



**GREEN TRANSITION**  
DENMARK

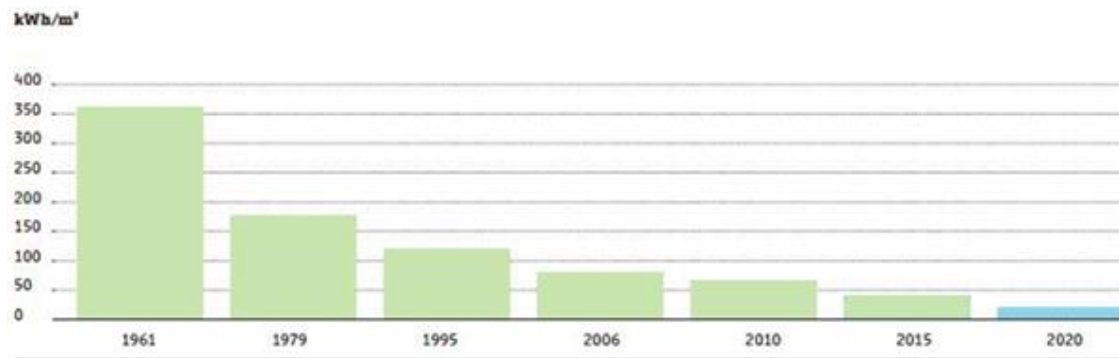
# **EMBODIED CARBON**

## **Benchmarking and regulation in the Danish Strategy**



**Signe Sand, Advisor on buildings in Green Transition Denmark**

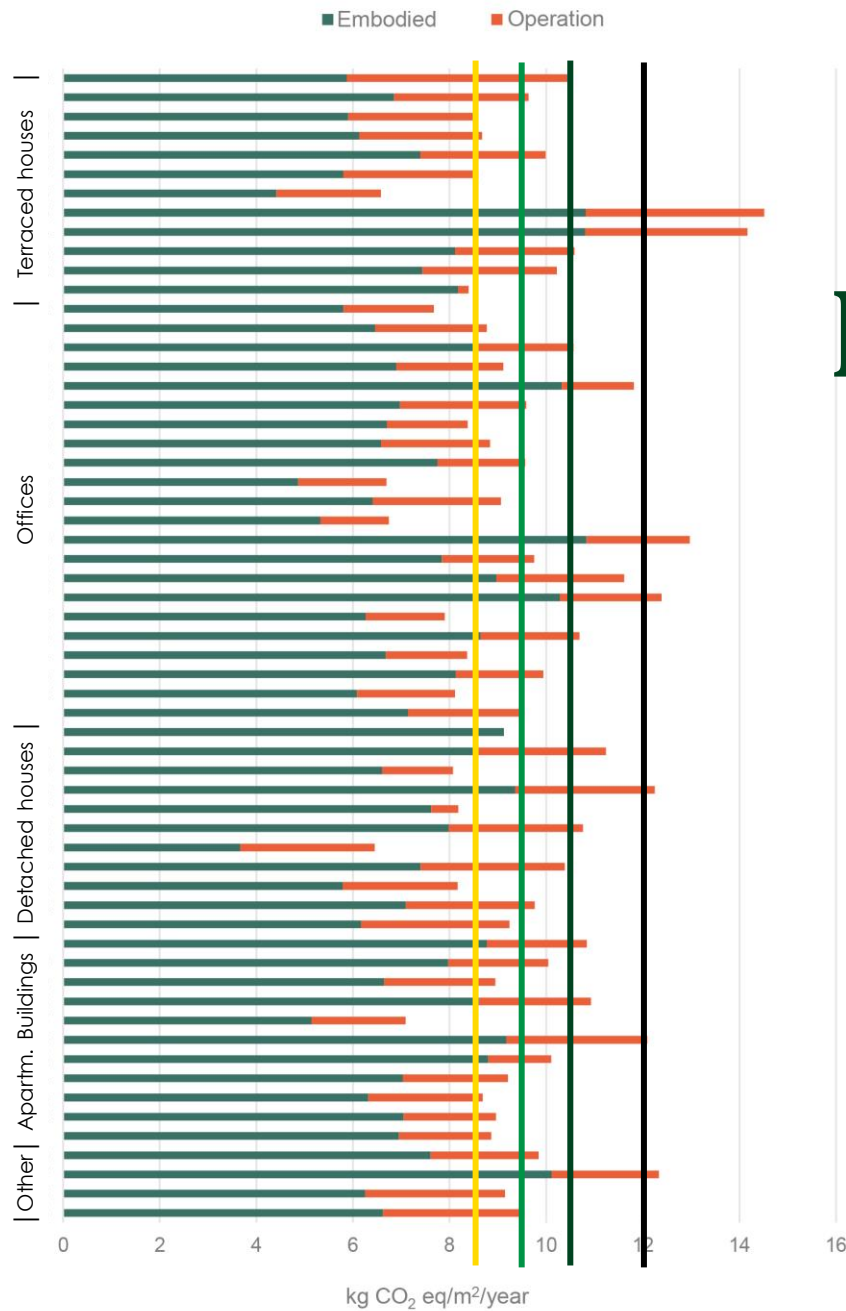
# PREVIOUS SUCCESSFUL FOCUS ON OPERATIONAL ENERGY



Kilde: Energistyrelsen

- Increasing demands through 7 Building Regulations since 1961
- Decreased from 350 kWh/m<sup>2</sup> to a tenth
- No rentability in further demands for newbuilds





# DANISH WLC BASELINES

Danish Research institute BUILD on Aalborg University  
Report in 2020: Whole Life Carbon Assessment of 60 Buildings

Based on the tool LCAbyg

Became baseline for Danish regulation of WLC

75% of climate footprint from embodied carbon

Lower quartile **8,5** kg CO<sub>2</sub>e/m<sup>2</sup>/year  
Median **9,5** kg CO<sub>2</sub>e/m<sup>2</sup>/year  
Upper quartile **10,6** kg CO<sub>2</sub>e/m<sup>2</sup>/year

Threshold 2023 **12** kg CO<sub>2</sub>e/m<sup>2</sup>/year

FIGURE 8. GWP of the 60 case buildings over a 50-year reference study period broken down by embodied carbon emissions (materials) and operational carbon emissions. Enf11 has no data for operations, and therefore only results for materials are shown.



# THRESHOLDS IN THE DANISH STRATEGY

Regulation of WLC, not limited to embodied

Mandatory thresholds:

Starting with **12** and decreasing to **7,5** in 2029

Voluntary CO<sub>2</sub> class:

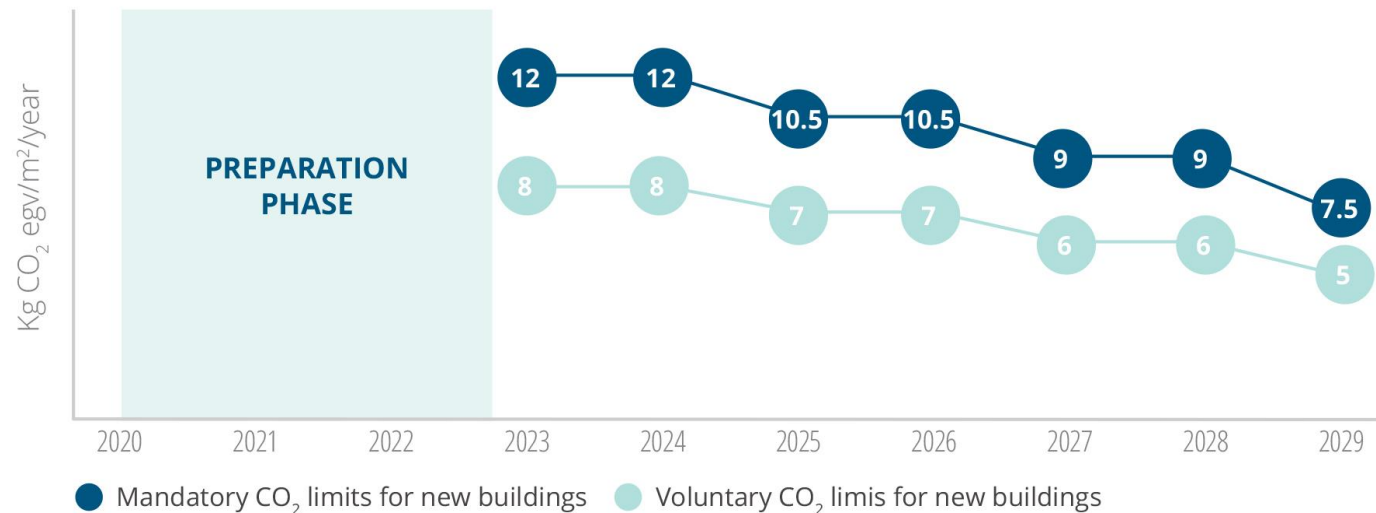
Starting with **8** and decreasing to **5** in 2029

12 seems very easy, but:

LCA's already developed

Rearward demands: Threshold based on year of finish

Development of LCA and EPD "as we go"





# BASIS OF ASSESSMENT

Databases – EPDs + ökobau

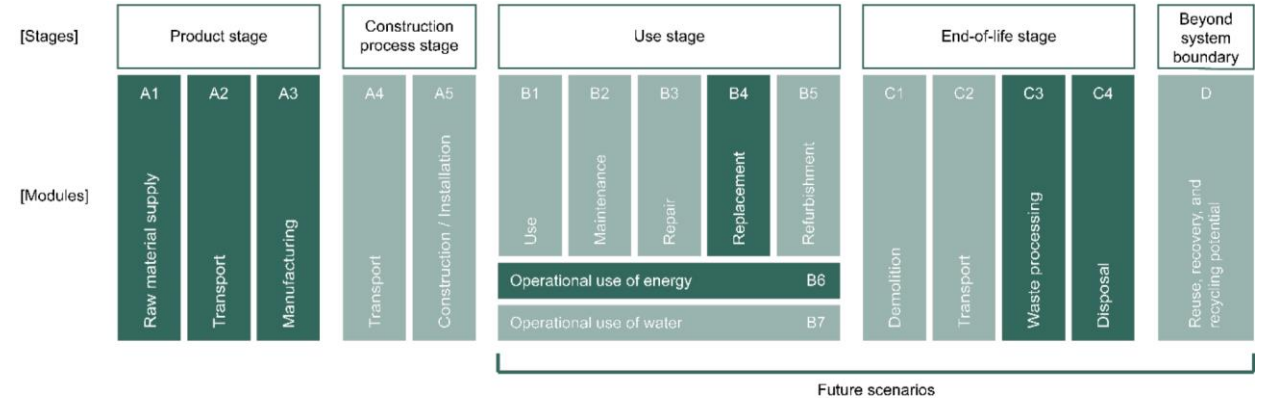
Building model

- Foundations
- Basement slabs
- Slabs
- External walls
- Load-bearing structures
- Internal walls
- Roofs
- Stairs/steps and ramps
- Balconies and access balconies
- Windows, doors and glass façades
- Drains
- Water
- Heating
- Ventilation and cooling
- Electricity and mechanical facilities
- Other

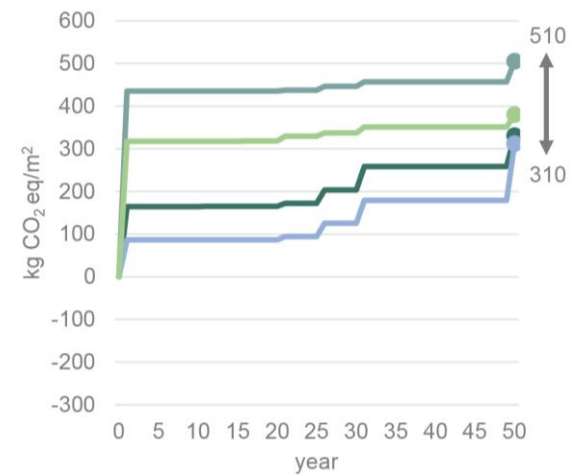
Emission factors

Area

## Modules



## Lifespans





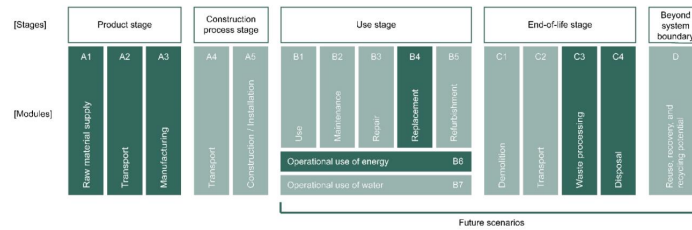
# NORMAL PROCESS

## Building model

Databases - EPDs

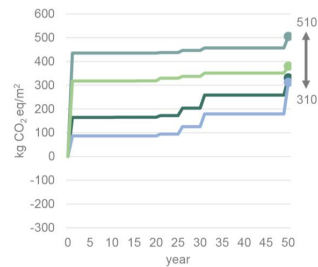
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## Modules



# Thresholds and regulation

## Lifespans



Emission factors

Area



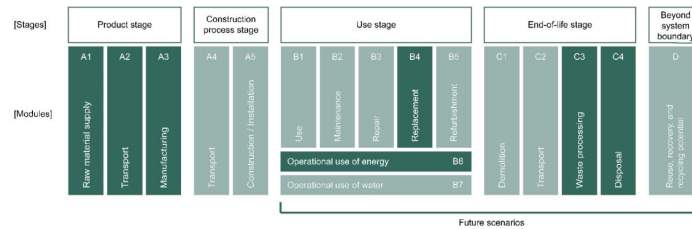
# DANISH FAST TRACK PROCESS

## Building model

Databases - EPDs

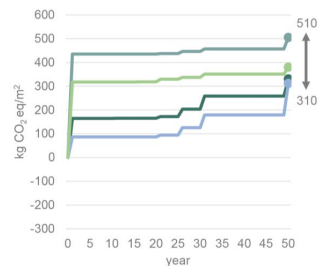
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- Other

## Modules



Thresholds and regulation

## Lifespans



Emission factors

Area

To secure lower climate impact from build environment in 2030, the thresholds and regulations should be prepared within this directive



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Get more information  
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