

Philanthropic Investment in Historic Buildings

NN

Who we are

Udvikler og bevarer



- Realdania By & Byg is a subsidiary of the philanthropic association Realdania founded in 2003
- We work to help realize Realdania's mission *to improve the quality of life through philanthropic investment and active ownership of properties and areas for urban development*
- We do this through philanthropic investments in properties, as it is determined in Realdania's articles of association that one of the associations' purposes is
- *to own and build properties with the purpose of preserving the built heritage and developing the building business.*



What we do

Udvikler og bevarer



- We own and preserve a collection of 60+ historic buildings that represent the development of Danish building heritage over 500 years. The historic buildings are rented to private individuals or businesses.
- We also develop innovative and experimental new buildings
- And we are involved in long-term urban development projects in partnership with municipalities in order to contribute to the development and quality of Danish towns

60+ Historic Buildings



15 Building Development Projects



4 Urban Development Projects



Portfolio in Denmark

Udvikler og bevarer

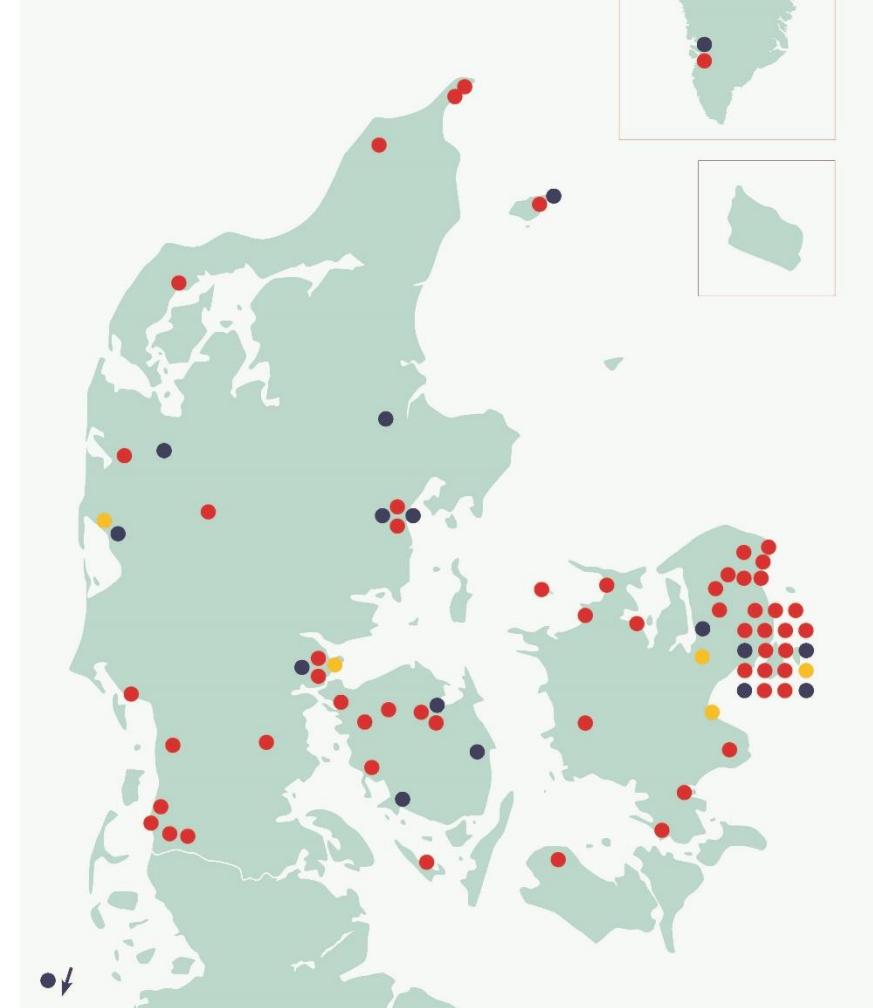


- 60+ historic buildings
- 15 building development projects
- 4 urban development projects

Geographically spread all over Denmark!

Portfolio in Denmark

- Historic Buildings
- Building Development Projects
- Urban Development Projects



Portfolio examples

Udvikler og bevarer

Among others, the portfolio contains the following building categories:

- Architects' own houses
- Farms
- Manor houses
- Estate construction



Philanthropic Investment

Udvikler og bevarer



- Philanthropic investments: A certain loss or reduced ROI is deemed acceptable to fulfil a philanthropic purpose.
- A philanthropic task in terms of conserving important cultural heritage is essential.
- Ownership provides both long-term commitment and a guarantee that the properties will be continuously maintained at a stable, high level, and preserved for posterity.



Conservation/restoration

Udvikler og bevarer



- Restoration starts with giving a building a function to ensure that it remains in use and to help generate rental income to finance its future upkeep.
- Many buildings can be conserved through continued usage for the purpose for which they were originally built.
- Other buildings require a new function to ensure continued use. This may involve a major restoration of the property.
- Upon completion of the conservation/restoration, the historic buildings are rented at market trends.



Business Model

Udvikler og bevarer



- Properties are bought at market value and on the basis of local estate agent valuations.
- On average, 30%-50% of restoration costs are written off as a philanthropic grant.
- Over time, in by far most cases, devalued properties will increase in value with inflation.
- The individual building must as a minimum be able to generate a rental income sufficient to ensure its ongoing upkeep and operation.
- Property rents follow market trends.
- The average rate of return over the years has been approx. 2% of gross investment at portfolio level.

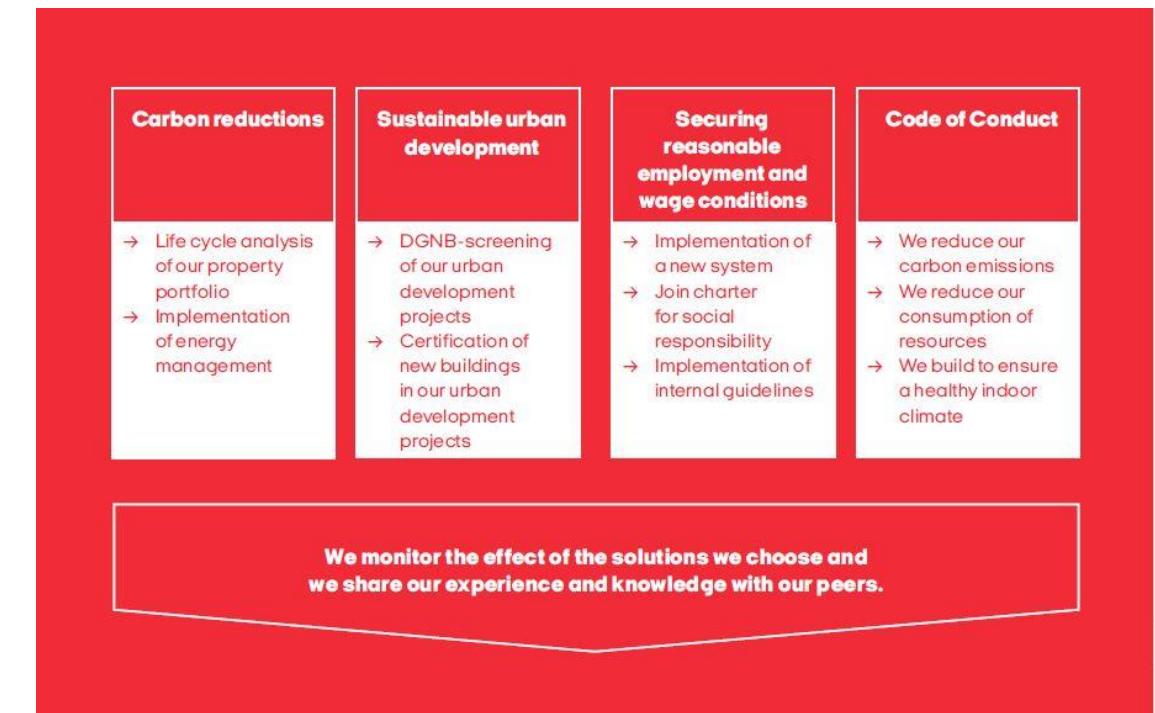
A hypothetical example (in €1000)

Acquisition:	500
Restoration:	400
Total investment:	900
Market value after restoration:	700
Loss/philanthropic grant:	200
Annual rental income:	38
Annual operating and maintenance costs:	10
Annual net operating income:	28
Return on market value after restoration of €700,000	4%
Return on total investment of €900,000	3,1 %

Goals for Environmental, Social and Governance Issues (ESG)

- Buildings have a huge carbon footprint and highly influence health and the quality of life.
- Consequently, sustainability in the broadest sense of the word permeates everything Realdania By & Byg does.
- In recent years new steps have been taken to ensure that the highest possible level of sustainability is achieved in the projects.
- The purpose is to inspire others to benefit current and future generations.

Udvikler og bevarer



Energy efficiency

Udvikler og bevarer



- Energy cost
- Create an overview
- Develop practices

Energiforbedring i historiske bygninger

- erfaringer og læringer fra Realdania By & Byg



Energy management system

Udvikler og bevare



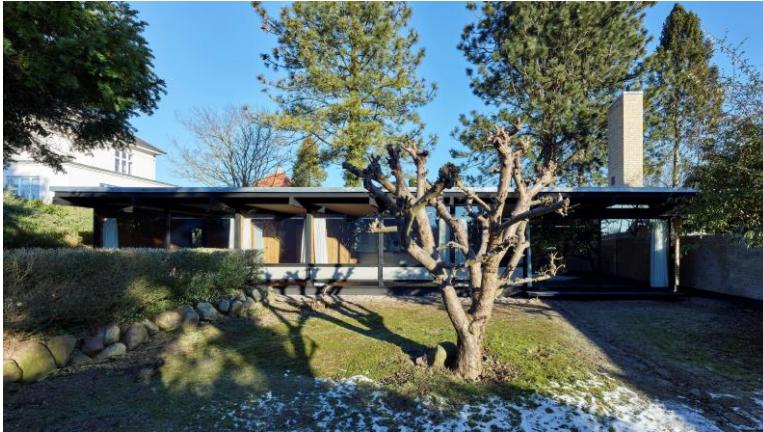
- It's never plug & play!
 - Support decisionmakers

Fjernvarme- & gasopvarmning			
Bygning	Areal OPV m ²	Forbrug i alt (MWh)	Forbrug m ² (KWH)
Diverse ejd.			
Banevolden 4, 5591 Gelsted			
Stormgade 14, 1470 København K	1.503	401,7	26,7
Puggaardsgade 3, 6760 Ribe	730	90,3	12,2
Frederiksgade 2 1265 København K	1.198	105,1	8,8
Total/Total/gennemsnit	3.431	597,0	15,1
Erhvervslejemål - Diverse			
Allegade 5, 2000 Frederiksberg	372	31,7	8,5
Fyrvej 36, 9990 Skagen	588	82,9	14,3
Gammelby Mellevj 62, 7000 Fredericia			
Nørregade 23, 6280 Højer	596	69,5	11,7
Olf Bagers Plads 2, 5000 Odense C	1.319	9,8	7,3
Storegade 24, 6200 Aabenraa			
Strandagervej 28, 2900 Hellerup	376	75,5	20,3
Torvet 1, 6280 Højer	596	56,9	9,5
Vestre Strandvej 10, 9990 Skagen	498	82,3	16,5
Total/Total/gennemsnit	4.344	408,5	11,1
Erhvervslejemål - Rådhuse			
Algade 8, 4660 Store Heddinge	430	90,8	21,2
Algade 97, 4760 Vordingborg	928	67,0	7,3
Amtmandstoften 1, 9800 Hjørring	1.178	112,4	9,4
Skolegade 33, 6700 Esbjerg	1.151	130,5	11,4
Store Torv 4, 7700 Thisted	911	75,6	8,3
Storgade 5, 4180 Sorø	40	9,9	24,8
Torvet 2, 4180 Sorø	949	90,3	9,3
Vendersgade 30D, 7000 Fredericia	1.349	111,8	8,3
Total/Total/gennemsnit	6.936	688,3	12,1
Erhvervslejemål - Kontorer			
Albani Torv 6 5000 Odense C	1.660	119,3	7,3
Allegade 15, 6270 Tønder	384	50,5	13,3
Alstrup Alle 11, 8361 Hasselager	1.806	199,8	11,1
Borgergade 111, 1300 København K	2.305	207,2	8,9
Frederiksholms Kanal 30, 1220 København K	3.587	294,4	8,3
Jarmers Plads 2, 1551 København V	9.593	1.066,1	11,2
Nørregade 29 5000 Odense C	1.492	184,8	12,3
Rosenhuset, Strandvejen 54, 2900 Hellerup	3.923	462,4	11,8
Vestergade 9 6270 Tønder	432	51,4	11,8
Total/Total/gennemsnit	23.522	2.516,6	10,4
Gårde			
Dreslettevej 5, 5683 Haarby	178	8,3	4,7
Korupvej 21, 5210 Odense NV	302	29,9	9,9
Ved Åen 17, 6270 Møgeltønder			
Total/Total/gennemsnit	480	38,2	7,7
Hoteldrift			
Hindsgaå Allé 7, 5500 Middelfart	9.190	1.118,3	12,3
Vembvej 35, 7570 Vemb	6.647	0,0	0,0
Total/Total/gennemsnit	15.837	1.118,3	6,9

Kvartalvis benchmarking af ejendomme								
01.10.22 - 31.12.22	Udvikling*	01.01.23 - 31.03.23	Udvikling	01.04.23 - 30.06.23	Udvikling	01.07.23-30.09.23	Udvikling	
Forbrug (mWh)	Q4-21/Q4-22	Forbrug (mWh)	Q1-22/Q1-23	Forbrug (mWh)	Q2-22/Q2-23	Forbrug (mWh)	Q3-22/Q3-23	I alt
137,2	89%	170,5	96%	58,3	79%	35,7	95%	401,7
28,7	101%	38,1	109%	16,5	112%	7,1	116%	90,3
34,9	87%	44,8	101%	16,4	85%	9,0	88%	105,1
11,4	214%	15,9	116%	4,0	85%	0,4	35%	31,7
26,7	60%	31,4	94%	18,2	74%	6,6	48%	82,3
23,2	89%	31,2	85%	11,7	72%	3,5	67%	69,9
3,9	150%	4,9	117%	0,9	79%	0,1	20%	9,8
28,3	100%	31,2	92%	11,3	76%	4,7	88%	75,8
18,5	83%	22,6	89%	10,1	80%	5,7	82%	56,9
28,4	164%	36,5	101%	12,2	79%	5,3	18%	82,2
30,3	90%	38,2	96%	15,8	92%	6,6	110%	90,8
23,5	198%	32,0	86%	10,1	77%	1,4	50%	67,9
35,8	0%	49,2	156%	18,9	84%	8,5	91%	112,2
57,1	0%	73,4	353%	0,0	0%	0,0	0%	130,9
29,0	107%	33,7	98%	9,9	76%	3,0	73%	75,6
3,4	106%	4,0	100%	1,7	96%	0,8	83%	9,9
32,5	89%	40,9	96%	14,1	90%	2,9	65%	90,3
40,4	0%	51,5	168%	16,2	88%	3,7	59%	111,8
43,5	85%	53,1	91%	17,6	79%	5,1	62%	119,8
15,5	79%	20,6	97%	10,0	105%	4,4	78%	50,1
56,3	683%	54,2	308%	54,9	166%	34,3	178%	199,8
72,9	75%	97,4	87%	27,7	55%	9,3	72%	207,8
105,6	88%	142,7	98%	37,1	83%	9,0	67%	294,8
380,6	91%	469,0	92%	160,8	81%	55,7	73%	1.066,8
63,8	93%	77,1	95%	30,9	78%	13,0	80%	184,8
162,3	86%	214,6	97%	74,6	89%	10,9	80%	462,8
16,6	87%	20,7	97%	9,7	95%	4,4	93%	51,4
3,2	56%	3,5	62%	1,2	41%	0,4	64%	8,3
16,1	86%	13,8	48%	0,0	0%	0,0	0%	29,9
369,9	95%	452,7	94%	184,9	80%	110,8	100%	1.118,8
0,0	0%	0,0	0%	0,0	0%	0,0	0%	0,0

LCA – Restoring and transforming historic houses

Udvikler og bevarer



← Erik Christians Sørensen own house



Det Harboenske enkefruekloster →



← Meldahls town hall



Bakkekammen 40, Bedre byggeskik →

LCA – Short introduction

Udvikler og bevarer

LCA – Life Cycle Assessment

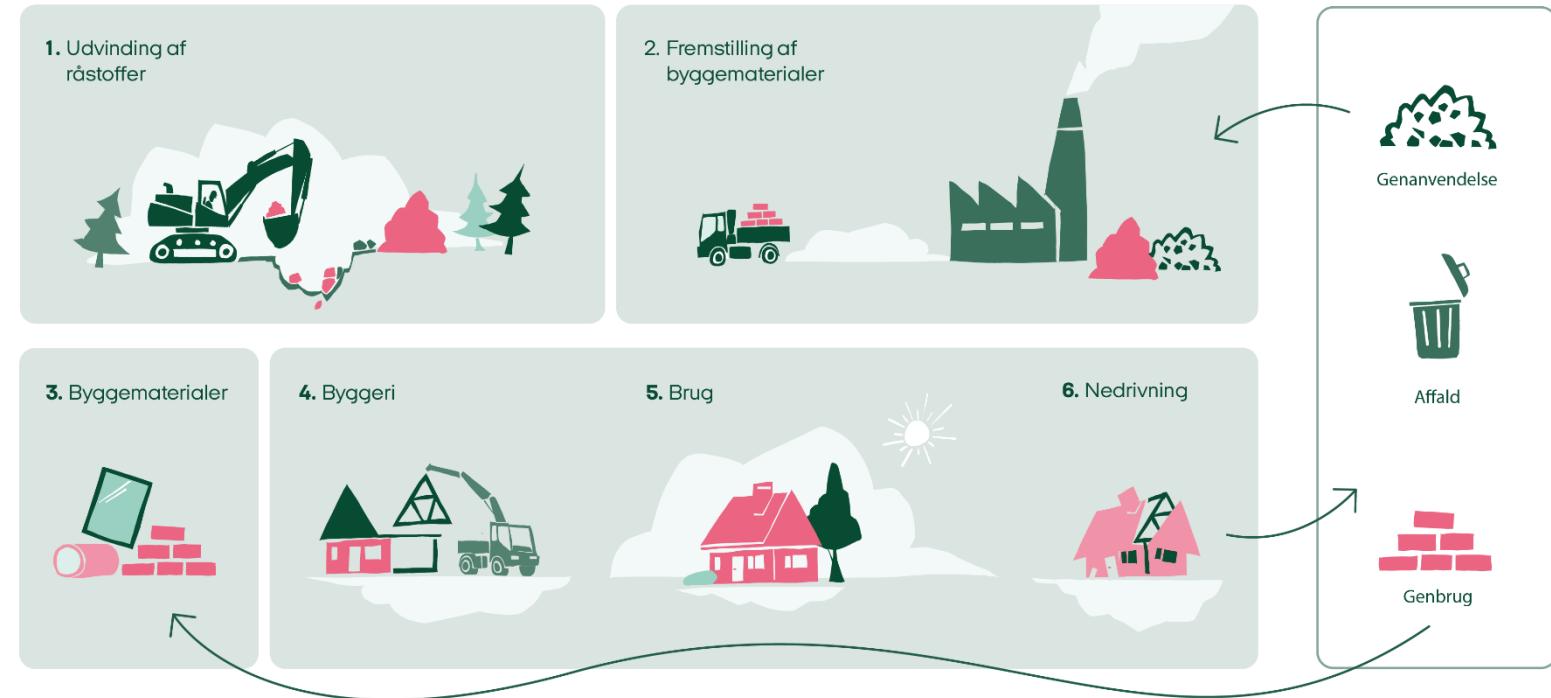
Global Warming (GWP) [CO₂ equivalents]

- Measures all greenhouse gases over a 100 years perspective.
 - CO₂, GWP:1
 - Methane, GWP:28
 - Nitrous oxide, GWP:265
 - High GWP-gasses, GWP: Up to 23.500

Danish requirements today and in the future:

- 2023 – 12 kg CO₂/m²/year
- 2025 – 10,5 kg CO₂/m²/year
- 2027 – 9 kg CO₂/m²/year
- 2029 – 7,5 kg CO₂/m²/year

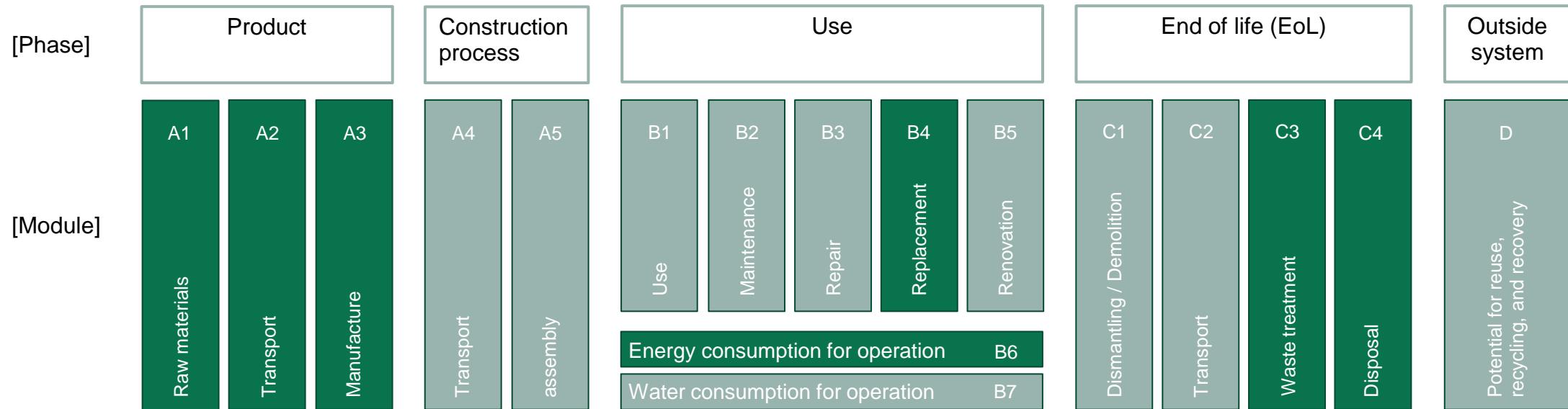
Livscyklus for byggeri



LCA – Introduction

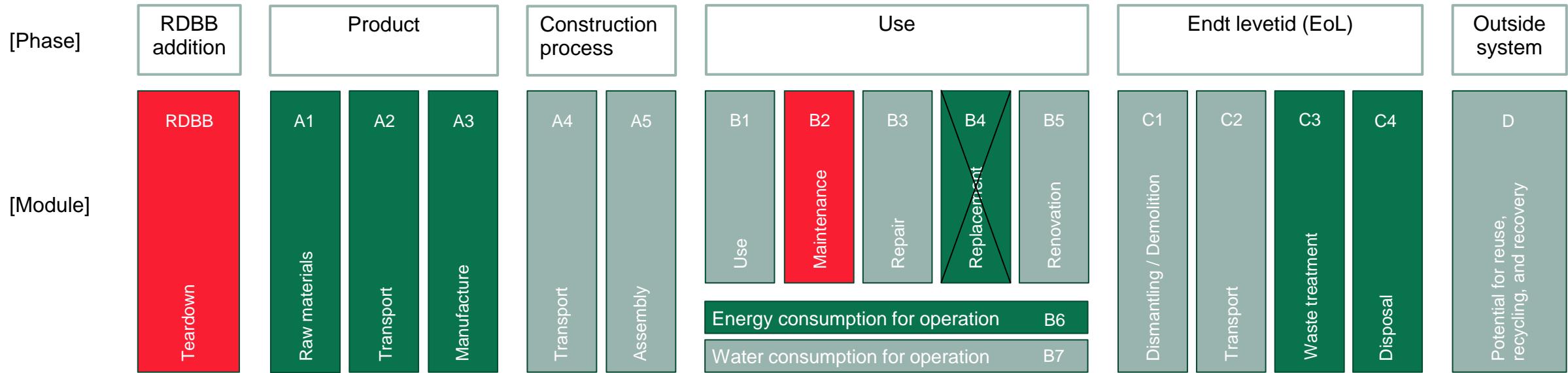
Legal requirements 2023 for new buildings

Udvikler og bevarer



LCA - Introduction RDBB method

Udvikler og bevarer



LCA – How we did it

Udvikler og bevarer



Project start 2020

Purpose: Mapping our CO₂ emissions related to our restorations and operation of our properties, with aim to reduce future CO₂ emissions

Method: LCAbyg, Energy consumption, maintenance.



Finished restoration



Data collection, drawings, descriptions, invoices and interviews



Summary of materials used, collection of EPDs



Finished CO₂ accounts

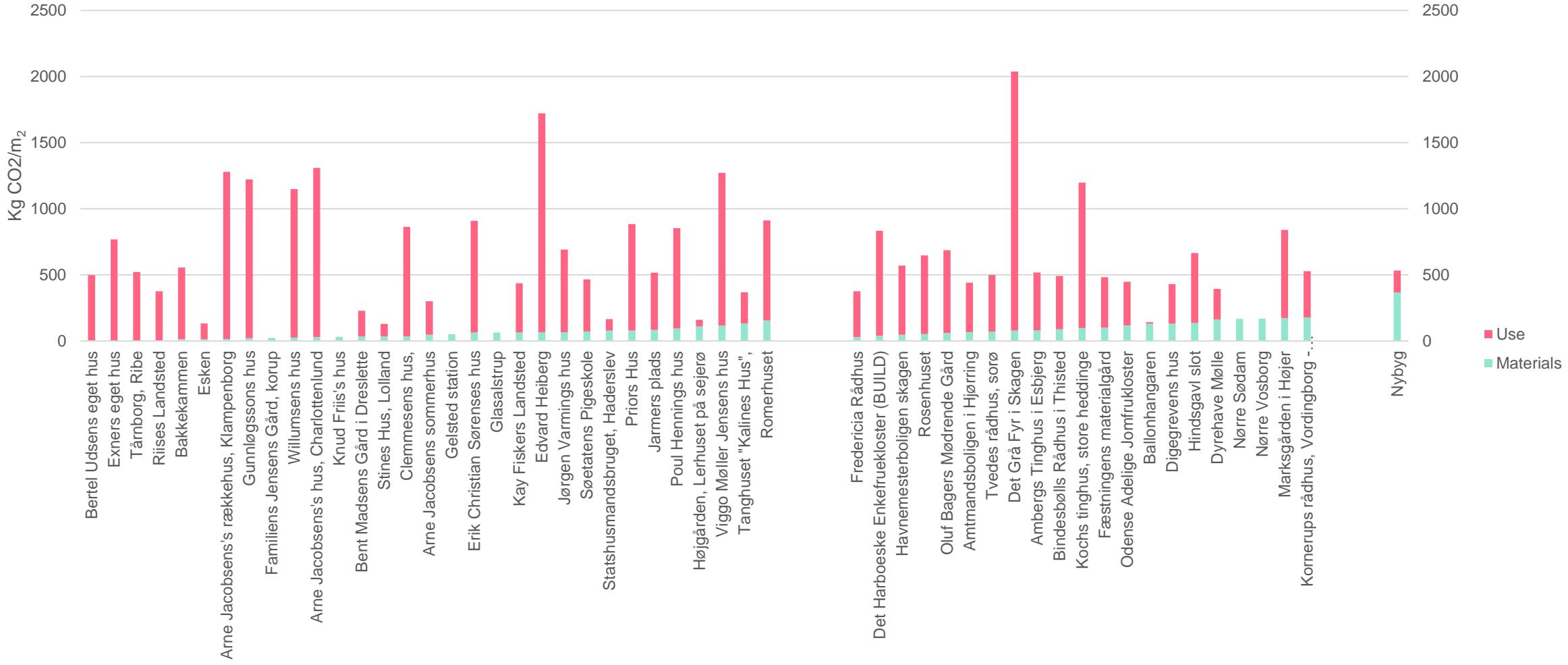
Results - Portfolio

Udvikler og bevarer



CO2 Emissions - Included modules: Demolition + A1-A3 (Product) + Use (B6) + C3-C4 (End of life)

Restorations and transformations



Results for all properties - Restoration, Transformation, New build

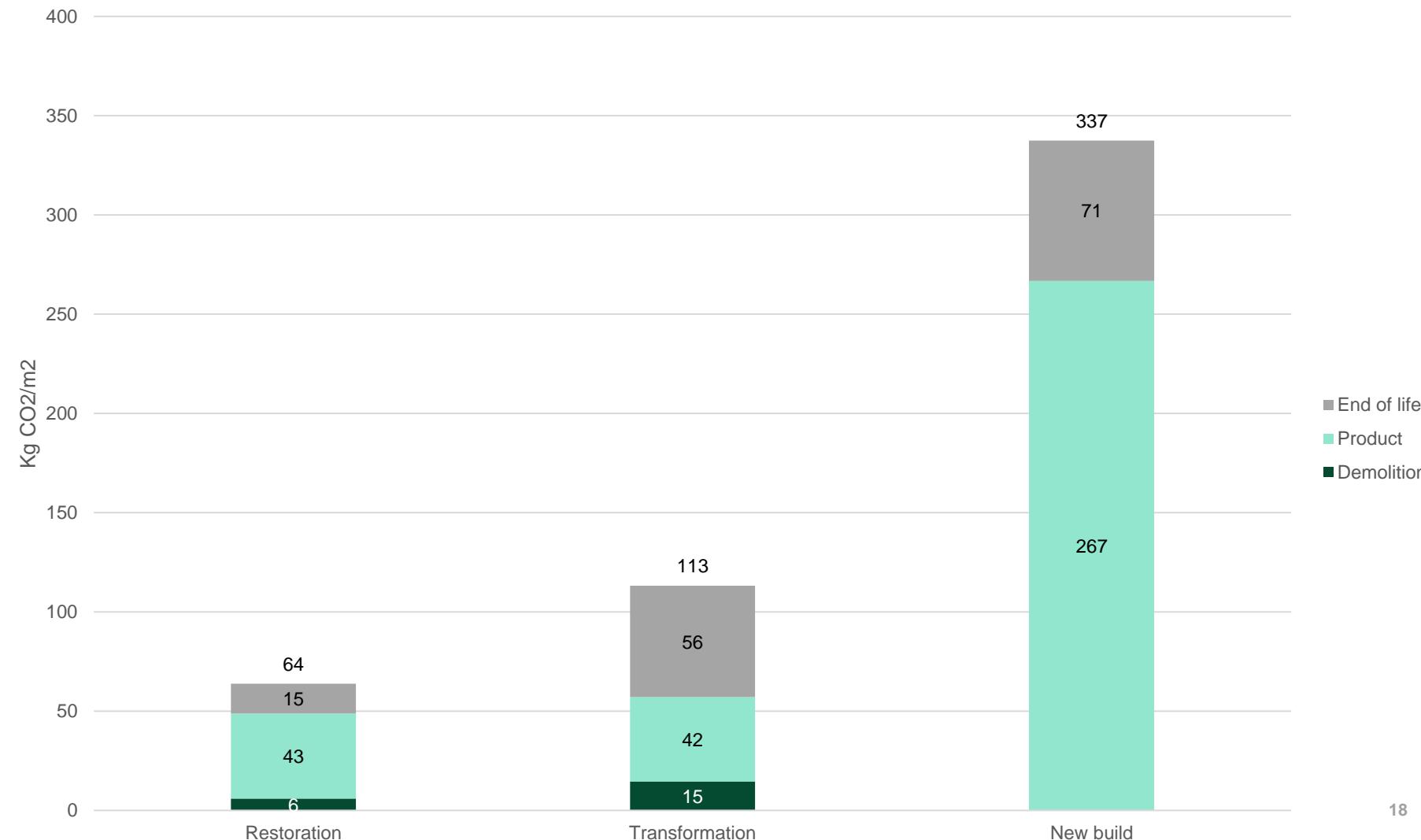
Udvikler og bevarer



Included modules

- Demolition
- A1-A3 (product)
- C3-C4(End of life)
- Use (B6) excluded due to various heating sources
 - District heating
 - Heatpumps
 - Gas
 - Oil
- Reference, new build
 - Klimapåvirkning fra 60 bygninger (SBI 2020:04) - Opdaterede værdier baseret på nyere data og danske branche EPD'er

Average CO2 emissions in, Restoration, transformation and new build



Results for district heating properties - Restoration, Transformation, New build

Udvikler og bevarer

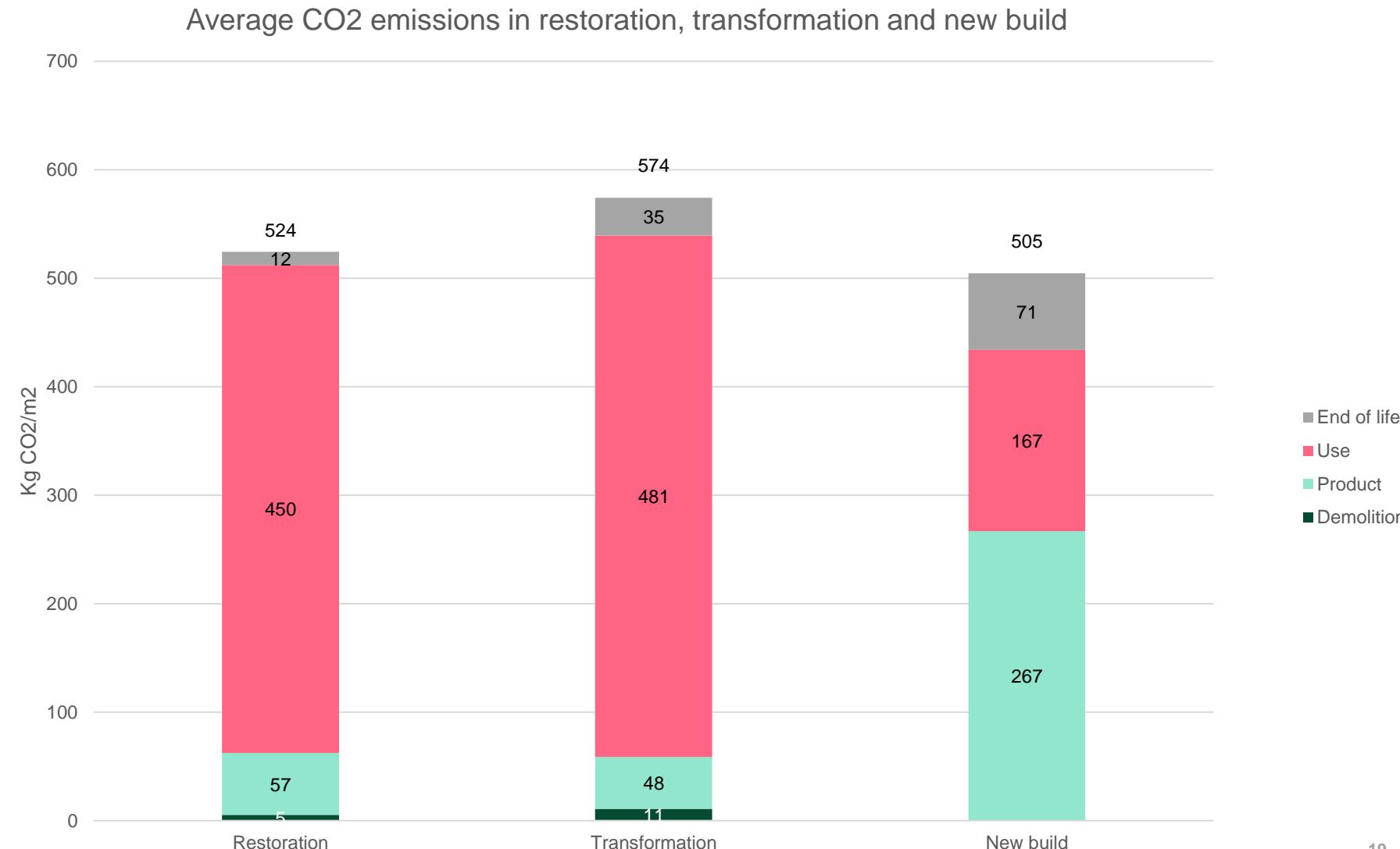
Included modules

- Demolition
- A1-A3 (product)
- B6 (Use – District Heating)
- C3-C4(End of life)

Reference, new build

- Klimapåvirkning fra 60 bygninger (SBI 2020:04) - Opdaterede værdier baseret på nyere data og danske branche EPD'er

CO2 emission projection for district heating from 2020



Results for district heating properties - Restoration, Transformation, New build

Udvikler og bevarer

Included modules

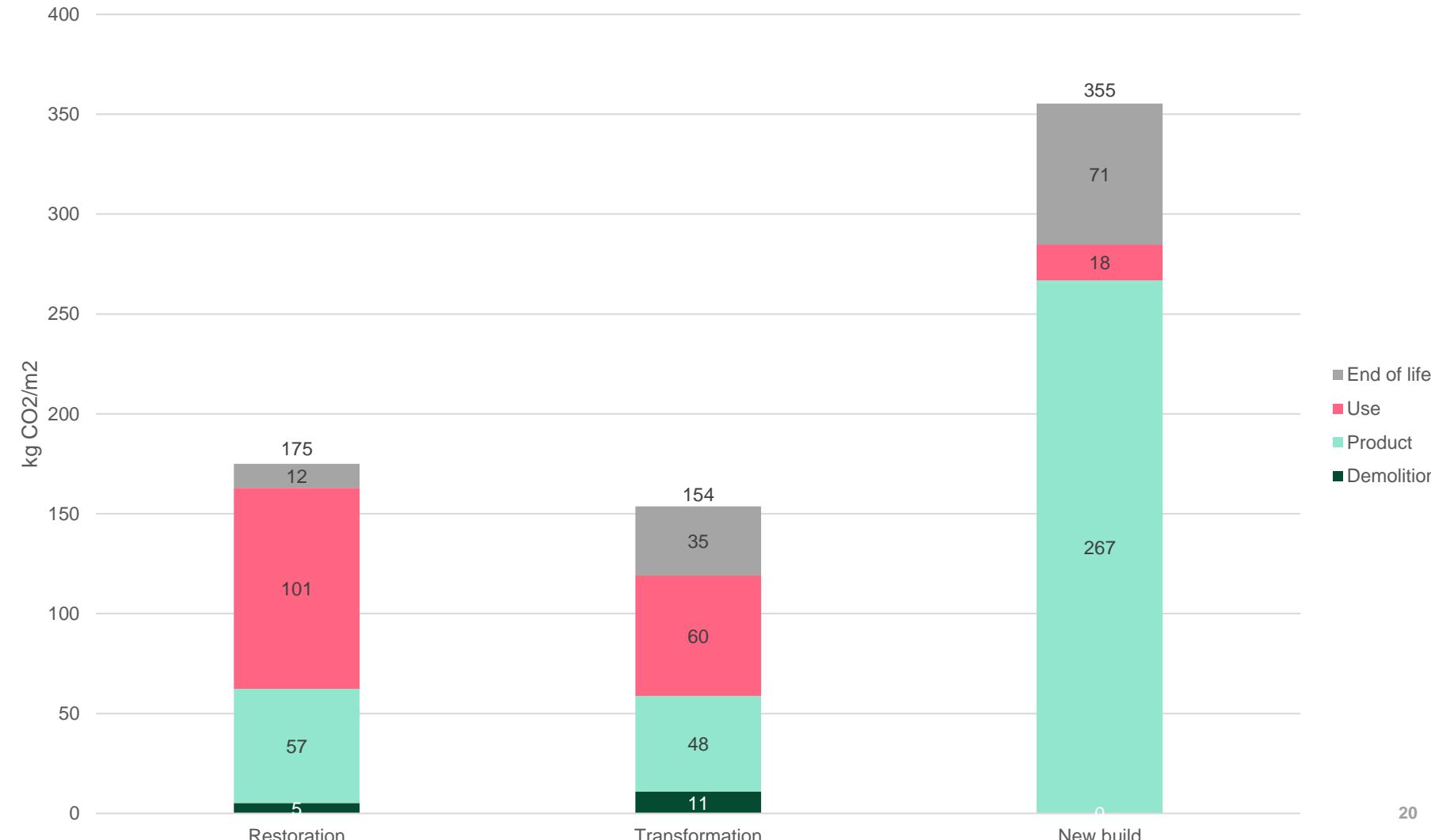
- Demolition
- A1-A3 (product)
- B6 (Use – District Heating)
- C3-C4(End of life)

Reference, new build

- Klimapåvirkning fra 60 bygninger (SBI 2020:04) - Opdaterede værdier baseret på nyere data og danske branche EPD'er

CO2 emission projection for district heating from 2023

Average CO2 emissions in restoration, transformation and new build



Results – Town halls

Udvikler og bevarer



Included modules

- Demolition
- A1-A3 (product)
- C3-C4(End of life)

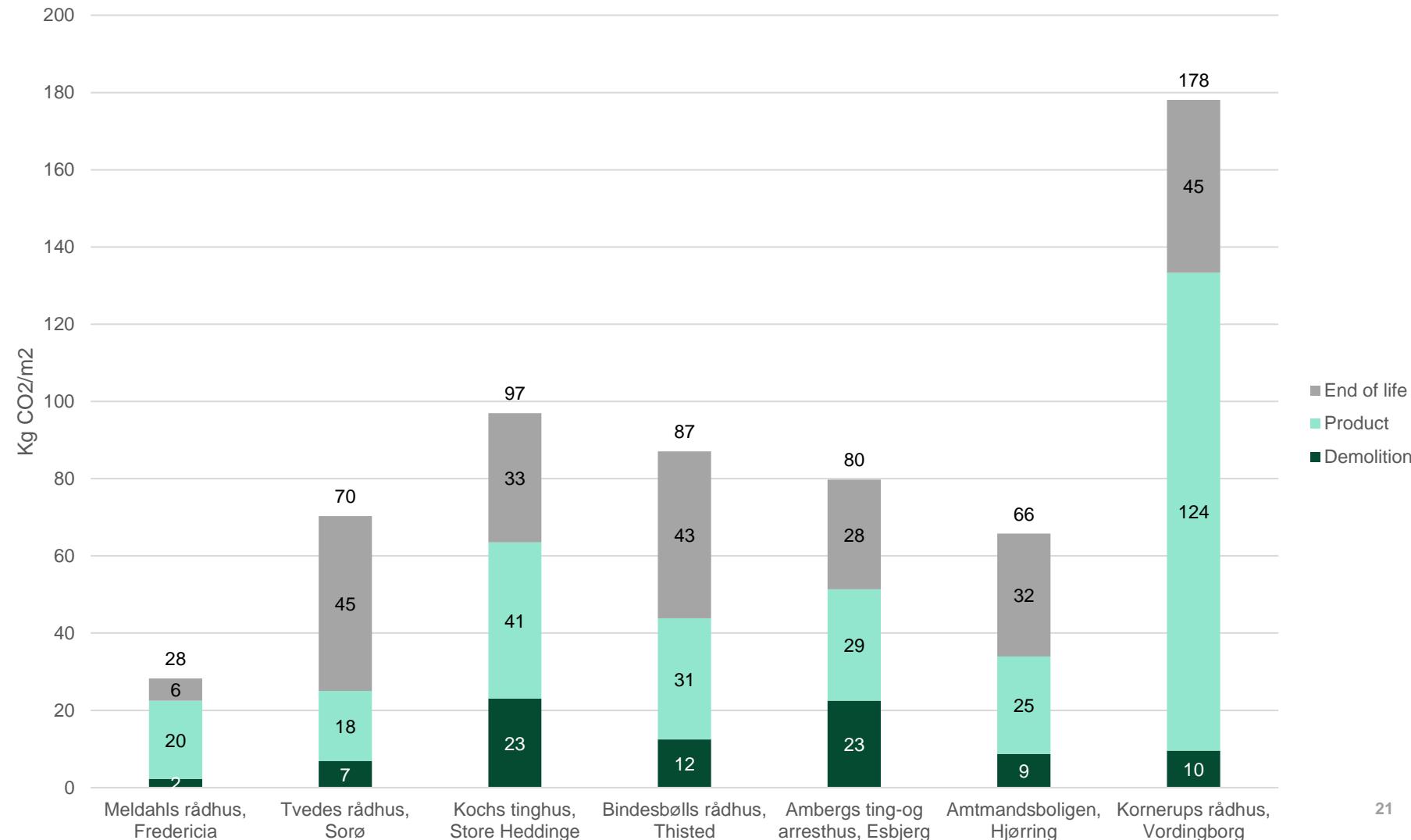
Use (B6) excluded due to various heating sources

- District heating
- Heatpumps
- Gas
- Oil

Reference, new build

- Klimapåvirkning fra 60 bygninger (SBI 2020:04) - Opdaterede værdier baseret på nyere data og danske branche EPD'er

CO2 emission broken down on phases – Town halls



Meldahls townhall

Udvikler og bevarer



Built: 1860

Renovated: 2005

CO2 emission from materials in renovation:

- 41 tons CO₂
- 28 Kg CO₂/m²
- 0,56 Kg CO₂/m²/year

CO2 emission in use:

- 504 tons CO₂
- 373 Kg CO₂/m²
- 7,47 Kg CO₂/m²/year



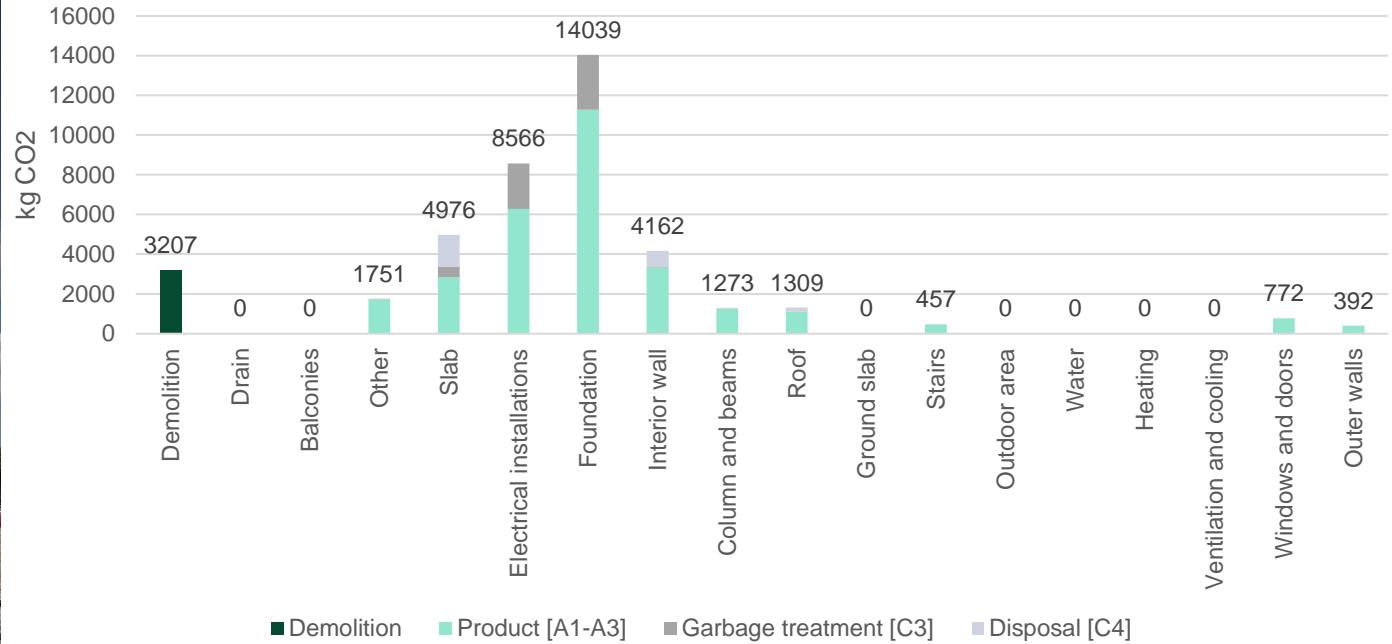
Results – Meldahls townhall

Udvikler og bevarer

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Distribution of CO2 emissions

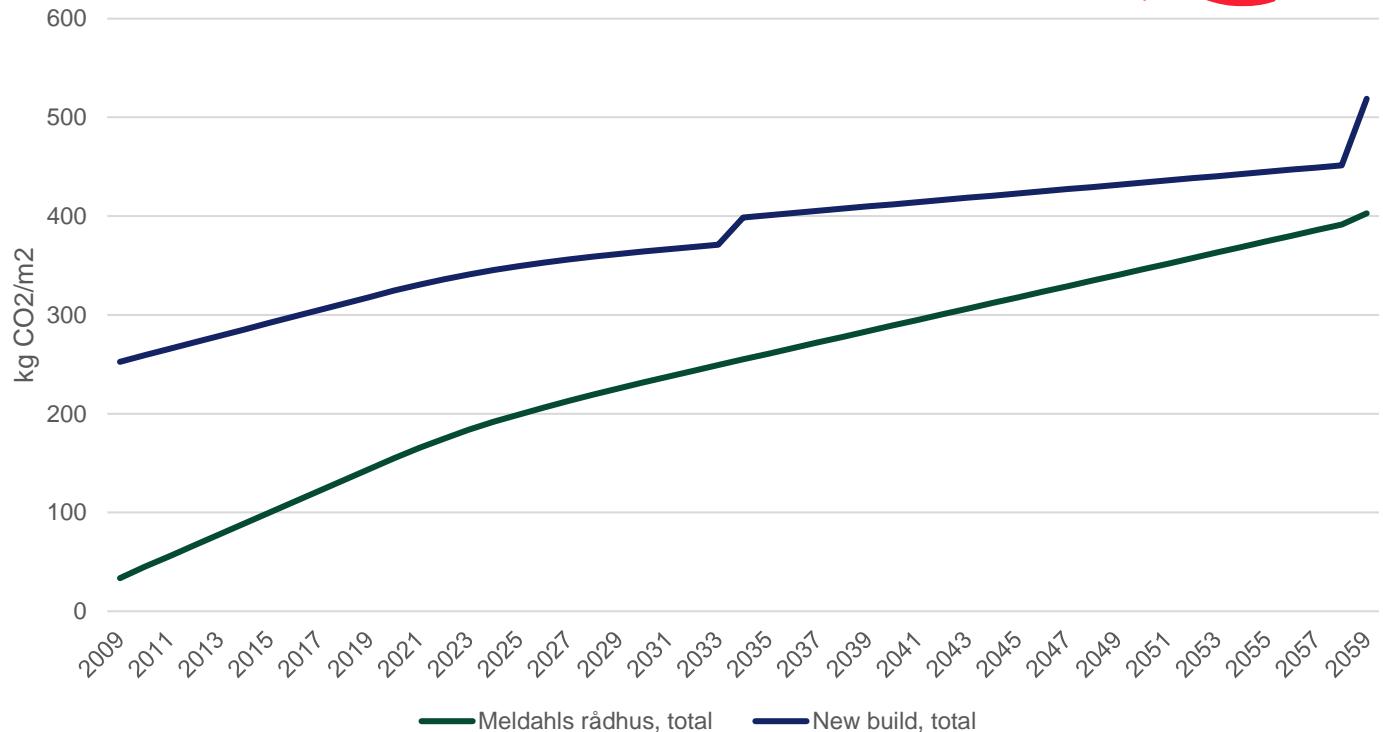


Building part	Kg CO2 emitted	Percentage of the total CO2 emission from the materials	Highest emission from single material [kg CO2]	Second most emission from single material [kg CO2]	Third most emission from single material [kg CO2]
Foundation	14039	34%	Concrete [13745]	Wood [294]	
Electrical installations	8566	21%	New electrical installations [8566]		
Slabs and floors	4977	12%	Rubber floor [3454]	Concrete surfacing [611]	Concrete [168]

Results – Meldahls townhall

Udvikler og bevarer

Realdania
Realdania
By & Byg



Activity	Kg CO2/m2	Percentage of the total CO2 emission	New build	Kg CO2/m2	Percentage of the total CO2 emission
Materials	28	7%	Materials	337	63%
Use (B6) District heating	374	92,7%	Use (B6) District heating	168	31%
Maintenance (B2) [2016-2022]	1	0,3%	Replacement (B4)	28	5%

Skagen grey lighthouse

Udvikler og bevarer



Built: 1858

Renovated: 2016

CO2 emission from materials in renovation:

- 52 tons CO2
- 77 Kg CO2/m²
- 1,5 Kg CO2/m²/year

CO2 emission in use:

- 1334 Tons CO2
- 1959 Kg CO2/m²
- 39,2 Kg CO2/m²/year



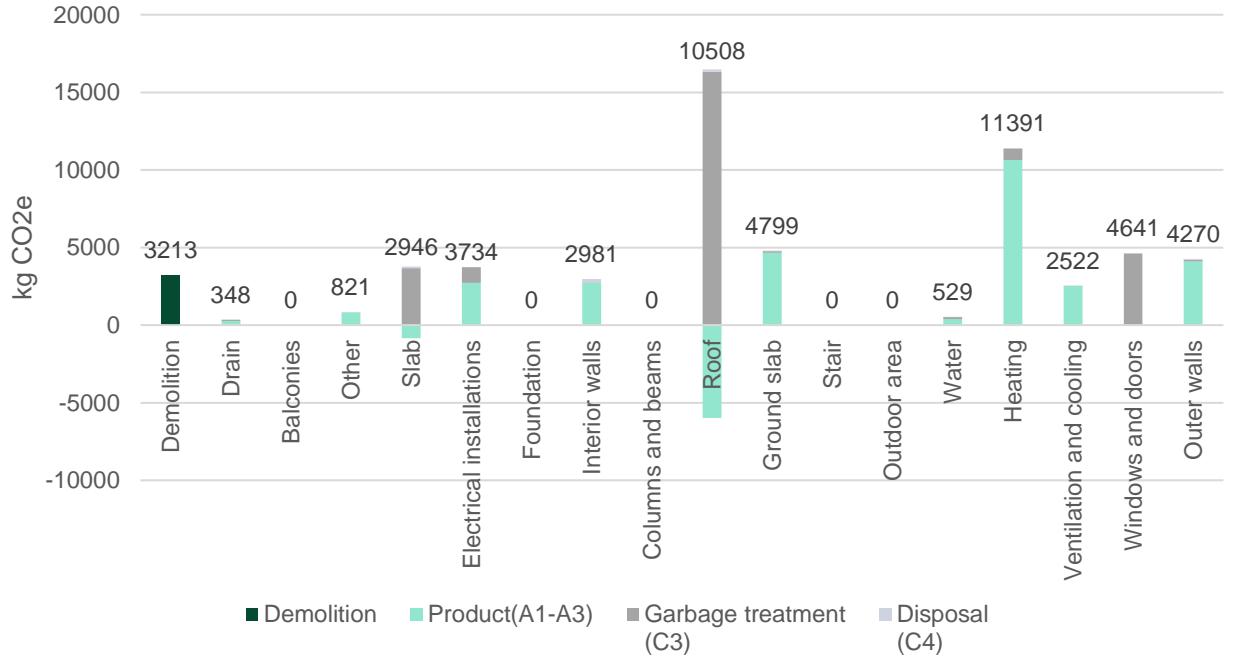
Results – Skagen grey lighthouse

Udvikler og bevarer

Realdania
By & Byg



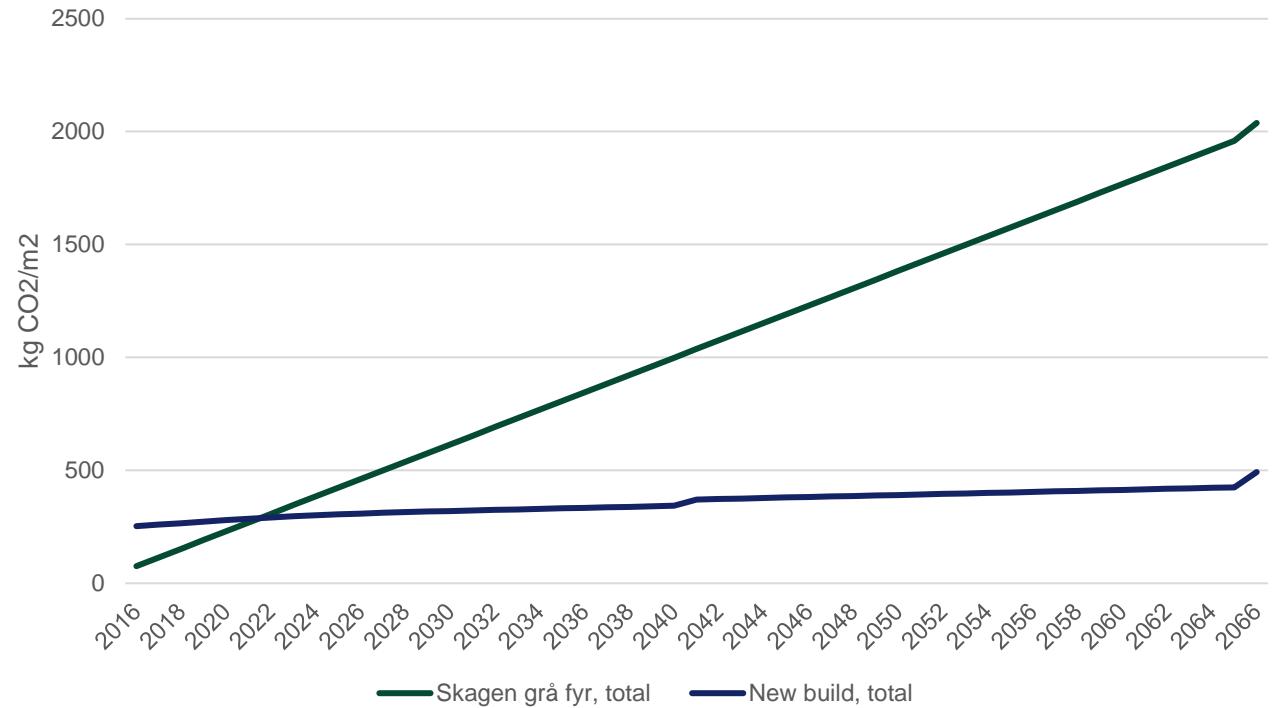
Distribution of CO2 emissions



Building part	Kg CO2 emitted	Percentage of the total CO2 emission from the materials	Highest emission from single material [kg CO2]	Second most emission from single material [kg CO2]	Third most emission from single material [kg CO2]
Heating	11391	21%	Radiator [8958]	Alu-pex pipes [1286]	Floor heating [1039]
Roof and ceiling	10508	20%	Zink [7707]	Wood [2394]	Lime mortar [970]
Windows and doors	4641	9%	Wood frame (400m) [1540]	Alu frame (65m) [1147]	Single layer glass [912]

Results – Skagen grey lighthouse

Udvikler og bevarer



Activity	Kg CO2/m2	Percentage of the total CO2 emission	New build	Kg CO2/m2	Percentage of the total CO2 emission
Materials	77	3,8%	Materials	337	40%
Use (B6) Oil	1959	96,1%	Use (B6) Oil	473	57%
Maintenance (B2) [2016-2022]	1,3	0,1%	Replacement (B4)	28	3%

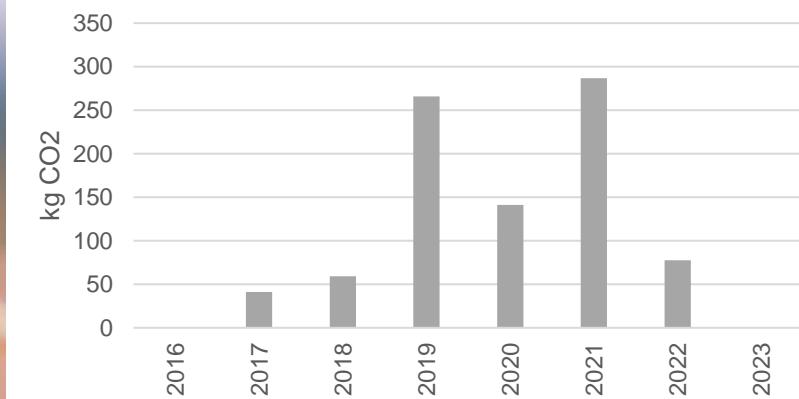
Tasks where LCA is included.

Udvikler og bevarer

- Preparation of budgets.
- Carrying out the ongoing maintenance.
- Energy measurement/energy optimization.
- LCA accounting.



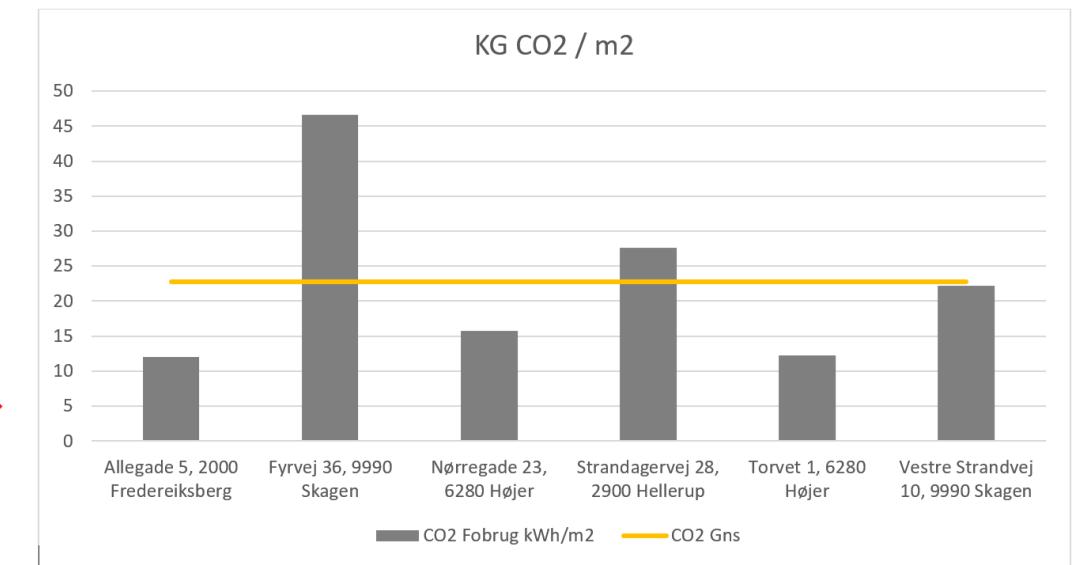
CO2 emission related to maintenance



Heat consumption

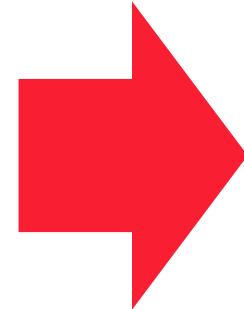
Udvikler og bevarer

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Energy optimization of heat source

Oil boiler



Air to water heatpump



Udvikler og bevarer

Realdania
By & Byg

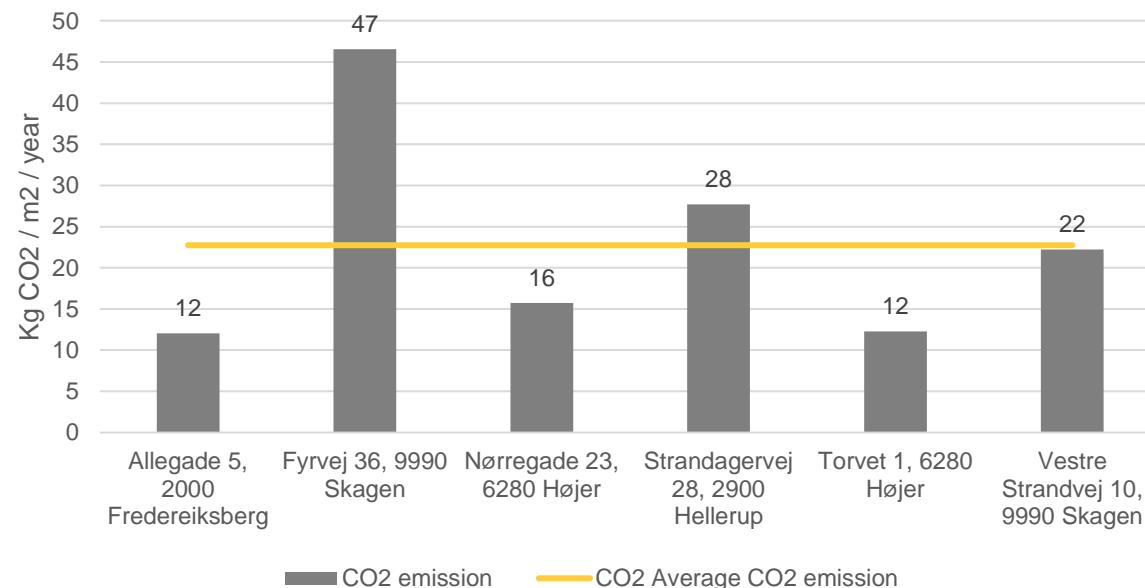
Energy optimization of heat source

Udvikler og bevarer



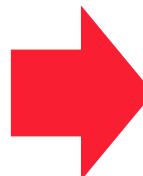
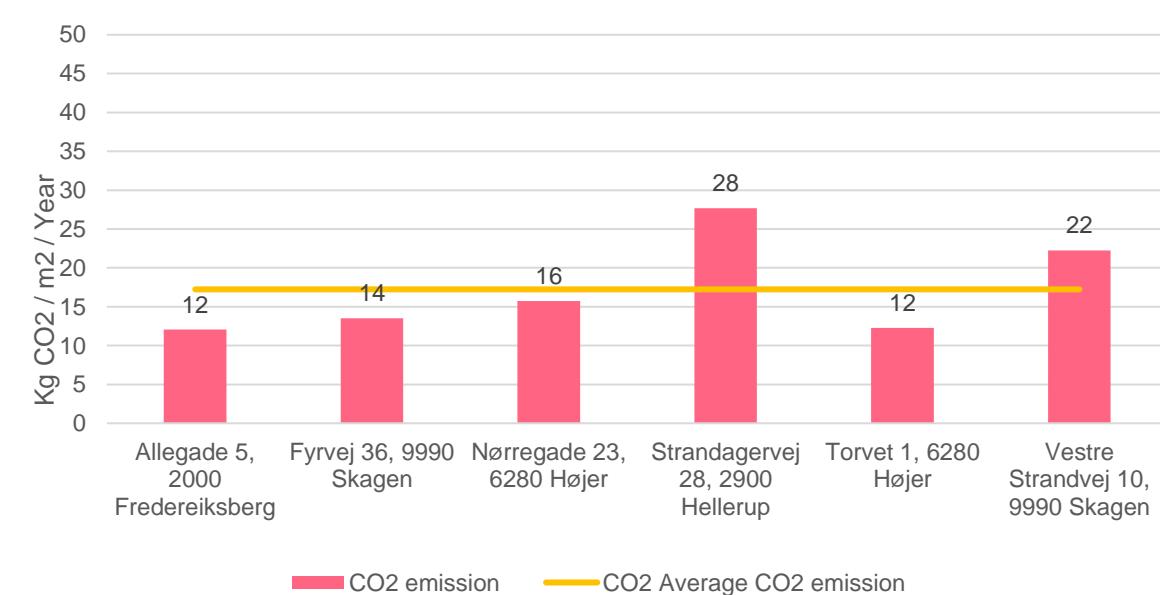
Skagen grey lighthouse with oil boiler

Yearly CO2 emission related to heat consumption



Skagen grey lighthouse with heatpump

Yearly CO2 emission related to heat consumption

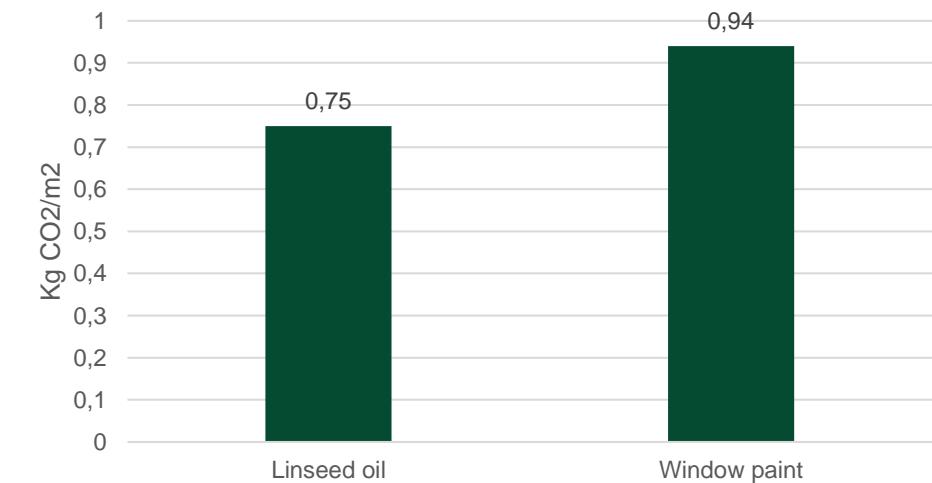


Maintenance of windows

Udvikler og bevarer



Kg CO₂/m² with linseed oil and window paint

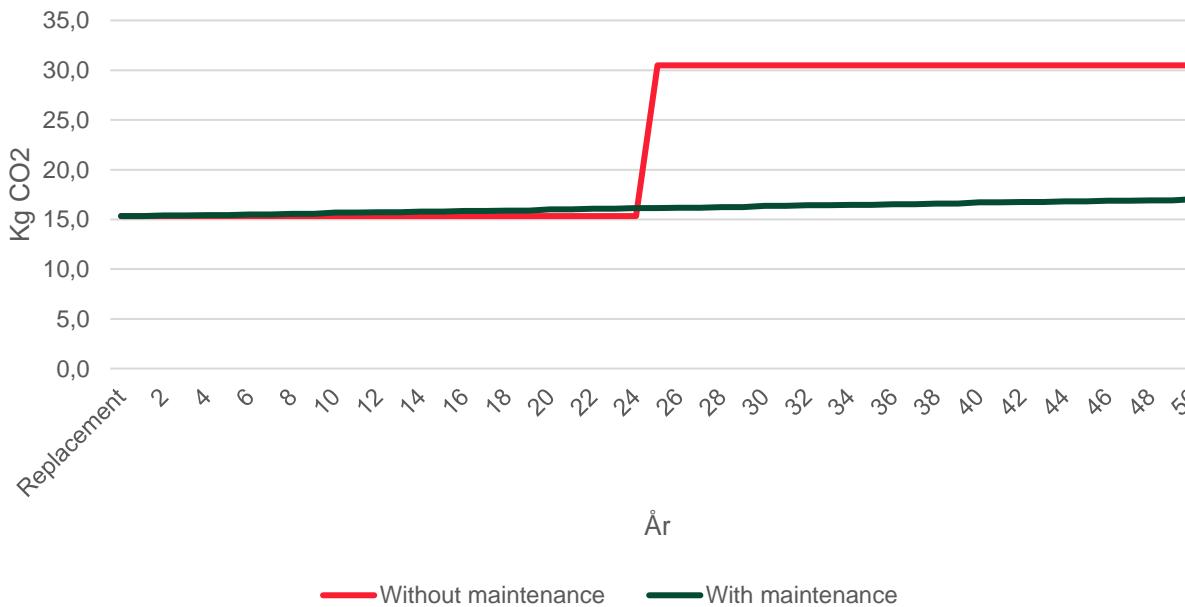


Maintenance of windows

Udvikler og bevarer



CO2 emission of a 4 meter wooden frame over 50 years
with and without proper maintenance



Before maintenance



After maintenance

Questions?

Udvikler og bevarer

