

3.5 Low Carbon Building Assessment Tools

Updated: August 2025

Supported by:



WHAT WILL YOU LEARN?

Carbon Assessment
Tools for Buildings

Typical Internationally-used
Carbon Assessment Tools: How it
Works and Case Examples

ALCBT Building Emission
Assessment Tool (BEAT):
How it Works, Scope and
Benefits

01

02

03



CARBON ASSESSMENT TOOLS

Analytics for sustainable buildings

Carbon assessment tool provides analytics for:



Assessing carbon footprint and reduction potential

Regulatory compliances

Achieving emissions reduction targets and other sustainability goals

Increasing market competitiveness

Informed decision-making

CARBON ASSESSMENT TOOLS

Design-integrated tool



- Web-based tool
- Whole life carbon analysis
- Environmental product declaration (EPD) generation
- Licensed access
- Tailored for the construction sector

Source: Carbon Leadership Forum

CARBON ASSESSMENT TOOLS

Calculators



- Web-based tool
- Whole life carbon analysis
- Pre-fed cases
- Comparative energy and material efficiency measures
- Free access
- Embodied Carbon in Construction Calculator
- Access to building material EPDs
- Useful for selection and procurement
- More like a comparison tool
- Focuses on A1–A3 emissions
- Free access

Source: Carbon Leadership Forum

CARBON ASSESSMENT TOOLS

Other life cycle assessment (LCA) tools in construction sector



- Software application for LCA and green building certification
- Free access



- Software tool for assessing embodied and operational carbon in the building sector, launched under the ALCBT Project in June 2025.

CARBON ASSESSMENT TOOLS

Other life cycle assessment tools targeting a range of industries: automotive, electronics, agriculture...



thinkstep
GaBi

- Whole life carbon analysis
- Licensed access
- Used mainly by industry professionals

SimaPro

- Paid service
- Whole life carbon analysis
- Used mainly by industry professionals



- EPD generation
- Free + paid datasets, popular in academia

Source: Carbon Leadership Forum

EC3 TOOL: EMBODIED CARBON CALCULATOR

Life cycle assessment tool

- The Embodied Carbon Calculator EC3 is a free, open-access tool developed by Carbon Leadership Forum and Building Transparency. It covers LCA scope A1 to A3, and has a straightforward, easy-to-use interface for global application
- How:
 - Uses building material quantities from construction estimates (and/or information from BIM/REVIT)
 - Uses transparent, free-to-access database for EC of each material used consisting of **digital, third-party-verified EPDs**
 - This allows the user to directly specify which low carbon material should be procured for construction
- EC3 tool does not have a certification scheme, but helps certification programs, owners and policy-makers assess supply chain data (data granularity)
- EC3 tool is highly specific **to embodied carbon in materials** and this tool is ideal for architects and engineers focused on material choices

Source: Building Transparency

EC3 APPLICATION

Data entry screen

Commercial Building Template (SI) Office 2020-07-10

Project Address
500 Yale Avenue North, Seattle, WA 98109

Map Satellite



Map data ©2024 Google. Terms. Report a map error

NOTES & LINKS

BUILDING CLASSIFICATION

Level of Development: 300 : Detailed Design Material Quantity Source A5 Construction Source Construction Project Scope

23% Complete

Choose the specific building type and location

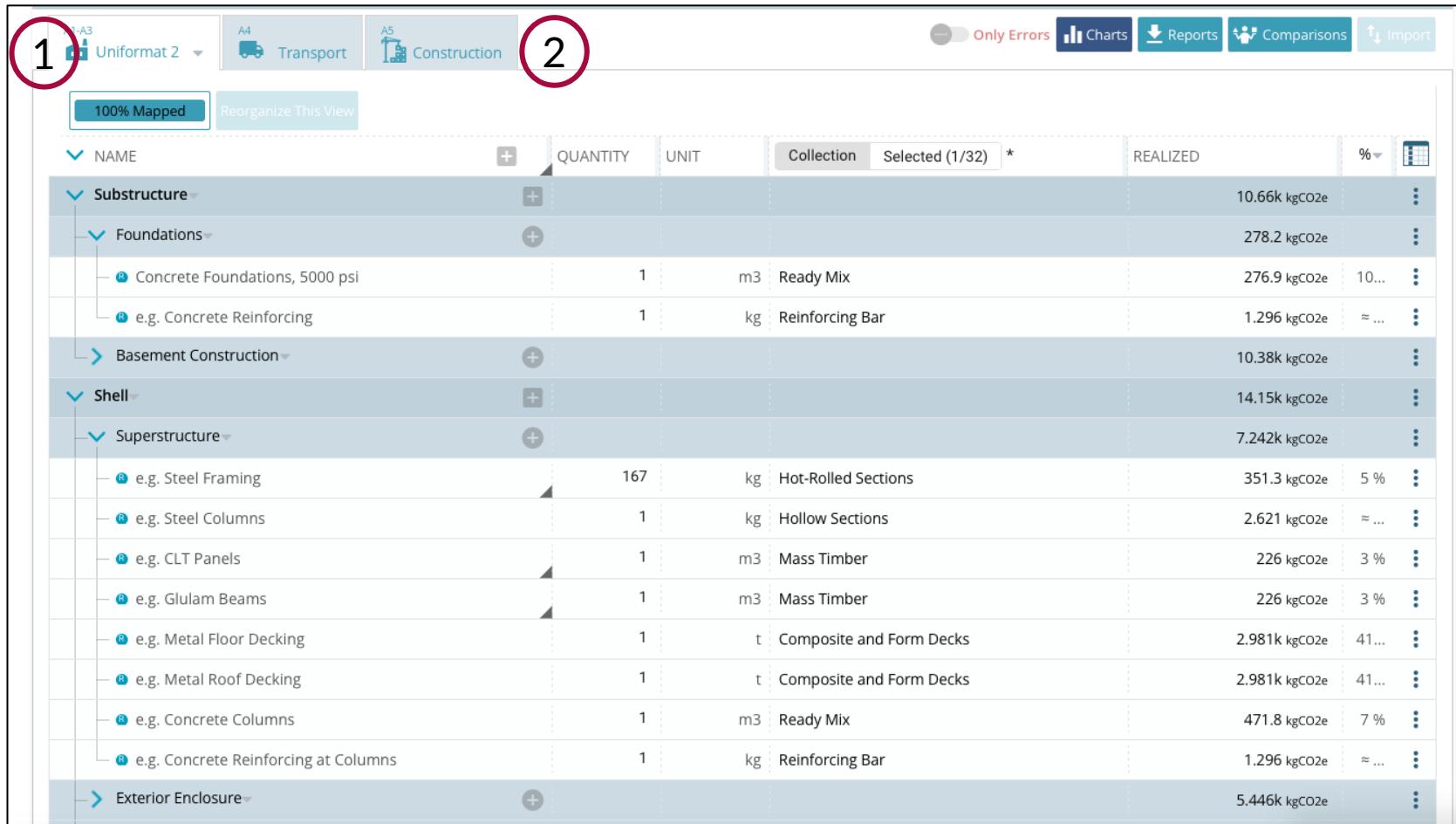
Add additional data (floor area, natural gas/electricity consumption, etc.)

Start work in materials in the building

Source: EC3

EC3 APPLICATION

Substructure, shell and interior



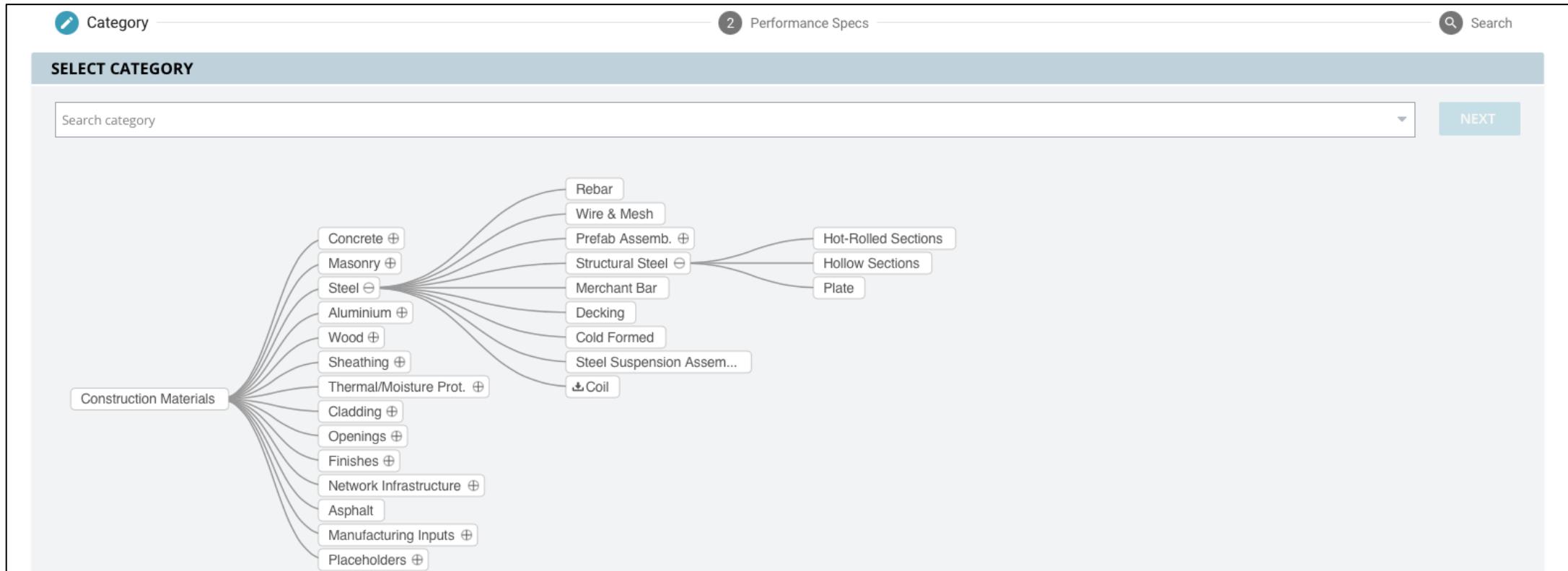
1. Subdivide into: e.g., substructure (foundations), shell (superstructure, exterior enclosure, roofing), and interior (insulation, ceiling tiles, carpet), ...

2. Additional emissions for transport and construction can be added (see tabs at the top). The importance is to know: the quantity of each material and the distance/how materials are transported

Source: EC3

EC3 APPLICATION

Material workflow



Choose the specific construction material

Choose the specific requirements (e.g., compressive strength), distance from location

Search and compare for relevant EPDs

Source: EC3

EC3 APPLICATION

Find and compare materials

The screenshot shows the EC3 Application search interface. On the left, there are three main search sections: **PERFORMANCE SPECIFICATIONS** (Yield Tensile Strength, Recycled Content, Post-Consumer Recycled Content, Steel Rebar Grade, Options, Compliance, EC3 / 1 kg), **GEOGRAPHIC** (Geography: Global, Distance Search only available in Building Projects), and **MORE...** (Filter by Manufacturer, Filter by Product Name, Filter by Product Description, Filter by Industry standards, Valid after: 2022-03-21, Filter by PCR, EPD Type: Product EPDs, Industry EPDs, Languages). At the bottom, there are search filters: Valid after: 2022-03-21 and EPD Type: Product EPDs, Industry EPDs. A **SEARCH** button is located at the bottom right. On the right, a box/whisker plot titled "kgCO2e embodied per 1 kg" shows the distribution of results. The plot includes a purple horizontal line at 1.6 labeled "2021 CLF Baseline", a black box representing the interquartile range with a median line at 1.019, and whiskers extending to 0.4809 (Achievable) and 0.4416 (Min). The plot is titled "TOUR: BOXPLOT DIAGRAM (Max: 6.45)".

SEARCH BY PROPERTIES: 03 21 00 REINFORCEMENT BARS

PERFORMANCE SPECIFICATIONS

Yield Tensile Strength, Recycled Content, Post-Consumer Recycled Content, Steel Rebar Grade, Options, Compliance, EC3 / 1 kg

GEOGRAPHIC

Geography: Global, Distance Search only available in Building Projects

MORE...

Filter by Manufacturer, Filter by Product Name, Filter by Product Description, Filter by Industry standards, Valid after: 2022-03-21, Filter by PCR, EPD Type: Product EPDs, Industry EPDs, Languages

Valid after: 2022-03-21 and EPD Type: Product EPDs, Industry EPDs

SEARCH

kgCO2e embodied per 1 kg

TOUR: BOXPLOT DIAGRAM (Max: 6.45)

2021 CLF Baseline

Conservative: 1.019

Achievable: 0.4809

Min: 0.4416

Box/Whisker plot of results

Search by performance characteristics

Search by location of manufacturing plant

More specialized search terms

"Search chips" that show exactly what you're searching. By default, the search is for Product and Industry EPDs valid as of today

Date on which the EPD needs to be valid (e.g., your construction start)

Image source: <https://docs.buildingtransparency.org/ec3/main-features>

EC3 APPLICATION

Plan and compare buildings

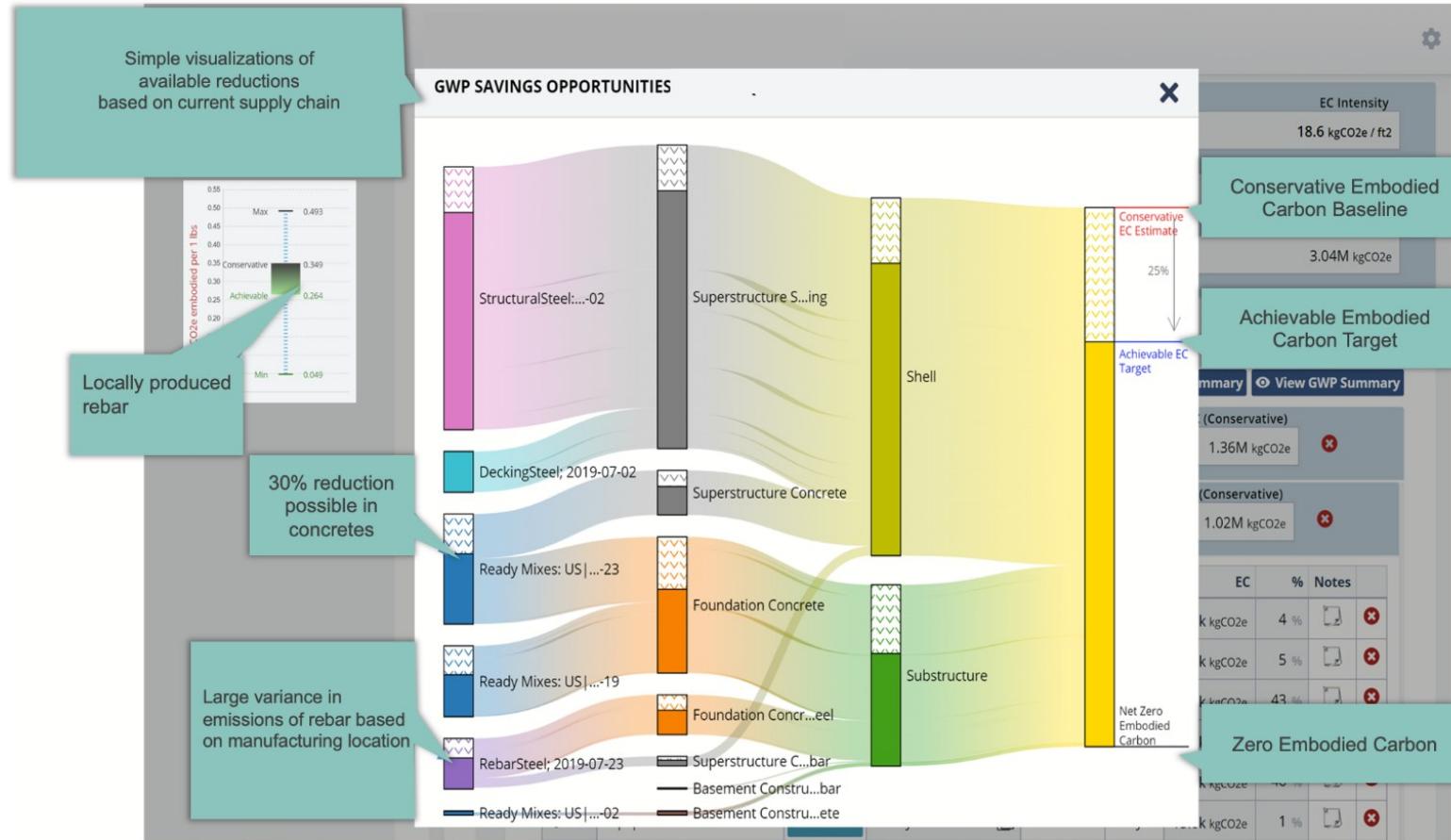


Image source: <https://docs.buildingtransparency.org/ec3/main-features>

EC3 APPLICATION

Results

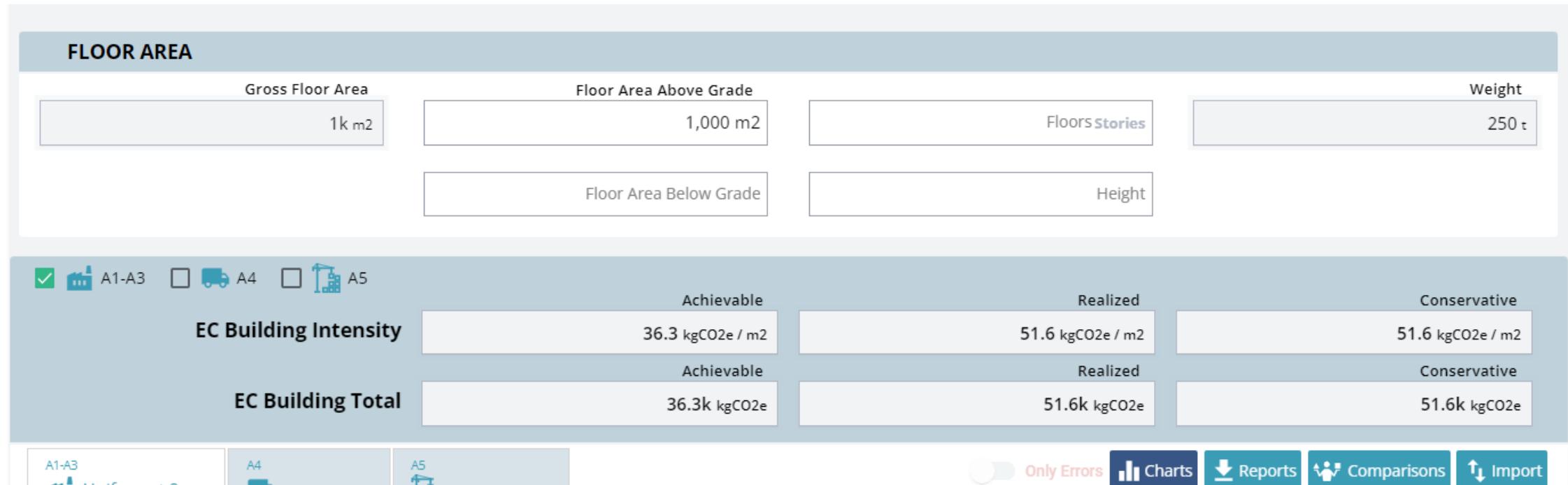


Image source: <https://docs.buildingtransparency.org/ec3/main-features>

EDGE APPLICATION

Life cycle assessment and certification tool

- EDGE is a green building certification system focused on making buildings more resource efficient. An innovation of IFC, a member of the World Bank Group, EDGE empowers emerging markets to scale up resource-efficient buildings in a fast, easy and affordable way
- EDGE enables developers and builders to quickly identify the most cost-effective strategies to reduce energy use, water use and embodied energy in materials. The strategies that are integrated into the project design are verified by an EDGE Auditor and certified by Green Business Certification Inc. (GBCI)
- EDGE is comprised of:
 - EDGE Software – The web-based EDGE App, available for free at edgebuildings.com, allows you to quickly determine the optimum combination of building design strategies for the best return on investment
 - Global Standard – EDGE requires a minimum projected reduction of 20% in energy use, water use and embodied energy in materials as benchmarked against a standard local building
 - Certification System – Certification by GBCI validates your achievements at a modest cost for nearly all building types, both new and existing

Source: US Green Building Council

EDGE APPLICATION

Life cycle assessment tool

- It is a comparative assessment tool, usually used for green building certification
- Based on location, typology and income group, pre-fed base case results are displayed:
 - Final energy usage
 - Final water use
 - Operational carbon
 - Embodied carbon
- The basic sections of the tool are:
 - Building design parameters
 - Energy efficiency measures
 - Water efficiency measures
 - Material efficiency measures
 - Operational energy

Source: EDGE

EDGE APPLICATION

Data entry screen

Apartments

Auto-Calculate: Off
Results Last Updated: 3 minutes ago

Subproject Floor Area: 1,200.00 m²

Final Energy Use: 440.00 kWh/Month/Apartment

Final Water Use: 13.00 m³/Month/Apartment

Final Operational CO₂ Emissions: 0.26 tCO₂/Month/Apartment

Final Embodied Carbon: 549.00 Kg CO₂e/m²

Design Energy 0.00% Water 0.00% Materials 0.00% Operations

Main parameters requiring user inputs

HIDE RESULTS

Building Type

Primary Building Type: Apartments

Subtype: Low Income

Location

Country: India

City: Gurugram

DASHBOARD VERSION 3.0.0 FILE CALCULATE AND SAVE

TASKBAR displays the results, as per the default case or improved case

Map of the world showing location details for India and Gurugram.

Source: EDGE

EDGE APPLICATION

Data entry screen

Design Energy 0.00% Water 0.00% Materials 0.00% Operations

Building Type

Primary Building Type

- Apartments
- Serviced Apartment
- Hotel
- Resort
- Retail
- Industrial
- Office
- Healthcare
- Education
- Mixed Use

Location

Country

- India

City

- Gurugram



Building Type

Primary Building Type

- Homes
- Apartments
- Serviced Apartment
- Hotel
- Resort
- Retail
- Industrial
- Office
- Healthcare
- Education
- Mixed Use

Subtype

- Subsidized/Gap
- Middle
- High

Base case values are governed by choosing building type, income group and location

Source: EDGE

BUILDING DESIGN PARAMETERS

User data entry

- User needs to input basic project details – name, organization, address, etc.
- Building data – number of apartments, floors above and below the grade, floor-to-floor height, etc.
- User can modify the typology according to project-specific details
- Building dimensions – building length in different directions
- HVAC system details
- Area and loads breakdown
- Fuel usage details (emissions factors of fuels can be customized)
- Climate data – elevation, annual rainfall, monthly average temperatures



Source: EDGE

ENERGY EFFICIENCY MEASURES

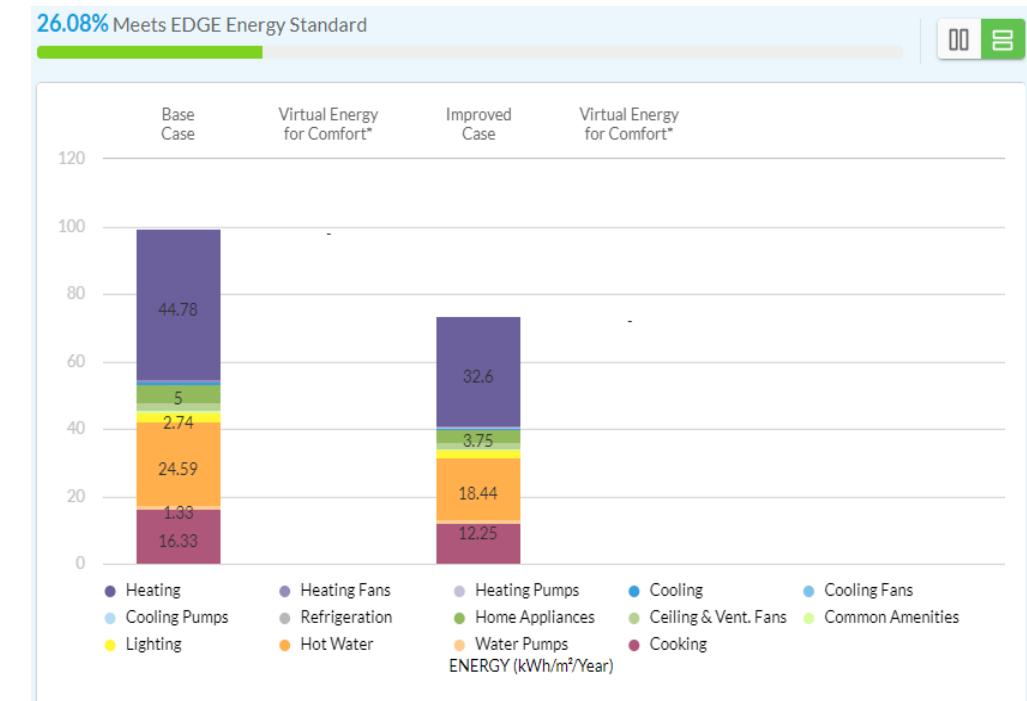
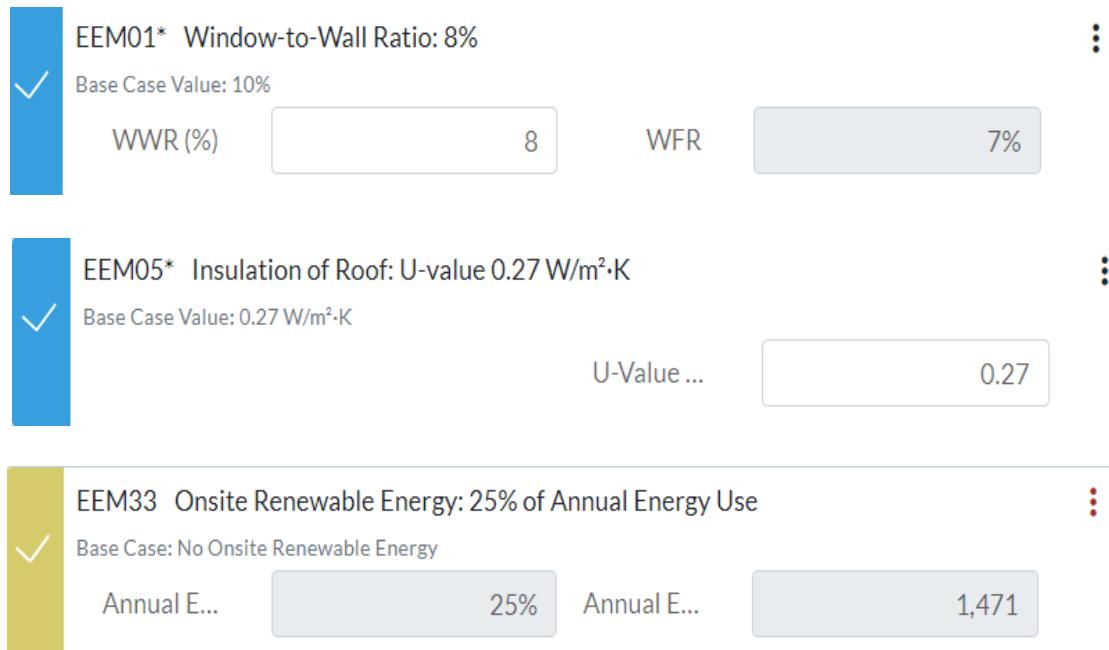
EDGE: List of measures available

- Air infiltration of envelope
- Natural ventilation
- Ceiling fans
- Cooling system efficiency: COP
- Variable speed drives
- Fresh-air pre-conditioning system
- Space heating system efficiency
- Room heating controls with thermostatic valves
- Domestic hot water system
- Window-to-wall ratio
- Reflective roof: solar reflective index
- Reflective exterior walls: solar reflective index
- Insulation of roof: U-value
- Insulation of ground/raised floor slab: U-value
- Green roof
- Insulation of exterior walls: U-value
- Efficiency of glass: U-value, SHGC, VT
- Domestic hot water pre-heating system
- Economizers
- Demand control ventilation using CO₂ sensors
- Efficient lighting for internal areas
- Efficient lighting for external areas
- Lighting controls
- Efficient appliances
- Efficient smart meters and submeters
- Power factor corrections
- Onsite renewable generation
- Low impact refrigerants
- External shading devices: annual average shading factor

Source: EDGE

ENERGY EFFICIENCY MEASURES

Comparative analysis



After choosing some measures, improved case shows the respective changes in the energy numbers

Source: EDGE

MATERIAL EFFICIENCY MEASURES

EDGE: List of measures available

- Bottom floor construction
- Intermediate floor construction
- Floor finish
- Roof construction
- Exterior walls
- Interior walls
- Window frames
- Window glazing
- Roof insulation
- Wall insulation
- Floor insulation

Source: EDGE

MATERIAL EFFICIENCY MEASURES

EDGE: List of measures available

Bottom Floor Construction

Base Case Material: Concrete Slab | In-situ Reinforced Conventional Slab

Thickness : 100mm & Steel : 35kg/m²

Type 1

Default Base Case Material

MEM01*

Proportion %	Thickness (mm)	Steel Rebar (kg/m ²)
100		

U-Value (W/m ² ·K)	Embodied Carbon (kg/m ²)
0.49	

For every measure, there is a default case available. The user can change it to other available variants, as shown in the drop down menu on the right

Default Base Case Material

X - Re-use of Existing Floorslab

Concrete Slab | In-situ Reinforced Conventional Slab

Concrete Slab | In-situ Reinforced Slab with >25% GGBS

Concrete Slab | In-situ Reinforced Slab with >30% PFA

Concrete Slab | Filler Slab

Composite Slab | In-situ Concrete over RC Planks and Joist System

Concrete Slab | Filler Slab with Polystyrene Blocks

Concrete Slab | In-situ Trough Slab

Concrete Slab | In-situ Waffle Slab

Concrete Precast | Hollow Core Slab

Composite Slab | In-situ Concrete on Precast Slim Deck with Embedded I-beam

Composite Slab | In-situ Concrete on Corrugated Steel Deck over I-beam

Concrete Precast | Double Tee Units

Composite Slab | In-situ Concrete over Thin Precast Concrete Deck

Timber Floor | Timberboard or Chipboard on Timber Joists

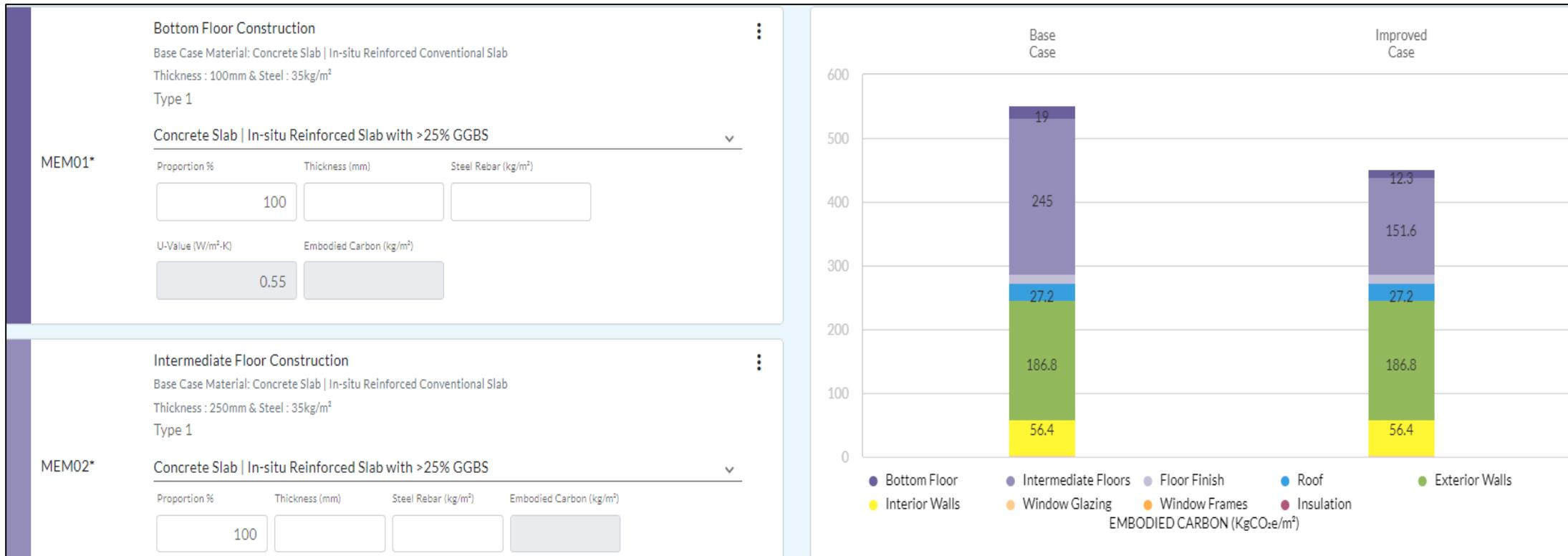
Steel Floor | Light-gauge Steel Floor Cassette

Customized Material

Source: EDGE

MATERIAL EFFICIENCY MEASURES

Comparative analysis



After choosing the measures, improved case shows the respective changes in the embodied carbon numbers

Source: EDGE

OPERATIONAL ENERGY

User data entry

- User needs to input energy consumption data for all the months, the energy sources being:
 - Conventional electricity
 - Onsite renewable electricity
 - Offsite renewable electricity
 - Carbon offsets purchased
- For onsite non-renewable energy generation (if applicable), user can input fuel type and fuel consumption values for different months
- Outputs from the tool:
 - Total energy consumption
 - Onsite carbon emissions
 - Carbon mitigation from exported renewable energy
 - Net carbon emissions onsite
 - Total GHG offset
 - Net carbon emissions balance

Source: EDGE

EDGE

Case example: Residential home in Philippines

- Location: Philippines
- Energy measures: Window-to-wall ratio, LED lighting, solar photovoltaics
- Material measures: Corrugated zinc sheets for roof, in-situ reinforced wall for external walls, ferrocement wall panel for internal walls

GHG reductions: 0.4 tCO₂/year/home

SOLUTIONS	SAVINGS
Energy  <ul style="list-style-type: none">► Reduced Window to Wall Ratio► LED Lighting► Solar Photovoltaics	42%
Water  <ul style="list-style-type: none">► Low-Flow Showerheads► Low-Flow Faucets for Kitchen Sinks► Low-Flow Faucets for Washbasins	20%
Materials  <ul style="list-style-type: none">► Corrugated Zinc Sheets for Roof► In-Situ Reinforced Wall for External Walls► Ferrocement Wall Panel for Internal Walls	26%
RESULTS	
Savings Utility Bills (\$/month/home) Energy (kWh/month/home) Water (kL/month/home) Embodied Energy (MJ/home)	11 135 2.4 1,320
Environmental Benefits GHG Reductions (tCO ₂ /year/home)	0.4

Source: EDGE

EDGE

Case example: Commercial building in Mexico

- Location: Mexico
- Energy measures: Window-to-wall ratio, external shading, AC with water-cooled chiller, low E-coated glass, energy efficient lighting system, insulation of roof and wall
- Material measures: Concrete filler slab for floors and roof, medium-weight hollow concrete blocks, finished concrete flooring, uPVC window frames

GHG reductions: 497 tCO₂/year

SOLUTIONS	SAVINGS
Energy  <ul style="list-style-type: none"> ▶ Reduced Window to Wall Ratio ▶ External Shading ▶ Air Conditioning with Water-Cooled Chiller ▶ Low-E Coated Glass ▶ Energy-efficient Lighting System ▶ Insulation of Roof and Wall 	51%
Water  <ul style="list-style-type: none"> ▶ Low-Flow Showerheads ▶ Dual Flush Water Closets ▶ Water-efficient Urinals 	32%
Materials  <ul style="list-style-type: none"> ▶ Concrete Filler Slab for Floors and Roof ▶ Medium-weight Hollow Concrete Blocks ▶ Finished Concrete Flooring ▶ uPVC Window Frames 	44%
RESULTS	
Extra Costs & Payback Time Green Solutions (\$) Payback (Yrs.)	56,000 0.6
Savings Utility Bills (\$/month) Energy (kWh/month) Water (lt./room/night) Embodied Energy (MJ/m ²)	7,634 90,028 121 744
Environmental Benefits GHG Savings (tCO ₂ /year)	497

Source: EDGE

EDGE

Case example: Unlocking green buildings market for banks

- ProCredit is an international group of development-oriented commercial banks mainly active in South-Eastern and Eastern Europe
- ProCredit has been interested and engaged in financing green buildings for years but has had to develop an individual assessment approach for each country. This approach has posed a serious challenge due to the substantial additional workload involved, coupled with the difficulty of obtaining relevant information
- The group launched its first green loans in 2006 and gradually developed a green lending methodology and a green bonds framework to standardize its lending process and ensure specific environmental impacts are achieved. As of the end of 2020, the group's green loan portfolio amounted to almost EUR1 billion, representing 19% of its total loan portfolio
- Initially, the group has assessed green buildings against country baselines and according to country building codes. The process is intensive and often difficult to implement, owing to a lack of data or proper regulation in its countries of operation
- The situation changed when ProCredit integrated EDGE into the environmental impact assessments carried out for the head offices of its banks, where the benefits of EDGE were apparent: user-friendly application, availability of data, the possibility of preliminary assessment and recognized certification

Source: Polychroniadou, 2021

EDGE

Case example: Unlocking green buildings market for banks (continued)

- ProCredit decided to promote this certification further in its markets by using it as a tool in the assessment process for green buildings. The banks can now use EDGE instead of conducting individual analyses for the purpose of assessing a building's eligibility for a green loan
- ProCredit proposes conducting a preliminary assessment using the EDGE app to make an initial determination whether the project has potential for improved performance of 20% compared to the local baseline. This is done in partnership with Sintali-SGS, who offers EDGE Expert support through its partner network. EDGE Experts provide support in using the application and conducting initial analyses of ProCredit clients' projects
- This assessment is then submitted to the business committee of the bank for review and if approved, the client can benefit from preferential loan rates for the development of the green building project. A further requirement to be eligible for these loan rates is the actual completion of the EDGE certification process
- The use of EDGE data to define eligibility criteria enables the ProCredit banks to have a standardized and comparable approach across its markets, thus unlocking significant potential for building improvement and green finance. It also reduces the time required to conduct an initial eligibility analysis, as local baselines have already been calculated in the EDGE app
- By implementing green lending programs and leading by example through the certification of its own buildings, ProCredit is putting sustainability into action

Source: Polychroniadou, 2021

EC3 AND EDGE TOOLS

Comparison: Easy-to-use tools with different visions



Not a Certification Scheme

- Focuses on construction materials
- Uses EPDs
- Compares individual materials to be procured
- Ideal for architects and engineers focused on material choices



Perspectives:
Granular Value Chain of Products (EC3) vs Financing/Policy (EDGE)



Current Focus:
Developed Countries (EC3) vs Developing Countries (EDGE)



Certification Scheme

- Financial calculator
- Simplified compliance
- Reduced processing
- Cost effective
- Better suited for broader assessments and policy-making

BEAT (Building Emission Assessment Tool)

Developed under the ALCBT Project

An easy-to-use **interactive tool** designed to help you **calculate your buildings carbon emissions** and make **informed decisions toward a low-carbon transition**.

Key Benefits

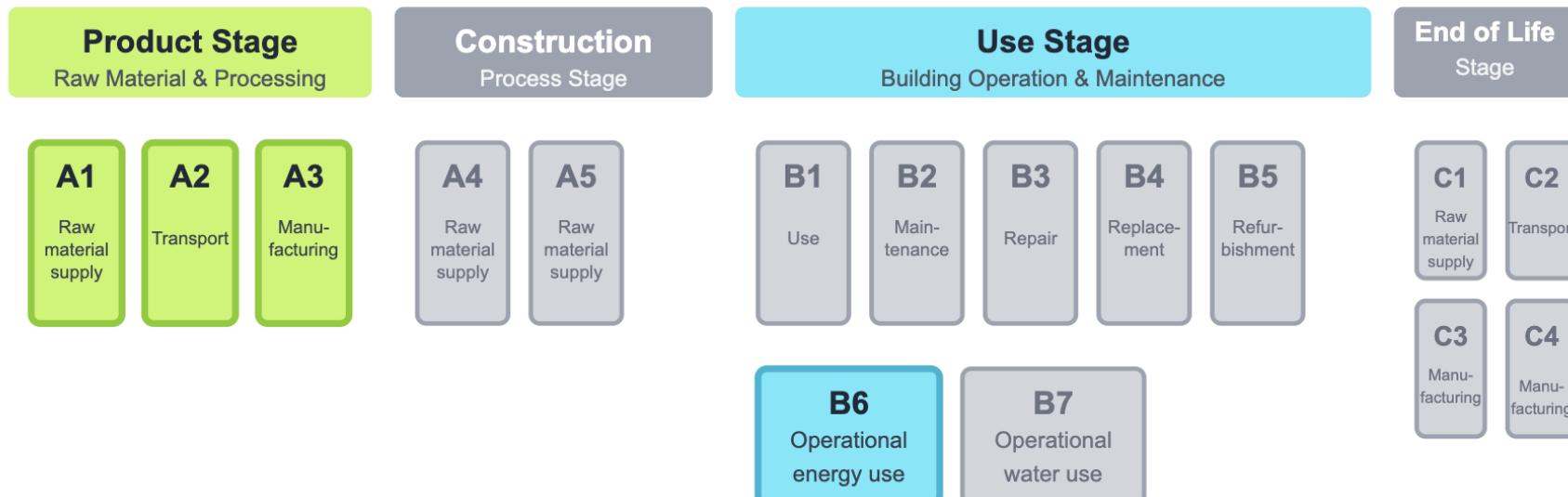
- Tailored to Asia's fast-growing building markets
- Supports national GHG inventories and climate targets
- Measures full building emissions by **quantifying both embodied and operational carbon**
- Enables low-carbon investment decision-making
- Fills data gaps with innovative EPD-based methods
- Promotes **transparency** in building-related emissions



Embodied Emissions:
Assess emissions from manufacturing, transport and installation of building materials.

Operational Emissions:
Calculate energy consumption during building operation.

Building Life Cycle Information



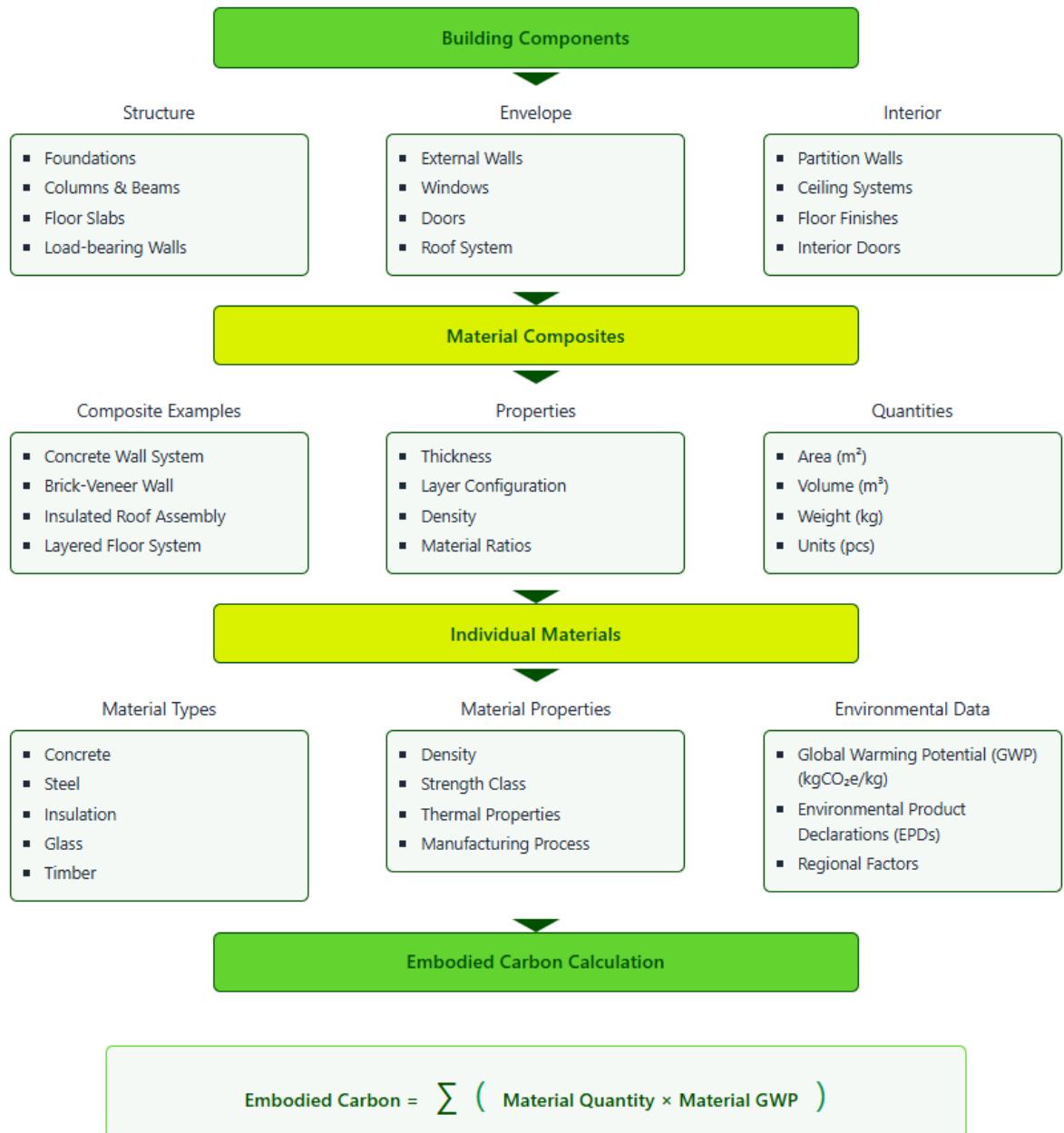
Legend: Modules covered by BEAT

Product Stage

Use Stage

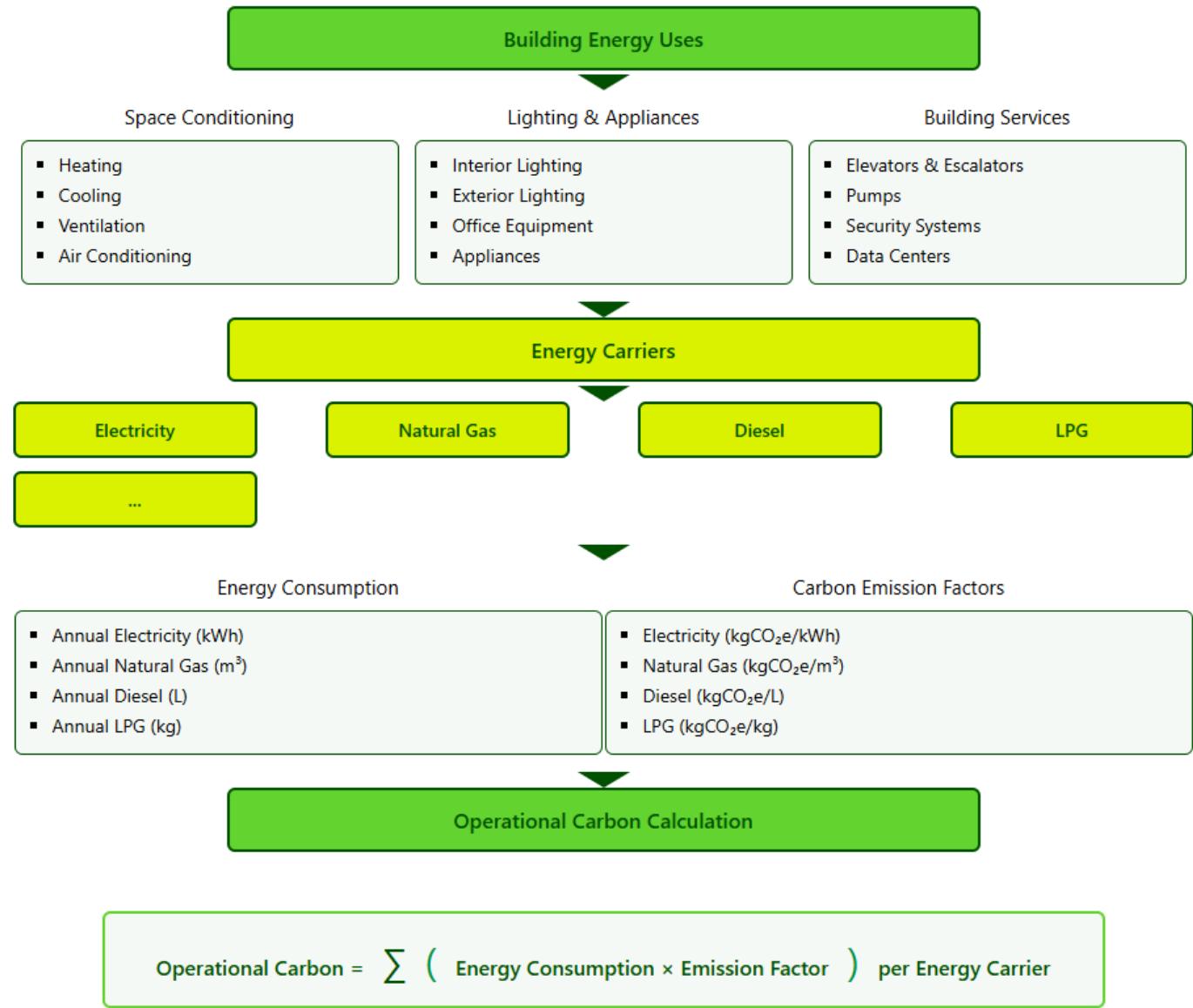
BEAT Methodology

How BEAT Calculates Embodied Carbon



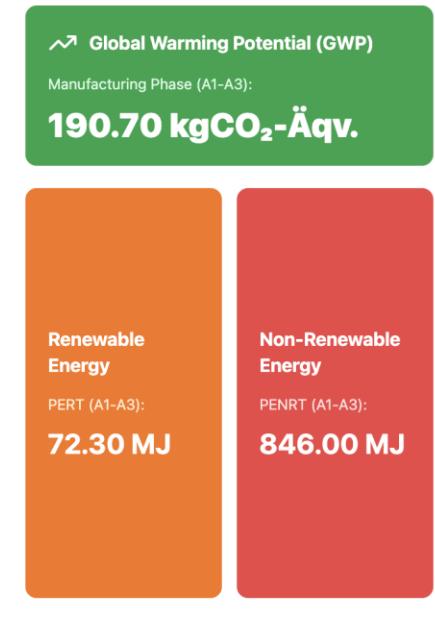
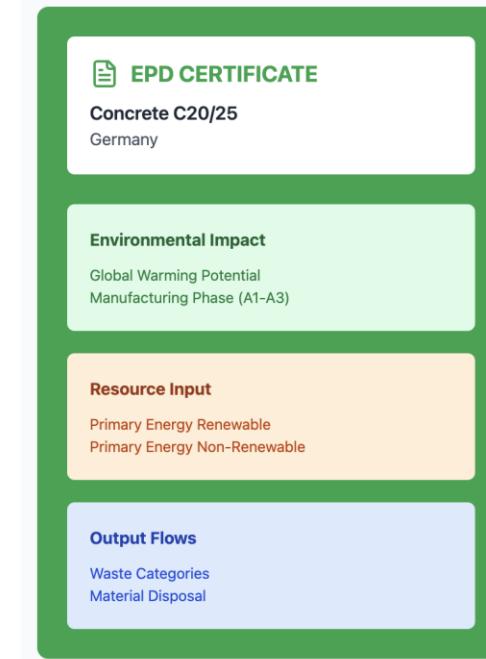
BEAT Methodology

How BEAT Calculates Operational Carbon



Environmental Product Declaration (EPD)

Example: 1 m³ Construction concrete C20/25 (Germany)



<https://epd-online.com/EmbeddedEpdList/Download/8773>

BEAT Builds on Three Types of EPDs

1 Official EPDs

(Highest Quality)

- Third-party verified and published in recognized databases
- Sources: ÖKOBAUDAT, ECO Platform, Asian National EPD Platforms

2 Generic EPDs

(Gap-Filling Solutions)

- Industry-average data when official EPDs are unavailable
- Maintains data quality standards for comprehensive coverage

3

Custom EPDs

(Future Feature)

- EPDs in process of national certification – complies with recognized standards but not yet officially certified at national levels
- Not available in national or international EPD databases – BEAT facilitates national certification process

BEAT

Status Quo of Available EPDs in ALCBT Countries

Cambodia	1
India	242
Indonesia	34
Thailand	27
Vietnam	38
Reference	
Germany	2,697

Solution: Three Tier Approach

● Use official EPDs when available

Leverage existing verified data

⊕ Apply generic EPDs as placeholders

Ensure comprehensive coverage

↗ Enable custom EPDs for future locally certified EPDs

Support national database development

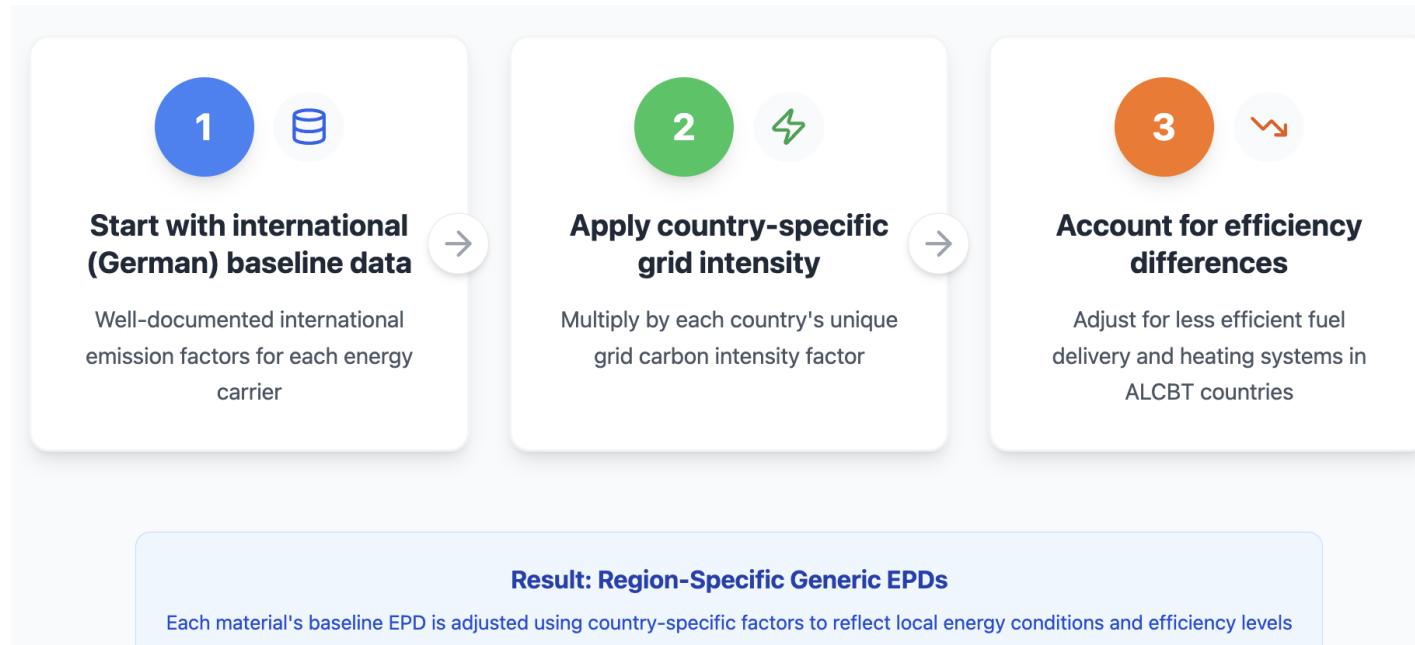
Goal: Complete coverage with increasing accuracy

As local data develops, transition from generic to official EPDs for improved regional accuracy

Encouragement

Local governments and industry to develop region-specific EPD datasets

Interim Step: Generic EPDs



Generic EPD Adjustment Factors: Grid Intensity and Energy Intensity Data Combined to Create Country-Specific EPD Adjustment Factors

Country	Grid Intensity (kgCO ₂ e/k Wh)	Energy Intensity (kg oil ₃ /1000\$)	Final EPD Adjustment
International (German) Baseline	0.42 100%	82 100%	100%
Cambodia	0.42 99%	142.5 174%	173%
India	0.71 168%	134.5 164%	275%
Indonesia	0.68 161%	118.9 145%	233%
Thailand	0.56 133%	98.7 120%	161%
Vietnam	0.41 98%	85.6 104%	102%

Source: <https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=table>

BEAT

Value Addition:
FREE
ACCESSIBLE
OPEN SOURCE

Feature	BEAT	One Click LCA	SimaPro	EDGE v3
<p> Cost & Access Cost & Accessibility</p> <p> Carbon Assessment Embodied Carbon Assessment</p> <p> Data Sources Environmental Product Declarations</p> <p> Operations Operational Carbon Assessment</p> <p> Regional Data Local Building Dataset & Benchmarks</p> <p> Transparency Data Transparency</p>	 <p>✓ Free & open access</p> <p>✓ Full assessment</p> <p>✓ Open EPD database with generic options</p> <p>⚠ Current: electricity bills analysis. Future: appliance efficiency</p> <p>✓ 200-250 ALCBT buildings with local benchmarks</p> <p>✓ Full emission factor traceability</p>	<p>✗ Paid license</p> <p>✓ Full assessment</p> <p>✓ Licensed global EPDs</p> <p>✓ Full energy modeling</p> <p>⚠ Limited ALCBT coverage</p> <p>✗ Static, non-editable coefficients</p>	<p>✗ Paid license</p> <p>✓ Full assessment</p> <p>✓ Licensed global EPDs</p> <p>✓ LCA-based energy impact</p> <p>✗ Academic focus, no project dataset</p> <p>⚠ Proprietary database</p>	<p>✓ Free access</p> <p>⚠ Partial coverage - structural elements limited</p> <p>⚠ Limited transparency in data sources</p> <p>✓ Energy savings estimation</p> <p>⚠ Limited public project data</p> <p>⚠ Proprietary methodology</p>

BEAT

Adopts GCCA Concrete Labels



GCCA EPD labels define performance benchmarks and provide verified data to assess embodied carbon in cement and concrete.

- **Every concrete EPD in BEAT** automatically receives GCCA band (A-G)
- Band A (excellent) to Band G (high carbon)
- **BEAT** plans to adopt similar labels to assist users in comparing EPDs for other building materials such as steel

Benefits:

- **For Users:** Instant product comparison
- **For Industry:** Market differentiation & drive low-carbon products demand

EPD Library X

Advanced search

Search

Product	Country	Type	Unit	CO2e	Band	Add
JSW M 25 Ready Mixed Concrete (RMC)	India	Ready mixed concrete	Unit: m3	171 kgCO2e	C A	C A
Dense concrete block	India	Precast concrete elements and goods	Unit: kg	0.16 kgCO2e		Add
JSW M 40 Ready Mixed Concrete (RMC)	India	Ready mixed concrete	Unit: m3	256 kgCO2e	D A	D A
Ready mix concrete with ordinary Portland cement (OPC)	India	Ready mixed concrete	Unit: kg	0.11 kgCO2e		Add
Lightweight concrete block	India	Light concrete	Unit: kg	0.37 kgCO2e		Add

Start 1 2 3 > End

BEAT

Inputting Data Requirements

<https://BEAT-ALCBT.GGGI.ORG>



Building Information

Data Category	Required Information	Example
Basic Identification	Building name, ID, location, year of construction	Office Tower A, Jakarta, 2018
Building Type	Primary use/classification	Office (Grade B), Residential, Hospital
Building Size	Gross floor area, number of floors (above/below ground)	10,000 m ² , 15 floors above + 2 basement
Climate	Climate zone, location coordinates	Tropical wet, -6.2088° S, 106.8456° E
Occupancy	Typical occupancy patterns	9am-6pm weekdays, 20% weekends

Note: Building information forms the foundation for all carbon calculations. Complete and accurate basic data ensures proper benchmarking against similar buildings.

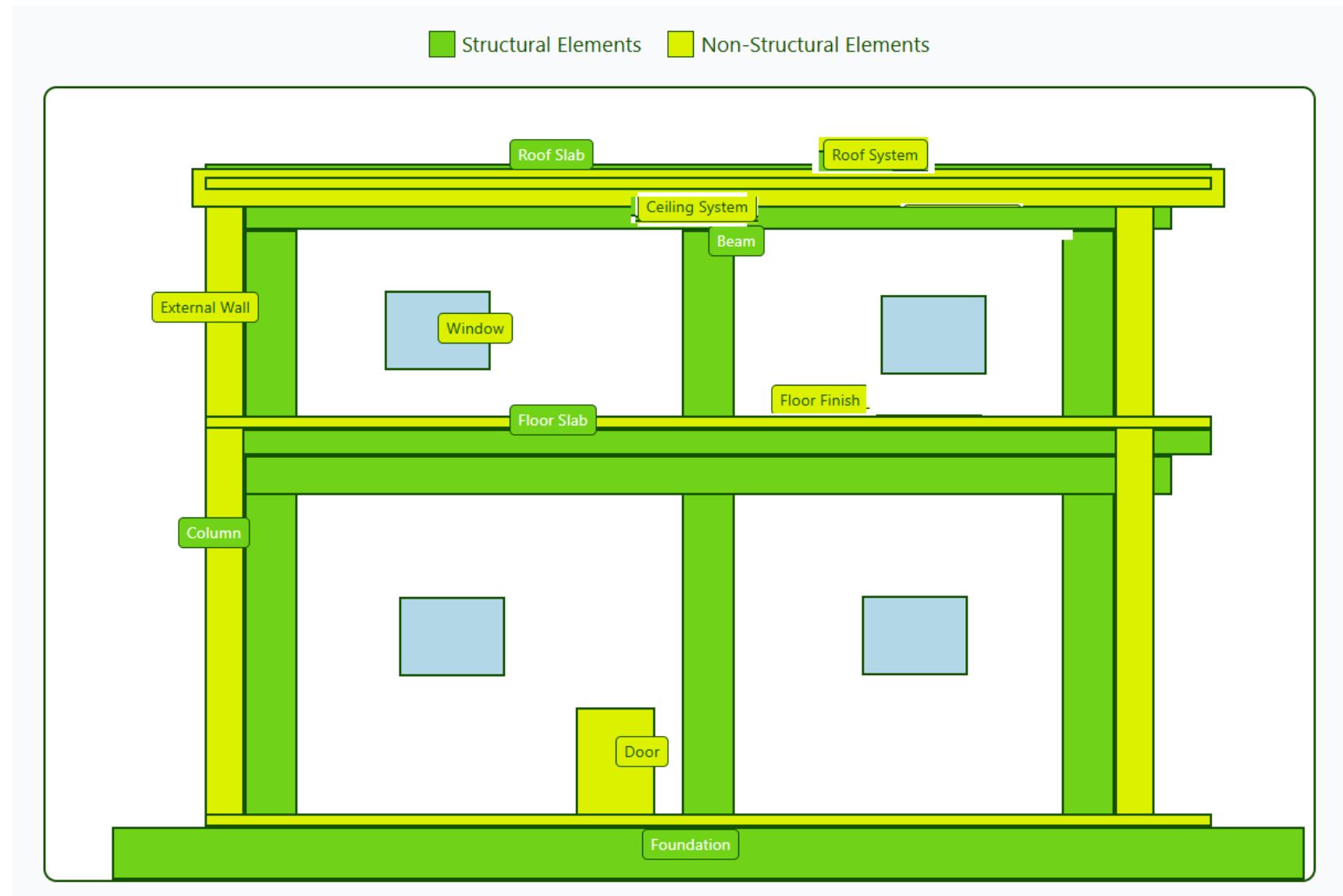
⚡ Operational Information

Data Category	Required Information	Units
Electricity Consumption	Annual electricity usage	kWh/year
Fuel Consumption	Natural gas, diesel, LPG usage	m ³ /year, L/year, kg/year
HVAC Systems	System type, capacity, efficiency	Type, kW, COP/EER
Lighting	Lighting system, lighting capacity	Type, kW
Comfort Parameters	Heating/cooling temperature setpoints	°C

Note: Operational data should ideally be based on actual measurements for existing buildings or detailed energy modeling for new buildings. Include at least 12 months of data when available.

BEAT

Building Components Evaluated



Material Quantities

Measurement Type	Material Type	Unit
Volume (m ³)	Concrete (foundations, columns, beams, slabs)	m ³
	Insulation materials	m ³
Mass (kg/tons)	Steel reinforcement	tons
	Structural steel	tons
	Aluminum (windows, facade)	kg
	Glass	kg
Area (m ²)	External walls, facades	m ²
	Windows, glazing	m ²
	Floor/wall/ceiling finishes	m ²
Length (m)	Railings	m

Note: Material quantities should be extracted from the Bill of Quantities (BoQ) or calculated from architectural and structural drawings. Include materials that contribute significantly to the building's carbon footprint.

BEAT Quality Data Requirements

For accurate embodied carbon assessment, all quantities must include:

Material Type	Quantity	Unit Measure	Building Component
JSW M30 Concrete	150	m ³	Foundation
Tata Steel Fe500 TMT	1	ton	Column
Penetron Seal Coat	5	kg	
Aluminium door	2	pieces	

All material quantities must be specified with precise measurement units and building component allocation for accurate carbon assessment

BEAT

Understanding Results

From 1 sample building in India

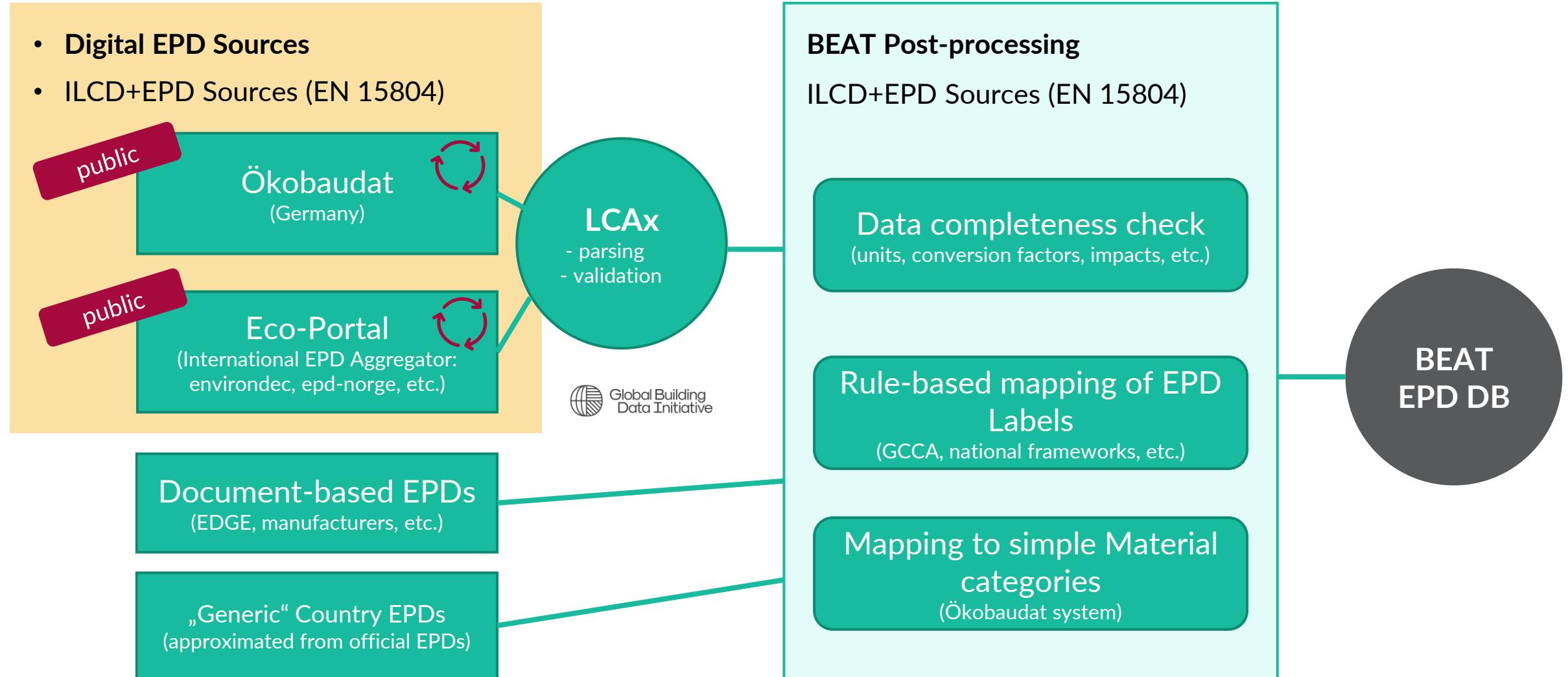
- 1. Material Carbon Hotspots:** BEAT identifies biggest carbon contributors: (e.g. Ready-mix concrete & cement: 35%, Steel: 18%, Rebar: 12%...)
Value: Target high-impact materials first
- 2. Building Element Breakdown:** BEAT shows carbon by elements: (e.g. Exterior walls: 31.7%, Foundations: 22.2%, Staircases & ramps: 12.4%...)
Value: Optimize design where it matters most
- 3. Complete Carbon Picture:** BEAT provides full lifecycle view: Total: 983 kg CO₂eq/m² (Embodied: 463 kg CO₂eq/m² (47%) & Operational: 520 kg CO₂eq/m² (53%))
Value: See both material and energy impacts
- 4. Regional Benchmarking:** BEAT enables performance comparison: Country-specific benchmarks and Clear performance indicators with Visual comparison tools
Value: Know where you stand vs. regional standards
- 5. Optimization Potential:** BEAT quantifies possible savings: (Current: 983 kg CO₂eq/m², Optimized: 778 kg CO₂eq/m²) Total reduction: 20.9%
Value: See exactly what's achievable
- 6. Strategic Insights:** BEAT transforms decision-making: Data-driven material choices, Science-based targets, Investment justification, Progress tracking
Value: Turn carbon data into competitive advantage

The BEAT website provides a handbook and video tutorial:
<https://beat-alcbt.gggi.org>

The image shows two screenshots of the BEAT website. The top screenshot is the 'Building Emission Assessment Tool (BEAT) Handbook', specifically 'Part 1: Core Concept Guide' from April 2025. It features a teal background with a cityscape image and the title 'Building Emission Assessment Tool (BEAT) Handbook'. Logos for GGGI, EESL, and the International Climate Initiative (IKI) are at the bottom. The bottom screenshot shows the BEAT login page with fields for Email and Password, and links for 'How it works', 'Forgot your password?', and 'Don't have an account? Sign up'.

BEAT

Data Quality



BEAT

Data Sharing Protocols

- BEAT closely follows the structured LCAX format, to define **buildings, assemblies, and EPDs**.
- **Import of EPD Data**
 - Parsing of ILCD+EPD format
 - Easily integrate other formats: BEAT only has minimal EPD requirements, allowing import from Document-based EPDs and national sources
- **Export of Data**
 - Export EPDs as Excel
 - Potential export of assemblies and buildings (e.g. LCAbyg)

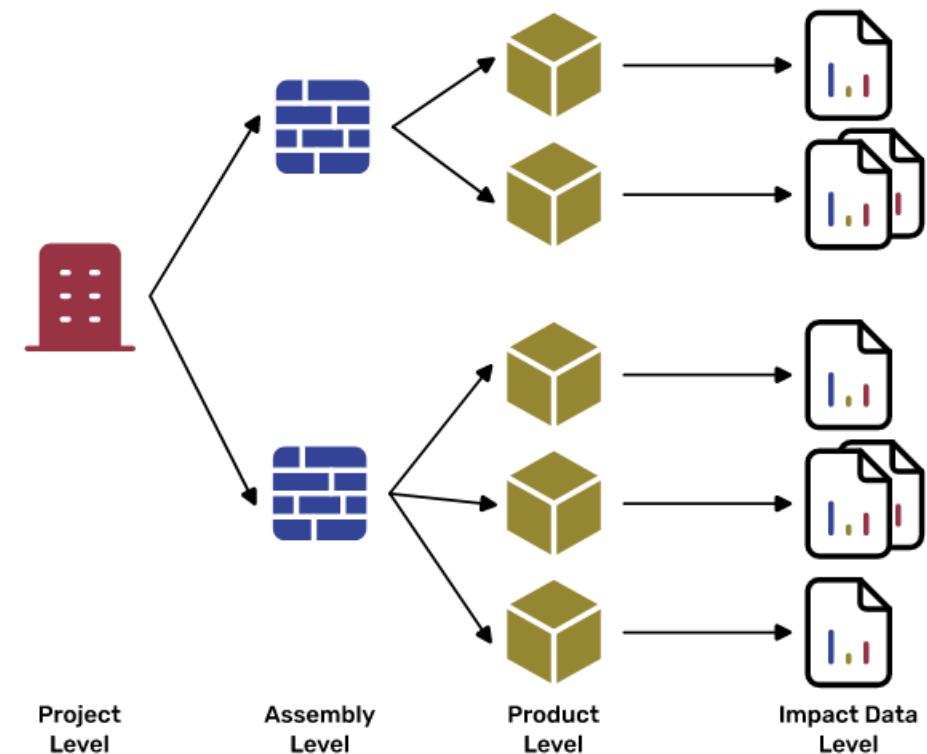
Source: LCAX Website, <https://docs.lcax.org/concept/data-structure>

EPD minimum requirements

GWP Impact

declared unit + declared amount (usually 1)

EPD Name, source



BEAT

Design Principles and Functions

Ready:

User Management

Embodied Carbon Assessment

EPD Database

Custom Structural Elements

Generic EPDs

Operational Carbon

In Progress:

Reuse of Customised Materials

Excel Import & Reports

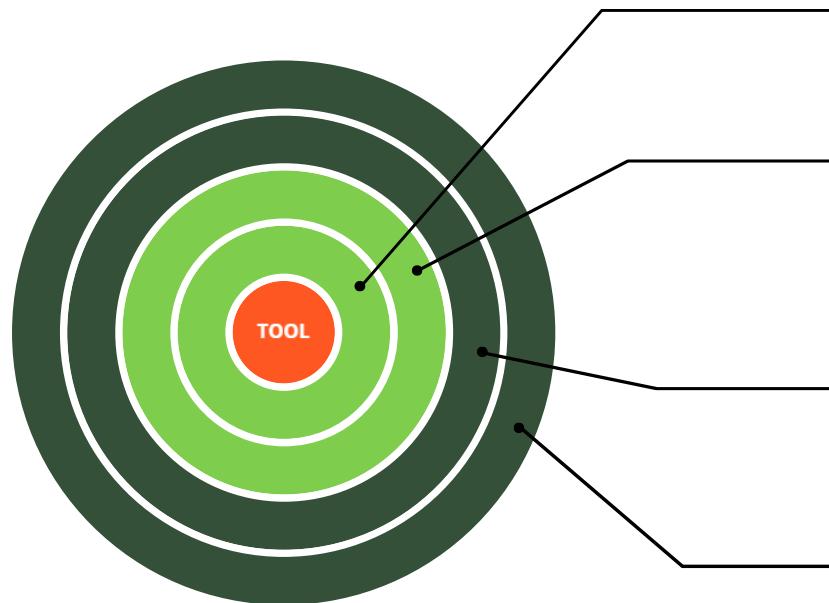
Benchmarking View

Language Translation

Planned:

Carbon Optimisation & Potential Savings

Advanced analytics for carbon reduction recommendations



Modular structure

Allows for updates and expansion

Comprehensive built-in material and EPD database and interface

Adaptive functionality

Accommodates limited data availability in certain regions

Full transparency

In calculations and data sources to ensure credibility and trust

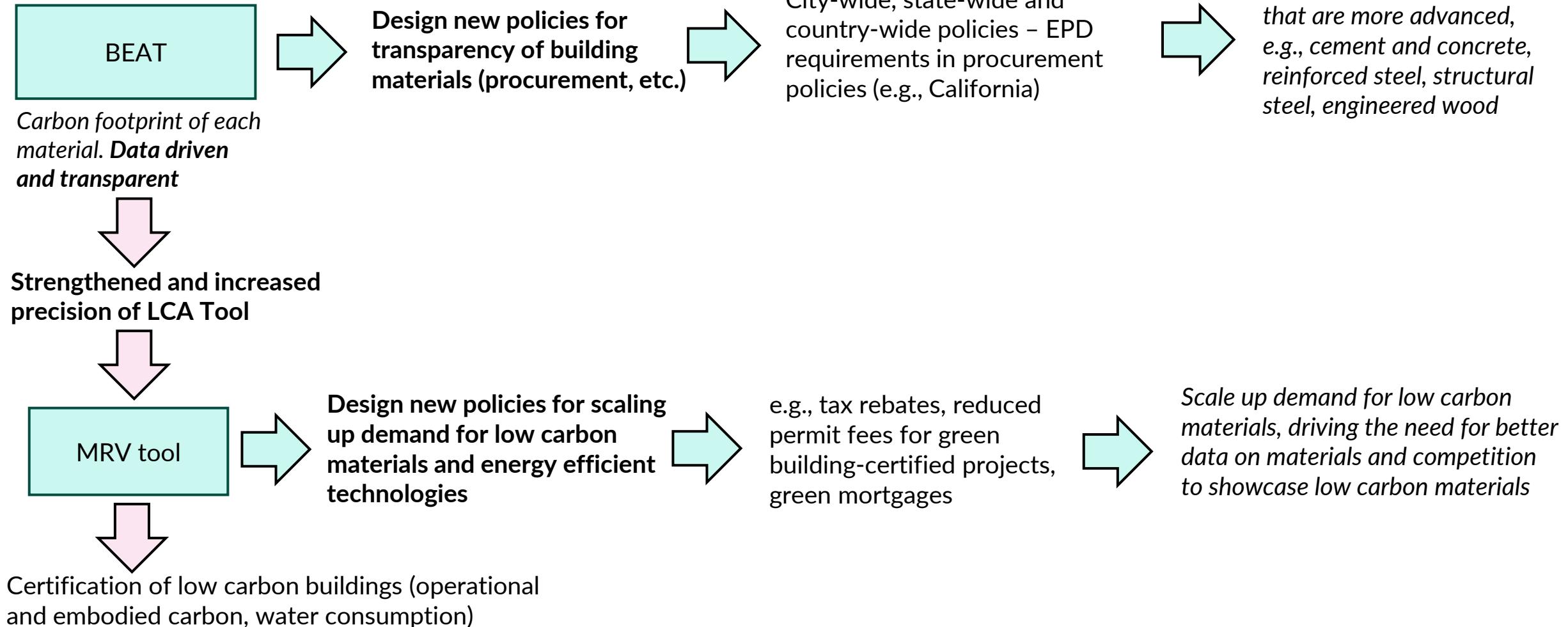
MRV CONCEPTS

Distinction between MRV Tool and BEAT

- BEAT helps to **create a baseline for a building stock** from ALCBT countries. This will help to feed in entry data for the monitoring, reporting and verification (MRV) tool.
- The MRV tool **calculates or estimates emissions under different future scenarios** by allowing users to change selected factors that impact projected emissions from the building sector at given time periods, including any significant actions such as regulations and policies, or introduction of efficient and low carbon solutions at specific periods, alone or in combination.
- The MRV tool supports large-scale modeling of buildings, building populations, and future pathways, scenarios and baselines. **This tool enables policy-makers to set national targets in NDCs and LT-LEDS.**
- BEAT can provide both quick and detailed modeling of whole life carbon of a building. This tool helps to define baselines for city- and country-specific buildings, and design new policies for scaling up the demand for low carbon materials and energy efficient technologies.

SCALING UP BUILDING LCA

Potential pathway



Thank you!

For more information, visit us at <https://ALCBT.GGGI.ORG>
or scan the QR code below



IKI Independent Complaint Mechanism

Any person who believes they may be harmed by an IKI project or who wish to report corruption or the misuse of funds, can lodge a complaint to the IKI Independent Complaint Mechanism at IKI-complaints@z-u-g.org. The IKI complaint mechanism has a panel of independent experts who will investigate the complaint. In the course of the investigation, we will consult with the complainant so as to avoid unnecessary risks for the complainant. More information can be found at <https://www.international-climate-initiative.com/en/about-iki/values-responsibility/independent-complaint-mechanism/>.

-  www.gggi.org
-  [@gggi_hq](https://twitter.com/gggi_hq)
-  [@GGGIHQ](https://www.instagram.com/GGGIHQ)

-  [@GGGIHQ](https://www.facebook.com/GGGIHQ)
-  [@gggi_hq](https://www.linkedin.com/company/gggi-hq)
-  [@GGGIMedia](https://www.youtube.com/GGGIMedia)

Supported by:



on the basis of a decision
by the German Bundestag

