated or too generic.

AVAILABLE COMPANY DATA IS NOT EQUAL

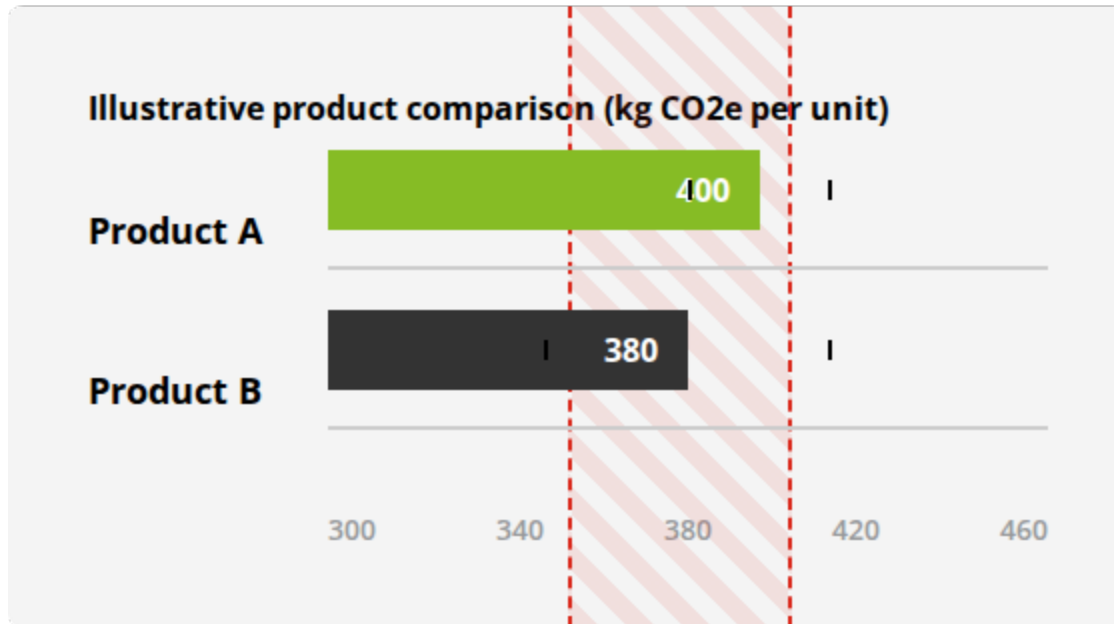
Spend / cost Audited invoices, ERP, PO data
Supplier / sector Vendor master, commodity codes
Quantity / units Often available but inconsistent
Weight / BOM Often missing, estimated, manual mapping

WHERE COST / SECTOR CAN BE A BETTER PROXY

SERVICES & SECTORS	COST / SECTOR PROXY ROUTE
Services, software, cloud	Cost + provider <i>(no meaningful product weight)</i>
Highly manufactured parts	Cost + sector <i>(kg generic material misses fabrication)</i>
Capital equipment, tooling	Cost + supplier <i>(complex upstream supply chain)</i>
Long tail item spending	Cost + sector <i>(invoices cover the long tail)</i>
Bulk materials	Weight + process <i>(mass is often decisive)</i>

NO ERROR BARS = NO DECISION CONFIDENCE

Point estimates are not enough for fair tenders. A lower footprint number is not decisive when uncertainty ranges overlap.



Overlap = not decision-grade difference

Reported point estimate Product B looks lower... but the uncertainty ranges overlap.

TENDER RULE IDEA

Rank only when the difference exceeds the uncertainty band or a predefined materiality threshold. Comparability requires uncertainty.

COST-FIRST LCA STRATEGY

Allow for a fully cost/expenditure-based LCA assessment initially, simply with a broader error bar. Moving to hybrid and physical data steps selectively narrows the error bar to improve the point estimate.

STEP 01— START EASY

Fully Cost-Based LCA

Input: Pure Spend / Expenditure Data from invoices or ERP systems.

Effort: Very Low (Fully Automated)

Uncertainty: Very Wide Error Bar ($\pm 40\text{--}50\%$) due to generic sector emission factors.

Instant baseline coverage across 100% of categories — already a better basis for decisions than physical models without error bars.

STEP 02— FOCUS EFFORT

Hybrid LCA Model

Input: Mix of spend data, specific supplier profiles, and bulk weights.

Effort: Medium (Targeted collection)

Uncertainty: Narrower Error Bar ($\pm 20\text{--}25\%$) for identified high-impact hotspots.

Saves massive administrative time by only auditing key materials.

STEP 03— DRIVE SMALL IMPROVEMENTS

Physical & EPD Data

Input: Product-specific Environmental Product Declarations (EPDs).

Effort: High (Supplier collaboration)

Uncertainty: Minimal Error Bar ($\pm 5\%$) representing true environmental performance.

Perfect for fair tenders and final product-to-product comparison.