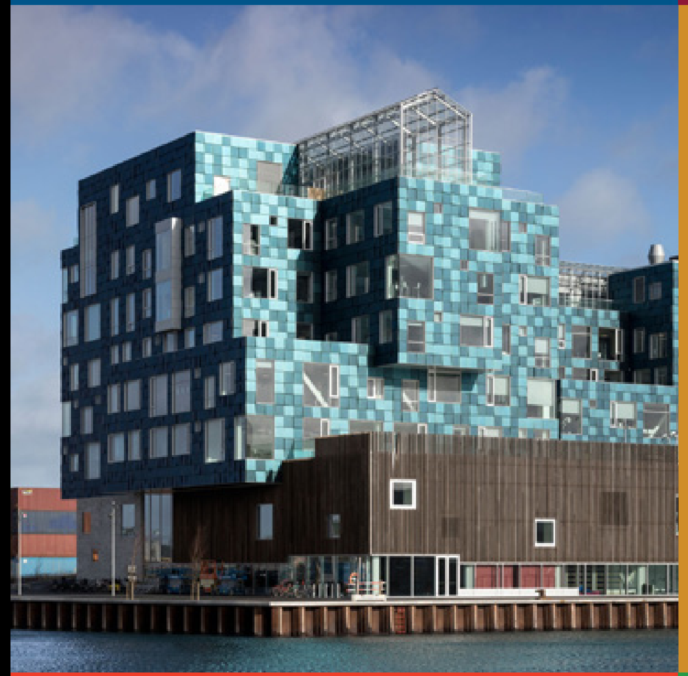
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

8 DECENT WORK AND ECONOMIC GROWTH

13 CLIMATE ACTION



12 RESPONSIBLE CONSUMPTION AND PRODUCTION

10 REDUCED INEQUALITIES

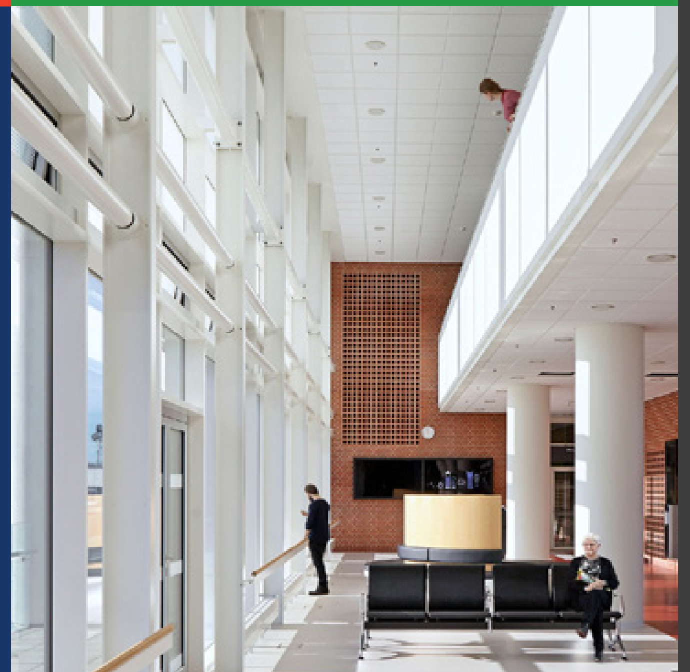
5 GENDER EQUALITY

3 GOOD HEALTH AND WELL-BEING

COMMUNICATION ON PROGRESS

UN GLOBAL COMPACT

17 PARTNERSHIPS FOR THE GOALS



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UNGC

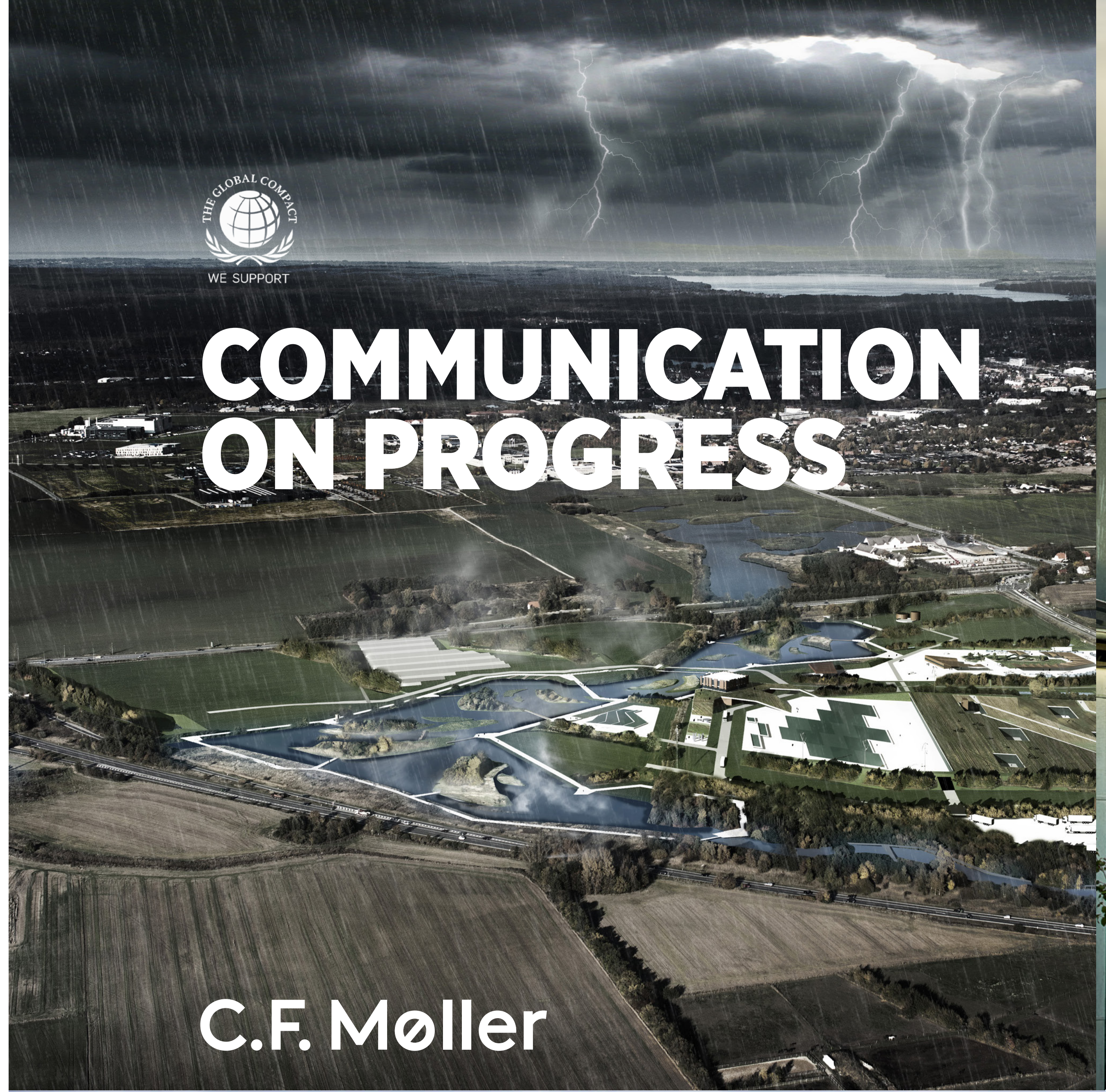
United nations Global Compact

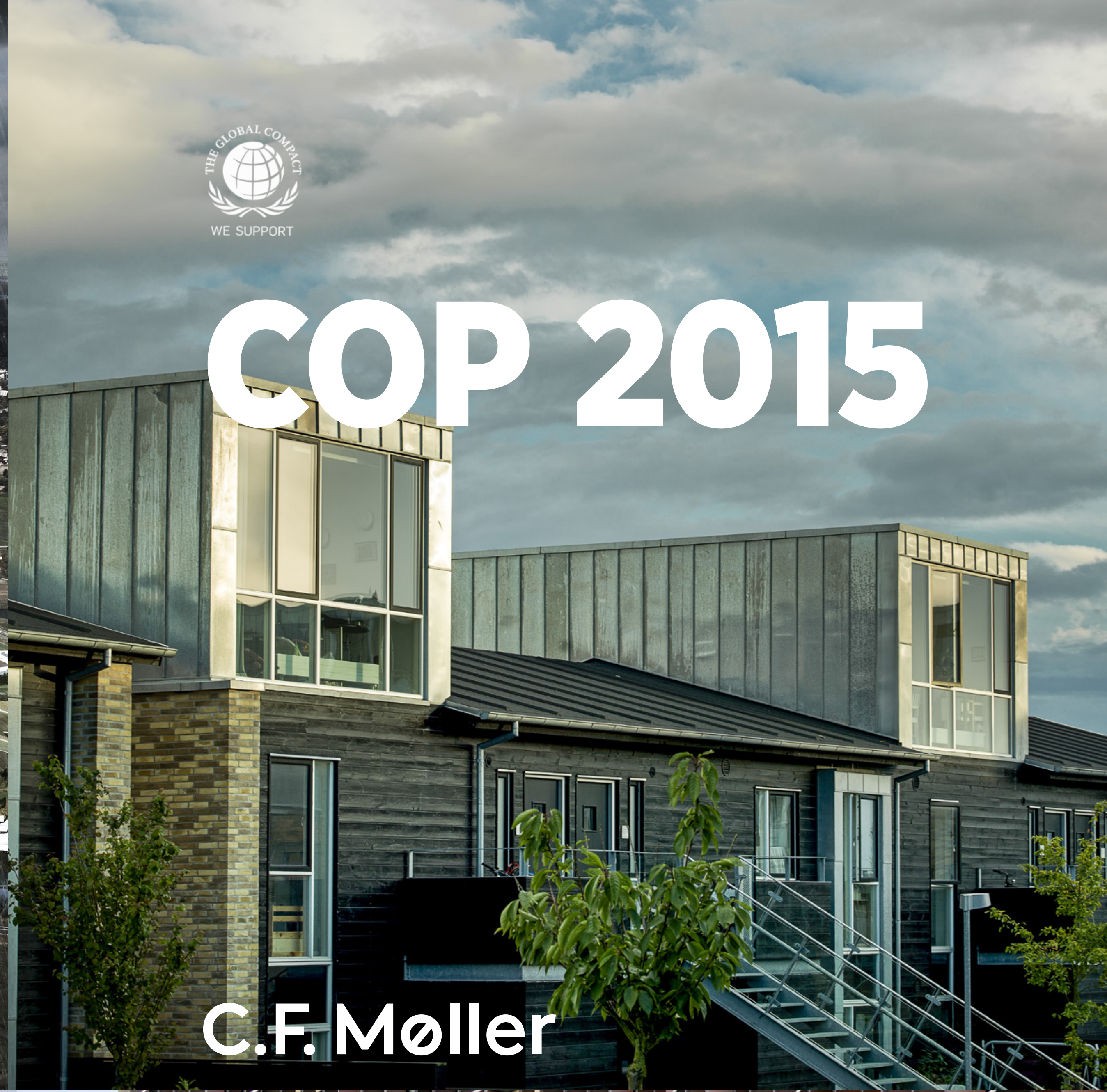
Voluntary initiative for businesses

Commitments to universal sustainability principles

C.F. Møller a member since 2014

Communication on Progress report submitted every year





COP 2018

New EU legal requirements for Corporate Social Responsibility

Legal requirements for Gender Equality

SDG's to integrate sustainability into our architecture

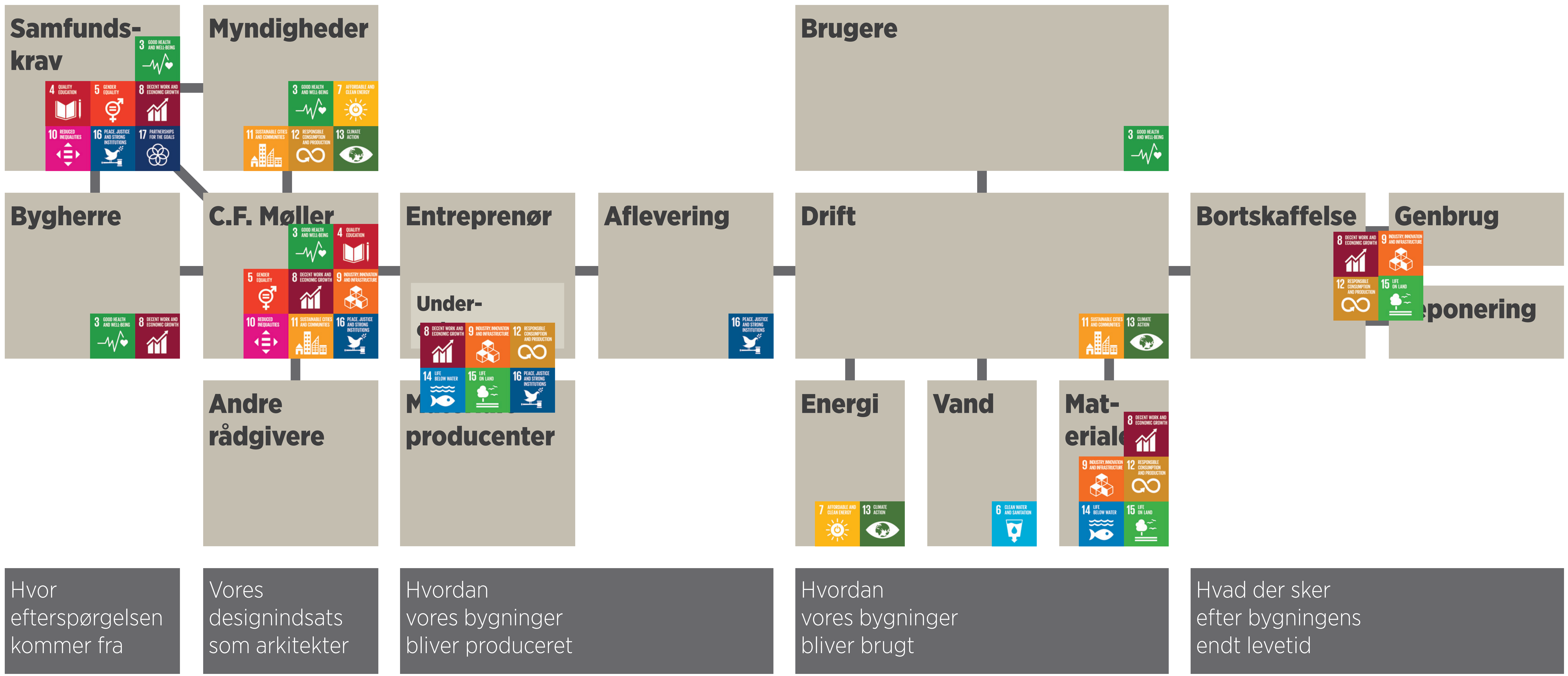
Business Model

Consulting architects with business model embedded in the construction sectors' extended value chain

The buildings and landscapes **we design now** will have longlasting impacts **into the future**

Our business model as part of the value chain	**Where demand for our services comes from**	**Our value creation and design work as architects**	**How our architecture is produced**	**How our architecture is experienced, used and transformed**	**What happens at the end of the lifespan**
Primary drivers and activities	Economic, societal and political drivers	We interpret our clients wishes and create value through our architectural design work	Construction, commis-sioning & handover	Our buildings' functionality, quality and transformation over time	Dismantling and reuse of materials
Major actors and co-operation partners	Private & public sector clients	Other consultants Planning & building regulation	Contractors & sub-contractors Materials production	Users, residents, administrators & owners Creation of cultural & societal value	Demolition sector New circular economy actors

Business Model



COP, CSR & SDGs

Environment		Society		Labour	Equality	Human Rights	Anti-corruption
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	17 PARTNERSHIPS FOR THE GOALS	3 GOOD HEALTH AND WELL-BEING	8 DECENT WORK AND ECONOMIC GROWTH	5 GENDER EQUALITY	10 REDUCED INEQUALITIES	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

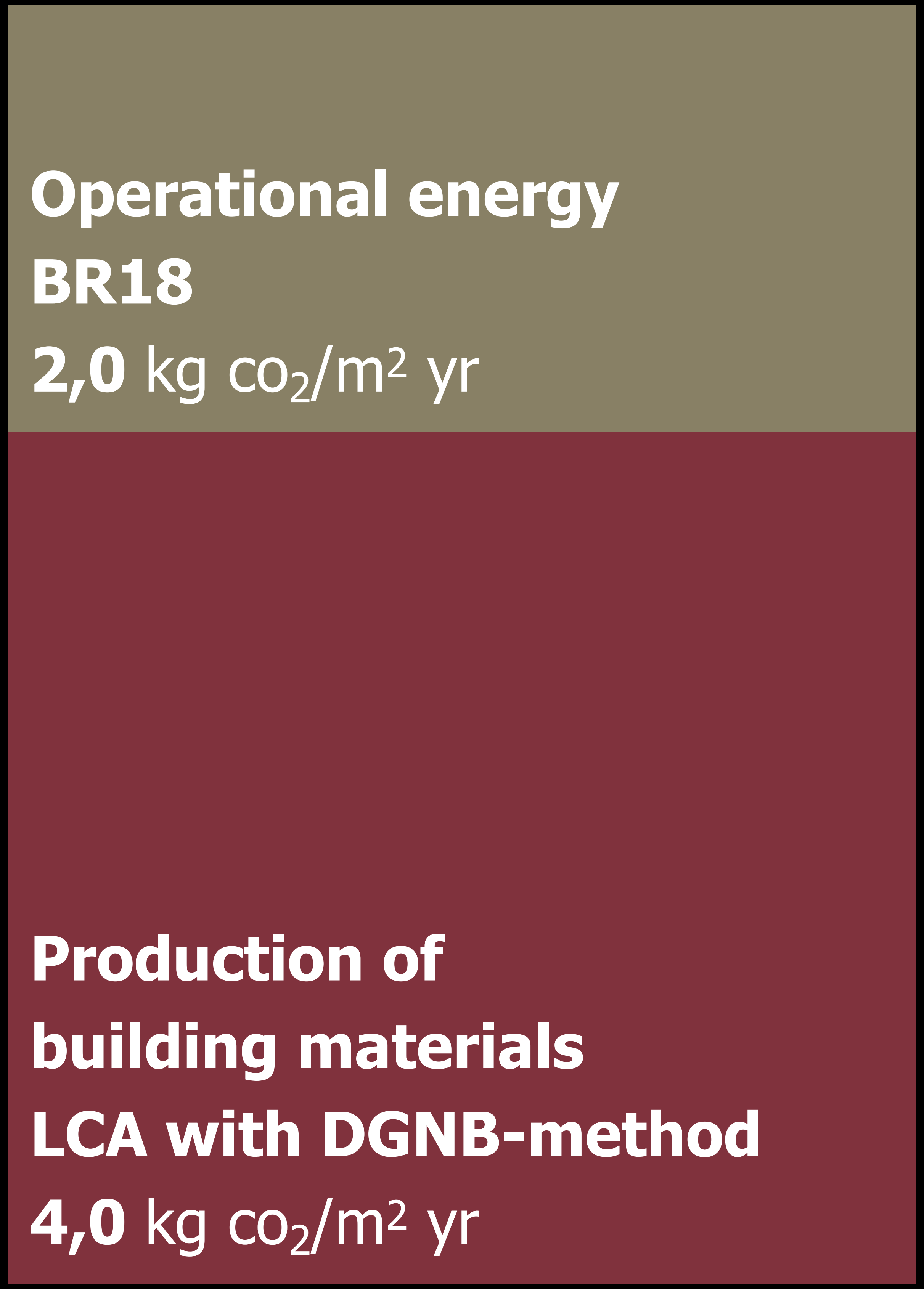
Risks & issues	Policies	Results	Activities

Environmental Impact of Construction Materials

- Environmental impact from materials larger than heating and ventilation
- Focus on life cycle assessment of materials
- Focus on multi-storey timber buildings

KAJSTADEN TOWER
This new 9 storey timber apartment building in Västerås is Sweden's tallest timber building, and is constructed entirely of massive timber. The loadbearing walls, floors, beams, balconies and elevator shaft have all been built with cross-laminated timber.

MATERIALS ENVIRONMENTAL IMPACT



Typical
Multistorey housing

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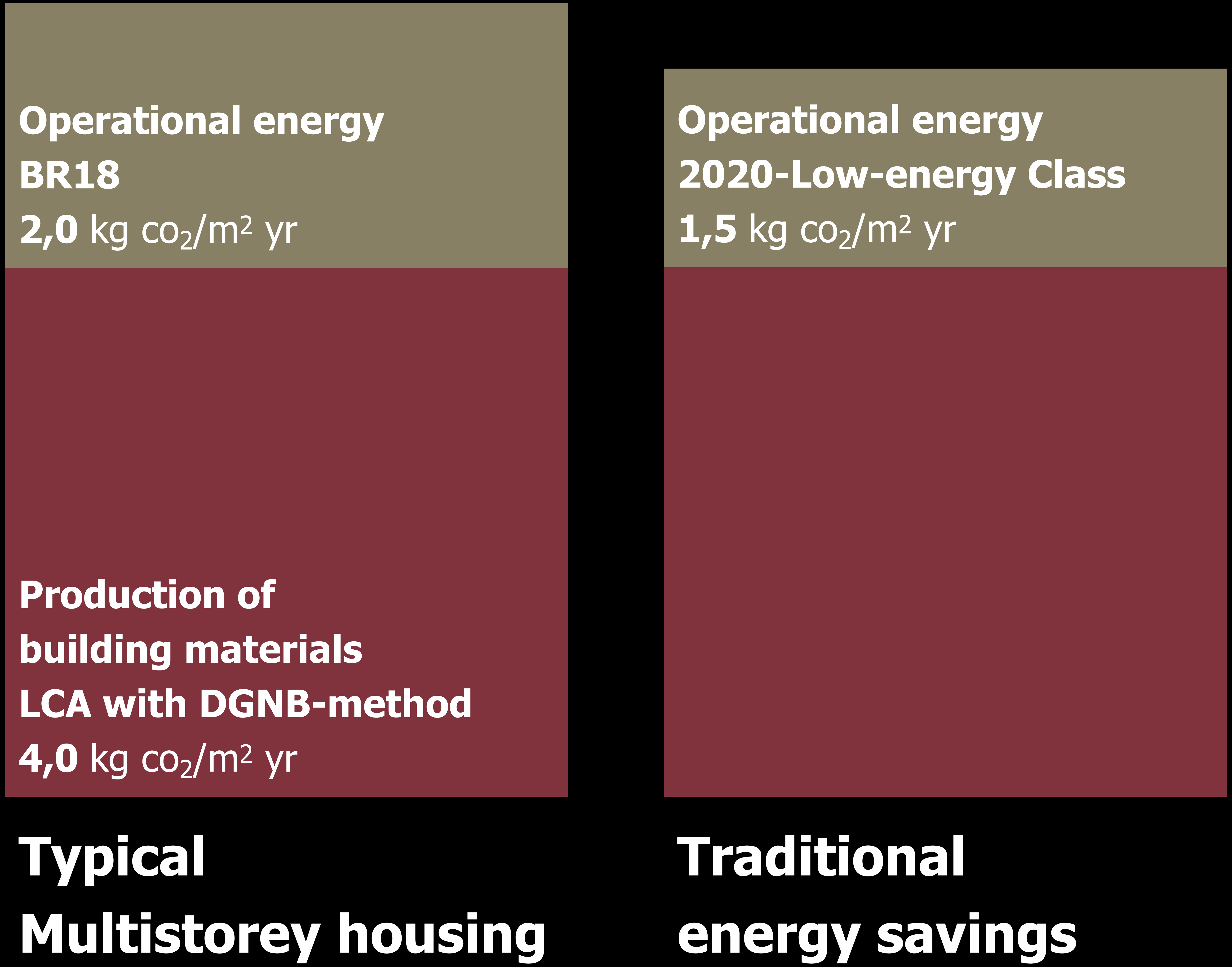
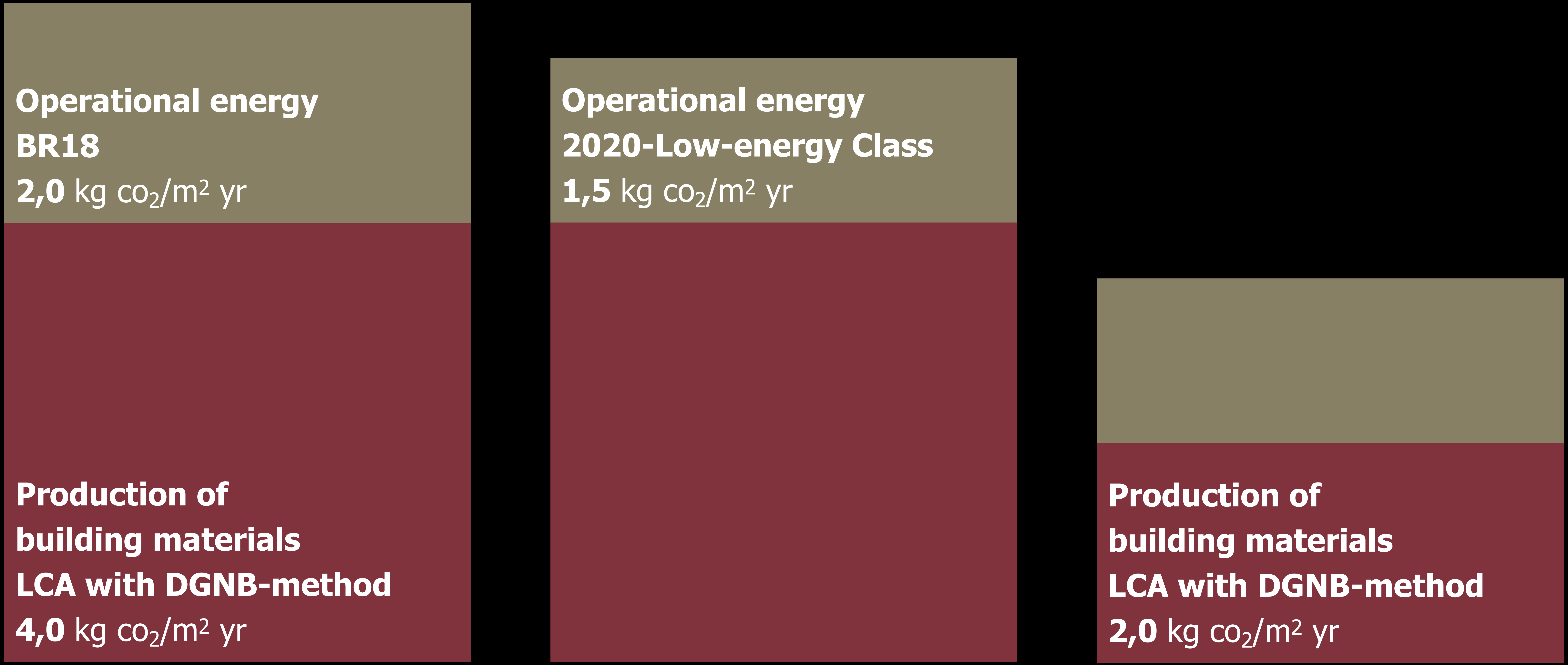
MATERIALS ENVIRONMENTAL IMPACT



MATERIALS ENVIRONMENTAL IMPACT



Typical
Multistorey housing

Traditional
energy savings

New focus on LCA
& timber buildings

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MATERIALS ENVIRONMENTAL IMPACT

50% reduction in materials' environmental impact by changing the loadbearing construction to timber

ENVIRONMENTAL SCIENCE & POLICY 13 (2010) 104–114

available at www.sciencedirect.com

journal homepage: www.elsevier.com/locate/envsci

Meta-analysis of greenhouse gas displacement factors of wood product substitution

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[b] FPInnovations-Forintek, Vancouver, BC, Canada V6T 1W5

ABSTRACT

A displacement factor can express the efficiency of using biomass to reduce net greenhouse gas (GHG) emission, by quantifying the amount of emission reduction achieved per unit of wood use. Here we integrate data from 21 different international studies in a meta-analysis of the displacement factors of wood products substituted in place of non-wood materials. We calculate the displacement factors in consistent units of tons of carbon (tC) of emission reduction per tC in wood product. The displacement factors range from a low of −2.3 to a high of 15, with most lying in the range of 1.0 to 3.0. The average displacement factor value is 2.1, meaning that for each tC in wood products substituted in place of non-wood products, there occurs an average GHG emission reduction of approximately 2.1 tC. Expressed in other units, this value corresponds to roughly 3.9 t CO_2 eq emission reduction per ton of dry wood used. The few cases of negative displacement factors are the result of worst-case scenarios that are unrealistic in current practice. This meta-analysis quantifies the range of GHG benefits of wood substitution, and provides a clear climate rationale for increasing wood substitution in place of other products, provided that forests are sustainably managed and that wood residues are used responsibly.

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Operational energy
BR18
2,0 kg co_2/m^2 yr

Production of
building materials
LCA with DGNB-method
4,0 kg co_2/m^2 yr

Typical
Multistorey housing

Operational energy
2020-Low-energy Class
1,5 kg co_2/m^2 yr

Traditional
energy savings

Production of
building materials
LCA with DGNB-method
2,0 kg co_2/m^2 yr

New focus on LCA
& timber buildings

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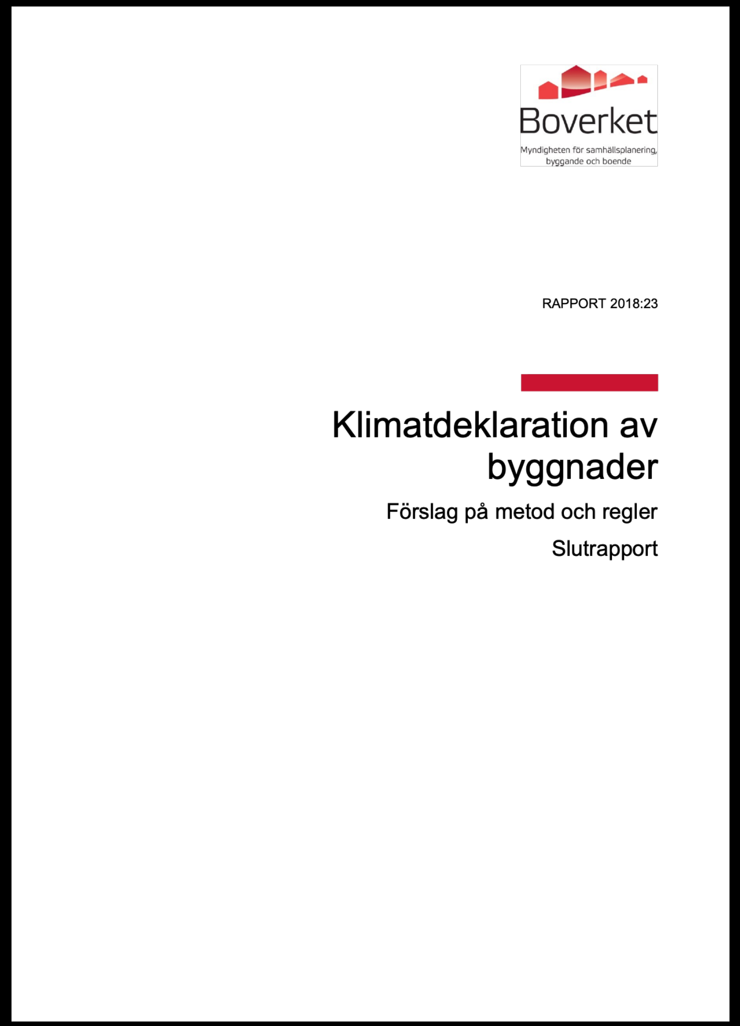
LCA PART OF BUILDING REGULATION IN 5 YEARS…



Sweden

- 'Klimadeklaration av byggnader'
- Emissions from materials production
- Legal requirement for LCA as part of BBR fra 2020/21

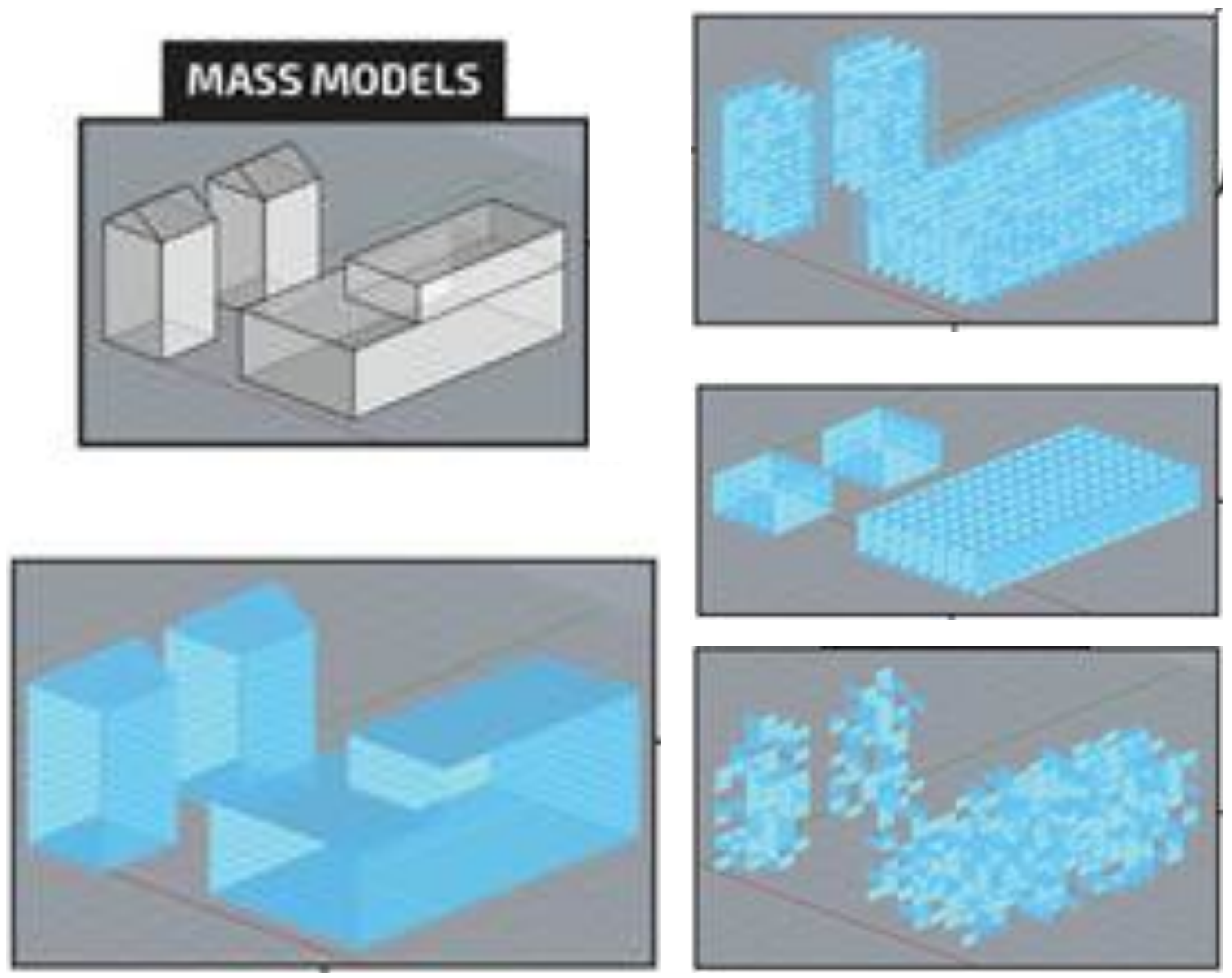
Denmark

- Voluntary Sustainability Class
- Includes LCA/materials
- Same approach as Low-energy Classes: Voluntary becomes Legal requirement

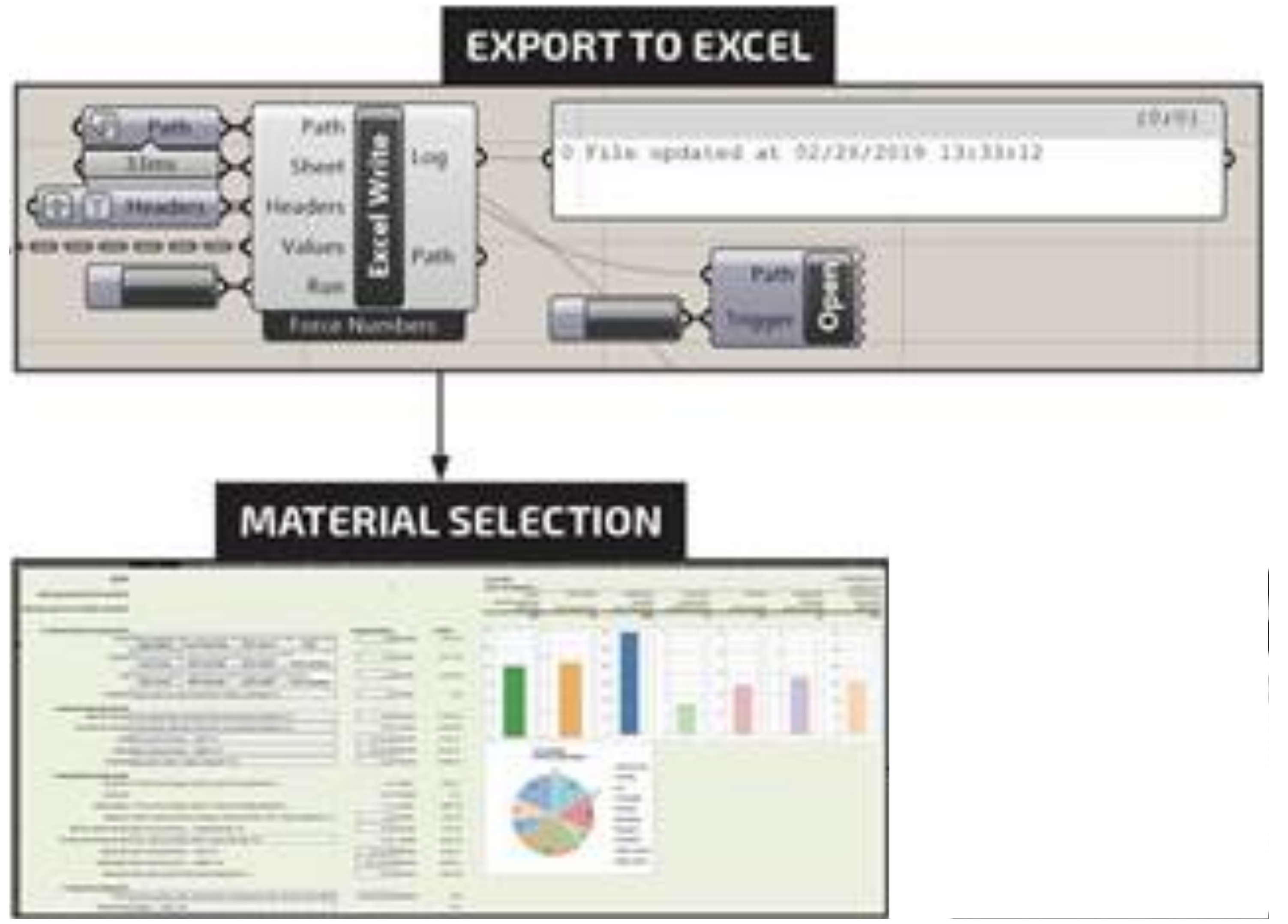
Life Cycle Analysis

- **Quick LCA with DGNB-method for Rhino mass models**
- **Geometric data and library of precalculated LCA-profiles of constructions**

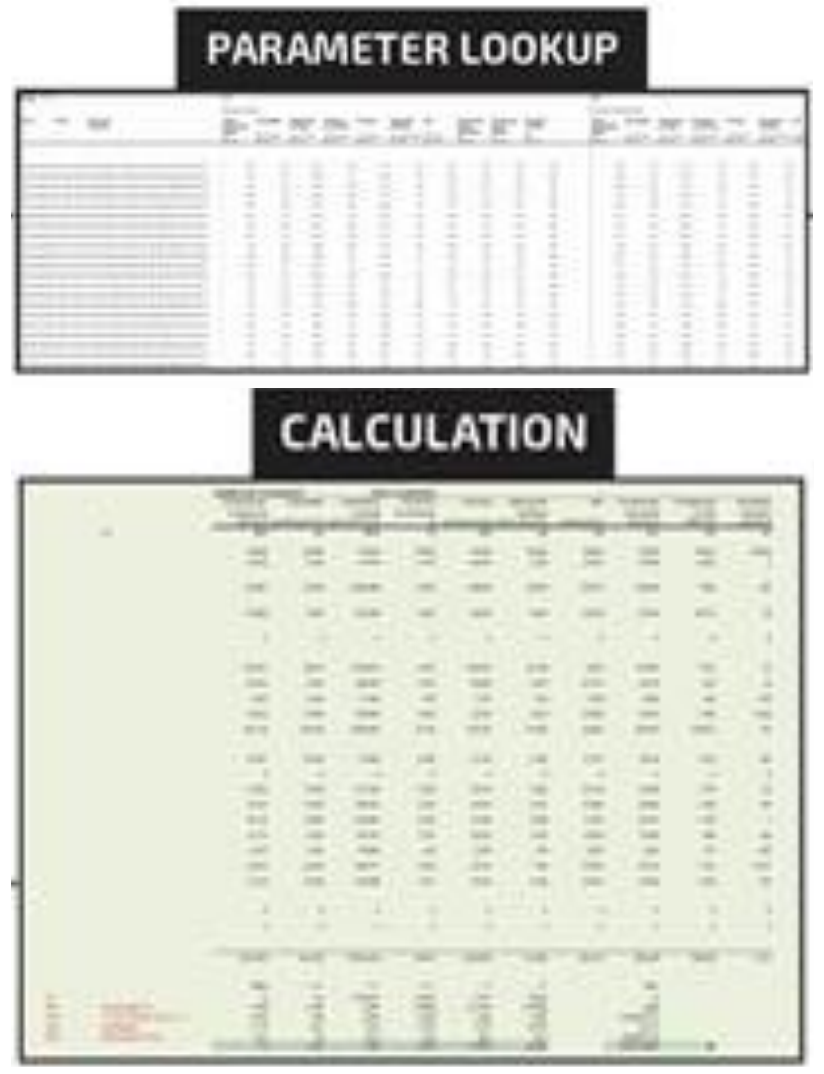
1 Extraction of construction areas



2 Select constructions from LCA-library



3 Calculate LCA

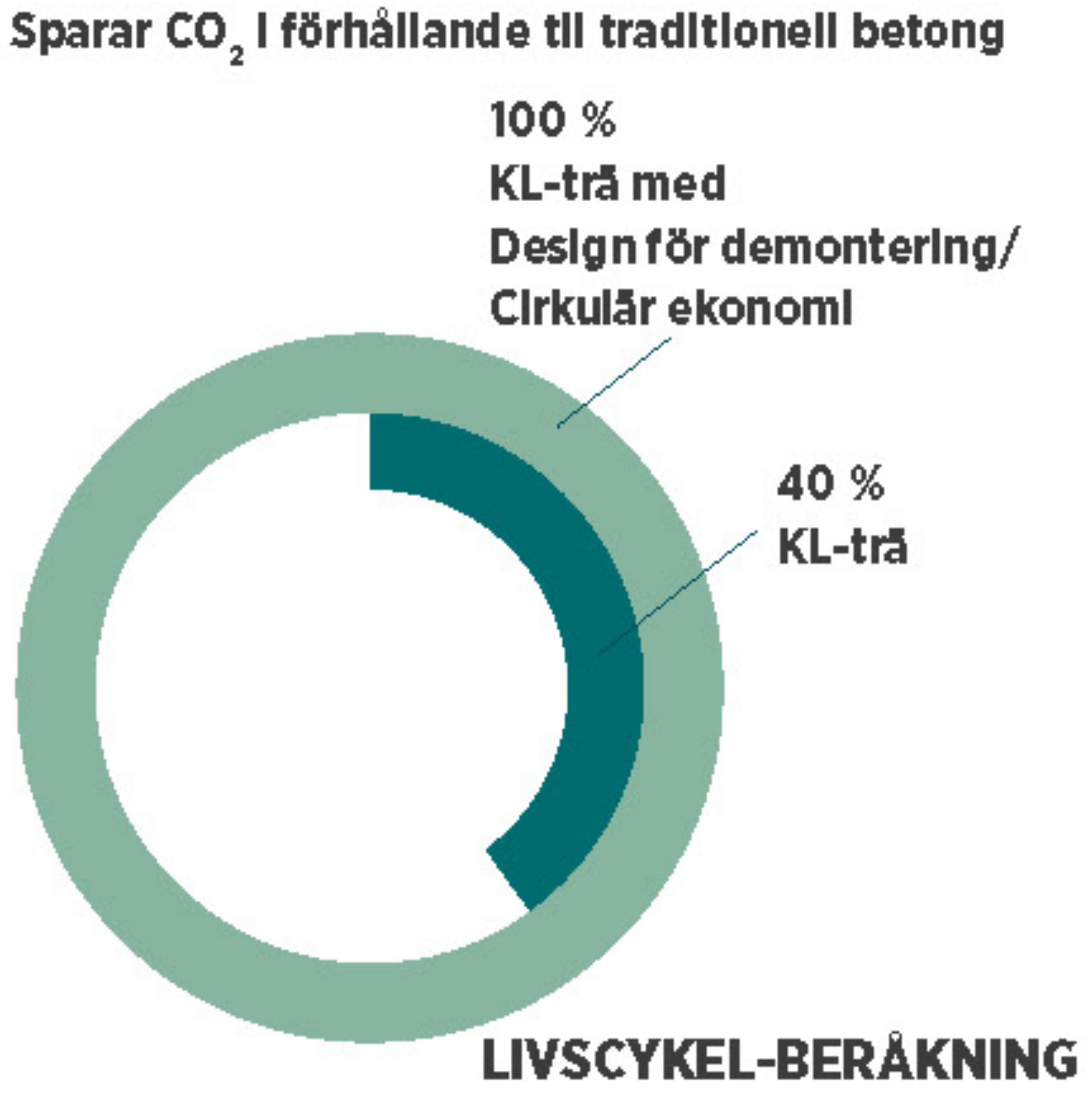


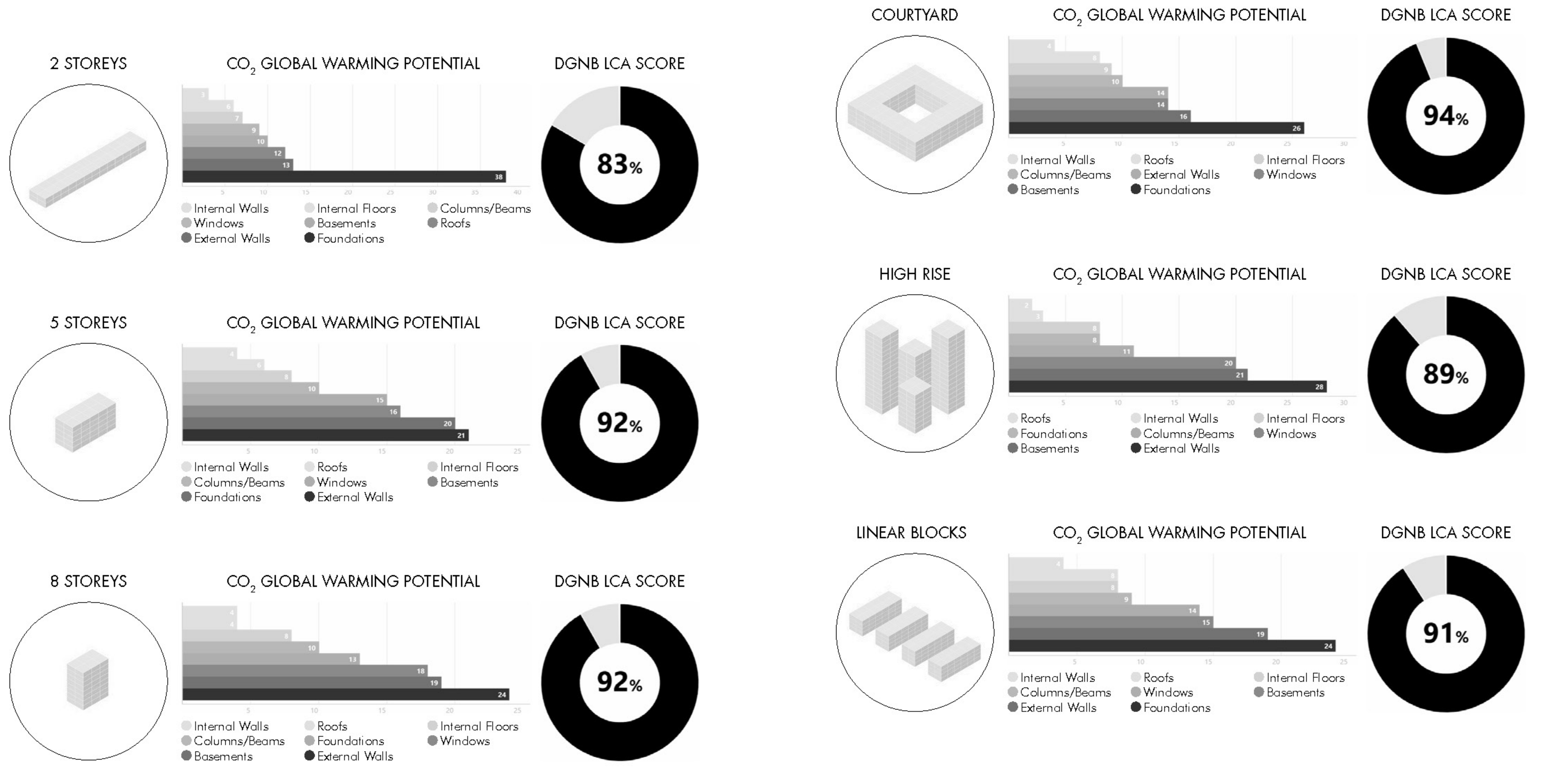
4 Results in Rhino

Life Cycle Analysis

Time used: **30 min vs. 50 hours**
Precision: **+/- 10%**

- **Parametric and strategic decisions**
- **Geometry and material choice**
- **Masterplanning and large developments**






KAJSTADEN VÄSTERÅS
Building type: Housing
Floor area: 3.500 m²
Construction: CLT
Status: Finished 2019
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- Four carpenters built loadbearing structure
- Quick assembly - 3 days per storey
- High precision +/- 1-2mm
- Mechanical joints with long screws

- CLT to elevator shaft

- Movement joints

- CNC-cutting to building services

- CLT walls, floors and roofs





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ARCHITECTS

NORRTALJE MARINA

Building type:	**Housing & Commercial**
Floor area:	**30.000 m² (3 phases)**
Construction:	**CLT**
Status:	**Construction 2019-**


ÖRNSRO TIMBER VILLAGE
Building type: Masterplan & Housing
Floor area: 19.000 m²
Construction: CLT & LVL
Status: Construction 01/2021-


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ARCHITECTS


MINISTRY OF ENVIRONMENT BERLIN
Floor area: 50.000 m²
Construction: CLT/LVL
Status: 1st Prize won 08/2020
CF MØLLER
ARCHITECTS