

1.5°C SCIENCE BASED TARGET SETTING IN THE BUILDINGS SECTOR

PUBLIC CONSULTATION WEBINAR

16 May 2023

Partner organizations



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VIDEO-CONFERENCE GUIDELINES

- This is a **zoom webinar**. Your camera and microphone are automatically muted.
- Participants can **send questions via the Q&A button**.
- **Slides from this webinar will be shared** after this call.
- Please note that this webinar will be **recorded** for the benefit of those who cannot attend.



AGENDA

- 1. Welcome and introduction**
2. Introduction to the SBTi and background
3. Buildings guidance and tool
 - In-use emissions pathways
 - Embodied emissions pathways
 - Key criteria and considerations
4. Q&A session

TODAY'S WEBINAR TEAM



KARL DOWNEY
Senior Technical Manager
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Campaign and Advocacy
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INTRODUCTION TO THE SBTi

What is the Science Based Targets initiative?



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

Founding Partners



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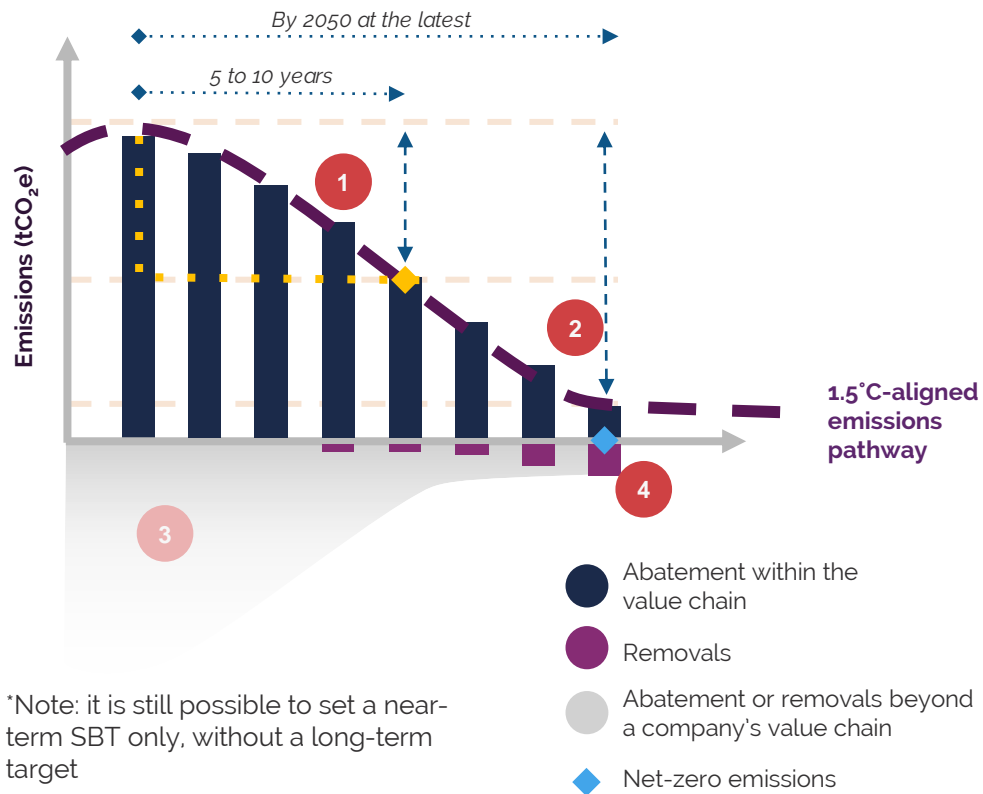
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THE NET-ZERO STANDARD FRAMEWORK



*Note: it is still possible to set a near-term SBT only, without a long-term target

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 .

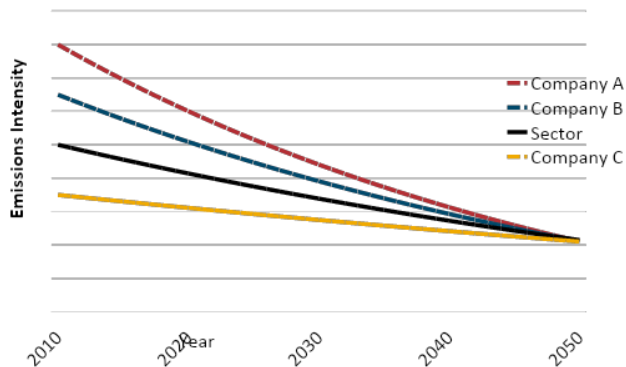
Beyond value chain mitigation:
In the transition to net-zero, companies should take action to mitigate emissions beyond their value chains. For example, purchasing high-quality, jurisdictional REDD+ credits or investing in direct air capture (DAC) and geologic storage.

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

TARGET-SETTING APPROACHES

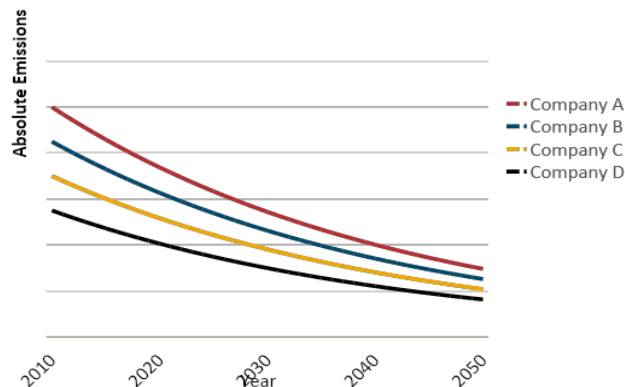
Carbon intensity convergence / Sectoral Decarbonisation Approach (SDA)



Homogeneous sectors:

- Power
- Cement
- Iron & Steel
- Transport (some sectors)
- **Buildings**

Carbon emissions contraction



Heterogeneous sectors:

- Other industry

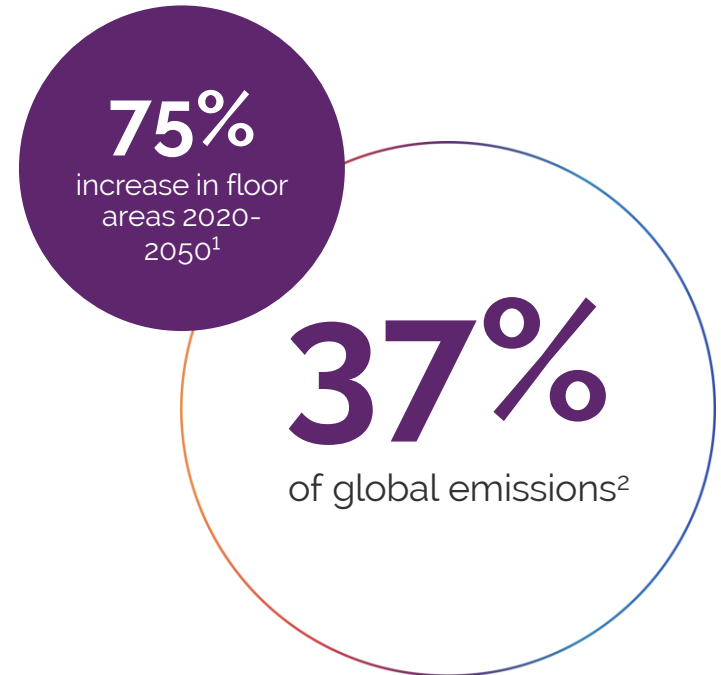
An absolute contraction target for 1.5°C requires a minimum 4.2% linear annual reduction or a 42% reduction over 2020-2030, whichever is higher.



THE SBTi BUILDINGS PROJECT

DECARBONIZING BUILDINGS IS CRUCIAL

- Today, the built environment is a **major contributor of emissions** globally.
- Simultaneously, **global floor area** is projected to increase significantly by 2050.
- Climate change affects the industry, **causing physical damage and risks** already.
- **Immediate climate action is needed** to accelerate the transformation to the net-zero economy.



¹ Source: [IEA, 2022](#).

² Source: [GABC, 2022](#)

PARTNERS

Technical Partners

- CRREM: 1.5°C in-use operational pathways.
- Ramboll: 1.5°C embodied pathways.
- PwC: guidance development.
- dss+: tool development.



Funding

The SBTi would like to thank Laudes Foundation for funding this project.

Laudes ———
——— Foundation

SBTi BUILDINGS PROJECT - EXPERT ADVISORY GROUP



AECOM	Council on Energy, Environment, and Water (CEEW)	Ramboll
Aldar	Environmental Coalition on Standards (ECOS)	Simon Property Group
APG	European Climate Foundation (ECF)	Skanska
Arup	Finance Ideas	Swire Properties
Better Buildings Partnership (BBP)	Global Real Estate Sustainability Benchmark (GRESB)	The European Network of Construction Companies for Research and Development (ENCORD)
Bouygues	Green Building Design Group	University of Regensburg
BRE	Green Finance Institute	University of Strathclyde
Buro Happold	JLL	World Business Council for Sustainable Development (WBCSD)
CapitaLand Investment	Mitsubishi Estate Co.	World Green Building Council (WGBC)
CBRE	Multiplex	World Wide Fund for Nature (WWF)
Climate Bonds Initiative	Partnership for Carbon Accounting Financials (PCAF)	International Finance Corporation (IFC)

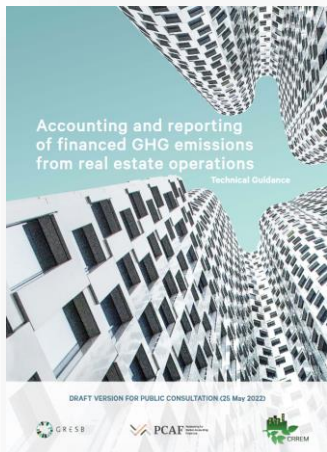
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WHAT DOES THE GUIDANCE INTEND TO DO?

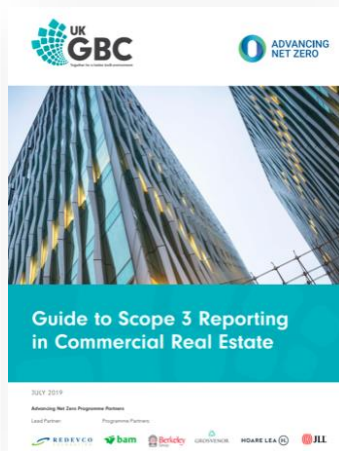
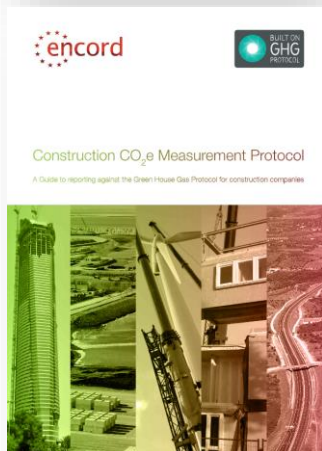
- SBTs indicate **how much and by when** an individual company should reduce emissions from its operations to be in line with the carbon budget.
- SBTs are different to asset-level standards, certification schemes or assessments - these are a complementary tool for designing and managing buildings in a sustainable way.





EXISTING SECTOR GUIDANCE

- SBTi's sector guidance documents provide the guidance companies need to set their targets, and include relevant tools.
- The basis is the Greenhouse Gas Protocol.
- The SBTi guidance builds upon and complements existing work, and fills gaps in accounting and reporting practices when needed.



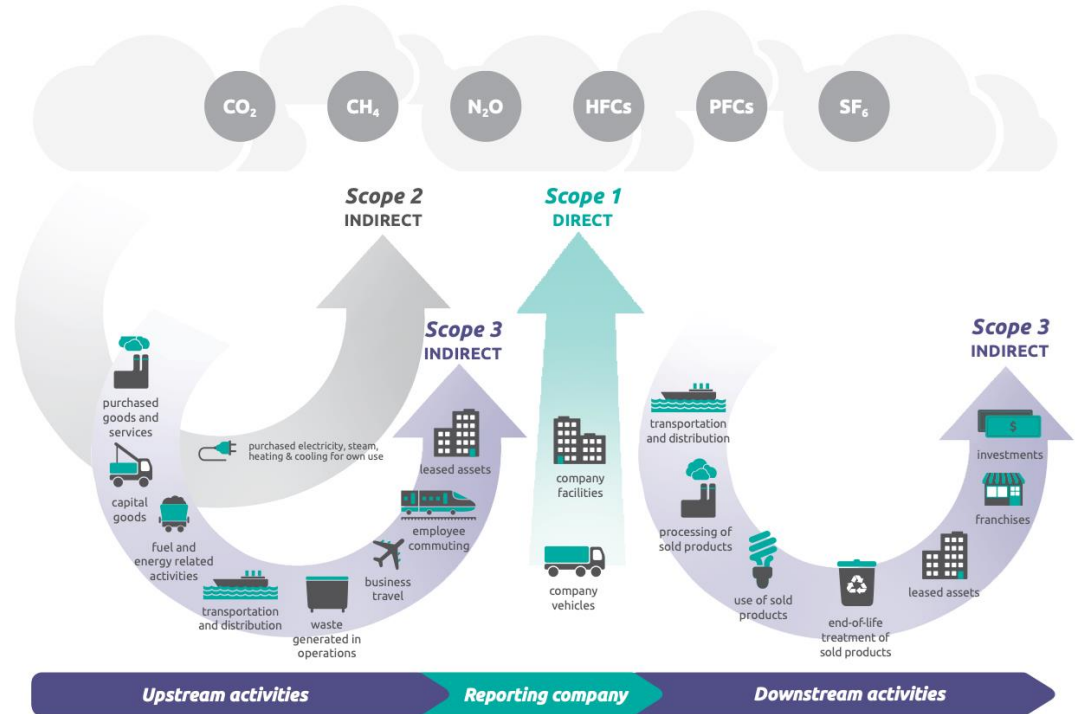
GUIDANCE FOR GHG ACCOUNTING AND TARGET-SETTING

1. Accounting and reporting:

- Required building-related categories.
- Detailed guidance on e.g. rebaselining, high turnover and growth.


2. Target-setting:

- Detailed guidance on setting science-based targets.
- Defining target boundary and available target-setting methods.



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THE CRREM-SBTi ALIGNED DECARBONIZATION PATHWAYS FOR REAL ESTATE

WHAT IS CRREM?

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— Foundation



The Carbon Risk Real Estate Monitor (CRREM) provides the real estate industry with **transparent, science-based decarbonization pathways** aligned with the Paris Climate Goals of **limiting global temperature rise to 2°C, with ambition towards 1.5°C**. CRREM considers both **operational carbon and energy intensities**.



THE CRREM STORY SO FAR

<https://www.crrem.eu>

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CRREM PATHWAYS V2 – NOW AVAILABLE!

Sources available

Public Consultation confirms the updated CRREM & The SBTi Aligned Decarbonisation Pathways for the In-Use Phase of Real Estate! Download the new Global pathways, Methodology documentation & CRREM Feedback Report:



2018

First Pathway
Release



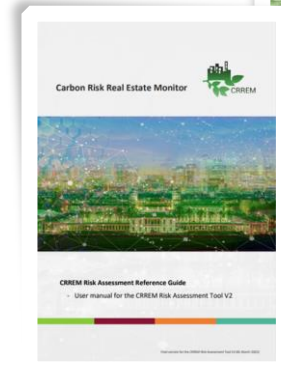
2022

Second
Pathway
Release



PROJECT LAUNCH

PUBLIC CONSULTATION



NECESSARY STEPS FOR THIS APPROACH ARE...

GLOBAL DECARBONISATION PATHWAY 2020 - 2050

A

1. Remaining anthropogenic global budget & ambition level (1.5°C)
2. Deriving the real estate share
3. Defining CO₂ only and GHG total for global buildings
4. Data input for the intensity pathways:
 - Floor area & growth rates
 - Whole building emissions
 - Weighted EF (grid decarbonization & DH etc.)
 - Property related other GHG (foremost F-gases)

COUNTRY- & PROPERTY-TYPE EUI PATHWAY

D

1. Derive Energy-intensity pathway via defined country- and property-type specific carbon-intensity pathway
2. Starting point for EUI intensity was defined in B & C
3. Derive weighted EF development until 2050
4. Convert carbon intensities in kwh intensities (account for renewables with zero emission)

COUNTRY SPECIFIC DECARBONISATION PATHWAYS

B

1. Methodology: using the SDA convergence approach
2. Define country floor area per segment (Resi / CRE)
3. Define country final energy consumption per segment
4. Derive CRE / Resi average starting figures in kwh
5. Define energy-mix & weighted EF in base year
6. Derive CO₂ intensity starting figures and apply SDA

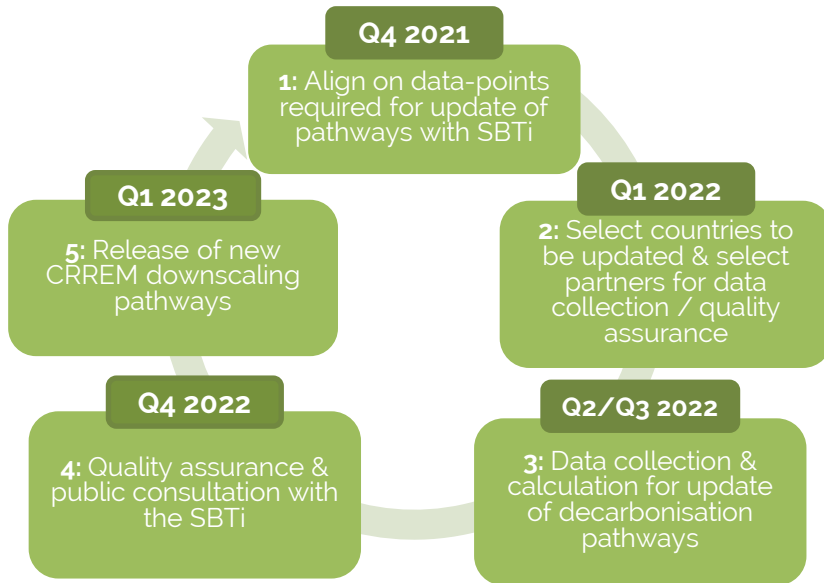
USE-TYPE SPECIFIC DECARBONISATION PATHWAYS

C

1. Define sub use-types (e.g. Retail, Office, Logistic etc.)
2. Define kWh/m² starting values
3. Define use-type specific energy-mix
4. Derive a specific weighted EF in base year
5. Derive sub-use decarbonization pathways via CRE pathway

PROCESS FOR RELEASE & UNDERLYING DATA

PROCESS FOR THE UPDATE OF THE CRREM DECARBONIZATION PATHWAYS WITH THE SBTi



CRREM PATHWAYS: Top-down downscaling

World Data:

- **NEW** Global budget:
 - IEA, IPCC

Individual Country Data (Commercial):

- **Energy Intensity** for the "whole-building" (kWh/m²/pa)
- Country average **emission factors** (EFs)
- **EF Development**
- **Energy-mix** & Development
- **Building Stock** (Commercial) &
- Building Stock **growth rate**

Real Estate Sub-sectors Data:

- Energy-intensity (kWh/m²/pa)
- EF & EF Development
- Energy-mix & Development
- Building Stock (Residential) &
- Building Stock growth rate

ENHANCING GRANULARITY

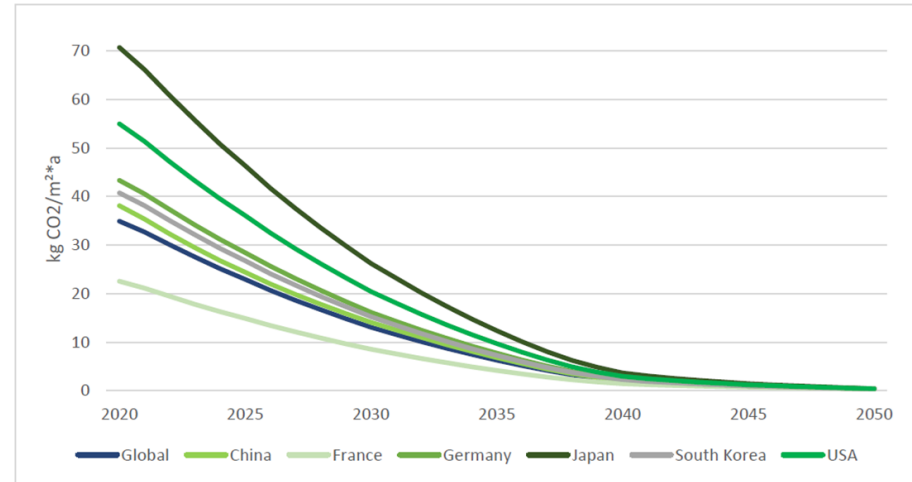
New update

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Some highlights:

- **More data partners:** for specific data. Partners include: CSR design, UKGBC, Australia GBC, etc.
- **Year:** New baseline year 2020 (2018 previously).
- **New property-type:** Industrial Dist. Warehouse Cooled & Industrial Dist. Warehouse Warm.
- **Further granularity on regions:** Further sub regions have been included for the USA as well as Australia (due to the country area/size).
- **New GHG-pathway:** New CO₂ & CO₂"e" pathways for correct benchmarking.



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SCIENCE
BASED
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

EMBODIED EMISSIONS PATHWAYS | RAMBOLL

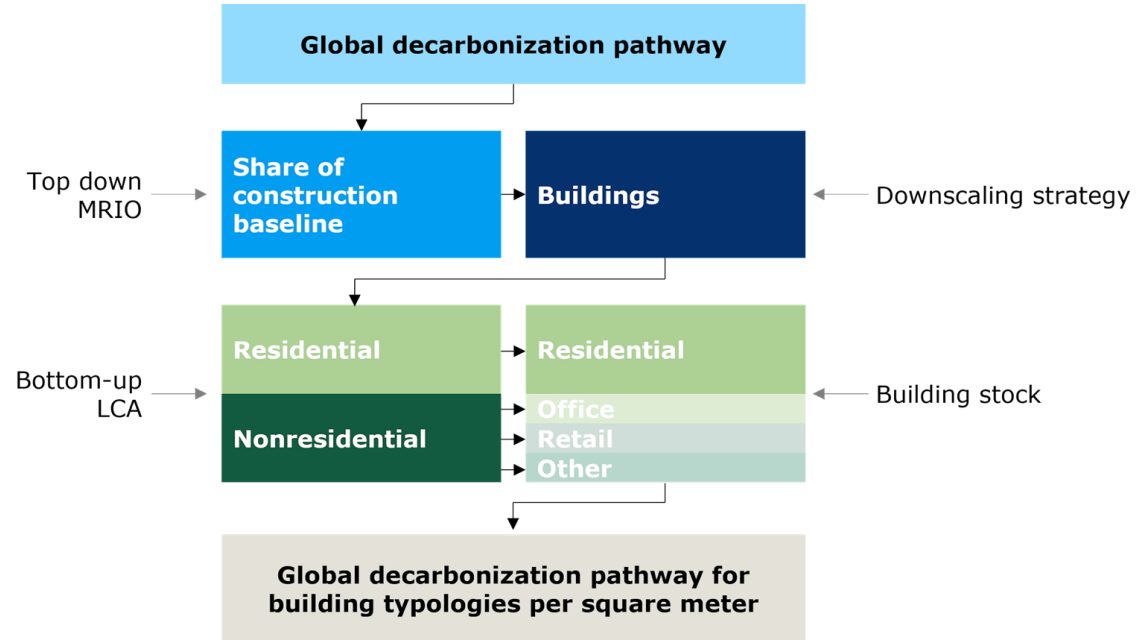
APPROACH

We define a reference pathway:

- Aligned with SBTi fundamentals.
- New construction.
- Upfront emissions.
- Absolute emissions pathway.
- Intensity target.
- Intensity metric CO₂e/m².

Alternative options are also provided:

- Absolute emissions target (in % reduction of carbon footprint).
- Combined pathway for new construction and renovation.



KEY ELEMENTS AND DATA SOURCES FOR A SCIENCE-BASED DECARBONIZATION PATHWAY FOR UPFRONT EMBODIED EMISSIONS (I)

Global carbon budget and decarbonization pathway

- IPCC AR6.
- Median of pathways for 1.5°C with no or little overshoot ("C1").

Data on construction emissions

- Exiobase version 3.8.2.
- Multi-Regional Input-Output Model that provides information on the environmental impacts of economic activities across regions and sectors.

Downscaling strategy

- Identify the appropriate share of buildings' embodied emissions out of the entire global carbon budget.

DOWNSCALING APPROACH	ALLOCATED SHARE FOR NEW BUILDING CONSTRUCTION
Grandfathering	10.2%
Economic value added	6.6%
Equal per capita and utilitarian	9.2%

Source: Own calculations based on Exiobase

KEY ELEMENTS AND DATA SOURCES FOR A SCIENCE-BASED DECARBONIZATION PATHWAY FOR UPFRONT EMBODIED EMISSIONS (II)

Bottom-up LCA data

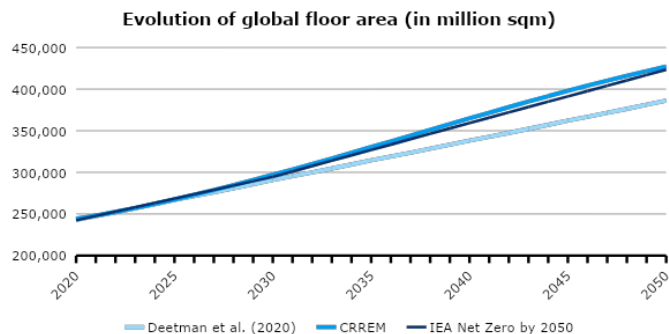
- Informs the status quo of upfront embodied carbon levels for the different building types .

AVERAGE CO ₂ eq EMISSION	KG CO ₂ eq / m ²
Residential	407.9
Offices (an assumed representative for other non-residential typologies)	572.4

Source: Röck, M. et al. (2020). Embodied GHG emissions of buildings – The hidden challenge for effective climate change mitigation. <https://doi.org/10.1016/j.apenergy.2019.114107>.

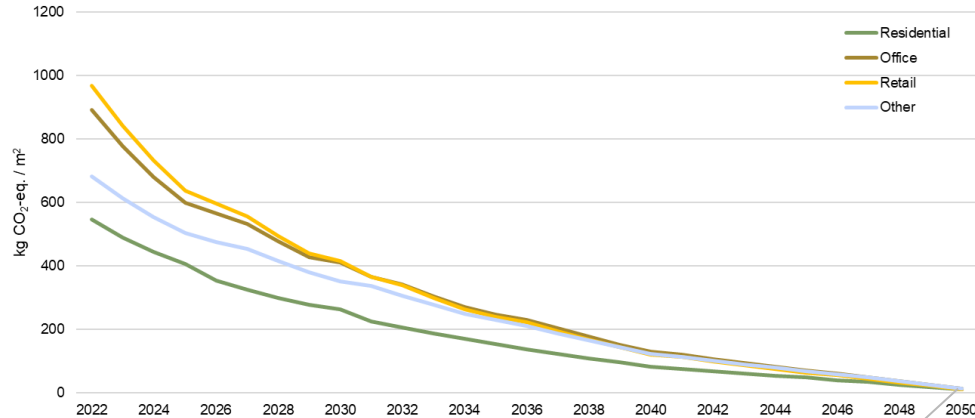
Building stock development

- Projected global floor area growth.
- Corrected for renovation to account only for net new building construction.
- Disaggregated for different building types (residential, offices, retail, other).



Sources: [IEA \(2021\)](#)
[Deetman et al \(2020\)](#). [Modelling global material stocks and flows for residential and service sector buildings towards 2050](#).

CARBON INTENSITY UPFRONT EMBODIED GHG EMISSIONS PATHWAY FOR NEW BUILDINGS



97% reduction relative to 2020 absolute GHG emissions by 2050

Emission intensity targets kg CO₂eq/m²

	2025	2030	2035	2040	2045	2050
Residential	406.8	257.4	154.1	84.2	49.0	11.3
Office	598.6	385.8	247.1	129.9	70.3	14.3
Retail	638.1	390.9	239.2	121.7	64.2	12.9
Other	504.0	350.6	230.3	124.0	69.4	14.9

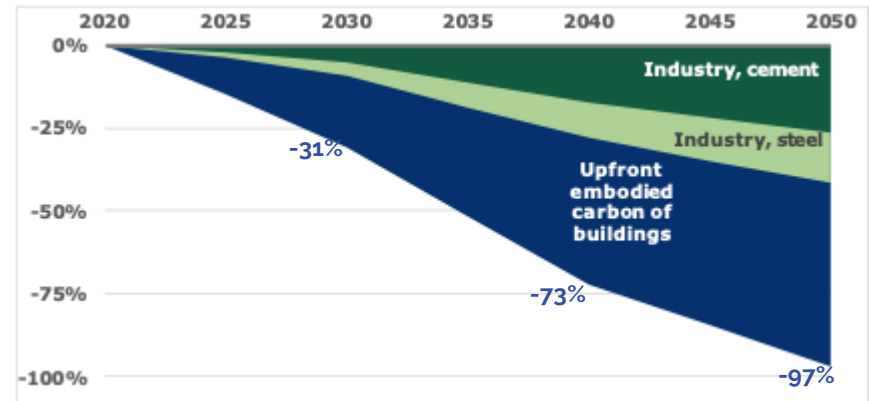
TO BE ALIGNED WITH A 1.5°C TARGET, EMISSIONS REDUCTIONS ARE NEEDED THAT GO MUCH BEYOND THE DECARBONIZATION OF THE PRODUCTION OF STEEL AND CEMENT

- Reducing upfront embodied emissions is influenced by material sectors, which reduce more slowly up to 2030.

SECTOR	SHARE OF TOTAL UPFRONT GHG EMISSIONS FROM CONSTRUCTION 2019	REDUCTION % RELATIVE TO 2020 LEVELS (SBTI ABSOLUTE REDUCTION, SCOPE 1)	
		2030	2050
Cement	28%	-19%	-94%
Steel	17%	-24%	-91%

- Much **further reduction measures are needed**, including improving design for less material use and shifting to low-carbon material alternatives from reuse, recycling or sustainable bio-based sources.

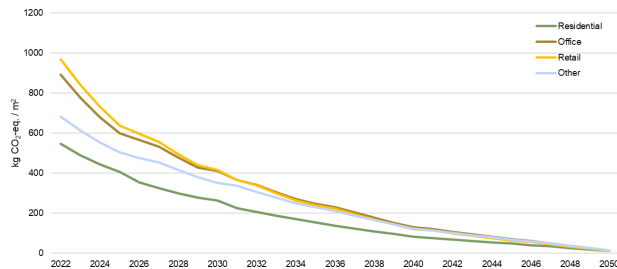
Reduction pathway for absolute upfront embodied emissions with contribution from cement and steel industries



THE PATHWAYS FOR ALL BUILDING CONSTRUCTION ACTIVITIES INCLUDING RENOVATION IS STEEPER THAN FOR NEW CONSTRUCTION ONLY

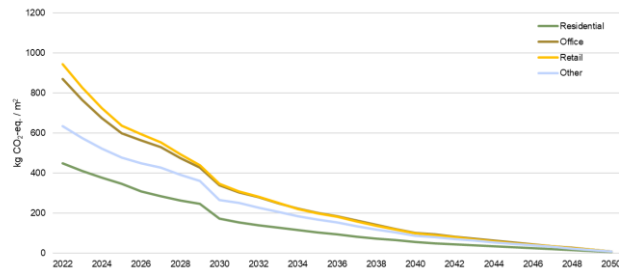
The **pathways for all building construction activities project a steeper reduction in kg CO₂-eq/m²**, due to the additional number of m² being included for renovation, with upfront GHG emissions per m² about 50% lower for renovation than for new construction. However the pathway for all building construction activities allow the market to focus on renovation and increase the number of m² that can be provided for the same carbon budget.

New buildings only



	2025	2030	2035	2040	2045	2050
Residential	406.8	257.4	154.1	84.2	49.0	11.3
Office	598.6	385.8	247.1	129.9	70.3	14.3
Retail	638.1	390.9	239.2	121.7	64.2	12.9
Other	504.0	350.6	230.3	124.0	69.4	14.9

All building construction activities

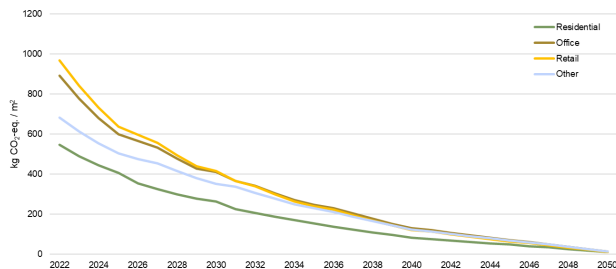


	2025	2030	2035	2040	2045	2050
Residential	348.0	171.6	105.5	56.5	31.2	6.5
Office	598.2	325.0	201.7	103.0	53.5	10.3
Retail	637.6	333.0	199.4	99.2	50.5	9.6
Other	478.8	265.4	169.3	88.7	47.4	9.4

THE PATHWAYS DO NOT SIGNIFICANTLY CHANGE WHEN A DIFFERENT DOWNSCALING APPROACH IS APPLIED

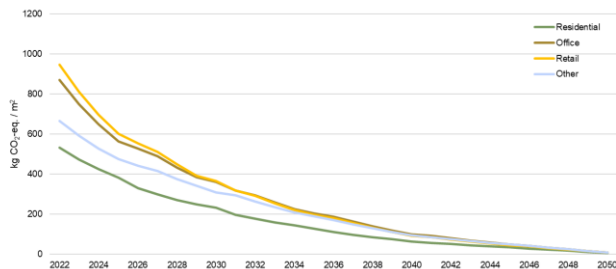
Independently of the downscaling approach applied, **the upfront embodied emissions pathways project a steep reduction in kg CO₂-eq/m²**, due to the projected expansion in m² being built in the future, especially in developing economies.

Grandfathering
(allocated share of emission budget = 10.2%)



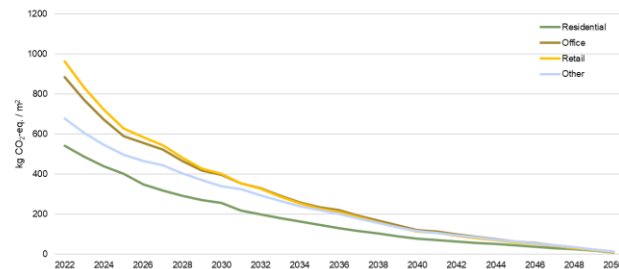
	2025	2030	2035	2040	2045	2050
Residential	406.8	257.4	154.1	84.2	49.0	11.3
Office	598.6	385.8	247.1	129.9	70.3	14.3
Retail	638.1	390.9	239.2	121.7	64.2	12.9
Other	504.0	350.6	230.3	124.0	69.4	14.9

Economic value added
(allocated share of emission budget = 6.6%)



	2025	2030	2035	2040	2045	2050
Residential	383.1	227.4	127.2	64.6	34.7	7.3
Office	563.7	340.8	203.9	99.6	49.8	9.3
Retail	600.9	345.4	197.4	93.3	45.5	8.4
Other	474.6	309.7	190.0	95.1	49.2	9.7

Equal-per-capita and utilitarian
(allocated share of emission budget = 9.2%)



	2025	2030	2035	2040	2045	2050
Residential	400.7	249.6	147.2	79.1	45.3	10.3
Office	589.6	374.2	236.0	122.1	65.0	13.0
Retail	628.5	379.1	228.4	114.3	59.4	11.8
Other	496.4	340.0	219.9	116.5	64.2	13.5

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MATERIALS PROVIDED FOR THE CONSULTATION

- **Buildings sector guidance** for companies and financial institutions operating in the real estate industry.
- **Buildings target-setting tool** for setting targets using the in-use and embodied emissions pathways.
- **Pathway development description** to provide context for the embodied emissions pathways.



WHOLE BUILDING APPROACH

Companies are required to report all building-related in-use operational emissions together despite the scope. This is called the '**whole building approach**'.



Traditional corporate GHG accounting:

Emissions of owner-controlled (scope 1 and 2) and tenant-controlled spaces are separated (scope 3).

Whole building approach: in-use operational emissions are expressed in kg CO₂e/m² for the whole building.

NOTE: Whole building approach is not to be confused with "whole life carbon", where all life cycle stages are considered together at the level of individual buildings.

MANDATORY SCOPE 3 CATEGORIES

Some user-specific categories are proposed to be mandatory in targets, for example:

- **Architecture/engineering companies:** required to include scope 3 category 11 (Use of sold products) covering lifetime emissions of the building.
- **Developers:** required to include category 2 (Capital goods) embodied emissions.





SPECIAL CONSIDERATIONS

To address the characteristics of the industry and companies in the buildings value chain, **special considerations and criteria** have been introduced, covering for example:

- a. Portfolios with high turnover.
- b. Increasing transparency in divestments.
- c. Grace periods for new acquisitions.
- d. Complementary commitments.

PORTFOLIOS WITH HIGH TURNOVER

Proposal:

Companies and financial institutions whose business model is reliant on a high turnover of assets are allowed to set **fixed intensity targets** aligned to sectoral decarbonization pathways.



INCREASING TRANSPARENCY IN DIVESTMENTS

Proposal:

To improve transparency behind emission reductions, and to ensure an understanding of the real world impact of investor's actions, users should provide disclosure regarding:

- Emissions reductions from decarbonization of assets (i.e. by using the like-for-like approach).
- Emissions reductions achieved through divestment of assets.



COMPLEMENTARY COMMITMENTS

Additional measure to safeguard against unintended consequences and to avoid harmful long-term investments.

Proposals:

- A) Energy efficiency improvements in line with CRREM's energy pathways.
- B) Commitment to no new fossil fuel installations in buildings portfolios from 2025.



EXAMPLE TARGET AND TARGET WORDING, IN-USE EMISSIONS

COMPANY/FI	DESCRIPTION	BASE YEAR 2021 OPERATIONAL IN-USE EMISSIONS (TCO _{2e})	REQUIRED INTENSITY REDUCTION BY 2030
A	REIT with 6 shopping malls operating in the USA across 3 states (2 in each state: New York, Houston, Chicago).	17,500	58.0%

Target wording:

“REIT A commits to reduce scope 1, 2, and 3 GHG emissions from in-use operational emissions of owned and leased space by 58.0% per m² by 2030 from a 2021 base year.”

EXAMPLE TARGET AND TARGET WORDING, UPFRONT EMBODIED EMISSIONS

COMPAN Y/ FI	DESCRIPTION	BASE YEAR 2021 OPERATIONAL IN-USE EMISSIONS (TCO _{2e})	OPTION 1: ABSOLUTE CONTRACTION TARGET BY 2030	OPTION 2: SECTOR- SPECIFIC INTENSITY REDUCTION BY 2030
B	A developer that develop sports and leisure facilities.	6,000	31%	53.8%

Target wording:

“Company B commits to reduce scope 3 GHG emissions from upfront embodied emissions in new buildings developed by 53.8% per m² by 2030 from a 2021 base year.”

“Company B commits to reduce absolute scope 3 GHG emissions from upfront embodied emissions in new buildings developed by 31% by 2030 from a 2021 base year.”

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Q&A SESSION

RESPOND TO THE SURVEY!

- We invite you to **provide feedback** on the SBTi Buildings Guidance until 16 July 2023.
- The guidance and materials can be found on the **SBTi buildings webpage**:
<https://sciencebasedtargets.org/sectors/buildings>.
- Slides and a **recording of this webinar** will be available on the **SBTi buildings webpage**.

Feedback will be considered by the SBTi project team and EAG, however, the SBTi does not guarantee all perspectives will be reflected in the final materials



THANK YOU!



SCIENCE
BASED
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

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