

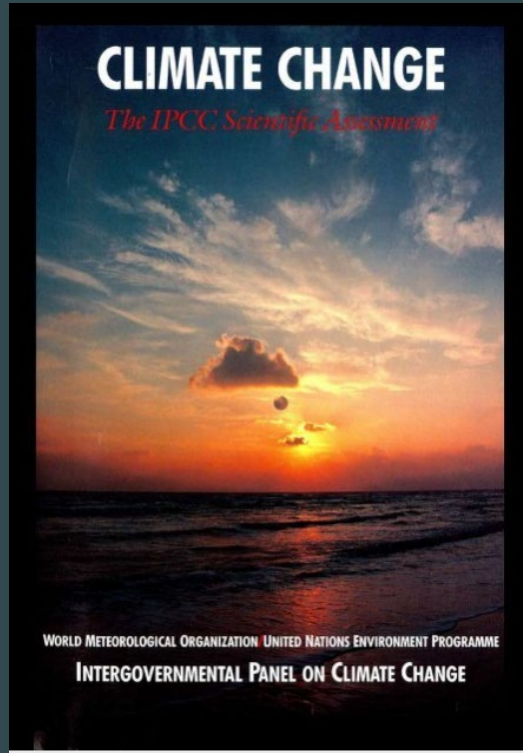
KLIMAVENLIGE MATERIALER

PROFESSOR HARPA BIRGISDÓTTIR
26.04.2022

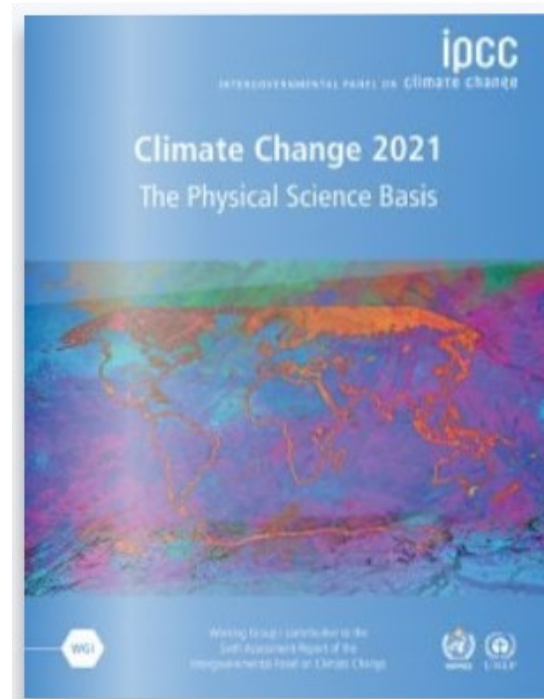


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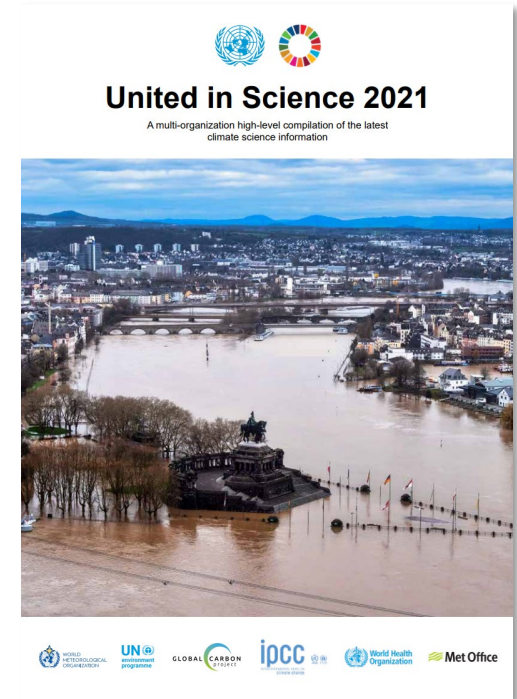
CLIMATE URGENCY



1990

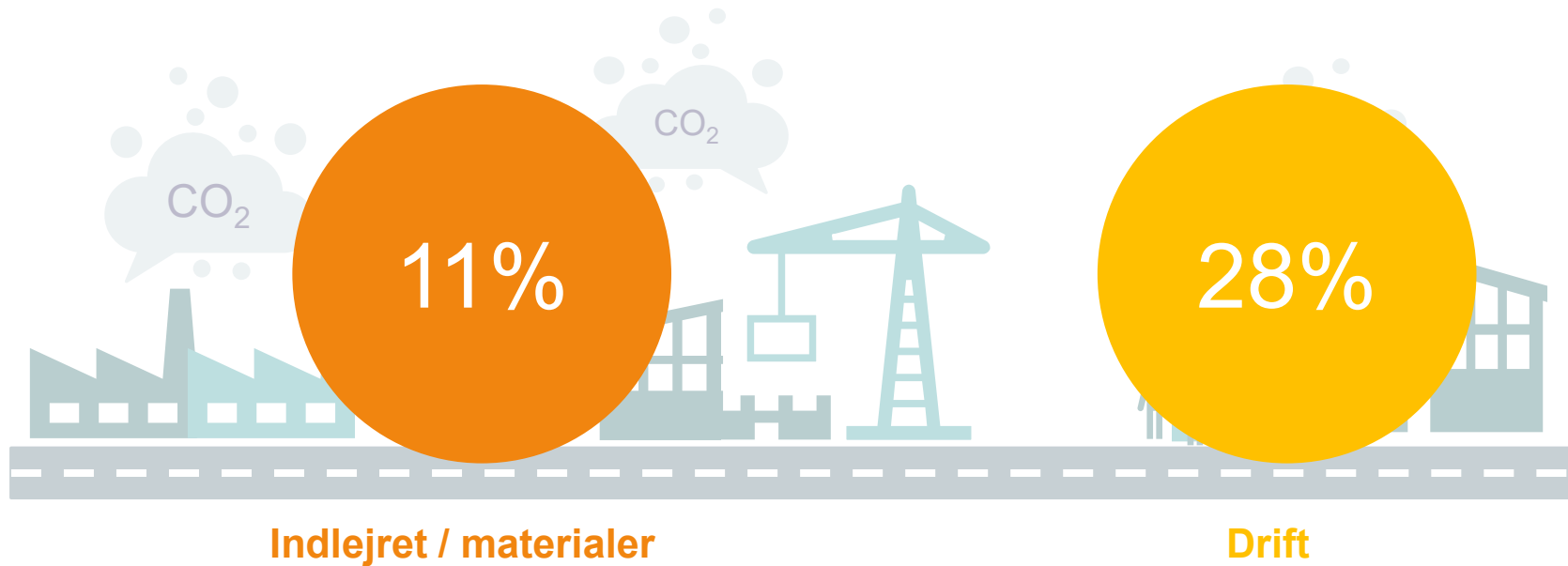


August 6th 2021



September 16th 2021

KLIMAPÅVIRKNINGER FRA BYGGERI

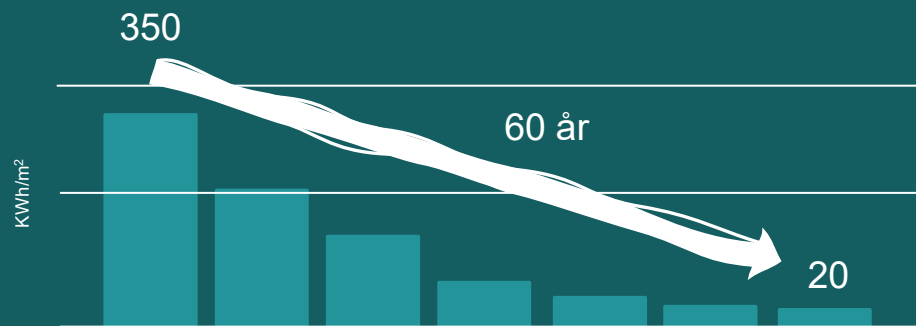


Tidligere

VS

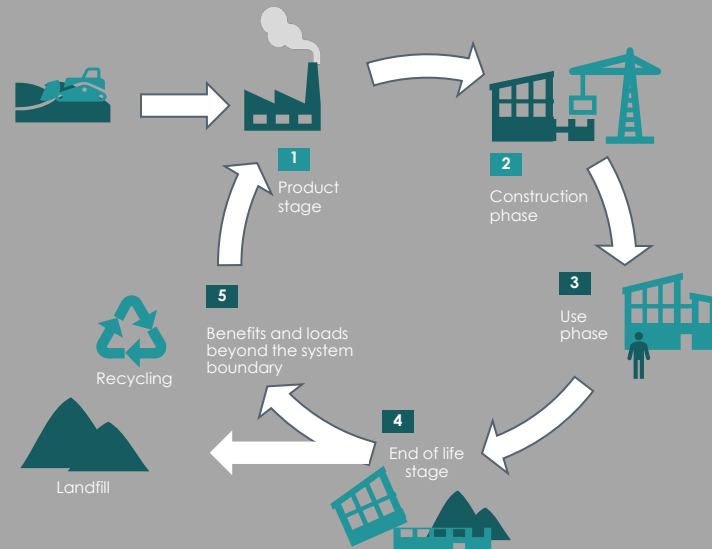
Nu

Udvikling af kravene til driftsenergiforbrug



Kilde Energistyrelsen

Til bygningens livscyklus



Rapport: Klimapåvirkninger fra 60 bygninger

SBI 2020:04

Klimapåvirkning fra 60 bygninger
Muligheder for udformning af referenceværdier
til LCA for bygninger

BUILD REPORT 2021:12

WHOLE LIFE CARBON
ASSESSMENT OF 60 BUILDINGS
POSSIBILITIES TO DEVELOP BENCHMARK VALUES
FOR LCA OF BUILDINGS

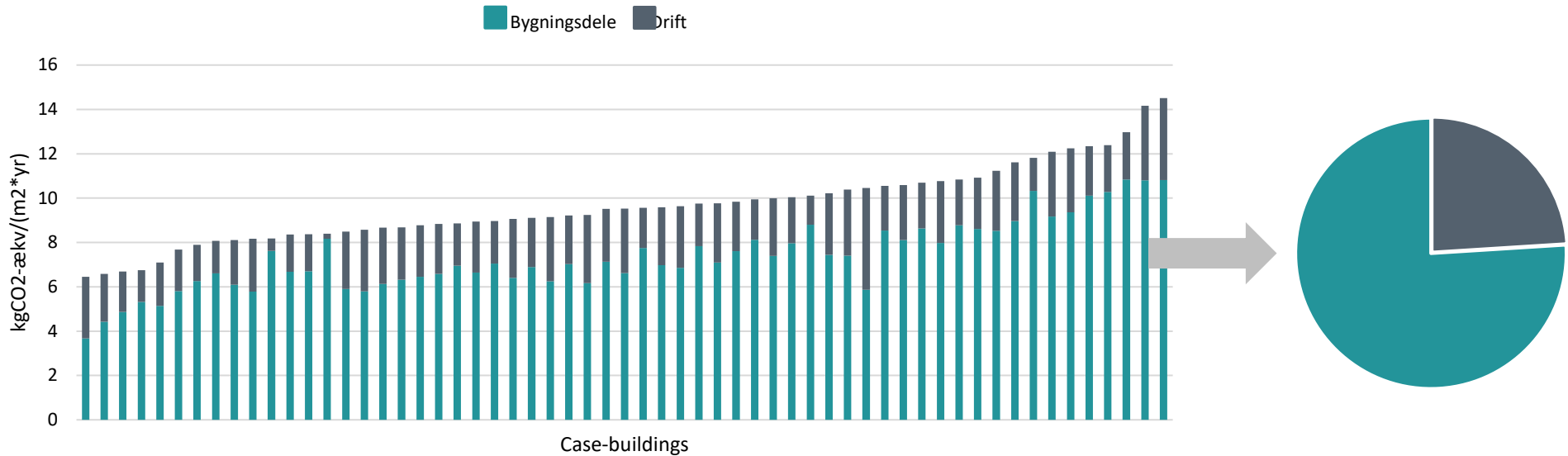
BUILD Rapport 2021:13

KLIMAPÅVIRKNING FRA 60
BYGNINGER
Opdaterede værdier baseret på nyere data og
danske branche EPD'er

Formål

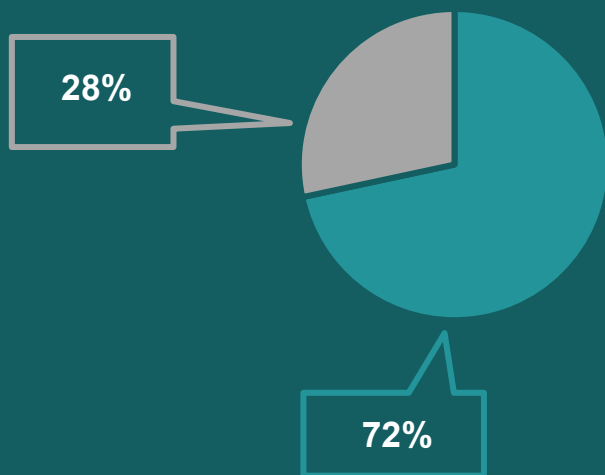
- At etablere tilstrækkeligt datagrundlag for bygningers klimabelastning i Danmark ved LCA
- På baggrund af dette, at beregne mulige referenceværdier

Klimabelastning ved 50 års betragtningsperiode

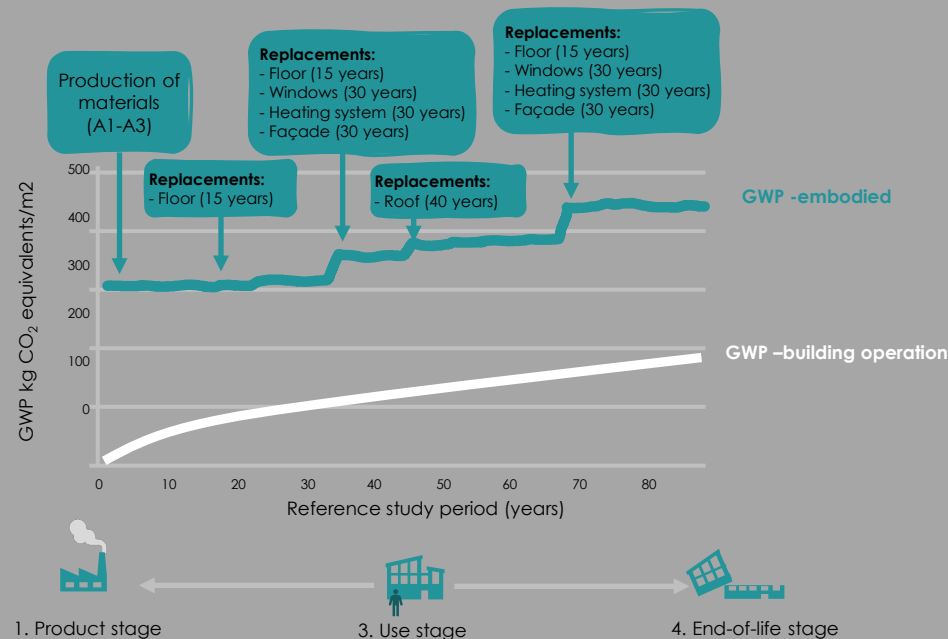


VIGTIG LÆRING FRA KLIMPÅVIRKNINGER FRA 60 BYGNINGER

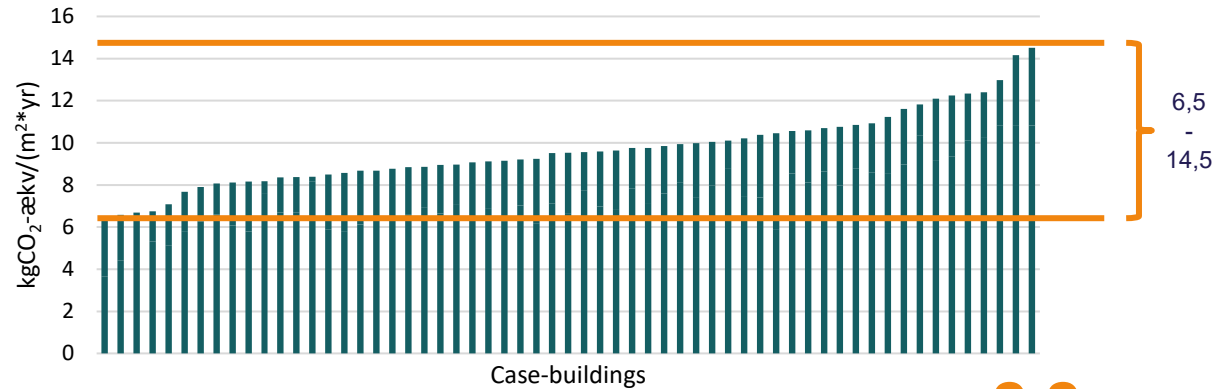
1. MATERIALERNES VIGTIGHED



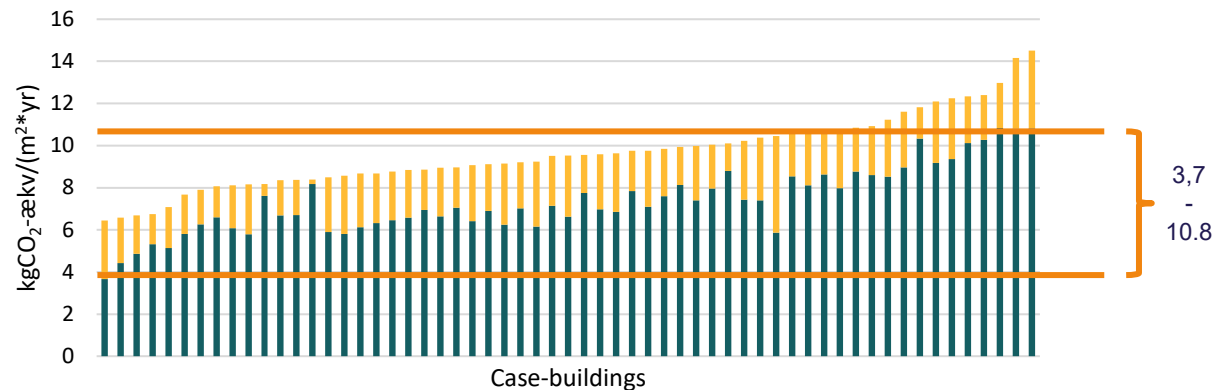
2. TIMINGEN AF EMISSIONER



VIGTIG LÆRING FRA KLIMPÅVIRKNINGER FRA 60 BYGNINGER



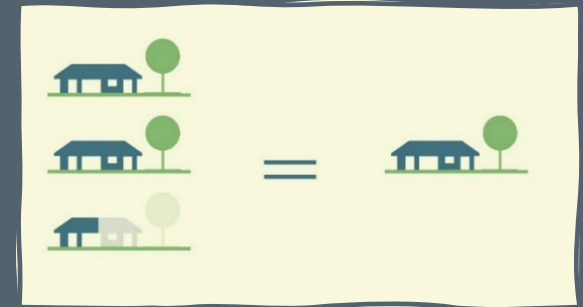
2.2 x



■ Embodied ■ Operational energy

2.9 x

3. Stort reduktionspotentiale!



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

National strategi for bæredygtigt
byggeri

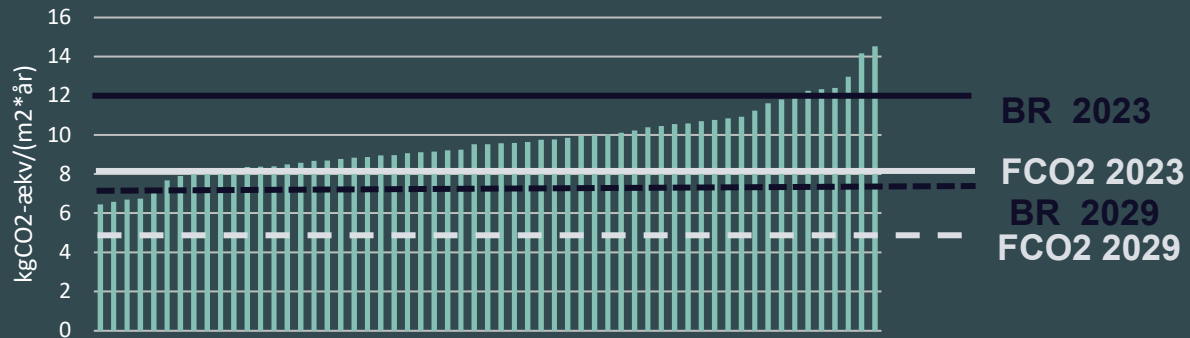
5. marts 2021

1



- 5. marts 2021
- National strategi for bæredygtigt byggeri
- Inkluderer grænseværdier for CO₂ i for nybyggeri fra 2023

National strategi vedtaget i 2021





URGENCY



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URGENCY

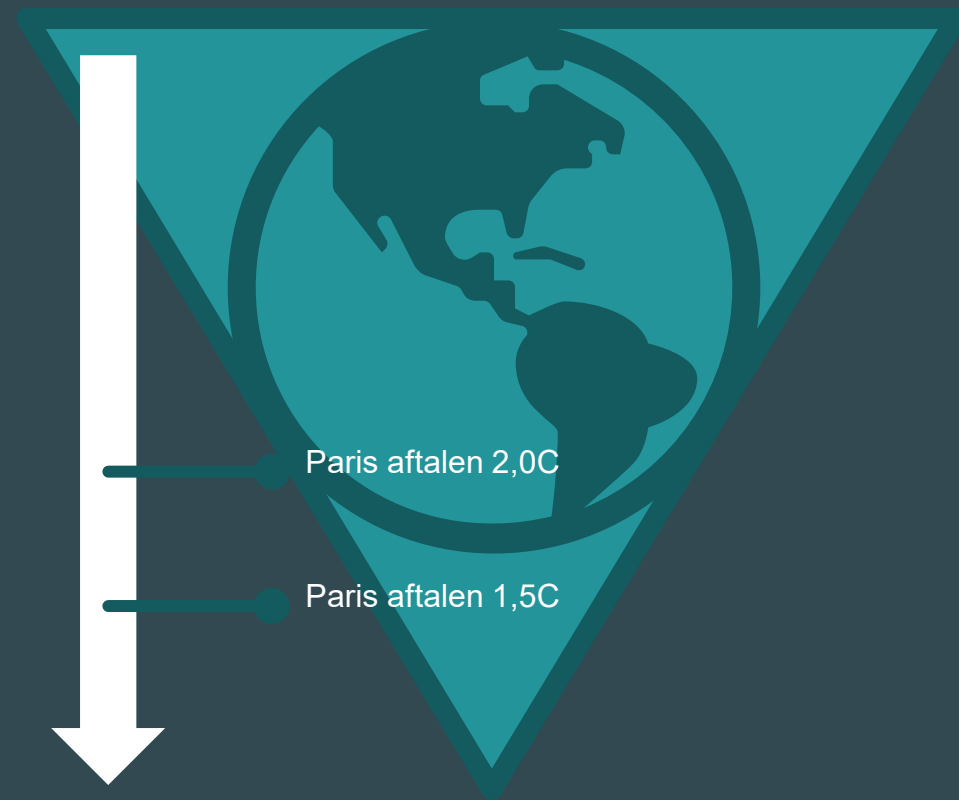
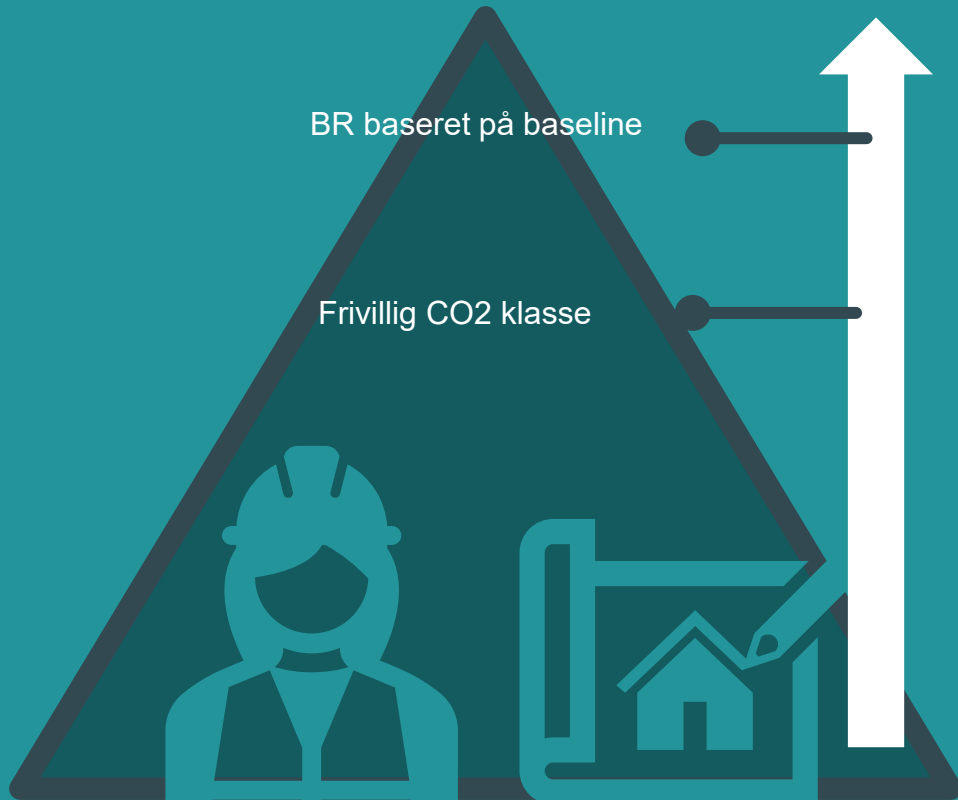
Er klimakrav i byggeri ambitiøse nok?



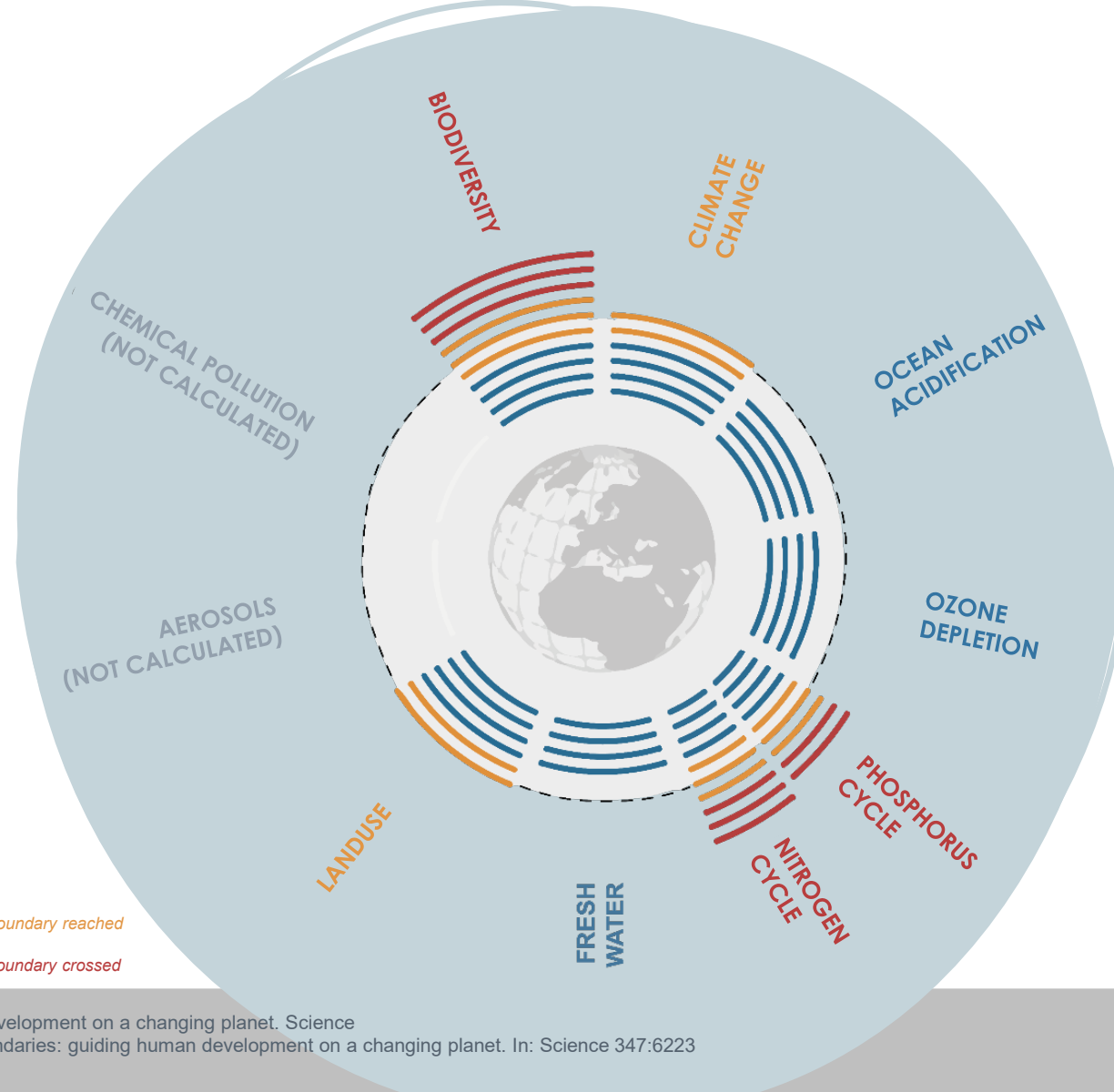
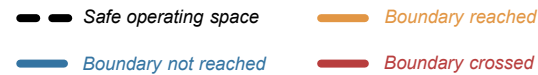
BOTTOM UP

VS

TOP DOWN



PLANETÆRE GRÆNSER



Steffen et al. (2015). Planetary boundaries: Guiding human development on a changing planet. Science

Graphics: Adapted from Steffen, Will et al. 2015: Planetary boundaries: guiding human development on a changing planet. In: Science 347:6223

ABSOLUT MILJØMÆSSIG BÆREDYGTIGHED

EKSEMPEL PÅ: KLIMAPÅVIRKNING

Building and Environment • Volume 171 • 15 March 2020 • Article number 106633

Assessment of absolute environmental sustainability in the built environment

Andersen C.E.^a ✉, Ohms P.^b, Rasmussen F.N.^a, Birgisdóttir H.^a,

Birkved M.^c, Hauschild M.^b, Ryberg M.^b

[Save all to author list](#)

^a Danish Building Research Institute, Aalborg University, Copenhagen, Denmark

^b Technical University of Denmark, Department of Management Engineering, Kgs. Lyngby, Denmark

^c Southern University of Denmark, Institute of Chemical Engineering, Biotechnology and Environmental Technology, Odense, Denmark

9

Citations in Scopus

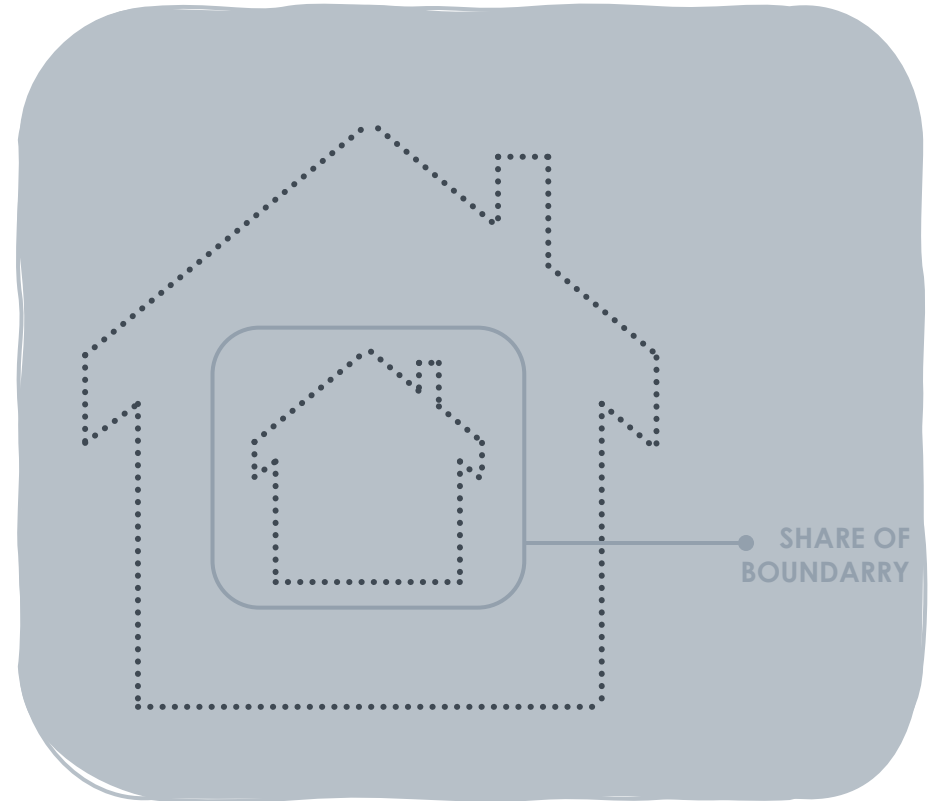
134

Views count [🔗](#)

[View all metrics >](#)

Abstract

The purpose of this study is to investigate absolute environmental sustainability in the built environment, by assessing whether contemporary environmentally optimized approaches to building design, with their associated consumption of resources and subsequent emissions, can be considered within the carrying capacity of Earth Systems. A life cycle assessment (LCA) was conducted for six dwellings to quantify their environmental footprints. Two methods for absolute environmental sustainability assessment were applied to the resulting life cycle inventories; one where the normalisation step applied normalisation factors reflecting carrying capacities of the Earth System and one where characterisation of elementary flows applied characterisation factors based on the Planetary Boundaries. For the assessment of environmental impact of each



M.Sc. Project of **Pernille Ohms, Camilla Andersen.**

Supervisors: Morten Rydberg, Michael Hauschild, Morten Birkved, Freja Nygaard Rasmussen, Harpa Birgisdóttir

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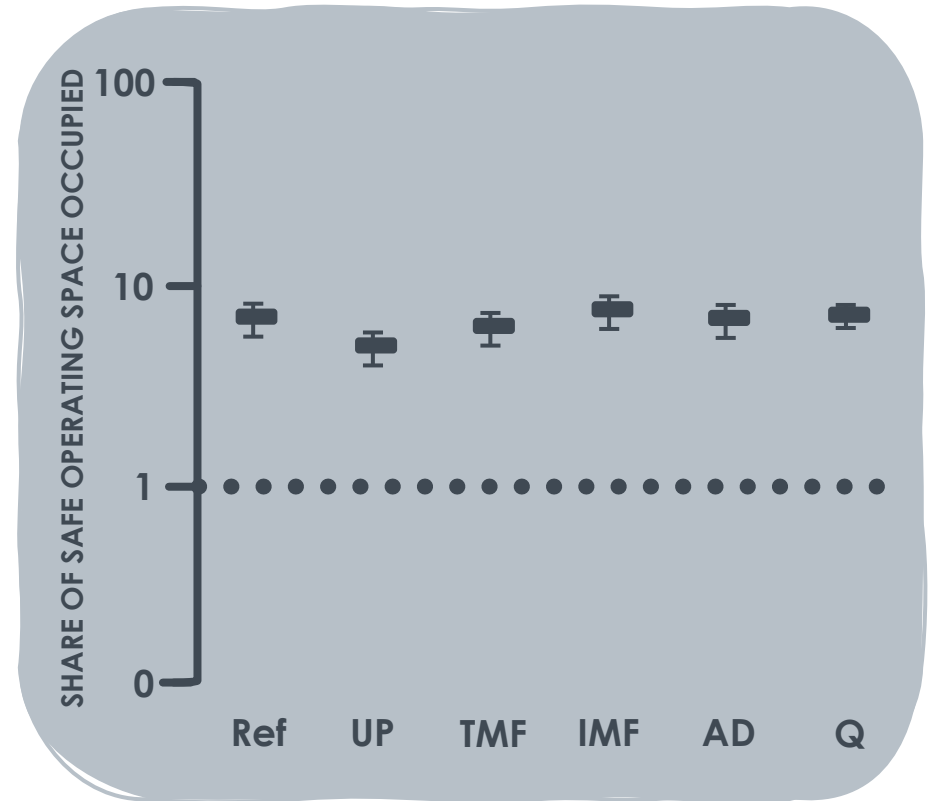
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Abstract

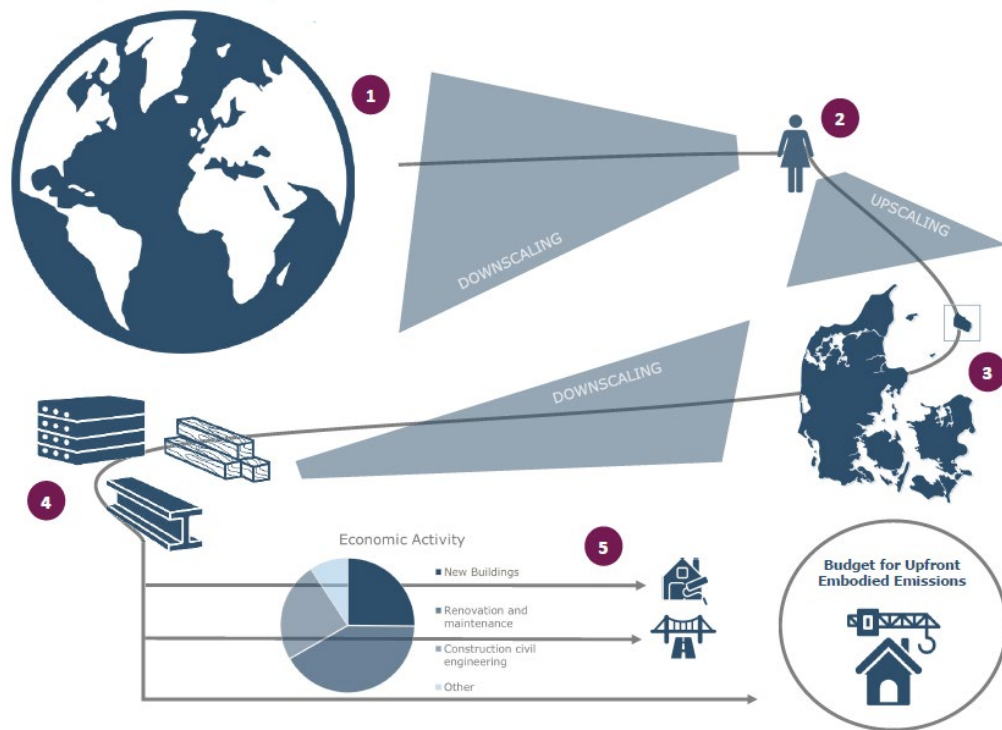
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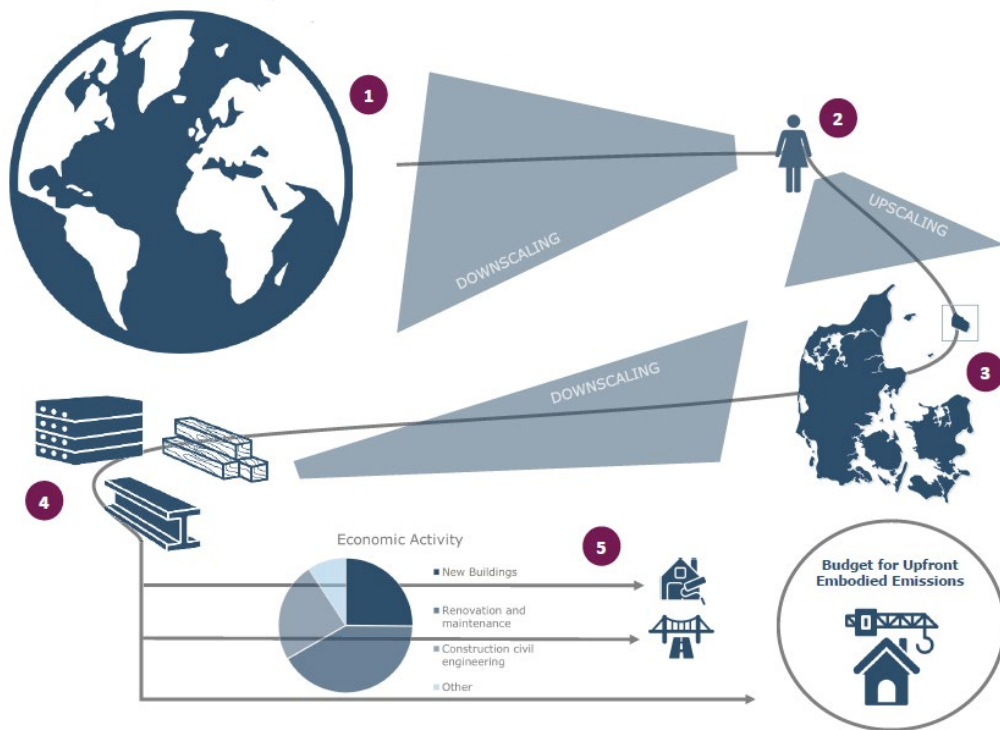
HVOR LANGT ER KLIMAKRAV I BYGNINGSREGLEMENT FRA DE CO2 BUDGETTER VI HAR FOR AT OVERHOLDE PARIS AFTALEN?



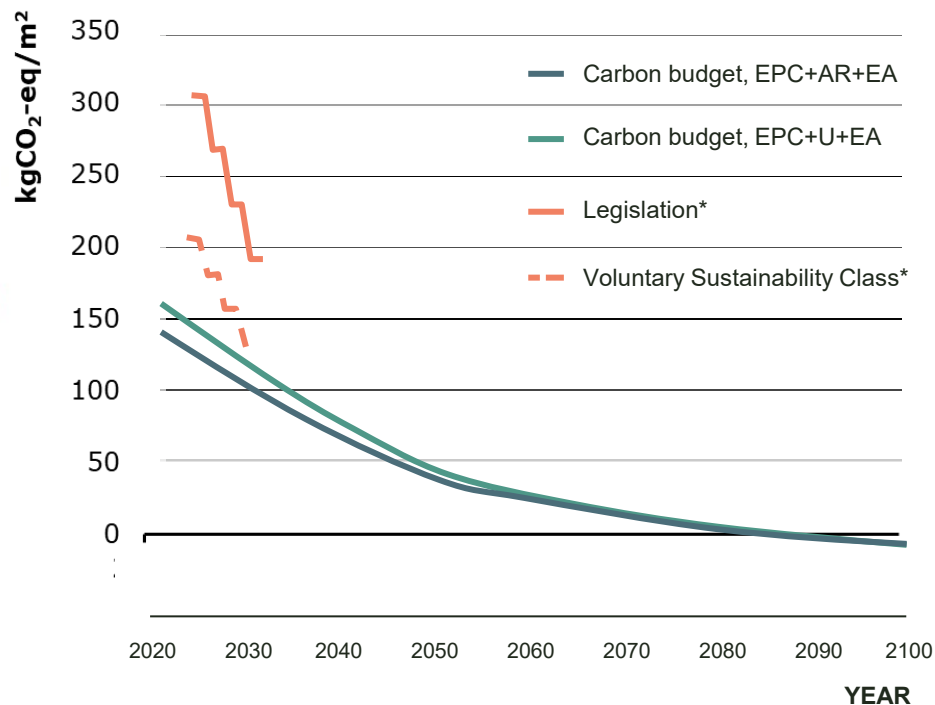
Industrial Phd project: **Lise Hvid Horup Sørensen**, Rambøll

Supervisors: Morten Ryberg, Michael Hauschild, Harpa Birgisdottir, Christian Thuesen, Andreas Qvist Secher and Gitte Gylling

HVOR LANGT ER KLIMAKRAV I BYGNINGSREGLEMENT FRA DE CO2 BUDGETTER VI HAR FOR AT OVERHOLDE PARIS AFTALEN?



BUDGET FOR UPFRONT EMBODIED CARBON EMISSIONS PER m²

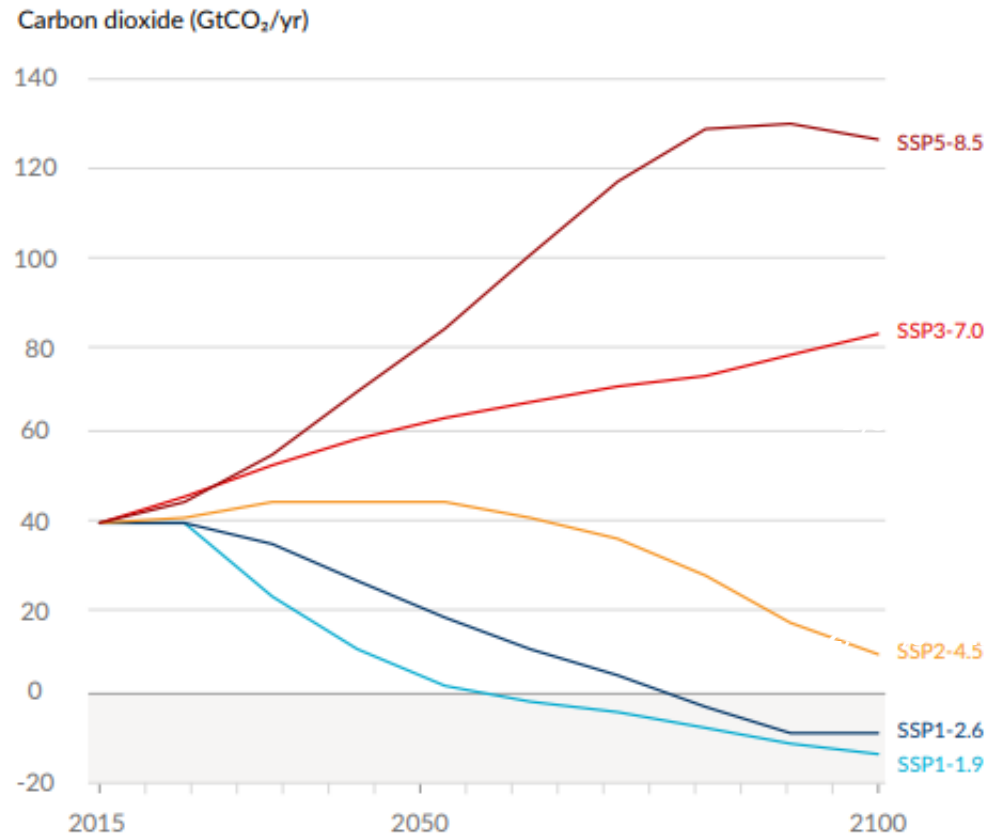


Industrial Phd project: **Lise Hvid Horup Sørensen**, Rambøll

Supervisors: Morten Ryberg, Michael Hauschild, Harpa Birgisdottir, Christian Thuesen, Andreas Qvist Secher and Gitte Gylling

IPCC

Hvilke scenarier er det vi
satser på for vores fremtidige
generationer?



IPCC

Hvilke scenarier er det vi
sætter på for vores fremtidige
generationer?



**Vi har stadig et
valg!**



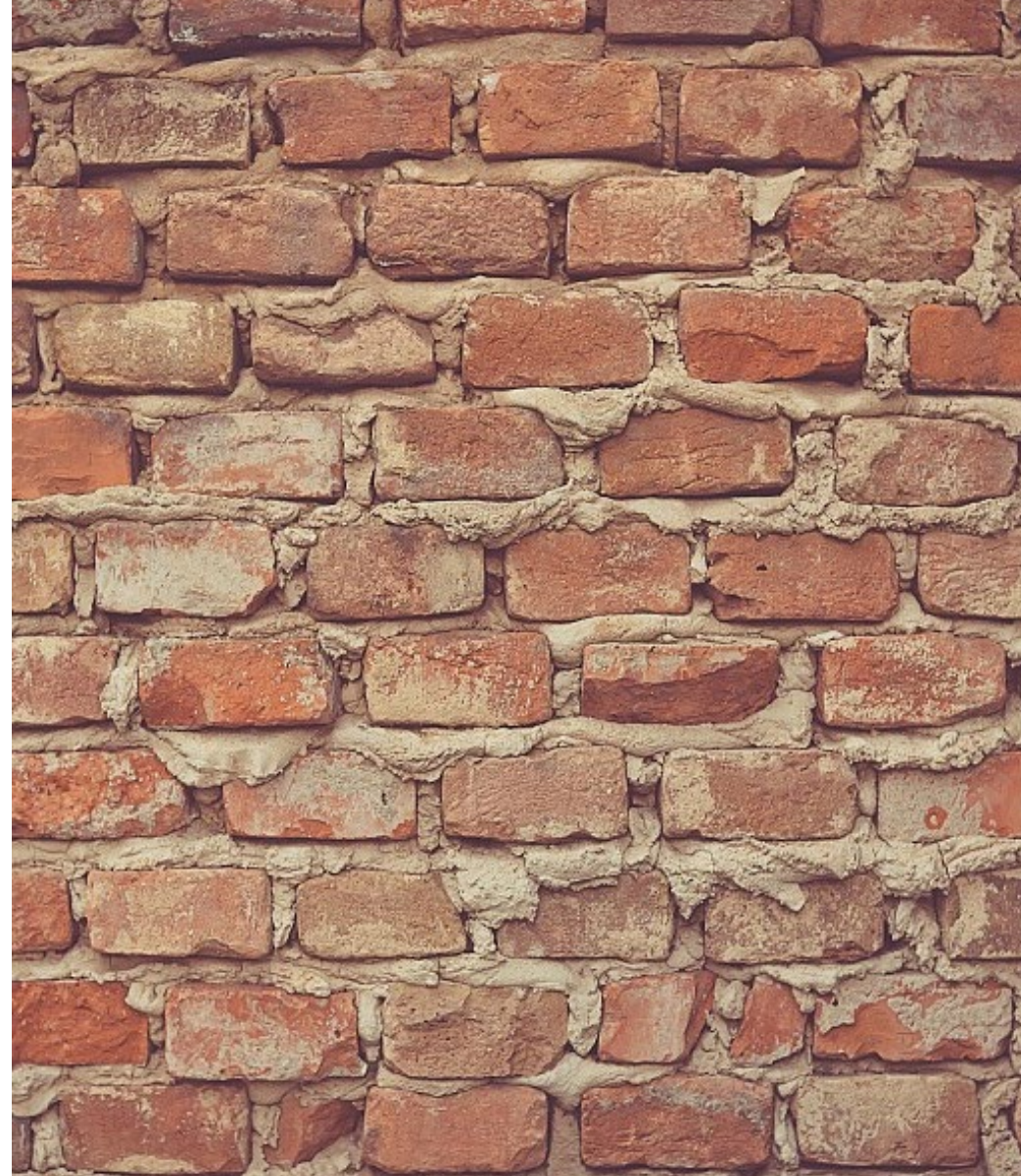
SÅ, HVAD HAR VI I VÆRKTØJSKASSEN?



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Materialer

- Fx forskning i træ
- Fx genbrug
- Optimering af konstruktioner
- Optimering af materialevalg





**SÅ, HVAD HAR VI I VÆRKTØJSKASSEN?
HER VIL DIGITALISERINGEN SPILLE
NØGLEROLLE**



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TILGÆNGELIGHED OG BETYDNING AF EPD'ER

En analyse der bygger på tilgængeligheden af specifikke miljødata repræsentativt for det danske marked og indflydelsen af disse på LCA-resultater



TILGÆNGELIGHEDEN AF EPD'ER



TILGÆNGELIGHED OG AFGRÆNSNING

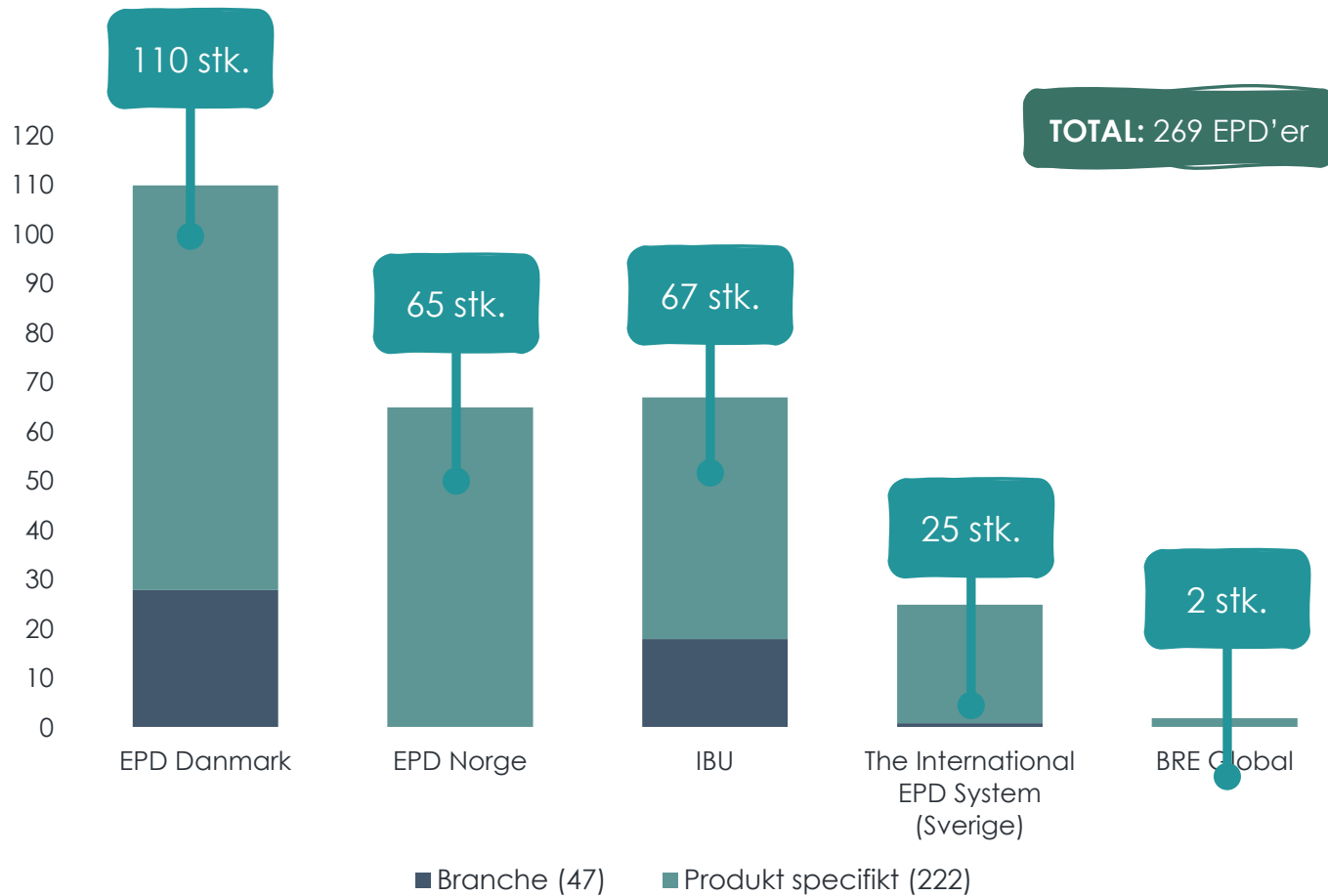
27



PRODUKTION



MARKED



BETYDNING AF EPD'ER PÅ LCA- RESULTATER

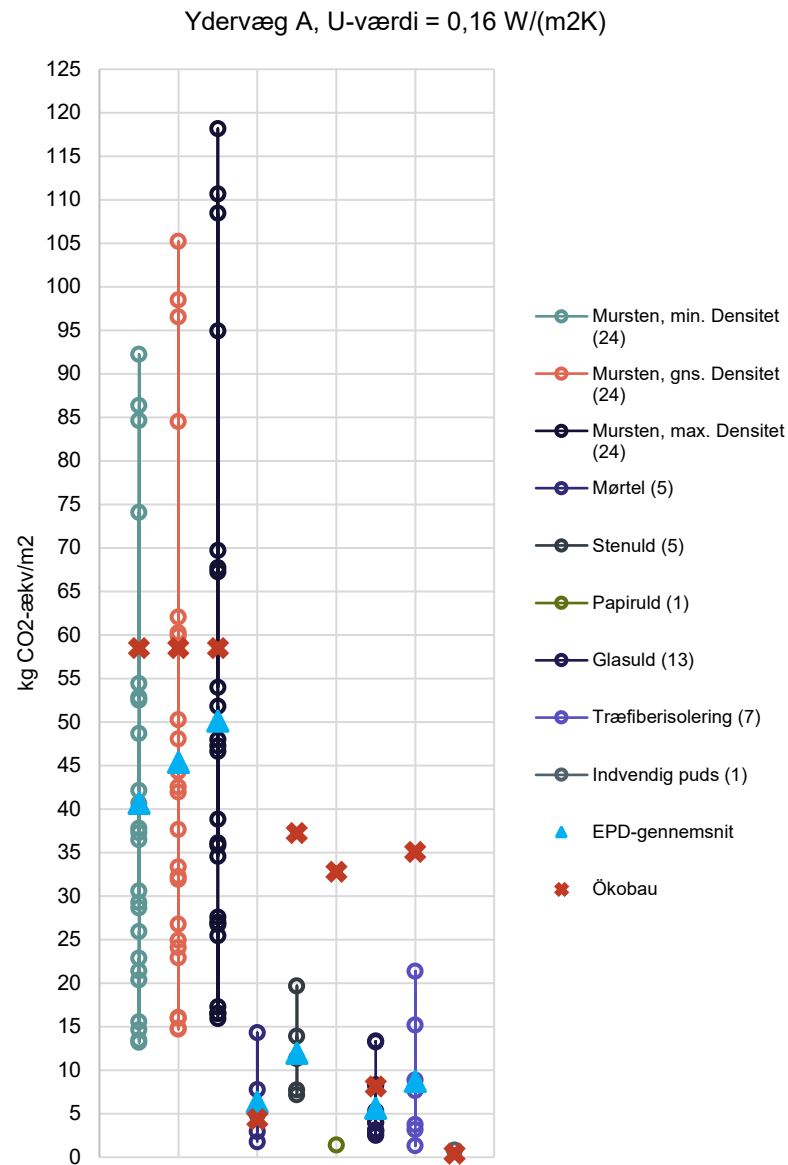


Problemstilling og metode

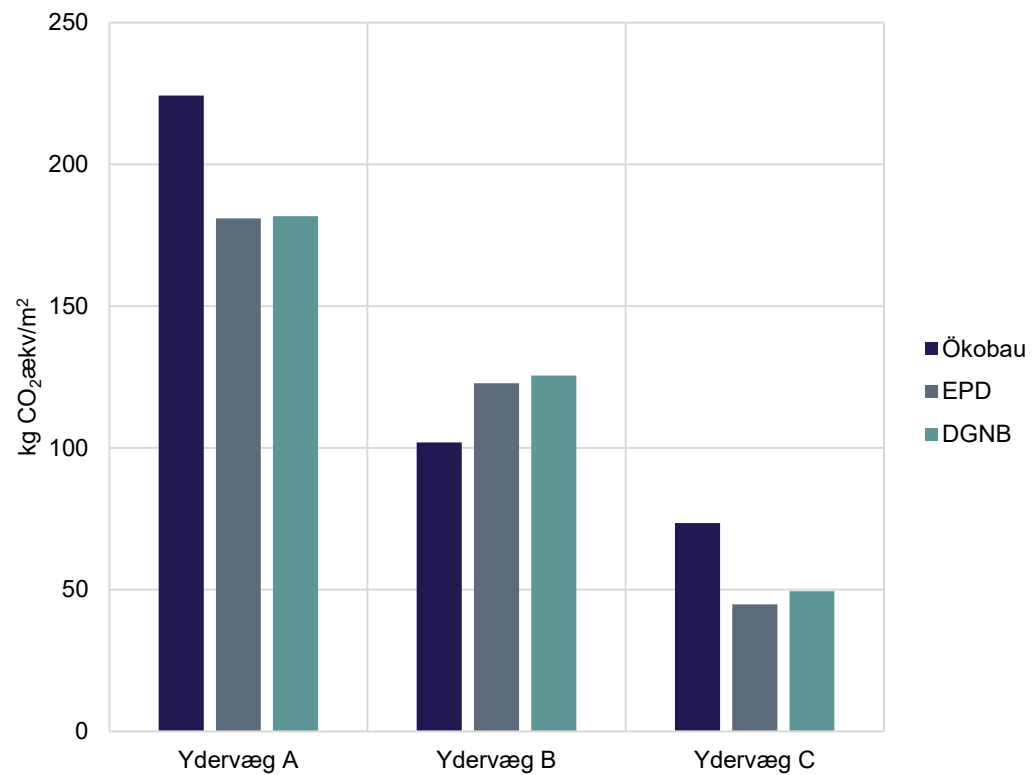
- Ydervæggene modelleres i flere materialetyper for at betragte adskillelig kombinationer.

		Yderside	Midterdel	Bagmur	Inderside
					
Ydervæg A	Variant 0	Tegl	Stenuld	Tegl	Puds og maling
	Variant 1	-	Papiruld	-	-
	Variant 2	-	Glasuld	-	-
	Variant 3	-	Træfiberisolering	-	-
Ydervæg B	Variant 0	Tegl	Stenuld	Beton	Puds og maling
	Variant 1	Træ	Papiruld	Porebeton	-
	Variant 2	Skifer	Glasuld	Letbeton	-
	Variant 3	Aluminium	Træfiberisolering	-	-
	Variant 4	Stål	-	-	-
	Variant 5	Fibercement	-	-	-
Ydervæg C	Variant 0	Træ	Stenuld	Træskelet	Gips, puds og maling
	Variant 1	Skifer	Papiruld	CLT	-
	Variant 2	Aluminium	Glasuld	-	-
	Variant 3	Stål	Træfiberisolering	-	-
	Variant 4	Fibercement	-	-	-

Ydervæg A Resultater



Resultater



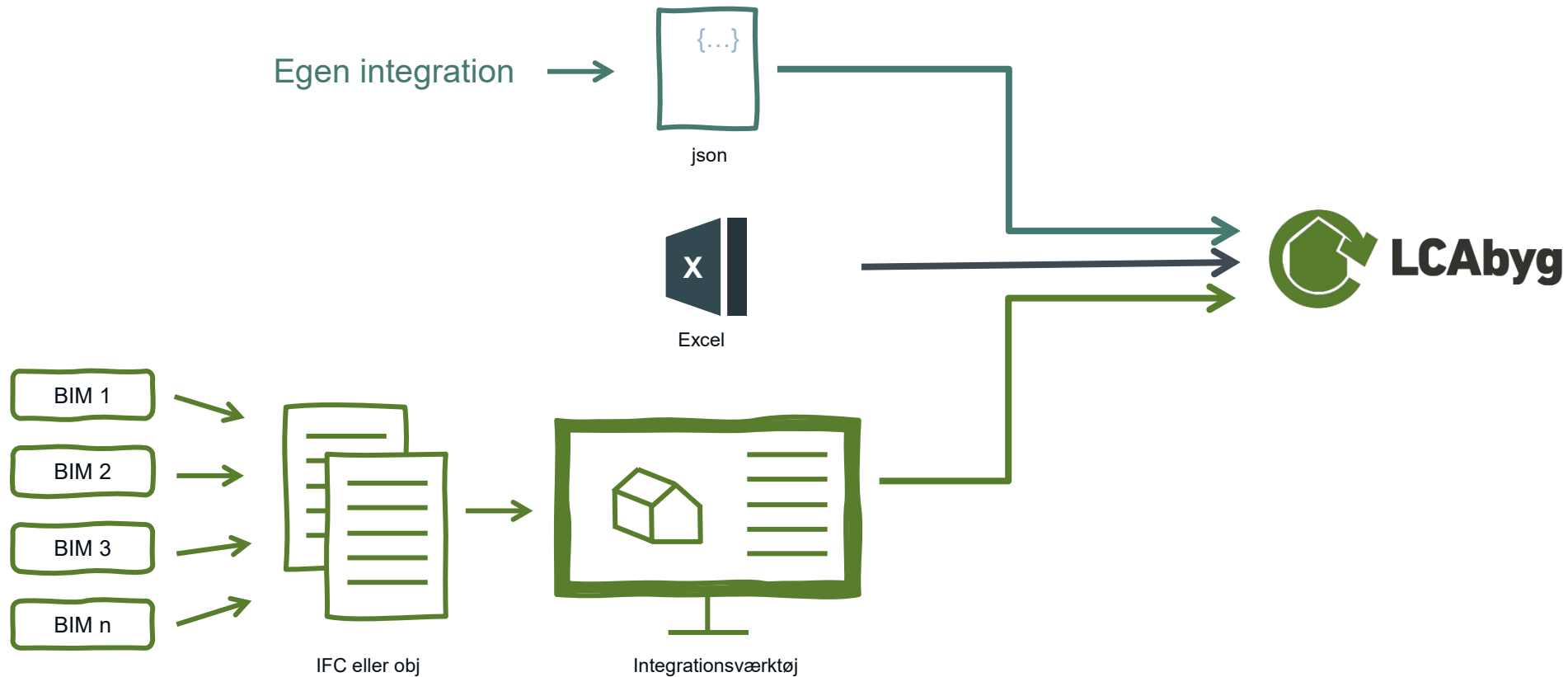
A large, dark teal illustration of a wrench and a screwdriver crossed in an 'X' shape, centered behind the main text.

DIGITALISERING IGENNEM HELE DESIGNFASEN



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Integrationsflows



Egen integration - json

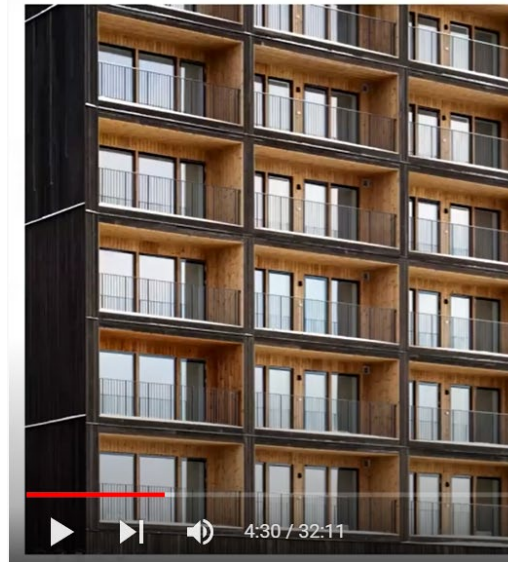
Introduktion til json formatet
- Hvad er det og hvordan kan det
bruges i LCAbyg 5?



Webinar: Introduktion til json formatet - Hvad er det og hvordan kan det bruges i LCAbyg 5?



DK



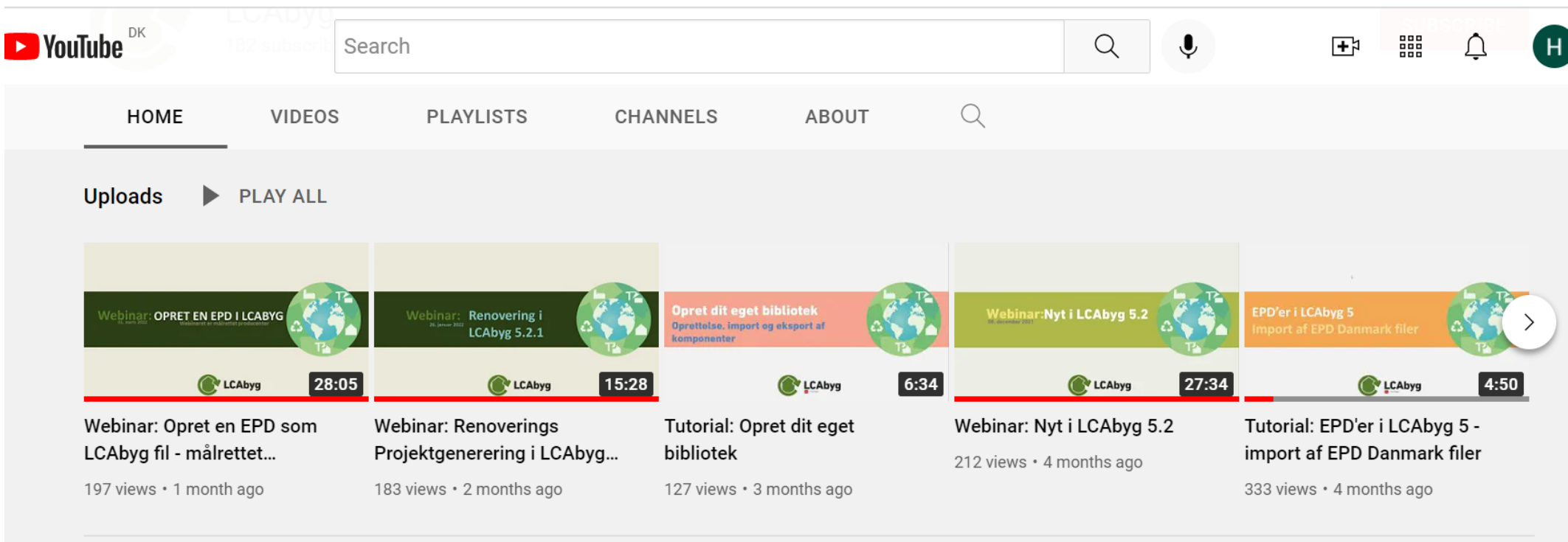
LCAbyg 5 - JSON
INTEGRATION MED TREDJEPARTSVÆR

Nicolaj Hostrup Langkjær
Bæredygtighedsingeniør
nhl@cfmoller.com

CF MØLLER
ARCHITECTS

Webinar: Introduktion til json formatet - Hvad er det og hvordan kan det bruges i LCAbyg 5?

Egen integration json



The screenshot shows the YouTube channel page for 'LCAbyg', which has 182 subscribers. The page displays a list of uploads under the 'PLAY ALL' tab. The uploads are as follows:

Video Title	Duration	Views	Time Ago
Webinar: OPRET EN EPD I LCAByg	28:05	197 views	1 month ago
Webinar: Renoverings Projektgenerering i LCAbyg	15:28	183 views	2 months ago
Tutorial: Opret dit eget bibliotek	6:34	127 views	3 months ago
Webinar: Nyt i LCAbyg 5.2	27:34	212 views	4 months ago
Tutorial: EPD'er i LCAbyg 5 - import af EPD Danmark filer	4:50	333 views	4 months ago