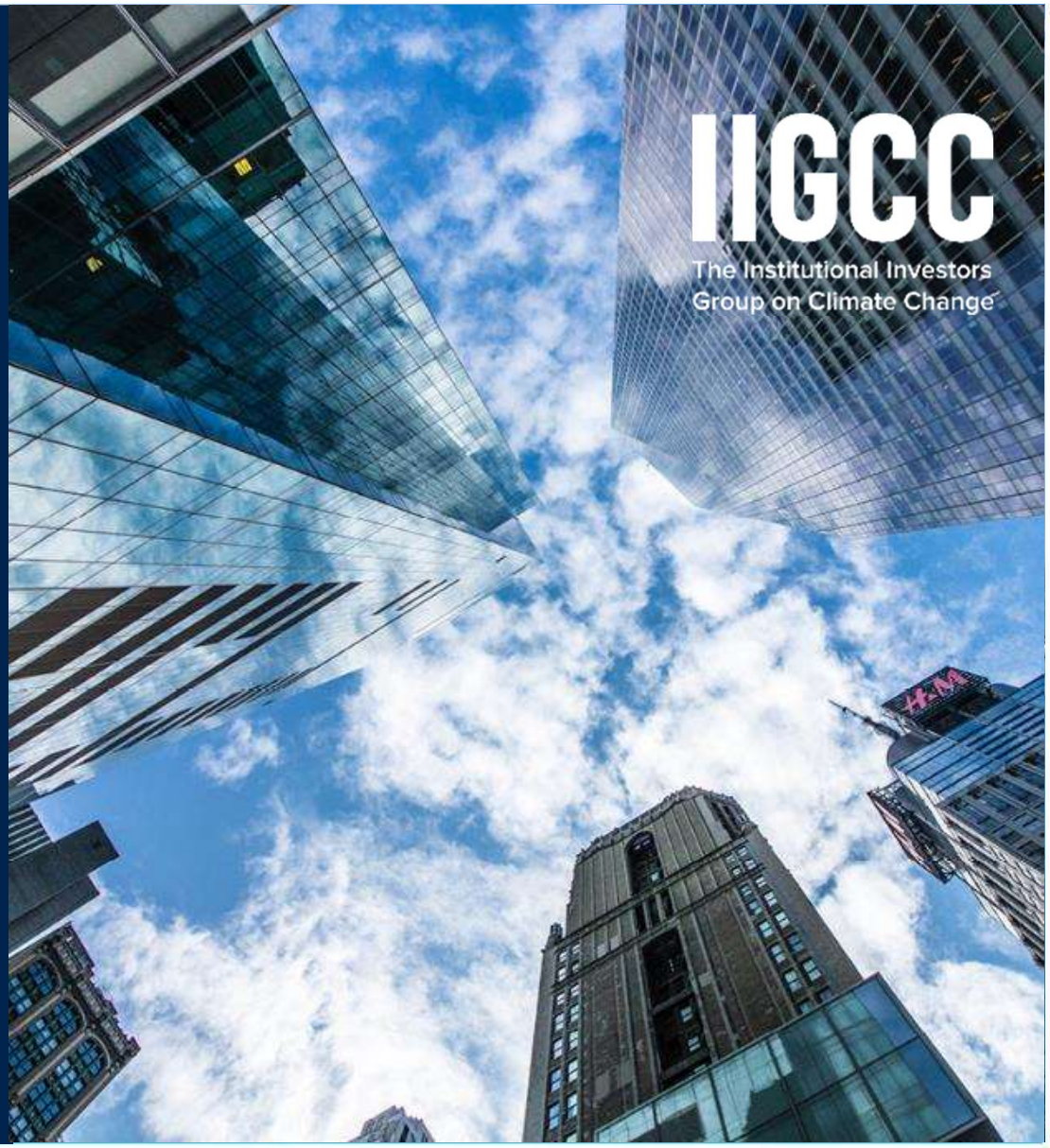
IIGCC real estate roundtable – Advancing best practice for measuring and managing whole life carbon emissions

19 July 2022



Agenda

5 mins	Welcome and introduction	Aleksandra Njagulj, DWS & IIGCC Real Estate Working Group Co-lead
15 mins	Measurement and benchmarking of embodied carbon	Xavier Le Den, Ramboll
15 mins	Alignment of pathways and target setting	Karl Downey, SBTi
20 mins	Q&A	All – moderated by Peter Sweatman, Climate Strategy & Partners
5 mins	Close	Hugh Garnett, IIGCC

Measurement and benchmarking of embodied carbon

Xavier Le Den, Ramboll

Towards embodied carbon benchmarks for buildings in Europe

Meeting with IIGCC

19 July 2022

RAMBØLL

Bright ideas.
Sustainable change.

Laudes Foundation

BUILD DEPARTMENT OF THE BUILT ENVIRONMENT

AALBORG UNIVERSITY

About Ramboll

Ramboll in brief

- Independent architecture, engineering and consultancy company
- Founded 1945 in Denmark
- 16,500 experts
- Present in 35 countries
- Particularly strong presence in the Nordics, the UK, North America, Continental Europe, and Asia Pacific
- Creating sustainable solutions across Buildings, Transport, Energy, Environment & Health, Water, Management Consulting and Architecture & Landscape.
- EUR 1.9 billion revenue
- Owned by Rambøll Fonden – The Ramboll Foundation

Markets

Buildings

Revenue share 2021:

26%

Employees:
4,432

Environment & Health

Revenue share 2021:

24%

Employees:
2,654

Transport

Revenue share 2021:

20%

Employees:
3,588

Energy

Revenue share 2021:

13%

Employees:
1,621

Water

Revenue share 2021:

8%

Employees:
1,035

Management Consulting

Revenue share 2021:

4%

Employees:
668

Architecture & Landscape

Revenue share 2021:

5%

Employees:
773

Employees in Business Support: (FTEE) 1,914

Ramboll provides design expertise and thought leadership to reduce whole life carbon in buildings

Key study findings

Project: “Towards embodied carbon benchmarks for buildings in Europe”

#1 What data is available on embodied carbon?
Embodied carbon data availability and quality in the EU

#2 Where are we now?
Setting the baseline based on LCA data

#3 Where do we need to be?
Defining targets according to global carbon budgets

#4 How can we close the gap?
Recommendations for EU performance framework for embodied carbon in buildings

Designed and executed by:

RAMBØLL

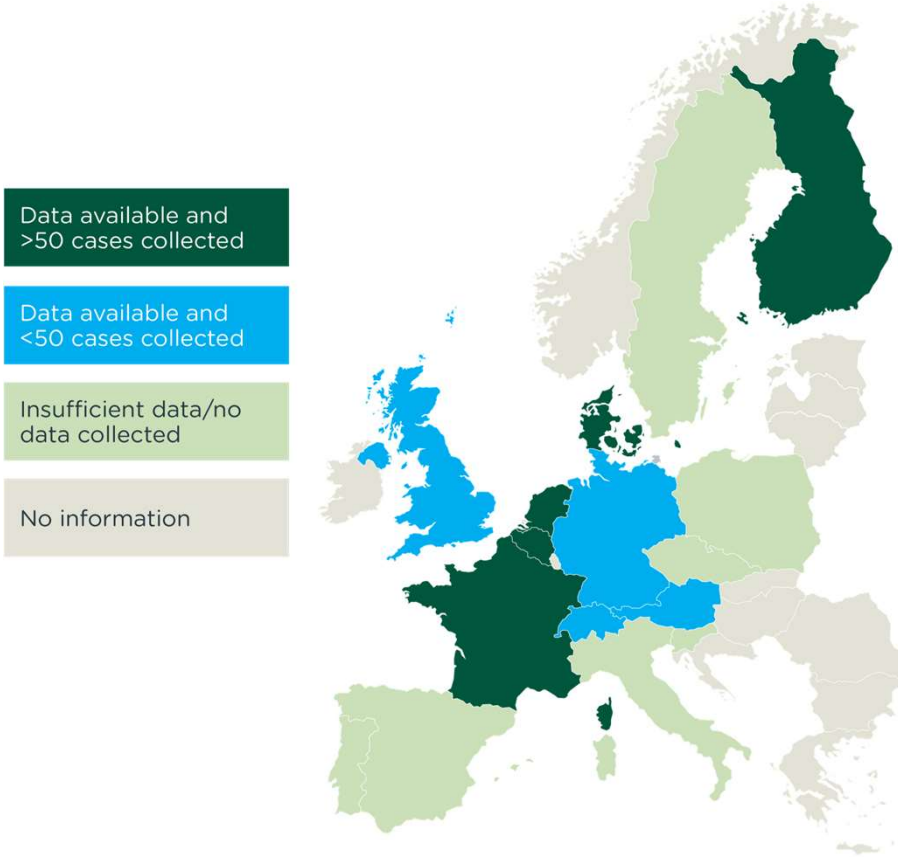
BUILD DEPARTMENT OF THE BUILT ENVIRONMENT
AALBORG UNIVERSITY

And data partners from KU Leuven, NIBE, CSTB, and Ministry of the Environment of Finland (with Granlund/OneClickLCA)

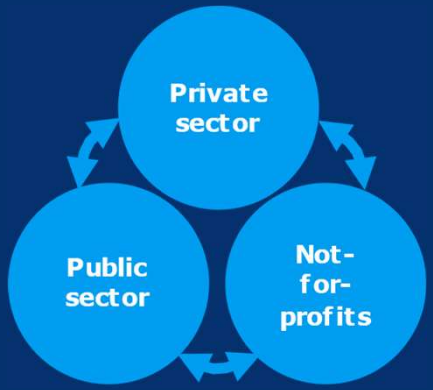
Funded by:

Laudes Foundation

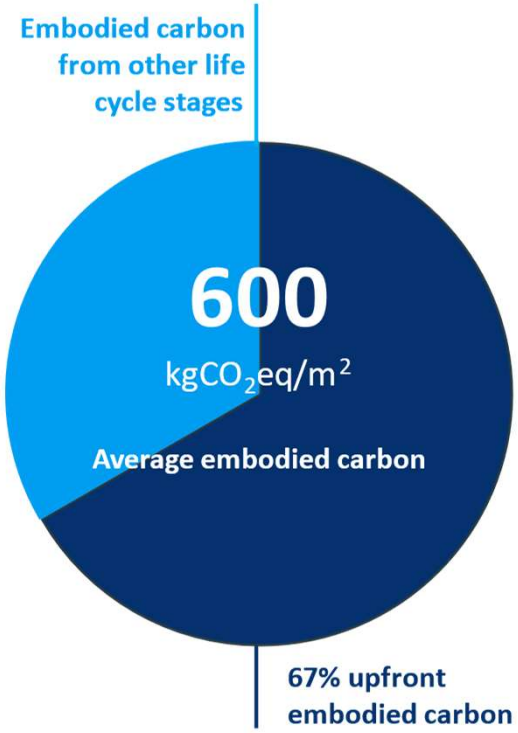
Data on embodied carbon is largely lacking

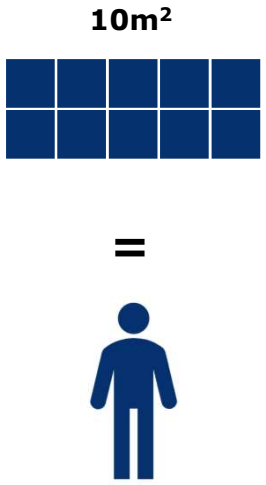


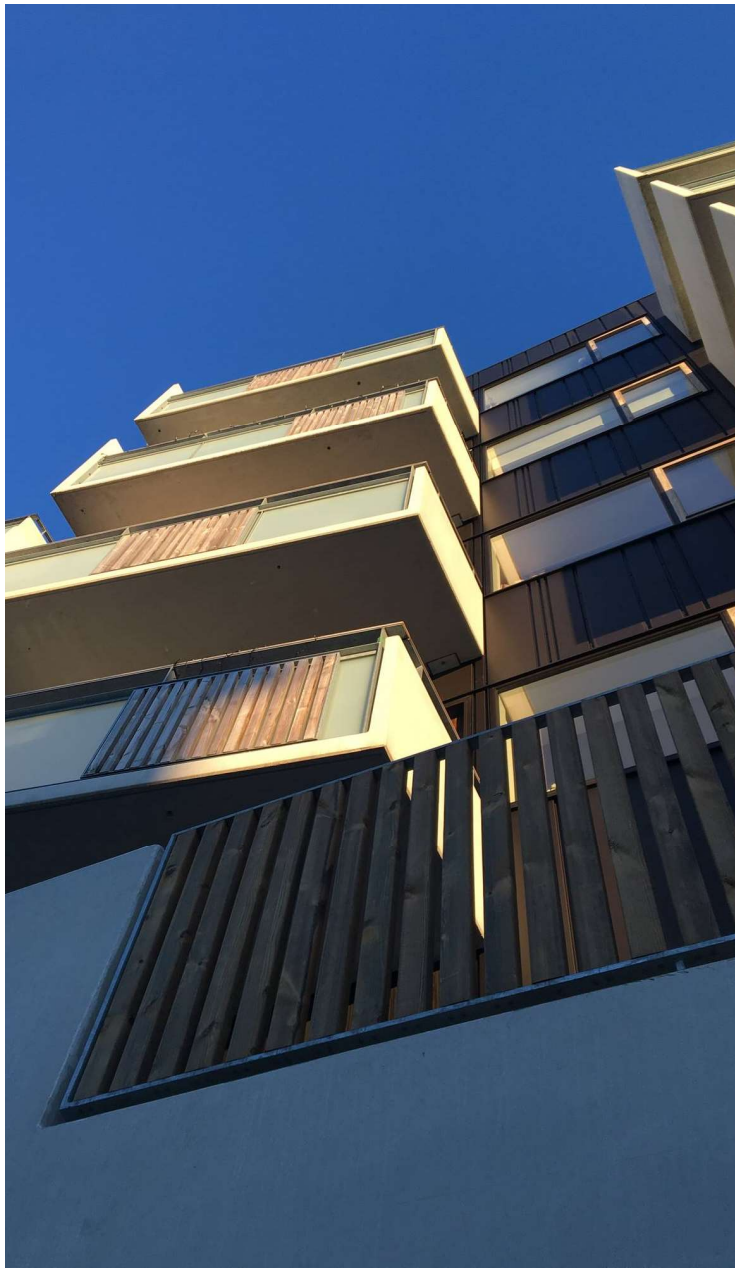
- **5 European countries** in which >50 cases could be collected
- **Data availability** is a key issue
- **Further challenges:**
  - Accessibility
  - Quality
  - Comparability
  - Representativeness



Embodied carbon matters

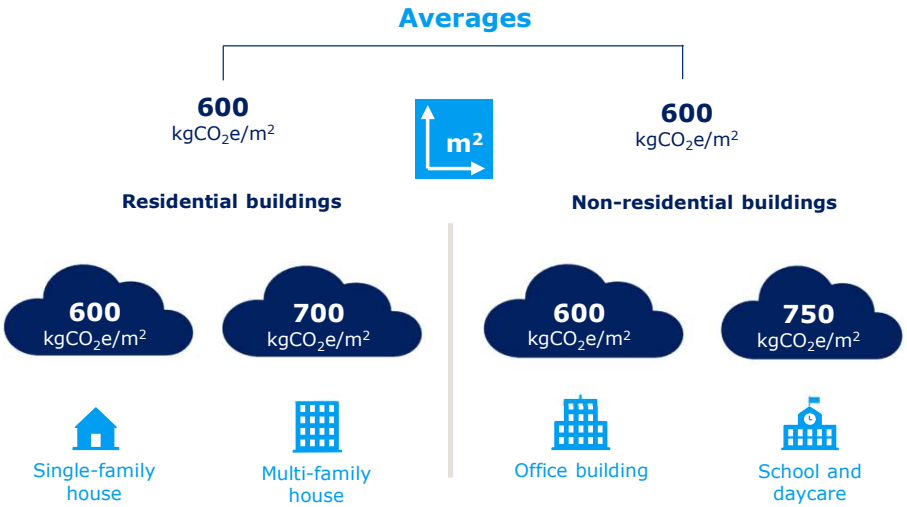




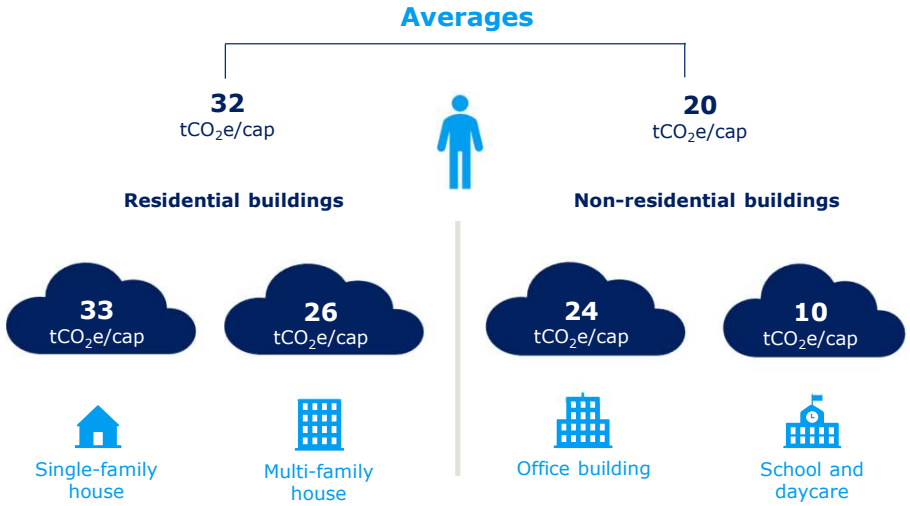


Building types shape embodied carbon levels

Life cycle embodied carbon per square meter (m^2)
In kg of CO_2e per m^2



Life cycle embodied carbon per capita (cap)
In tonnes of CO_2e per cap



Building structure and material choices also shape embodied carbon levels

Wood frame building

500
$kgCO_2e/m^2$

Massive concrete building

750
$kgCO_2e/m^2$

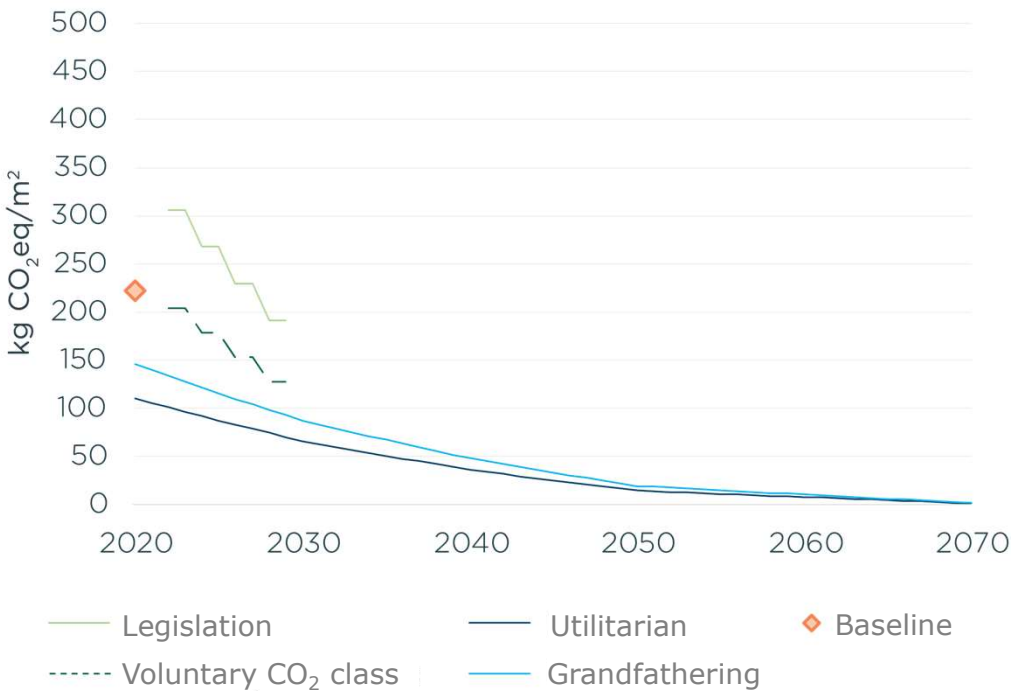
Carbon budget considerations are needed in the embodied carbon debate

Approach used for upfront embodied carbon budgets

- A carbon budget **quantifies the remaining GHG emissions** that can still be emitted to limit global warming to a certain limit.
- **No existing initiative** has so far calculated carbon budgets for embodied carbon of buildings.
- **Allocation principles** are crucial for downscaling and require choices that influence the specific budget.

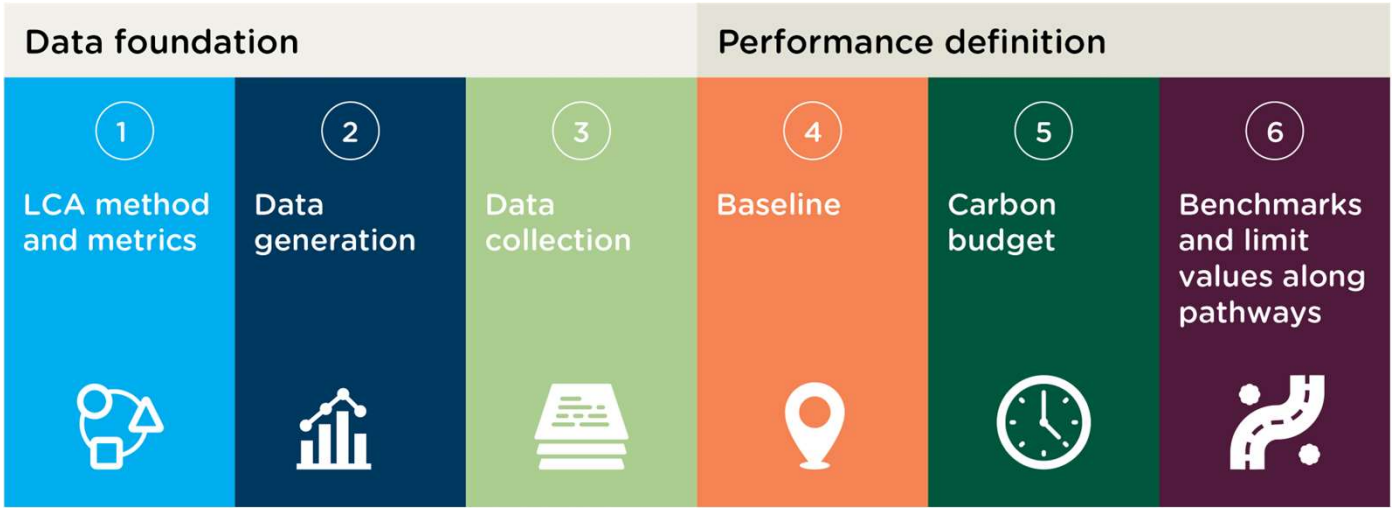
Carbon budget considerations are needed in the embodied carbon debate

National carbon budget for upfront embodied carbon (in $kgCO_2eq/m^2$) for Denmark



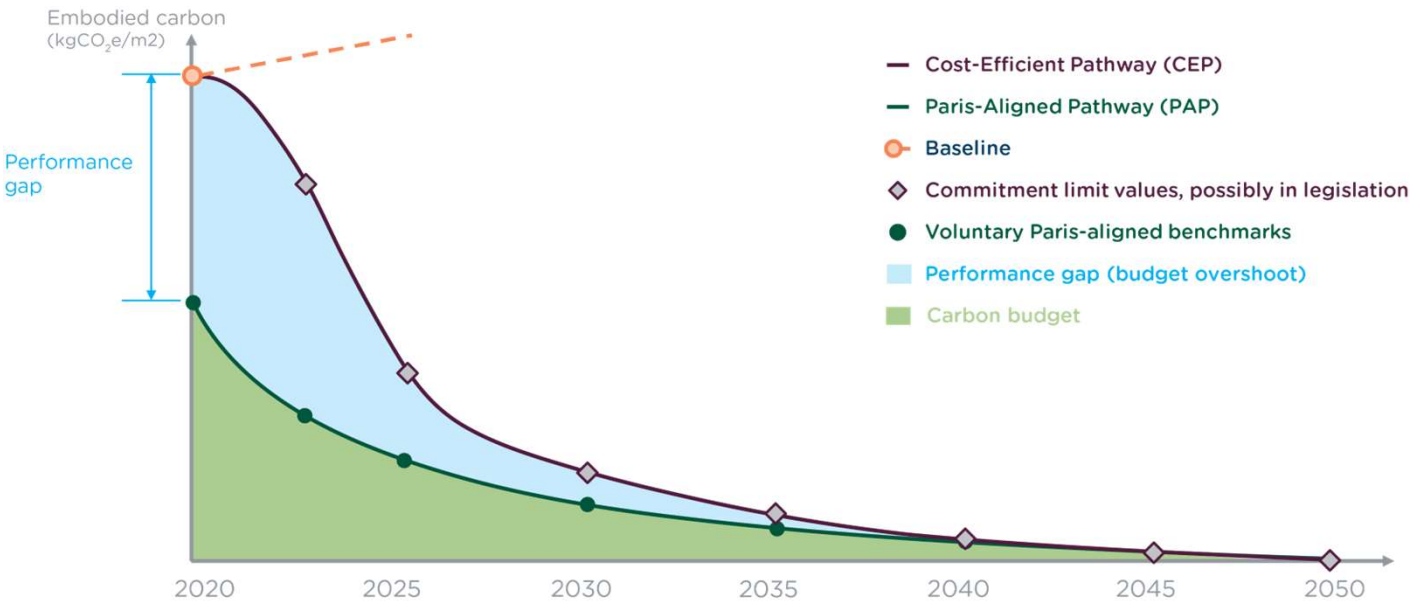
- **Different results depending on allocation** for sectoral emission budgets.
  - **Utilitarianism**: based on current value added to national economy
  - **Grandfathering**: based on current share of embodied carbon out of national emissions
- Baseline and existing national legislation **exceed the budget**.
- **Additional measures** will have to be taken to stay within budget.

A performance framework can bridge the gap between baseline and carbon budget



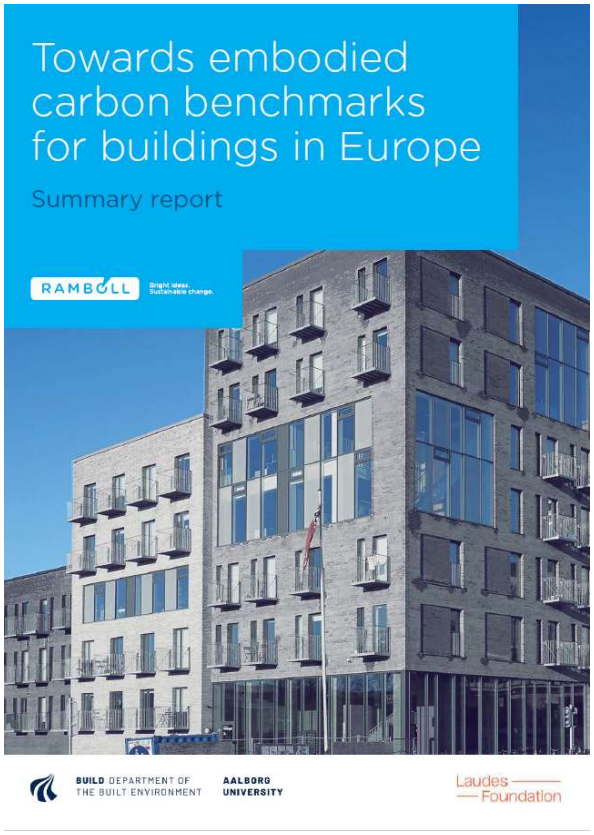
- **Collaborative efforts** to create the evidence base through LCA building data
- Bring together **bottom-up and top-down** considerations on embodied carbon
- Define a **Paris-aligned pathway** for climate neutrality and a **cost-efficient pathway** as a reduction commitment by the industry

All stakeholders need to act with urgency



- Any **delay increases the budget overshoot**
- **Data collection and emission reduction** need to be stepped up
  - **Governments** to define standard methods with strong incentives
  - **Certification** bodies to share LCA data and promote budget-aligned benchmarks
  - **Investors** to align portfolios with reference values and move to climate neutrality in buildings
  - **Designers** to design buildings within reference values

Download all reports on our website



https://c.ramboll.com/lets-reduce-embodied-carbon

Bright
ideas.
Sustainable
change.

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Ramboll is a global engineering and management consultant

What is our personal responsibility?

Company CO_2 footprint

1 tons
per person

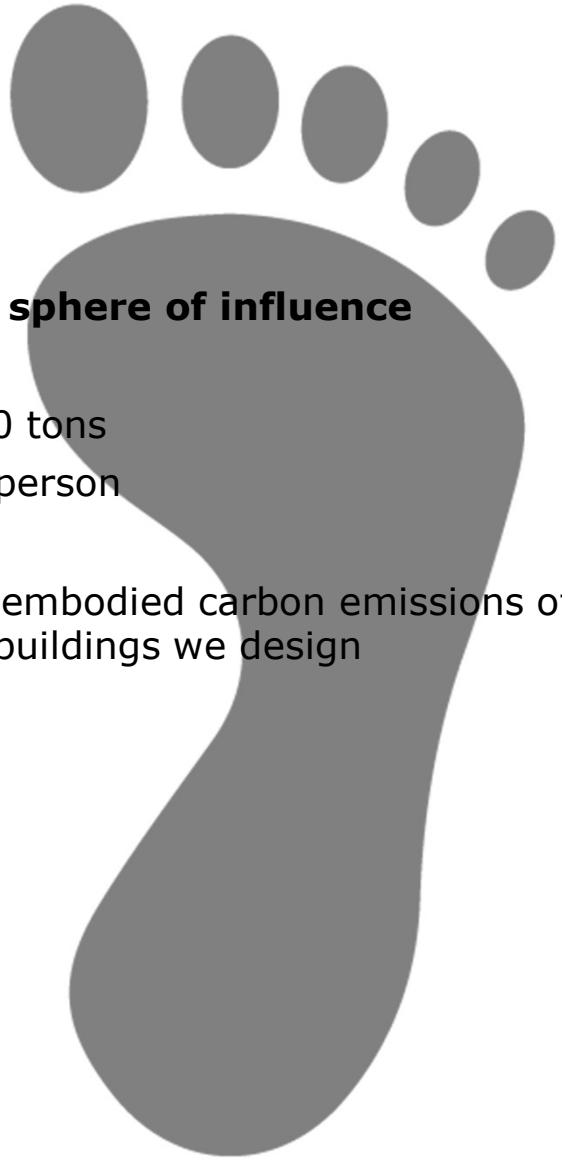
Private CO_2 footprint

5-15 tons
per person

Our sphere of influence

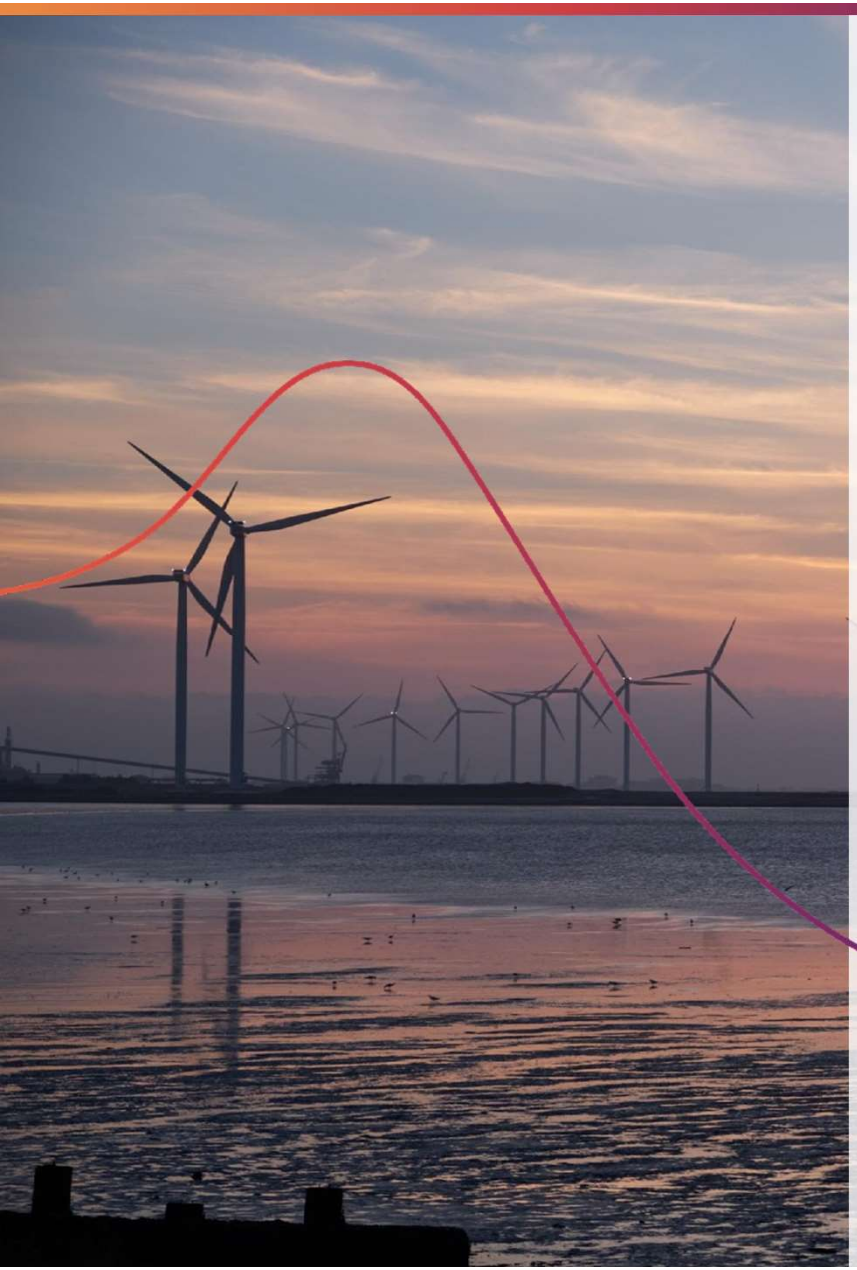
1000 tons
per person

The embodied carbon emissions of the buildings we design



Alignment of pathways and target setting

Karl Downey, SBTi



SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

1.5ºC science-based target-setting in the buildings sector

IIGCC
19 July 2022
Karl Downey
Senior Technical Manager & Industry lead
Science Based Targets initiative (SBTi)

Partner organizations

CDP DISCLOSURE INSIGHT ACTION
United Nations Global Compact
WORLD RESOURCES INSTITUTE
WWF

In collaboration with

WE MEAN BUSINESS COALITION

INTRODUCTION TO SCIENCE-BASED TARGETS

INTRODUCTION TO THE SBTi

What is the Science Based Targets initiative?

The Science Based Targets initiative (SBTi) is a **global body** enabling businesses to set **ambitious emissions reductions** targets in line with the **latest climate science**.

Founding Partners

CDP
DISCLOSURE INSIGHT ACTION

United Nations Global Compact

WORLD RESOURCES INSTITUTE

WWF

In collaboration with

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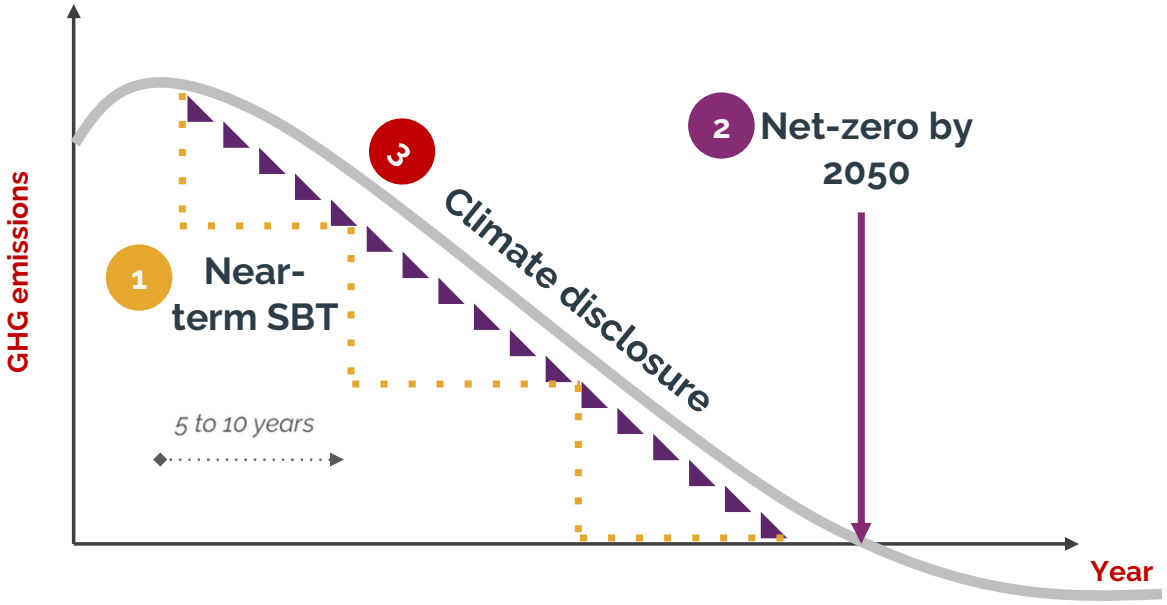
INTRODUCTION TO THE SBTi

What are science-based targets?



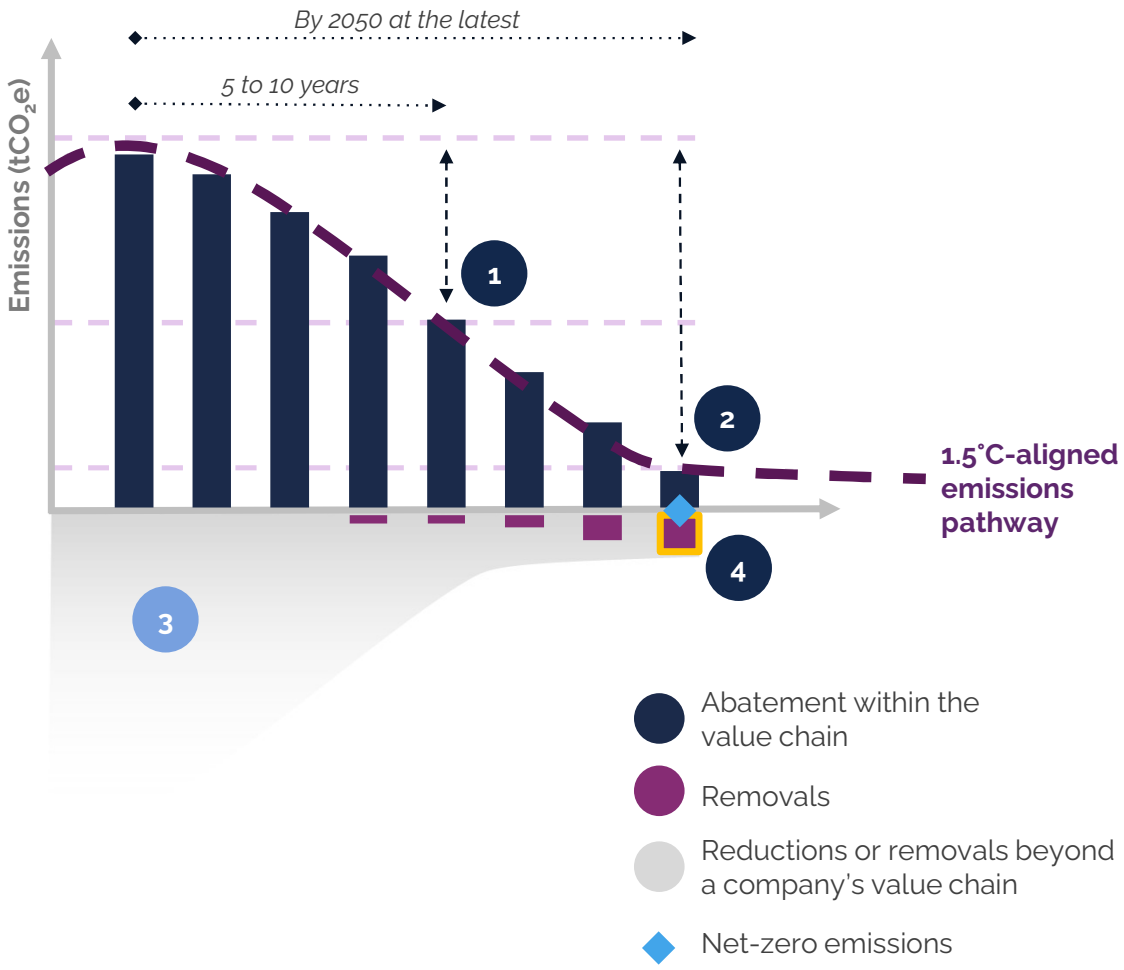
1. **(Near-term) science-based target:** Ensures that the company is taking near-term action to reduce emissions at a pace that is consistent with keeping warming below 1.5°C;

2. **Long-term net-zero target:** Provides clarity about the direction that the company will follow and serves as a north-star for long-term strategic and investment decisions;

3. **Annual disclosure:** Gives visibility on how the climate strategy is being implemented and provides transparency on progress against targets

Science-based targets show companies **how much** and **how quickly** they need to reduce their greenhouse gas (GHG) emissions to prevent the worst effects of climate change

FOUR KEY ELEMENTS MAKE UP THE NET-ZERO STANDARD FRAMEWORK



1. **To set near-term science-based targets**: 5-10 year emission reduction targets in line with 1.5˚C pathways

2. **To set long-term science-based targets:** Target to reduce emissions to a residual level in line with 1.5˚C scenarios by no later than 2050

3. **Beyond value chain mitigation:** In the transition to net-zero, companies should take action to mitigate emissions beyond their value chains. For example, purchasing high-quality, jurisdictional REDD+ credits or investing in direct air capture (DAC) and geologic storage

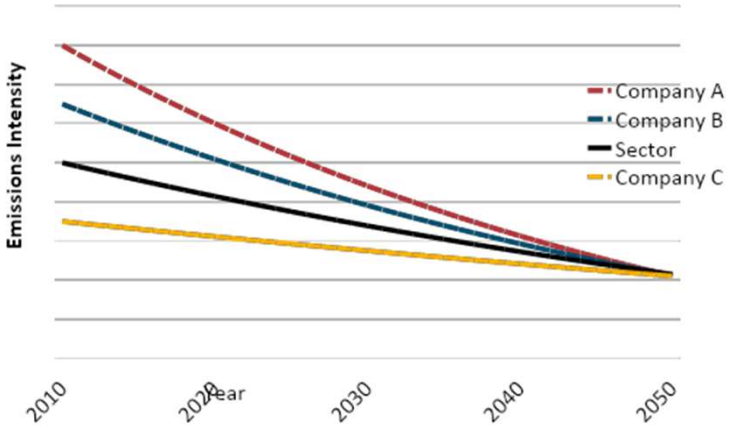
4. **Neutralization of residual emissions:** GHGs released into the atmosphere when the company has achieved their long-term SBT must be counterbalanced through the permanent removal and storage of carbon from the atmosphere

Required Recommended

SECTORAL ALLOCATION APPROACHES

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

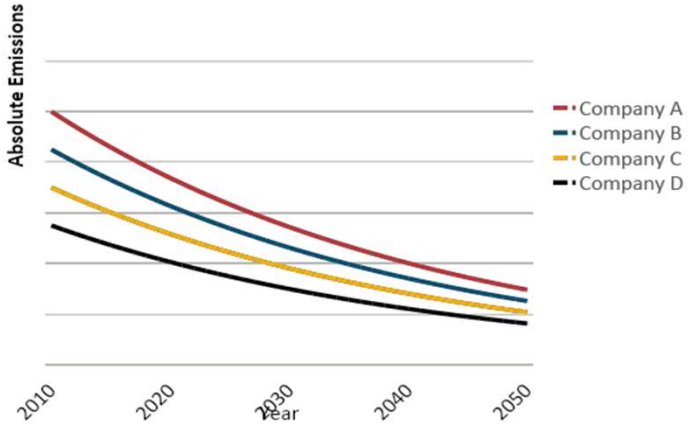
Carbon intensity convergence



Homogeneous sectors:

- Power
- Cement
- Iron & Steel
- Aluminium
- Pulp & Paper
- Transport (some sectors)
- Buildings

Carbon emissions contraction



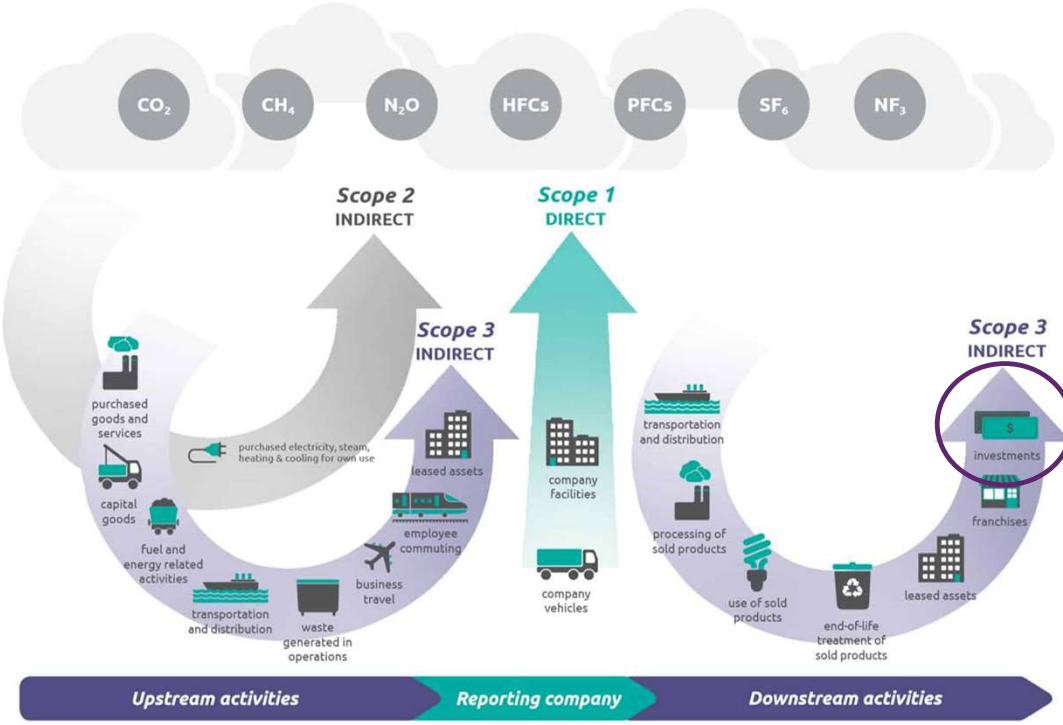
Heterogeneous sectors:

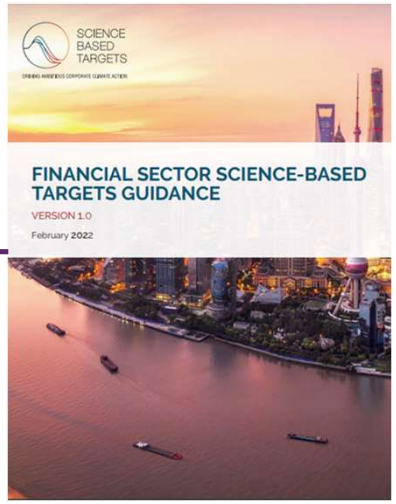
- Other industry

Note: an absolute contraction pathway for 1.5°C has already been derived by the SBTi and requires a minimum 4.2% linear annual reduction or a 42% reduction over 2020-2030, whichever is higher.

The SBTi Financial Institutions Framework

Acts as an add-on to the corporate framework with specific criteria and methods for scope 3 category 15: financed emissions from lending and investment activities.



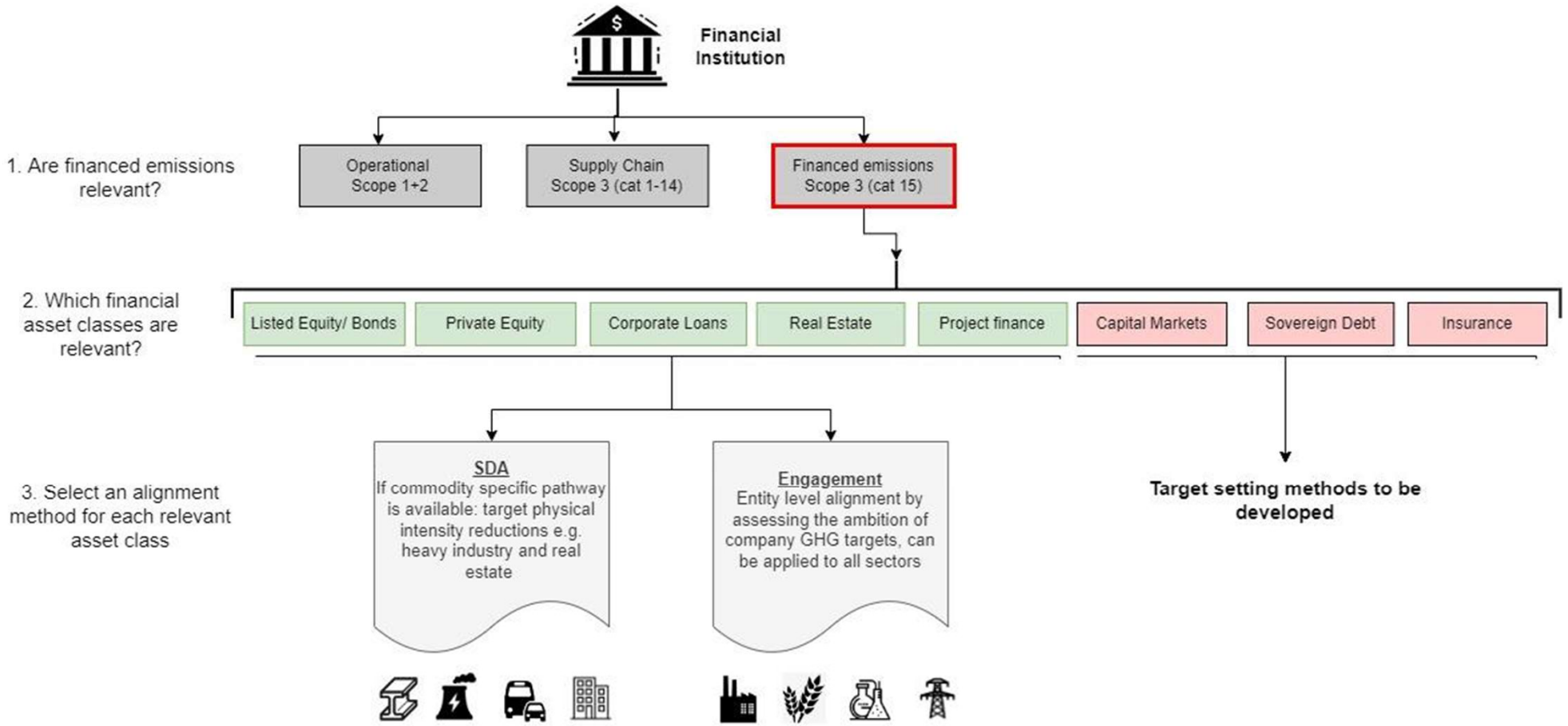


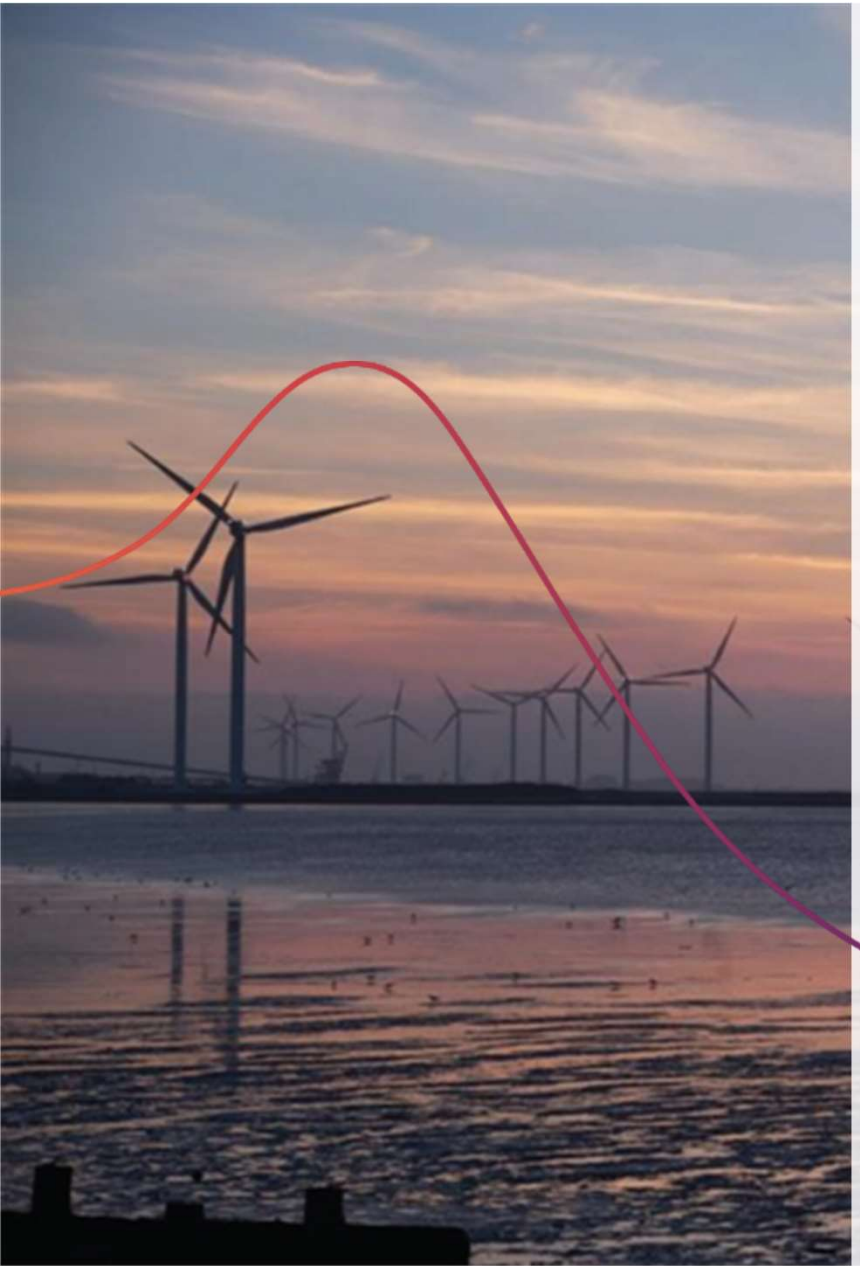
Goal of the framework is to align lending and investment activities with the goals of the Paris Agreement.

This means FIs need to engage portfolio companies to set their own ambitious targets.

The SBTi Financial Institutions Framework

The FI framework is built upon the corporate framework using similar methods. We rely on the methods developed to assess companies i.e. SDA, absolute contraction and other sector development guides





SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

SBTi's BUILDINGS PROJECT

Funded by Laudes Foundation

PARTNER ORGANIZATIONS

CDP DISCLOSURE INSIGHT ACTION

United Nations Global Compact

WORLD RESOURCES INSTITUTE

WWF

IN COLLABORATION WITH

WE MEAN BUSINESS COALITION

BUILDINGS SECTOR PROJECT: OBJECTIVES

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Objective 1	Objective 2	Objective 3
Develop granular 1.5°C aligned pathways for **in-use** emissions of global buildings sector	Develop a 1.5°C aligned pathway for **embodied** emissions of global buildings sector	Issue guidance for emissions accounting, reporting, and target-setting for all stakeholders within the sector (i.e., developers, owners, architects, engineers, and builders, financial institutions).

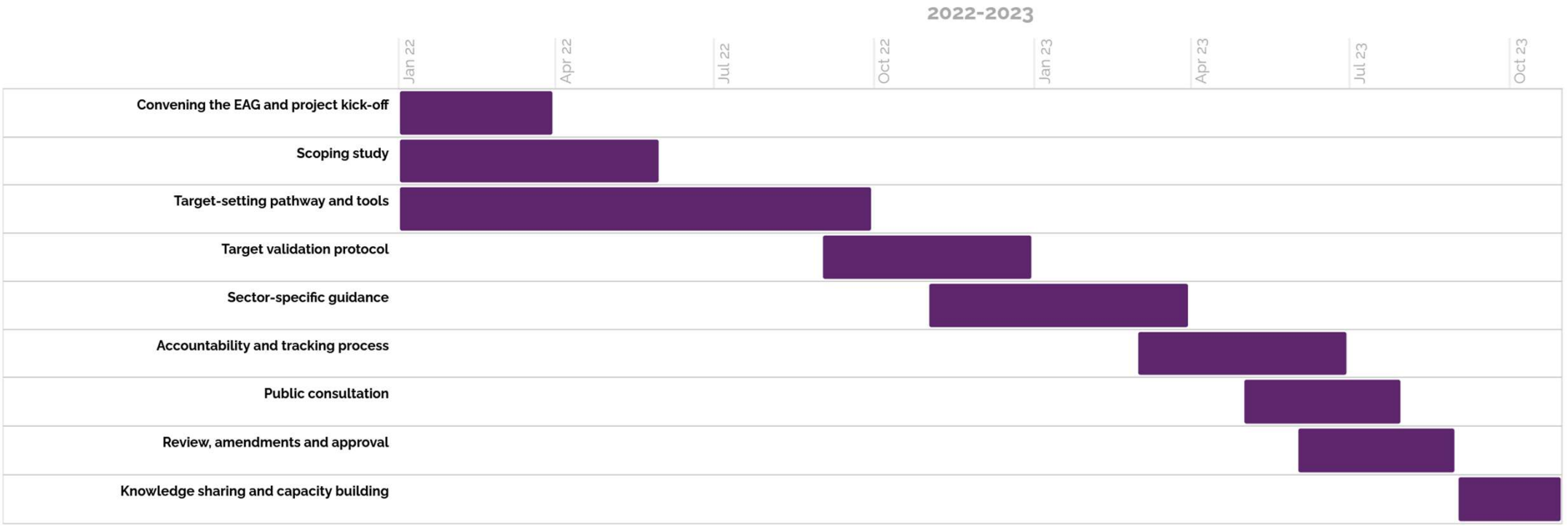
BUILDINGS SECTOR PROJECT: EXPERT ADVISORY GROUP

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

- AECOM
- Aldar
- APG
- Arup
- Better Buildings Partnership (BBP)
- Bouygues
- BRE
- Buro Happold
- CapitaLand Investment
- CBRE
- Climate Bonds Initiative
- Council on Energy, Environment, and Water (CEEW)
- Environmental Coalition on Standards (ECOS)
- European Climate Foundation (ECF)
- Finance Ideas
- Simon Property Group
- Skanska
- Swire Properties
- The European Network of Construction Companies for Research and Development (ENCORD)
- University of Regensburg
- University of Strathclyde
- World Business Council for Sustainable Development (WBCSD)
- World Green Building Council (WGBC)
- World Wide Fund for Nature (WWF)

BUILDINGS SECTOR PROJECT: TIMELINE

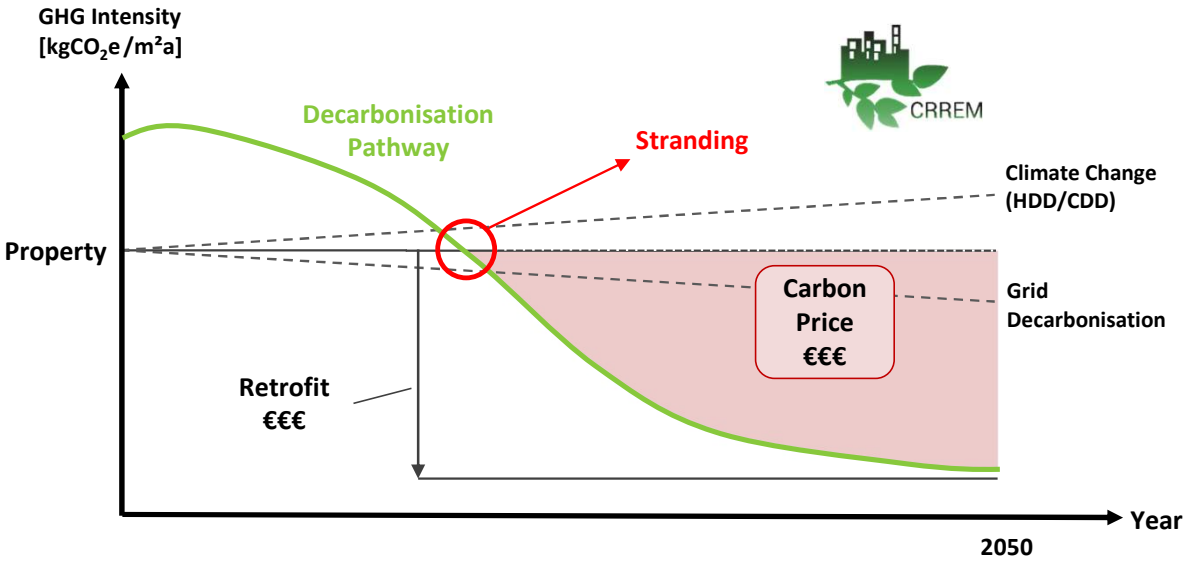
SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION




SCIENCE
BASED
TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION
IN-USE EMISSIONS
PATHWAYS

CARBON RISK ASSESSMENT & MANAGEMENT BASED ON QUANTITATIVE PERFORMANCE DATA AND TARGET SETTING

ASSET LEVEL STRANDING DIAGRAM



DECARBONISATION PATHWAYS

Aligned with 1.5°C and 2°C global warming, country- and building type specific

+

BUILDINGS' CARBON PERFORMANCE

Energy consumption, carbon emission factors, grid decarbonsation, changed heating and cooling demand, normalisation..,

=

CARBON RISK ANALYSIS

Year of stranding, excess emissions, carbon costs, energy costs, benchmarking

The SBTi and CRREM joined forces

- SBTi and CRREM have signed an MOU to cooperate and jointly publish the new pathways to be finalized asap.
- The pathways will be called **"CRREM-SBTi pathways"** for existing buildings
- Partners will also **jointly work on the underlying budget**, **scope attribution** and will update the **methodology accordingly**.
- This one-voice-to the market will be very **beneficial to both organizations**. Harmonization and global alignment are key for reaching Net-Zero in the industry.

Memorandum of Understanding SBTi - CRREM

1. Parties

The Science-Based Targets Initiative (the "SBTi") and Carbon Risk Real Estate Monitor Initiative ("CRREM") represented by IIÖ GmbH, are hereafter referred to as the parties.

The **SBTi** is a partnership between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF) that drives ambitious climate action in the private sector by enabling companies to set science-based emissions reduction targets.

CRREM provides institutional real estate investors, managers and other stakeholders globally with a set of clear Paris-aligned 1.5 or 2.0 °C-aligned decarbonization and energy-intensity pathways and targets for the operation of buildings. CRREM has developed scientifically-derived pathways for various regional market- and sector combinations. CRREM is a not-for-profit-initiative operated by the IIÖ GmbH, Institute for real estate economics (Josef-Steinbacher-Straße 1, Austria - 6300 Wörgl, Managing Director: Prof. Dr. Sven Bienert MRICS REV) whereas IIÖ, APG, NBIM, PGGM (are jointly holding the IP rights) of the global pathways, and GRESB Foundation is the data partner. CRREM is funded by APG, PGGM, NBIM and the Laudes Foundation.

CRREM PATHWAYS: DOWNSCALING FROM GLOBAL EMISSIONS TO CARBON INTENSITY PATHWAYS

DOWNSCALING

Global GHG budget and emissions pathway (consistent with a certain amount of global warming)

↓

Global buildings GHG emission pathway

↓

Global buildings GHG intensity pathway

↓

Country-specific residential GHG intensity pathway

↓

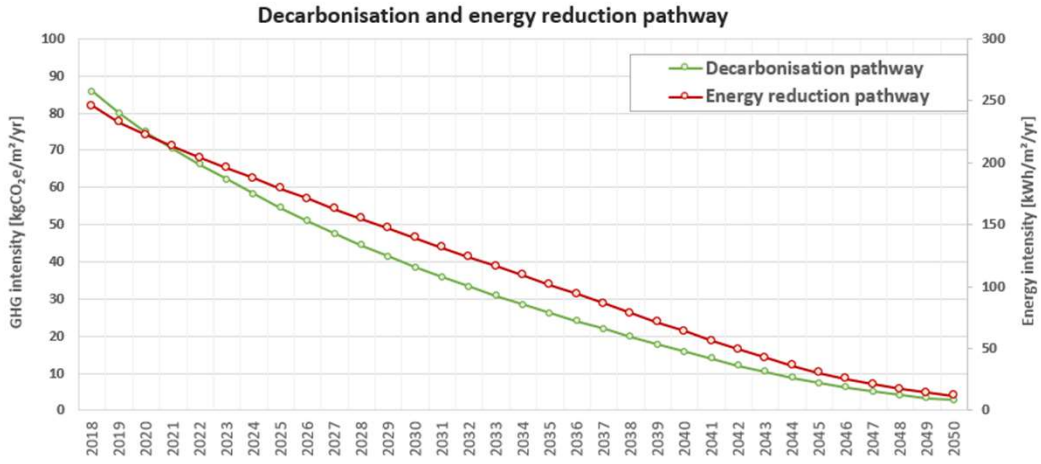
Country-specific CRE GHG intensity pathways

↓

Country-specific CRE-subsector GHG intensity pathways

↓

Country-specific CRE-subsector energy intensity pathways



Global warming target:	1.5°C
Country:	USA
Type of use:	Office

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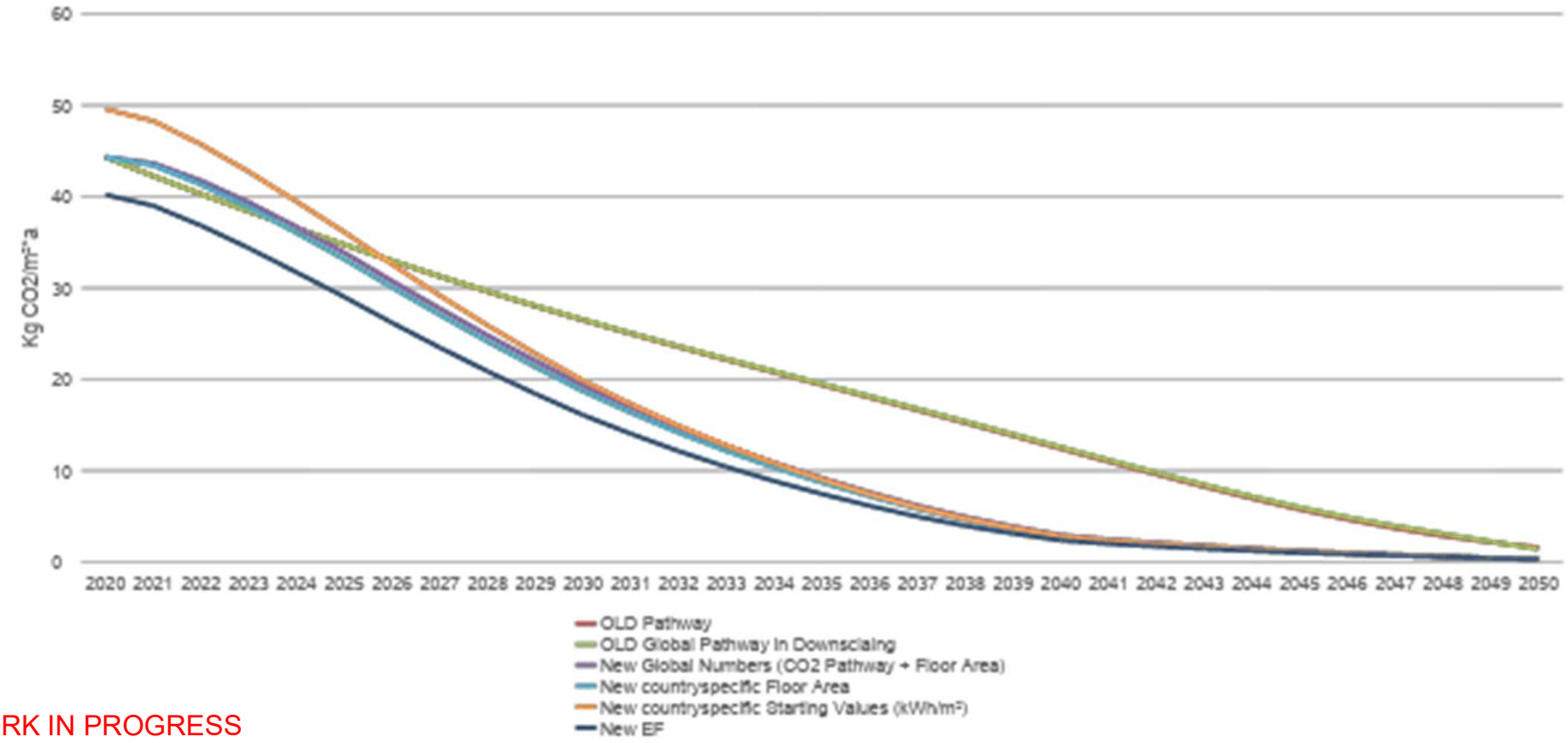
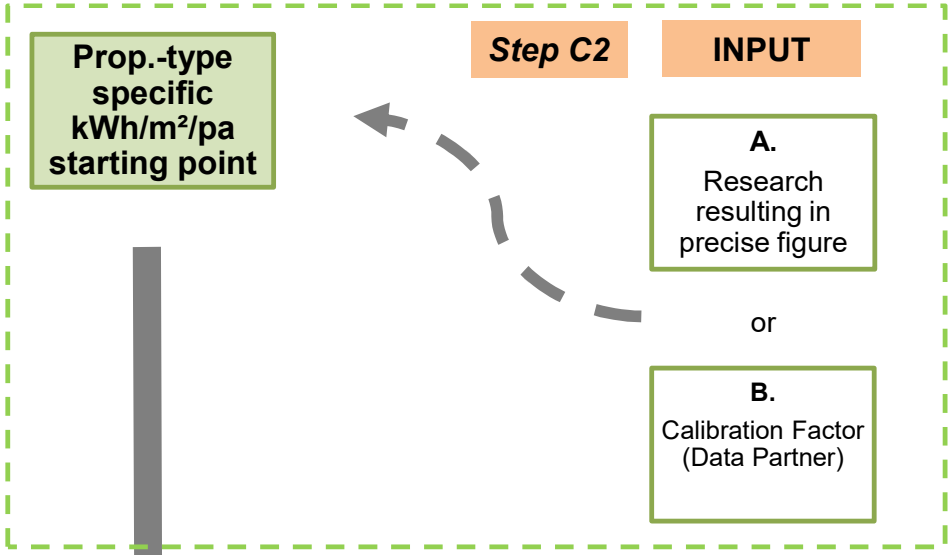


WORK IN PROGRESS

SUB-SECTOR CO2-PATHWAYS CALCULATION (1/4)

C



WORK IN PROGRESS

EXAMPLE CALCULATION NL Residential - RMF

(NL) – Residential average: 120 kWh/m²/pa[1]

Suggested factor: 0,90

Multi Family: 108 kWh/m²/pa

[1]source: Final Energy Balance, Floor Area via DGBC

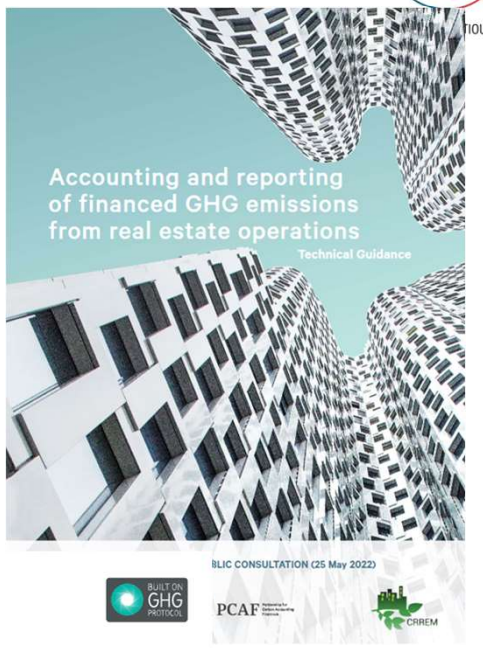
Suggested value for RMF by data partner was 140 kWh/m²/pa.


SCIENCE
BASED
TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION
EMBODIED EMISSION
PATHWAYS

TARGET-SETTING AND ACCOUNTING GUIDANCE

SECTOR GUIDANCE

- SBTi's sector guidance documents provide the guidance companies need to set their targets, and included relevant tools for setting the boundary, emissions accounting, constructing targets, and evidence needed for validation
- The basis is the Greenhouse Gas Protocol
- The SBTi receives a large volume of queries from the buildings sector, indicating that guidance is insufficient in this sector
- The SBTi guidance should build upon and complement existing work

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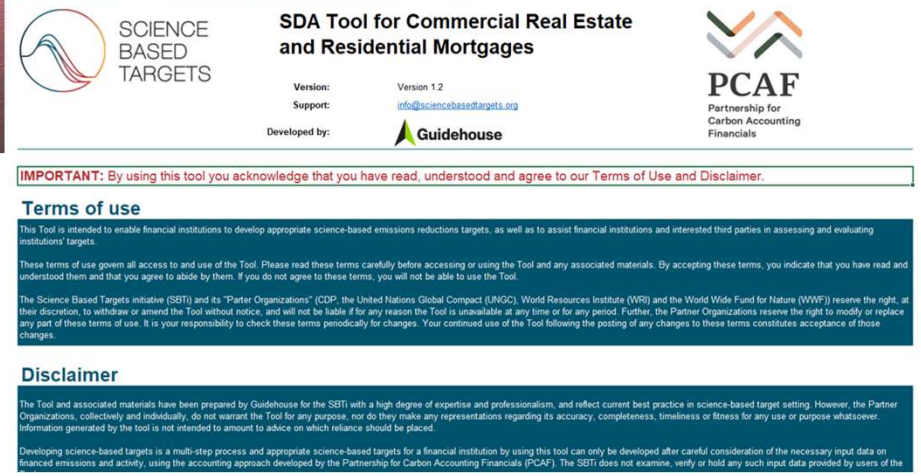
GUIDANCE FOR
FINANCIAL INSTITUTIONS

FINANCIAL INSTITUTIONS

- The SBTi plans to expand its guidance specifically on buildings for financial institutions

- What do investors need?

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QUESTIONS?

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SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

THANK YOU

PARTNER ORGANIZATIONS

CDP DISCLOSURE INSIGHT ACTION

United Nations Global Compact

WORLD RESOURCES INSTITUTE

WWF

IN COLLABORATION WITH

WE MEAN BUSINESS COALITION

sciencebasedtargets.org

@ScienceTargets

Science Based Targets

/science-based-targets

info@sciencebasedtargets.org

Q&A

Moderated by Peter Sweatman, Climate Strategy and Partners

Thank you

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