IEA ANNEX 57

Guidline for Construction Product Manufacturers

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Guideline for Construction Product Manufacturers

Generating and Providing Embodied Energy and Global Warming Potential related Information – Recommendations for Construction Product Manufacturers

WORLD SBE HONG KONG 2017
WORLD Sustainable Built Environment Conference
Organisers:
CONSTRUCTION INDUSTRY COUNCIL 建造業議會
HKGBC 香港綠色建築議會
SBE SERIES
International Co-owners:
CIB
iiSBE
UNEP Sustainable Buildings and Climate Initiative
FIDIC
Global Alliance for Buildings and Construction

Generating and Providing Embodied Energy and Global Warming Potential related Information – Recommendations for

Construction Product Manufacturers // with focus on small and medium-sized manufacturing enterprises (SMEs)

00 What is needed to assess Embodied Impacts of construction products?

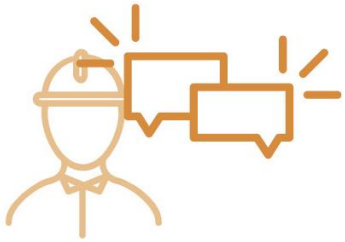
PART 01 — THE IMPORTANCE OF CONSIDERING EMBODIED IMPACTS AS AN ADDITIONAL ASPECT IN YOUR DAILY PRACTICE

01 — FROM PAGE 07

PART 02 — BASICS, TERMS AND DEFINITIONS

02 — FROM PAGE 19

PART 03 — STEPWISE QUANTIFICATION AND ASSESSMENT PROCESS OF EMBODIED IMPACTS



03 — FROM PAGE 33

PART 01

01 — FROM PAGE 07

PART 01 — THE IMPORTANCE OF CONSIDERING EMBODIED IMPACTS AS AN ADDITIONAL ASPECT IN YOUR DAILY PRACTICE

- Embodied impacts — an additional aspect in the manufacturing and marketing process for construction products
- The role of manufacturers in the supply chain
- Application possibilities

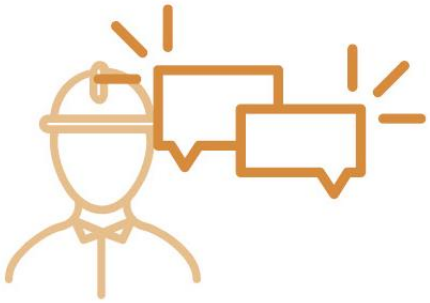
PART 02

02 — FROM PAGE 19

PART 02 — BASICS, TERMS AND DEFINITIONS

- The concept of embodied impacts
- Terms and definitions
- State of standardization
- Implications of the choice of object of assessment
- Modelling of the product life cycle
- The perspective of upstream and downstream processes
- The indicators
- Available data sources

PART 03



03 — FROM PAGE 33

PART 03 — STEPWISE QUANTIFICATION AND ASSESSMENT PROCESS OF EMBODIED IMPACTS

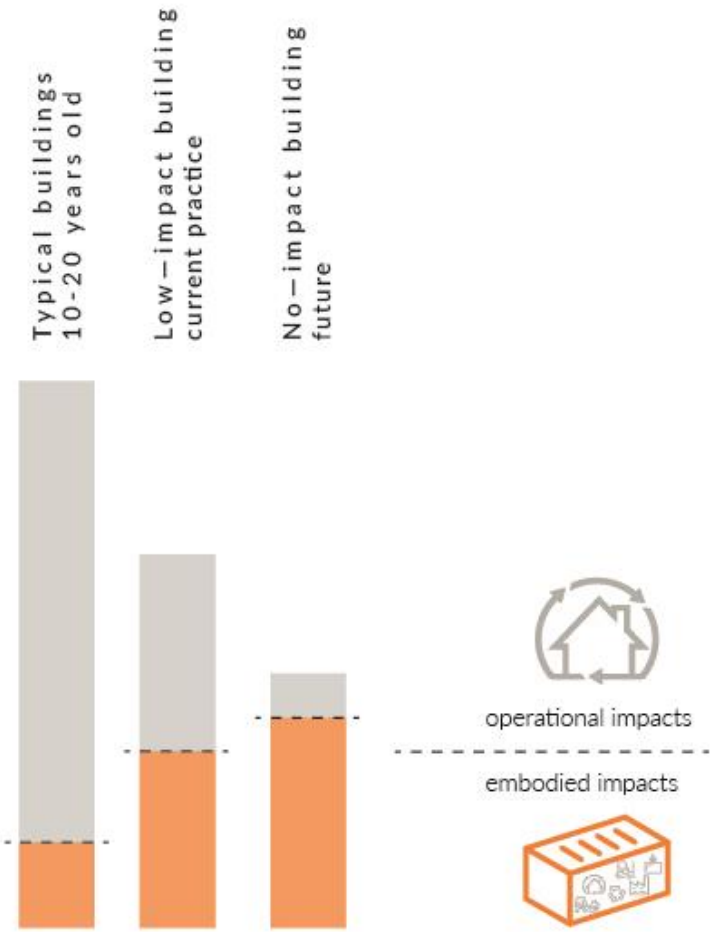
- Description of the product
- Selection and description of the system boundaries
- Collection, processing and presentation of information on individual life cycle stages
- Compilation and analysis — reporting and communication

PART 01

01 — FROM PAGE 07

PART 01 — THE IMPORTANCE OF CONSIDERING EMBODIED IMPACTS AS AN ADDITIONAL ASPECT IN YOUR DAILY PRACTICE

PART 01 Operational & Embodied Impacts



PART 01 Embodied Impacts as a result of different Life Cycle Stages

- A1 Raw material supply
- A2 Transport
- A3 Manufacturing
- A4 Transport
- A5 Construction — installation process
- B1-B4 Maintenance, repair & replacement
- C1-C4 Deconstruction, transport, waste processing & disposal
- D *Recovery, reuse, recycling potential*

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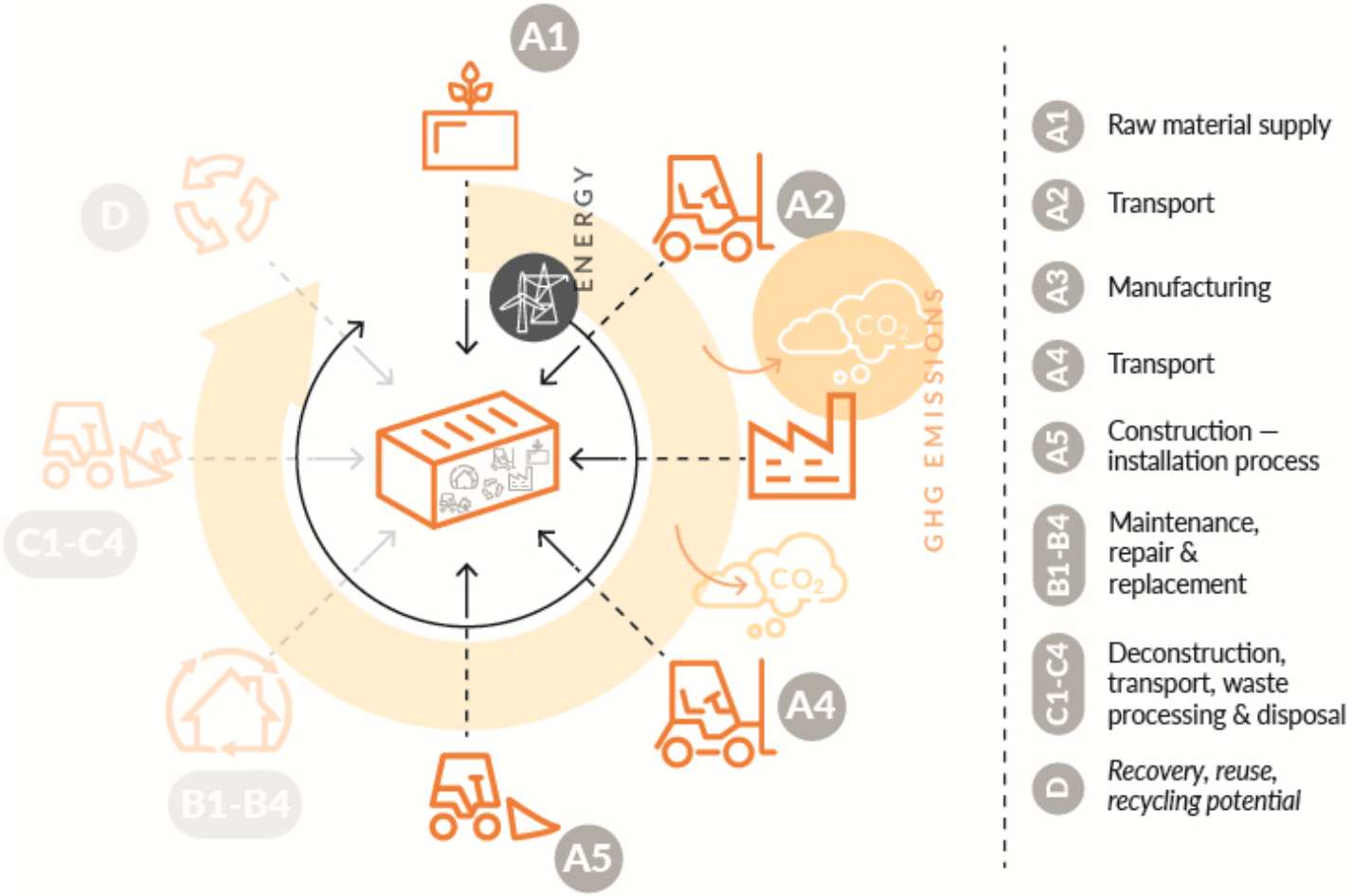

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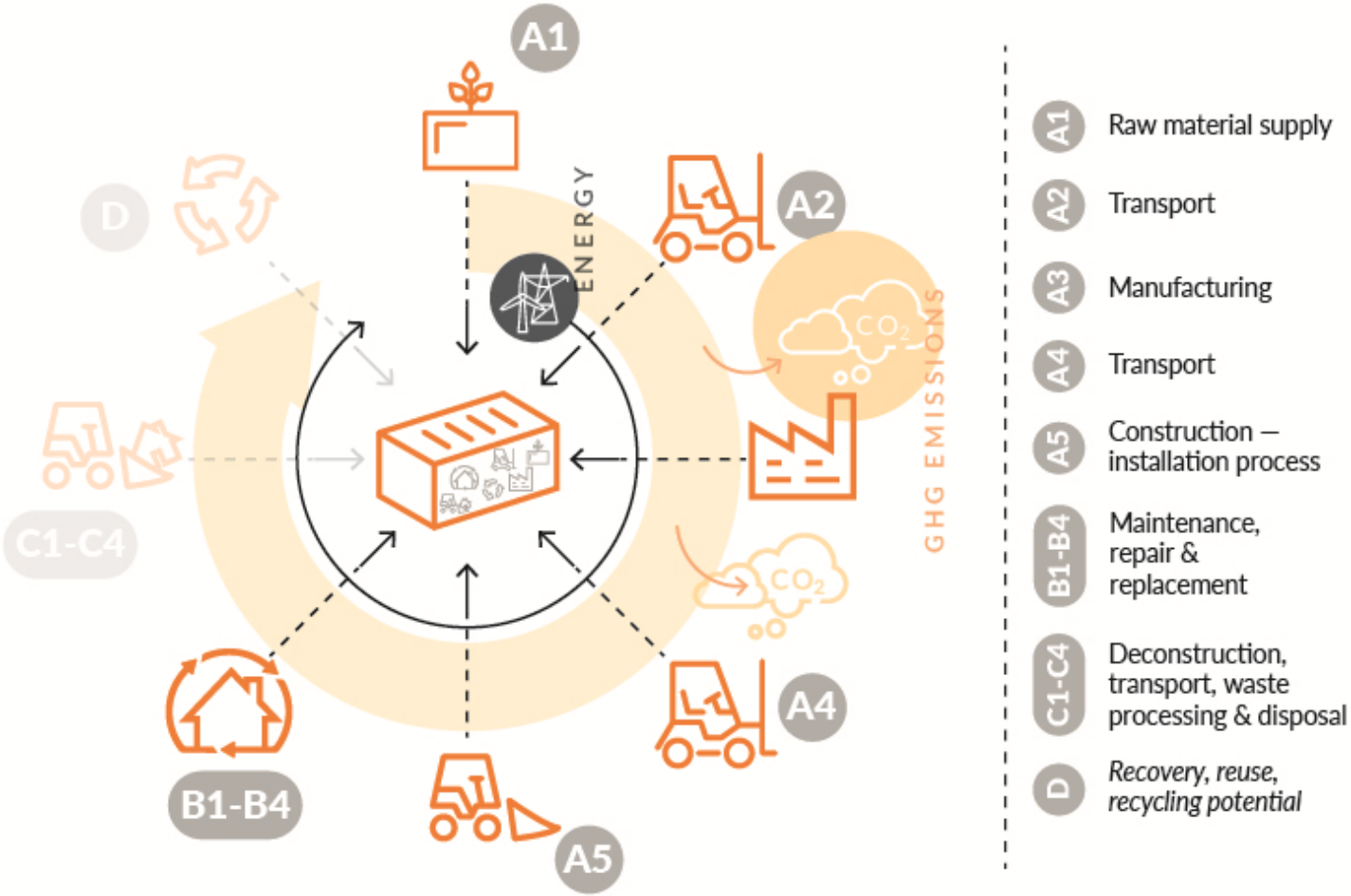

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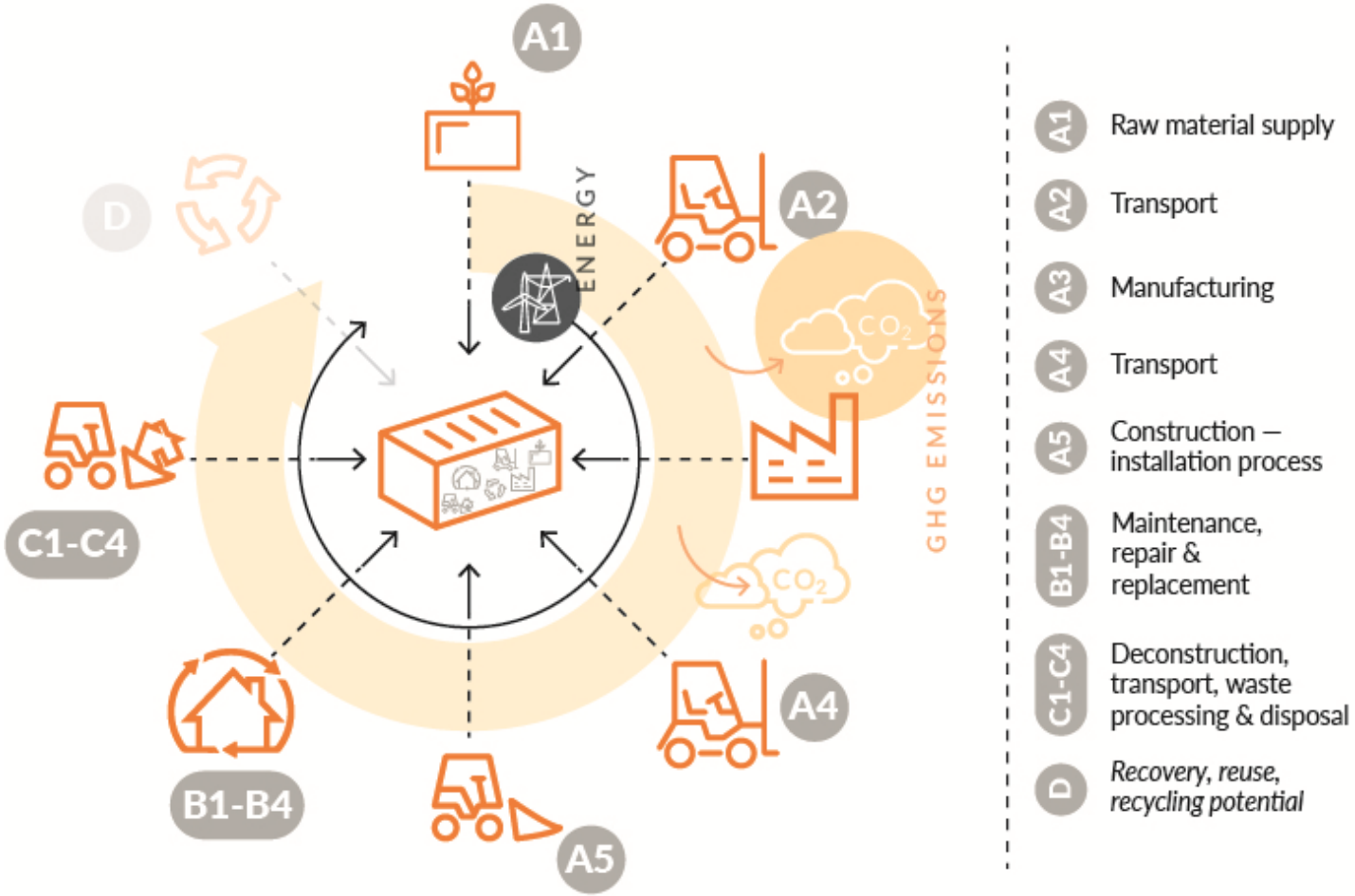

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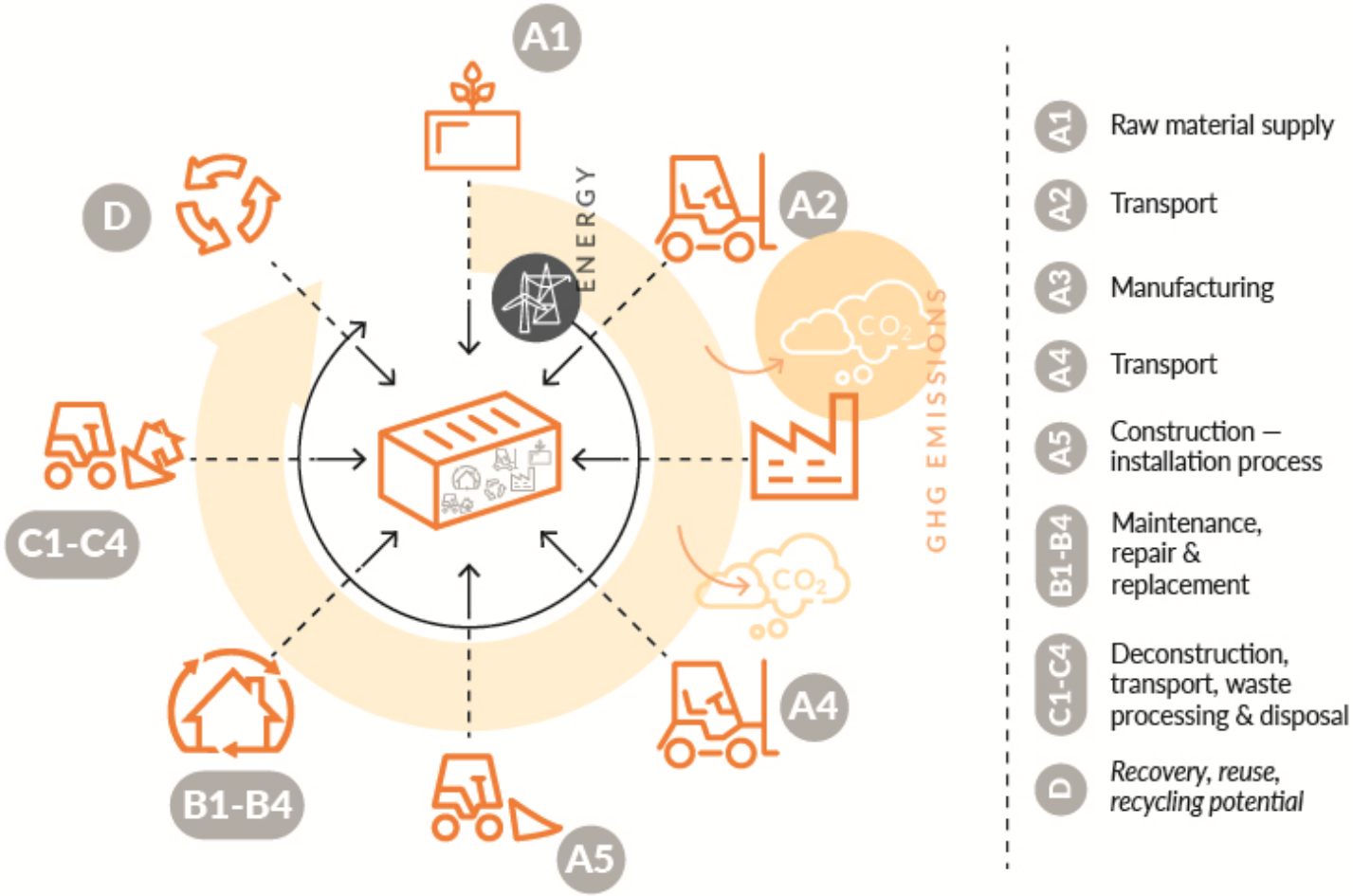
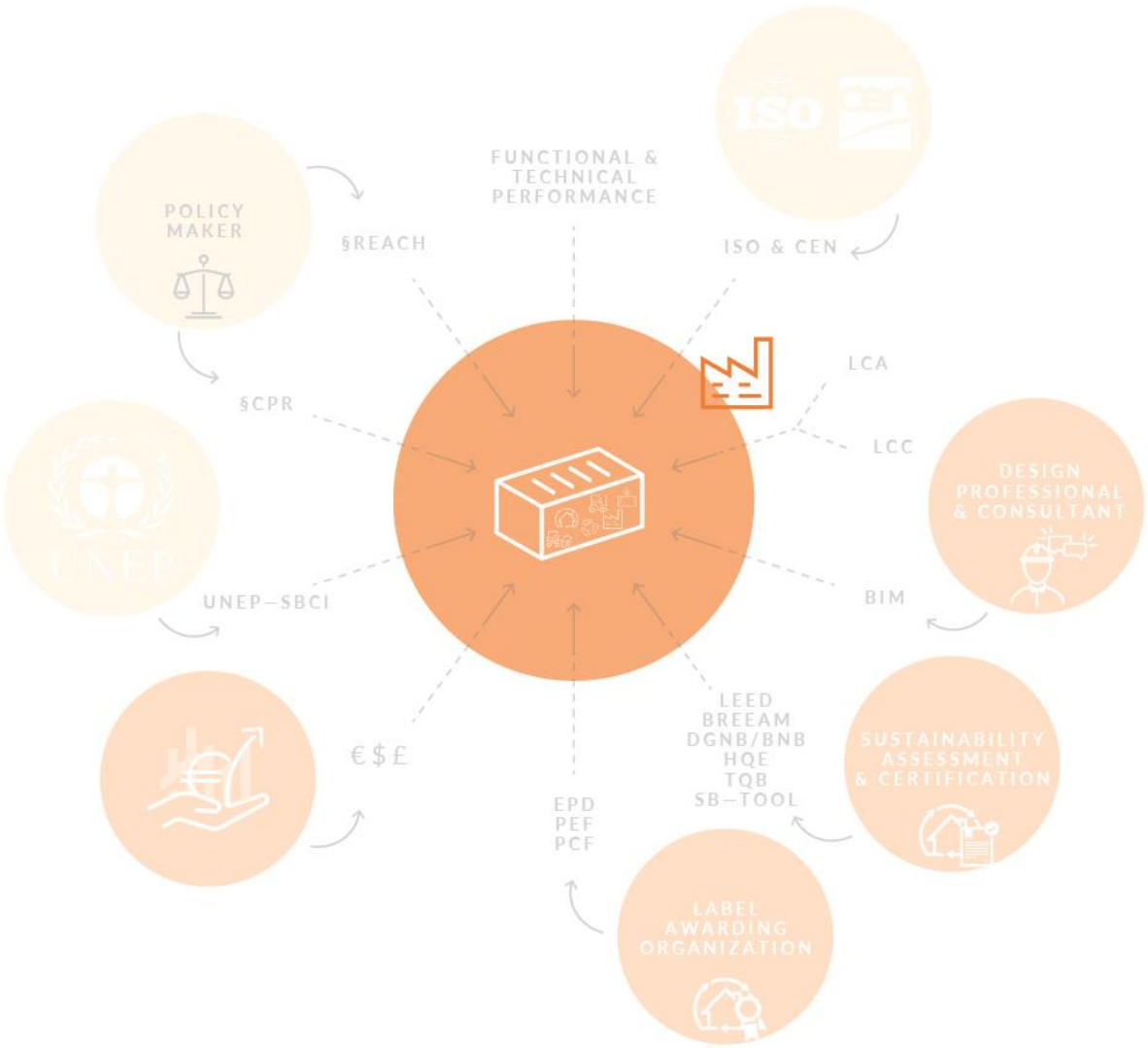


PART 01 Influences on construction products



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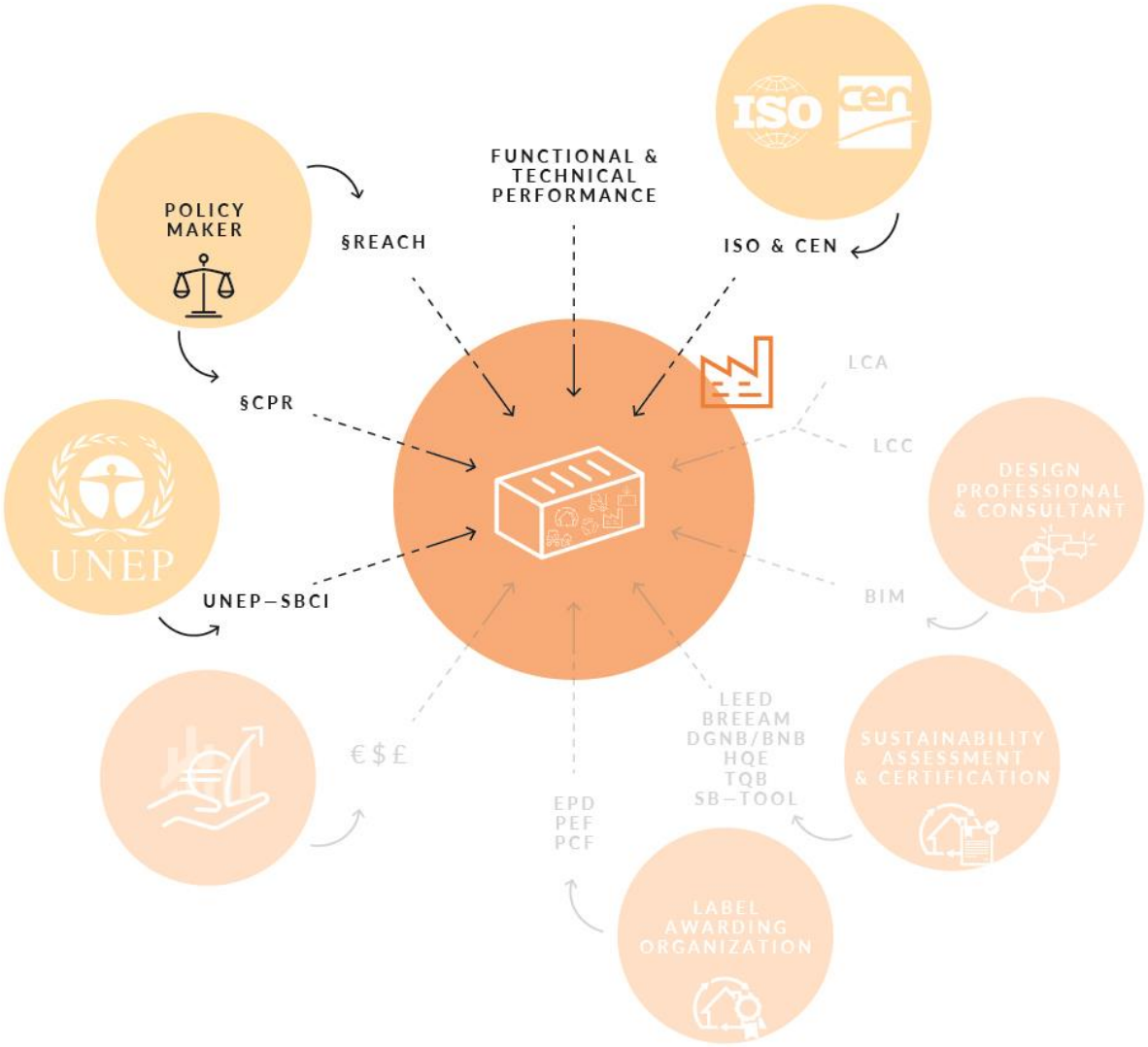

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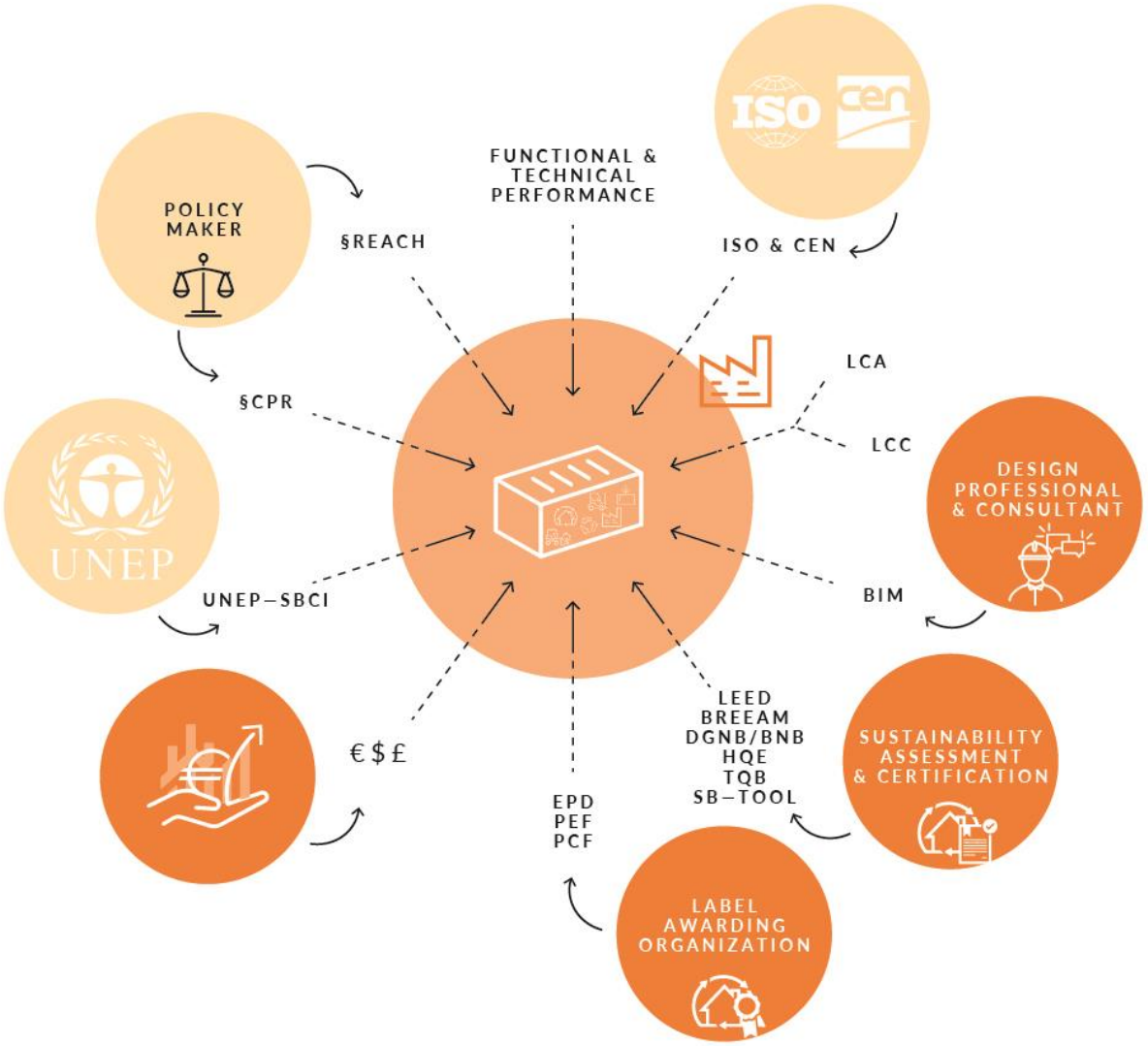

PART 01 The role of Construction Product Manufacturers in the Supply Chain

CONSTRUCTION
PRODUCT
MANUFACTURERS

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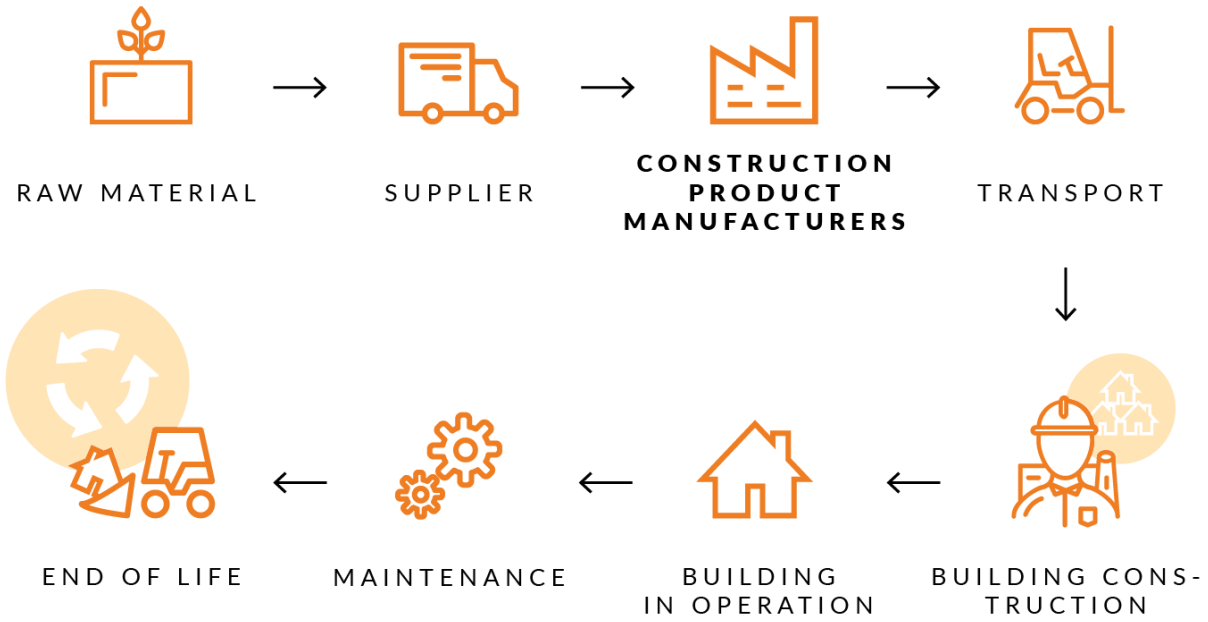

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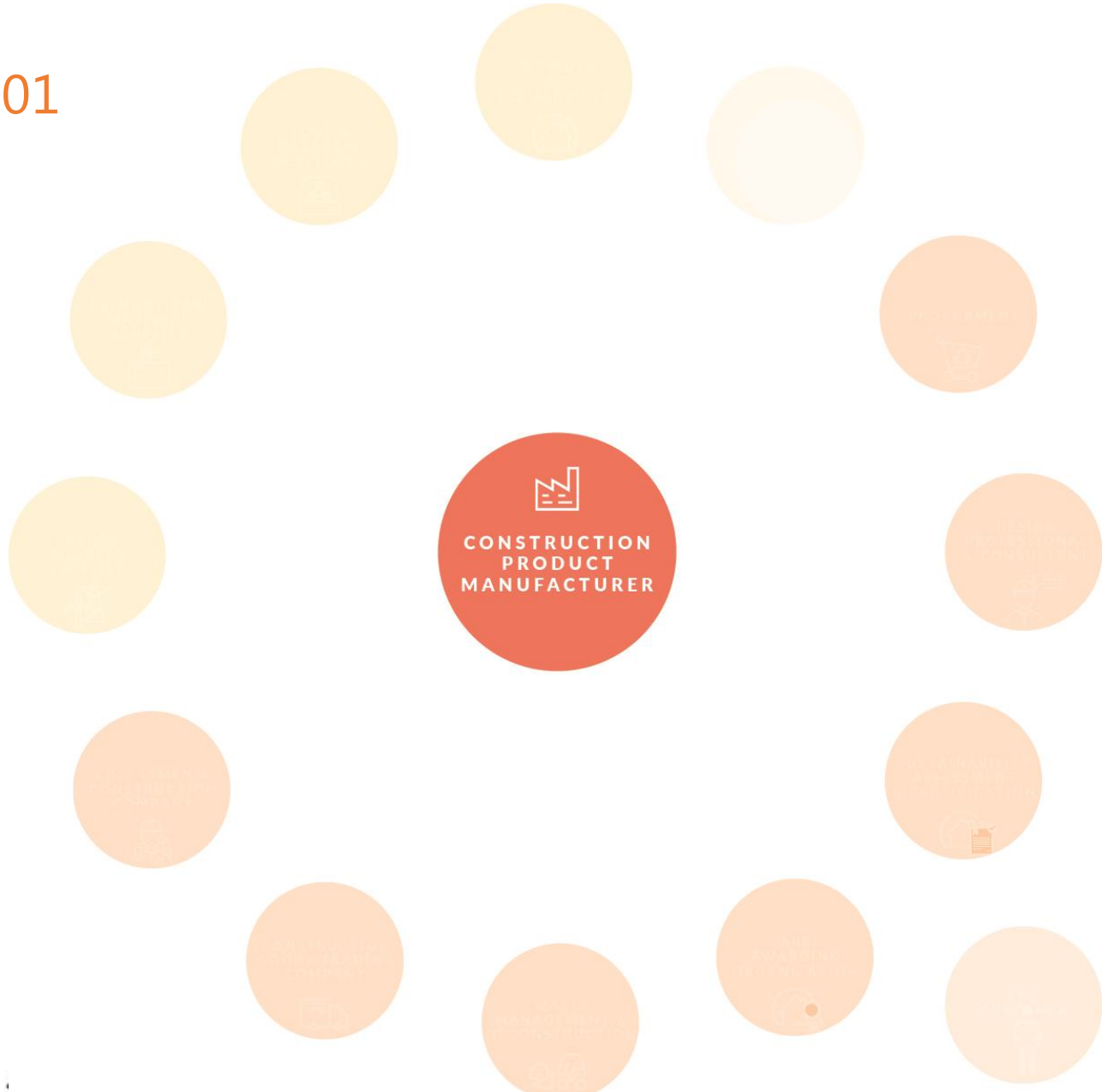

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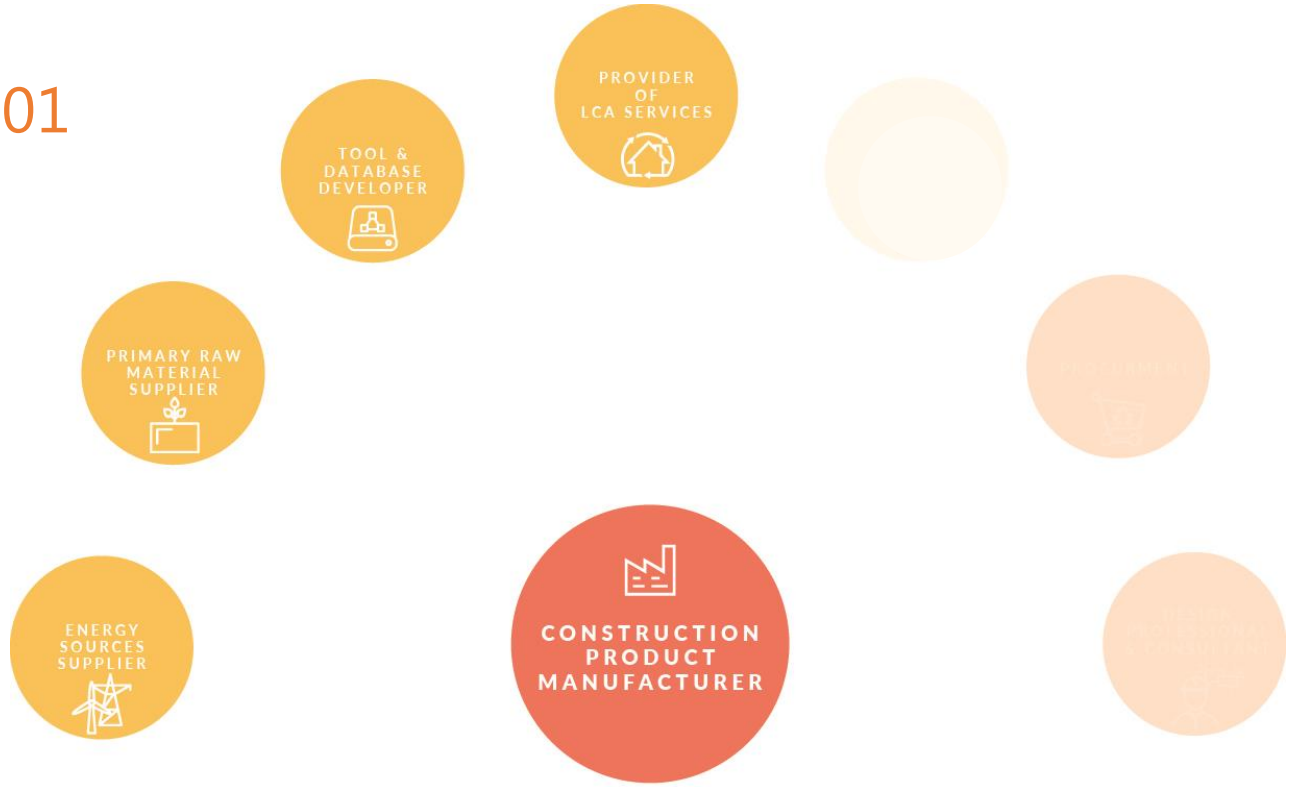
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TOOL & DATABASE DEVELOPER
PRIMARY RAW MATERIAL SUPPLIER
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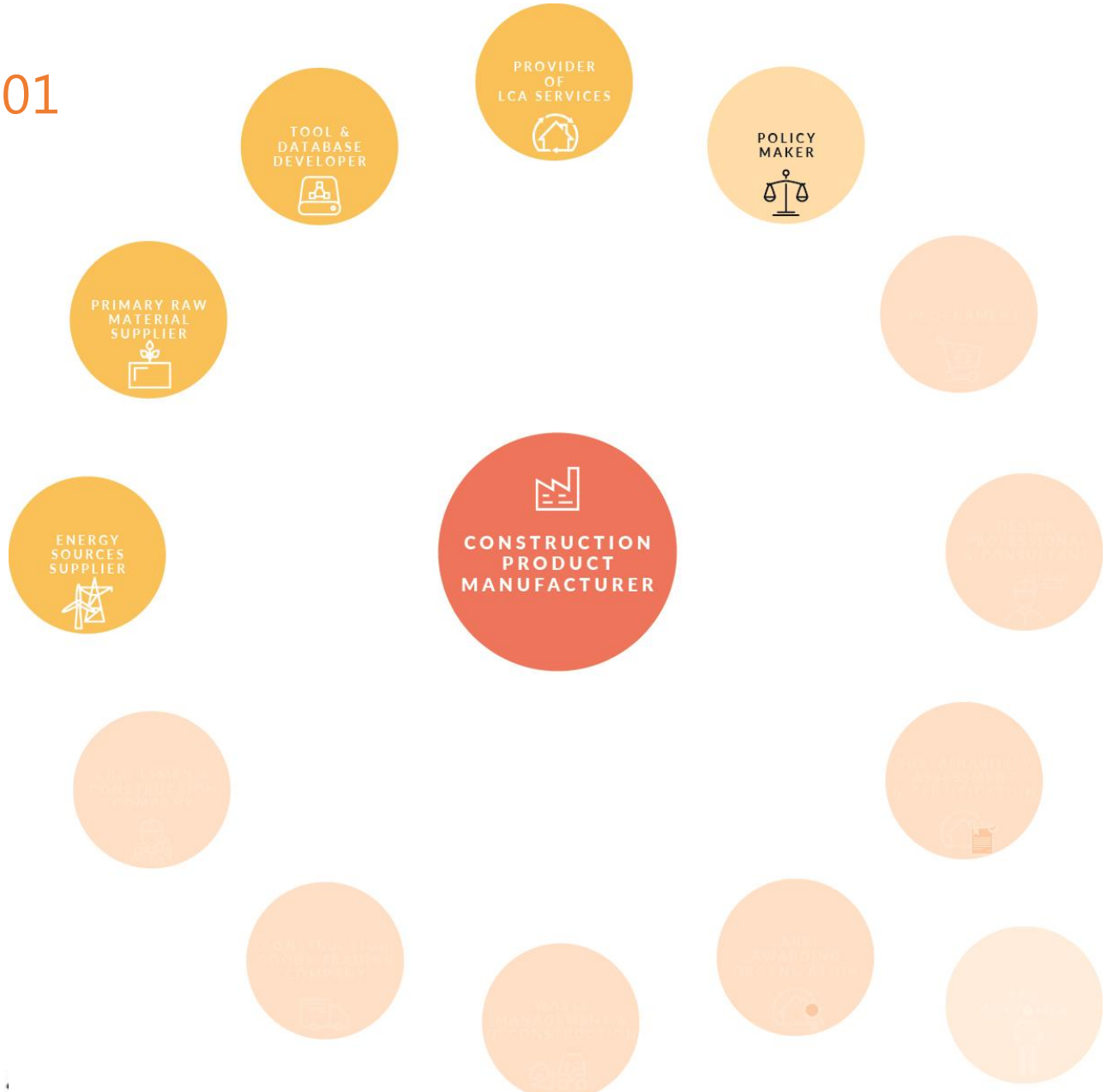
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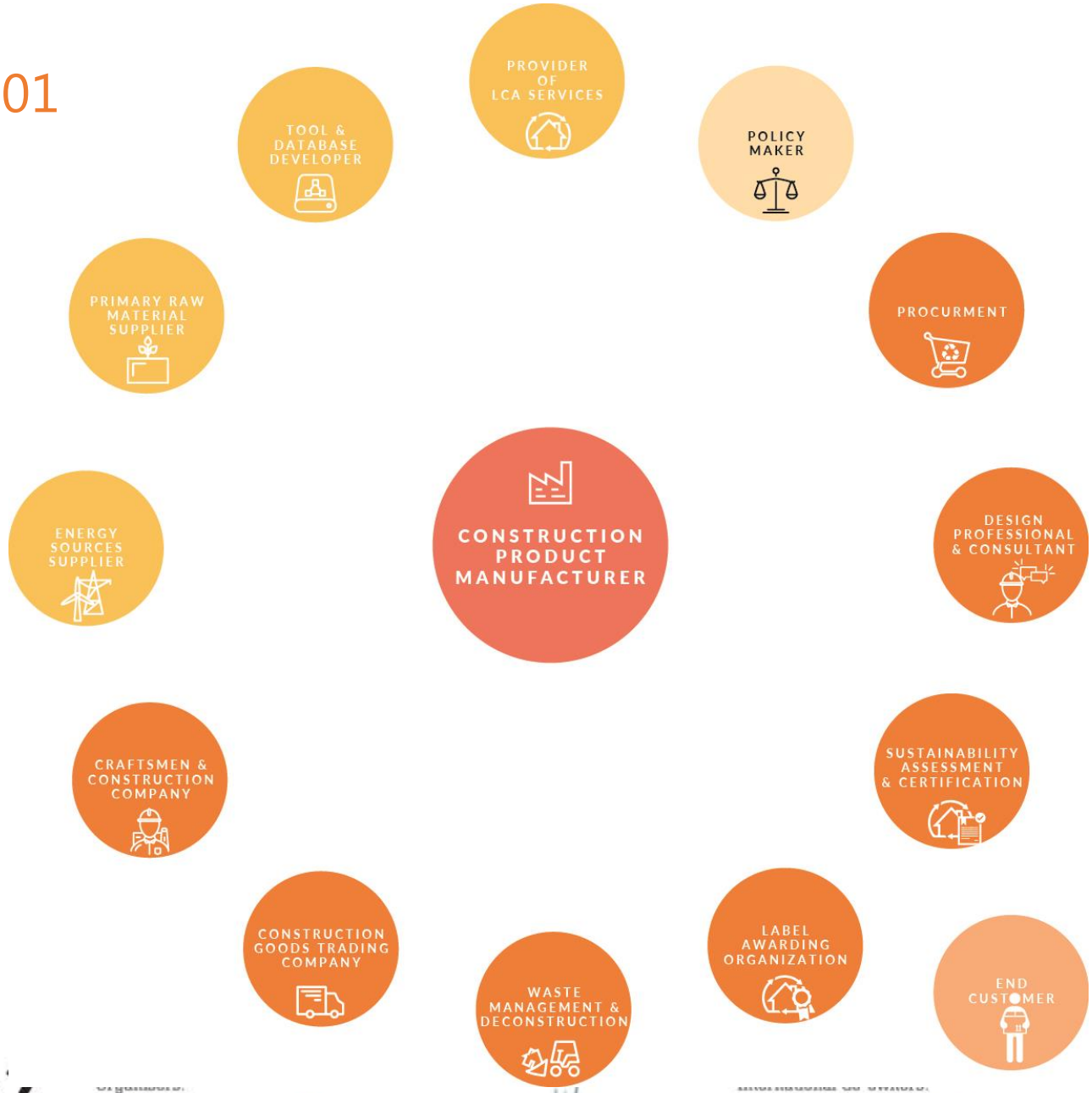
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WASTE MANAGEMENT & DECONSTRUCTION
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PART 01


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PART 01 How to combine business goals & sustainability?

BUSINESS GOAL	DESCRIPTION
Climate change management	Identify energy and environmental related risks in product's life cycle
	Hotspot and risk analysis from fluctuations in energy and material availability
Hotspot analysis and performance tracking	Assess and report of environmental product performance
	Strategic product-related reduction of embodied impacts Lift cost-saving opportunities through reduction of embodied energy and related impacts
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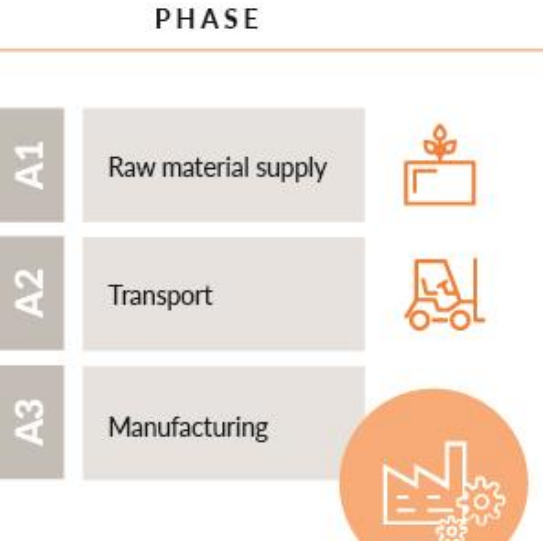
Customer and supplier management	Assess supplier performance for embodied impacts
	Reduce embodied impacts in the supply chain
	Marketing of environmental performance
	Provide additional products related information
Improvement of market competitiveness and product unique selling proposition	Identify new market opportunities
	Strengthen company image regarding environmental performance
	Redesign of products to better respond to customer and policy preferences
	Achieve competitive advantage by pursuing embodied impacts reduction opportunities

PART 01 Application Possibilities



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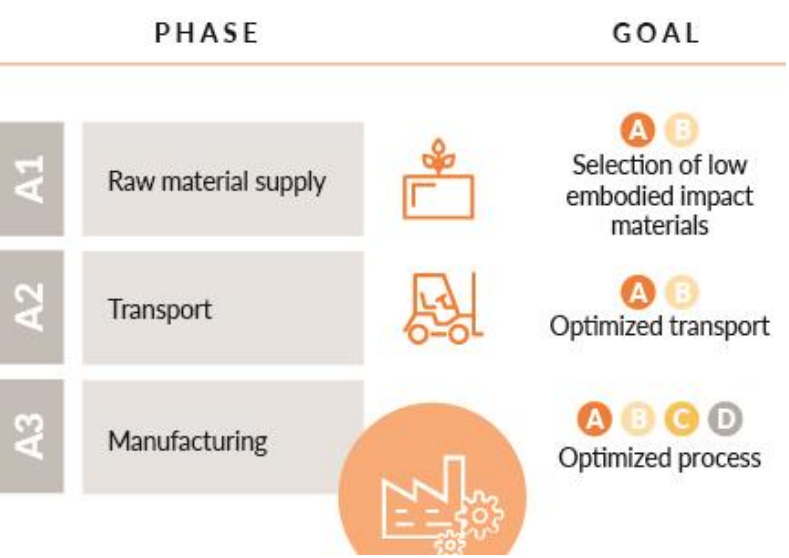

PART 01 Application Possibilities

PHASE		GOAL	COURSE OF ACTION IN RELATION TO EMBODIED IMPACTS & APPLIED METHODS
A1	Raw material supply	A B Selection of low embodied impact materials	– Extended comparison of raw material options – Include information from EPD's | environmental labels pf primary products
A2	Transport	A B Optimized transport	– Extended comparison of transport options – Prefer of locally produced raw and primary products – Avoidance of empty runs – Include information from EPD's | environmental labels pf primary products
A3	Manufacturing	A B C D Optimized process	– Implementation of process optimized approach during manufacturing – Thinking of improvement strategies for dismantling, reuse and recycling – Include information from EPD's | environmental labels pf primary products – Life cycle documentation for integrated planning process – Use of maturity assessments to improve efficient utilization of materials

A B C D

Multi criteria decision making

Environmental product declaration & labeling

Life cycle approach

Maturity assessment

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			BENEFITS IN PRODUCT STAGE
			– Optimized project chain (identification of weaknesses) – Cost reduction (i.e. materials, external, transport, etc.) – Protection of natural ressources – Decreased energy consumption and CO_2 emissions – Contribution to CPM sustainability report and basis for sustainability assessments – Provide life cycle information for relevant databases and a basis for ecolabeling and use in BIM – Increase of competitiveness

A B C D

Multi criteria decision making

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– Provide life cycle information for relevant databases and a basis for ecolabeling and use in BIM
– Increase of competitiveness

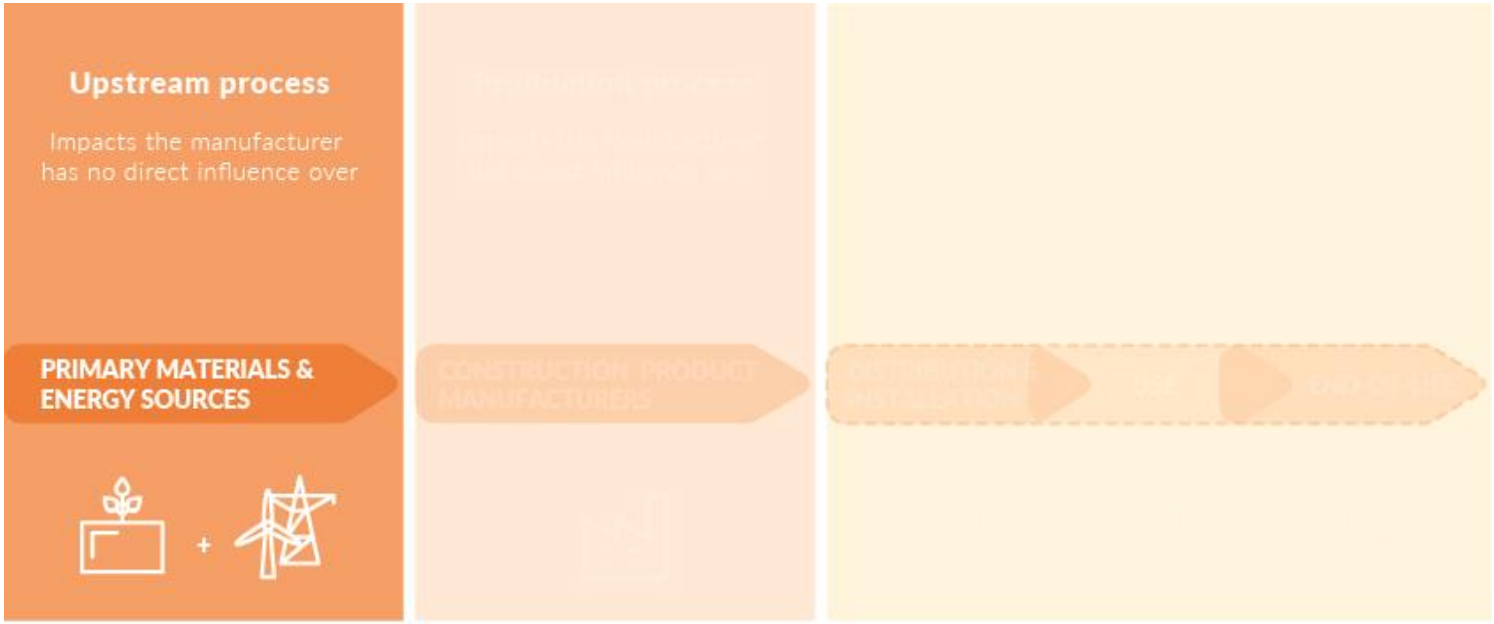
PHASE		GOAL	BENEFITS IN USE AND EOL STAGE	
A4	Transport	Optimized transport	– Less embodied impact product due to optimized packaging	
A5	Construction – installation process	Optimized assembling	– Less embodied impact due to improved product assembling	
B2-B4	Maintenance, repair & replacement	Optimized maintenance, repair and replacement	– Low embodied impact due to improved durability and/or easy handling during repair/replacement	
C1-C4	Deconstruction, transport, waste processing & disposal	Optimized dismantling	– Low embodied impact due to improved dismantling potential and have less waste generation	
D	*Recovery, Reuse, Recycling Potential*	Optimized reuse, recovery and recycling	– Low embodied impact due to high reuse, recovery, recycling potential	

PART 02

02 — FROM PAGE 19

PART 02 — BASICS, TERMS AND DEFINITIONS

PART 02 Product Life Cycle Accounting



PART 02 Product Life Cycle Accounting

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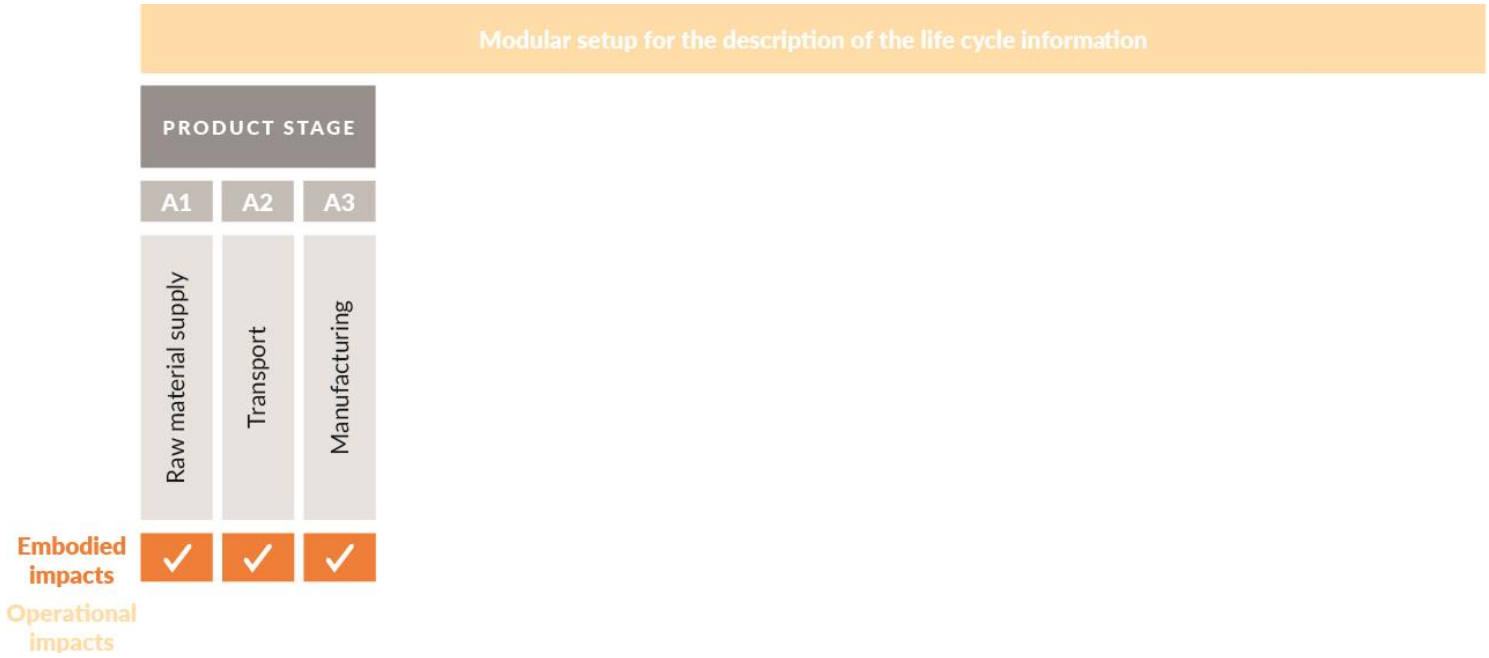
PART 02 Modular approach for the description of the product related Life Cycle Information



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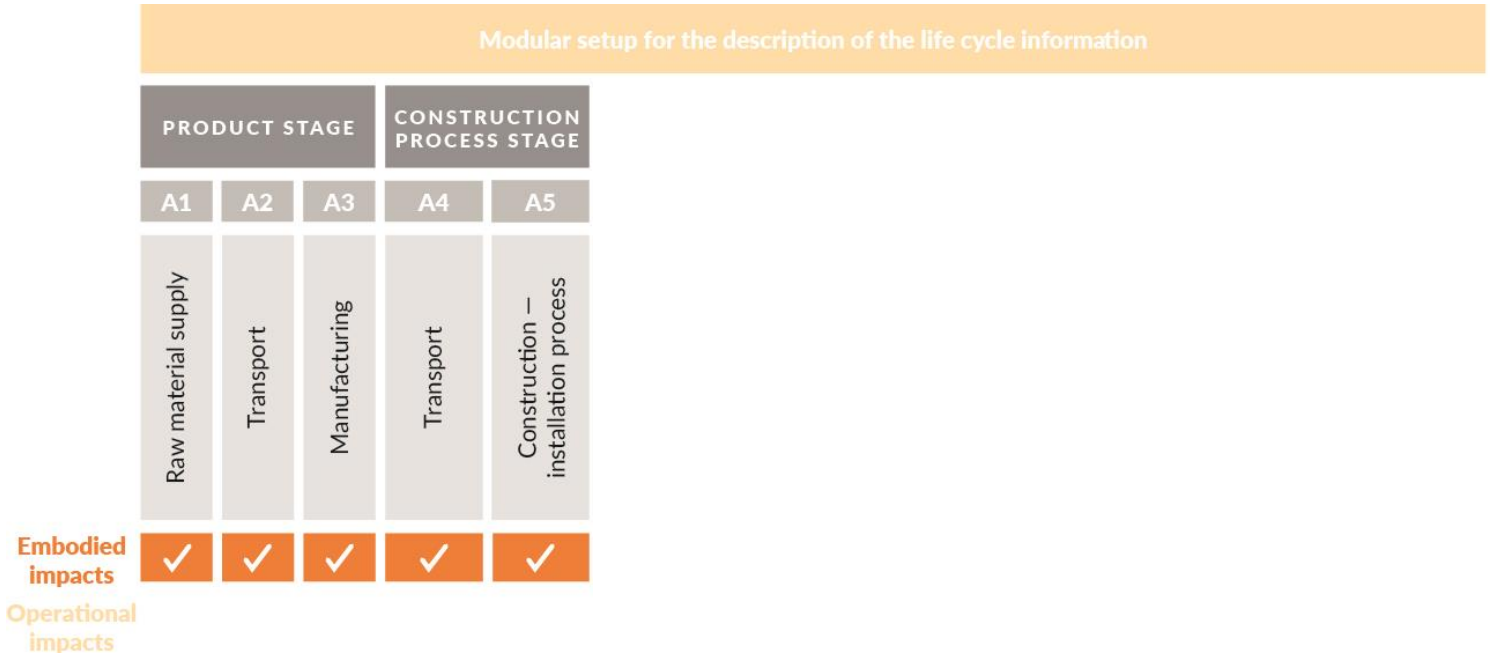

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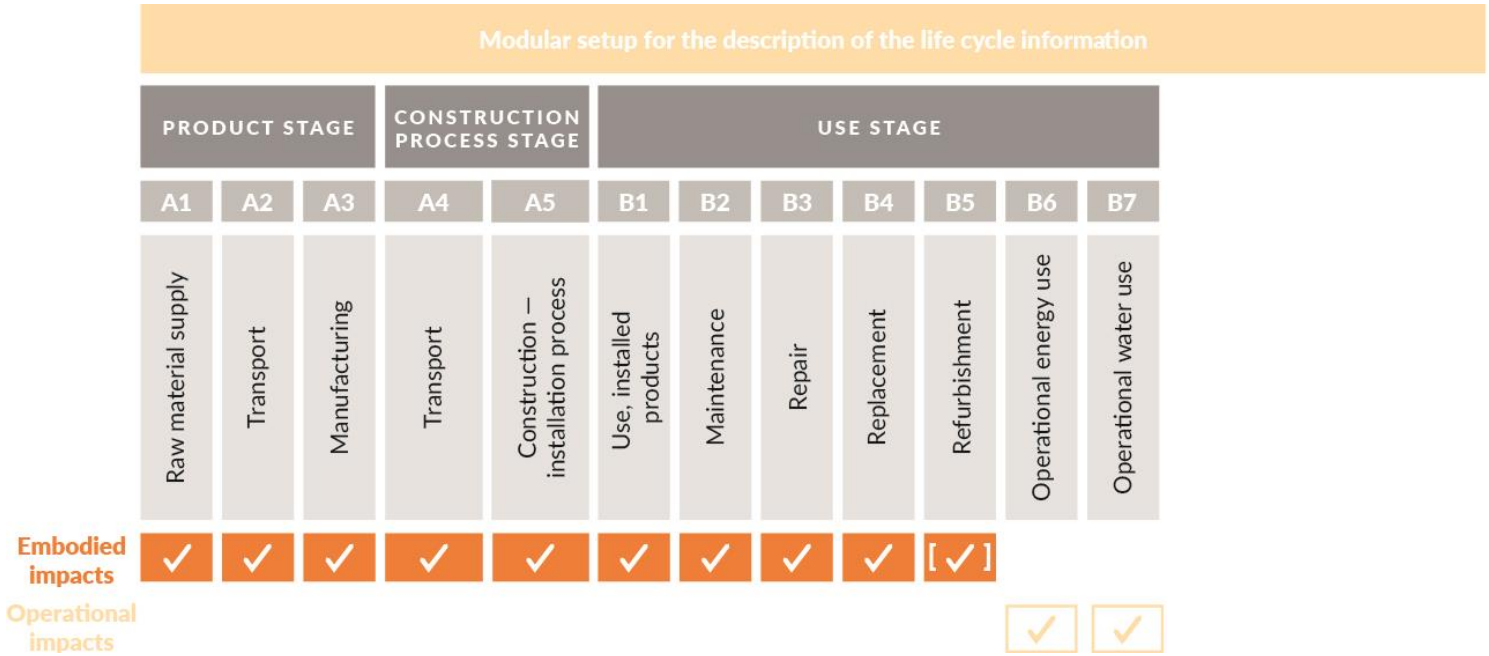

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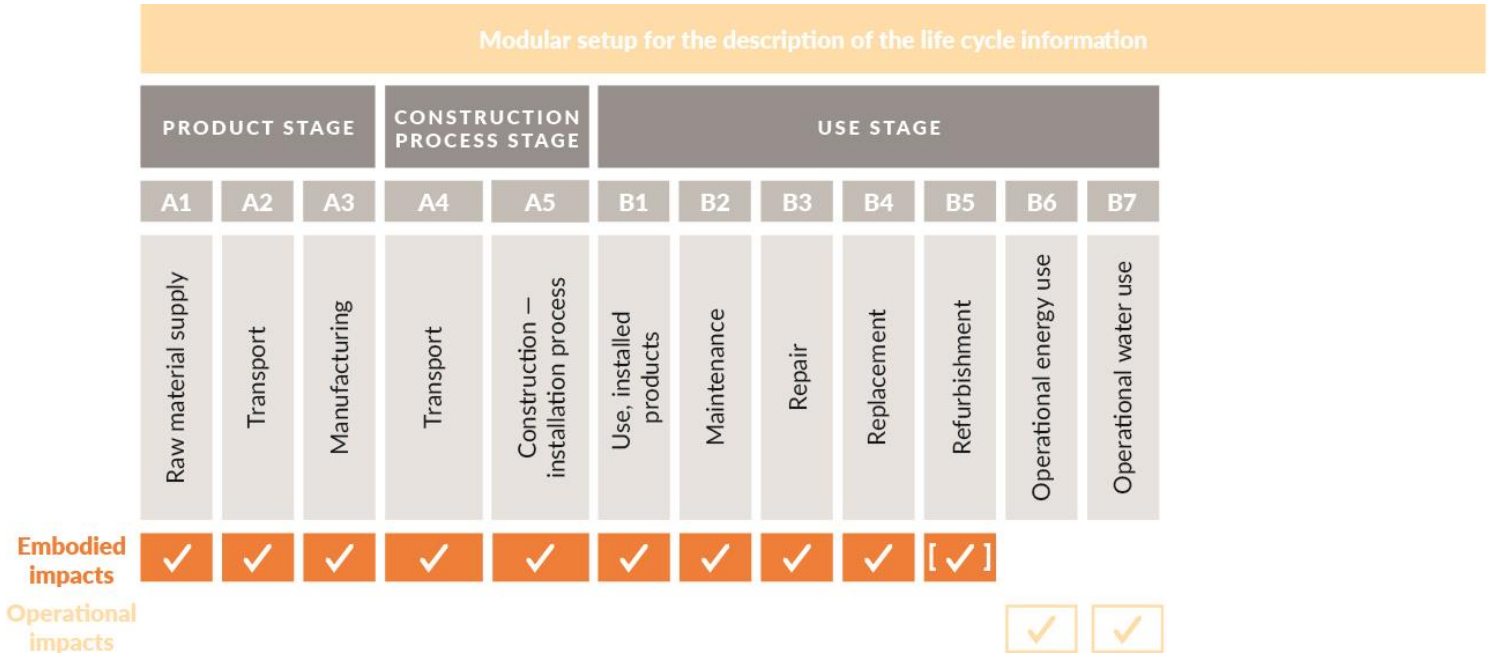

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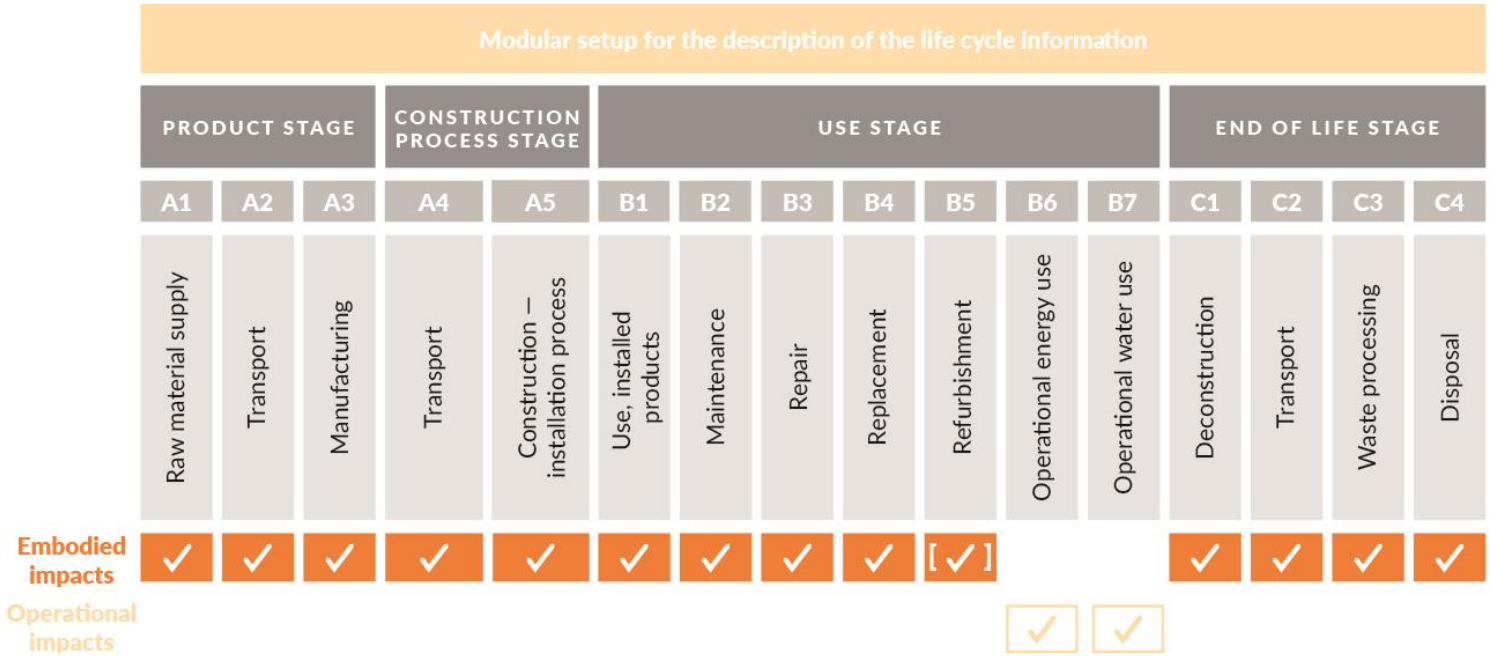

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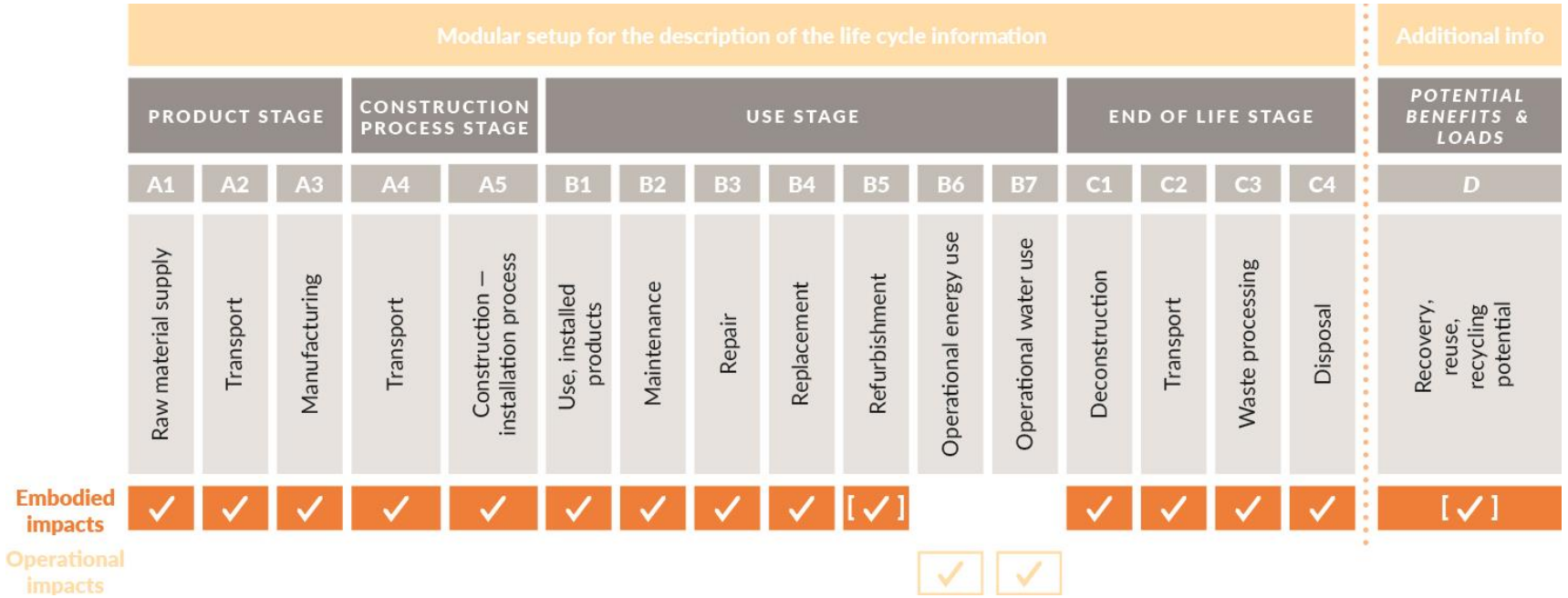

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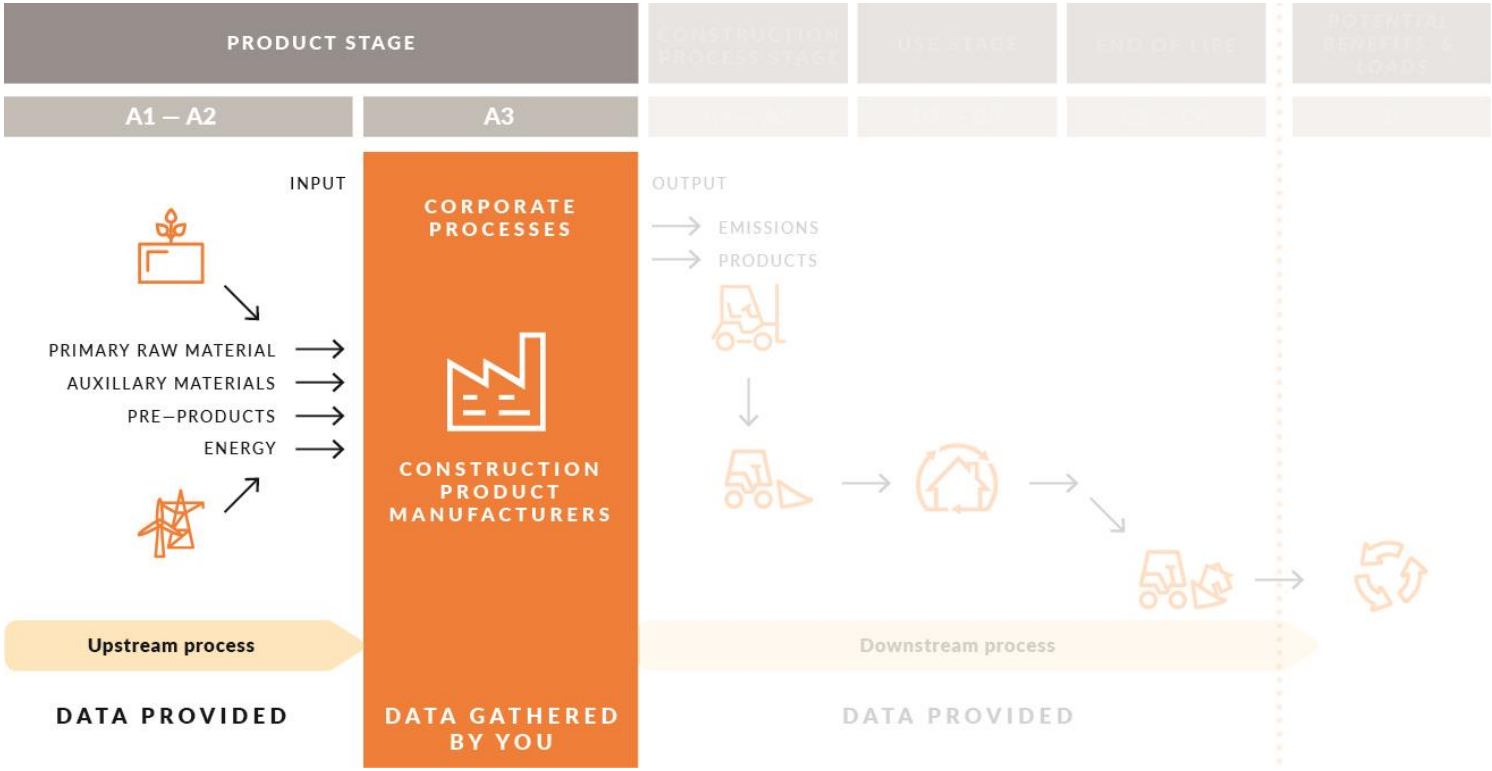

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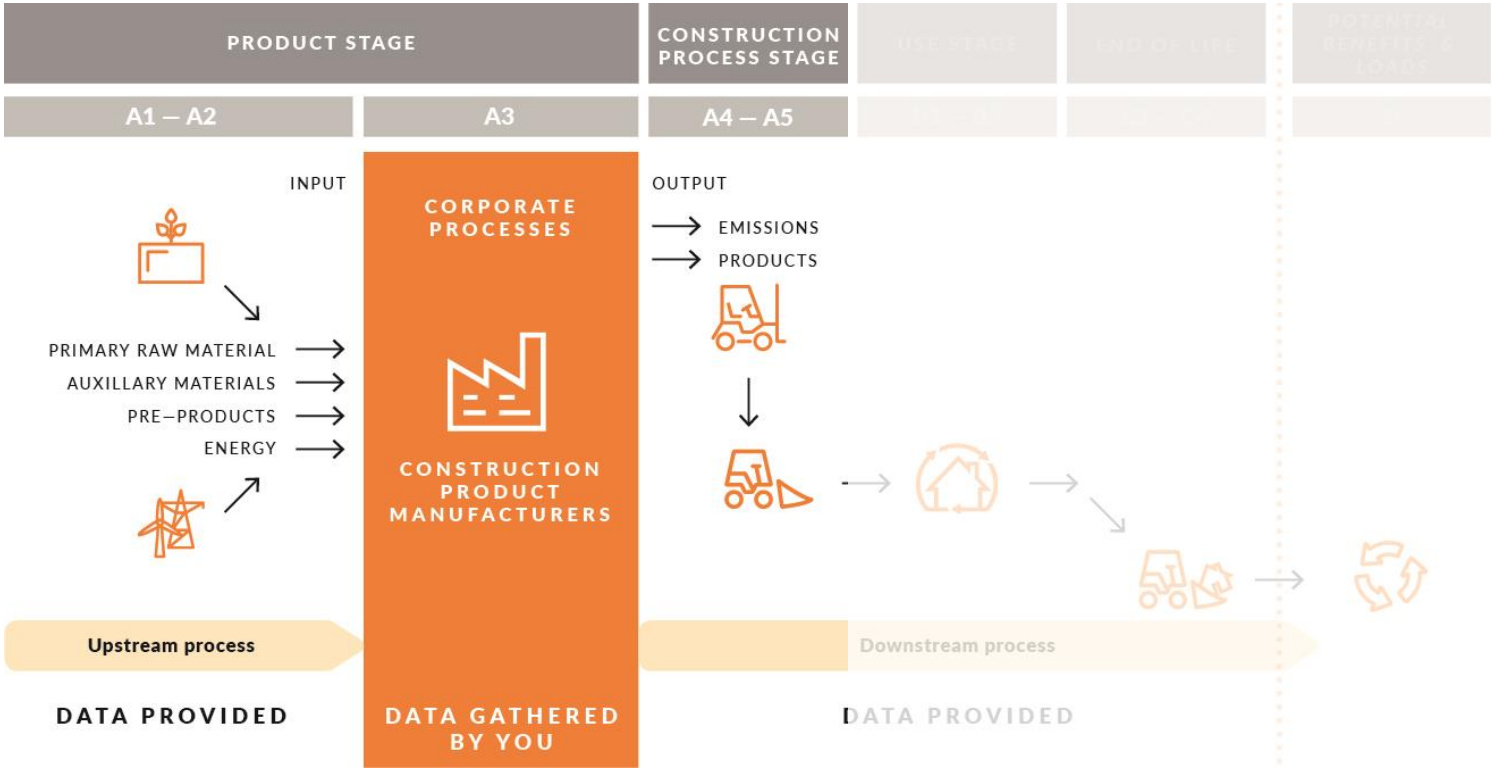

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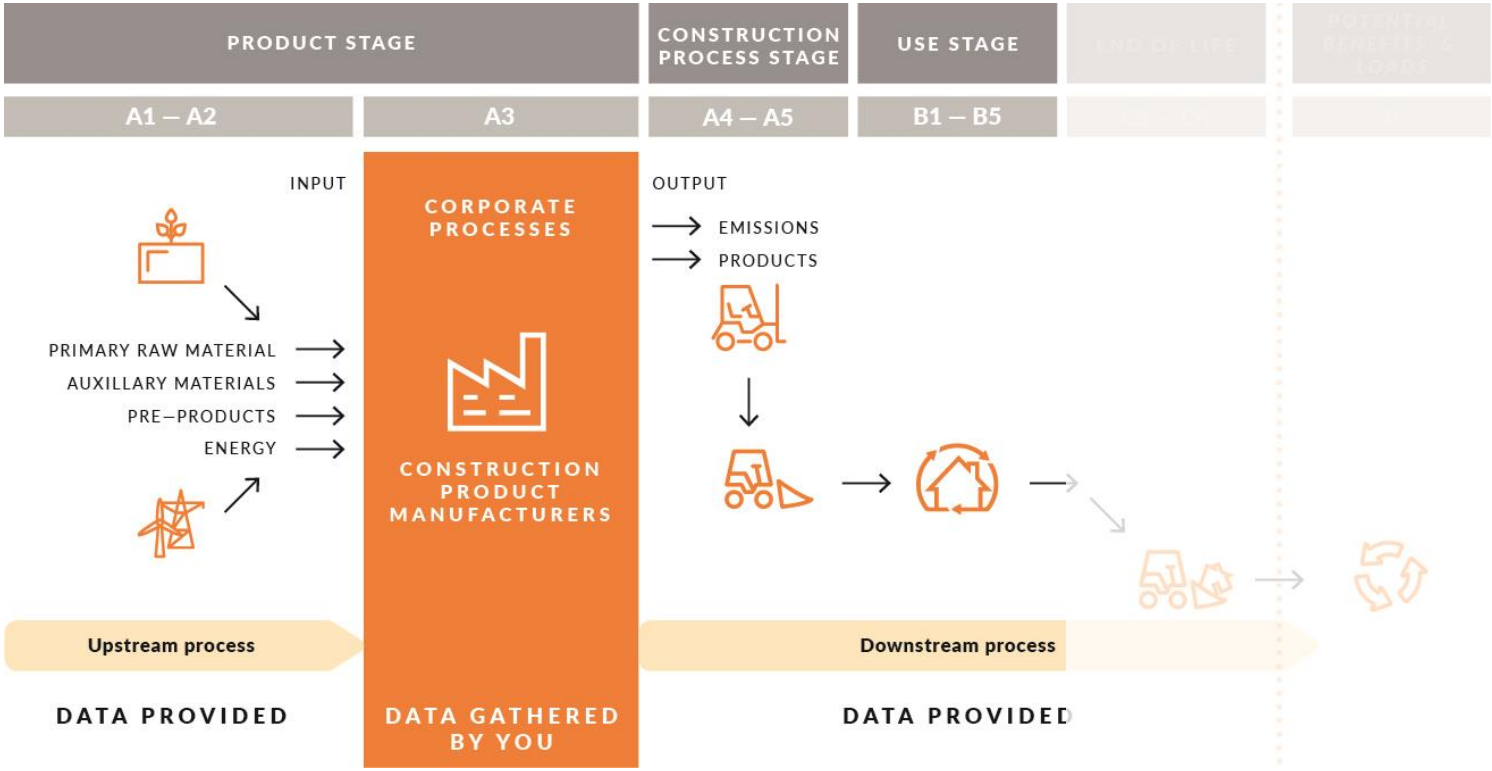

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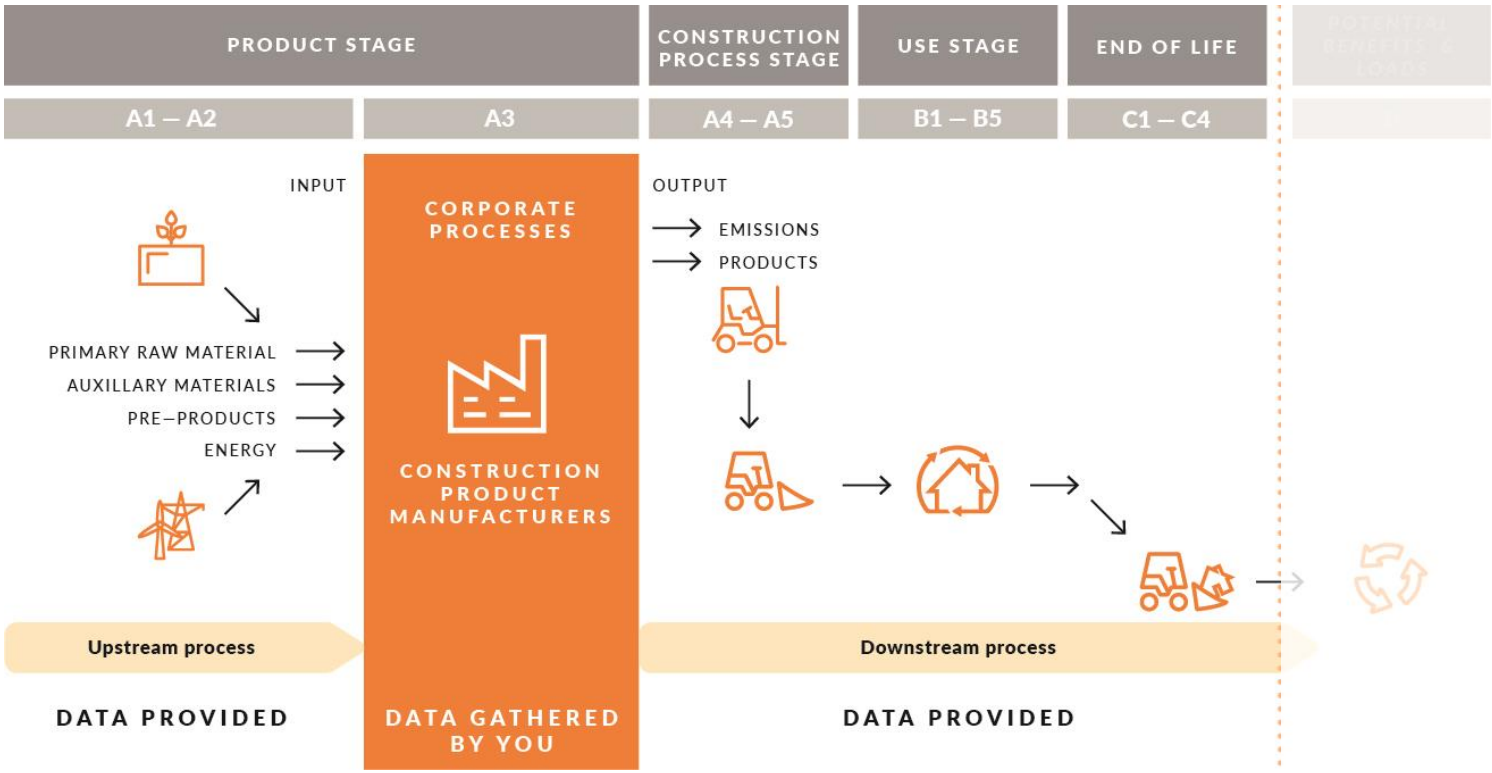

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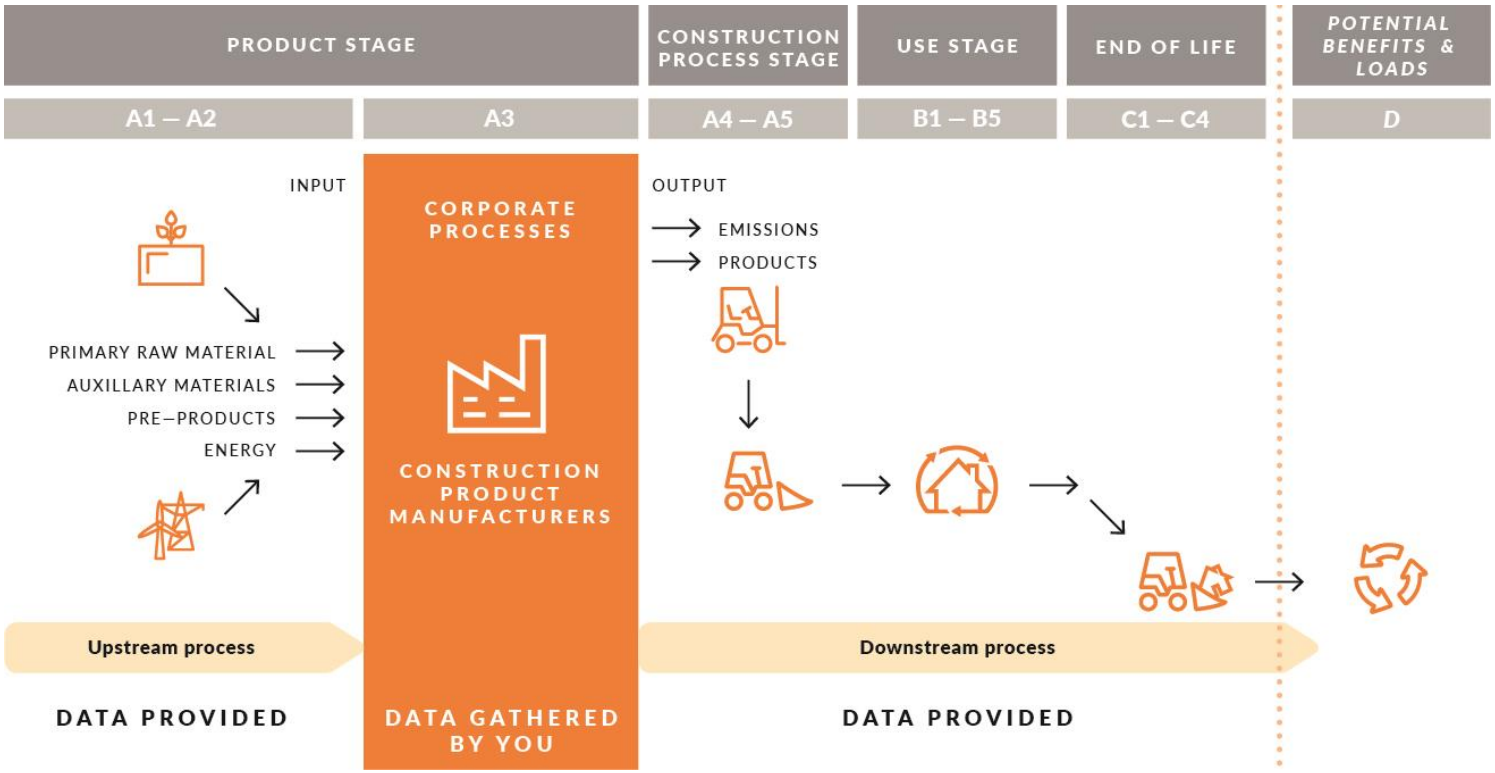
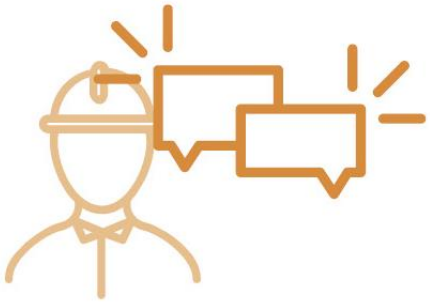


PART 03



03 — FROM PAGE 33

PART 03 — STEPWISE QUANTIFICATION AND ASSESSMENT PROCESS OF EMBODIED IMPACTS

PART 03 The Stepwise Quantification

1 – DESCRIPTION OF THE PRODUCT

2 – SYSTEM BOUNDARIES

3 – PROCESSING AND PRESENTATION

4 – REPORTING AND COMMUNICATION

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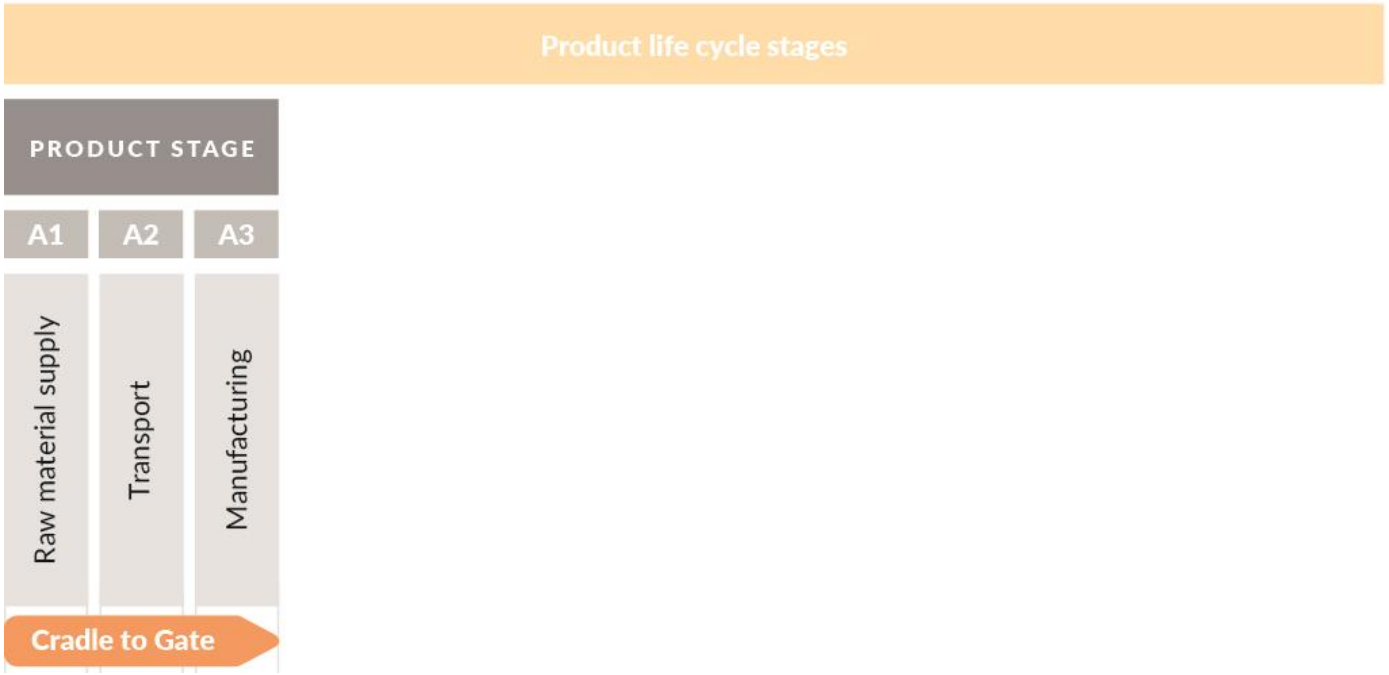
PART 03 System Boundaries & Life Cycle Stages

based on Balouktsi & Lützkendorf, ANNEX 57 ST 1 Report



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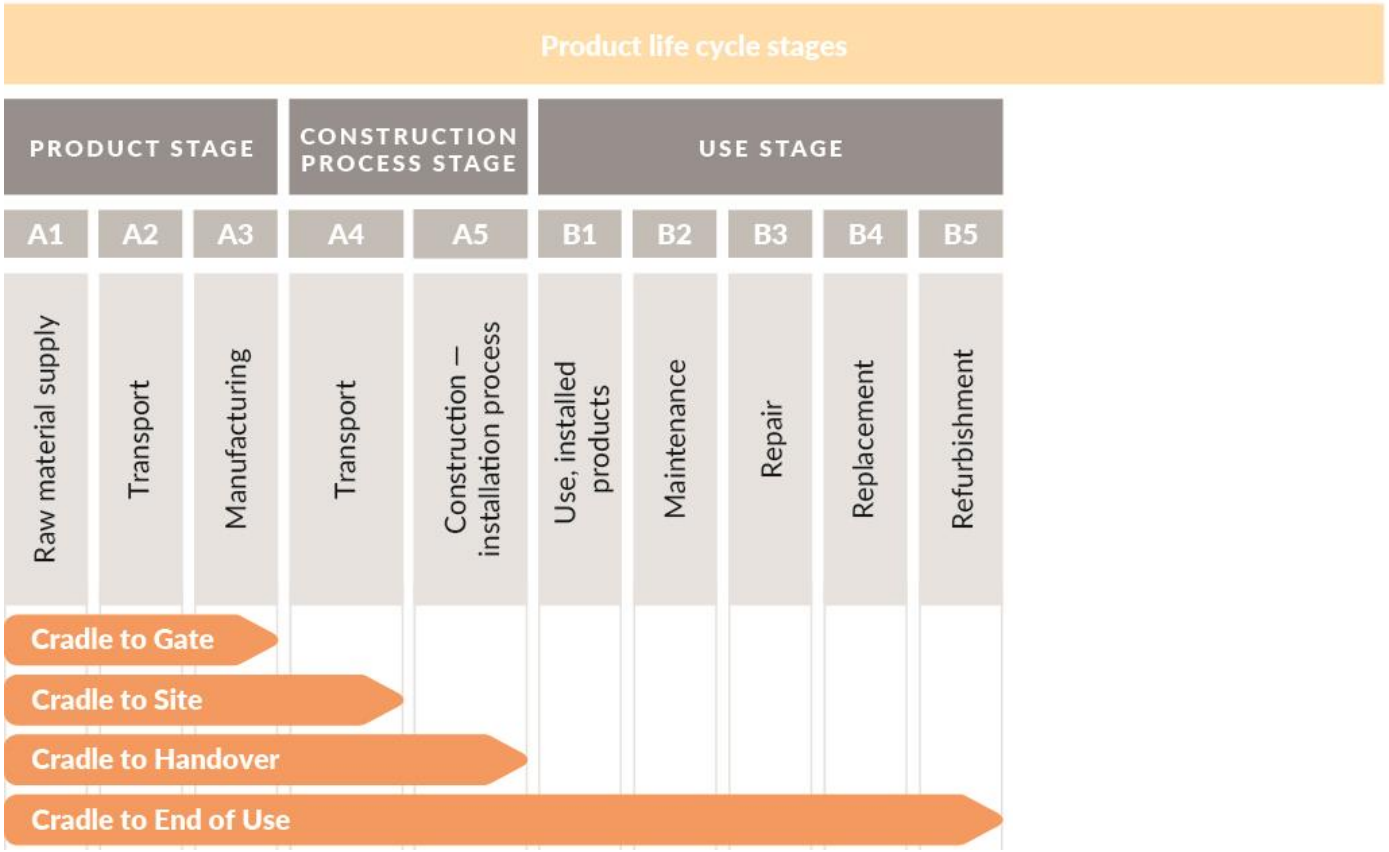

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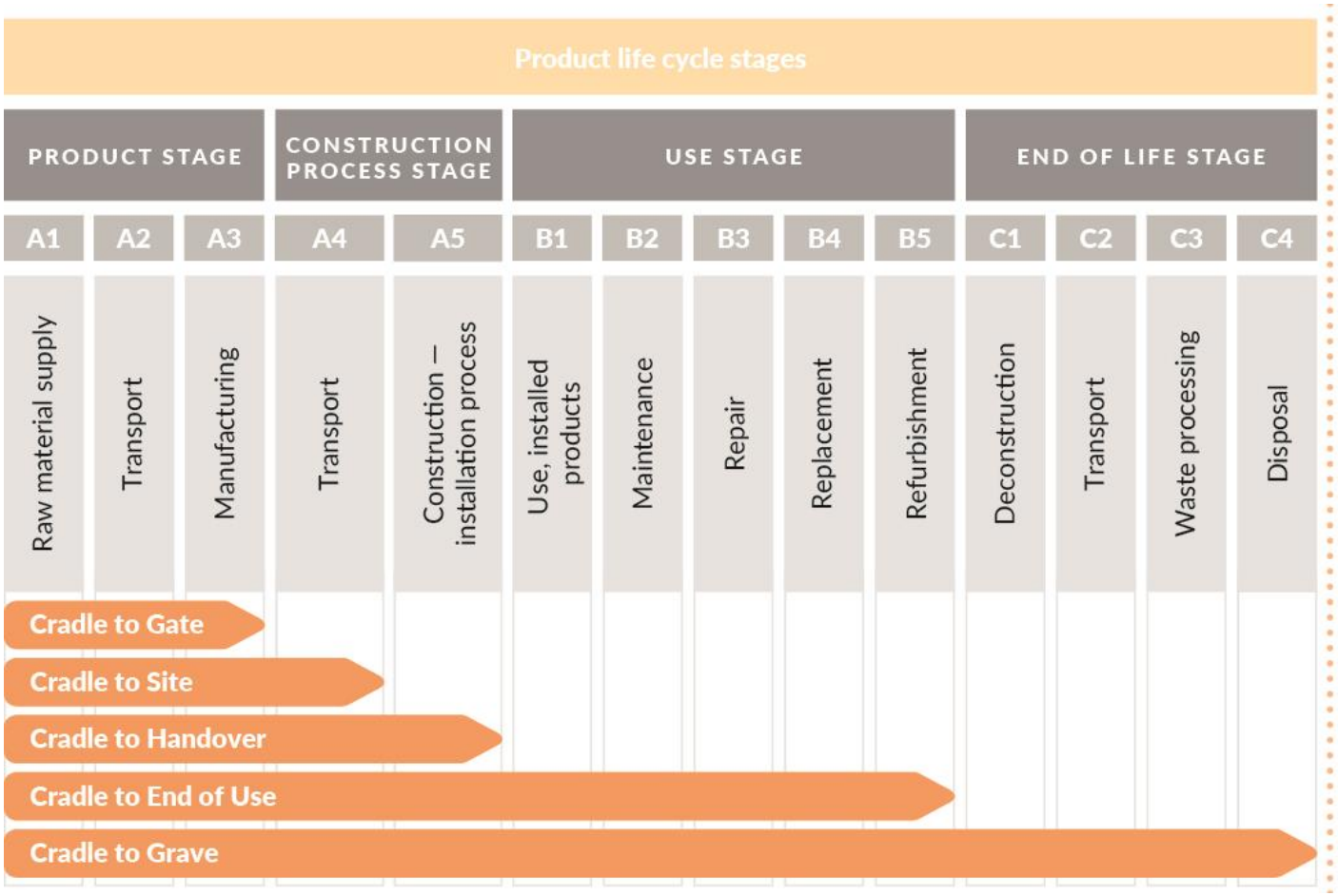

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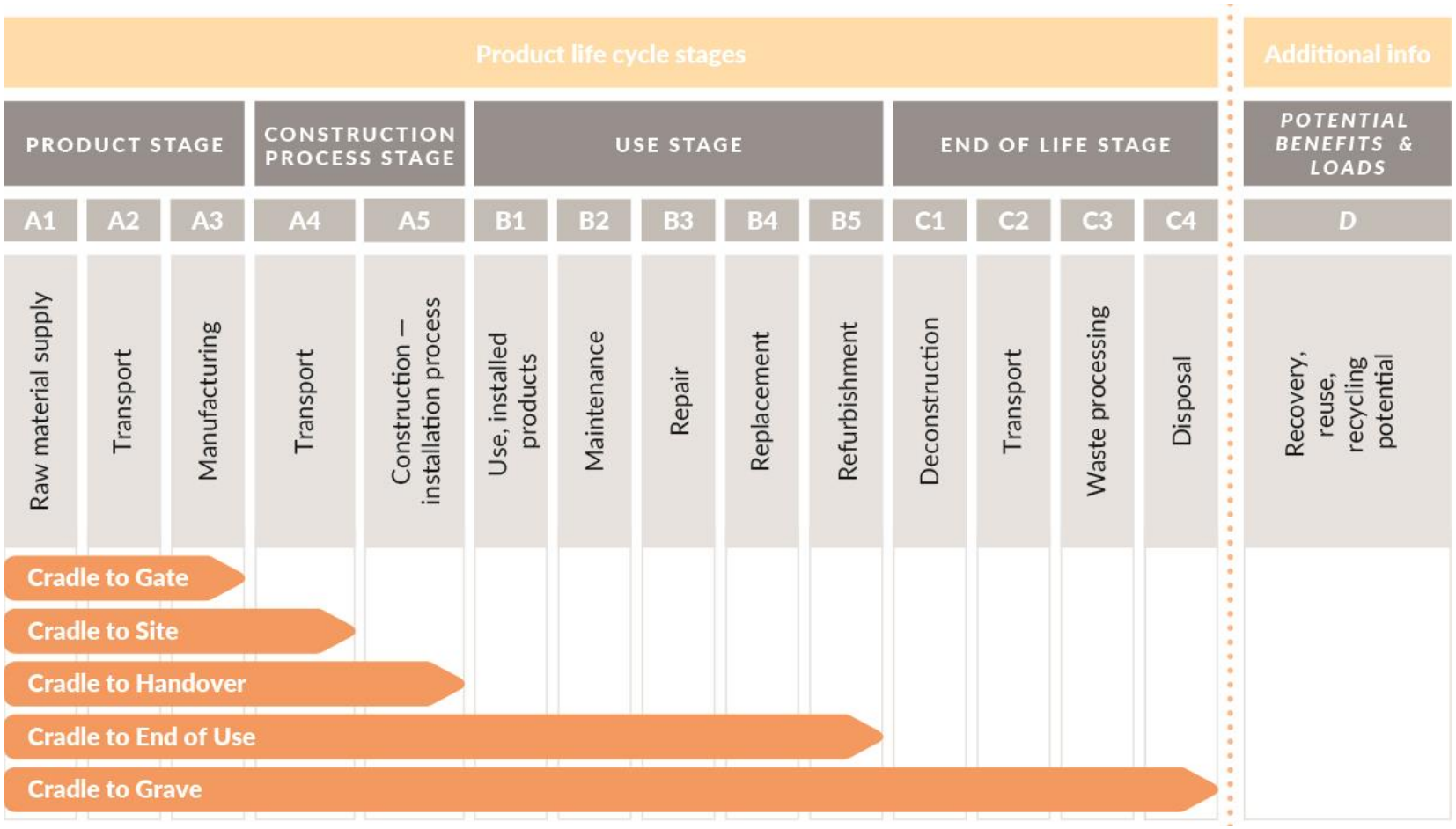
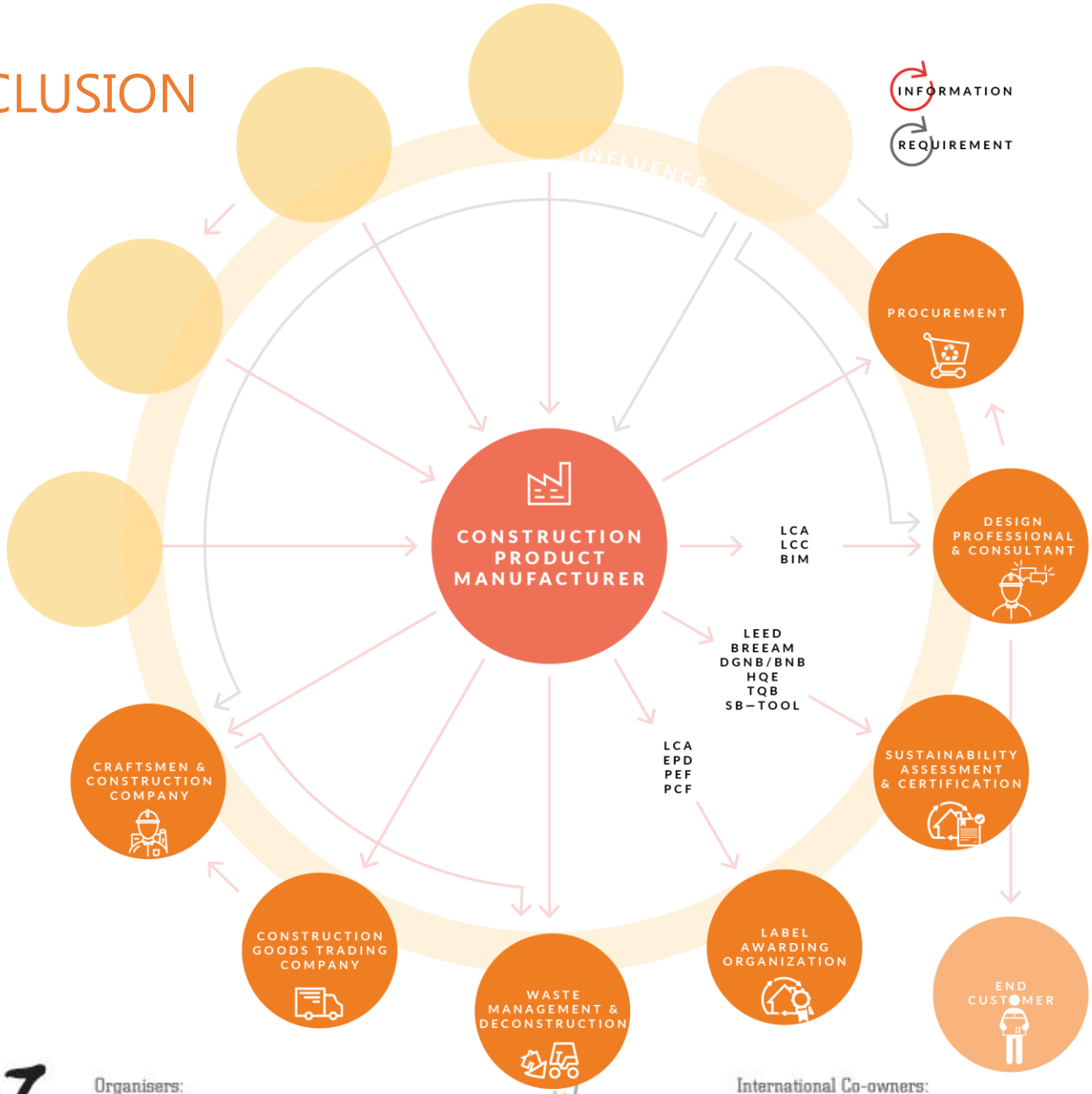


CONCLUSION


INFORMATION
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HQE
TQB
SB–TOOL
LCA
EPD
PEF
PCF

CONCLUSION & OUTLOOK

Especially **SMEs need to be supported** as they often shy away from the effort assosciated with the task due to lack of ressources etc.

By gathering the needed data CPMs can on one hand **improve their overall market competitiveness** & on the other hand **help to reduce EE & EG to create a green products incl. supply chain**

- Transparent and accountable product information & communication enable consumers/professionals **to make informed, profound decisions**
- Considering the framework of sustainability assessment | data on construction products provide the basis, **a need for credible unbiased information is therefore evident**

Consequently, it becomes indispensable for CPMs to think about the full life cycle approach, **to contribute to the shift towards sustainable circular economy.**

thank you for your attention.

Annex57-team

Alexander Passer | Angelika Hinterbrandner | Helmuth Kreiner | Maria Balouktsi | Thomas Lützkendorf

thank you for your attention.

If you have any questions or need further information on the topic feel free to contact us.

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Sources |

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