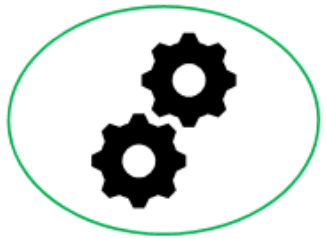
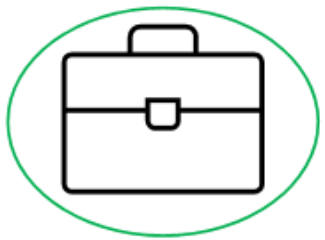

One
Click
LCA

One Click LCA – World-leading carbon and life cycle metrics software

Professional services and Training – EPD verification/publishing, Sustainable policy, life-cycle assessment, life-cycle costing, CSR



Custom Solutions – Branded and white labelled solutions for life-cycle efficiency, best practice tracking, scoring, data collections, environmental impacts assessment, and more



High Impact Research on Decarbonisation – The Embodied Carbon Review of 100+ regulations and global rating systems

One Click LCA

ABOUT ONE CLICK LCA

World-leading Carbon & Life-cycle Metrics Software.

MADE FOR CONSTRUCTION

Buildings and Renovation, Infrastructure, Product EPDs, CSR

COMPLIES WITH 40+ CERTIFICATIONS

BREEAM, LEED, DGNB, HQE/ E+C-, CEEQUAL, etc.

INTEGRATE WITH YOUR DESIGN TOOLS & 40+ DATABASE

Revit, BIM, IFC file. IESVE, other tools.

One Click LCA

ABOUT ONE CLICK LCA

Easy to use tools for construction sustainability metrics and impact reduction

LIIFE CYCLE ASSESSMENT

LIFE CYCLE COSTING

EMBODIED CARBON REDUCTION

EARLY DESIGN OPTIMIZATION

CIRCULARITY ASSESSMENT

EPDs GENERATION

One Click LCA

One Click LCA helps to improve your project in every stage

PRE-PROJECT

DESIGN

AS BUILT

1. BRIEF → 2. CONCEPT → 3. DESIGN → 4. CONST-RUCTION → 5. AS BUILT

Set a target

CARBON HEROES

Site Designer

Decide direction

Carbon Designer

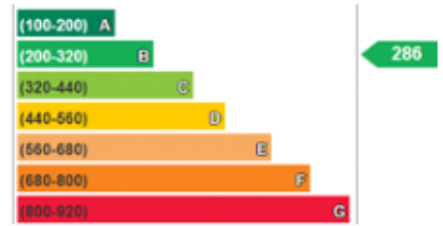
Optimize design

AUTODESK REVIT

SOLIBRI Model Checker

Specify products

Validate result and compare against pears

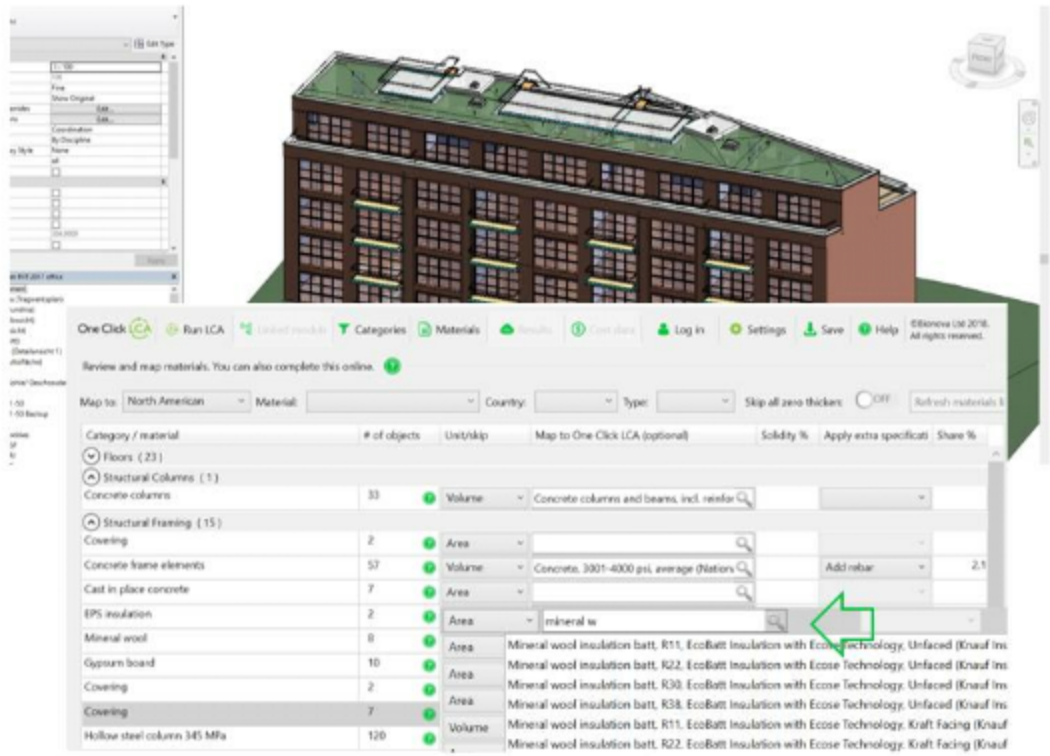


High influence & cost-efficiency: reducing carbon can reduce cost

Some influence & cost savings possible

Limited influence, savings rarely possible

Automation from Design Tools



COMPLAIANCE TOOLS

DesignBuilder

IES

DESIGN

AUTODESK REVIT

GRAPHISOFT ARCHICAD

TEKLA

Rhinoceros + grasshopper

FILE FORMATS

Microsoft Excel

gbXML

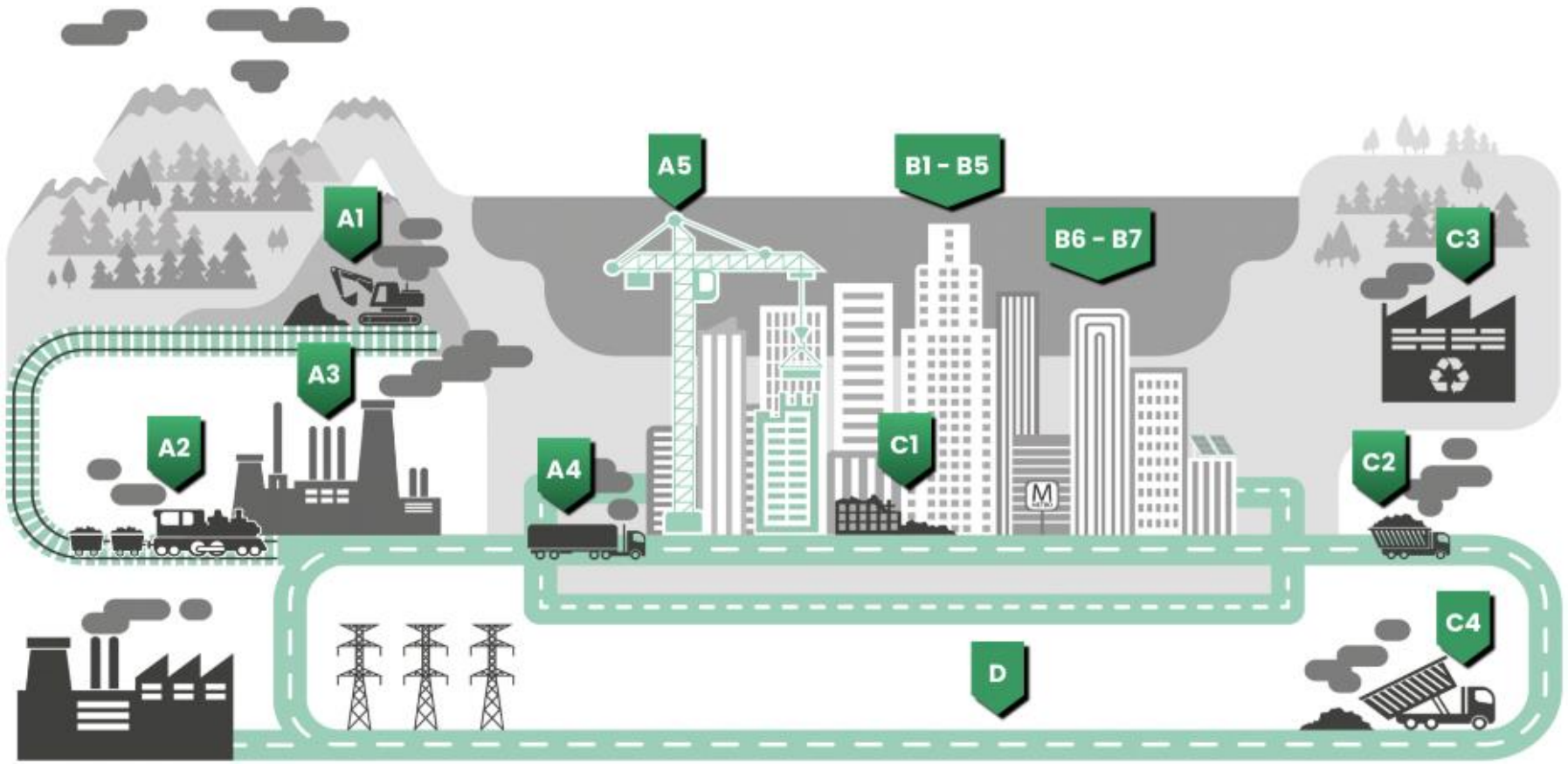
BIM MANAGEMENT

Trimble Connect

SOLIBRI Model Checker

simplebim.

One Click LCA



A1 - A3 Product stage

- **A1** Raw material extraction
- **A2** Transport to manufacturing site
- **A3** Manufacturing

A4 - A5 Construction stage

- **A4** Transport to construction site
- **A5** Installation / Assembly

B1 - B5 Use stage

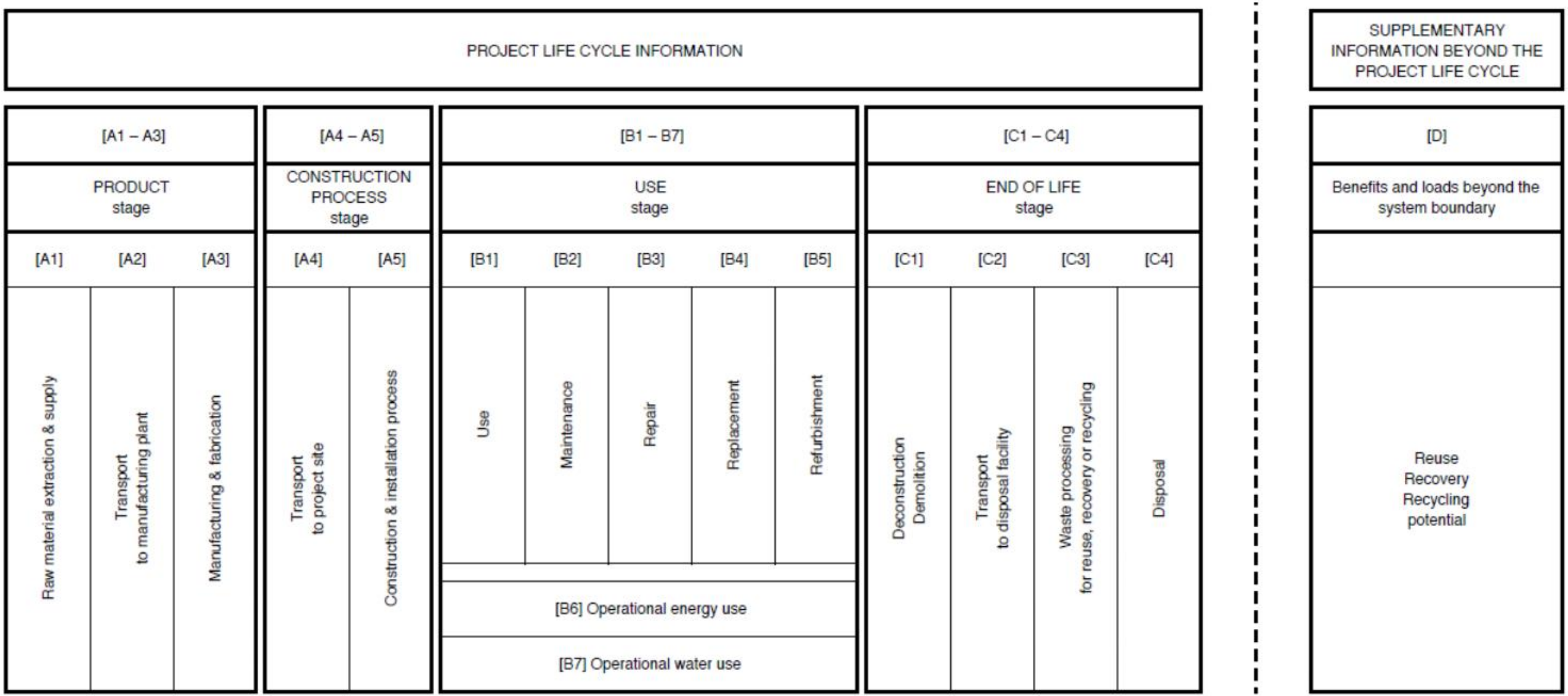
- **B1** Use
- **B2** Maintenance
- **B3** Repair
- **B4** Replacement
- **B5** Refurbishment
- **B6** Operational energy use
- **B7** Operational water use

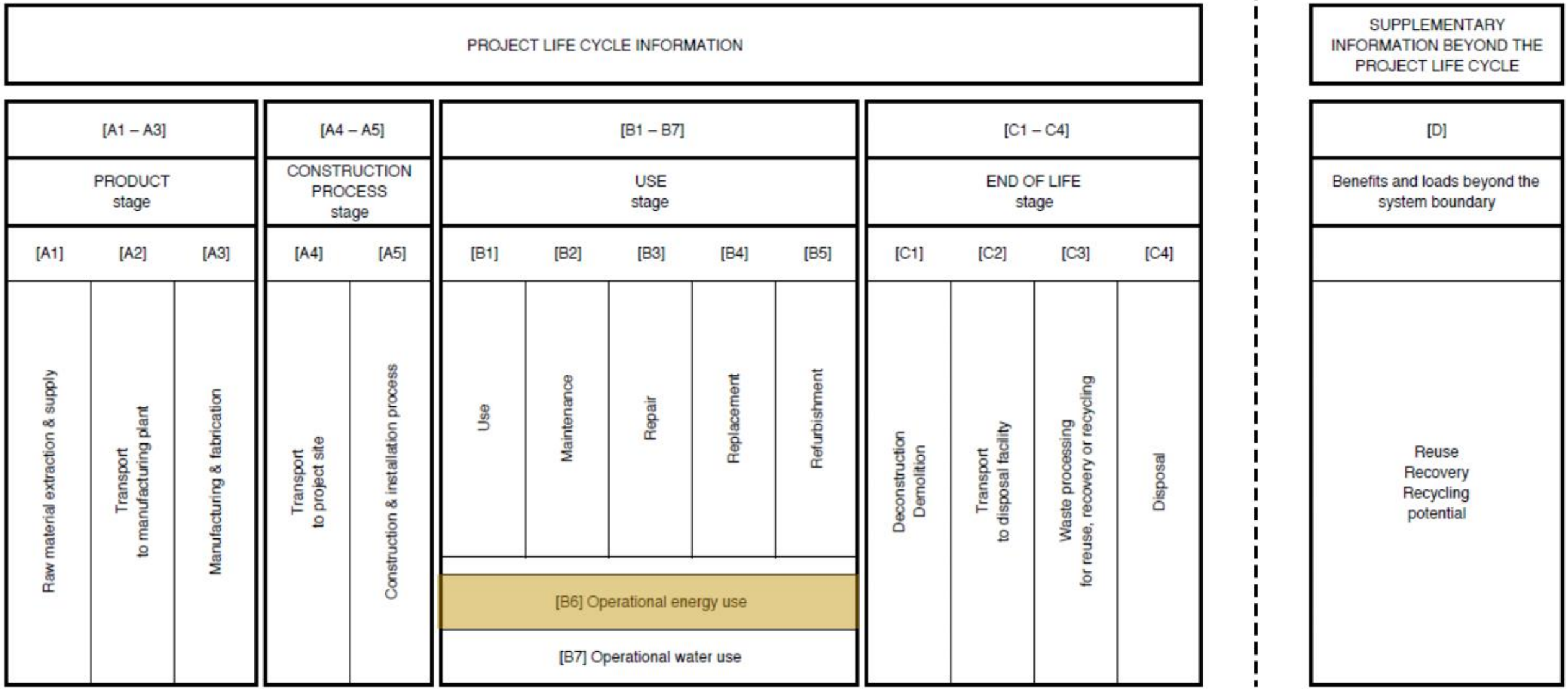
C1 - C4 End of life stage

- **C1** Deconstruction & demolition
- **C2** Transport
- **C3** Waste processing
- **C4** Disposal

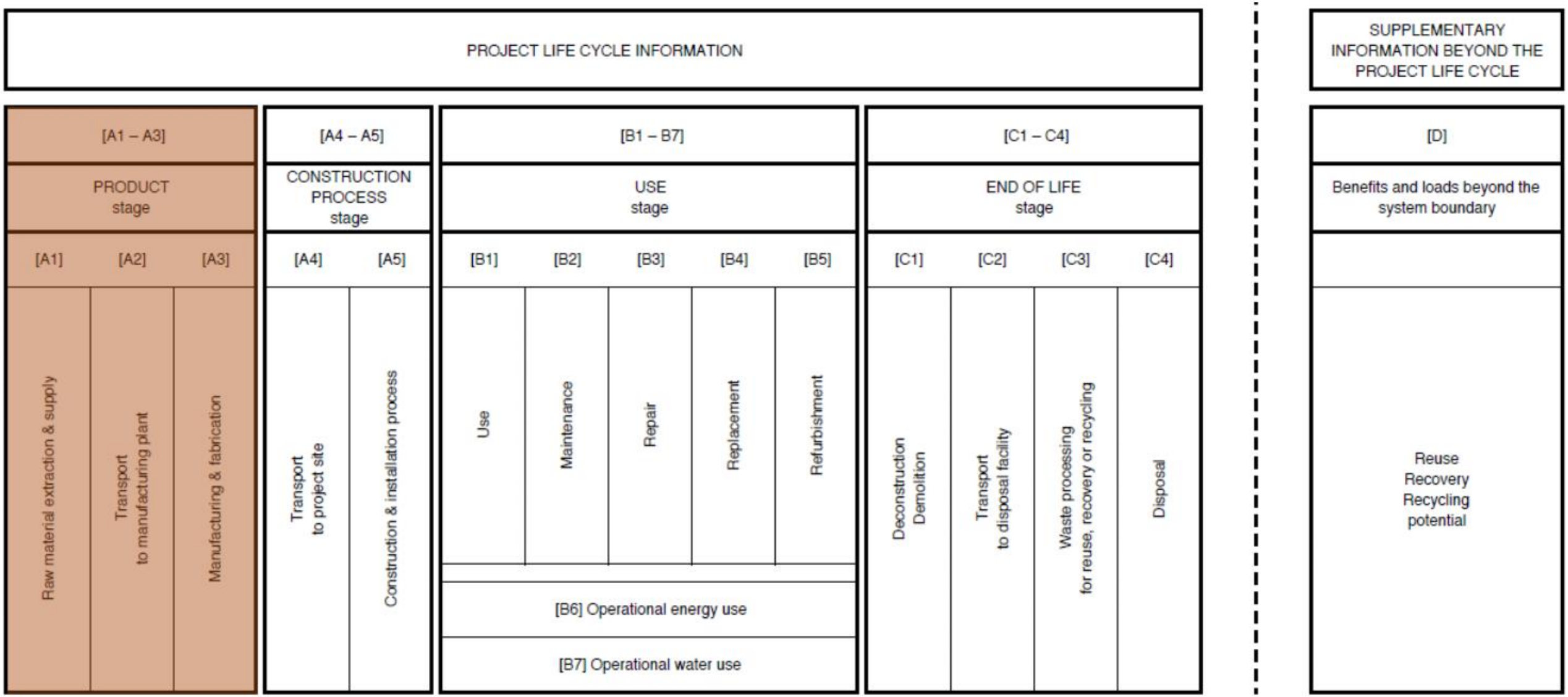
D - Benefits and loads beyond system boundary

Reuse, recovery and/or recycling potentials, expressed as net impacts and benefits

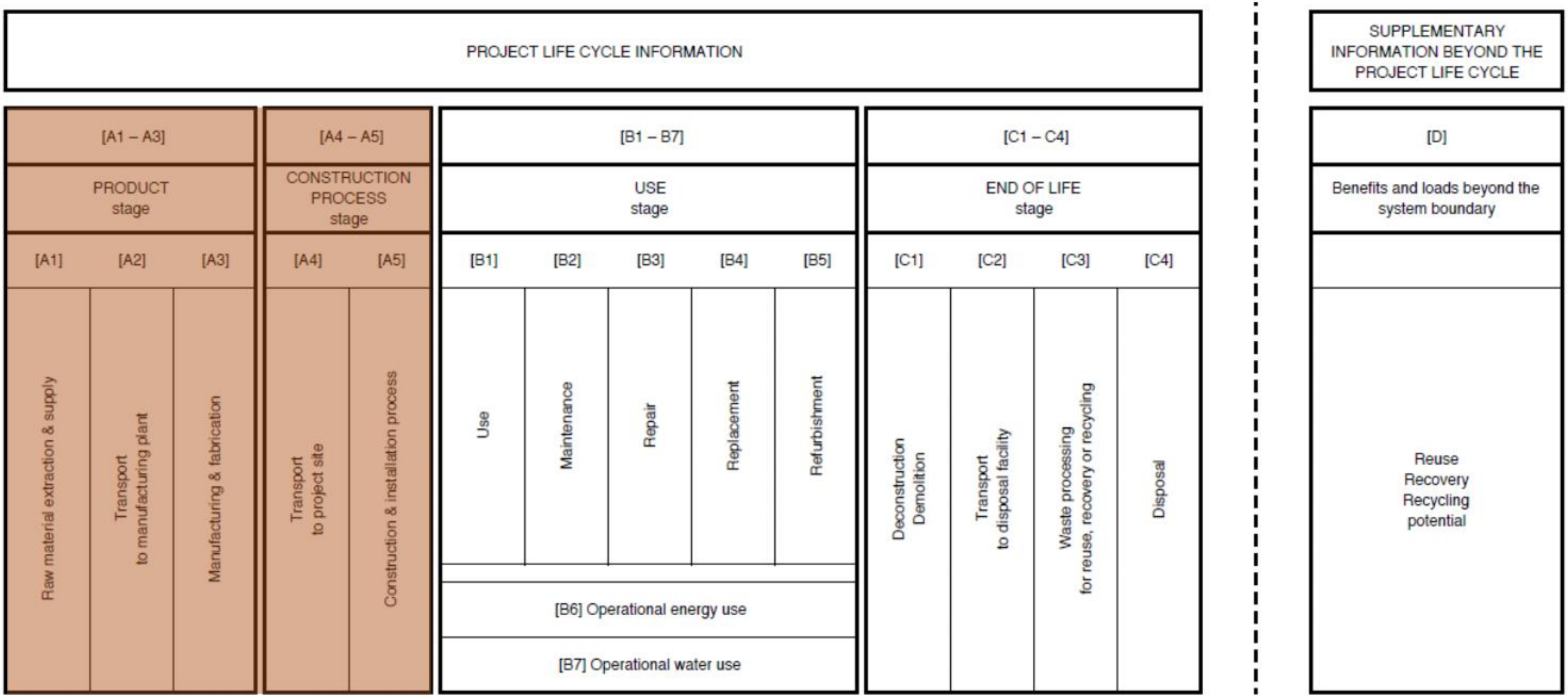

PROJECT LIFE CYCLE INFORMATION
SUPPLEMENTARY INFORMATION BEYOND THE PROJECT LIFE CYCLE
[A1 – A3]
PRODUCT stage
[A1]
[A2]
[A3]
Raw material extraction & supply
Transport to manufacturing plant
Manufacturing & fabrication
[A4 – A5]
CONSTRUCTION PROCESS stage
[A4]
[A5]
Transport to project site
Construction & installation process
[B1 – B7]
USE stage
[B1]
[B2]
[B3]
[B4]
[B5]
Use
Maintenance
Repair
Replacement
Refurbishment
[B6] Operational energy use
[B7] Operational water use
[C1 – C4]
END OF LIFE stage
[C1]
[C2]
[C3]
[C4]
Deconstruction Demolition
Transport to disposal facility
Waste processing for reuse, recovery or recycling
Disposal
[D]
Benefits and loads beyond the system boundary
Reuse
Recovery
Recycling
potential



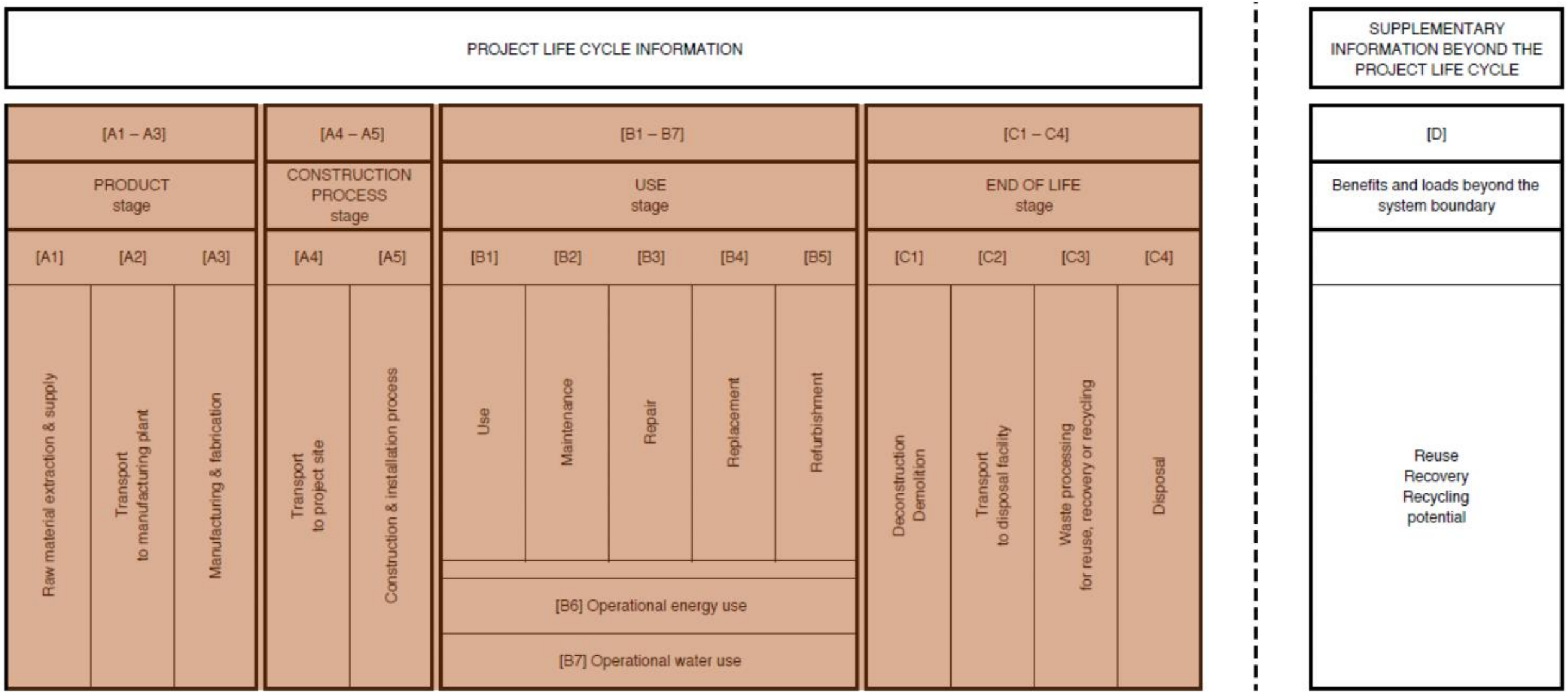
What most regulations focus on at the moment



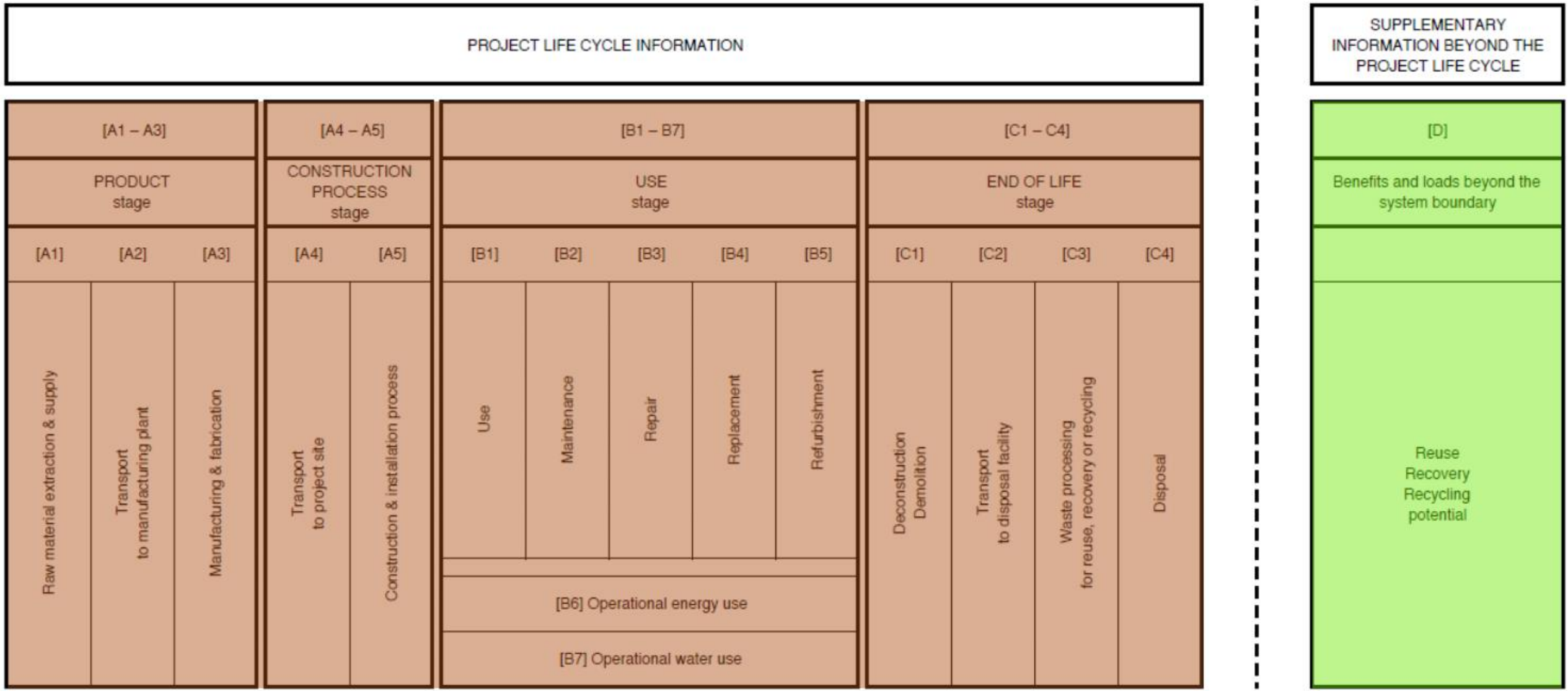
Cradle to gate



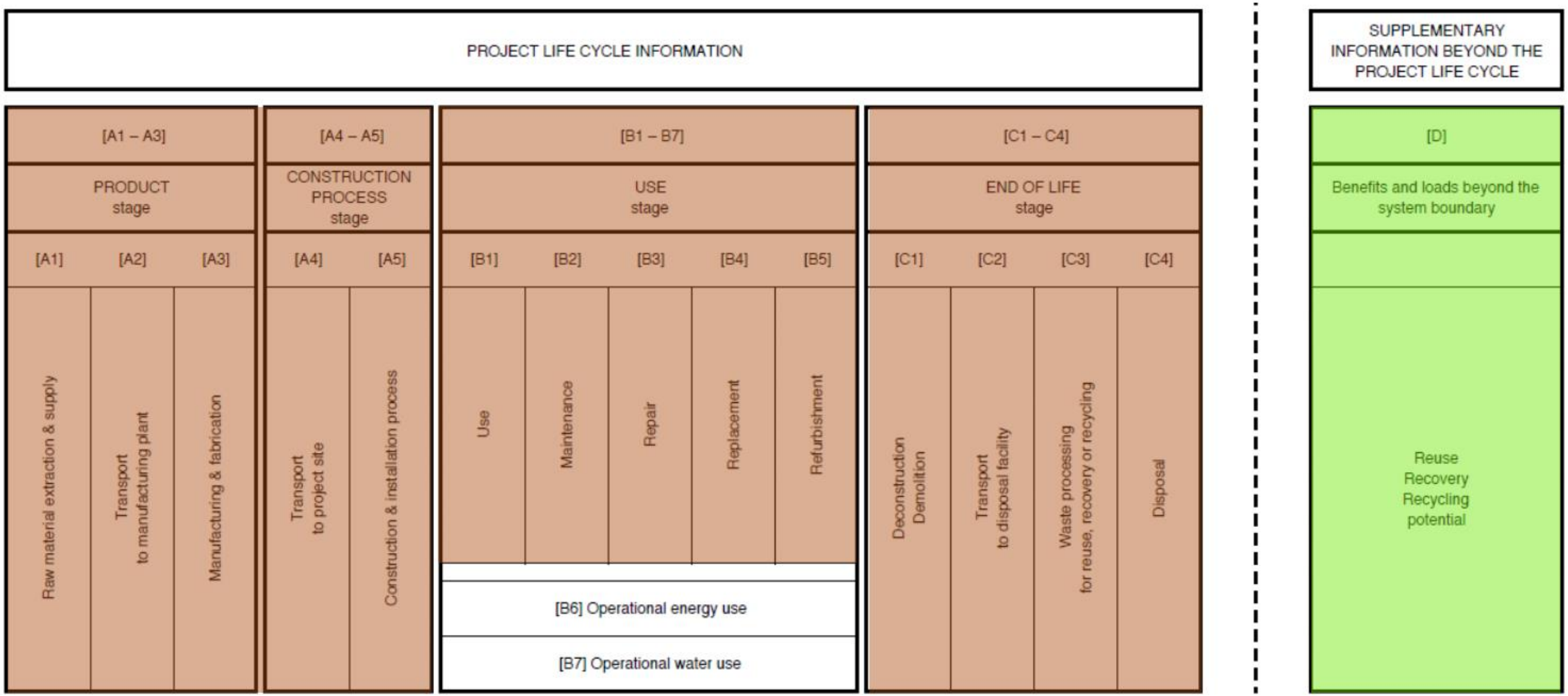
Cradle to practical completion



Cradle to Grave



Cradle to Cradle



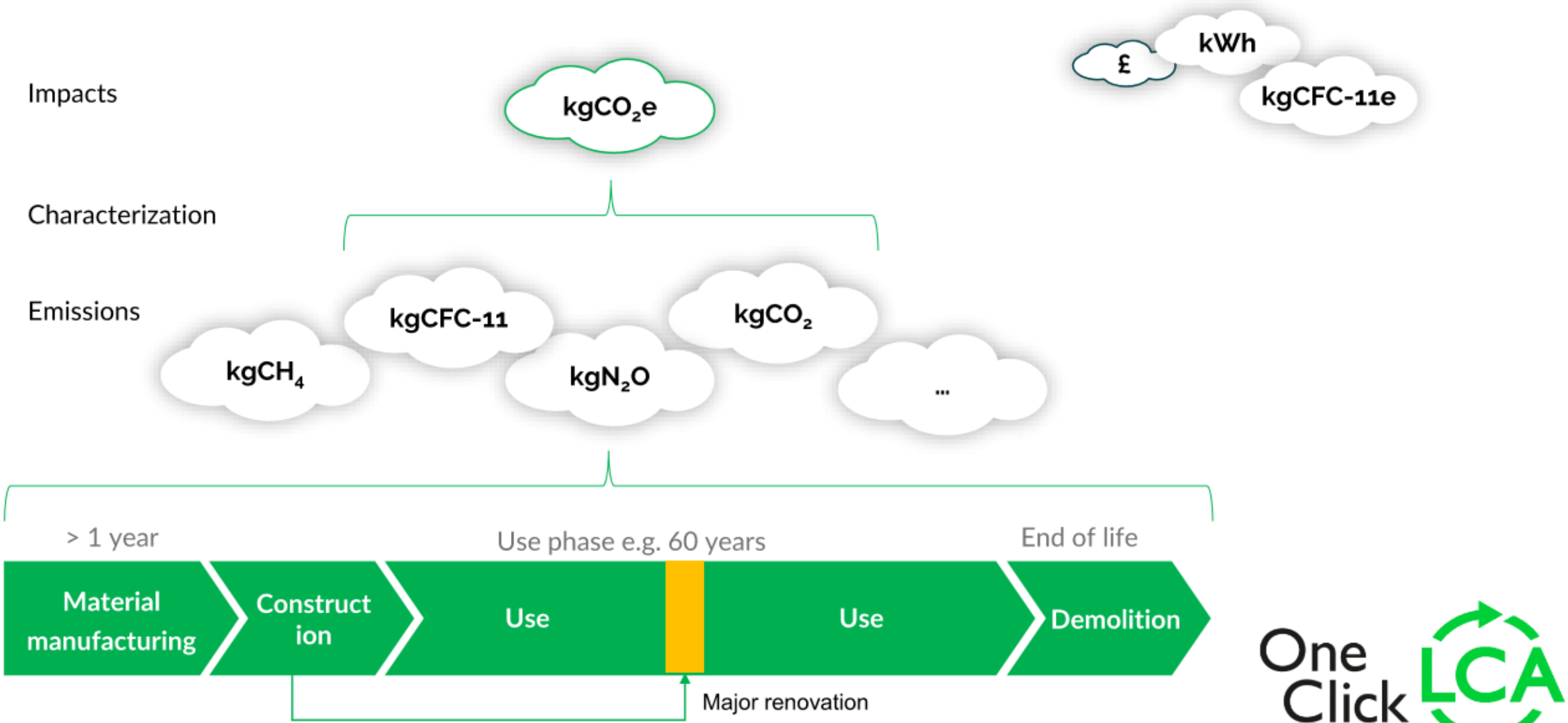
Embodied Carbon Assessment

LCA outputs are environmental indicators

Each indicator describes a particular category of environmental impacts. The impacts are expressed as quantities of a matter that has the potential to cause such impacts – but they do not represent the actual harm (final impact, e.g. endpoint) eventually caused. For instance, global warming potential represents the amount of CO2e gases released. But the final impact is the acceleration to the polar melt, for instance.

- **Global Warming Potential** describes how much a product contributes to climate change. When LCA concerns only this impact category, it's called the carbon footprint.
- **Acidification** describes how much product acidifies the environment, resulting e.g. acid rain.
- **Eutrophication** describes flow of nutrients to ecosystems, resulting e.g. to algae growth.
- **Ozone Depletion** describes damage caused to the Ozone Layer in the stratosphere.
- **Tropospheric Ozone** describes the quantity of summer smog causing gases emitted.
- **Depletion of fossil resources** describes how much fossil resources are withdrawn.

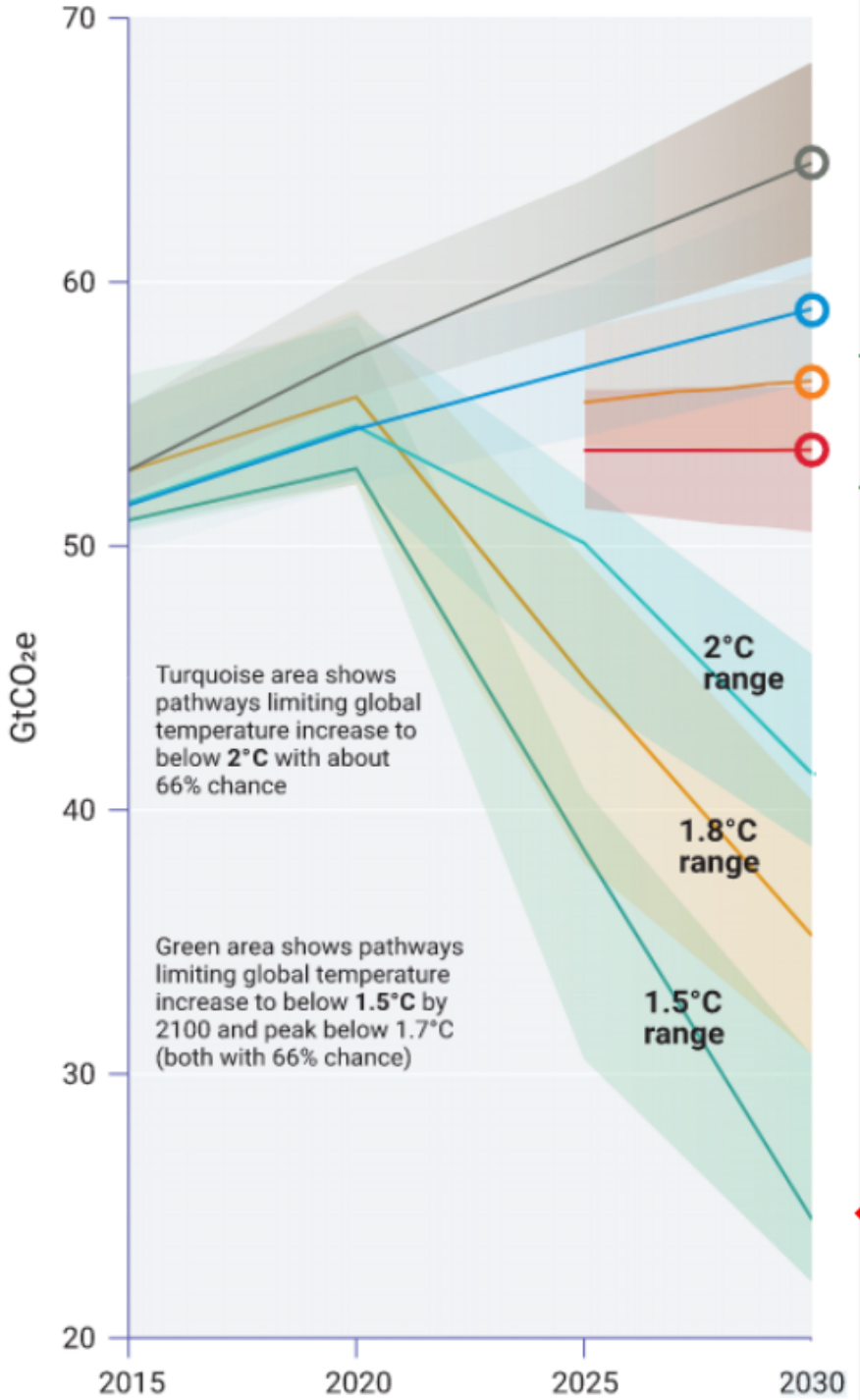
Characterization



LCA characterization methods

Impact assessment methodology defines the target units and emission characterization factors. European standards require using CML (Charactaration Factor). North American data is normally in TRACI method.

LCA impact indicator units	CML 2002	TRACI 2.1	ReCiPe
Global warming potential	**CO_2e**	CO_2e	CO_2e
Ozone depletion potential	**CFC-11-eq**	CFC-11-eq	CFC-11-eq
Acidification potential (land)	**SO_2e**	SO_2e	SO_2e
Eutrophication potential (fresh water)	**PO_4^3e**	N eq	P eq
Formation of tropospheric ozone(photochemical oxidant formation)	**C_2H_4e**	NO_xeq	kg NMVOC
Depletion of non-renewable energy resources	**MJ**	MJ	Kg oil eq



2010 Policies Scenario

Current policies Policies Scenario

Current targets

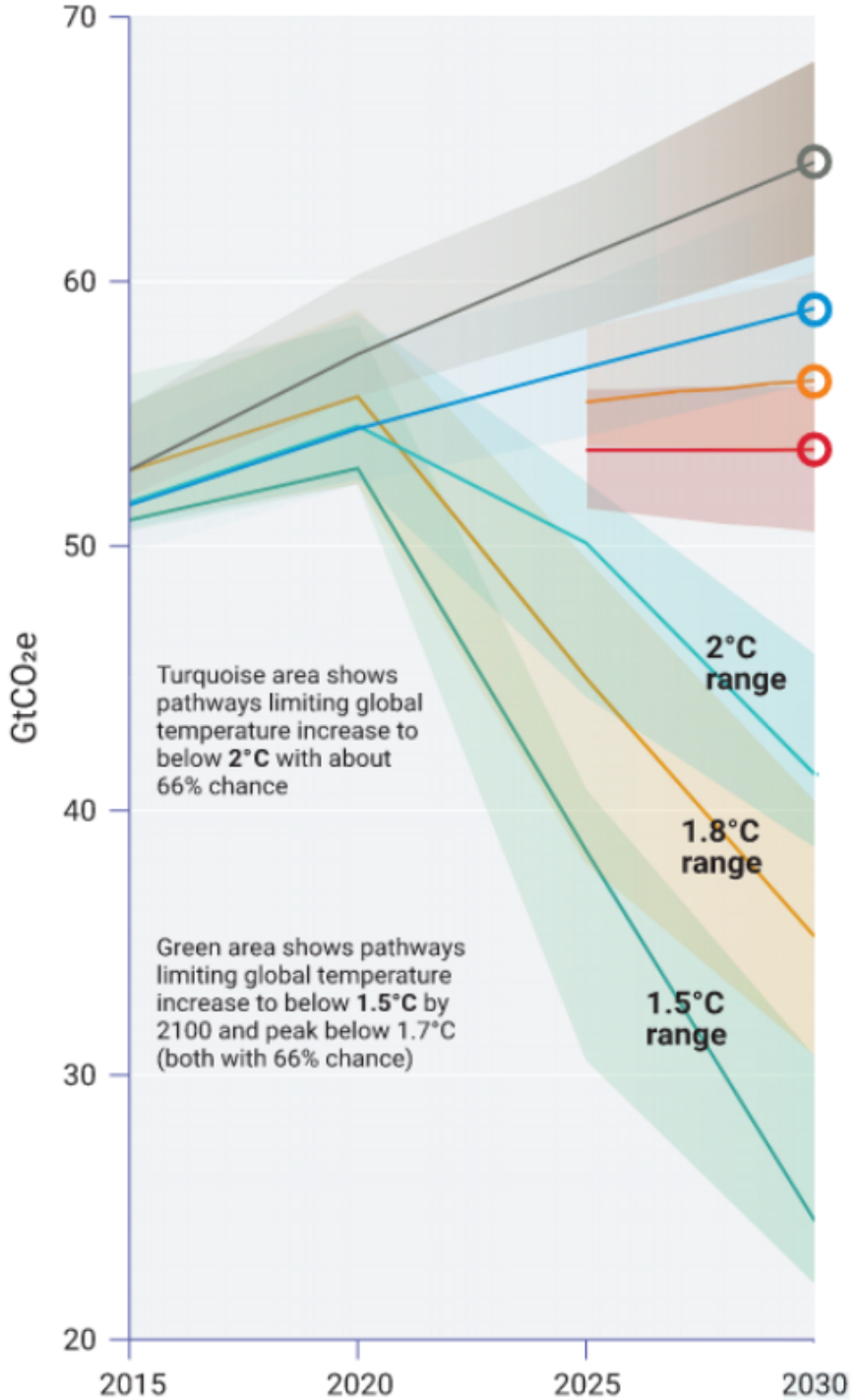
Predicted global GHGs

Current level 53 GtCO2e /a

Emissions on 2030 with current actions 55 – 60 GtCO2e/a

25-30 GtCO2e/a

Source: UN EP Emission Gap Report 2020.



Restricting global warming to 1,5 degrees requires approx. **35 GtCO2e of additional emission reduction measures**

Source: UN EP Emission Gap Report 2020.

Buildings are responsible for 39% of global carbon emissions:

28% from operational emissions

11% from materials and construction

SOURCE: BRINGING EMBODIED CARBON UPFRONT

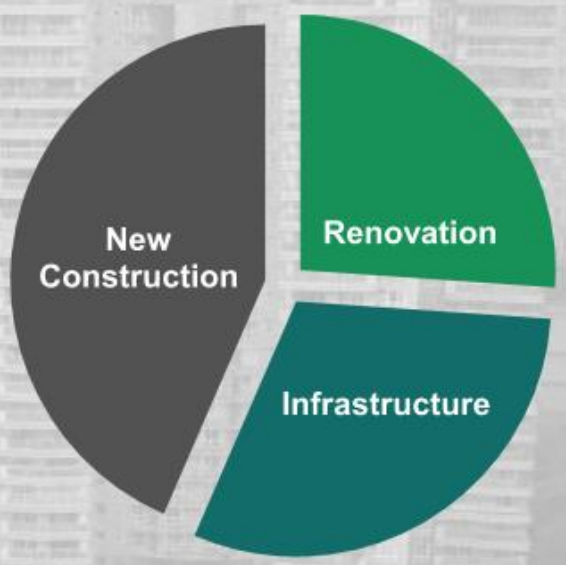
One Click LCA

Cities will double by 2060, creating 150-250 gigatons of embodied carbon from construction materials

CITIES GROW

230 BILLION M²

BY 2060



GENERATING

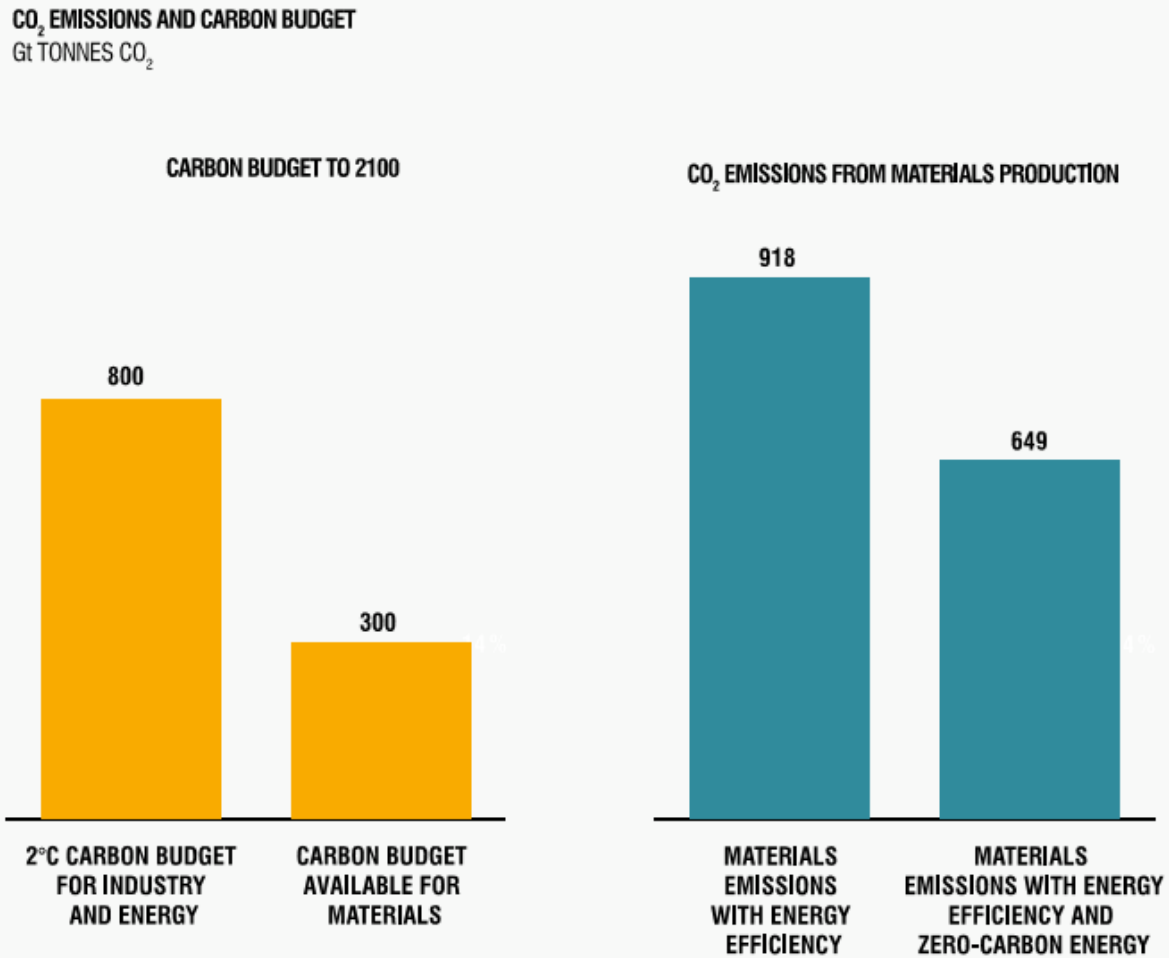
150-250 GIGATONS

EMBODIED CARBON

Emissions from material manufacturers alone risk exceeding the 2-degree emission scenario

Aim, 2 degrees

Full carbon budget for industry and power generation & budget for 4 main materials (Steel, plastics, concrete, aluminium)



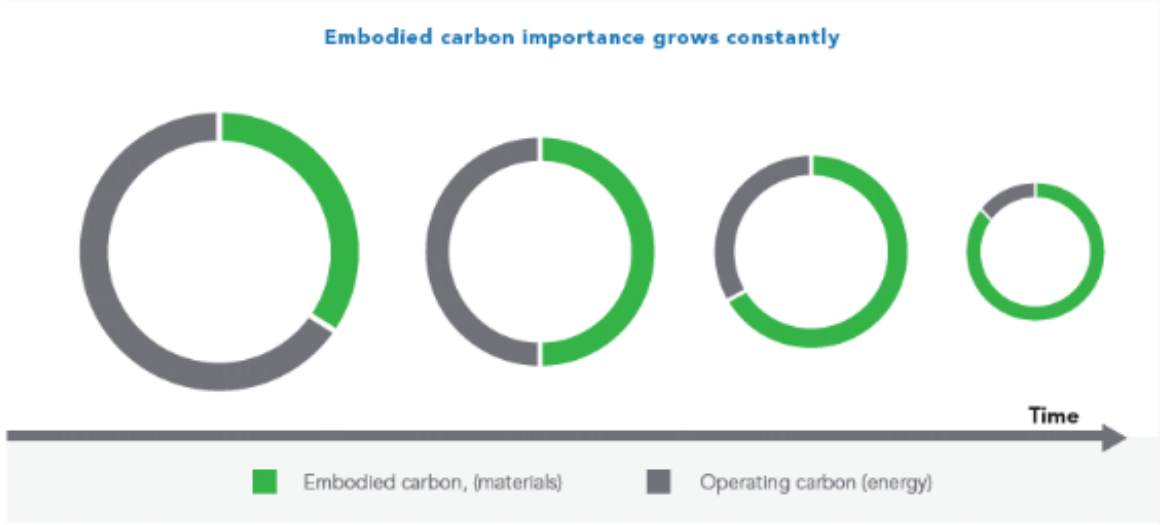
SOURCE: MATERIAL ECONOMICS MODELLING AS DESCRIBED IN TEXT. MULTIPLE SOURCES, SEE ENDNOTES.[9]

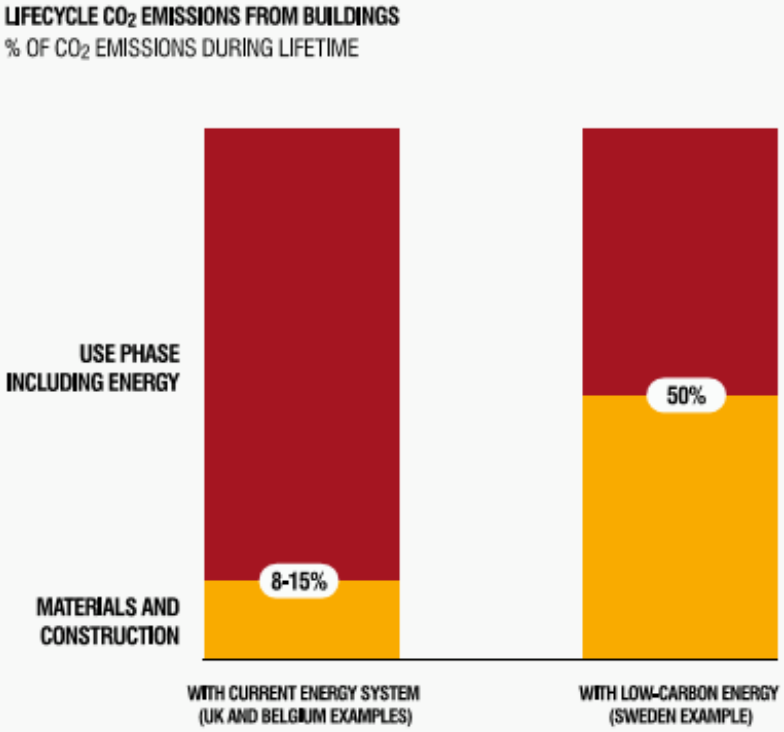
Current state

Emissions of materials with reduction of energy emissions

How emissions are created during building life cycle?

- Energy efficiency and cleaner production reduce the emissions from operational energy
- Material emissions already exceed emissions of operating energy within a 50-year time frame, for some countries





Source: Embodied carbon review – Embodied carbon reduction in 100 + regulatory and rating systems globally www.embodiedcarbonreview.com

World GBC: We need to be cutting embodied carbon now

All construction to be
operationally carbon neutral
and create at least
40 % less embodied carbon
by 2030

WORLD GREEN BUILDING COUNCIL

Embodied carbon = CO_2e from manufacturing, transporting, replacing and disposing of materials

Source: https://www.worldgbc.org/embodied-carbon½

One Click LCA

Summary of Industry trends

Certifications Like BREEAM and LEED incrising credits and weighting in material sections

Investestors and developers growing geen agenda and Zero carbon commitments

European commission has released their Level(s) framework for sustainable construction.

Amount of manufacturer EPDs in Europe and also globally increase rapidly. France has regulated EPD's.

Many countries and cities are moving towards building LCA regulation and requirements to achieve their carbon targets.

LCA follows standards

Cornerstone standards

ISO 14040 and ISO 14044 – fundamentals for LCA; used in all industries and in professional context, almost all the time

Construction works specific standards

EN 15978 – LCA standard for construction projects
ISO 21929-1 and ISO 21931-1 - hardly used LCA standards in Europe

Environmental Product Declaration standards

ISO 14025 – cornerstone standard for all kinds of EDPs
EN 15804 (EPD data) and EN 15942 (EPD format)
ISO 21930 – hardly used EPD standard in Europe

Generic LCA principles

Life-cycle assessment may be done with several different scopes:

- cradle to gate (product before use),
- cradle to grave (product, including use and final disposal) basis,

Note! for construction projects, the natural scope is always cradle to grave.

The construction LCA standards use attributional approach.

Attributional LCA assigns responsibility using allocation methodology and avoids the use of system expansion.

Conduct an LCA following agreed EN & ISO standards or National methodology like RICS

An LCA may be used to identify performance gaps, compare products, make procurement decisions or improve designs, amongst others.

Environmental Product Declarations (EPDs)

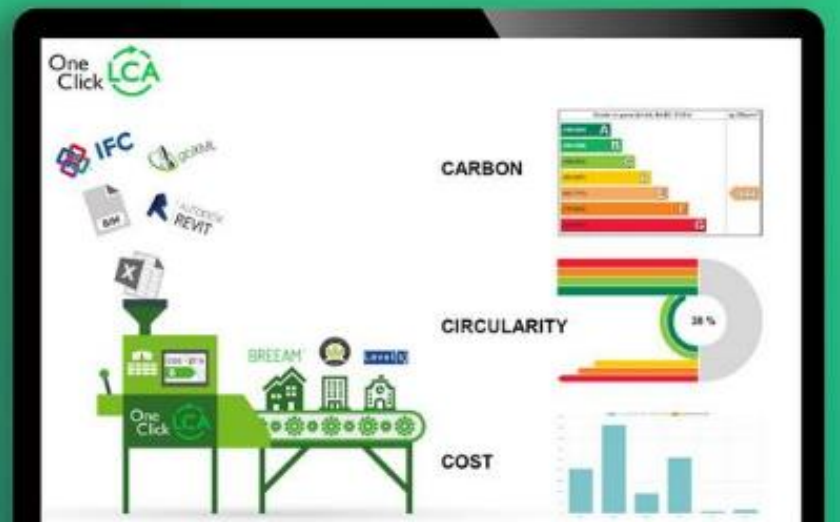
Calculate Your Environmental Impacts in Minutes

Reduce Cost, Carbon, and Material Use in Construction.

For LEED, BREEAM and more.

Integrated with Revit, BIM, IESVE and other tools.

GET A FREE DEMO

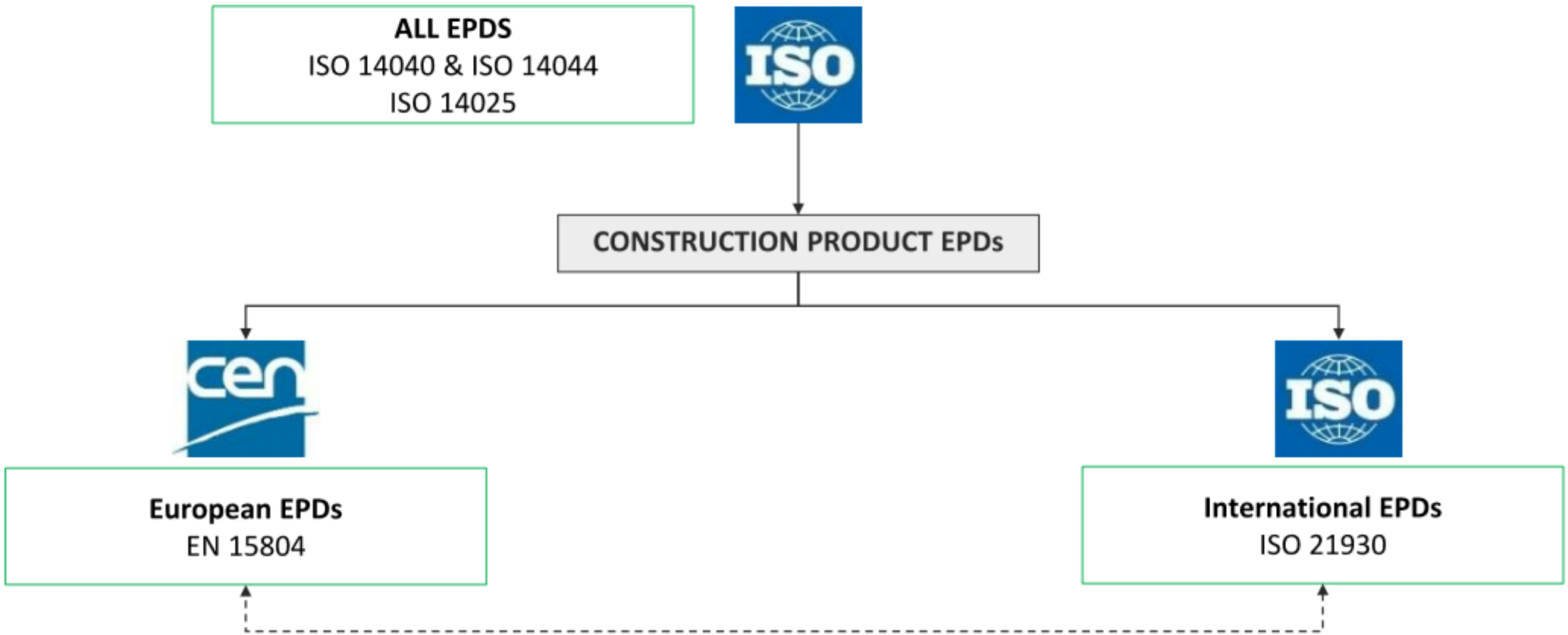


An EPD is an LCA for a product with additional rules for calculation, verification and publication

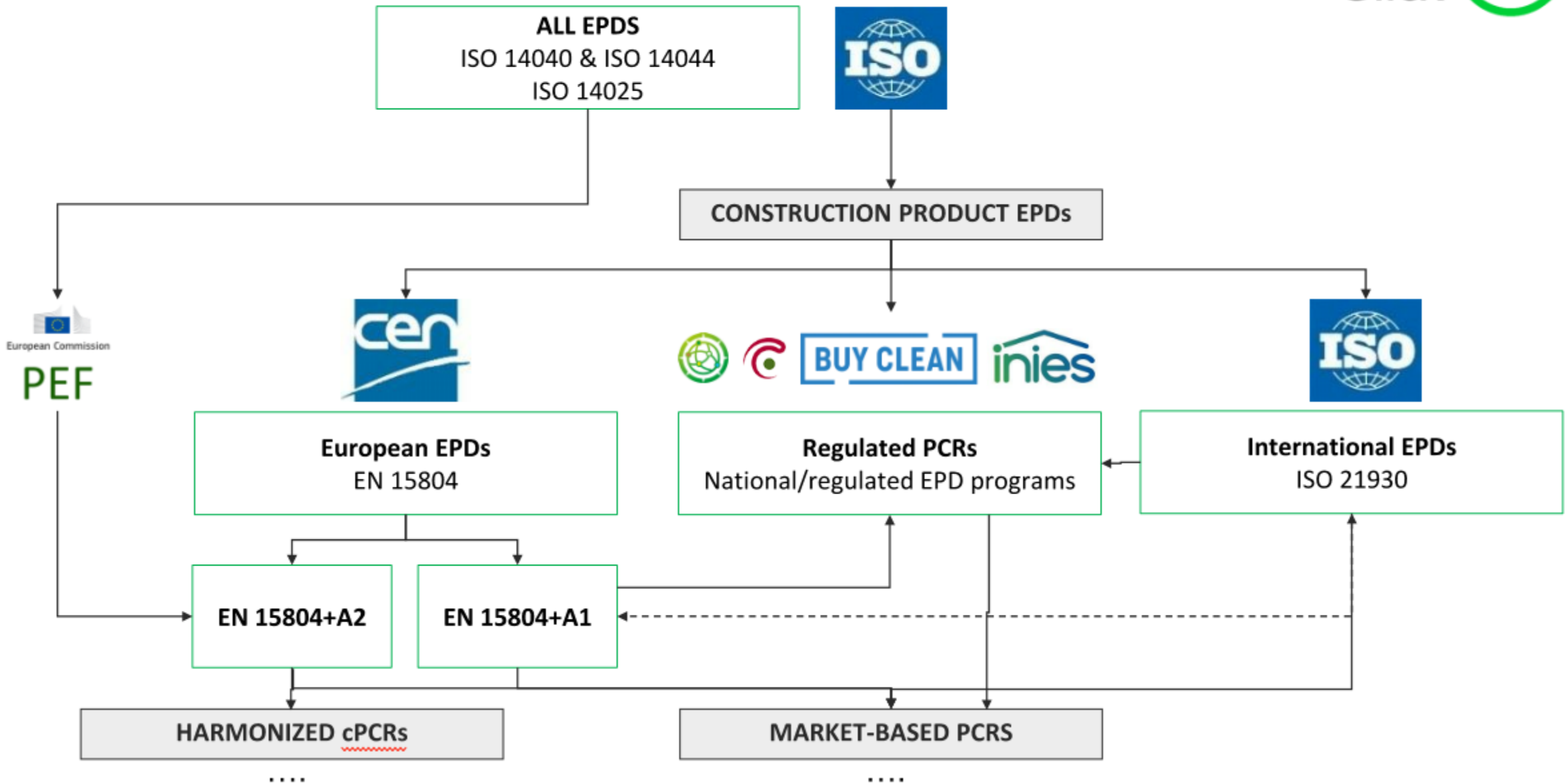
EPD in a Nutshell

- Based on real data, no forecasting
- Can represent either one product and one factory or many products and many factories
- Often valid for 5 years
- Several kinds of EPDs, that represent different scopes
  - Cradle-to-gate
  - Cradle-to-grave
  - Cradle-to-gate with options
- Offer knowledge on the product's environmental performance. Only similar products that are calculated with same methods can be compared.

The family of EPD standards...



… is growing fast!



Example EPD

FINNFOAM

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

TULPPA - WET ROOM BOARDS

FINNFOAM OY

PRODUCT DESCRIPTION

Finnfoam Oy's Tulppa is a Finnish-made wet room panel, which functions as both a construction board and waterproofing material. The core of the panel is made from a closed-cell, waterproof and mold-proof Finnfoam (XPS) insulation material and the surface layer consists of strong, special-purpose cement mortar. The Tulppa panel can be used as a base for tiling.

PRODUCT APPLICATION

Tulppa is a horizontally installed wet room panel, which functions as both a construction board and waterproofing material.

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m²
Mass per declared unit	3.54 kg (with 12.5 mm XPS) 3.80 kg (with 20 mm XPS) 4.15 kg (with 30 mm XPS) 4.85 kg (with 50 mm XPS) 5.90 kg (with 80 mm XPS)

TULPPA WITH 12.5 MM XPS

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Climate change – fossil	kg CO2e	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Climate change – biogenic	kg CO2e	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Climate change – LULUC	kg CO2e	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ozone depletion	kg CFC11e	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acidification	mol H+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Eutrophication, aquatic freshwater	kg Pe	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Eutrophication, aquatic marine	kg Ne	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Eutrophication, terrestrial	mol Ne	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Photochemical ozone formation	kg NMVOCe	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Abiotic depletion, minerals & metals	kg Sbe	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Abiotic depletion of fossil resources	MJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Water use	m³e depr.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comparing EPDs

DECLARED UNIT	
Declared unit	1 m²
Mass per declared unit	500 kg/m²

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4
GWP – total	kg CO2e	6,58E1	4,89E0	3,86E0	7,45E1	5,49E0	MND	MND	MND	MND	MND
GWP – fossil	kg CO2e	6,48E1	4,89E0	3,69E0	7,33E1	5,54E0	MND	MND	MND	MND	MND
GWP – biogenic	kg CO2e	9,83E-1	2,97E-3	1,49E-1	1,14E0	3,4E-3	MND	MND	MND	MND	MND
GWP – LULUC	kg CO2e	1,78E-2	1,73E-3	1,4E-2	3,36E-2	1,96E-3	MND	MND	MND	MND	MND
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

One Click LCA

Carbon footprint and LCA gives points in green building certifications

LCA: 3 + 1 pistettä
EPDs: 2 pistettä

LCA: 5 + 1 credits
LCC: 3 credits
EPDs: 1 + 1 credits

World's Most Sustainable Office Building – UK (BREEAM)

One Click LCA was used to calculate LCA for the World's Most Sustainable Office Building, Bloomberg's New European Headquarters.

Zoo Atlanta Savanna Hall and Exhibit – US (LEED)

Read this case study on Life Cycle Assessment for LEED v4 and find out how Epsten Group used One Click LCA for their Savannah Hall project.

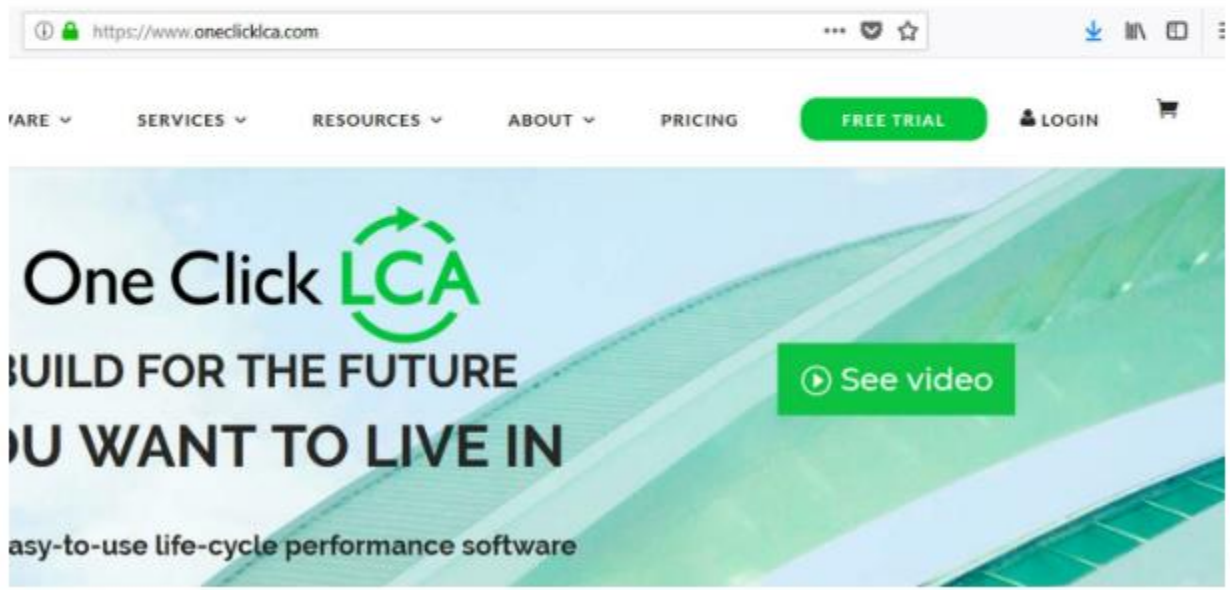
Shopping center I3 – Finland

Granlund has used One Click LCA to measure Life-Cycle metrics for their Kauppakeskus I3 project in Finland.

One Click LCA

Create account

1. Go to oneclicklca.com
2. Choose “Login” from the right corner of the page
3. In the login form choose “New user? Register here!”
4. Fill in your information
5. Activate the account from the link in your email
6. Log in to One Click LCA using the same login form

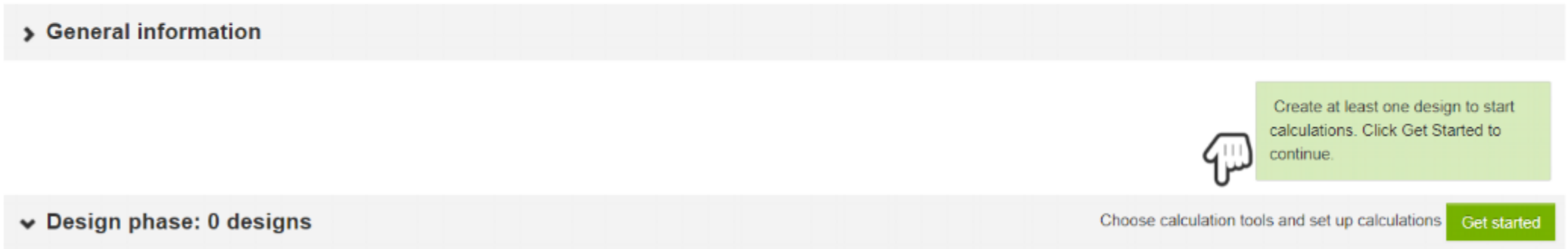


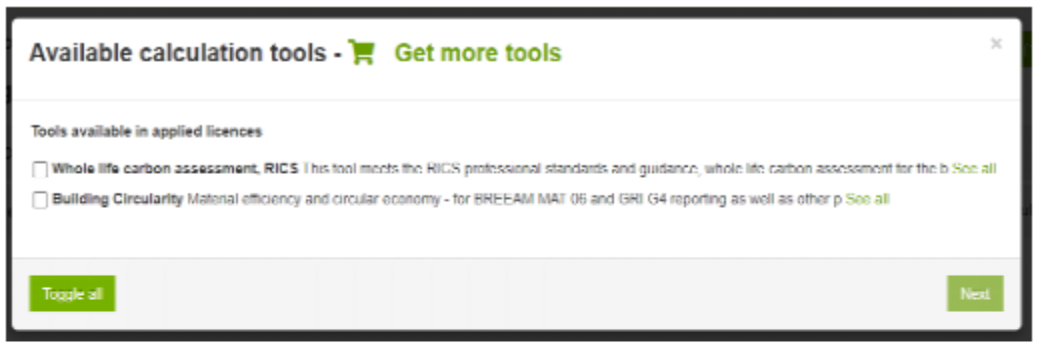
Create project and activate licence

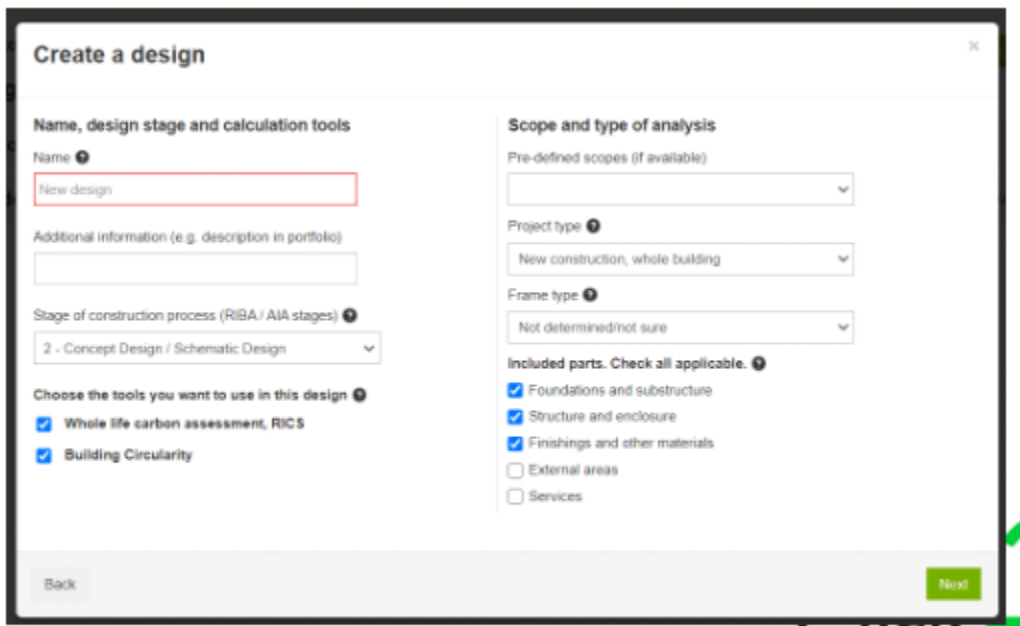
1. Select “Create a new project”
2. Select “Building”
3. Choose building and add basic information for your own building and save.
4. Activate your licence by typing the licence key provided by your teacher.
5. Press “Get started” and add the Level(s) tool.

Getting started – Inside the project

1/ Click on "Getting Started" button and
2/ name your 1st design



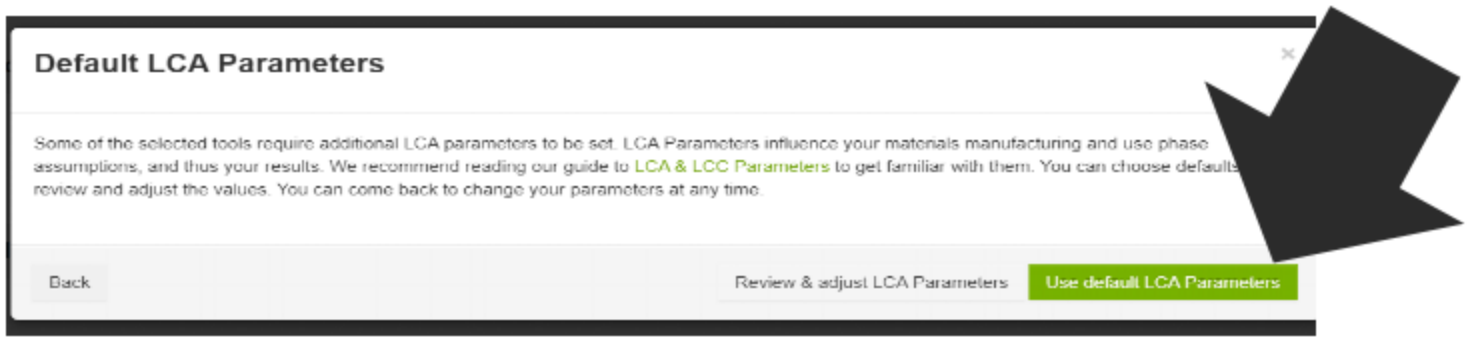


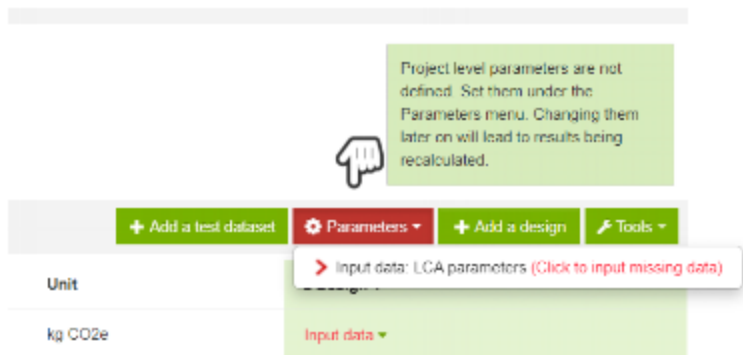


Getting started – Approve or review parameters

3/ You can confirm “Use default LCA Parameters” or Review

- Default choices are almost always what you need
- Can always be edited and project is recalculated





All set to start adding data to your 1st DESIGN