

22. June 2023

BUILD

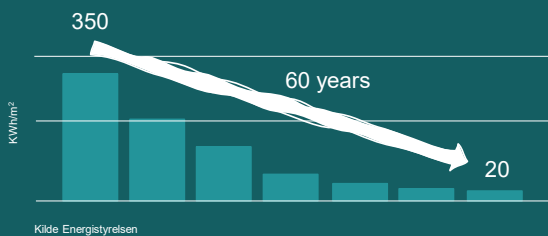
# LCA requirements in Danish Building Regulation – what is it and how did we get here?

Professor Harpa Birgisdottir



## THE PAST

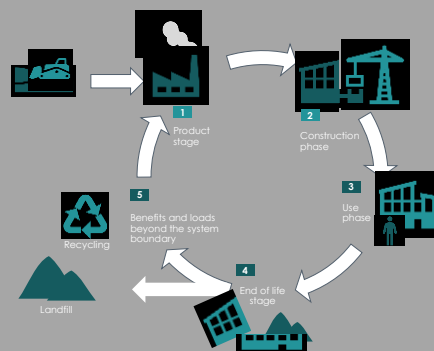
Development of the operational energy requirements



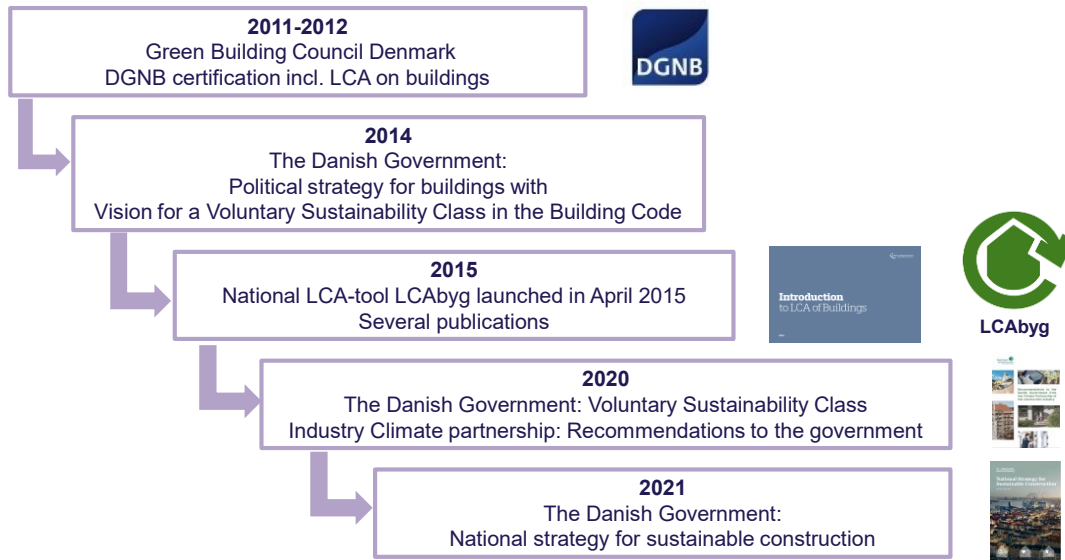
VS

## NOW

Focus on building life cycle

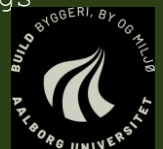


## 10 YEARS OF FOCUS ON LCA ON BUILDINGS IN DENMARK



# LCAByg

Danish tool for LCA of buildings



## A NATIONAL TOOL

**16.705**

registered  
accounts

**5.943**

downloads of  
LCAbyg 2023

**9.209**

downloads of  
LCAbyg 5.2.1

LCAbyg is free of  
charge for the  
industry

LCAbyg is  
developed for  
Danish  
conditions

3rd party  
integration for  
easy workflow



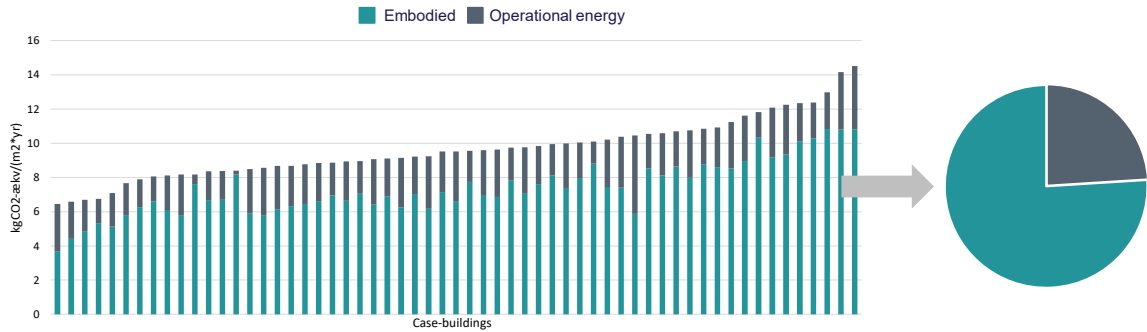
## REPORT FROM BUILD (2020): WHOLE LIFE CARBON ASSESSMENT OF 60 DANISH BUILDING CASES



### Purpose

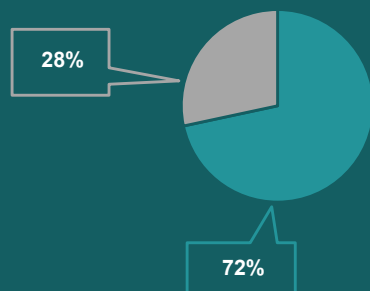
- To establish sufficient data background on the climate impact of buildings in Denmark over their life cycle.
- On the basis of this, possible reference values are calculated and suggested

## WHOLE LIFE CARBON (50 YEARS REFERENCE STUDY PERIOD)

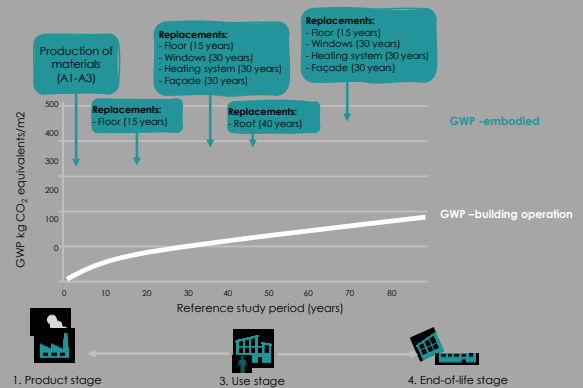


## IMPORTANT LESSONS FOR WHOLE LIFE CARBON OF NEW BUILDINGS

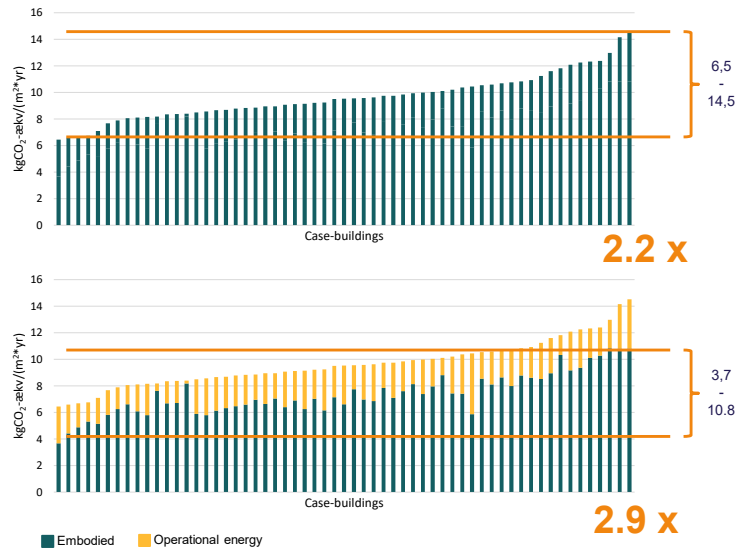
### 1. The importance of embodied



### 2. The timing of emissions



## IMPORTANT LESSONS FOR WHOLE LIFE CARBON OF NEW BUILDINGS



### 3. Large potential to reduce!



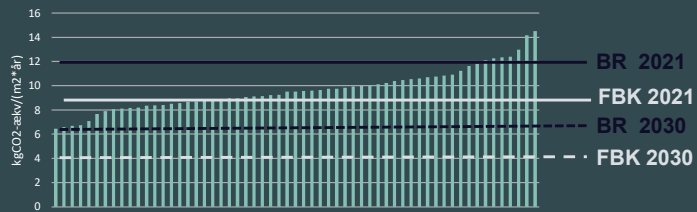
HOW

RESULT

ED ?



## CLIMATE PARTNERSHIPS SUGGESTIONS OF LIMIT VALUES (IN 2020)

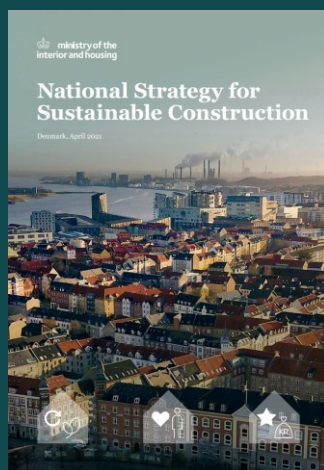


	Building regulation kg CO <sub>2</sub> /m <sup>2</sup> /year	Voluntary sustainability class kg CO <sub>2</sub> /m <sup>2</sup> /year
2021	12	8,5
2030	6	3,5 - 4

Regeringens  
klimapartnerskab  
for konstruktionsbranchen



Recommendations to the  
Danish Government from  
the Climate Partnership of  
the construction industry



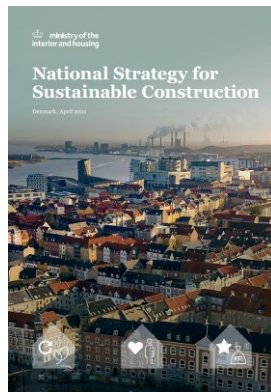
## NEW NATIONAL STRATEGY (2021)



Aftale mellem regeringen  
(Socialdemokratiet) og Venstre, Dansk  
Folkeparti, Socialistisk Folkeparti,  
Radikale Venstre, Enhedslisten, Det  
Konservative Folkeparti og Alternativet  
om:

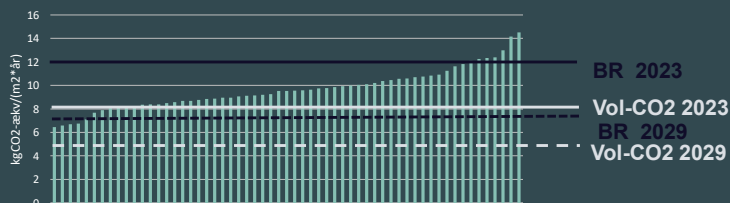
National strategi for bæredygtigt  
byggeri

5. marts 2021



- March 5<sup>th</sup> 2021
- Danish National Strategy for Sustainable Construction
- Including limit values for GHG emissions (CO<sub>2</sub>) from new construction from 2023

## NATIONAL STRATEGY LIMIT VALUES (IN 2021)



## Package for LCA for buildings is needed



- **Tool**
  - National free available tool, LCAbyg
  - Homepage with information ([www.lcabyg.dk](http://www.lcabyg.dk)) + LCAbyg Youtube channel with tutorials & webinars
  - Courses available
- **Data**
  - EPD's and generic database (Ökobau database from Germany used also in Denmark)
  - BUILD service life tables, Report 2021:32
- **Methodology**
  - Limit values (with allowance to exceed if necessary)
  - European standards + well documented Danish method description according to the legal requirements
  - Knowledge center with all information needed on the methodology (<https://byggeriogklima.dk/>)
  - Courses available

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# Energiforbrug og klimapåvirkning

## (§ 250 - § 298)

Se reglementet i en anden periode

BR18 (Aktuelt) ▼

Krav

Vejledning

8



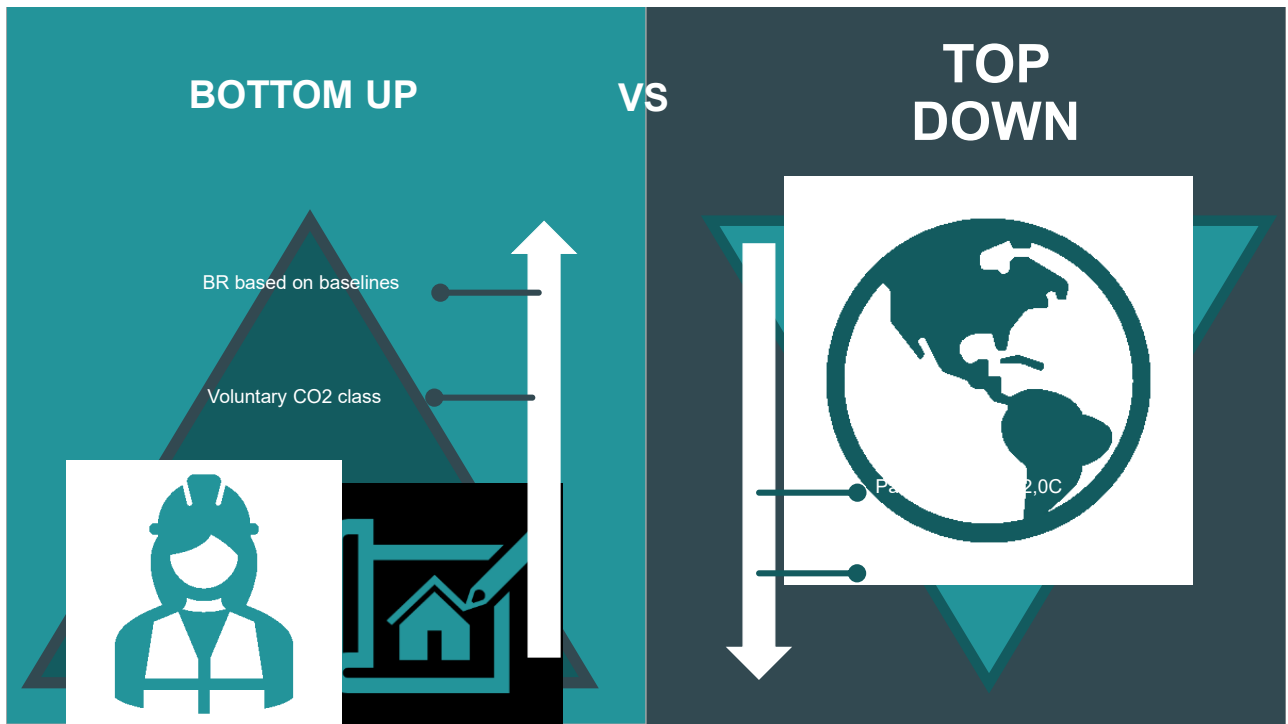
## Details of the requirement in the building regulation

Bestemmelse	Paragraf	Stykke	BR18 bilag
Omfattede bygninger	§ 297	stk. 1	
Livscyklus og betragtningsperiode		stk. 2	
Referenceareal		stk. 3	
Bygningsmodel		stk. 4	2, tabel 6
Datagrundlag		stk. 5	2, tabel 7
Miljøvaredeklarationer		stk. 6	
Levetider		stk. 7	
Emissionsfaktorer		stk. 8	2, tabel 8
Lavemissionsklassen		stk. 9	
CO <sub>2</sub> -grænseværdi	§ 298	stk. 1	
Modul D		stk. 2	
Energitillæg		stk. 3	
Særlige forhold		stk. 4	2, tabel 9

## Allowance to exceed

- Definition of what can be accepted as special needs and what can not
- How to handle this





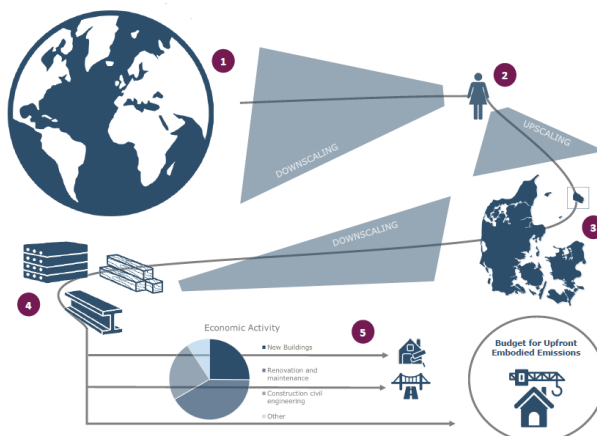
## URGENCY

Are the requirements ambitious enough?



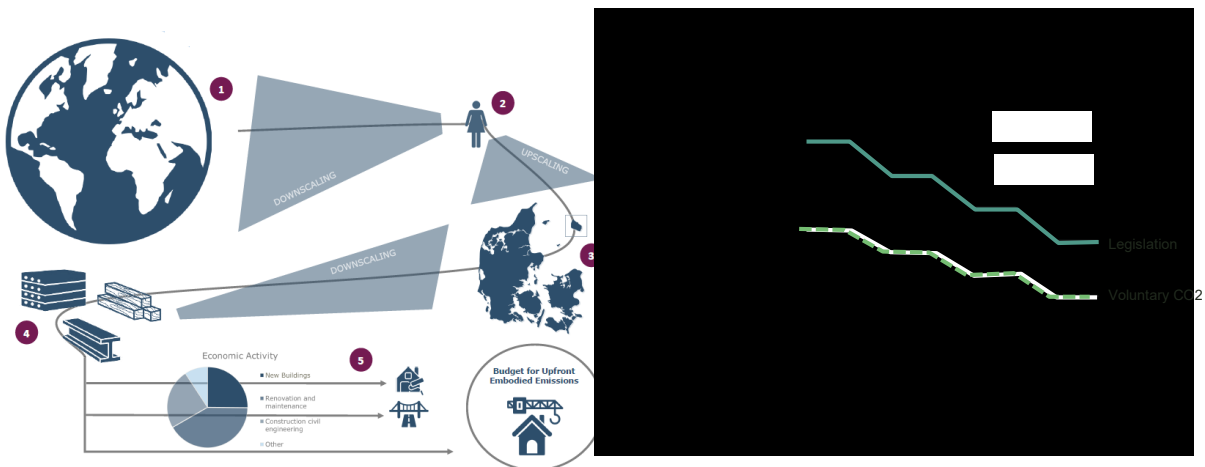


## HOW FAR ARE THE REQUIREMENTS FROM MEETING THE PARIS AGREEMENT?

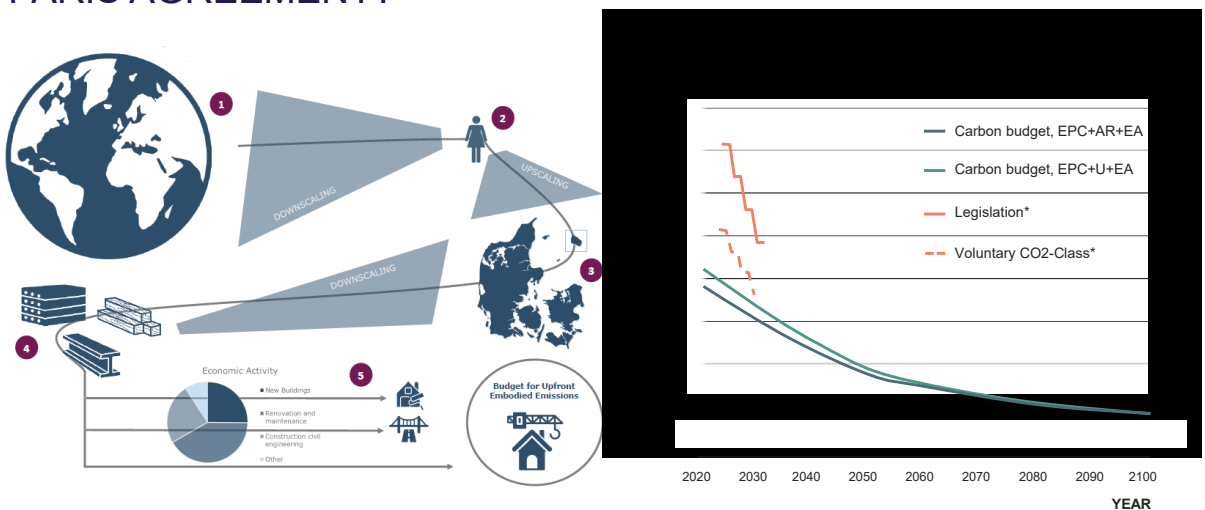


Industrial Phd project: Lise Hvid Horup Sørensen, Rambøll  
Supervisors: Morten Ryberg, Michael Hauschild, Harpa Birgisdottir, Christian Thuesen, Andreas Qvist Secher

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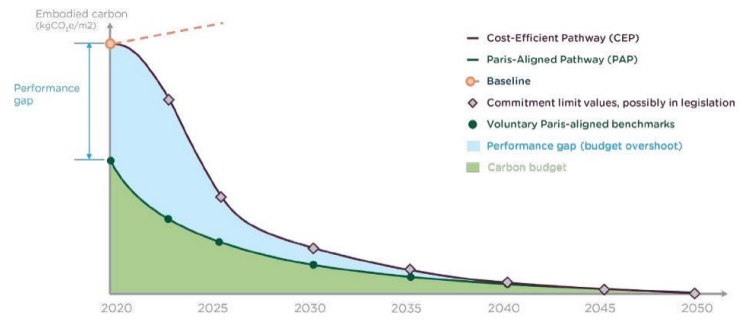
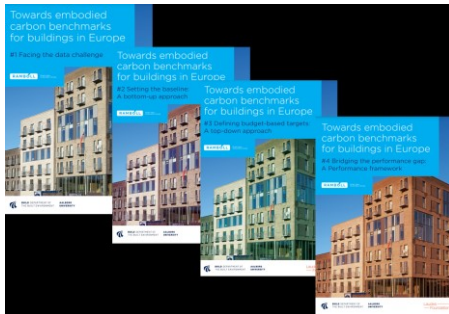


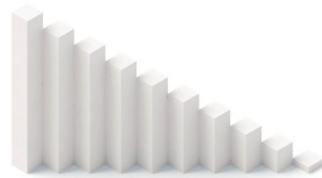
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## How do we meet our commitments?

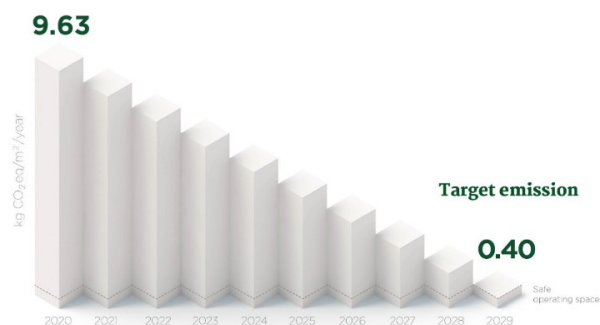




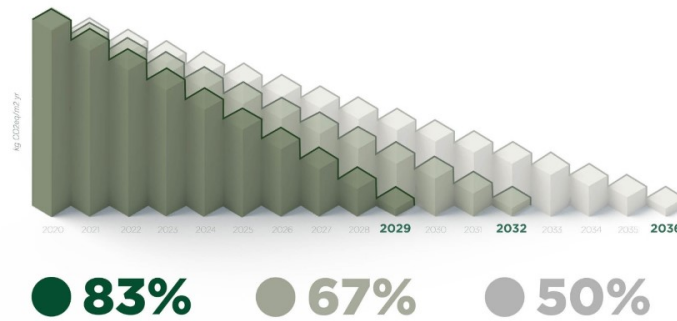
[www.reductionroadmap.dk](http://www.reductionroadmap.dk)

33 - 51

#### Emissions today

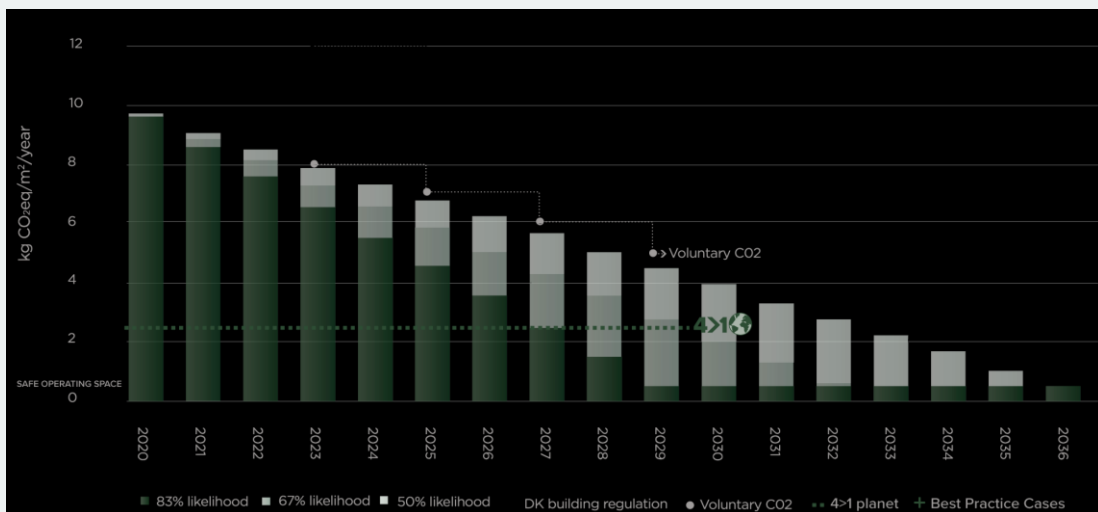


Reduction path

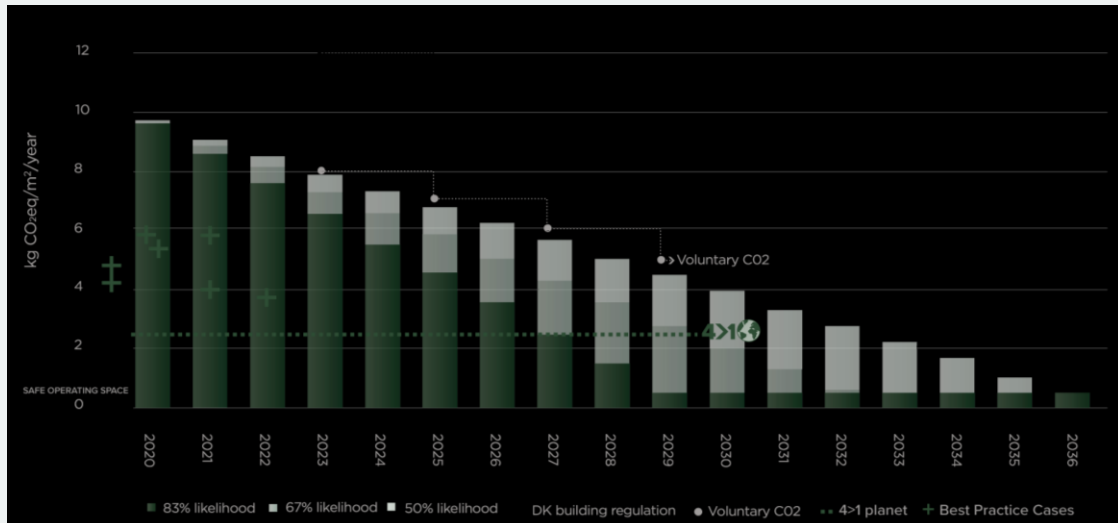


The 50% scenario for 1,5 degrees warming  
is closing in on the 83% likelihood for meeting 1,7 degrees

## > Best practice cases – residential buildings



## > Best practice cases – residential buildings



## > BUILD SAMPLE OF RESIDENTIAL BUILDING CASES

