

London Industry Seminar
CRREM-ERES

Stranding Risk

1st Panel: Climate change impact on
real estate- uncertainty and solutions

CRREM | Carbon Risk Real Estate Monitor

CRREM Tool: Mitigating stranding risk



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no.

785058

TARGETS: Transparent decarbonization pathways

Breaking down global GHG emissions budget to **sector, company, portfolio and property level**

ACTIONS: Strategic implication of “Stranded assets”

Defining areas for improvement and strategic options

TOOLS: Framework, toolkits & methods:

Making decarbonisation in the commercial real estate sector measurable

IIÖ
INSTITUT FÜR
IMMOBILIENÖKONOMIE

IIÖ Institut für Immobilienökonomie
Coordinator | Austria



TiasNimbas Business School
Tilburg University | Netherlands



University of Ulster | UK



University of Alicante | Spain



Industry bodies and academics

CDP

Alberto Carrillo Pineda (*Director Science Based Targets and Renewable Energy*)

INREV

Mathieu Elshout (*Investor Advisory Council*)

DGBC Dutch Green Building

Martin Mooij (*Head of Certification and Project manager DGBC Deltaplan sustainable renovation*)

ULI Greenprint Center for Building Performance

Marta Schantz (*Senior Vice President*)

DGNB German Sustainable Building Council

Anna Braune (*Director Research and Development*)

University of Cambridge

Franz Fürst (*Professor of Real Estate and Urban Economics*)

EPRA European Public Real Estate Association

Gloria Duci (*ESG Officer*)

WGBC World Green Building Council

Stephen Richardson (*Technical Lead - Energy Efficiency Mortgages*)

ZIA German Property Federation

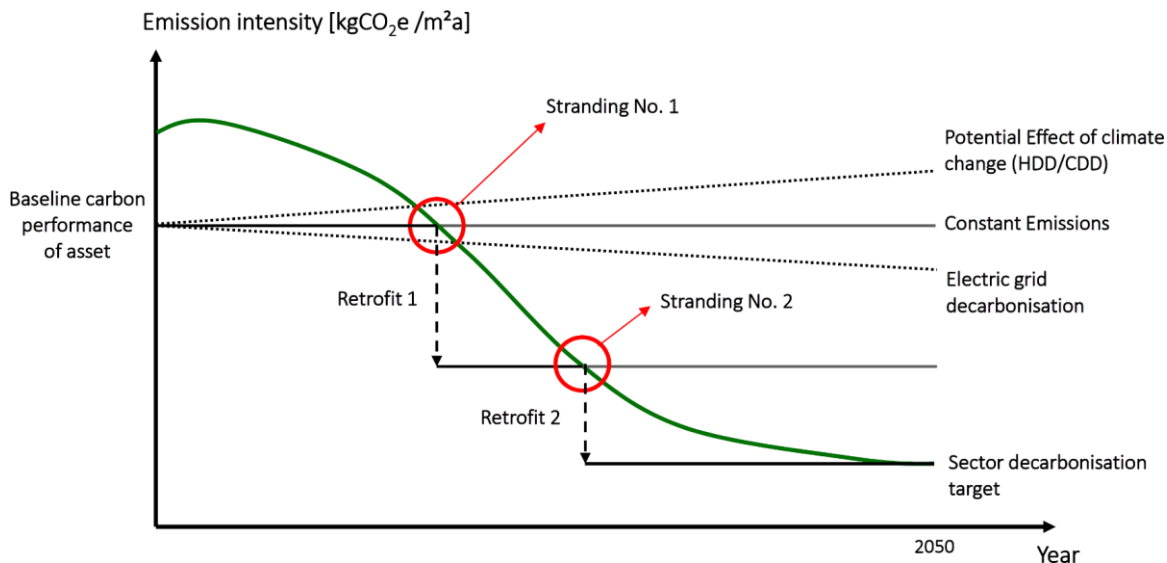
Philipp Matzke (*Consultant Energy and Climate Protection, Facilities Engineering*)

Institutional investors & corporate partners

Aberdeen Standard Ruairi Revell (<i>ESG Manager, Real Estate</i>)	ista International Hans Martin Hermann (<i>Senior Manager Public Affairs</i>)
alstria Alexander Dexne (<i>CFO</i>) Robert Kitel (<i>Head of Sustainability & Future Research</i>)	Land Securities Tom Byrne (<i>Sustainability Manager</i>)
APG Asset Management Derk Welling (<i>Senior Responsible Investment & Governance Specialist</i>)	Metro AG Olaf Schulze (<i>Director Facility, Energy & Resource Management</i>)
BNP Paribas Real Estate Consult Hermann Horster (<i>Regional Director, Head of Sustainability</i>)	Nelson Group Carlos Morgado (<i>Project Manager</i>)
Credit Suisse Asset Management Roger Baumann (<i>COO & Head of Sustainability Global Real Estate</i>)	PGGM Mathieu Elshout (<i>Senior Director Private Real Estate</i>)
ECE Projektmanagement Maria Hill (<i>Director Sustainability & Internal Services</i>)	RE-sponsibility Michael Ullmann (<i>Managing Director</i>)
Grosvenor Emily Hamilton (<i>Sustainability Manager</i>)	Savills Investment Management Lucy Auden (<i>Head of ESG</i>) Gerhard Lehner (<i>Managing Director, Head of Fund Management</i>)
Union Investment Jan von Mallinckrodt (<i>Head of Sustainability, Head of Segment Development</i>)	

CRREM TOOL: IDENTIFYING STRANDED ASSETS

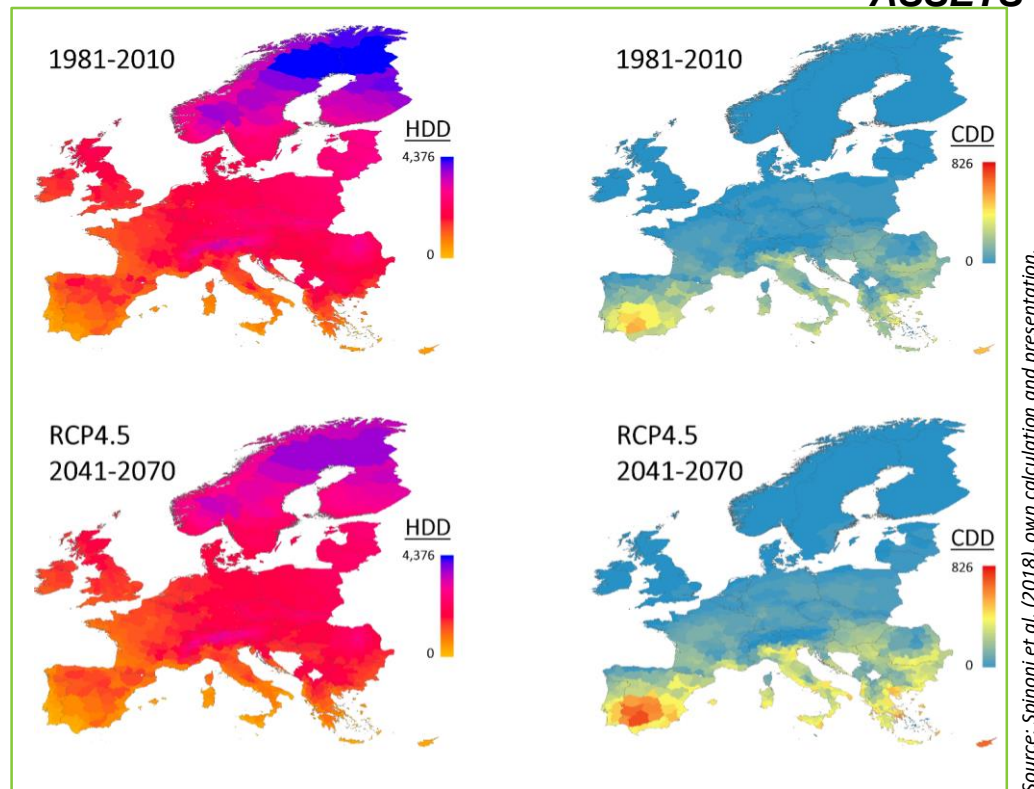
- **Key indicator:**
GHG intensity [$\text{kgCO}_2\text{e}/\text{m}^2/\text{a}$]
- **Decarbonisation pathways:**
Country and sector-specific
Proxy for future evolution of policy
- **Stranding point**
Assets face potential write-downs
- **Future evolution of emissions:**
Changing heating and cooling loads
Electric grid decarbonisation



Source: CRREM

CRREM TOOL: IDENTIFYING STRANDED ASSETS

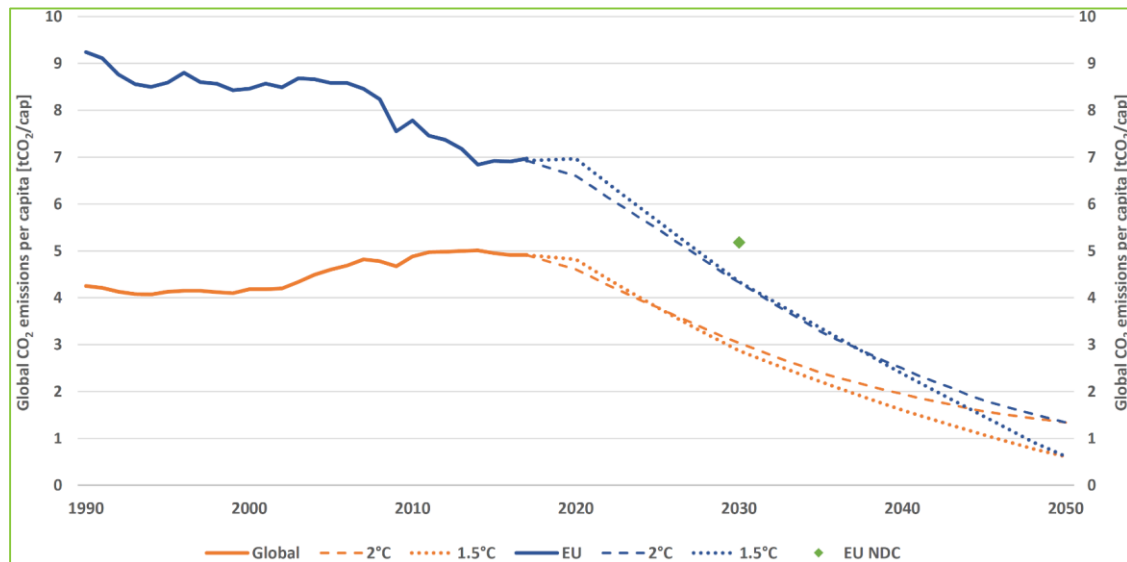
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Country and sector-specific pathways

- **Global GHG** budget and pathway
Consistent with 1.5 and 2.5 scenarios
- **EU emission pathway**
Convergence of per capita emissions to 2050

Interim downscaling step: EU emission pathway



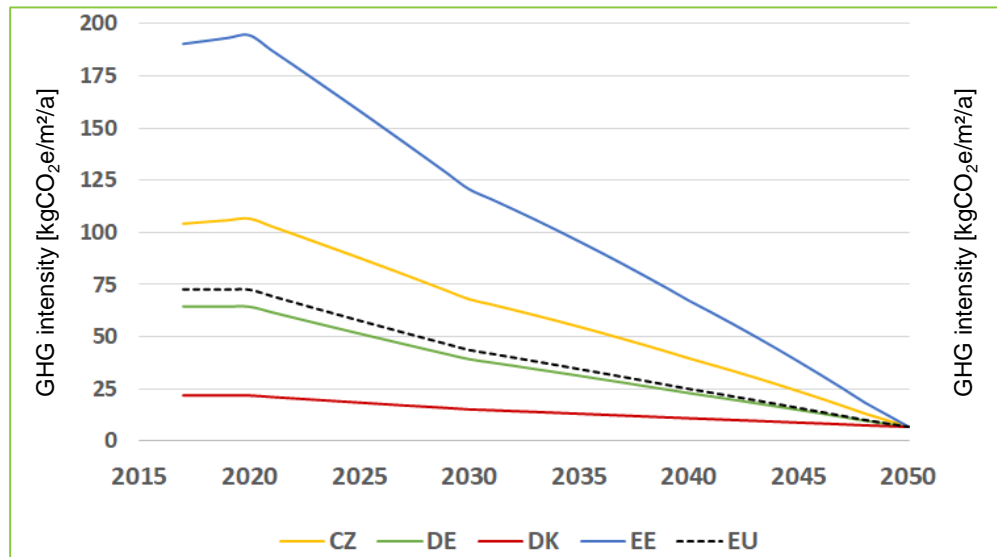
Source: Own calculations; IEA, 2017; Rockström et al., 2017; UN DESA, 2017; PBL, 2018

PATHWAYS: DOWNSCALING OF GHG-TARGETS

Country and sector-specific pathways

- **Global GHG** budget and pathway
Consistent with 1.5 and 2.5 scenarios
- **EU emission pathway**
Convergence of per capita emissions to 2050
- **EU commercial real estate sector**
Intensity metric introduced [kgCO_2/m^2]
- **Country-specific targets**
Convergence of GHG intensity

Interim downscaling step: Country-specific GHG intensity targets (1.5°C target)



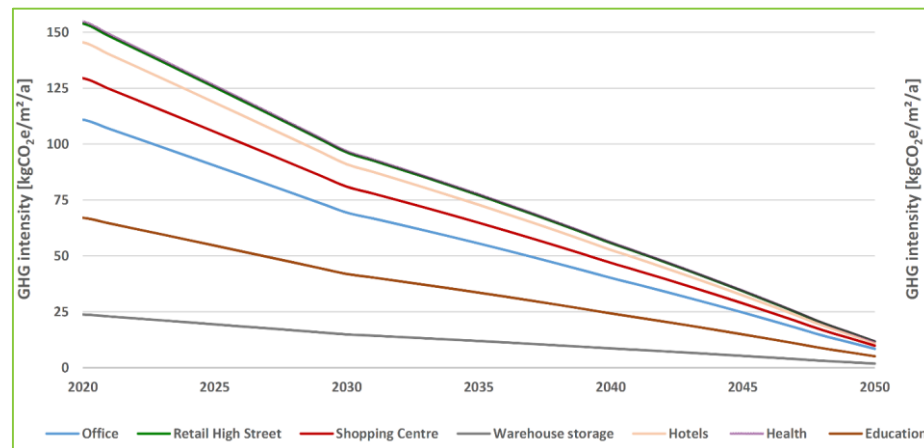
Source: Own calculations; IEA, 2017; Rockström et al., 2017; UN DESA, 2017; PBL, 2018

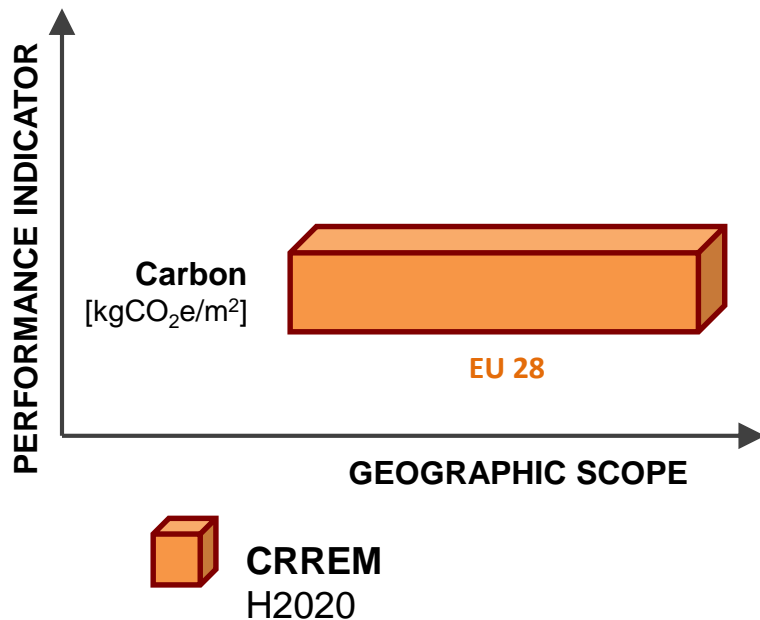
PATHWAYS: DOWNSCALING OF GHG-TARGETS

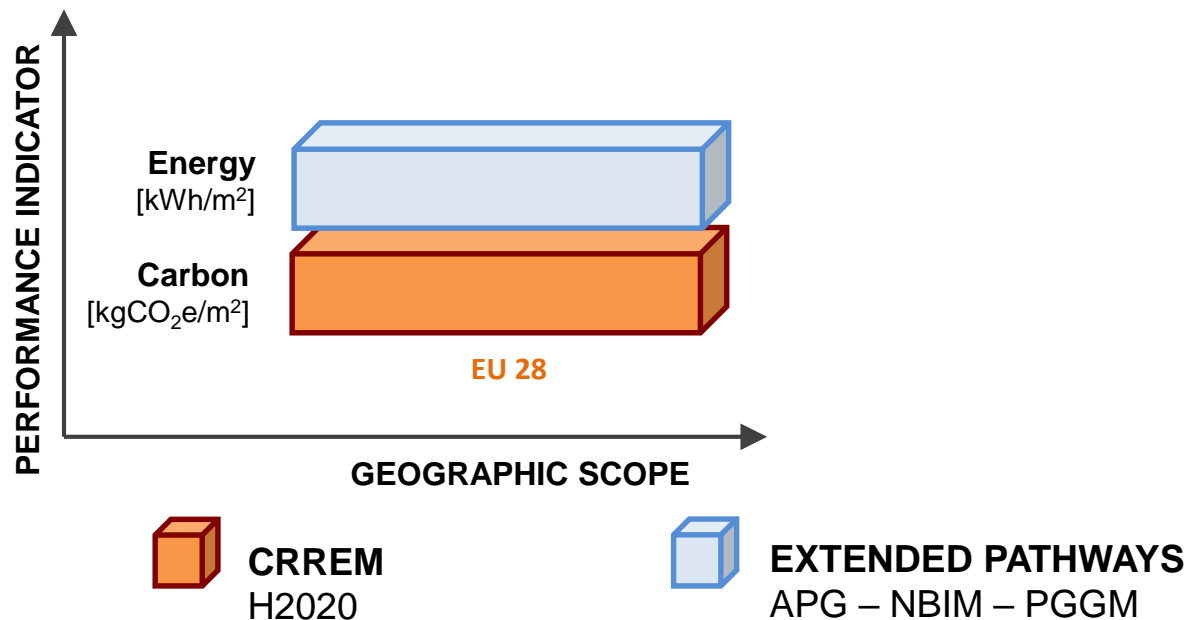
Country and sector-specific pathways

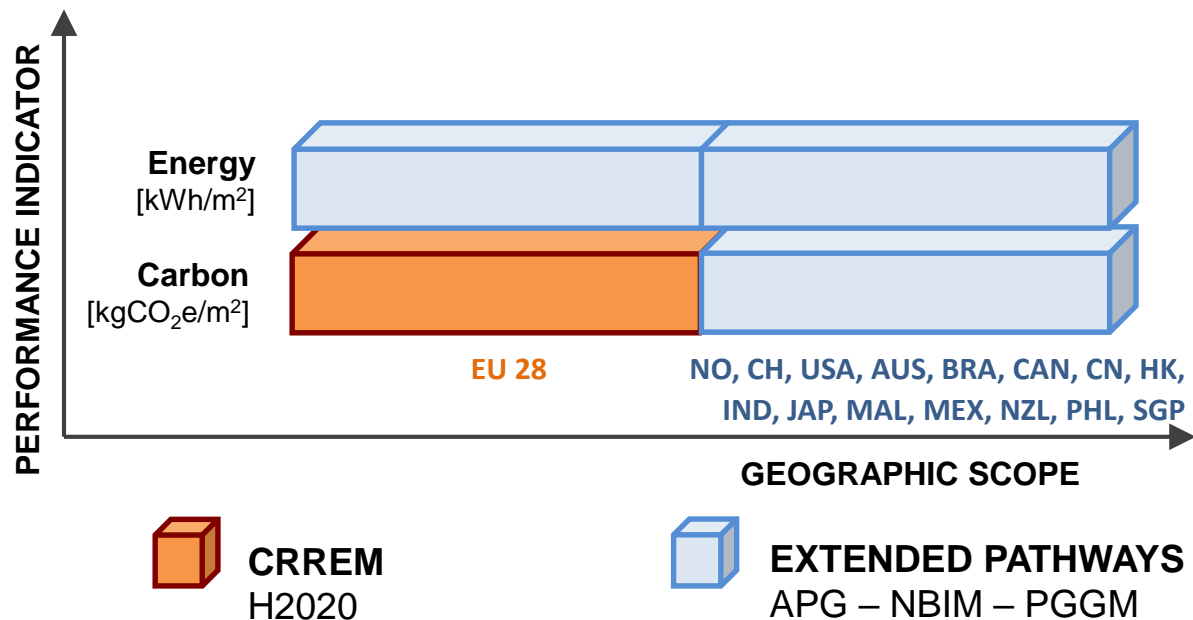
- **Global GHG** budget and pathway
Consistent with 1.5 and 2.5 scenarios
- **EU emission pathway**
Convergence of per capita emissions to 2050
- **EU commercial real estate sector**
Intensity metric introduced [kgCO_2/m^2]
- **Country-specific targets**
Convergence of GHG intensity
- **Sector-specific targets** for each country:
Compression of GHG intensity for each subsector – Office, retail etc.

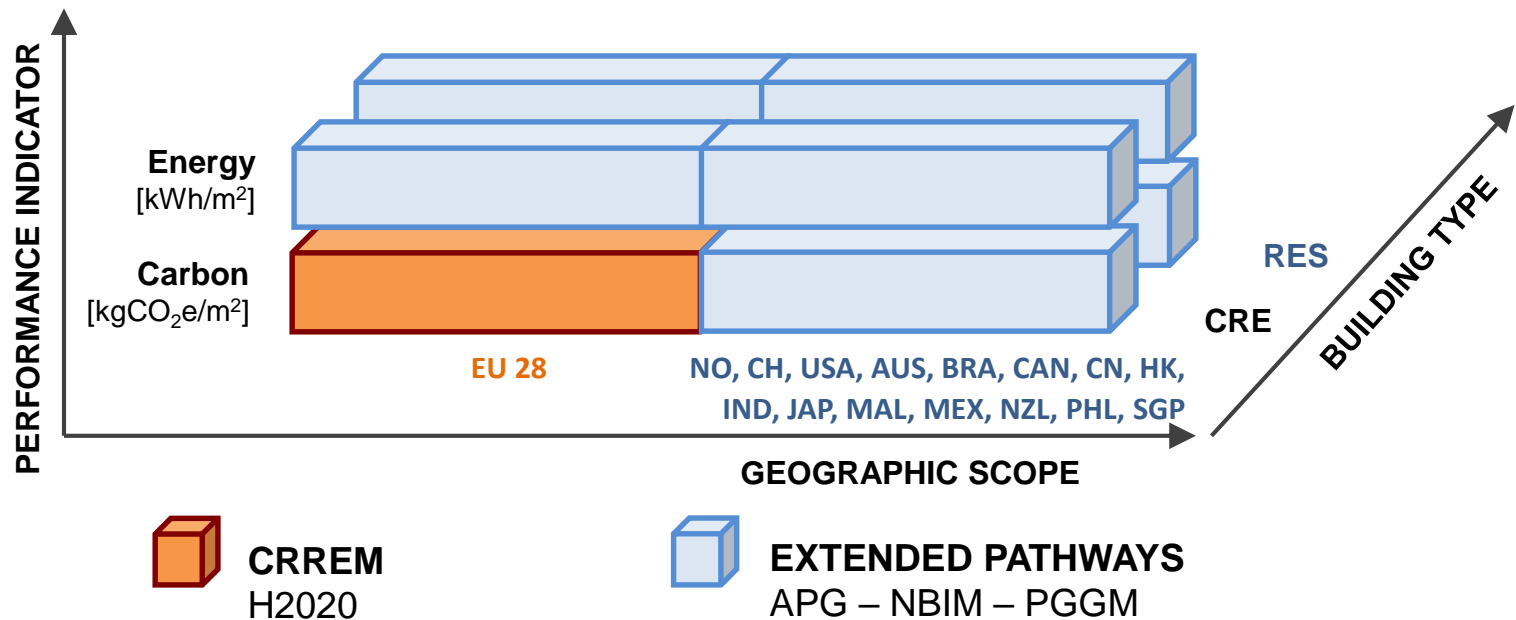
Sector-specific GHG intensity targets: Germany (1.5°C target)











CRE Commercial Real Estate:

RES Residential Real Estate:

Office | Retail | Hotel | Health Care | Education | Industrial | Data Centres | Leisure/Culture
Multi-Family

1. User input:

- *Property characteristics:* Location, year of construction, occupancy, energy consumption, emissions
- *User assumptions:* Discounting, carbon price, energy prices, abatement costs, own assumptions

2. Database:

GHG reduction targets, emission factors, weather normalisation, energy prices, carbon price, HDD/CDD, abatement costs, grid decarbonisation, warming scenarios

3. Result:

Stranding Diagram, Stranding Risk, costs of retrofits necessary to meet targets, carbon costs...

Source: CRREM

Select an asset (ID) to see results:

7

Global warming target
(or user-defined):

1.5°C

[Click here to define own targets
\(\"Settings\" sheet\)](#)

[Click to see further tabular
results for the selected asset](#)

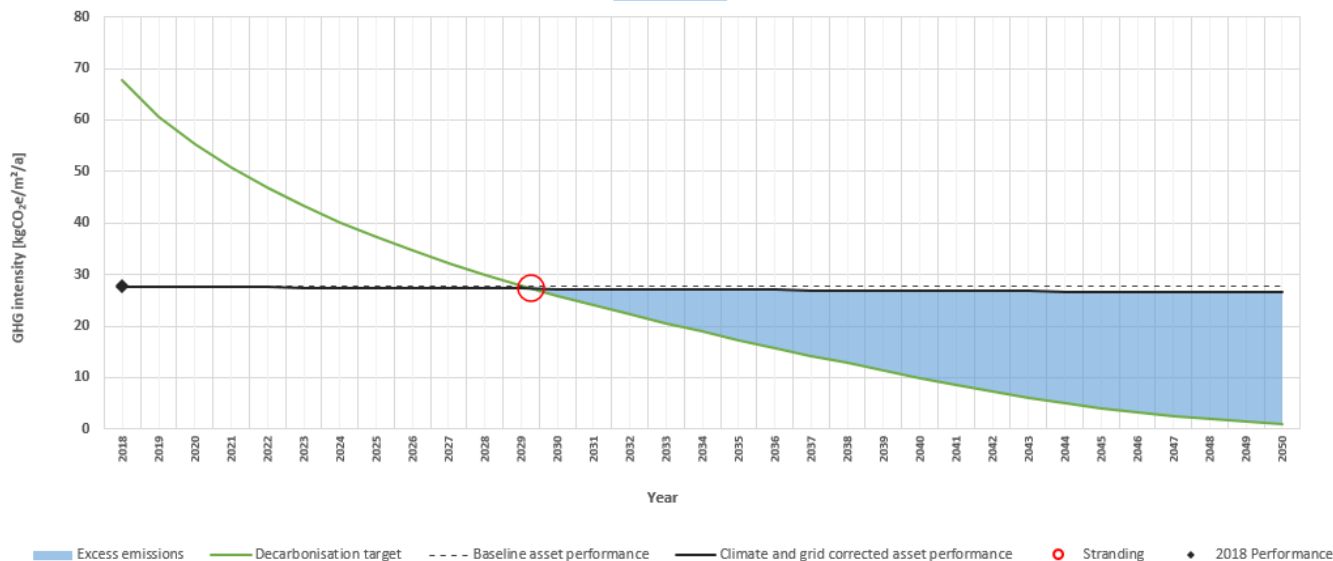
[Click here
\(default c](#)

STRANDING DIAGRAM (Asset #7 - Star Center)

Based on global warming target: 1.5°C

Display excess emissions:

Yes



Year of stranding: 2030

Type of use: Retail, Shopping Center

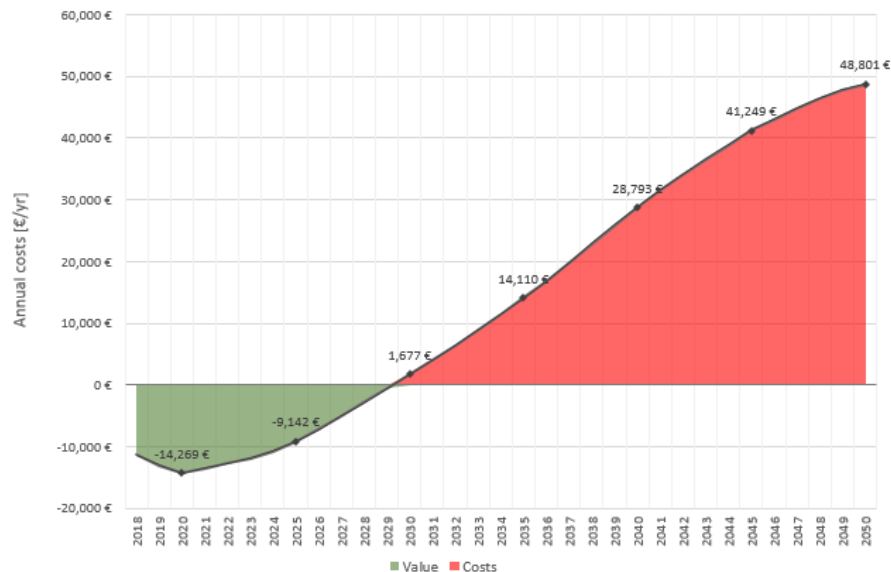
Country: Denmark

Carbon value at Risk: 1.0%

Source: CRREM

CARBON COSTS OF EXCESS EMISSIONS (Asset #7 - Star Center)

Emission above/below decarbonisation pathway times carbon price



Set discount rate:

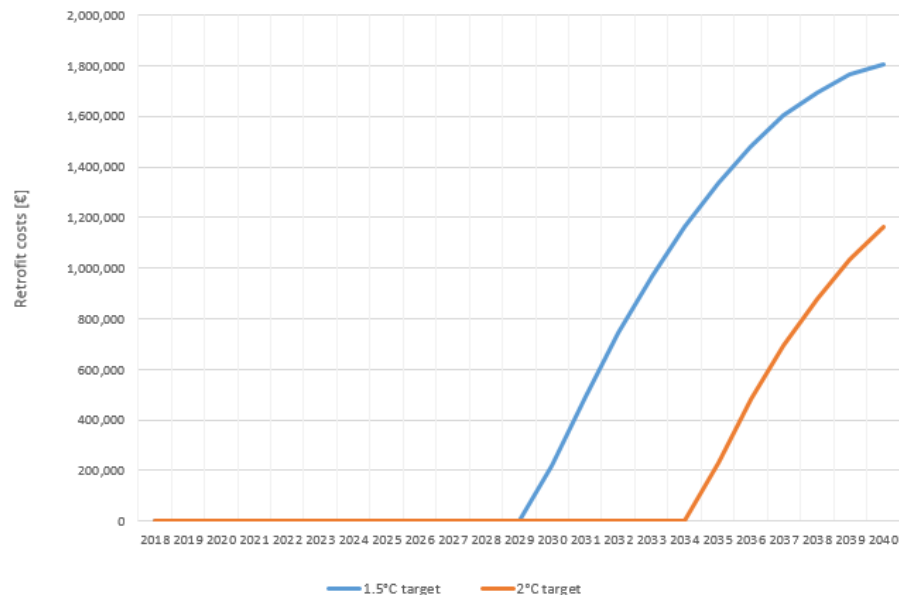
Discounted costs of excess emissions: - 356,192 €

Discounted value of emissions below target: 105,711 €

Carbon Value at Risk 1.00%

COSTS OF RETROFITTING TO COMPLY WITH DECARBONISATION PATHWAY

(Asset #7 - Star Center)



Source: CRREM

Set filter:

Country: **All**

Property
type: **All**

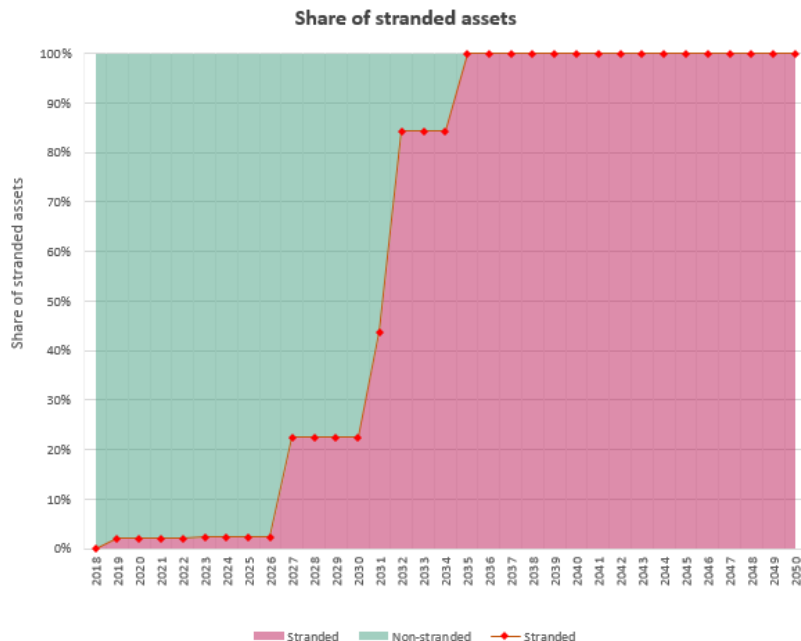
Entity/Fund: **All**

Assessment year: **2018**

EVOLUTION OF STRANDING WITHIN PORTFOLIO

Diagrams on the right display the evolution of stranding within your portfolio. Upper graph: Relative share of stranded assets. Lower graph: Absolute figures. Choose whether to display data based on the number of buildings, gross floor area (GFA) or gross asset value (GAV). Choose whether to exclude individual assets or exclude them from a certain year on.

Asset ID	Include	Sell in year
1	Yes	Don't sell
2	Yes	Don't sell
3	Yes	Don't sell
4	Yes	Don't sell
5	Yes	2022
6	Yes	Don't sell
7	Yes	Don't sell
8	Yes	2023
9	Yes	Don't sell
10	Yes	Don't sell
11	Yes	Don't sell



Show shares based on:

Gross asset value

Climate target:

2°C

Source: CRREM

Assessment of retrofit measures

1. Economical:

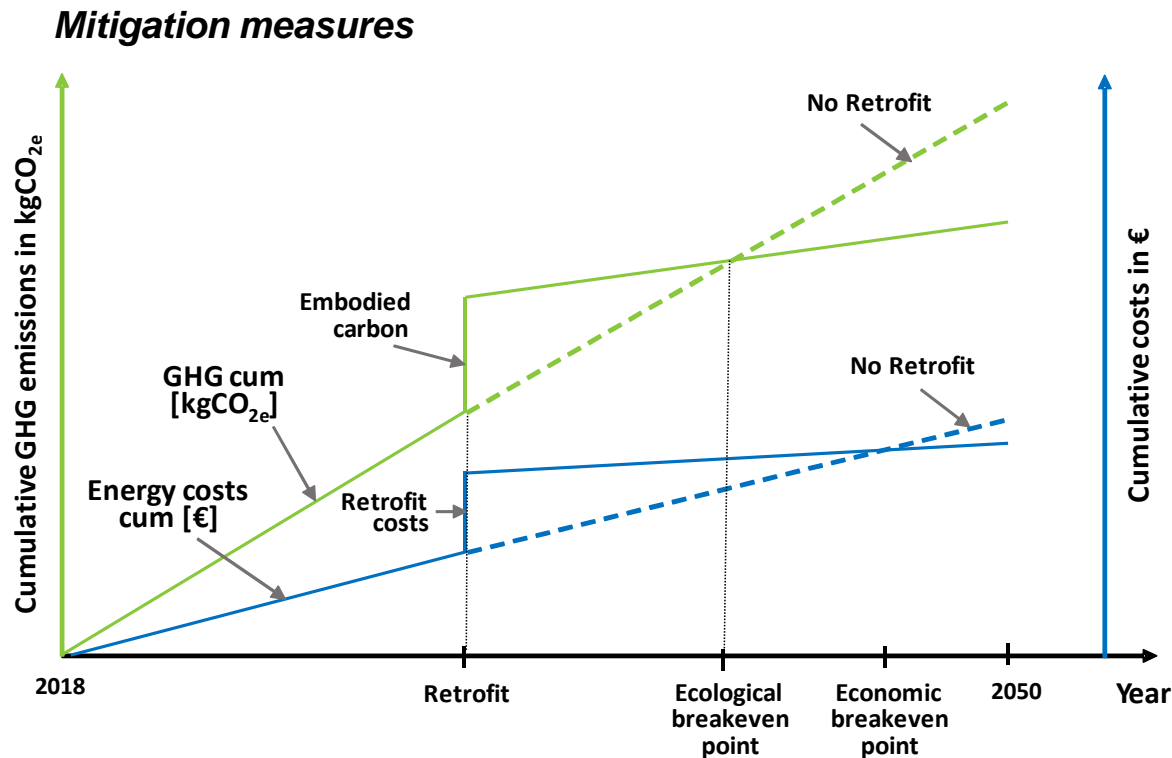
- Annual energy cost savings
- Investment costs
- Net present value

2. Ecological:

- Annual GHG emission savings
- Embodied carbon

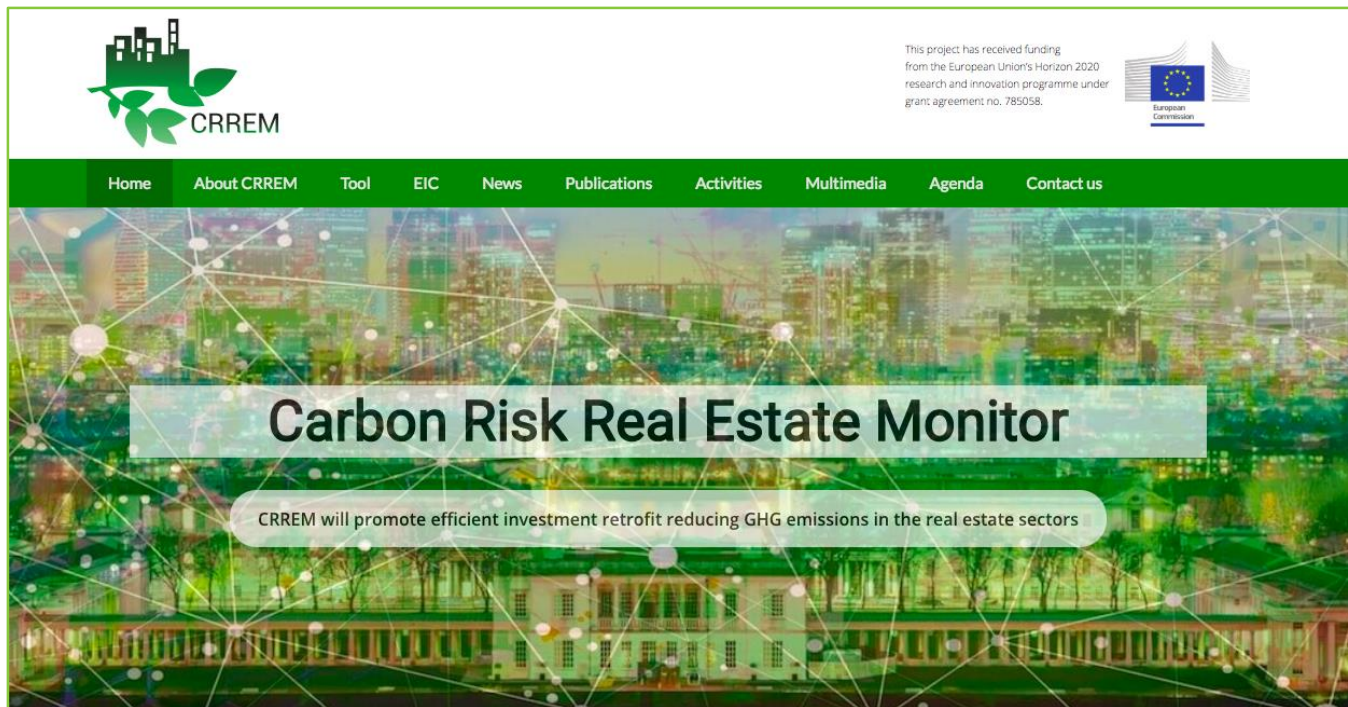
Economic break-even point

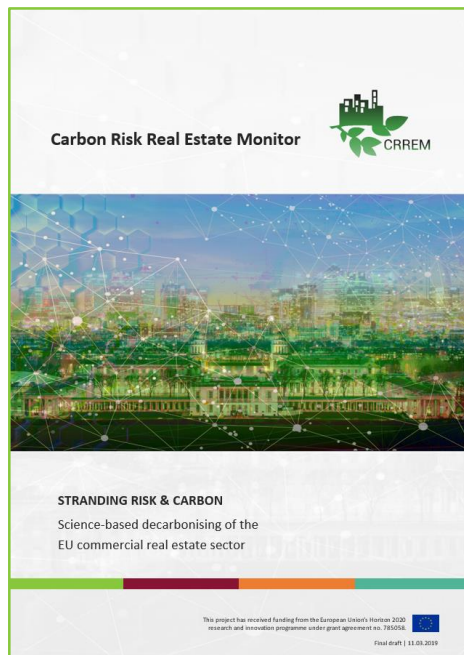
Ecological break-even point



Source: CRREM

www.crrem.eu/tool





www.crrem.eu/reports

1. Stranding Risk & Carbon
2. Carbon Risk Integration in Corporate Strategies within the Real Estate Sector
3. Retrofit Harmonisation Roadmap
4. Report on Completion of Pilot Testing Phase
5. CRREM support to corporate reporting in the real estate sector [Upcoming]

www.crrem.eu

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