



# Development of limit values for CO<sub>2</sub>-emissions in buildings in Denmark

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# Agenda

**01**

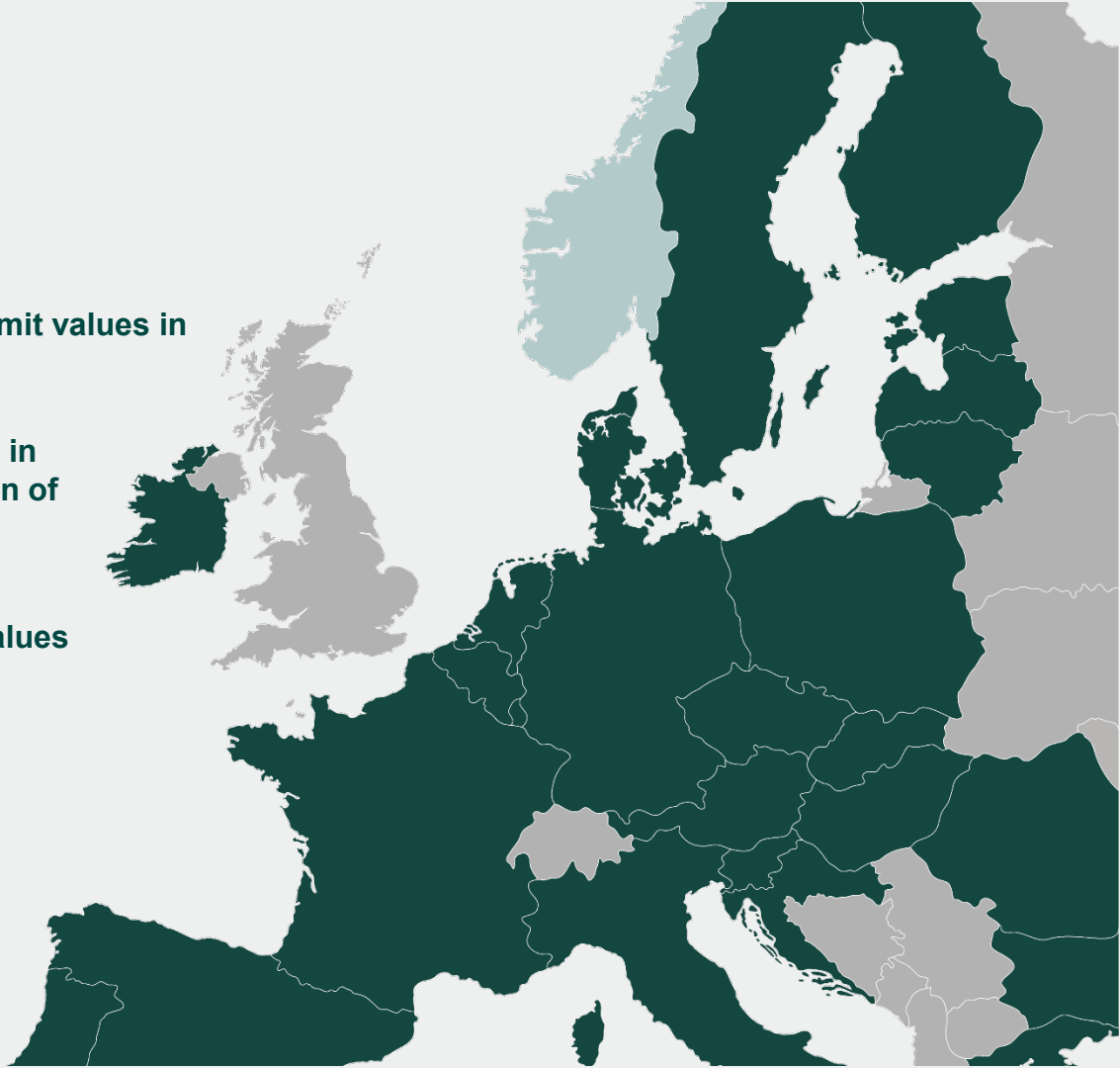
Status of the work with limit values in Denmark

**02**

Challenges we are facing in regards to implementation of limit values

**03**

Further work with limit values



# Status of the work with limit values

# Status of the work with limit values in Denmark



# Quick overview of the coming regulation

## Criteria is implemented in Danish national regulation from 2023

- All new buildings which apply for building permit from the first of January 2023 have to document the climate impact
- Buildings over 1000m<sup>2</sup> have to fulfill a limit value
- Generic data or EPDs can be used
- Detailed regulation: Appendix for which building parts have to be implemented, how to calculate area, and service life
- Certain building functions which need *more* or *specific products*, can extend the limit value

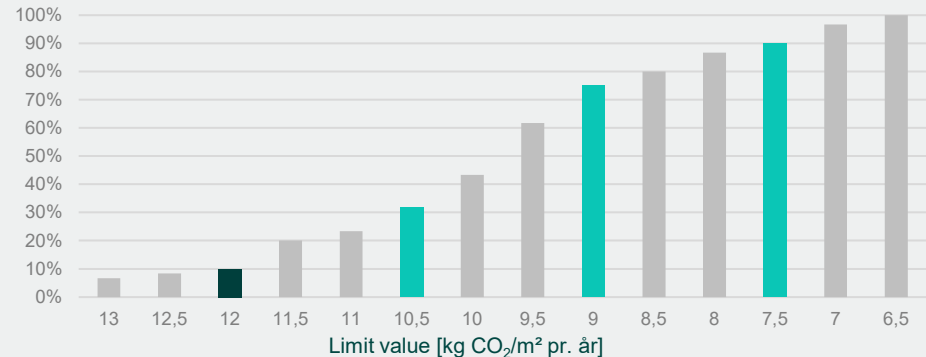
Stage	Moduler	
Product	A1	Raw material supply
	A2	Transport
	A3	Manufacturing
Construction process	A4	Transport
	A5	Construction-installation process
Use	B1	Use
	B2	Maintenance
	B3	Repair
	B4	Replacement
	B5	Refurbishment
	B6	Operational energy use
	B7	Operational water use
End of life	C1	De-construction demolition
	C2	Transport
	C3	Waste processing
	C4	Disposal
Beyond the system boundary	D	Reuse-, Recovery- Recycling-potential

# Challenges with limit values

# Challenges

## Set the limit values & define the regulation

- Limited amount of LCA's for representative "new" buildings
- Development – relatively unknown baseline for limit values
- Conditions from limit values needed to be stuck to in the regulation



# Challenges

## Stick to – and adjust calculation assumptions

### Area (paragraph 3)

- Adjustment of the gross area for the building for the right incentive

### Building model (paragraph 4)

- Degree of detail
- Developed a long list together with the industry
- Always in mind, what was the baseline?

## Section 297, paragraph 3

*Paragraph 3.* The climate impact of materials shall be calculated in relation to the floor area as determined in accordance with section 455, with the following modifications:

- 1) All basement areas, waste rooms at ground level and air raid shelters are included.
- 2) Exterior ramps, stairs, fire escapes, access balconies, and the like are counted as only 25 per cent of their floor areas.
- 3) Integrated garages for single family dwellings, terrace houses, and the like are counted as only 50 per cent of their floor areas.
- 4) Integrated carports, outbuildings, protective covering, sheds, and the like are counted as only 25 per cent of their floor areas.
- 5) Walk-on-ceilings and the like are counted as only 25 per cent of their floor areas.
- 6) Garages and carports that are not integrated in the primary building, as well as outbuildings, chicken coops, greenhouses, covered patios, and the like are not counted.

## Section 297, paragraph 4

Category	Type	Building component	Description/synonyms	Incl.	Detail level
Construction basis					
	Terrain				
		Prepared ground	Site prep., stripping of top soil	No	
		Excavation pit incl. bracing	E.g. trenching	No	
		Sheet piling	E.g. piling components	Yes	Only permanent sheet piling for the building itself. Not sheet piling in terrain or as land containment.
		Construction site	E.g. site fencing, vehicle planking, scaffolding, portacabins, etc.	No	
	Foundations				

# Challenges

## Use stage

- Based on scenarios for electricity and district heating from 2019
- Difference in how the projections are done
- Most projections only goes 10-20 years in the future, but we need 50 years
- District heating is in the LCA calculation currently getting worser results, but we have doubt if the method gives the right indication
- Could incentivise heating pumps
- Area of the Danish Energy Authority
- Should use stage be part of the total limit value?

# Challenges

## Expansion of knowledge about climate impacts from special building types

### ***Section 298, paragraph 3***

- Additional energy use

### ***Section 297, paragraph 4***

- Baseline for CO<sub>2</sub>-limit value is mainly based on conventional building types
- Creation of model for possible exceedance
- Report about possible exceedance: [CO<sub>2</sub>-krav-og-saerlige-bygningsforudsætninger.pdf \(build.dk\)](#)

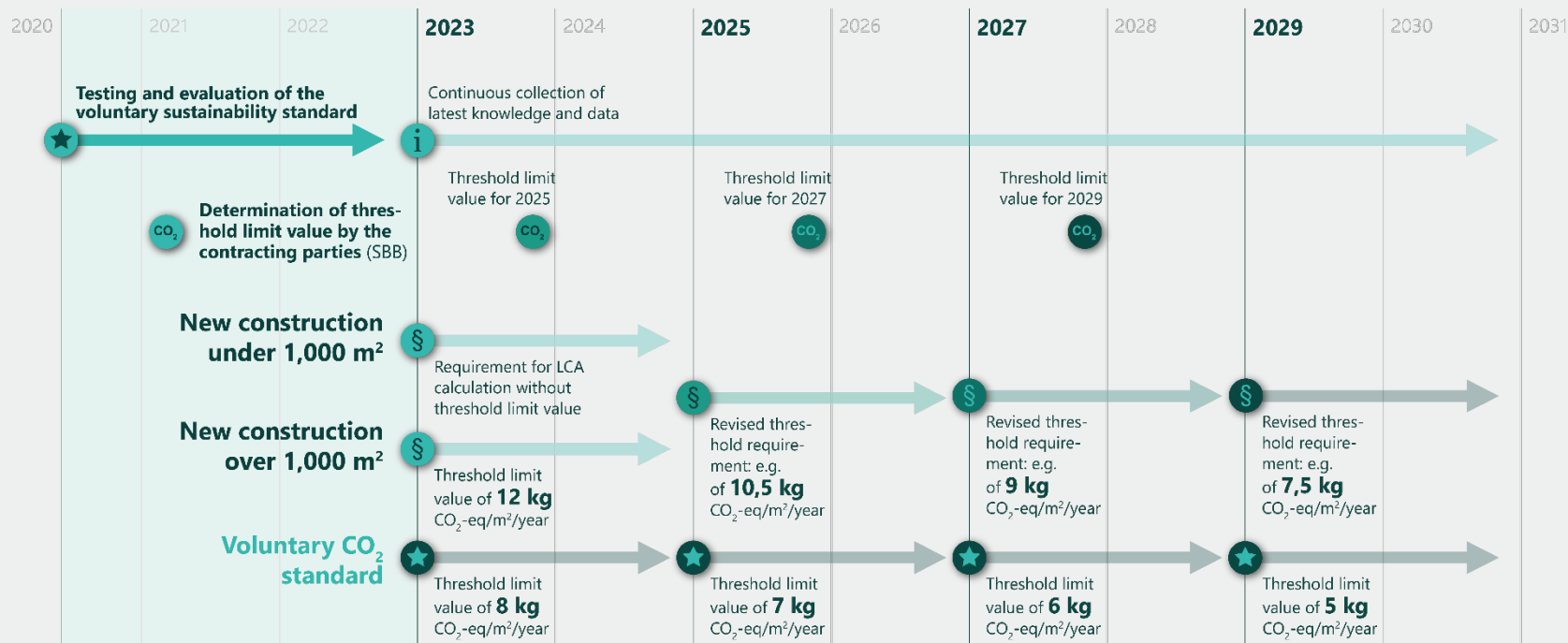
*Paragraph 3.* If the building has an energy framework with an add-on (see section 260, paragraph 3), the portion of the energy demand that entails the add-on is not included in the calculation under paragraph 1.

*Paragraph 4.* If the building has special circumstances as a result of its location, function, etc. which necessitate material consumption that leads to an increased climate impact, such increased climate impact is not included in the calculation under paragraph 1.'

# Further work with limit values



# Staged phasing and tightening of the CO<sub>2</sub>-criteria



# Political agreement on limit values

**End of 2023 the political parties in Denmark meet to define a limit value for 2025**

## **Where to set the next limit values?**

Presentation of different models of limit values based on:

- Existing building LCA's (amount of cases and representativeness of cases)
- Top-down – can we indicate where to set the limit value in regards to the carbon budget?
- Stage of modules/phases
- Experience and costs
- Possibility of different values for different building types or building size?
- Risk of use-stage included in the limit value
- EPD's within limit values
- How to incentive circular economy within the building?
- How to make data less static?

# Thanks for your attention!

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# Relevant links

- 60 buildings study (limit values, DK) [SBI udgivelser \(build.dk\)](#)
- [National Strategy for Sustainable Konstruktion.pdf \(im.dk\)](#); [Ny aftale sikrer bæredygtigt byggeri \(im.dk\)](#)
- National hearing (DK) [Høringsdetaljer - Høringsportalen \(hoeringsportalen.dk\)](#)
- Notification [Søg i databasen - European Commission \(europa.eu\)](#)
- Certain building types (english summary) [CO2-krav og særlige bygningsforudsætninger \(build.dk\)](#)