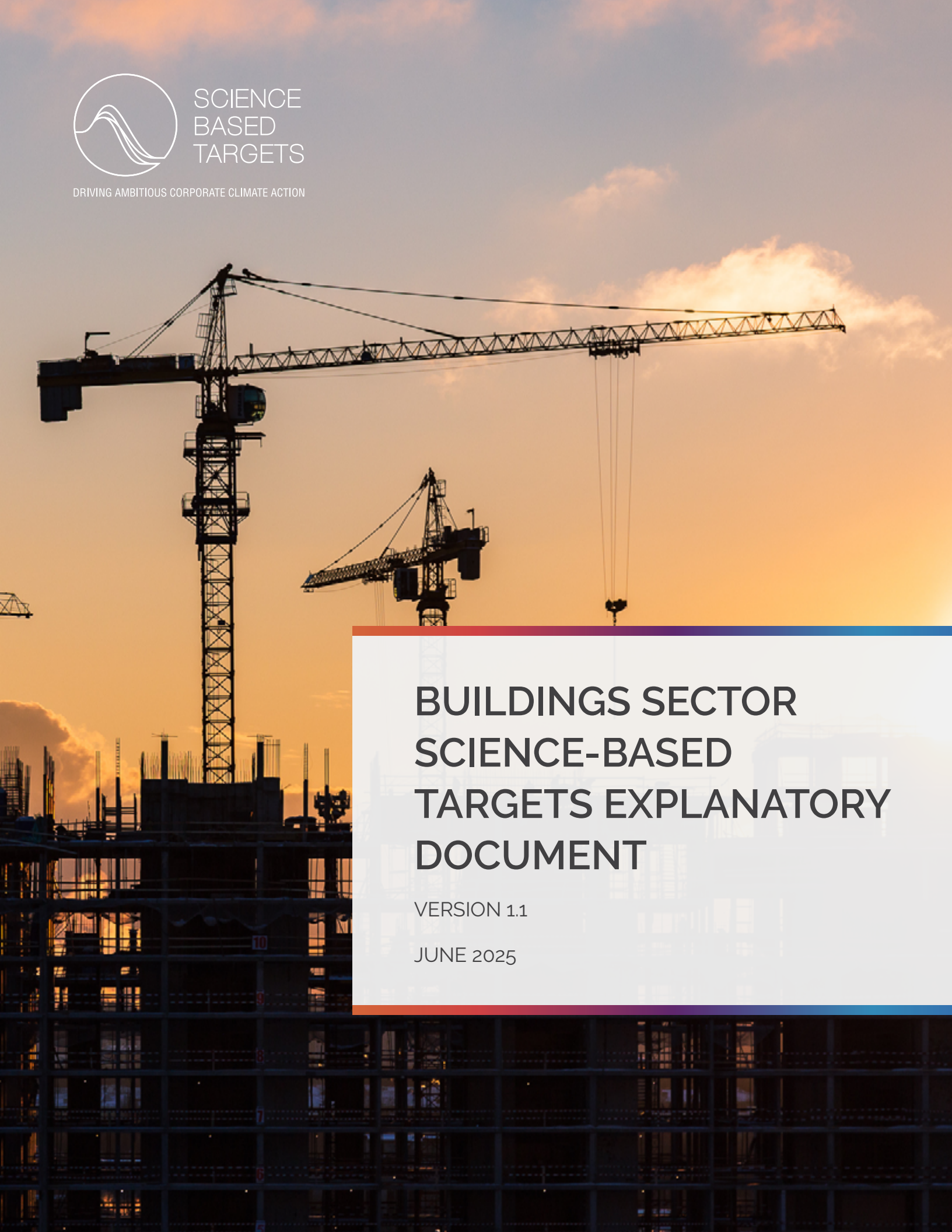
SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



BUILDINGS SECTOR SCIENCE-BASED TARGETS EXPLANATORY DOCUMENT

VERSION 1.1

JUNE 2025

ABOUT SBTi

The Science Based Targets initiative (SBTi) is a corporate climate action organization that enables companies and financial institutions worldwide to play their part in combating the climate crisis.

We develop standards, tools and guidance which allow companies to set greenhouse gas (GHG) emissions reductions targets in line with what is needed to keep global heating below catastrophic levels and reach net-zero by 2050 at latest.

The SBTi is incorporated as a charity, with a subsidiary which will host our target validation services. Our partners are CDP, the United Nations Global Compact, the We Mean Business Coalition, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF).

DISCLAIMER

VERSION HISTORY

VERSION	CHANGE/UPDATE DESCRIPTION	DATE PUBLISHED	EFFECTIVE DATE
1.0	Release of the final Buildings Sector Science-Based Target-Setting Criteria	August 28, 2024	August 28, 2024 - June 4, 2025
1.1	Minor revisions to correct typographical errors, resolve inconsistencies, and enhance clarity.	June 4, 2025	June 4, 2025

CONTENTS

INTRODUCTION

INTRODUCTION

Science-based targets (SBTs) specify how much and how quickly a company would need to reduce its GHG emissions in order to align with the goals of the Paris Agreement. Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to limiting global warming to 1.5˚C above pre-industrial levels.

The buildings sector has a very large emissions footprint. It is responsible directly and indirectly for 34% of global final energy consumption and 26% of global energy-related emissions (IEA, 2023). In 2022, around 8% of global energy- and process-related emissions were related to the use of fossil fuels in buildings, around 18% to the generation of electricity and heat used in buildings, and a further 4% were related to the embodied emissions of buildings — the manufacture of cement, steel, and aluminum used for construction (IEA, 2023). Beyond carbon dioxide (CO_2), fugitive emissions from fluorinated GHGs are also a substantial, and growing, source of emissions for the buildings sector, mainly arising from refrigeration and air-conditioning equipment. According to a 2020 estimate, hydrofluorocarbons (HFCs), which represent around 80% of fugitive emissions, accounted for 8% of buildings sector GHG emissions (Hu et al., 2020).

Buildings account for

34%

of the global final energy consumption.

(IEA, 2023)

Additionally, it is expected that global floor area will increase substantially in the future, by around 15% to 2030, with more than 80% of this area growth predicted to be in developing and emerging economies (IEA, 2023). This area is equivalent to more than the whole built floor area of North America (IEA, 2023). Newly constructed buildings are more energy-efficient, but since 80% of buildings that will exist in 2050 have already been built, decarbonizing our existing stock must be a priority (WEF, 2022). Furthermore, there is an increasing need, particularly in developed economies, to extend the useful life of buildings through retrofitting instead of constructing new buildings which requires more energy and resources to build. With fossil fuel demand in the sector growing at an average rate of 0.5% since 2010, and 35% of total buildings' energy consumption still supplied by fossil fuels in 2022, it is clear that the sector's energy intensity needs to follow a steep decline to align with the Net Zero Emissions by 2050 Scenario (IEA, 2023). Thus, this decade is crucial to designing and enforcing the measures necessary to decarbonize the sector.

1.1 PURPOSE OF THIS DOCUMENT

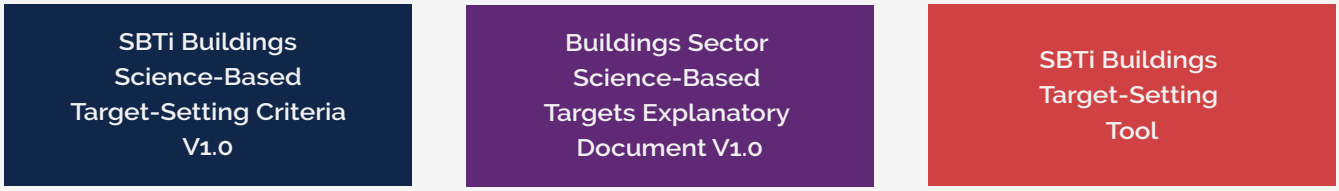
This explanatory document is part of the science-based target-setting framework that provides corporates and financial institutions that own, develop and finance buildings with the resources they need to set 1.5°C-aligned near- and long-term decarbonization targets. This document provides:

- An overview of the development of the SBTi Buildings Criteria, its accompanying documents and its use in Section 1.
- The context behind near-term, long-term and net-zero science-based targets in Section 2.
- The scientific basis for buildings sector 1.5°C decarbonization pathways, the sector-specific intensity convergence approach (also known as SDA), as well as key elements of the pathways, namely the intended users and building typologies within scope of the criteria in Section 4.
- Clarifications on GHG accounting practices for the buildings sector in Section 5.
- Guidance on target boundaries, calculating emission inventories, constructing targets, and submitting them for validation. This section also addresses challenges specific to the buildings sector, such as acquisitions and divestments, as well as user-specific requirements for near-term scope 3 target setting in Section 6.
- Additional guidance for Financial Institutions (FIs) in setting targets, as their interactions with the buildings sector differ compared to other guidance users in Section 7.
- The Appendices include further information on the target-setting methods, the pathways, the SBTi Buildings Target-Setting Tool, and worked examples.

These sector-specific criteria supersede the SBTi Corporate Net-Zero Standard, for the activities defined in the scope and applicability section of this document. Sources not included in the scope and applicability of this document remain subject to the SBTi Corporate Net-Zero Standard, which serve as the basis for this document. Users shall also follow the Greenhouse Gas Protocol (GHGP) Corporate Standard, Scope 2 Guidance and Corporate Value Chain (Scope 3) Accounting and Reporting Standard for their emissions accounting and reporting.

The SBTi Buildings Criteria Version 1.0 should be read in conjunction with the SBTi Buildings Science-Based Targets Explanatory Document Version 1.0, which includes informative guidance; the SBTi Buildings Target-Setting Tool, which helps to formulate intensity-based targets using the sector-specific methods; the Procedure for Validation of SBTi Targets, which describes the underlying process followed to assess targets; the Buildings Criteria Assessment Indicators, which detail the indicators used to determine conformance and non-conformance with criteria; and the SBTi Glossary, which lists the terms, definitions and acronyms used in this document.

Figure 1. The SBTi buildings sector science-based target-setting resources



1.2 OVERVIEW OF THE DEVELOPMENT PROCESS

The SBTi Buildings Project started in October 2021. The research and drafting phases of the project were completed between December 2021 and May 2023. The draft deliverables were approved by an internal review team on 30 April 30, 2023. A public consultation was then held between May 16, 2023 and July 16, 2023. Following the public consultation, further research and drafting were conducted alongside meetings with the Expert Advisory Group (EAG). The EAG, composed of 33 organizations from industry, civil society, and academia, provided detailed input during the development of the Buildings Project. EAG members were selected based on their geographic location, expertise, relationship to the sector, and ambition to align their targets with the latest climate science.

Table 1. Expert Advisory Group member organizations

- AECOM
- Aldar Properties
- 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
- Global Real Estate Sustainability Benchmark (GRESB)
- Green Building Design Group
- Green Finance Institute
- International Finance Corporation (IFC)
- JLL
- Mitsubishi Estate Co.
- Multiplex
- Partnership for Carbon Accounting Financials (PCAF)
- Ramboll
- 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 (WorldGBC)
- World Wide Fund for Nature (WWF)

The SBTi is grateful for the engagement and input from EAG members. Their role was advisory, and final sign-off for deliverables was by the SBTi. Therefore, criteria and recommendations expressed within this document may not represent the views of every EAG organization.

Once the revision phase was completed, the draft resources for pilot testing were approved by an internal review team on October 25, 2023. In line with the Standard Operating Procedure (SOP) for Development of SBTi Standards, adopted by the Board of Trustees in December 2023, the Buildings Project held a pilot testing phase from November 21, 2023 to March 26, 2024. Fifteen companies and FIs across the world participated in the pilot phase to inform the development of clear and robust resources, and identify any challenges in the implementation of the criteria across geographies and user types, addressed before publishing the final resources.

The SBTi is grateful for CapMan Real Estate, Cofinimmo, Goodman Group, Link REIT, Mitsubishi Estate Co., Swire Properties, Urban Partners, CapitaLand Investment, and six participants that wished to remain anonymous, for their active engagement and time provided in the pilot phase.

The SBTi developed the sectoral pathways, accompanying tool, criteria and this explanatory document in technical partnership with four organizations: Carbon Risk Real Estate Monitor (CRREM), Ramboll, PricewaterhouseCoopers (PwC) and dss+. The SBTi worked in collaboration with CRREM and Ramboll to develop 1.5°C-aligned building sector pathways for in-use operational and upfront embodied emissions, respectively. Dss+ contributed to the development of the SBTi Buildings Target-Setting Tool. Meanwhile, PwC contributed to the development of the SBTi Buildings Criteria and this explanatory document, providing guidance on emissions accounting, target setting and reporting.

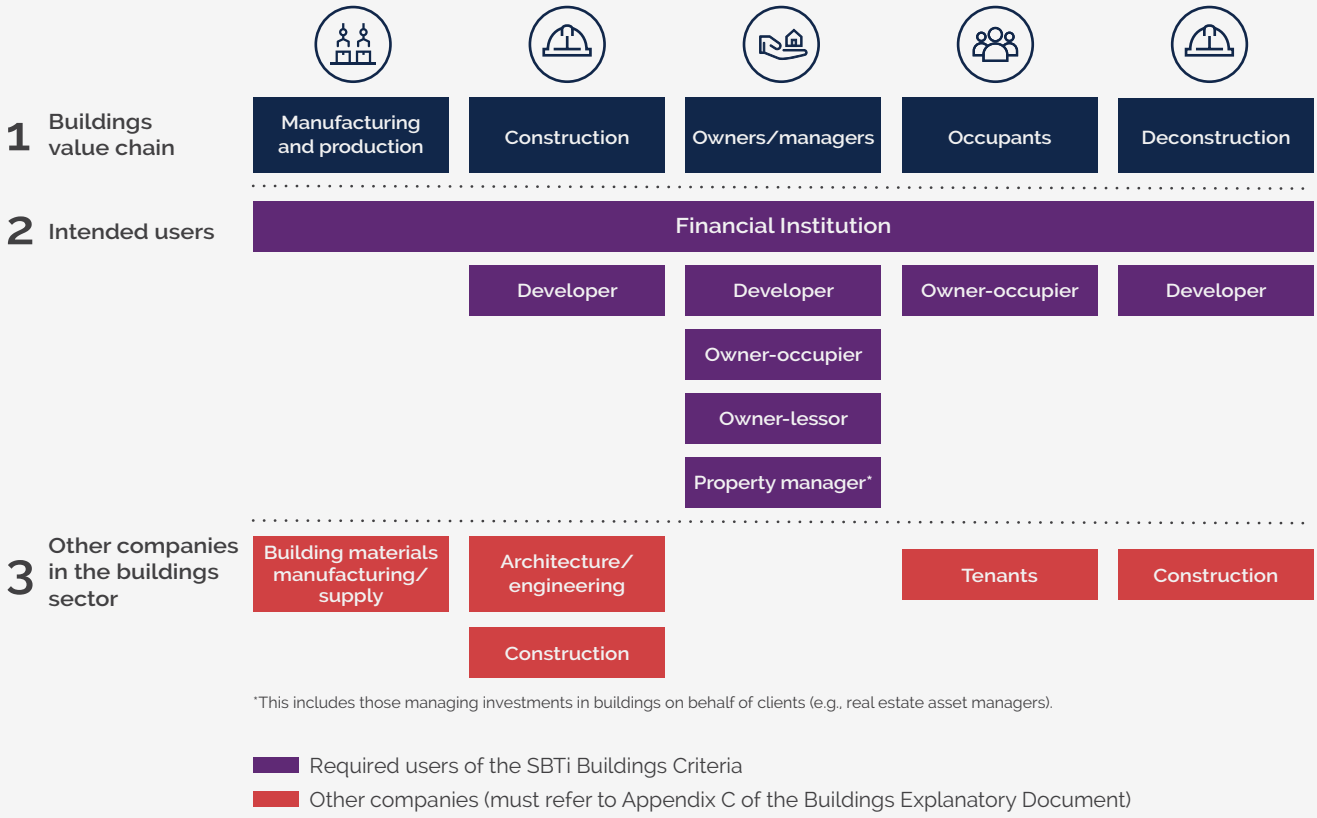
On July 26, 2024, a non-objection agreement to publish the final deliverables was given by the SBTi's independent Technical Council.

The SBTi's Buildings Project was primarily funded by Laudes Foundation.

1.3 INTENDED USERS OF THE SBTi BUILDINGS CRITERIA

The buildings value chain contains a broad array of actors involved in the design, financing, development, construction, management, and occupation of buildings (see Figure 2). The SBTi appreciates buildings can be viewed differently to their day-to-day functions, for example as financial assets or even products themselves. The SBTi Buildings Criteria has been designed with this in mind in order to be applicable to both corporates and FIs.

Figure 2. Intended users within the buildings value chain



However, not all target-setting methods described in this criteria can be implemented by each and every intended user. This is due to the need to tailor target-setting methods to the varying levels of influence and responsibility in the complex buildings value chain. As such, the main text is focused on users classified as for whom the new target-setting methods are readily implementable, with additional guidance and recommendations provided for supplementary users who should continue to use the SBTi's cross-sector guidance and target-setting methods in Appendix C.

Section 4.4.1 provides additional information to aid in understanding the applicability of this criteria and guidance to your organization.

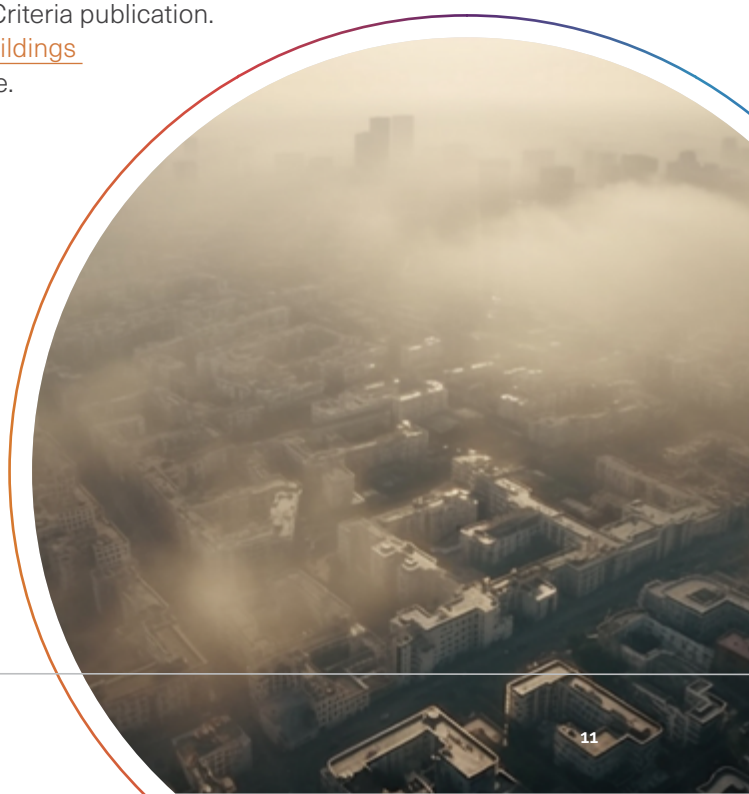
1.4 HOW DOES THE SBTi BUILDINGS CRITERIA CHANGE TARGET-SETTING REQUIREMENTS COMPARED TO PREVIOUS PRACTICE?

The SBTi previously offered 2°C, well below 2°C and 1.5°C pathways for residential and commercial buildings' operational emissions, and many companies have already set targets using these. To further advance science-based decarbonization in this sector, the SBTi Buildings Sector Criteria has been developed to codify and clarify criteria already being applied by companies and the SBTi Target Validation Team when assessing and validating SBTs in this sector.

The SBTi Buildings Criteria has been designed to align with the SBTi Corporate Near-Term Criteria and SBTi Corporate Net-Zero Standard, and the 1.5°C minimum ambition.[1] To offer the buildings sector more granular pathways reflecting variations in building typology and geography, the SBTi, in collaboration with CRREM, has developed a set of 1.5°C-aligned in-use operational emissions pathways for the sector. Furthermore, to improve accountability for emissions reduction, the in-use operational pathways and criteria abide by the 'whole building approach'.[2] This means that a building's complete operational energy consumption, including both landlord and tenant-controlled spaces, are included and combined within a user's target boundary.[3]

The criteria also aims to raise ambition around embodied emissions, which have historically lacked global sectoral decarbonization pathways. Through a collaboration with Ramboll, the SBTi has developed the first 1.5°C-aligned upfront embodied emissions pathways for the global buildings sector to set science-based targets covering the emissions associated with materials production and construction processes of new buildings. However, it is important to note that the robustness and granularity of these recently developed embodied emissions pathways is currently limited by data availability. The SBTi plans to build on this initial work to identify methods to include additional sub-geographies and building typologies to the pathways in the future.

Companies that meet the threshold for in-use operational emissions set out in the SBTi Buildings Criteria, **Buildings-C1**, and/or the threshold for upfront embodied emissions of new constructed buildings set out in **Buildings-C2**, and meet any of the user classifications in **Buildings-C3**, shall follow requirements for target setting and minimum ambition levels as indicated in this sector-specific criteria for target submissions or re-submissions, starting six months after the SBTi Buildings Criteria publication. Targets shall be modeled using the latest version of the SBTi Buildings Target-Setting Tool and latest methods approved by the initiative.



1 The latest versions of these documents at the publication of the SBTi Buildings Criteria.

2 The 'whole building approach' means that a building's complete in-use operational energy consumption from landlord and tenant-controlled spaces are included within a user's target boundary and reported on a regular basis. This must not be confused with Whole (Building) Life Carbon, which means addressing emissions through a building's life cycle.

3 This entire target boundary does not correspond to all scope 1 and 2 emission reporting, rather it spans all relevant emissions categories that are relevant for the in-use operational target boundary.

1.5 LEVERS TO DECARBONIZE BUILDINGS PORTFOLIOS

To reach the level of deep decarbonization required by the 1.5°C goal, emissions scenarios for the buildings sector point to a wide range of opportunities to decarbonize (IEA, 2021). Levers already being implemented across the buildings value chain include low-carbon design, the use of low-carbon building materials, electrification, switching to renewable sources of electricity, electric heating and the installation of technologies that reduce energy demand. Electric heat pumps, for example, are almost four times more efficient than conventional boilers (IEA, 2021).

Decarbonization should holistically reduce the energy intensity of the buildings sector, by acting to improve energy efficiency throughout each stage in the life cycle of buildings. In the International Energy Agency's (IEA) Net Zero Emissions by 2050 Scenario, the pace of retrofits of existing buildings needs to more than double over the decade, with one in five buildings worldwide retrofitted to be zero-carbon-ready[4] by 2030 (IEA, 2021). Zero-carbon-ready buildings either use renewable energy directly or rely on a source of energy supply that can be fully decarbonized, such as electricity or district energy (IEA, 2023). Highly energy efficient buildings are ready to be scaled up today, reducing CO_2 emissions and cutting energy bills.

Reducing emissions from construction materials starts with building less with less material (UNEP, Yale CEA & GlobalABC, 2023). The adoption of circularity principles in the way buildings are designed is a key decarbonization lever and could reduce global carbon emissions from building materials by 38% by 2050, due to reduced demand for steel, aluminum, cement and plastic (Ellen Macarthur Foundation, 2020). Research has shown that up to 25% of materials in residential buildings scheduled for decommissioning or deconstruction can be reused, while up to 70% can be recycled in some form (RICS, 2020). Redevelopment and renovation of the existing building stock to answer the change in demand also serves as a sufficiency measure in the industry by reducing the need for newly constructed buildings.

1/5

buildings worldwide must be retrofitted to be zero-carbon-ready by 2030

(IEA, 2021)

Circularity in buildings design could reduce by

38%

global emissions from materials by 2050

(Ellen Macarthur Foundation, 2020)

There are building-level frameworks that help ensure that emissions at an asset level are being appropriately managed and reported. Global certification standards like LEED, BREEAM and EDGE, or regional ones like Australia's Green Star, Germany's DGNB or Singapore's GreenMark, help verify that buildings are designed, built, and operated to a high standard. Reporting and benchmarking frameworks like GRESB can help those achievements be translated into emissions level reporting that can be used to show compliance with SBTi's pathways and to compare performance against peers. Reporting standards like Royal Institution of Chartered Surveyors (RICS) 'Whole-life Carbon Assessment' help track emissions across an asset's life, while programs like WorldGBC's Global Commitment for Net Zero Buildings help ensure that entities are committed and in alignment with net-zero carbon goals.

4 Highest energy efficiency class based on local rating schemes and either uses renewable energy directly or uses an energy supply that will be fully decarbonized by 2050, such as electricity or district heat (IEA, 2023).

NEAR-TERM, LONG-TERM AND NET-ZERO SCIENCE-BASED TARGETS

NEAR-TERM, LONG-TERM AND NET-ZERO SCIENCE-BASED TARGETS

The SBTi Corporate Net-Zero Standard was published in October 2021. It was developed for corporate net-zero target setting in line with climate science. It includes guidance, criteria and recommendations companies need to set science-based net-zero targets consistent with limiting global temperature rise to 1.5°C. The Corporate Net-Zero Standard sets out three key elements which make up a net-zero target:

1. Near-term SBTs.
2. Long-term SBTs.
3. Neutralization of any residual emissions.

SBTs specify how much and how quickly a company would need to reduce its GHG emissions at a minimum to align with limiting global warming to 1.5°C, as per the Paris Agreement. The SBTi makes a distinction between near- and long-term SBTs:

5-10 years

A near-term SBT has a timeframe of 5-10 years from the date the target is set.

by 2050

A long-term SBT shows the degree of emissions reductions needed for companies to reach net-zero by 2050 at the latest.

Companies wishing to set a net-zero target shall set both near- and long-term targets. Alternatively, companies may choose to set just a near-term target, but they cannot set only a long-term target.

The SBTi Financial Institutions' Near Term Criteria and SBTi Financial Institutions Science-Based Targets Explanatory Document both include requirements, recommendations and guidance for FIs to set near-term science-based targets on their investment and lending activities, for certain sectors where methods are available. At the time of the release of the SBTi Buildings Criteria, the SBTi was in the process of developing the world's first Standard for science-based net-zero targets in the financial sector. FIs will be able to set net-zero targets once the Financial Institutions' Net-Zero Standard is finalized and released.

For the full criteria and explanations, please refer to the SBTi Corporate Net-Zero Standard and the Financial Institutions' Near Term Criteria.

SBTi BUILDINGS CRITERIA

SBTi BUILDINGS CRITERIA

Please refer to the SBTi Buildings Criteria.

BUILDINGS DECARBONIZATION PATHWAYS

BUILDINGS DECARBONIZATION PATHWAYS

The SBTi follows a three-step approach to create tools that intended users of the SBTi Buildings Criteria can use to calculate SBTs:

- First, the global carbon budget is allocated across sectors.
- Then, emissions pathways describing a plausible decarbonization trajectory that fits within the sector budget are either chosen or developed based on a comparison with the IEA Net Zero by 2050 Scenario and discussion with the EAG.
- Finally, target-setting methods, such as the sector-specific intensity convergence approach (also named the Sectoral Decarbonization Approach or SDA), are applied to translate the sector pathways into targets.

This section explains the scientific basis for buildings sector 1.5°C decarbonization pathways, the SDA, as well as key elements of the pathways, namely the intended users and building typologies within the scope of these criteria.

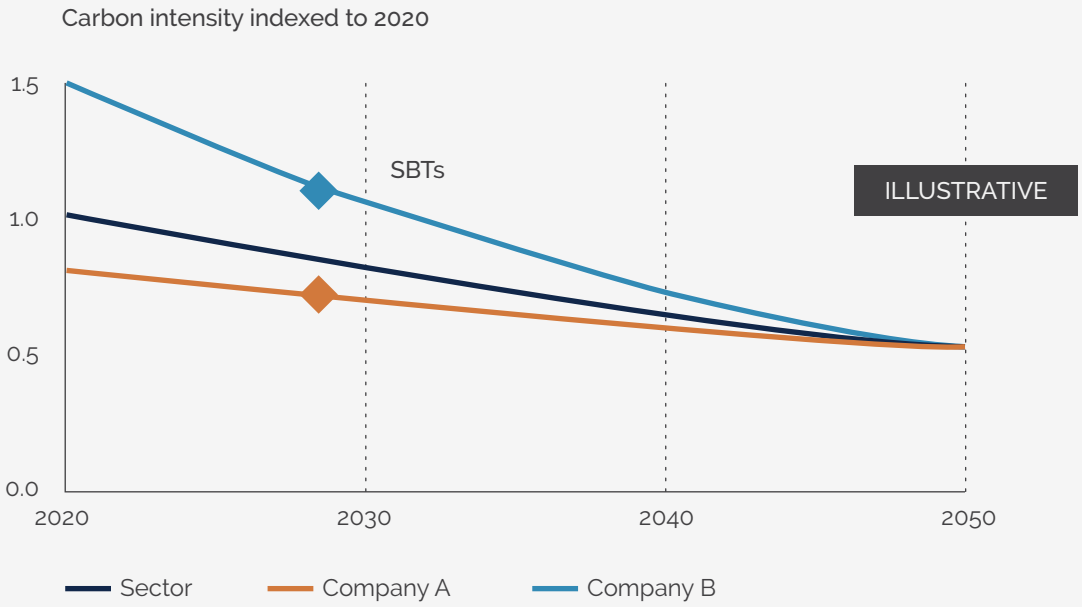
4.1 TARGET-SETTING METHOD: SECTOR-SPECIFIC INTENSITY CONVERGENCE APPROACH (SDA)

The SDA is a target-setting methodology allowing companies to model physical intensity GHG emission reduction targets that align with a sector-specific pathway. The method allocates the global carbon budget to different sectors, and companies within each sector are able to derive their science-based emission reduction targets based on their relative contribution to the total sector activity and their carbon intensity relative to the sector's intensity in the base year.

Targets are set by assuming that all companies converge to the same intensity level as the sector average in the long term, usually 2050. SBTs are set in the near-term (5 to 10 years) along this convergence path, the steepness of which is defined by the relative intensity of the company compared to the sector in the base year, and the rate of forecasted company activity growth by the target year (Figure 3). The further a company is above the curve in the base year, the steeper the percentage intensity reduction required. For further information on how the SDA method works, please refer to SBTi's Quick Guide to the SDA.

The SDA is used for sectors that have a dedicated decarbonization pathway. The cross-sector absolute reduction method,[5] or absolute reduction more generally, which requires absolute emissions reductions at or above a fixed annual rate (currently defined as 4.2% linear annual reduction), can be used by most sectors, especially those that do not have a sector-specific pathway. However, for the buildings sector, the sector-specific pathways are more ambitious than the cross-sector pathway due to significant projected growth in global floor area and various technologically and commercially mature options to decarbonize heating and cooling that are already available, including energy efficient building envelopes, heat pumps, and on-site renewables. Therefore, companies operating in the buildings sector shall adhere to sector-specific requirements for target setting and minimum ambition levels as indicated in the criteria.

Figure 3. Illustration of an intensity convergence pathway - companies should converge to the sector average intensity (dark blue line) by 2050, setting near-term targets along the way



5 Formerly known as the cross-sector absolute contraction approach.
6 Climate Action Tracker (2022).

4.1.1 Sufficiency considerations in sector-specific target-setting methods

Company specific intensity pathways and thus reduction targets formulated with the SDA take into account a business or FI's current activity, as well as its projected market share in future, the so-called 'm parameter'. Application of the 'm parameter' means that companies that expect faster growth than the industry in general will have steeper intensity targets. To demonstrate that intensity targets also lead to absolute emissions reductions, and to demonstrate progress through sufficiency measures, companies whose targets are expressed in intensity terms are recommended to also publish the absolute emissions reductions that will be achieved by their targets (**Buildings-R9**).

The absolute contraction method, in turn, may incentivize companies to build less as it requires companies to reduce emissions from their building activities in absolute terms.

4.2 THE LIFE CYCLE OF BUILDINGS

The SBTi acknowledges the importance of taking into consideration emissions from all phases of a buildings' life cycle (see Figure 4 and Table 2). The buildings sector globally is increasingly moving towards performing whole life carbon assessments for all stages of the project life cycle and using these assessments as aids to inform planning, design, construction and procurement of low-emissions buildings (i.e., RICS, 2023).

To support the sector to take a holistic view on emissions from buildings, this document provides target-setting guidance and methods to enable users to set targets on their embodied emissions at a portfolio level.

Figure 4. Diagram illustrating a building's life cycle and stages adapted from EN 15978:2011 (European Standard, 2012)

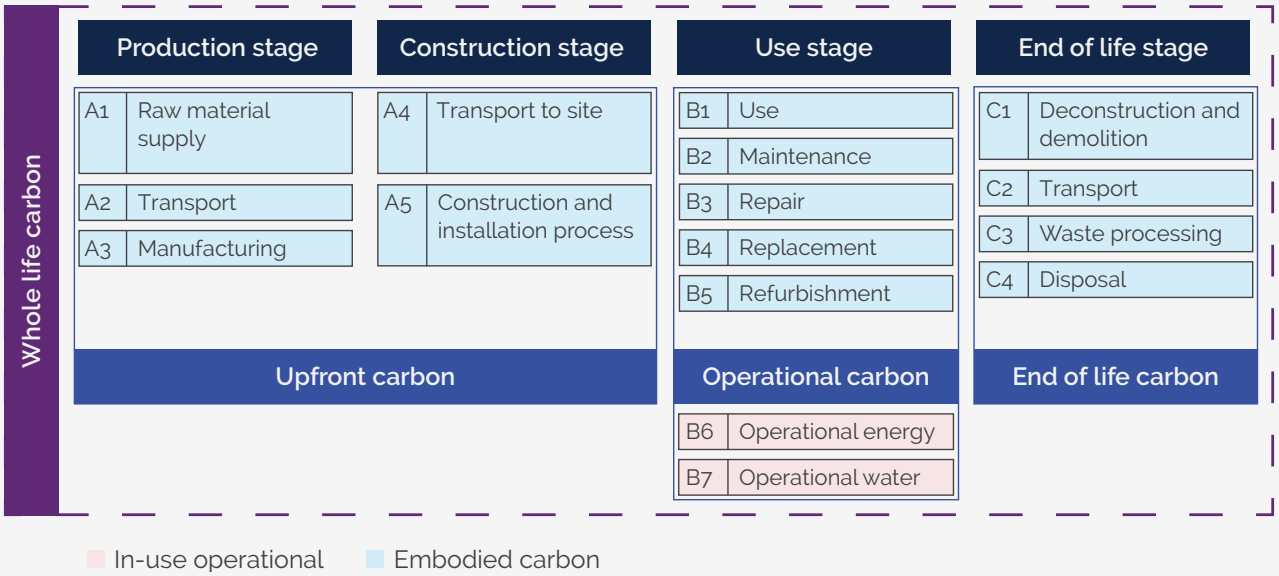


Table 2. Definitions of the phases of a building's life cycle

PHASE	DEFINITION
Production (A1-A3)	Production refers to the stage in which the building materials and components are manufactured and processed. This phase includes the extraction and processing of raw materials, the fabrication, packaging and supply of building products and materials.
Construction (A4-A5)	The process of planning, design, procurement, transportation and distribution of materials to the site, and building of the structure. It encompasses all activities related to the creation of a building, from the initial concept and design to the practical completion of the building.
Use (B1-B7)	A building's operational life phase. During this period, the building is ready for use, regardless of whether it is continuously occupied. Retrofitting activities also take place for general maintenance to extend the building's useful life, and to improve energy efficiency through the introduction of new materials, products and technologies. Retrofitting and deep energy renovation are increasingly deemed as pivotal actions in the building sector's decarbonization.
End-of-life (C1-C4)	The dismantling, destroying, wrecking or removal of buildings or structures.

Emissions beyond a building's life can also be considered. However, these emissions are beyond the building's system boundary and are currently beyond the scope of science-based target-setting.

Terminology used in the SBTi Buildings Criteria and this explanatory document, and how it links to the life cycle stages and modules illustrated in Figure 4

- **In-use operational emissions:** Those associated with the operation of a building in its use stage. Module B6 in a building's life cycle.
- **Upfront embodied emissions:** Those associated with materials and construction processes of new buildings. Modules A1-A5 in a building's life cycle.
- **In-use embodied emissions:** Those associated with materials and construction processes during renovations and retrofits of existing buildings. Modules B1-B5 in a building's life cycle.

4.3 SECTOR CARBON INTENSITY PATHWAYS

The SBTi has developed two sets of 1.5°C-aligned emissions intensity pathways for the buildings sector, one for in-use operational emissions and the other for upfront embodied emissions from newly constructed buildings. The SBTi Buildings Target-Setting Tool fully integrates both sets of pathways to allow users along the buildings value chain to set 1.5°C-aligned science-based targets on their buildings portfolio using the sector-specific methods.

It is up to each company or FI, based on their user type and business activities, to determine whether they require use of both SDAs when setting targets. It is imperative that corporates and FIs use appropriate targets to avoid delays or rejection in the validation process.

4.3.1 Why does the buildings sector warrant dedicated criteria and pathways?

Decarbonizing the buildings sector is critical for meeting the objectives of the Paris Agreement. There are three compelling reasons why the buildings sector warrants dedicated pathways:

1. The vast scale of emissions from the buildings sector (as described in Section 1) and the rate of decarbonization necessary, which is different to other sectors.
2. The diversity and complexity of buildings' life cycle, and GHG profiles across multiple typologies and in different geographies, gives them a unique distribution of emissions compared to other sectors.
3. The large and diverse ecosystem of different stakeholders in the buildings sector involved in financing, development, ownership and operation of buildings.

4.3.2 In-use operational emissions pathways

In-use operational emissions are those associated with the operation of a building in its use stage i.e., the energy needed for heating, cooling, power (B6) any any fugitive emissions, as illustrated in Figure 4.

The in-use operational emissions pathways used for target setting in the scope of the SBTi Buildings Criteria are developed in collaboration with CRREM, and offer the buildings sector more granular pathways reflecting variations in building typology and geography.

Setting SBTs with the CRREM-SBTi Decarbonization Pathways

In 2021, CRREM and the SBTi joined forces to develop new, 1.5°C-aligned decarbonization pathways for in-use operational emissions. CRREM's resources support stakeholders in many ways, including the development of carbon mitigation strategies for their buildings portfolios or to assess climate-related transition risks (CRREM, 2023a). These new pathways that are now used by both organizations for target setting and risk assessment purposes were published in early 2023.

The SBTi uses these CRREM-SBTi 1.5°C-aligned decarbonization pathways for in-use operational emissions target setting by applying the SDA. The SDA derives bespoke decarbonization pathways for individual companies, based on the company's current portfolio, its performance and growth estimates. Companies may therefore notice differences in the target carbon intensity when comparing targets determined using the SBTi's in-use operational emissions SDA versus modeling using the in-use operational decarbonization pathways only. For further information on the SDA, see the SBTi's report on the SDA methodology (SBTi, 2015).

The CRREM-SBTi 1.5°C-aligned decarbonization pathways for in-use operational emissions, integrated in the SBTi Buildings Target-Setting Tool, cover all GHG emissions associated with the use phase of a building.

4.3.3 Embodied emissions

Embodied emissions refer to the GHG emissions associated with materials and construction processes throughout the whole life cycle of a building (WorldGBC, 2019). These emissions can occur throughout different life cycle stages of a building, as illustrated in Figure 4.

The intensity pathways developed for the buildings sector corresponds to upfront embodied emissions (A1-A5) only. The assumptions used to derive the sectoral budget for these emissions address changes in the activity of the sector holistically. As embodied emissions are typically scope 3 emissions for nearly all intended users of the SBTi Buildings Criteria, the published pathways serve only as proxy pathways to determine the remaining 1.5ºC-aligned carbon budget for the sector, and how it could be distributed for future new construction. For more details on the development of the pathway, please see Appendix B-2.

The inclusion of embodied emissions in target setting helps bridge the gap in SBTi's sector-specific guidance between the production of construction raw materials, as covered by sectoral guidance documents such as the SBTi Cement Guidance and the SBTi Steel Guidance, and the 'end products' of the buildings sector (i.e., the buildings themselves). Thus, despite manufacturing industries not being included as intended users of the SBTi Buildings Criteria, the embodied emissions pathway reflects the intrinsic relationship between those industries and

the buildings sector, and the key role emissions reductions from building material manufacturers play in meaningful decarbonization of the built environment. These novel pathways thus incentivize a cross-sectoral drive towards decarbonization by allowing the inclusion of emissions from raw material production in the scope 3 of intended users of the criteria.

4.4 INTENDED USERS OF THE SBTi BUILDINGS CRITERIA AND EXPLANATORY DOCUMENT

This section addresses the applicability of the SBTi Buildings Criteria in terms of intended users, building typologies, and a building's life cycle stages.

4.4.1 Companies required to comply with the SBTi Buildings Criteria

Related criteria: **Buildings-C1**, **Buildings-C2**, **Buildings-C3**

The SBTi Buildings Criteria are intended to be used by those companies for whom buildings-related emissions are substantial in relation to their overall activities.

As such, companies shall use the SBTi Buildings Criteria to set targets on in-use operational and/or upfront embodied emissions if the conditions introduced in **Buildings-C1** and/or **Buildings-C2** are met. Entities whose buildings-related emissions are below the thresholds in **Buildings-C1** or **Buildings-C2** may set targets following SBTi Corporate Net-Zero Standard or other relevant SBTi sector guidance or standards.

Please note that entities identifying as small or medium-sized enterprises (SME) can use either the target validation route for SMEs or the SBTi Buildings Criteria.

Companies that do not satisfy any of the threshold conditions in **Buildings-C1** and/or **Buildings-C2** and/or do not fit into any of the user categories in **Buildings-C3** can still use the SBTi Buildings Criteria, explanatory document and methods to set separate SBTs for their buildings-related emissions, but are not required to do so. The SBTi recommends companies use the most ambitious methods available to set SBTs.

4.4.2 Intended users

Related criteria: **Buildings-C3**

The buildings sector is broadly a heterogenous, complex sector with various entities spread across the buildings value chain. However, as all companies within this sector engage with one 'product', i.e., buildings, common 1.5°C pathways are possible. The pathways are customized to accommodate different building typologies and specific countries[7], influencing the necessary targets themselves.

7 Country-level pathways available only for the in-use operational emissions pathway.

The user categories outlined below in Table 3 have been designed to encapsulate the range of stakeholders found in the buildings value chain. The list and definitions are non-exhaustive. The business activities listed are indicative only and are provided as examples of activities to help intended users understand if and how the SBTi Buildings Criteria applies to their organization. They are intended to capture the wide range of responsibilities which might sit under 'umbrella' user types and are therefore not meant to exclude potential users.

Table 3. Definitions of the intended users of the criteria and their business activities

USER	DEFINITION	BUSINESS ACTIVITIES[8]
Developer	An entity which contracts for the construction of a building with the intent to either own or transfer ownership.[9]	• Project planning and design. • Site selection. • Project financing. • Construction management. • Regulatory compliance. • Risk management. • Aftercare.
Owner-occupier	An entity that has ownership and operational control of the building, as they are occupying it or employing its use.	• Legal ownership of building. • Operational control of building.
Owner-lessor	An entity that has ownership of the building but does not occupy it. This entity is engaged in a lease with one or more third parties for total or partial occupancy and use of the property. Depending on the leasing arrangement, an owner-lessor will exert varying levels of operational and financial control over the building.	• Financial management. • Financial ownership. • Legal compliance. • Authority over property management. • Authority over contract management. • Authority over tenant relations and leasing decisions. • Authority over investment management of the building. • Leasing the property. • Rent collection. • Contract management and legal compliance. • Financial management of building operations. • Tenant relations and communication. • Risk management. • Property inspections. • Repairs and maintenance. • Facilitating and brokering sale of property, including the listing of properties.

8 Non-exhaustive. Furthermore, not all business activities listed will be relevant for all companies within that intended user designation. Variations in core business activities due to diverse business models, and other factors such as leasing arrangements, are expected.

9 For assessing whether a project qualifies as a new construction, refer to the 'new construction' definition in 2023 Real Estate Reference Guide, 2022.

USER	DEFINITION	BUSINESS ACTIVITIES
Property manager	An entity whose business involves acting as an agent overseeing the operational, financial, or investment management of a building, without the requirement of occupying or owning the property. This includes those providing transaction-related services (e.g., brokers, estate agents) where there is control of building operations and emissions and those managing buildings on behalf of clients.	• Leasing the property. • Rent collection. • Contract management and legal compliance. • Financial management of building operations. • Asset management to maximize property value and investment returns. • Tenant relations and communication. • Risk management. • Property inspections. • Repairs and maintenance. • Facilitating and brokering sale of property, including the listing of properties.
Financial institution (FI)*	An entity whose business (5% or more of a company's revenue) involves the dealing of financial and monetary transactions, including deposits, loans, investments, and currency exchange.[10]	• Directly invests (equity, debt or loans) in a real estate asset or in a listed or unlisted real estate entity. • Indirectly invests in real estate assets through investment in listed or unlisted real estate funds.

* It is important to note that a company, categorized primarily as a non-FI intended user, may undertake activities (i.e., investments) that fall under the FI category. For example, an integrated real estate developer may develop buildings for sale as their main business activity, while also investing directly or indirectly into buildings as part of their portfolio. These users should ensure they familiarize themselves with the relevant sections of the criteria for both corporates and FIs, and apply the relevant criteria and recommendations appropriately, ensuring coverage of their relevant business activities as a non-FI and FI user in line with SBTi general criteria. Real estate funds that directly invest in buildings (majority shareholding) would be classified as building owners and shall follow the appropriate SBTi Buildings Criteria for corporations.

10 Definition of an FI provided in SBTi Financial Institutions' Near-Term Criteria Version 2.0.

User classification

Users have discretion in selecting which intended user category or categories best apply to their company's business activities within the buildings sector. Users shall briefly explain their applicable intended user categorization when submitting targets for validation.

In practice, the buildings sector is composed of companies whose business activities, roles and responsibilities are varied. Some users may find that they cannot place themselves firmly within one category of user. For such companies, it is recommended that they select the most appropriate user type(s) from the options provided.

Intended user classification

Example 1

A company which owns and occupies part of a building, and leases out part of the building to a tenant, would classify as an owner-occupier and an owner-lessor.

Example 2

A company which develops buildings would classify as a developer. If it also owns its own corporate offices, it would be further classified as an owner-occupier.

Example 3

A company that directly owns buildings (as a majority shareholder or outright owner) for the purposes of leasing out space in the buildings to tenants would classify as an owner-lessor and would follow guidelines for corporates (Section 6) for target-setting. The same company also manages indirect investments in real estate, on behalf of investors, so would further classify as an FI, following FI (Section 7) guidelines and methods for target-setting.

4.4.3 Building typologies and geographies

Buildings with common characteristics can be categorized into individual 'typologies'. The SBTi Buildings Criteria provide separate decarbonization pathways for available typologies and geographic locations for in-use operational emissions and upfront embodied emissions.[11]

An approach is provided in the criteria for selecting the most appropriate building typology and geographic location for assets, even where an exact match is not available.

11 The upfront embodied emissions pathways are currently only available at a global level.

Building typologies covered in the SBTi Buildings Criteria

Table 4. Building typologies covered by the in-use operational emissions pathways

BUILDING TYPOLOGY	SUB-TYPE	DESCRIPTION[12]
Office		Includes free-standing offices, office terraces, unattributed office buildings and office parks.
Retail	High street	Retail buildings located on the high street in a particular area, usually terraced buildings located in the city center or other high-traffic pedestrian zones.
	Shopping center	Enclosed centers for retail purposes. Examples may include, but are not limited to: regional malls and shopping malls.
	Warehouse	Refers to buildings in an unenclosed retail space, otherwise known as a strip center or strip mall, whereby buildings are usually stand-alone and situated side-by-side with their entrance facing a main street or carpark.
Hotel		Includes hotels, motels, youth hostels, lodging and resorts.
Industrial distribution warehouse	Warm storage	Refers to a building in an unenclosed space, usually these are stand-alone buildings situated by a car park or truck loading areas as they act as a shipping hub, receiving shipments and holding items until they are loaded onto trucks and distributed elsewhere. Often the warehouses are in the form of large halls and are located on the outskirts of cities.
	Cold storage	
Healthcare		Buildings used for the purpose of primary health care. Examples may include, but are not limited to: hospitals, clinics, physical therapy centers and mental health centers.
Medical office		Offices specifically used for the purpose of medical administration, secondary research or other purposes, exclusive of the property types specified for healthcare centers.
Lodges, leisure and recreation		Includes lodging, sports club houses, gyms, sports stadiums, indoor sports arenas, halls, swimming pools, theaters and auditoriums.
Residential	Multi-family	Refers to multi-family residential buildings.
	Single-family	Refers to single-family residential buildings.

12 Adapted from CRREM's Risk Assessment Reference Guide (CRREM, 2023c).

BUILDING TYPOLOGY	SUB-TYPE	DESCRIPTION[12]
Buildings that are not covered with the building typologies above		Buildings that are not covered by the building typologies above shall use the 'Other' pathway for in-use operational emissions. If the subtype of the building is not known, the pathway that gives the most ambitious result shall be selected. Mixed-use assets shall refer to Section 6.3.3 in this document in determining the building typology

Table 5. Building typologies covered by the embodied emissions pathways

BUILDING TYPOLOGY	DESCRIPTION
Retail	Retail refers to properties used for commercial purposes that are primarily focused on selling goods and services directly to customers. These properties may be located on a high street, in a shopping center, lifestyle center, or strip mall, and may be enclosed or open-air.
Office	Includes free-standing offices, office terraces, unattributed office buildings and office parks.
Residential	All residential properties, including but not limited to single-family and multi-family residential buildings, family homes (not including apartment blocks), student housing, retirement living and other residential properties.
Buildings that are not covered with the building typologies above	Buildings that are not covered by the building typologies above must use the 'Other' pathway for upfront embodied emissions.

Geographies covered by the pathways

Compared to other sectors, the buildings sector's 'products' are greatly influenced by the geographies in which they are constructed. Geographic considerations may affect the shape and form of the buildings themselves as they are designed in response to site-specific features such as climate, topography and even local culture. This results in varying emissions profiles for buildings depending on their geographic location. For these reasons, the in-use operational emissions pathways are subdivided into narrower geographical boundaries where possible, enabling more tailored targets to be set. The upfront embodied emissions pathway provides global level data for reasons explained in the dedicated section below.

12 Adapted from CRREM's Risk Assessment Reference Guide (CRREM, 2023c).

ACCOUNTING FOR BUILDINGS-RELATED EMISSIONS

ACCOUNTING FOR BUILDINGS-RELATED EMISSIONS

Note

Guidance in this section is applicable to all intended users, including FIs, unless otherwise stated.

This section intends to clarify and codify accounting and reporting of operational and embodied buildings-related emissions to enable intended users to set SBTs. It builds on the GHG Protocol, and aligns with other relevant accounting standards and guidance. Where any deviation from existing standards or guidance is necessary, explanations are provided. Companies and financial institutions may find it helpful to refer to additional guidance for data quality in commercial real estate provided in Table 5-14 of the PCAF Standard.

The accounting and reporting guidance provided here is not exhaustive and should not be used as justification for claiming that particular emissions scopes or categories are not relevant when reporting. Companies shall determine and report emissions from all value chain activities in their scope 3 inventory, at a minimum using methods permitted by the SBTi Corporate Near-Term Criteria.

5.1 WHOLE BUILDING APPROACH FOR IN-USE OPERATIONAL EMISSIONS

Related criteria: **Buildings-C6**, **Buildings-C8**, **Buildings-FI-C2**

The SBTi Buildings Criteria follows the 'whole building approach' (PCAF, GRESB & CRREM, 2023), which requires that all intended users include emissions arising from operational energy consumption and from landlord- and tenant-controlled spaces within both their GHG inventory and target boundaries.[13]

This is because emissions from a single building can be categorized under different scopes depending on the user, their chosen GHG boundary consolidation approach (i.e., equity share, operational control or financial control), the lease type and utilities arrangements. For example, an owner-lessor of a multi-tenanted building that only purchases electricity for landlord-controlled spaces and has adopted the operational control approach would categorize emissions arising from operational energy consumption from tenant-controlled spaces within scope 3.

While the inclusion in the target boundary of an owner-lessor's emissions from both tenant-controlled and landlord-controlled spaces is required through the 'whole building approach', the classification by scope and category of each energy supply might differ due to the consolidation approach chosen by the company, and therefore shall be considered individually.

The 'whole building approach' raises ambition in the sector, encouraging collaboration to decarbonize a building's energy consumption and reduce emissions.

'Whole building approach' for property managers

If a property manager chooses to set an SDA target for in-use operational emissions of the properties under management, it shall adhere to the 'whole building approach'. When setting emissions reduction targets using the SDA method and the 'whole building approach', care should be taken to ensure that all emissions from buildings are included in either scopes 1 and 2, or in the relevant scope 3 category.

When a property manager is providing services to only a certain proportion of a building, the application of the 'whole building approach' refers to the inclusion of a proportional share of emissions from landlord-controlled spaces in their inventory and subsequent target boundary.

As per the GHG Protocol Scope 3 Standard, the minimum boundary of each scope 3 category includes the scope 1 and 2 emissions of the relevant value chain partner, which may mean that not all operational emissions are captured. In these cases, the cross-sector target-setting methods should be used.

13 The 'whole building approach' as referred to in the SBTi Buildings Criteria and this explanatory document, always refers to in-use operational emissions, including fugitive emissions, and not embodied emissions.

5.2 MARKET-BASED AND LOCATION-BASED ACCOUNTING

Related criteria: **Buildings-C13**, **Buildings-R1**

The GHG Protocol Scope 2 Guidance requires measuring and reporting of scope 2 emissions as part of the GHG inventory using two methods:

- A **location-based approach** that reflects the average emissions intensity of the local grid from which energy consumption occurs.
- A **market-based approach** that reflects emissions from electricity generation that companies have actively sourced using market instruments.

For setting a baseline and tracking progress towards achievement of SBTs, a single and consistent approach shall be used.

Additional guidance for intended users in the buildings sector:

- It is recommended that users adopt the location-based approach.
- If the market-based approach is chosen for target setting, companies shall measure and report their whole building in-use operational emissions intensity using the location-based approach, as an additional separate line item in their annual GHG inventory. An example is shown in the box below.
- When the location-based approach is used, companies shall take into account the actual location and regional grid performance of all assets within their portfolio.

Example of requirement to disclose whole building in-use operational emissions

Company A, an owner-lessor, chooses the market-based approach to set their SBTs. As per **Buildings-C13**, Company A shall also measure and disclose its whole building in-use operational emissions using the location-based approach. Company A's portfolio consists of 100,000 m^2 of residential buildings across the USA.

CATEGORY	Scope 1	Scope 2 location-based	Scope 2 market-based	Scope 3
TOTAL ANNUAL EMISSIONS (tCO_2e)	300	1,700	1,200	4,000
TARGET				
Total whole building in-use operational emissions (S1+2+3) *Scope 2 market-based*	5,500 (Scope 1: 300 Scope 2: 1,200 Scope 3: 4,000)	"Company A commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of owned and leased buildings by 60.2% per m^2 by 2030 from a 2021 base year." Whole building in-use operational emissions intensity in the base year is 56.00 $kgCO_2e/m^2$ and the company shall report progress against its target using the market-based accounting method throughout the years.		
Total whole building in-use operational emissions (S1+2+3) *Scope 2 location-based*	6,000 (Scope 1: 300 Scope 2: 1,700 Scope 3: 4,000)	No target set, but the company shall disclose its in-use operational location-based emissions intensity annually, which is 60.00kg COe_2/m^2 in the base year.		

5.3 BUILDING LIFETIME ASSUMPTIONS

Related criteria: **Buildings R-6, Buildings-C8**, **Buildings-C11**, **Buildings-R5**

The GHG Protocol Scope 3 Standard states that total expected lifetime emissions from all relevant products sold in the reporting year shall be included under scope 3 category 11 use of sold products. For intended users of the SBTi Buildings Criteria required to include emissions from this category within their GHG inventories and targets, this means that the assumed expected lifetime of each sold building is a key input for emissions calculations.

Users accounting for scope 3 category 11 use of sold products should use a minimum building lifetime figure of 60 years in their calculations,[14] and shall provide the building lifetime assumptions used as a part of the evidence included in the submission. If a company chooses to use another lifetime estimate than what is recommended in **Buildings-R5**, the lifetime assumptions they are using shall be explained.

Users should use projections for future grid decarbonization in determination of their use of sold products emissions (Buildings R-6). Projections used should be referenced and justified. Where grid decarbonization projections are not considered in calculations, justification of this omission should be provided in the submission. Users developing the properties but selling them during the use phase may deduct the years used before selling from the lifetime emissions.

The GHG Protocol recognizes that companies that produce more durable products with longer lifetimes, such as buildings, could appear to be penalized because, as product lifetimes increase, scope 3 emissions increase, assuming all else is constant. To reduce the likelihood for emissions data to be misinterpreted, the GHG Protocol recommends companies to also report relevant information, such as product lifetimes and emissions intensity

5.4 ACCOUNTING FOR UPFRONT EMBODIED EMISSIONS OF NEW BUILDINGS

Existing guidance for the buildings sector recommends that the developer and the first owner both account for the upfront embodied emissions of newly constructed buildings (UKGBC, 2019). The SBTi's Buildings Criteria extends this to include financiers of new building development (either through direct investment or corporate loans). However, target setting for financed embodied emissions for FIs is optional.

5.4.1 Defining a building's first owner

Related criteria: **Buildings-C2**, **Buildings-C8**

'New buildings' are defined as new constructions developed (i.e., reached practical completion) or acquired by the intended user.

There can be many different parties involved in the sale or transfer of a new building. Should a new building pass through one or more owners in rapid succession (e.g., holding companies or other parties involved in the transaction without control over rental leases or building management), between the sale or transfer by the developer and acquisition by the intended 'first owner', it is ultimately the first owner and the developer who should account for the upfront embodied emissions associated with the new building. As such, these emissions shall be included in that user's emissions inventory and target boundary even if they may not technically be the first owner. Thus, the first owner starts the use phase of a new building.

Once this first owner sells the building, all subsequent owners will have substantially limited influence over the already emitted upfront embodied emissions and are therefore not required to set targets for the upfront embodied emissions of the acquired building.

14 60 years is the indicative lifetime as per EN15978 and RICS Guidance.

It is possible that the same company is both the developer and the first owner of a building. When a developer completes the construction of a building and occupies or leases it, the relationship they have to the building changes from that of a developer to a first owner. The upfront embodied emissions shall be reported by the company only once, at practical completion at the latest (please see Section 5.4.3). In these cases, no subsequent owners are required to report the upfront embodied emissions of the building.

Example identifying the first owner of a new building

Developer A contracts a construction company, Company B, to construct a new office building. Developer A sells the office building to Company C, a holding company. After a few months, Company D acquires the building from Company C. Company D is the ultimate first owner of the building, and occupies it for their own use. Financial Institution E provides a loan to Company D to acquire the building. In this example, all activity took place in the chosen base years for each company and the FI. Only Developer A and Company D are therefore required to include the upfront embodied emissions of the building in their target boundary, Company D as a first owner of the building and Developer A as a developer. Targets on financed upfront embodied emissions are currently optional for Financial Institution E.

5.4.2 Defining a new building

Related criteria: **Buildings-C2**, **Buildings-C8**

To assess whether a project qualifies as a newly developed/constructed building, these criteria and guidance refer to the 'new construction' definition in the GRESB Reference Guide (GRESB, 2022):

> **New construction**: Includes all activities to obtain or change building or land use permissions and financing. Includes construction work for the project with the intention of enhancing the property's value. Development of new buildings and additions to existing buildings that affect usable space can be treated as new constructions.

A 'new construction' thus differs from a 'major renovation' as defined below (GRESB, 2022):

> **Major renovations:** Are alterations that affect more than 50% of the total building floor area or cause relocation of more than 50% of regular building occupants.

In the context of the SBTi Buildings Criteria, upfront embodied emissions refer to the upfront emissions from the construction of projects classified as 'new construction'.

5.4.3 Embodied emissions accounting practices for developers

Related criteria: **Buildings-C2**, **Buildings-C4**, **Buildings-C8**, **Buildings-R2**

Developers typically use one of two methods when accounting for the upfront embodied emissions of new buildings, depending on their accounting preferences. Both methods are valid for setting SBTs:[15]

Method 1: Accounting for the amount of construction completed that year

In this method, developers account for the upfront embodied emissions of a building project annually as the construction occurs, even if the project is not finished. Upstream emissions from the extraction, production and transportation of building materials, as well as all emissions related to the construction of the building are accounted for under scope 3 category 1 purchased goods and services, in the year in which they occur.

The benefit of this method is that it aligns with existing GHG and financial annual reporting cycles. The principal drawback of this method is that as projects are not completed, it is not possible to use intensity-based target-setting methods, which require calculation using both a total embodied emissions numerator and a corresponding completed floor area (m^2) for the denominator. In addition, the embodied carbon performance of buildings under construction may be obscured by fluctuating levels of activity in a developer's portfolio (e.g., the yearly quantity of cement purchased by a developer could be used for the construction of several energy efficient buildings or a single poorly performing asset) leading to potentially reduced transparency for stakeholders.

Companies and FIs choosing this method shall use cross-sector scope 3 target-setting methods (see Section 6.1.4).[16]

Method 2: Accounting for finished buildings at practical completion

In this method, the building is treated as a 'capital good' and upstream emissions from the extraction, production and transportation of building materials, including all emissions related to the construction of the building, are accounted for under scope 3 category 2 "capital goods" by the developer in the year in which the building reaches practical completion.

The benefit of this method is that it provides the total emissions and floor area data needed to be able to apply the intensity-based SDA target-setting method. The principal drawbacks of this method are the multi-year time lag between actual emissions to the atmosphere and accounting by the developer, as well as the potential for large fluctuations in total reported emissions in years with projects that reach completion.

Companies and FIs choosing this method may use sector-specific target-setting methods to set targets for upfront embodied emissions (see section Section 6.1.4).

15 For further details on applicable target-setting methods for upfront embodied emissions, see Section 6.1.4.

16 General rules and guidance for target setting for non-buildings-related emissions are found in the SBTi Corporate Net-Zero Standard Criteria.

Developers are encouraged to consider the nature of their involvement in the construction project when choosing the GHG accounting methodology for upfront embodied emissions. For example, companies which are directly involved in the procurement of building materials for a development might find method 1 to be a more accurate representation of their activities, while a company which only provides financing and overview of a development, outsourcing construction to contractors, might prefer method 2.

Whichever accounting method is chosen, developers should report the upfront embodied carbon intensity of their completed developments as an additional disclosure to increase transparency and data availability in the sector.

5.4.4 Minimum boundary for upfront embodied emissions calculations

When calculating upfront embodied emissions from newly constructed buildings, companies should strive for the most accurate and detailed calculations as possible. The life cycle assessment scope shall include at least structural elements, building envelope, internal walls and finishes. Technical equipment is another important element that should be included in the assessment scope.

The upfront embodied emissions pathways are developed by allocating a global carbon budget to the construction activities and then to the construction of new buildings. Please refer to the 1.5°C Pathways for the Global Buildings Sector's Embodied Emissions: Development Description for a more detailed description of the pathways development process.

5.4.5 Accounting for upfront embodied emissions of existing buildings

Users may account for upfront embodied emissions of existing buildings[17] in scope 3 category 2 capital goods, in the buyer's inventory at the point of transfer.[18]

17 See Section 5.4.2 for the definition of a new construction.

18 "Strict interpretation of the GHG Protocol would require the accounting of all whole life emissions for every building sold as well as the accounting of all cradle-to-gate emissions for buildings purchased. However, it is currently difficult for the commercial real estate sector to gather accurate data on whole life impacts for existing buildings" (UKGBC, 2019).

5.5 FUGITIVE EMISSIONS

Related criteria: **Buildings-C7**

Under the GHG Protocol, all GHGs should be included in a company's inventory. Application of the 'whole building approach' also requires fugitive emissions to be accounted for in a company's emissions inventory, if relevant, even if typically associated with tenant-related scope 3 emissions.[19]

Fugitive or 'F-gas' emissions are the most important non-CO_2 GHGs for decarbonization of the buildings sector. The US EPA summarizes F-gasses as follows:[20]

> The five main types of fluorinated GHGs are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and other fully fluorinated GHGs. These fluorinated GHGs can be emitted from F-gas production as by-products, reactants, intermediates, or products, and from process vents, leaks, container venting, or destruction processes.

According to the IPCC, F-gasses account for 2.3% of total global GHG emissions, with 250% growth since 1990.[21] According to Hu et al. (2020), HFCs account for 8% of global building sector GHG emissions as of 2017.[22] HFCs typically account for approximately 80% of F-gas emissions in buildings. HFCs are the most relevant F-gas in the buildings sector because of their use in refrigeration, cooling, heat pump, and fire suppression equipment. HFCs emissions have increased steadily since 1990, when they were first adopted as substitutes for ozone-depleting chemicals following the Montreal Protocol. Increasing urbanization in developing economies, typically accompanied by increased demand for space cooling and refrigeration, will likely result in further F-gas emissions growth in a business-as-usual scenario.

F-gas emissions in the buildings sector occur primarily via leakage during equipment installation, operation, servicing, maintenance and disposal. Hermetically sealed systems and strict procedures for charging and discharging equipment can help to reduce leakage rates.

The decarbonization pathways used to develop the in-use operational emissions SDA targets contain all GHGs, including fluorinated gasses. Therefore, for the purposes of setting SBTs:

- Companies shall include fugitive emissions, from all building types, within their in-use operational emissions and as part of their target boundary.
- Where data is not collected on fugitive emissions, companies must use an estimate and disclose their estimation methodology.

19 Fugitive emissions may be categorized under an intended user's scope 1 or scope 3 emissions, depending on the ownership, leasing arrangements, and control over the building in question. Whichever scope the emissions are categorized under, they must be included within the user's target boundary.

20 EPA, Fluorinated greenhouse gas emissions and supplies reported to the GHGRP (2022).

21 Parmesan, C. et al. (2022). Terrestrial and Freshwater Ecosystems and their Services. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 197-377, doi:10.1017/9781009325844.004

22 Hu, S., Cabeza, L. F., & Yan, D. (2020). Review and estimation of global halocarbon emissions in the buildings sector. Energy and Buildings, 225, 110311. https://doi.org/10.1016/j.enbuild.2020.110311.

5.6 ADDITIONAL GUIDANCE TO REPORT BUILDINGS-RELATED EMISSIONS IN A GHG INVENTORY

Table 6 provides additional guidance to report emissions from buildings' life cycle stages in a corporate GHG inventory.

> **Note**
>
> Targets covering optional scope 3 emissions (e.g., indirect use-phase emissions according to the GHG Protocol, which fall outside the minimum boundary) do not count towards the 67% minimum scope 3 coverage requirement. The required scope 3 categories are specified in Buildings C-8.

Table 6. Buildings-related emissions allocation in a GHG inventory

INTENDED USER	SCOPE 3 CATEGORY	EMISSIONS (EXAMPLES)
Developer	Category 11: Use of sold products	Lifetime in-use embodied emissions of sold buildings (in the reporting year).[23]
	Category 12: End-of-life treatment of sold products	End-of-life embodied emissions of sold buildings (in the reporting year).
Owner-occupier	Category 1: Purchased goods and services	Embodied emissions of materials and services purchased or acquired by the reporting entity (owner-occupier) for maintenance, repair, replacement or refurbishment, as occurred in the reporting year.
Owner-lessor	Category 1: Purchased goods and services	Embodied emissions of materials and services purchased or acquired by the reporting entity (owner-lessor) for maintenance, repair, replacement or refurbishment in owner-controlled spaces, as occurred in the reporting year.
	Category 13: Downstream leased assets	Embodied emissions of materials and services purchased or acquired by a tenant for maintenance, repair, replacement or refurbishment in tenant-controlled spaces, as occurred in the reporting year, where not already in a scope 1, 2, or other scope 3 category.[24]
Property manager	Category 1: Purchased goods and services	Embodied emissions of materials and services purchased or acquired by the reporting entity (property manager) for maintenance, repair, replacement or refurbishment in managed spaces, as occurred in the reporting year.
Financial institution (FI)	See Section 7.2	

23 Embodied emissions during the use phase do not form part of the minimum boundary for this category according to the GHG Protocol and are therefore recommended only.

24 Embodied emissions during the use phase do not form part of the minimum boundary for this category according to the GHG Protocol and are therefore only recommendations.

5.7 ACQUISITIONS AND DIVESTMENTS

It is important that acquisitions and divestments are addressed in this explanatory document, as multiple intended users can be involved, directly or indirectly, in the transfer of control and ownership of buildings. Thus, acquisitions and divestments form a large part of the economic activity which occurs within the sector.

5.7.1 Addressing the risk of misinterpreting divestments as emissions reductions

Related criteria: **Buildings-R8**, **Buildings-R9**

In general, divestments should not be used by users to report improved emissions performance.

There are many possible reasons for the divestment of single assets or even entire portfolios. However, there is a risk that the impact of such divestments on reported GHG figures could be misinterpreted by stakeholders as constituting an emissions reduction, rather than the asset having left the company's inventory boundary. Such an action simply shifts ownership of the asset from one party to another, without addressing the actual emissions to the atmosphere.

Efforts should instead be made to improve the actual performance of buildings through energy efficiency and other means in the period that they are held by a user, and to ensure that new developments are designed and built with the lowest emissions impact possible from the outset.

To address these concerns and improve transparency around this issue, users should disclose the following information:

- Emissions reductions from decarbonization of assets (i.e., by using the like-for-like approach).
- Absolute emissions of assets divested in the reporting period.

Reported information can be either quantitative or qualitative. They should be developed depending on data availability, completeness and quality with a view to ensuring the comparability between measurements.

5.7.2 Assets entering the portfolio during the base year

For buildings acquired during the chosen base year, the requirements for inclusion of the operational in-use emissions in the target boundary are:

- **If being acquired to sell**, the owner should include emissions proportional to the period that they have held the asset during the reporting year. For example, if the building has been owned for only three months out of twelve in the base year, the user shall include the actual emissions data if available for the hold period or 25% of the emissions in the base year's emissions activity.
- **If being acquired for its own occupation or leasing (as lessor)**, the owner should include emissions for the entire reporting year to ensure that the base year is representative of future portfolio activities as this is deemed an expansion of the portfolio. This is because including only partial building emissions in the base year inventory would imply better performance than the full year (annual) performance.

Similarly, for property management agreements started during the chosen base year, the property manager shall include emissions for the entire reporting year to ensure that the base year is representative of future portfolio activities.

5.7.3 Assets leaving the portfolio during the base year

In-use operational emissions for a building leaving the portfolio during the chosen base year should be excluded from both the reporting year and base year calculation. To ensure that the base year is representative of future portfolio activity, such divestments or terminated lease or property management agreements are deemed to be a reduction in the portfolio boundary; emissions from these buildings should be excluded to avoid an artificially inflated base year performance.

5.7.4 Partial occupancy

Buildings often have vacant space, i.e., they are not fully occupied. While emissions quantification should reflect actual performance (PCAF, GRESB & CRREM, 2023) irrespective of occupancy, normalization may be applied for the purposes of setting a representative base year. This is because emissions intensity calculations, derived from emissions data for partially vacant buildings as the numerator, while using total building floor area as the denominator, could imply better than actual performance.

If normalization is applied, 'average annual vacancy' should be used. However, the normalization should only be applied upwards. That is, vacancy may be assumed to go down, however vacancy cannot be assumed to go up. Vacancy rates can fluctuate over a building's lifetime and occur for a number of reasons, such as when a building is being held for sale or undergoing refurbishment.

5.8 DATA QUALITY

The SBTi validates a company's targets against the baseline data it has provided. Given the importance of this data, companies should strive to use the best and most complete data available in their GHG emissions accounting. Companies setting buildings-related targets should provide information on assets' emissions per asset type and per geography.

Companies setting buildings-related targets should follow data quality guidelines provided by the GHG Protocol. Additional guidance on data quality issues for scope 3 emissions is provided in the GHG Protocol Value Chain (Scope 3) Standard. Additionally, companies in the buildings sector may benefit from industry-specific reporting guidance such as:

- Construction CO_2e Measurement Protocol by ENCORD.
- Embodied Carbon: Scope 3 Measurement and Reporting by UKGBC.

In developing their annual inventories, companies should use their best efforts to use reliable data, that is the most granular and representative of the actual buildings related emissions, and to improve the robustness and accuracy of any estimated emissions over time. For transparency, companies should disclose and explain calculation methods and assumptions made in their inventories.

Ensuring the utilization of quality data for quantifying embodied carbon is a challenge in the construction industry. Companies should recognize this and prioritize the integration of the best and most comprehensive data available.

The process of reporting carbon emissions entails a continuous cycle of data collection, assessment and enhancement of data quality over time. Additionally, to guarantee accuracy and alignment across different assessments, attention should be paid to various factors, such as:

- **Establishing clear system boundaries**, focusing on upfront embodied emissions (A1-A5) as outlined in the SBTi Buildings Criteria and this explanatory document.
- **The building element groups specified by the criteria and explanatory document**, comprising structural elements, building envelope, internal walls and finishes, shall be incorporated to ensure a comprehensive assessment, referenced in Section 5.4.4.
- **Floor area**.
- **Selecting appropriate reference study periods**, as stated in the criteria and in Section 5.3 for building lifetime assumptions.

By adhering to these guidelines and utilizing high-quality data, companies can enhance the precision and reliability of their embodied carbon quantification efforts in the construction industry.

5.8 OPTIONAL CONSIDERATIONS FOR FRANCHISORS

Related criteria: **Buildings-R3**

Franchisors can have substantial influence over the lifetime emissions of a building. This is because the design and materials used in the construction of a new building owned as part of a franchise arrangement are typically mandated by the franchisor, not the franchisee, while the latter typically owns the building.[25] Examples of common buildings that can be found under franchise agreements include restaurants, fuel stations, supermarkets, cinemas and hotels. According to the GHG Protocol Guidance for Scope 3 Category 14 Franchises:

> "Franchisors should account for emissions that occur from the operation of franchises (i.e., the scope 1 and scope 2 emissions of franchisees) in this category".

To encourage low-carbon design and construction of buildings that are designed by franchisors, but owned by franchisees, and to ensure that accountability for embodied emissions sits with those that have the most influence, for the purposes of setting SBTs it is recommended that franchisors should include[26] upfront embodied emissions from franchisee buildings in their scope 3 category 14 emissions inventory, reported in the year of completion for newly constructed franchisee buildings.[27]

25 In the case where the franchisor owns the property and the franchisee occupies the property under a lease, the franchisor is the owner-lessor and the franchisee is a tenant, under the classifications provided in this explanatory document.

26 While franchisors are not a distinct intended user type themselves, this recommendation is applicable to all users of this document that are also franchisors.

27 There are no requirements for franchisors included in this document, only recommendations. Embodied emissions do not form part of the minimum boundary for this category according to the GHG Protocol and are therefore only recommendations.

HOW TO SET A SCIENCE-BASED TARGET

HOW TO SET A SCIENCE-BASED TARGET

The SBTi Buildings Criteria supersedes the general SBTi Corporate Near-Term Criteria, which serves as the basis for this document. Users shall also follow the Greenhouse Gas Protocol (GHGP) Corporate Standard, Scope 2 Guidance and Corporate Value Chain (Scope 3) Accounting and Reporting Standard for emissions accounting and reporting.

The SBTi Buildings Criteria should be read in conjunction with the Buildings Sector Science-Based Targets Explanatory Document, which includes informative guidance; the SBTi Buildings Target-Setting Tool, which helps to formulate intensity-based targets using the sector-specific methodology; the Procedure for Validation of SBTi Targets, which describes the underlying process followed to assess targets; the Buildings Criteria Assessment Indicators, which detail the indicators used to determine conformance and non-conformance with criteria; and the SBTi Glossary, which lists the terms, definitions and acronyms used in this document.

This section provides additional guidance for intended users of the SBTi Buildings Criteria to set near-term SBTs. Four steps are described:

1. **Determine target boundaries, scopes and target-setting methods:** Review the SBTi general criteria, SBTi Buildings Criteria and this explanatory document to determine how to set target(s) across relevant activities and scopes.
2. **Calculate emissions inventory:** Calculate base year and most recent year emissions inventories and activity following guidance provided by the GHG Protocol alongside the SBTi Buildings Criteria and this explanatory document.
3. **Construct targets:** Model buildings-related emissions target(s) using the SBTi Buildings Target-Setting Tool. Other emissions may need to be covered by additional targets to meet the SBTi Coporate Near-Term Criteria and can be modeled using the standard SBTi tools.
4. **Submit targets to the SBTi:** Send a completed Target Submission Form to the SBTi.

DETERMINE TARGET BOUNDARIES, SCOPES AND TARGET-SETTING METHODS

The following steps should be followed to determine which emissions should be covered by SBTs, and which approaches to use when calculating SBTs:

1. Decide whether to set a near-term target only or target(s) aligned with SBTi's Corporate Net-Zero Standard (which requires a near-term and long-term target).
2. Decide on a base year and target year for each target. Near-term targets shall have a timeframe of 5-10 years from the date of submission. For those choosing to set a long-term target, any required long-term target year shall be 2050 at the latest.
3. Determine if a scope 3 target is either recommended or required according to the SBTi generic criteria and the sector-specific requirements.
4. Set target boundaries according to the SBTi Corporate Near-Term Criteria and the sector-specific guidance below (and SBTi Corporate Net-Zero Standard Criteria, if wishing to commit).
5. Choose a target-setting method to apply to each target as listed in the SBTi Buildings Criteria, in criterion **Buildings-C4**.

6.1.1 Required target boundary

Related criteria: **Buildings-C8**

Companies and FIs with activities within the buildings value chain, if the thresholds included in Buildings C-1 or C-2 are met, shall follow the SBTi Buildings Criteria and this explanatory document for all user types applicable to their activities. For example, an integrated real estate company may design, build, develop, own and operate its whole portfolio. If a company has multiple business operations over the same buildings, these emissions should be calculated once, and when these emissions can fall into any scope, scopes 1 and 2 shall be prioritized.

Additional requirement for setting near-term targets using the Buildings Criteria and explanatory document:

- All required scope 3 emissions categories shall be included in a user's target boundary, irrespective of whether or not the user is required to set a scope 3 target according to SBTi's general criteria.[28]

28 This does not necessarily mean a separate scope 3 target is needed for this category; it could be combined with other scope 3 categories, or with scope 1 and 2 in the case of in-use operational emissions, under the 'whole building approach'.

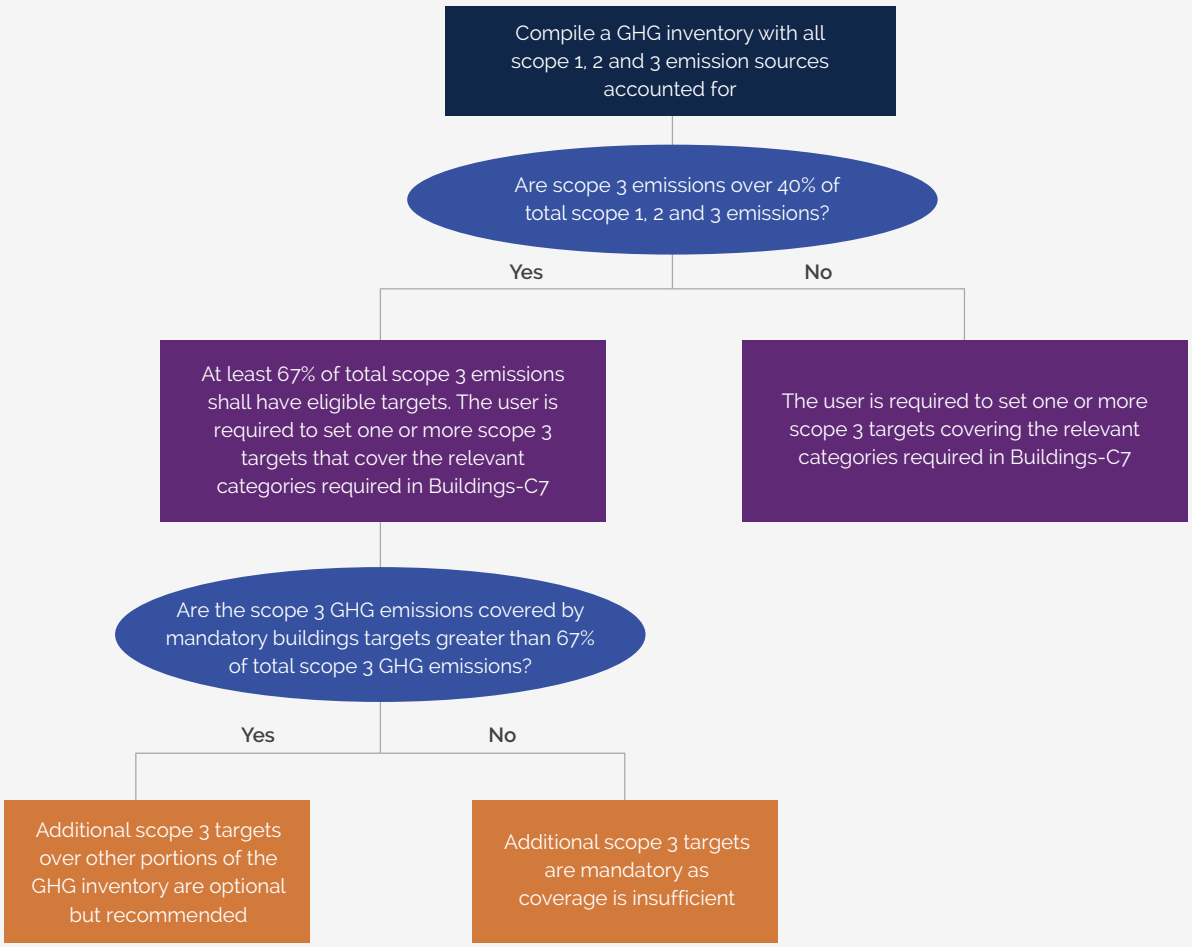
6.1.2 Required scope 3 categories

Related criteria: **Buildings-C6**, **Buildings-C8**

Required scope 3 categories for buildings-related emissions are found in **Buildings-C8**, by user type. It is important to note that guidance on target boundaries is distinct from GHG accounting and reporting requirements. All relevant scope 3 categories shall be included in the user's GHG emissions inventory, as required by the GHG Protocol.

The required emissions categories have been determined based on the relevance of each intended user's known business activities, the applicability of individual target-setting methods, and the company's level of influence over associated emissions reductions. The details of which emissions shall be included within each user's target boundary are provided in **Buildings-C8**.

Figure 5. Flow chart clarifying target setting for required scope 3 emissions for near-term targets



Near-term target-setting example

Company A, an owner-lessor, is required to set a whole building in-use operational emissions target for several reasons:

- Company A's total scope 3 emissions corresponding to tenant energy use (category 13 downstream leased assets) exceed the threshold set in Buildings-C1.
- Buildings-C6 requires Company A to set a whole building in-use operational emissions target covering its buildings-related scope 1 and 2 emissions, and scope 3 emissions from tenant energy use. It shall apply the buildings in-use operational emissions SDA method to set this target (Buildings-C4).
- However, Company A does not meet the threshold in Buildings-C2 and so is not required to set a separate upfront embodied emissions target.
- To ensure minimum coverage of at least 67% of total scope 3 emissions in accordance with SBTi general criterion C8, the company also decides to set a separate target on scope 3 emissions outside of the in-use operational emissions target boundary, using the cross-sector absolute contraction method.

6.1.3 Additional target-setting guidance for upfront embodied emissions

Related criteria: **Buildings-C2**

Developers and first owners are required to set a target on upfront embodied emissions if this emission source meets the threshold condition in **Buildings-C2**. Targets on upfront embodied emissions formulated with the SBTi cross-sector methods may be aggregated with other scope 3 emissions categories.

For companies that meet Buildings-C2

Developers

Developers shall choose and consistently apply an accounting method from Section 5.4.3 when setting upfront embodied emissions targets.

A company may develop a new building with a view to owning and even managing the property itself in the long term, rather than selling to a buyer. In such cases, there is no 'product' (i.e., a building) being sold, and consequently scope 3 category 11 the use of sold products and category 12 end-of-life treatment of sold products are not applicable. Therefore, the criteria regarding inclusion in the target boundary of lifetime estimates for operational and embodied emissions, as well as end-of-life emissions, do not apply. This is on the basis that the leased spaces within the building are instead categorized according to the criteria provided for owner-lessors or owner-occupiers (UKGBC, 2019).

First owner

For the purposes of setting SBTs, intended users that are the first owner/acquirer of a new building shall set targets on upfront embodied emissions of new buildings acquired.

6.1.4 Permitted target-setting methods for buildings-related emissions

Related criteria: **Buildings-C4**

Permitted target-setting methods for scope 1, 2 and 3 buildings-related emissions are laid out in **Buildings-C4**. The SBTi recommends using the most ambitious method that leads to the earliest reductions and the least cumulative emissions.

For in-use operational emissions (scope 1, 2 and 3 categories 1-14), owner-lessors, owner-occupiers, developers (if relevant) and FIs shall use the in-use operational SDA as the target-setting method. Property managers may opt to use either the in-use operational SDA or cross-sector methods for in-use operational emissions of buildings under management.

Targets for upfront embodied emissions are recommended to be set using physical intensity convergence (SDA) or sector-specific absolute reduction, but the following six approaches are permitted: cross-sector absolute reduction, buildings sector-specific absolute reduction, physical intensity convergence (SDA), economic intensity reduction, physical intensity reduction, or supplier/customer engagement.

For any other near-term targets, cross-sector methods can be used following the SBTi Corporate Near-Term Criteria and SBTi Corporate Net-Zero Standard Criteria.

For scope 3 long-term targets, supplier/customer engagement targets may not be used. All other applicable target-setting methods may be used.

General rules and guidance for target-setting for non-buildings-related emissions are found in the SBTi Corporate Near-Term Criteria and SBTi Corporate Net-Zero Standard Criteria. Additional sector-specific guidance can be found in the table below. See Section 7 for target-setting guidance for FIs' financed emissions.

Sector-specific target-setting method for whole building in-use operational emissions (scopes 1, 2 and 3)

In-use operational emissions SDA

The sector pathways for in-use operational emissions enable companies to set an emissions intensity reduction target that converges to a buildings sector-specific intensity. It is derived from the 1.5°C in-use operational emissions pathways developed by CRREM and the SBTi for the buildings sector.

Owner-occupiers and owner-lessors shall use the buildings in-use operational emissions SDA, and for property managers the buildings in-use operational emissions SDA is recommended as it is more ambitious than the cross-sector absolute reduction method.

> **Note**
>
> While delineation between scopes 1, 2 and 3 is unnecessary for considering whole building in-use operational emissions, this is not the same for scope 3 categories. This is because the in-use operational emissions SDA is based on a building's annual operational energy emissions in the use phase, and for some scope 3 categories (e.g., scope 3 category 11 use of sold products in the case of developers), the in-use operational emissions of a building are calculated over its lifetime, rather than annually, to comply with the GHG Protocol.[29] In which case, the buildings in-use operational emissions SDA cannot be used and an alternate target-setting method should be applied.

Sector-specific target-setting methods for upfront embodied emissions

The SBTi has developed two sector-specific target-setting methods for users to set targets on upfront embodied emissions for new buildings. Both methods are more ambitious than the previous cross-sector well-below 2°C absolute reduction method, and will help companies set ambitious targets on their upfront embodied emissions, which is a key aim of the Buildings Criteria:

1. **Buildings upfront embodied emissions SDA**

   The sector pathway for upfront embodied emissions enables companies to set an emissions intensity reduction target that converges to a buildings sector-specific intensity. It is derived from the 1.5°C upfront embodied emissions pathway developed by Ramboll and SBTi for the buildings sector (see Appendix B for further details).

2. **Buildings sector-specific absolute reduction method**

   This method is a sector-specific method that functions similarly to the SBTi's cross-sector absolute reduction method. Absolute emissions are reduced by an amount that is, at a minimum, consistent with the buildings sector-specific pathway; in this case the relevant 1.5°C upfront embodied emissions pathway developed by the SBTi. For the buildings sector, the minimum annual sector-specific reduction is 3.1% annually. This method is currently only applicable to upfront embodied emissions, as stated in **Buildings-C4**.

29 GHG Protocol, Chapter 11. See Section 5.3 for further details.

CALCULATE EMISSIONS INVENTORY

In this step, companies should collect data for emissions for their base year and most recent year. All GHG accounting for target setting shall follow SBTi's general Criteria Assessment Indicators, the Buildings Criteria Assessment Indicators, the GHG Protocol Corporate Accounting and Reporting Standard and the relevant accounting guidance in Section 5. If required to use the Buildings SDA, users shall also collect additional data, as outlined below.

Data points necessary for companies to use the Buildings SDAs

To set a science-based target using the in-use operational emissions or upfront embodied SDA, intended users of the SBTi Buildings Criteria shall collect the following data:

- Base and target year[30] floor area, split by each applicable building typology and geographical region covered by the pathways.[31]
- Base year emissions (in-use operational and/or embodied emissions).
- If the most recent year is not used as a base year, the GHG inventory of the most recent year shall be calculated.

6.2.1 Selecting a representative base year

Companies need to establish a base year to set meaningful targets, and track and report emissions performance consistently and meaningfully over their target period.

As such, it is important that base year emissions should be representative of a company's typical emissions profile. Due to potential fluctuations in activity across buildings portfolios, intended users of the SBTi Buildings Criteria may use either different base years for different targets or a rolling base year to set targets.

In this way, companies can assess representativeness of data by comparing inventories and business activity levels over time for the purpose of setting buildings-related targets. If it proves challenging to identify a single year that is representative, companies should instead average GHG data over multiple consecutive years (one of which shall be the chosen base year) to form a more representative base period that flattens out fluctuations in emissions. The maximum duration of the rolling base year is three years.[32]

Companies using different base years for different targets or a rolling base year may be required to provide additional evidence during validation to prove that it meets the 67% requirement for scope 3 target coverage.

30 Unless using the "fixed market share" option.

31 Geographic breakdown of floor area is not required for the upfront embodied SDA as these pathways are global.

32 For the avoidance of doubt, averaging GHG data over multiple consecutive years is only permitted in this case to determine a representative base year. Averaging emissions over consecutive years should not be used to determine whether a company has met its target emissions intensity in its target year or to report interim performance.

CONSTRUCT TARGETS

To construct their SBTs, intended users should follow these steps:

1. Forecast annual floor area figures to the target year (for SDA targets only).
2. Input the emissions inventory data from previous steps into the target-setting tools provided to calculate the reductions required for valid targets for scopes 1, 2 and 3 following the additional guidance and examples in this document.
3. Decide on target wording according to the SBTi Target Submission Form and the examples given in this document.

6.3.1 Guidance on target setting

Target-setting guidance and a selection of examples are provided throughout the Buildings Criteria and this explanatory document.

6.3.2 Combined-scope targets

Targets covering annual whole building in-use operational emissions will by design combine emissions across scopes 1, 2 and 3. When using the buildings in-use operational emissions SDA, the individual scope components of these targets shall be submitted separately for validation as indicated in the Buildings Annex. When disclosing the progress against targets, companies can use the total emissions figure for in-use operational emissions, following the target wording. Additionally, companies shall report scopes 1, 2 and 3 separately as part of their GHG inventory, in line with the GHG Protocol; however, in this case, a company's scopes 1 and 2 may not be identical to its buildings-related scopes 1 and 2.

As per SBTi general criteria, other targets that combine scopes (1+2 or 1+2+3) are permitted if the SBTi can review the ambition of the individual components of the target and confirm that each individual component meets the relevant ambition criteria.[33]

Targets that are an aggregation of different target-setting methods, are permitted only where the following conditions are met:

- Data is submitted for validation that allows the ambition level of each scope or element to be checked separately.
- Aggregation is technically feasible, e.g., two different SDA-based targets such as tCO_2 / t cement produced and tCO_2 / m^2 floor area cannot be aggregated as intensity targets since the denominators are different, whereas two absolute targets could be aggregated into one.
- Where intensity targets are converted to absolute targets, it is a requirement that the underlying intensity targets or sub-targets are also reported.

33 See SBTi Corporate Near-Term Criteria, SBTi Corporate Net-Zero Standard Criteria, SBTi's general Criteria Assessment Indicators and the Buildings Criteria Assessment Indicators.

6.3.3 Using the SBTi Buildings Target-Setting Tool

Related criteria: **Buildings-C5**

The 1.5°C buildings pathways are integrated into SBTi's Buildings Target-Setting Tool. The tool, and the sections below, contain instructions for how the tool shall be used.

Selecting the correct growth rate in the tool

The SBTi Buildings Target-Setting Tool requires the user to input a company's growth rate/activity projection as part of the SDA target calculation. This input differs on whether the target is being set for in-use operational emissions or upfront embodied emissions like so:

- **For in-use operational emissions**, the company shall input its own projected floor area for the specific building typology and geography corresponding to its chosen target year.
- **For upfront embodied emissions**, the company shall input its projected newly constructed floor area for the specific building typology corresponding to its chosen target year.

In addition to the growth rate provided by the company, the SBTi Buildings Target-Setting Tool offers a "fixed market share" option to input a company's growth rate/activity projection as part of the target calculation. When using the fixed market share, the company's percentage change in output over the target timeframe is assumed to be the same as the growth rate associated with the pathway. Care should be taken to choose the correct option, as growth rate relative to the global rate will affect the intensity target calculated. If the company's growth is expected to be different from the global rate associated with the pathway, the company should provide its own growth projections to get accurate targets.

Care should also be taken to choose the correct inputs and a credible growth estimation to avoid target recalculations later on.

Selecting a building type

In-use operational emissions

Users should align their assets and target-setting approach as closely as possible with the available typologies in the SBTi Buildings Target-Setting Tool; however, some assets may not be accurately covered by any typology, e.g., places of worship, law courts, prisons (see Table 4 for the list of available typologies).

Where a building's type is not covered by the existing definitions provided, a default pathway is available in the tool, named 'Other'.

Companies submitting targets should provide an explanation in the Buildings Annex for using the default pathway. The default pathway shall not be used where another pathway is applicable.

The SBTi may choose to update and expand the available building typologies, and accompanying emissions pathways, in the future. It is recommended that users keep up to date with subsequent SBTi communications regarding the buildings sector, to ensure targets are aligned with the latest climate science and emissions pathways for the sector.

Embodied emissions

Three embodied emissions typologies are provided in the SBTi Buildings Target-Setting Tool: residential, office and retail (see Table 5).

Where a building's type is not covered by the existing definitions provided, a default typology, 'Other', is available in the tool. Companies submitting targets should provide an explanation in the Buildings Annex for using the default pathway. The default pathway shall not be used where another pathway is applicable.

Approach for mixed-use buildings

The approach for mixed-use buildings is different for in-use operational and upfront embodied emissions accounting as outlined below.

1 Mixed-use buildings in in-use operational target setting

When using the Buildings Target-Setting Tool for mixed-use assets, users should only include the emissions (and associated floor area) from the relevant typology, and set targets on different building typologies separately (see the box below for an example). The proportional floor areas by typology shall be the sum of the total floor area of the mixed-use building.

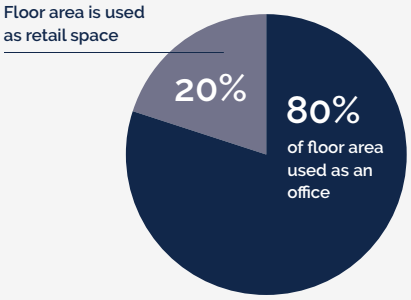
For mixed-use assets reporting for in-use operational emissions where one typology represents at least 90% of the floor area, companies may select the typology which represents the highest share of floor area of the building (e.g., a building with 92% residential and 8% retail space could be categorized as 100% residential).

2 Mixed-use buildings in upfront embodied target setting

For mixed-use assets, companies should select the typology which represents the highest share of floor area of the building (e.g., a building with 40% residential and 60% retail space would be categorized as 100% 'retail').

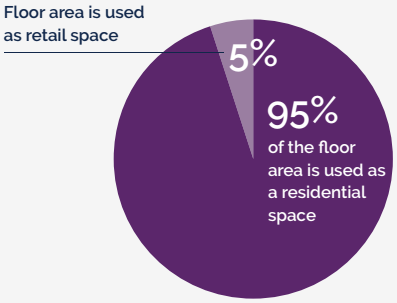
Example of mixed-use buildings in in-use operational emissions target setting

Building A has a total floor area of 20,000 m^2. Its usage is split as follows:



When calculating their base year floor area inventory for 'Section A4: Enter emissions and activity data' in the tool, they will input 16,000 m^2 (80% of Building A's floor area) to their total floor area for office buildings in their portfolio in base year. Similarly, they will also add 4,000 m^2 (20% of Building A's floor area) to their total retail floor area.

Building B has a total floor area of 10,000 m^2. Its usage is split as follows:



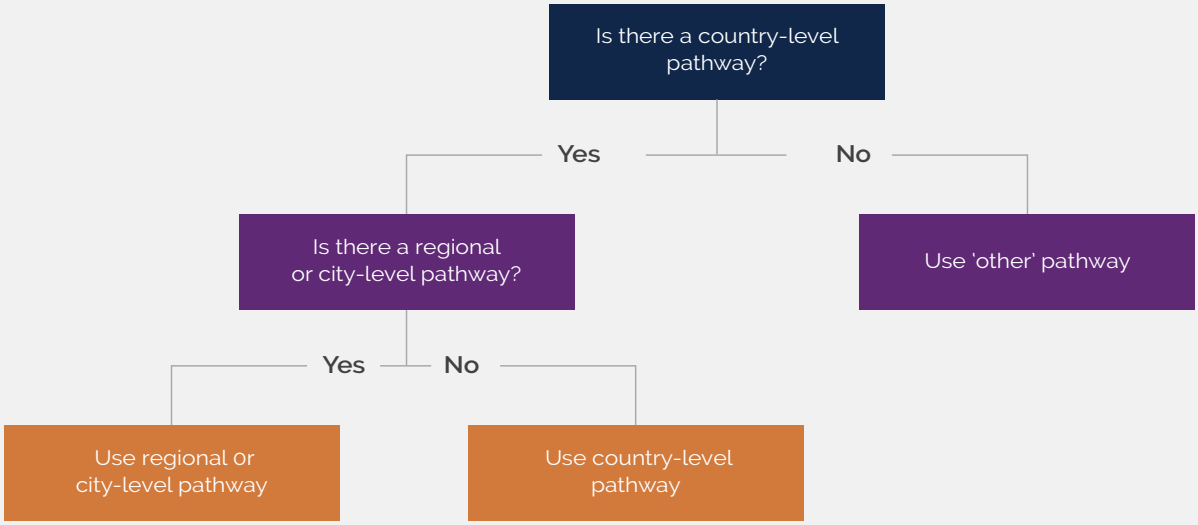
When calculating their base year floor area inventory for 'Section A4: Enter emissions and activity data' in the tool, they will input 10,000 m^2 (100% of Building B's floor area) to their total floor area for residential buildings in their portfolio in base year.

6.3.4 Selecting a building's geography

In-use operational emissions

Decarbonization pathways for a number of geographic regions (e.g., sub-regions, countries, cities) are provided in the SBTi Buildings Target-Setting Tool. It is recommended that users align their assets as closely as possible with the available geographies in the tool; however, some assets may not be adequately covered by the geographic breakdowns provided. Where an asset is located outside of one of these locations, an 'Other' pathway is available (applicable to all building types). Users shall use the most precise applicable pathway for their buildings. For example, if a city-level pathway exists for a particular building (Houston), it is not permissible to instead select the associated country-level pathway (USA) for that building.

Figure 6. Selecting the in-use operational pathway based on geographical location



Further guidance is available in the SBTi Buildings Target-Setting Tool.

Embodied emissions

Embodied emissions pathways in the SBTi Buildings Target-Setting Tool are provided at a global level only.

6.3.5 Examples of target wording

SDA target wording examples

> "[Company X/FI name] commits to reduce scope [1, 2 and 3] in-use operational GHG emissions of owned and leased buildings [xx.x]% per m² by [TARGET YEAR] from a [BASE YEAR] base year."
>
> "[Company Y/FI name] commits to reduce upfront embodied scope 3 GHG emissions of new buildings [xx.x]% per m² by [TARGET YEAR] from a [BASE

Sector-specific absolute contraction target wording example

> "[Company Z/FI name] commits to reduce upfront embodied absolute scope 3 GHG emissions of new buildings [xx.x]% by [TARGET YEAR] from a [BASE YEAR] base year."

Target wording for targets formulated with cross-sector methods

Companies that want or are required to set additional targets can find guidance and target wording examples in the SBTi Corporate Near-Term Criteria and SBTi Corporate Net-Zero Standard Criteria.

6.3.6 Additional commitments

Related criteria: **Buildings-C14**, **Buildings-R10**

The buildings sector is a significant contributor to global emissions, as described in the introductory sections of this document. Following the IEA's Net-Zero Emissions by 2050 Scenario, the pace of retrofits of existing buildings needs to more than double over the decade, with one in five buildings worldwide retrofitted to be zero-carbon-ready[34] by 2030 (IEA, 2021). Therefore, it is imperative that companies put equal emphasis on energy efficiency in their buildings portfolios, including the energy supplies used. The steep decarbonization needed in the buildings sector emphasizes the importance of adopting innovative design practices focused on optimizing performance and reducing reliance on fossil fuels.

To safeguard the GHG emissions reductions and that priority is put on energy efficiency and supplies, the SBTi Buildings Criteria includes two additional commitments to complement the GHG emissions reductions targets:

- A requirement to commit to no new fossil fuel equipment (**Buildings-C14**); and
- A recommendation to commit to implement energy efficiency improvements (**Buildings-R10**).

Commitment to no new fossil fuel equipment

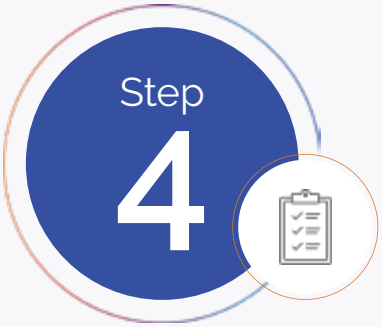
The commitment language will be posted on the SBTi website, along with the target language.

Companies may provide additional context for their commitment as a part of their reporting progress against targets. Content of this additional information is not validated by the SBTi and is not required to be submitted as a part of the validation documents.

Energy efficiency commitment

Companies willing to commit to energy efficiency improvements (**Buildings-R9**) may report their energy efficiency strategies and targets as a part of their reporting progress against targets. Content of this additional voluntary commitment is not validated by the SBTi and is not needed to be submitted as a part of the validation documents.

34 Highest energy efficiency class based on local rating schemes and either uses renewable energy directly or uses an energy supply that will be fully decarbonized by 2050, such as electricity or district heat (IEA, 2023).



SUBMIT TARGETS TO THE SBTi

Companies should follow the general SBTi guidelines for submitting a target for validation. The following sections include some additional criteria and recommendations for buildings sector companies.

6.4.1 Submission of targets and additional evidence

To determine if your buildings-related targets are science-based, the SBTi's team of validation experts will review your submission, validate it against our science-based criteria and communicate a decision and detailed feedback. Intended users of the Buildings Criteria shall therefore complete the relevant forms as clearly, completely and accurately as possible, as well as provide additional evidence to demonstrate that targets meet all criteria in terms of timeframe, emissions coverage, and ambition when disaggregated by typology and geography. The additional evidence shall include all disaggregated emissions and activity data per building type and geography, as well as individual target calculations using the SBTi Buildings Target-Setting Tool which correspond to the individual geographies and typologies present in the user's portfolio. While users are not required to publicly report this additional evidence, the information will be used to validate buildings-related targets.

6.4.2 Recalculation and target validity

According to the SBTi general guidance, targets must be reviewed, and if necessary, recalculated and revalidated, at a minimum every 5 years. Additionally, existing targets shall be recalculated, as needed, to reflect significant changes[35] that could compromise relevance and consistency of the existing target.[36] These include significant changes in company structure and activities, significant adjustments to the base year inventory, and/or changes in data to set targets such as growth projections.

Within the buildings sector, the following may indicate significant changes that should trigger a target recalculation:

- Significant changes in the building typology and/or geographical composition of portfolios.
- New geographies and/or building typologies are added to the portfolio (e.g. through acquisition, development, or business expansion).
- A significant proportion of the total portfolio floor area, as stated in the base year, has changed building typology due to major renovations.[37]
- Acquisition or development of new buildings leading to a potential change in whether the condition in Buildings-C2 is met, resulting in the user being defined as first owner and thus being required to set an upfront embodied emissions target.

35 'Significant change(s)' correspond to the significance threshold defined in the Criteria Assessment Indicators.
36 Please refer to the SBTi Corporate Net-Zero Standard and the Criteria Assessment Indicators for the list of changes that should trigger a target recalculation.
37 Defined according to GRESB (Section 5.4.2).

To avoid the requirement for repeated rebaselining for companies whose operating model consists of frequent acquisitions and divestments, Section 6.4.3 outlines how these companies can set fixed intensity targets.

In addition to recalculating targets following significant changes, the SBTi recommends an annual review of the validity of targets developed using the Buildings Target-Setting Tool.

Defining significant changes within SDA targets

1. A building in an existing geography and building type enters or exits the portfolio:

   The change is considered significant if the floor area of that specific building type and geography deviates by 10% or more below the base year floor area, or exceeds the projected target year floor area by 10% or more.

2. A building outside existing geographies and building types enter the portfolio:

   The change is considered significant if any of the following conditions is met:

   - In-use operational scope 1 and 2 emissions change by 10% or more.
   - In-use operational scope 3 emissions change by 10% or more for buildings with all in-use operational emissions in scope 3.
   - Upfront embodied emissions change by 10% or more.

3. When assessing the need to recalculate the in-use operational emissions target, new and existing buildings entering the portfolio are treated similarly.

6.4.3 Fixed intensity targets for users with high turnover portfolios

The process of acquiring or divesting buildings adds complexity to target recalculation. This is due to different rates of acquisition, divestment and hold periods across business models and investment strategies in the buildings sector, affecting the stability of portfolios. Companies and FIs with a high level of turnover in their portfolios may therefore find portfolio-level target-setting methods challenging for the following reasons:

1. A reduced ability to effect building improvements due to short hold periods.
2. Difficulty in collecting complete and accurate whole building in-use operational emissions data (including tenant emissions).
3. A frequent requirement to recalculate targets due to regular, significant changes in the portfolio (as outlined in Section 6.4.2).

46 Defined according to GRESB (section 5.4.2)

To account for these challenges, the SBTi Buildings Criteria allows intended users whose business model results in a high turnover of assets, subject to the conditions below, to set fixed intensity targets aligned to sectoral decarbonization pathways for in-use operational emissions. This method requires companies to meet a specific portfolio emission intensity performance in the target year and exempts users from target recalculation in the intervening period.

This method works as follows (see worked example 6 for an example on how to set targets in Appendix D):

- Set an in-use operational emissions intensity target in line with the in-use operational emissions pathways for a chosen target year.
- Target year shall be five years from the base year.
- If needed, calculate an aggregated target year intensity by calculating the weighted average using the base year floor area.
- Commit to reporting portfolio emissions intensity annually for transparency. If the portfolio consists of several building types, calculate the weighted average using the floor area of the reporting year.
- Annual operational GHG emissions from the buildings shall be estimated using the emissions from the hold period. Companies may use other estimation methods if explained in the validation documents and used consistently until the target year.

To qualify for this target-setting method, the following conditions shall be valid:

- The user is classified as an owner-occupier, owner-lessor or an FI; and
- The user can demonstrate high portfolio turnover is integral to their business model. A non-exhaustive list of examples is provided below:
  - The user is an opportunistic fund, acquiring older, less efficient buildings and repositioning via refurbishment or redevelopment prior to sale, i.e., they may have no common assets over a 36-month period.
  - The user is an 'instant buyer', i.e., a real estate company that uses algorithms and technology to buy and resell residential buildings quickly.
  - The user has a historical and/or projected average buildings portfolio turnover ratio over the next 5 to 10 years of over 70%, where the yearly ratio is defined as:

$$\textit{Portfolio turnover ratio (\%)} = \frac{|\textit{Divested building floor area } (m^2)| + |\textit{Acquired building floor area } (m^2)|}{\textit{Average portfolio area } (m^2)} \times 100$$

Commitment language should take the following form:

> "[Company X/FI name] commits to reducing its scope [1, 2 and 3] in-use operational GHG emissions of owned and leased buildings to [xx.x] CO_2e per m^2 or below in [TARGET YEAR] target year."

6.4.4 Maintenance targets

Corporates and FIs[38] that are classified as owner-lessor, owner-occupier and/or FI, and meet the following conditions, may set an emissions intensity maintenance target up to 2030 for their buildings portfolio:

- Have a portfolio emissions intensity that is at or below the 2050 sector intensity level in a 1.5°C-aligned pathway for its building typology- and geography-specific pathway; and
- Have a commitment to maintain the base year portfolio emissions intensity through 2030 and only finance and/or own and/or lease 1.5°C-aligned real estate assets.
    - Where 1.5°C-aligned financing for the real estate sector is defined as a commitment to only finance new developments that are zero-carbon-ready (i.e., highest energy efficiency class based on local rating schemes and either uses renewable energy directly or uses an energy supply that will be fully decarbonized by 2050, such as electricity or district heat) and/or existing developments if they have an emissions reduction plan consistent with limiting warming to 1.5°C with no or limited overshoot.

This maintenance target aims to accommodate corporates and FIs that have already achieved, at a portfolio level, the emissions intensity required to align with the 2050 sector intensity level in a 1.5°C pathway.

Corporates and FIs that have several different building typologies and countries in their buildings portfolios, can choose the lowest target year intensity of the relevant pathways as target-setting entities are free to set targets that are more ambitious than the tool outputs.

Commitment language should take the following form:

> "[Company X/FI name] commits to maintain its scope [1, 2 and 3] in-use operational GHG emissions of owned and leased buildings at or below [xx.x] CO_2e per m^2 up to [TARGET YEAR] from a [BASE YEAR] base year."

38 FIs may refer to the SBTi Financial Institutions Near-Term Criteria and SBTi Financial Institutions Science-Based Targets Explanatory Document for additional options to set maintenance targets.

ADDITIONAL GUIDANCE FOR FINANCIAL INSTITUTIONS' FINANCED EMISSIONS

ADDITIONAL GUIDANCE FOR FINANCIAL INSTITUTIONS' FINANCED EMISSIONS

Note

The SBTi strongly recommends that FIs thoroughly review the SBTi Buildings Criteria and this explanatory document in full before developing targets.

7.1 INTRODUCTION AND TARGET AUDIENCE

FIs play a critical role in providing the necessary funding and financing solutions that enable the various players throughout the buildings value chain to undertake their activities. This financing can come in the form of loans, bonds or equity investments to support the development and construction of new assets, acquisition of existing assets, and ongoing management and maintenance of properties (including through refurbishments, renovations, and upgrades).

In order to accelerate the decarbonization of the buildings sector it is therefore important for FIs to be able to set SBTs on their investment and lending portfolios related to real estate[39] assets and companies, demonstrating their commitment to align their portfolio emissions reductions to limit global temperature increase to 1.5°C above pre-industrial levels.

7.1.1 Context and target audience for this guidance

This section builds on existing SBTi guidance (Financial Sector and Private Equity Sector) to provide FIs with additional target-setting criteria and recommendations for investments and lending activities related to the buildings sector, aligned to a sector-specific 1.5°C decarbonization pathway. Any deviation from existing criteria has been highlighted.

39 Many FIs are familiar with the term real estate when considering their financing activities. While there are meaningful differences between the terms 'real estate sector' and the 'buildings sector', in this section they are considered analogous and used interchangeably.

For detailed guidance on setting targets as an FI, please refer to the SBTi Financial Institutions Near-Term Criteria and Private Equity Sector Science-Based Target Guidance.

The SBTi defines an FI as a company whose business involves the arrangement and execution of financial and monetary transactions, including deposits, loans, investments and currency exchange (SBTi, 2022a). More specifically, the SBTi deems a company an FI if 5% or more of its revenue comes from the activities described above. In practice, the primary audience includes banks, asset managers,[40] asset owners (pension funds, closed-end funds, insurance companies), private equity firms and mortgage real estate investment trusts (REITs). This framework is also relevant for any FI that meets the definition above and has holdings in the following asset classes related to the buildings sector, where target-setting methods are currently available:

- Real estate assets
- Mortgages
- Corporate loans
- Equity (investment)
- Fixed income (investment)

Asset classes beyond this list are currently out of scope. Bilateral and multilateral development FIs (e.g., the World Bank) are not considered an intended user of the SBTi Buildings Criteria and this explanatory document.

Equity REITs, defined as real estate companies that own and/or manage income-generating properties and lease them to tenants, shall pursue the regular target validation route for companies and should refer to Section 6 of this document for further guidance.

7.2 HOW TO SET SCIENCE-BASED TARGETS

7.2.1 Measuring financed emissions to facilitate target-setting

Harmonized measurement and disclosure of financed emissions (scope 3 category 15) are key to ensuring comparability and transparency among FIs. The SBTi has identified the Global GHG Accounting and Reporting Standard for the financial industry, developed by the Partnership for Carbon Accounting Financials (PCAF), as a freely available approach to measure portfolio-wide or asset-level-financed emissions.

The Accounting and Reporting of GHG Emissions from Real Estate Operations authored by PCAF, GRESB, and CRREM builds on the PCAF Standard to provide real estate sector-specific guidance that is applicable to FIs.

40 Real estate asset managers who tactically manage investments and their related properties, must pursue the regular target validation route for companies and should refer to Section 7 of this document for further guidance.

7.2.2 Approaches to setting scope 3 portfolio targets

The SBTi supports four methods for FIs to set targets on their investment and lending portfolios: the sector-specific intensity convergence (SDA) method, the SBTi Portfolio Coverage method, the Temperature Rating method and the Fossil Fuel Finance Target method. The last method is not relevant for the buildings sector. The SBTi Financial Institutions Science-Based Targets Explanatory Document includes guidance on the target-setting methodologies and tools for FIs to set near-term targets. These methods use asset class approaches to link FIs' investment and lending portfolios with climate stabilization pathways. An asset class-oriented approach was chosen for this framework to take into consideration the varying degree of data availability, market liquidity and levels of ownership of different asset classes.

Among these four methods, the SDA is the only approach that requires emissions measurement on an asset level. **As the SDA is also the only sector-based approach, it will be the focus of the guidance provided in this document**.

It is worth noting that while FIs may wish to aggregate their emissions data across multiple asset classes (e.g., equity investment in real estate companies, commercial real estate lending), in order to set a target on their real estate activities as one sector-level target; this approach may not be practical given the emissions data that would be needed. In addition to the SDA, FIs with a high turnover in their portfolio may use a fixed intensity target, provided they meet the eligibility criteria. Please see Section 6.4.3 for further details.

The SBTi Portfolio Coverage and Temperature Rating methods take an engagement-oriented approach focused on portfolio companies' actions to measure and reduce emissions. Both methods are applicable to all sectors for the corporate instrument asset classes.

The SBTi Portfolio Coverage method is a financial sector analogue to supplier engagement targets for "real economy" companies' scope 3 emissions. The Temperature Rating method expands the scope of the SBTi Portfolio Coverage method and enables FIs to assess the ambition of portfolio companies based on their public GHG reduction targets, as compared to approved SBTs only.

FIs may use one or more of these methods to develop asset-class level targets for an SBT submission. Please refer to the SBTi Financial Institutions Near-Term Criteria and SBTi Financial Institutions Science-Based Targets Explanatory Document for an overview of the methods by relevant asset class, followed by a description of each method.

7.2.3 Compiling a GHG inventory

Care has been taken in these criteria and explanatory documents to draw on existing GHG accounting guidance for the real estate sector, clarifying where necessary, and indicating which emissions shall be included within an FI's target boundary for the purposes of setting SBTs.

Setting organizational and operational boundaries for financial institutions

To simplify target setting, the SBTi Financial Institutions Near-Term Criteria requires FIs to use the operational control or the financial control approaches in line with the GHG Protocol when accounting for emissions, and include all investment and lending activities in scope 3 category 15 "investments" (financed emissions).[41]

FIs shall impose the PCAF Standard for the purpose of delineating emissions for scopes for accounting of financed emissions in the real estate sector. In practice, this means applying an operational boundary over the whole building and an attribution method based on a proportional share. The PCAF, GRESB & CRREM technical guidance provides further guidance on this topic to increase comparability and avoid double counting and emissions omissions.

Furthermore, FIs can finance and invest in building assets in various ways and do so for different purposes, including their own use, acting as an owner-lessor, and/or for investment purposes (through equity investment or loans to finance/refinance the acquisition or construction of a building). This has implications for how emissions are accounted for and reported according to different scopes and categories by each intended user. The main drivers between how and where emissions are reported are:

1. The chosen consolidation approach by the FI.
2. Whether the FI is also leasing the building to others or acting only as an investor/lender.

GHG accounting for lessors of real estate (wholly owned, majority equity share, or controlling partner) shall follow the GHG Protocol Corporate Standard, whereby the consolidation approach will match the objectives of the reporting of the FI (PCAF, GRESB & CRREM, 2023). These are **not considered financed emissions.**

41 See the SBTi Financial Institutions Near-Term Criteria and SBTi Financial Institutions Science-Based Targets Explanatory Document for further information.

Non-controlling actors (minority equity investments or lenders) in real estate will follow the PCAF Standard, whereby the relevant emissions (considered financed emissions and accounted for in scope 3, category 15 "investments") are attributed to the appropriate level of aggregation using the relevant financial share metric (PCAF, GRESB & CRREM, 2023). This approach means that the emissions from a single building can be distributed across scopes 1, 2 and 3.

Therefore, for the purposes of setting SBTs:

1. Where an FI is an owner (occupier or lessor) of a building they should refer to Section 6 for guidance on target-setting, following the GHG Protocol Corporate Standard. These emissions are not considered financed emissions.

2. Where an FI finances real estate through investment or lending activities they should refer to the criteria and guidance in Section 7. These emissions are considered scope 3 category 15 "financed emissions".

Whole building approach for FIs

FIs shall include all in-use operational emissions from the entire building in GHG accounting ('whole building approach'). This requires the quantification of all in-use operational GHG emissions (including fugitive emissions) of buildings in operation, irrespective of the organizational boundaries or control approaches used by various stakeholders in their corporate reporting. This is referred to as the 'whole building approach' (PCAF, GRESB & CRREM, 2023).[42]

Note that this approach does not contradict existing methods to allocate emissions to multiple investors based on the appropriate control approach or using PCAF attribution methods for real estate, and so these should still be used. In essence, the 'whole building approach' ensures that in-use operational emissions from both landlord and tenant spaces, which have not always been considered together in the past, shall be included in the user's target boundary.

42 See Section 5.1 for more information about the 'whole building approach'.

In-use operational emissions from real estate

Table 7 summarizes the ways in which FIs finance real estate and how this affects the accounting of emissions from their investments in buildings as assets.

Table 7. In-use operational emissions for FIs[43]

INVESTOR/ LENDER ACTIVITY	USE OF ASSET	GHG EMISSIONS CLASSIFICATION FOR THE INVESTOR /LENDER	ARE THESE CONSIDERED FINANCED EMISSIONS?	GHG EMISSIONS ACCOUNTING FOR TARGET SETTING
Directly invests (equity) into a real estate asset and is a **majority** equity shareholder or controlling partner in a joint venture.	Investor occupies the building, for their own use (e.g. as their headquarters).	Investor's scope 1 and 2.	No	These are not considered financed emissions, however, for the purposes of setting SBTs these assets shall be included within an investor's target boundary. See Section 6 for guidance on how to set targets as an owner-occupier. The investor shall abide by the whole building approach for in-use operational emissions.
	Investor acts as an owner-lessor.	Depending on the chosen consolidation approach and the lease type, these emissions are accounted for in the lessor's scope 1 and 2, and/or scope 3 Cat 13 "downstream leased assets".	No	Investors shall follow the GHG Protocol Corporate Standard, whereby the consolidation approach will match the reporting objectives of the FI. See Section 6 for guidance on how to set targets as an owner-lessor. The investor shall abide by the whole building approach for in-use operational emissions, ensuring that emissions from lessor and tenant spaces are included within the target boundary.
Directly invests (equity) into real estate asset and is a **minority** equity shareholder **or** any **debt investment** into a real estate asset (acting as a lender), **including mortgages**.	The use of proceeds is **known**, however, the investor/ lender typically **cannot** dictate how the asset is used.	Considered financed emissions and accounted for in the investor/lender's scope 3 category 15 investments.	Yes	Investor/lender shall follow the PCAF Standard, with the relevant emissions attributed to the appropriate level of aggregation using the appropriate financial share metric. The investor/lender shall abide by the whole building approach, accounting for their proportional share of whole building in-use operational emissions.

43 Adapted from Accounting and Reporting of GHG Emissions from Real Estate Operations, 2023.

INVESTOR/ LENDER ACTIVITY	USE OF ASSET	GHG EMISSIONS CLASSIFICATION FOR THE INVESTOR /LENDER	ARE THESE CONSIDERED FINANCED EMISSIONS?	GHG EMISSIONS ACCOUNTING FOR TARGET SETTING
Indirect investment into a real estate asset (e.g. through investment into a listed or unlisted real estate company,[44] REIT, or fund, and business loans, corporate bonds etc.).	The use of proceeds is **unknown**, therefore the investor **cannot** dictate how the asset is used.	Considered financed emissions and accounted for in the investor/lender's scope 3 category 15 investments.	Yes	Investor/lender shall follow the PCAF Standard, with the relevant scope 1, 2, and 3 emissions attributed to the appropriate level of aggregation using the appropriate financial share metric. The investor/lender shall abide by the whole building approach, accounting for their proportional share of whole building in-use operational emissions, even if these are categorized in the investee's scope 3.[45]

Embodied emissions from real estate

The SBTi's Buildings Criteria related to embodied emissions are focused on upfront embodied emissions as defined in Section 4.3.3. FIs may set targets on upfront embodied emissions from their loans and investments in real estate; however, this is currently optional.

Table 8. Optional target setting for embodied emissions for FIs

INVESTOR/LENDER ACTIVITY	INCLUSION OF UPFRONT EMBODIED EMISSIONS IN TARGET BOUNDARY
Directly invests (equity) into a real estate asset and is a **majority** equity shareholder or controlling partner in a joint venture.	**Required, if threshold is met in Buildings-C7.** These are not considered financed emissions and the FI should follow guidance in Section 5 and Section 6 for building first owners, with emissions categorized under scope 3 category 2 capital goods.
Directly invests (equity) into real estate asset and is a **minority** equity shareholder **or** any **debt investment** into a real estate asset (acting as a lender), **including mortgages**.	**Optional.** This would cover the majority of cases where FIs lend to building owners, developers, and construction companies to finance/refinance the purchase, development, or construction of buildings.
Indirect investment into a real estate asset (e.g. through investment into a real estate company,[46] REIT, or fund listed or unlisted, business loans, corporate bonds etc.).	**Optional.**

44 For example REITs, developers, property management companies, construction companies, housing providers etc.

45 For example, FI A invests in a publicly traded REIT which owns and leases buildings. The in-use operational emissions from tenant consumption in the REIT's buildings must be included in FI A's GHG inventory and target boundary.

46 For example REITs, developers, property management companies, construction companies, housing providers etc.

Targets on upfront embodied emissions set using the available methods for upfront embodied emissions should be separate and not aggregated with in-use operational emissions targets or any other targets on embodied emissions from other stages, i.e., in-use or end-of-life embodied emissions.

Additional disclosure recommendation for FIs

All FIs are strongly encouraged to report data on embodied emissions (at any life cycle stage, but particularly for upfront embodied emissions) for buildings they acquire or finance (**Buildings-FI-R1**).

For example, FIs should report the emissions intensity of total construction emissions per square meter for a given building, measured at practical completion, for any building they acquire or finance through loans to owners, developers or constructors. This disclosure will increase transparency and data collection, and support future target setting on these emissions.

7.2.4 Defining the boundary of portfolio targets

To seek approval from the SBTi, FIs shall follow the criteria in the SBTi Financial Institutions Near-Term Criteria to set target(s) on their investment and lending activities.[47] Depending on the composition of their portfolios, an FI may be able to meet criteria using methods that do not require measurement of financed emissions. Therefore, it is possible that FIs do not need to quantify any financed emissions of their holdings or only need to do so in a partial manner.

Financial sector activities have been organized into three categories: required, optional and out-of-scope activities, to determine the target boundary. For detailed guidance on the minimum boundary of portfolio targets for FIs, including definitions of required, optional and out-of-scope activities, see SBTi Financial Institutions' Near-Term Criteria.

7.2.5 Description of methods to set portfolio targets

This section provides a sector-specific overview of methods available to set targets on FIs' investment and lending portfolios in the buildings sector.

Sector-specific intensity convergence approach (SDA)

The sector-specific intensity convergence (or SDA) is a method for setting physical intensity targets that uses convergence of emissions intensity. An intensity target is defined by a reduction in emissions relative to a specific business metric, such as production output of the company (e.g., metric tonne CO_2e per tonne product produced, e.g., cement). For buildings, this is metric tonne CO_2e per m^2 of floor area. In the buildings sector, two distinct sets of decarbonization pathways utilizing the SDA method were developed, one for in-use operational emissions and another one for upfront embodied emissions.

The SDA is the only applicable method for several asset classes, as specified in the SBTi Financial Institutions' Near-Term Criteria. For the remaining asset classes, the SDA can be used on its own or with one or both other methods to collectively meet the minimum required boundary coverage. FIs should refer to the SBTi Financial Institutions' Near-Term Criteria for further details on calculating emissions intensities for SDA targets. Detailed guidance on the methods to calculate financed emissions per asset class is provided in the PCAF Standard (2022).

47 Partial targets will not be officially recognized and published by the SBTi even if they meet all relevant criteria.

Calculating the portfolio emissions intensity is the first step FIs need to take to set emissions-based targets. This is followed by converging the projected emission intensity to the same level as the sector-specific decarbonization pathway in 2050.

SDA for real estate

A real estate investment is the allocation of capital for partial or full ownership of property. This can be through direct (equity) investment into a property or through lending for commercial real estate.

Required targets on a real estate portfolio are set using the 1.5°C in-use operational decarbonization pathways, disaggregated by building typology and geography accordingly. FIs shall abide by the 'whole building approach' when accounting for the in-use operational emissions of buildings.

FIs should use the SBTi Buildings Target-Setting Tool to set targets on their real estate portfolios. FIs are currently permitted to continue using the existing mortgages and real estate target-setting tool. However, this tool will be retired at a later date.

SDA for mortgages (consumer loans)

A mortgage is a lending agreement to purchase a residential property in exchange for a regular repayment at interest, which the lender is entitled to with the condition that the loan becomes void upon the payment of the debt. Residential property refers to a building for a single family or multifamily that is used primarily for human dwelling (i.e., apartments and houses).

Required targets on a mortgage portfolio are set using the 1.5°C in-use operational decarbonization pathways, disaggregated by building typology and geography accordingly. FIs shall abide by the 'whole building approach' when accounting for the in-use operational emissions of the household.

FIs should use the SBTi Buildings Target-Setting Tool to set targets on their real estate portfolios. FIs are currently permitted to continue using the existing mortgages and real estate target-setting tool. However, this tool will be retired at a later date.

SDA for corporate instruments

This methodology covers listed equity, private equity, corporate bonds and corporate loans. Targets are set on the relevant "Required Activities" available in the SBTi Financial Institutions' Near-Term Criteria.

Regarding the emissions scopes of investee/borrower companies that shall be included in the targets, FIs shall abide by the approach as set out by user type in Section 6.1.2, including, at a minimum, the required scope 3 emissions for that user type. For instance, FIs' targets on lending to an equity REIT, categorized as an owner-lessor for the purposes of the SBTi Buildings Criteria, shall include their scope 1 and 2 emissions, as well as scope 3 category 13 "downstream leased assets" for in-use operational emissions in tenant spaces.

An exception to this is when the investee/borrower is categorized as a developer; for investments into this user type, FIs shall use an engagement approach to set SBTs (Portfolio Coverage or Temperature Rating) and cannot use the Buildings SDAs.[48]

FIs' targets for operational and embodied emissions shall not be combined and must be set separately.

48 This is because this user type is required to set targets on certain scope 3 emissions using non-SDA methods as part of their minimum requirements for SBTs. Developers must use the cross-sector absolute reduction method to set targets on scope 3 category 11 lifetime in-use operational emissions of sold buildings. As these emissions are not suitable for target setting using the buildings in-use operational SDA, FIs also cannot use the SDA method for financing activities of these user types.

Other target-setting methods: Portfolio Coverage for corporate instruments

FIs may use the SBTi Portfolio Coverage method to set targets on their corporate instrument asset classes, including corporate loans, listed equity and bonds, private equity and debt to drive adoption of science-based targets. This method can be used on its own or with the other methods to collectively meet the minimum coverage for all "Required Activities". See the SBTi Financial Institutions' Near-Term Criteria for further details on using this method.

FIs' borrowers and/or investees that are in scope of the buildings sector, shall follow the latest SBTi Buildings Criteria and recommendations for companies to set SBTs.

Other target-setting methods: Temperature Rating for corporate instruments

FIs may use the Temperature Rating method to address and cover corporate instruments, including corporate loans, listed equity and bonds, private equity and debt (see relevant "Required Activities" in the SBTi Financial Institutions' Near-Term Criteria). Under this approach, FIs determine the current temperature score of their portfolio based on the public GHG emissions reduction targets of their borrowers and/or investees. It enables FIs to set targets to align their base year portfolio temperature score to a long-term temperature goal. This approach can be used on its own or with the other four methods to collectively meet the minimum coverage for all "Required Activities." See the SBTi Financial Institutions' Near-Term Criteria for further details on using this method.

FIs' borrowers and/or investees that are in scope of the buildings sector shall follow the latest SBTi Buildings Criteria and recommendations for companies to set SBTs.

Approaches to set targets on other scope 3 categories

For FIs to focus their efforts on their investment and lending activities, the SBTi recommends, but does not require, that FIs measure emissions and set targets on scope 3 categories 1–14, except in the case of direct investment in real estate (acting as an owner-occupier or owner-lessor) where a whole-building in-use operational emissions target shall be set across scopes 1, 2 and 3, as stated elsewhere in this section.

7.3 HOW TO COMMUNICATE SCIENCE-BASED TARGETS AND TRACK PROGRESS

Refer to the SBTi Financial Institutions' Near-Term Criteria for further details.

7.4 TARGET RECALCULATION AND VALIDITY

General SBTi Financial Institutions' Near-Term Criteria are applicable, specifically on recalculation and target validity.

FIs should also refer to Section 6.4.2 in this document for further direction on this topic.

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The SBTi develops standards, tools and guidance which allow companies to set greenhouse gas (GHG) emissions reductions targets in line with what is needed to keep global heating below catastrophic levels and reach net-zero by 2050 at latest.

The SBTi is incorporated as a charity, with a subsidiary which will host our target validation services. Our partners are CDP, the United Nations Global Compact, the We Mean Business Coalition, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF).

The SBTi Buildings Criteria and supplementary resources were in advanced stages of development when the Standard Operating Procedure (SOP) for Development of SBTi Standards was adopted by the SBTi. Therefore, it has not been subjected to the procedures and processes outlined in the SOP.

Partners in developing the SBTi Buildings Criteria and this explanatory document

The SBTi developed the criteria and explanatory documents in technical partnership with PwC, a leading professional services network.

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Contributing authors

Karl Downey, Head of Sector Standards, SBTi
Ayla Dinçay, Buildings Lead, SBTi
Dan Dowling, PwC UK
Paul Bosworth, PwC UK
Mohammed Echcharqaouy, PwC UK
Vish Arora, PwC UK
Sara Atanasiu, PwC UK

Review team

Abhilash Desu, Senior Target Analyst, SBTi
Fernando Rangel Villasana, Corporate Decarbonization Lead, SBTi
Ginger Kowal, Research Manager, SBTi
Howard Shih, Technical Manager, Financial Institutions, SBTi
Lucas Bartol-Bibb, Validation Technical Lead, SBTi
Mona Karraoui, Head of Quality, SBTi
Saul Chambers, Head of Transport Sector, SBTi

Other contributors

Aamir Khan, Sector Standards Manager, SBTi
María García, Technical Buildings Manager, SBTi
Paulina Moreno, Communications Manager, SBTi

APPENDICES

APPENDICES

APPENDIX A. CHOICE OF EMISSIONS SCENARIOS FOR 1.5˚C

The SBTi's procedure for developing target-setting methods always begins with determining a representative set of emissions scenarios. Such emissions scenarios should meet SBTi's criteria of plausibility (credibility of narrative), responsibility (reduced risk of not meeting the 1.5°C goal), objectivity (not biased towards any particular industry or organization) and consistency (have a strong internal logic).

In 2015, the SBTi developed the sector-specific intensity convergence approach, a scientifically-informed method for companies to set GHG emissions reduction targets necessary to stay within a 2°C temperature rise above pre-industrial levels.

The IPCC's Special Report on Global Warming of 1.5°C was widely accepted as a warning that we shall limit the global temperature rise to 1.5°C above pre-industrial levels and reach net-zero carbon dioxide (CO_2) emissions by 2050 for the best chance of avoiding catastrophic climate breakdown. More recently, the IPCC 6th Assessment Report also highlighted the need to keep warming within a 1.5°C temperature rise. As such, the SBTi's Buildings Project focused on the development of new methodologies, tools, criteria and guidance for the sector that build on the previously developed sector-specific intensity convergence methodology for buildings to create 1.5°C-aligned resources.

In particular, the SBTi's Buildings Project aimed to achieve three objectives:

1. Establish a global pathway for buildings' in-use operational emissions aligned with 1.5°C.
2. Establish a global pathway for buildings' upfront embodied emissions aligned with 1.5°C.
3. Issue guidance on emissions accounting and reporting, as well as target-setting and validation.

By setting emissions reduction targets in line with this goal and defining appropriate decarbonization strategies, companies in the buildings sector can help accelerate the transition to a net-zero economy and prevent the worst effects of climate change.

APPENDIX B. DEVELOPMENT OF THE DECARBONIZATION PATHWAYS

The SBTi published an assessment of possible 1.5°C emissions scenarios for all sectors in its Pathways to Net-Zero: SBTi Technical Summary (2021). This reviewed estimates of the remaining emissions budget, top-down mitigation scenarios, and sectoral studies to determine 1.5°C-aligned pathways at the global and sectoral level. According to the IPCC, the remaining budget to limit global warming to 1.5°C with a 50% probability is about 500 GT of CO_2 (IPCC, 2021). In aggregate, 1.5°C-aligned pathways used by the SBTi stay within the 500 GT carbon budget and reach net-zero CO_2 at the global level by 2050, under the assumption of at least 1-4 GT CO_2 removal per year by 2050. Within this framework, the SBTi developed a cross-sector emissions corridor that covers CO_2, CH_4 and N_2O emissions from energy supply, buildings, industry and transport, based on published studies and expert judgment.

However, it was noted that further detail and study was required to accurately capture the variances in budget allocation for the buildings sector. Furthermore, it was decided that embodied emissions from buildings needed to be accounted for within the sector too. Therefore, the SBTi set out to develop 1.5°C-aligned science-based target-setting methodologies, tools, criteria and guidance for companies in the buildings sector to set targets that include in-use operational emissions, as well as the first pathway for upfront embodied emissions.

1 In-use operational emissions pathway

The SBTi has provided global pathways for in-use operational emissions for commercial and residential real estate for several years. In order to offer the buildings sector more granular pathways reflecting different geographical locations and building typologies, the SBTi embarked on a partnership with CRREM in January 2022 to provide a joint set of 1.5°C-aligned pathways for the industry to decarbonize.

CRREM has been providing the industry with appropriate science-based carbon reduction pathways at the building portfolio and company level, and financial risk assessment tools to cost-effectively manage carbon mitigation strategies since its inception in 2017. Their objective is to optimize the buildings sector's investments in energy efficient retrofits by making risks more transparent and unveiling climate-related opportunities for property owners and investors. The CRREM project is therefore well-aligned with the goals of the SBTi's Buildings Project.

CRREM developed regional pathways for buildings by downscaling the 1.5°C emissions pathway for buildings from the Net Zero Emissions by 2050 Scenario (NZE) published by the International Energy Agency (IEA).[49] The 'Other' pathway, which is provided for buildings and geographies that are not covered by the existing CRREM pathways, is developed from the remaining carbon budget and projected floor area developments for the regions that do not currently have a CRREM pathway.

The SBTi and CRREM technical teams have worked together to ensure that the underlying assumptions, carbon budgets and methodological foundation for the in-use operational emissions pathways are fully aligned. Furthermore, CRREM's technical work underwent a thorough review process by the SBTi between August and September 2022. The methodology was assessed in comparison to relevant literature, methodological choices were subjected to sensitivity analyses, and limitations to the method were identified. For an in-depth explanation of the downscaling methodology used by CRREM to produce the in-use operational emissions pathway, please refer to their downscaling methodology document 'From global emission budgets to decarbonization pathways at property level'.

49 IEA (2021), Net Zero by 2050.

The CRREM in-use operational emissions pathways provide data for CO_2 emissions from the buildings sector globally (Figure 7), as well as for CO_2e emissions intensity in terms of floor area in square meters (Figure 8). For setting SBTs using these criteria and guidance, companies shall use the CO_2e pathways (incorporated in the SBTi Buildings Target-Setting Tool).

Figure 7. Graph showing the global carbon emission pathways on a square meter basis (CO_2-only) of 1.5˚C scenario (CRREM, 2023b)

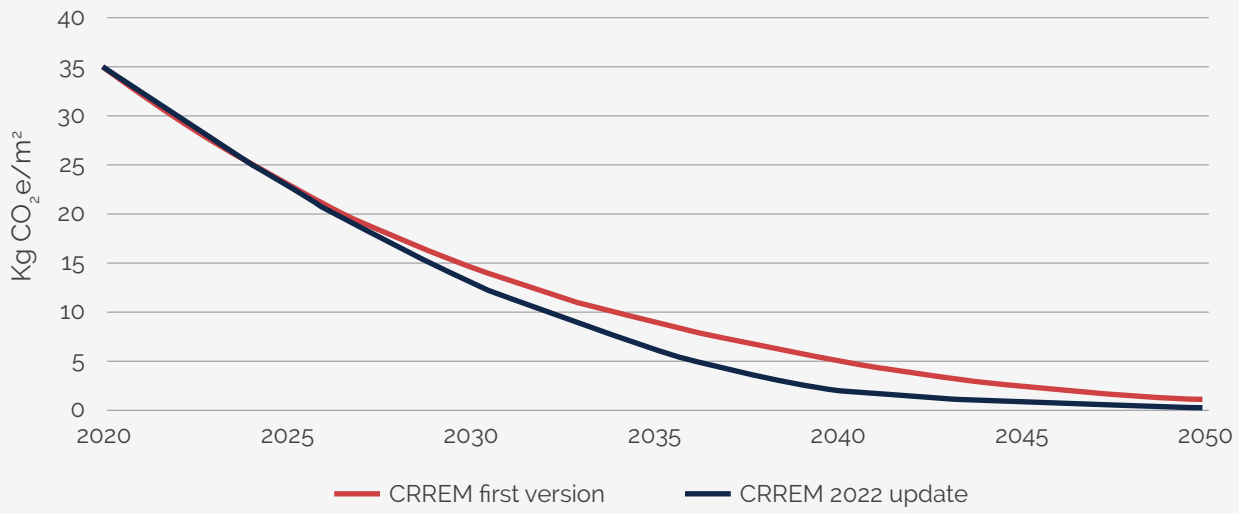
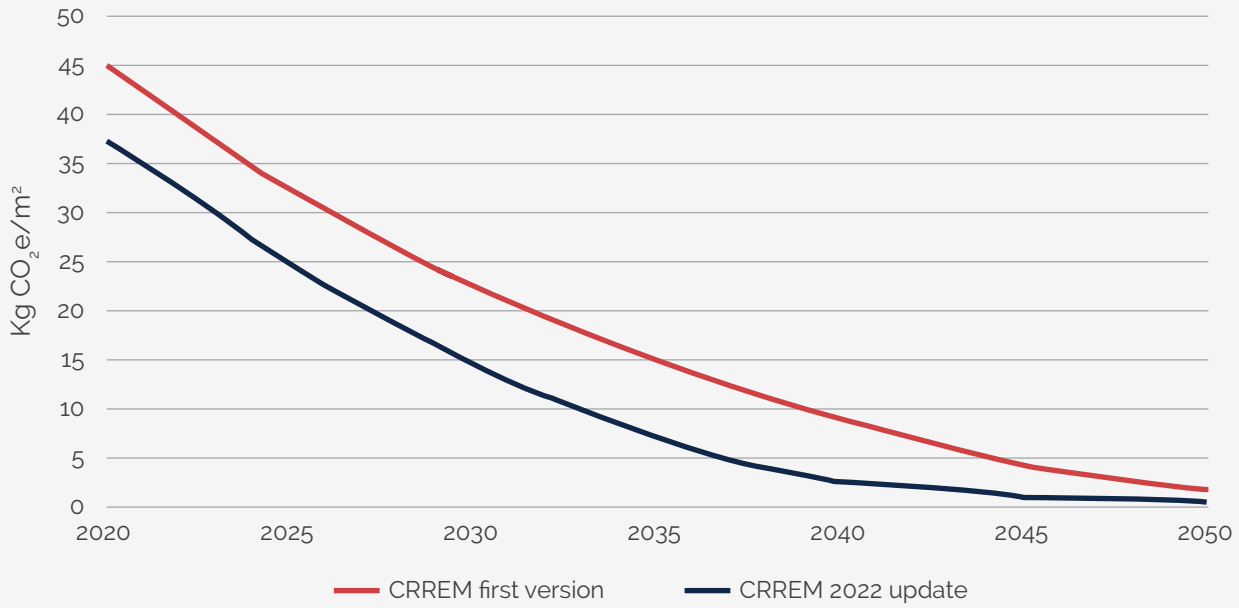


Figure 8. Graph showing the global building sector CO_2e intensity pathways (CRREM, 2023)



As observed, the CRREM pathways have become steeper following its 2022 update, highlighting the inadequate level of decarbonization which has been occurring in the sector.

2 Embodied emissions pathway

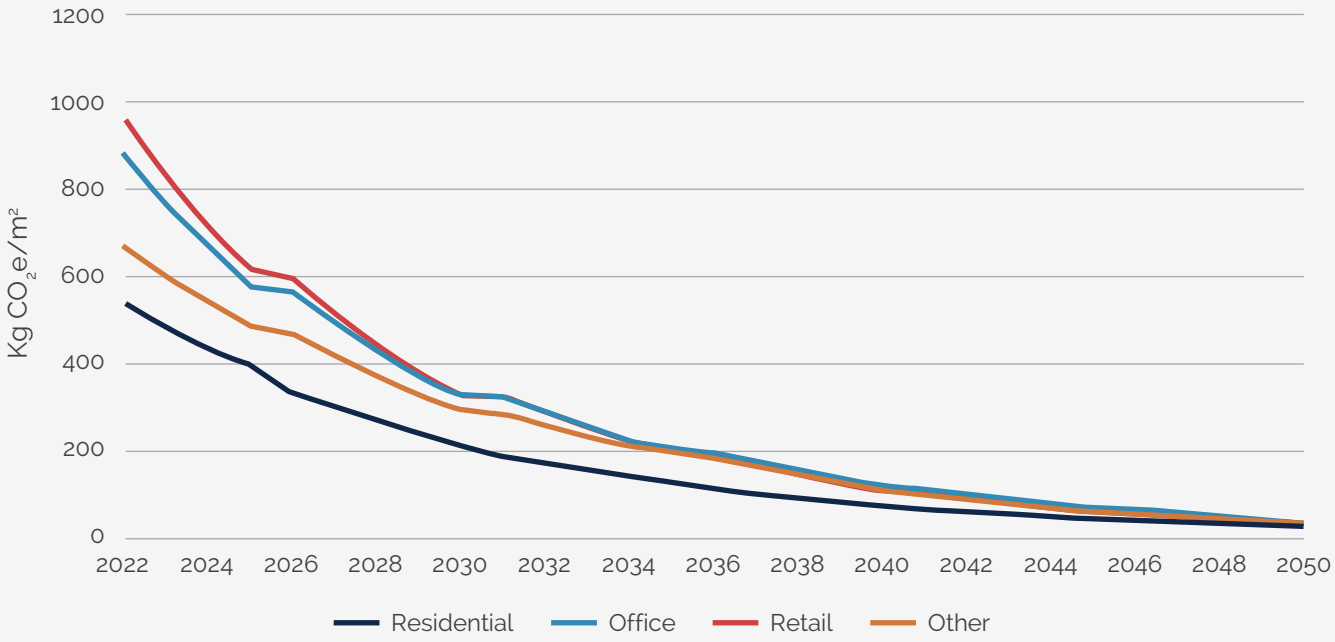
The SBTi has developed the upfront embodied emissions pathways together with Ramboll. The 1.5°C Pathways for the Global Buildings Sector's Embodied Emissions: Development Description outlines in detail the process of developing the SBTi upfront embodied emissions pathways. The document includes information regarding:

- The role of buildings' embodied emissions in the SBTi framework.
- The scope of a relevant embodied carbon pathway.
- Allocation principles for downscaling.
- Development of the embodied emissions pathway.

Figure 9 shows the default pathway for the upfront embodied emissions of new buildings (including life cycle stages A1-A5) using a grandfathering-based downscaling approach, corrected for renovation.

Please refer to the 1.5°C Pathways for the Global Buildings Sector's Embodied Emissions: Development Description for further details.

Figure 9. Graph showing the decarbonization pathway for embodied CO_2 emissions in buildings, using scenario AR6 IPCC C1, grandfathered corrected for renovation (SBTi 1.5°C Pathways for the Global Buildings Sector's Embodied Emissions Development Description, 2023)



APPENDIX C. GUIDANCE AND RECOMMENDATIONS FOR OTHER COMPANIES IN THE BUILDINGS' VALUE CHAIN

Architecture, engineering and construction companies are vital to the decarbonization of the buildings sector, providing a variety of complex services typically involving collaboration among multiple companies. Table 9 below defines other relevant company types in the buildings value chain, and includes a non-exhaustive list of typical services for illustration, some of which may be supplied individually by a specialist provider or more likely offered together by a multidisciplinary company.

Table 9. Other relevant companies in the value chain and their definitions

INTENDED USER	DEFINITION	SERVICES (NON-EXHAUSTIVE)	
Architecture or engineering company	An entity whose business involves the preparation or modification of a design, blueprint, plan, schematic or prototype which informs the development and construction of a building and related structures.	• Architectural design • Planning • Design specifications • Structural engineering • Mechanical, electrical and plumbing engineering • Interior design	• Project management • Producing construction documentation • Structural quality control • Site analysis and assessment • Feasibility studies
Construction company	An entity whose business is the construction, renovation or structural alteration of a building, in whole or in part, in compliance with design specifications, safety standards and regulations.	• Construction site management • Lead contractor • Sub-contractors working on individual elements of construction projects • Site analysis and assessment	• Project management • Preparing a site for construction (which may include demolition of a pre-existing structure) • Construction execution • Safety management
Building materials manufacturing or supply company	An entity involved in the manufacture or supply of one or more building materials such as steel, cement, concrete, sand and gravel, timber or glass etc., that are used in the construction of buildings.	• Primary or intermediate product processing	• Manufacturing, transport, or supply of relevant building materials
Tenant	An entity to whom a lease is granted, which occupies a property without ownership of the building, in whole or in part.	• Use of building • Payment of rent • Compliance with building rules and regulations • Reporting of maintenance issues	• Payment of energy consumption • Operational control of building (depending on leasing arrangements)

The SBTi Buildings Criteria and the explanatory document provide new sector-specific target-setting methods for building developers, owners, managers and FIs. Although architecture, engineering, construction companies and tenants were explored as a part of the development of these criteria, these companies should continue to use SBTi's cross-sector guidance and methods to set targets for the following reasons.

Architecture and engineering companies

There are no new target-setting methods available for these companies to use.

- The SBTi's buildings in-use operational emissions SDA is an intensity-based target-setting method that is calculated using an emissions numerator and a floor area denominator. For many companies that are only involved in part of the design of a building (e.g., a building services engineer appointed to design the fire protection system), while it could be technically feasible to calculate emissions, the lack of an available floor area figure makes it impractical to use this target-setting method. In addition, for planning, financial and other reasons, there can be a significant time-lag of many years between a completed design and a constructed building, including changes to the design by additional designers. As the SDA method is derived from a sector-specific carbon budget, this time-lag makes this method less appropriate compared to an absolute reduction approach.
- While these companies must allocate in-use operational emissions from the use of building projects that have been constructed in their use of sold products,[50] there is no consensus on the treatment of embodied emissions in their scope 3 using the GHG Protocol.

Construction companies

In most cases, there are no new target-setting methods available for these companies to use.

- The buildings upfront embodied emissions SDA provides a target setting method for companies covering the upfront embodied emissions of newly constructed buildings. As it is an intensity-based pathway, with floor area as the denominator, it requires upfront embodied emissions reported at practical completion as the numerator, rather than annual emissions from construction activities that may take place over multiple years.
- Further, construction activities frequently involve the collaboration of several companies and subcontractors, which are each responsible for separate features of the final building. It can therefore be impractical for construction companies to determine the share of their scope 1, 2 and 3 emissions that are attributable to the floor area of a newly constructed building, which is necessary when using the SDA method. However, where a construction company is the main contractor, they may be able to use the intensity-based SDA method, taking responsibility for all emissions involved in the construction of the building while using the total floor area as the denominator. In these cases, construction companies may follow the same target-setting criteria as developers in order to set targets on their upfront embodied emissions using the upfront embodied emissions SDA.

Additional recommendations on GHG accounting, target setting and reporting are also provided in order to increase transparency, promote best practice and support the rapid reduction of emissions within the buildings sector. The additional recommendations in this section may be revisited in future versions of the Buildings Criteria and explanatory document.

50 Criteria Assessment Indicators. Targets set using existing SBTi cross-sector methods.

Tenants

The buildings sector is broadly a heterogenous, complex sector where various entities interact with the same buildings. Therefore, the building occupiers, whether they are owners of the building or not, also have an important role in decarbonizing the sector. Tenants play a particularly important role in the efficient use of the building and its systems; additionally, they can influence building owners by demanding high-performing, energy-efficient and electrified buildings. Tenants were explored as part of the development of these criteria and explanatory document, but due to the huge variety of business activities and operations that depend on buildings, those leasing and occupying buildings (e.g., tenants), requirements for tenants have been removed in order to dedicate more time towards engaging with these entities and exploring these lessor-occupier relationships further.

1 Additional recommendations for architecture and engineering companies

Target setting

Architecture and engineering companies should continue to use SBTi's cross-sector guidance and methods to set targets. The companies:

- May allocate the emissions from the use of building projects that have been constructed as direct use-phase emissions in their scope 3 use of sold products.
- May use customer engagement targets when setting near-term targets.[51]
- May include whole life carbon emissions (operational and embodied) in their use of sold products.[52]

Additional disclosure recommendation

- Architecture and engineering companies are strongly encouraged to calculate and publicly disclose whole life carbon for all of their designed buildings, even if their work only relates to part of the final building. This is recommended as a separate disclosure, outside of the GHG inventory.

51 As stated in the Criteria Assessment Indicators.

52 Optional scope 3 emissions will not be counted towards the minimum two thirds scope 3 target boundary. See SBTi Corporate Near-Term Criteria and SBTi Corporate Net-Zero Standard Criteria.

2 Additional recommendations for construction companies

Target setting

Construction companies should continue to use the SBTi's cross-sector guidance and methods to set targets. Please note:

- Depending on the accounting approach chosen for emissions, construction companies may use the intensity-based SDA to set an upfront embodied emissions target for buildings where they are the main contractor, similarly to guidance provided for developers (Section 5.4.3).
- Construction companies may use supplier/customer engagement targets when setting near-term targets, as per the Criteria Assessment Indicators.
- Construction companies are also encouraged to include in-use and end-of-life embodied emissions in their scope 3 target boundary when setting SBTs.

Additional disclosure recommendation

- Construction companies are strongly encouraged to focus on improving the whole life carbon profile of their construction projects, whether they are a lead contractor or sub-contractor, and to improve the measurement and public disclosure of GHG emissions, particularly for embodied carbon.

3 Additional recommendation for companies that occupy buildings without ownership

Target setting

Companies that occupy buildings without ownership should continue to use SBTi's cross-sector guidance and methods to set targets. However, if a company meets the threshold set in **Buildings-C1**, it may set intensity-based SDA targets for its in-use operational emissions, similarly to criteria provided for owner-occupiers.

If using the SDA methodology, the application of the 'whole building approach' refers to the inclusion of a proportional share of emissions from landlord-controlled spaces in their inventory and subsequent target boundary. It is important to note that the application of the 'whole building approach' for tenants does not refer to the inclusion of other tenants' emissions in their GHG inventory or target boundary.

4 Other upstream companies in the buildings sector

Another notable exclusion from the scope of intended users of the SBTi Buildings Criteria and explanatory document are upstream manufacturers and suppliers of building materials (e.g., cement and steel). While their products are intrinsic to the buildings sector, and are involved in setting embodied emission targets, given the variety of materials required to construct a modern building (such as concrete, cement, steel, timber, stone, glass, foam, etc.) which would each require specific decarbonization pathways, these companies are beyond the scope of the SBTi Buildings Criteria. They are recommended to seek target-setting guidance from the sector-agnostic Corporate Net-Zero Standard or any other sector guidance applicable to their activities.

APPENDIX D. WORKED EXAMPLES FOR CORPORATES

Worked example 1: Owner-occupier

Brief business activity description	Company X is a professional services firm operating in Europe. It owns and occupies office buildings in the UK and Germany.
Intended user classification	Owner-occupier.
Near-term target or both near- and long-term targets	The company decides to set a near-term target only.
Base year and target year	The company chooses a near-term target timeframe of 2021-2030.
Is the company required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	Yes, Company X meets the 20% threshold in Buildings-C1 and is therefore required to set an in-use operational emissions target covering emissions from owned buildings. As Company X is an owner-occupier, its whole building in-use operational emissions are categorized under scope 1 and 2 only. The company shall use the buildings in-use operational SDA method to set this target.
Is the company required to set an upfront embodied emissions target as per Buildings-C2?	No. An upfront embodied emissions target is not required as Company X does not meet the threshold in Buildings-C2. This is because the buildings the company owns were not acquired as new buildings in the previous three years.
Other near-term scope 3 target[53]	Company X meets the 40% threshold as per C4 in the SBTi Corporate Near-Term Criteria and is required to set a scope 3 target. As mentioned above, buildings-related emissions of Company X are in scopes 1 and 2, and therefore Company X would need to set a scope 3 target using SBTi cross-sector methods.
Asset geography – in-use operational emissions	UK. Germany.
Asset geography – upfront embodied emissions	N/A
Asset typologies – in-use operational emissions	Office.
Asset typologies – upfront embodied emissions	N/A
Target aggregation and communication for buildings-related targets[54]	Company X commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of owned buildings by 58.3% per m^2 by 2030 from a 2021 base year.

53 Scope 3 categories are either required, as determined in Buildings-C8 and Table 2 in the SBTi Buildings Criteria, and must be e included in the target boundary to meet SBTi general criteria for scope 3 and coverage requirements, or they are optional categories that the entity has chosen to set targets on.

54 Companies may choose or be required to set separate targets using the SBTi cross-sector methods or other sector criteria/standards. These targets are not addressed in this worked examples document.

In-use operational emissions

Aggregator tab of the SBTi Buildings Target-Setting Tool

		Emissions and floor area data			Target (1.5°C)				
		Base year (2021)			Target year (2030)				
	Building type and location	In-use emissions [$kgCO_2e$]	Floor area [m^2]	Carbon intensity [$kgCO_2e/m^2$]	Floor area [m^2]	In-use emissions [$kgCO_2e$]	% reduction	Carbon intensity [$kgCO_2e/m^2$]	% reduction
1	Europe | United Kingdom | Office	8,480,000.0	100,000.0	84.8	110,731.4	3,930,165.3	53.7%	35.49	58.1%
2	Europe | Germany | Office	4,440,000.0	60,000.0	74.00	56,610.1	1,740,457.0	60.8%	30.74	58.5%
		12,920,000.0	**160,000.0**	**80.75**	**167,346.5**	**5,670,622.2**	**56.1%**	**33.71**	**58.3%**

Worked example 2: Owner-occupier, owner-lessor

Brief business activity description	Company X is a software company operating in Singapore. They operate across six large offices, which they own. Some spaces of these buildings are leased out to other companies.
Intended user classification	Owner-occupier; owner-lessor.
Near-term target or both near- and long-term targets	The company decides to set a near-term target only.
Base year and target year	The company chooses a near-term target timeframe of 2021-2030.
Is the company required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	Yes, covering emissions from the buildings where Company X is an owner-occupier and owner-lessor (emissions categorized under scopes 1, 2 and 3). The company shall use the buildings in-use operational SDA method to set this target.
Is the company required to set an upfront embodied emissions target as per Buildings-C2?	No. An upfront embodied emissions target is not required as Company X does not meet the threshold in Buildings-C2. This is because the buildings the company owns were not acquired as new buildings in the previous three years.
Other near-term scope 3 targets[55]	Company X meets the threshold required to set a scope 3 target according to C4 in the SBTi Corporate Near-Term Criteria, but 67% scope 3 coverage is not met with the in-use operational emissions in scope 3. Therefore, Company X is required to set another scope 3 target to meet the SBTi requirements.
Asset geography - in-use operational emissions	Singapore.
Asset geography - upfront embodied emissions	N/A

55 Scope 3 categories are either required, as determined in Buildings-C8 and Table 2 in the SBTi Buildings Criteria, and must be included in the target boundary to meet SBTi general criteria for scope 3 and coverage requirements, or they are optional categories that the entity has chosen to set targets on.

Asset typologies – in-use operational emissions	Office.
Asset typologies – upfront embodied emissions	N/A
Target aggregation and communication for buildings-related targets[56]	Company X commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of owned buildings 62.0% per m² by 2030 from a 2021 base year. Company X also commits to reduce absolute scope 3 GHG emissions from use of sold products and business travel 25.0% within the same timeframe.

In-use operational emissions

In-Use Aggregator tab of the SBTi Buildings Target-Setting Tool

A: In-use Operational Targets

Section A1. Enter preferred units

(also applies to calcs of Upfront Embodied Target)

m^2 & $kgCO_2e$	*("tons" are metric)*	Required Input	Results

Section A2. Select geography

○ Africa	○ Americas	◉ Asia	○ Europe	○ Oceania	
Singapore					OK

Sub-region	
	OK
N/A	

(See "AUS zones" tab for climactic zones in Australia)

Section A3. Select building type

Office	OK	*Refer to explanatory document for details on building types.*

Section A4. Enter emissions and activity data

Select base year	2021			
In-Use Operational emissions in base year	32,500,000.0	$kgCO_2e$	32.500	$ktonCO_2e$
Floor area in base year	26,000.0	m^2	0.026	million m^2
Base-year intensity	1,250.00	$kgCO_2e/m^2$		

Select target year	2030	*Target year must be at least 5 years and at most 10 years from the current year.*		
Floor area in target year		m^2		
			0.026	million m^2

Section A5. Review target modelling results

Target modelling results - 1.5°C (In-Use Operational)

Note that the SBTi asses "forward-looking" ambition of target(s) by using the year the target is submitted to the intiative (or the most recent completed GHG inventory). Please refer to the Target Validation Protocol for Near-term Targets for more information on forward-looking ambition.

		Base year (2021)	Target year (2030)	% Reduction 2021 - 2030
Asia | Singapore | Office	Total in-use emissions [$kgCO_2e$]	32,000,000.00	12,554,705.00	61.4%
	Overall in-use emissions intensity [$kgCO_2e/m^2$]	1,250.00	456.18	63.5%

56 Companies may choose or be required to set separate targets using the SBTi cross-sector methods or other sector criteria/standards. These targets are not addressed in this worked examples document.

Worked example 3: Owner-lessor

Brief business activity description	REIT X is a small REIT that owns a chain of shopping malls across three states in the USA, leasing individual commercial units to tenants. In certain malls, REIT X procures utilities centrally and recharges tenants while in other malls the tenants procure their own supply. REIT X also leases office space for its own offices.
Intended user classification	Owner-lessor.
Near-term target or both near- and long-term targets	The company decides to set a near-term target only.
Base year and target year	The company chooses a near-term target timeframe of 2021-2030.
Is the company required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	Yes, REIT X shall include whole building in-use operational emissions from: • The shopping malls it owns and leases to tenants (i.e., acting as lessor), categorized under downstream scope 3 category 13 emissions for tenant-controlled spaces and scope 1 and 2 for landlord-controlled spaces. REIT X may include whole building in-use operational emissions from: • Spaces where REIT X is a tenant (i.e., its own offices, acting as a lessee) categorized under scope 1 and 2 for its own operations and upstream scope 3 category 8 emissions for lessor-controlled spaces. For simplicity, REIT X decides to include its office space into its in-use operational SDA target together with the in-use operational emissions from owned buildings.
Is the company required to set an upfront embodied emissions target as per Buildings-C2?	No. An upfront embodied emissions target is not required as REIT X does not meet the threshold in Buildings-C2. This is because the malls were acquired as existing assets and so REIT X is not considered the first owner.
Other near-term scope 3 targets[57]	Company X meets the threshold required to set a scope 3 target according to C4 in the SBTi Corporate Near-Term Criteria, which is met with the in-use operational emissions in scope 3. Therefore, REIT X is not required to set another scope 3 target to meet the SBTi requirements but is recommended to do so to increase emissions coverage.
Asset geography - in-use operational emissions	USA, New York. USA, Houston. USA, Chicago.
Asset geography - upfront embodied emissions	N/A
Asset typologies - in-use operational emissions	Retail (shopping center). Office.
Asset typologies - upfront embodied emissions	N/A

57 Scope 3 categories are either required, as determined in Buildings-C8 and Table 2 in the SBTi Buildings Criteria, and must be included in the target boundary to meet SBTi general criteria for scope 3 and coverage requirements, or they are optional categories that the entity has chosen to set targets on.

Target aggregation and communication for buildings-related targets[58]	REIT X commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of owned and leased space by 56.7% per m^2 by 2030 from a 2021 base year.

In-use operational emissions

Aggregator tab of the SBTi Buildings Target-Setting Tool

		Emissions and floor area data			Target (1.5°C)				
		Base year (2021)			Target year (2030)				
	Building type and location	In-use emissions [$kgCO_2e$]	Floor area [m^2]	Carbon intensity [$kgCO_2e/m^2$]	Floor area [m^2]	In-use emissions [$kgCO_2e$]	% reduction	Carbon intensity [$kgCO_2e/m^2$]	% reduction
1	Americas | USA – New York | Office	328,000.0	4,000.0	82.00	4,641.7	185,148.3	43.6%	39.89	51.4%
2	Americas | USA – New York | Retail Shopping Mall	4,825,000.0	50,000.0	96.50	58,021.0	2,764,791.3	42.7%	47.65	50.6%
3	Americas | USA – Houston | Retail Shopping Mall	9,350,000.0	100,000.0	93.50	116,042.0	5,080,527.5	45.7%	43.78	53.2%
4	Americas | USA – Chicago | Retail Shopping Mall	14,760,000.0	100,000.0	147.60	116,042.0	6,659,646.9	54.9%	57.39	61.1%
		29,263,000.0	**254,000.0**	**115.21**	**294,746.6**	**14,690,114.0**	**49.8%**	**49.84**	**56.7%**

Worked example 4: Developer, property manager and owner-occupier

Note

This worked example, specifically the activities of the developer, could also apply to a construction company that was a main or general contractor.

Brief business activity description	Company X is a real estate developer, operating solely in Sweden, that develops sports and leisure centers and sells them to owners. The company also offers property management services for sports and leisure facilities. The company owns one office building which it uses as a corporate headquarters. In the base year, Company X completed development on seven sports/leisure center projects. Six of them were sold in that reporting year. One remains unsold. In the base year, Company X provided property management services for clients covering 40 properties.

58 Companies may choose or be required to set separate targets using the SBTi cross-sector methods or other sector criteria/standards. These targets are not addressed in this worked examples document.

<table>
<tr><td>Intended user classification</td><td>Developer. Property manager. Owner-occupier.</td></tr>
<tr><td>Near-term target or both near- and long-term targets</td><td>The company decides to set a near-term target only.</td></tr>
<tr><td>Base year and target year</td><td>The company chooses a near-term target timeframe of 2021-2030.</td></tr>
<tr><td>Is the company required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?</td><td>Yes, Company X shall use the buildings in-use operational SDA method to set a target covering emissions from owned spaces.

Additionally, Company X decides to include emissions from properties under management into its SDA target as per Buildings-C6.

Therefore, Company X sets a whole building in-use operational emissions target covering emissions from spaces where Company X is an owner-occupier (categorized under scopes 1 and 2) and where it is the property manager (categorized under scope 3 category 11).</td></tr>
<tr><td>Is the company required to set an upfront embodied emissions target as per Buildings-C2?</td><td>The company tests whether it meets Buildings-C2:

<table>
<tr><th></th><th>2021
(Target base year)</th><th>2022</th><th>2023</th></tr>
<tr><td>Number of developments reaching practical completion in the year</td><td>7</td><td>0</td><td>1</td></tr>
<tr><td>Number of developments sold in the year</td><td>6</td><td>0</td><td>0</td></tr>
<tr><td>Total scope 1, 2 and 3 category 1-14 emissions[59] (tCO_2e)</td><td>220,000</td><td>29,000</td><td>39,000</td></tr>
<tr><td>Upfront embodied emissions (tCO_2e)</td><td>49,000</td><td>0</td><td>7,000</td></tr>
<tr><td>% of total scope 1, 2 and 3 category 1-14 emissions</td><td>22.3%</td><td>-</td><td>17.9%</td></tr>
</table>

Yes, in one of the previous three years, upfront embodied emissions from new developments (that reached practical completion) exceeded 20% of total scope 1, 2 and 3 category 1-14 emissions in any one year (2021); therefore, the company shall use the SBTi Buildings Criteria to set targets and also set a separate target on upfront embodied emissions.[60]

Company X chooses method 2, accounting for the upfront embodied emissions of new developments at practical completion, under scope 3 category 2 “capital goods”. The company further chooses to use the buildings upfront embodied SDA as the target-setting method, as per Tables 1c and 1d in Buildings-C4.</td></tr>
</table>

59 Including lifetime in-use operational emissions for sold buildings.

60 Other conditions may also be met that are not shown here.

Other near-term scope 3 targets[61]	The required scope 3 categories as per Buildings-C8 satisfy C4 in the SBTi Corporate Near-Term Criteria, on minimum scope 3 coverage; further inclusion of scope 3 emissions categories is not required but is recommended to increase emissions coverage.
Asset geography – in-use operational emissions	Sweden.
Asset geography – upfront embodied emissions	Sweden.
Asset typologies – in-use operational emissions	Property manager: Lodges/Leisure & Recreation: 40 managed properties. Owner-occupier: Office: one building.
Asset typologies – upfront embodied emissions	Developer. Other.
Target aggregation and communication for buildings-related targets[62]	Company X commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of owned buildings and managed spaces by 61.2% per m^2 by 2030 from a 2021 base year. Company X also commits to reduce upfront embodied scope 3 GHG emissions of new buildings by 54.0% per m^2 over the same timeframe.

In-use operational emissions

Aggregator tab of the SBTi Buildings Target-Setting Tool

		Emissions and floor area data			Target (1.5°C)				
		Base year (2021)			Target year (2030)				
	Building type and location	In-use emissions [$kgCO_2e$]	Floor area [m^2]	Carbon intensity [$kgCO_2e/m^2$]	Floor area [m^2]	In-use emissions [$kgCO_2e$]	% reduction	Carbon intensity [$kgCO_2e/m^2$]	% reduction
1	Europe | Sweden | Office	108,500.0	3,500.0	31.00	3,411.3	40,953.9	62.3%	12.01	61.3%
2	Europe | Sweden | Leisure/Lodging	16,000,000.0	400,000.0	40.00	389,861.3	6,049,518.3	62.2%	15.52	61.2%
		16,108,500.0	**403,500.0**	**39.92**	**393.272.6**	**6,090,472.1**	**62.2%**	**15.49**	**61.2%**

61 Scope 3 categories are either required, as determined in Buildings-C8 and Table 2 in the SBTi Buildings Criteria, and must be included in the target boundary to meet SBTi general criteria for scope 3 and coverage requirements, or they are optional categories that the entity has chosen to set targets on.

62 Companies may choose or be required to set separate targets using the SBTi cross-sector methods or other sector criteria/standards. These targets are not addressed in this worked examples document.

Upfront embodied emissions

Aggregator tab of the SBTi Buildings Target-Setting Tool

Section B1. Select building type

Other	*Refer to explanatory document for details on building types.*	Required Input	Results

Section B2. Select target-setting approach

Sectoral Decarbonization Approach	*Refer to explanatory document for details on approaches.*

Section B3. Enter emissions and activity data

(Units of measure specified in In-Use Targets - section A1)

Select base year	2021			
In-Use Operational emissions in base year	49,000,000.0	$kgCO_2e$	49.000	$ktonCO_2e$
Floor area in base year	70,000.00	m^2	0.070	million m^2
Base-year intensity	700.00	$kgCO_2e/m^2$		
Select target year	2030	*Target year must be at least 5 years and at most 10 years from the current year.*		
Floor area in target year		m^2		
			0.109	million m^2

Section B4. Review target modelling results

Target modelling results – 1.5°C (Upfront Embodied)

Please refer to the Target Validation Protocol for Near-term Targets for more information on forward-looking ambition.

		Base year (2021)	Target year (2030)	% Reduction 2021 - 2030
Other buildings	Total embodied emissions [$kgCO_2e$]	49,000,000.00	34,976,913.55	28.6%
	Overall embodied emissions intensity [$kgCO_2e/m^2$]	700.00	322.09	54.0%

Worked example 5: Developer

> **Note**
>
> This worked example, specifically the activities of the developer, could also apply to a construction company that was a main or general contractor.

Brief business activity description	Company X is a residential housing developer in South Africa. They develop new residential housing developments with oversight of key construction activities.
Intended user classification	Developer.
Near-term target or both near- and long-term targets	The company decides to set a near-term target only.
Base year and target year	The company chooses a near-term target timeframe of 2022-2030.
Is the company required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	No, as Company X is not owning any buildings with operational emissions, it is not required to set a target on whole building in-use operational emissions. The company shall use SBTi cross-sector methods for its scope 1 and 2 emissions.

<table>
<tr><td>Is the company required to set an upfront embodied emissions target as per Buildings-C2?</td><td>Yes. Company X meets Buildings-C2:
<table><tr><th></th><th>2021</th><th>2022
(Target base year)</th><th>2023</th></tr><tr><td>Number of buildings sold in the year</td><td>100</td><td>200</td><td>100</td></tr><tr><td>Total scope 1, 2 and 3 category 1-14 emissions[63] (tCO_2e)</td><td>65,000</td><td>70,000</td><td>60,000</td></tr><tr><td>Upfront embodied emissions (tCO_2e)</td><td>20,000</td><td>16,000</td><td>17,000</td></tr><tr><td>% of total scope 1, 2 and 3 category 14 emissions</td><td>30.8%</td><td>22.9%</td><td>28.3%</td></tr></table>
In more than one of the three years prior to the year of target submission, upfront embodied emissions from new developments exceeded 20% of total scope 1, 2 and 3 category 1-14 emissions in any one year (2021, 2022 and 2023); therefore, the company uses the Buildings Criteria and explanatory document to set targets, and also set a separate target on upfront embodied emissions.[64]

Company X prefers to choose method 1, accounting for the upfront embodied emissions for the amount of construction activity completed that year under scope 3 category 1 “purchased goods and services”. The company further chooses to use the cross-sector absolute reduction 1.5°C method as the target-setting method, as per Tables 1c and 1d in Buildings-C4.</td></tr>
<tr><td>Other near-term scope 3 targets[65]</td><td>The required scope 3 categories as per Buildings-C7 satisfy C4 in the SBTi Corporate Near-Term Criteria on minimum scope 3 coverage so further inclusion of scope 3 emissions categories is not required. However, Company X decides to include scope 3 GHG emissions from use of sold products into its target boundary.

As Company X chose to use cross-sector methods to set a target on upfront embodied emissions, it may aggregate these into one target.</td></tr>
<tr><td>Asset geography – in-use operational emissions</td><td>N/A</td></tr>
<tr><td>Asset geography – upfront embodied emissions</td><td>N/A as the company is not using the upfront embodied SDA method to set targets on upfront embodied emissions.</td></tr>
<tr><td>Asset typologies – in-use operational emissions</td><td>N/A</td></tr>
<tr><td>Asset typologies – upfront embodied emissions</td><td>N/A as the company is not using the upfront embodied SDA method to set targets on upfront embodied emissions.</td></tr>
<tr><td>Target aggregation and communication for buildings-related targets[66]</td><td>Company X also commits to reduce absolute scope 3 GHG emissions from upfront embodied emissions in purchased goods and services, and from use of sold products lifetime in-use operational emissions of buildings sold 42.0% over the same timeframe.</td></tr>
</table>

63 Including lifetime in-use operational emissions for sold buildings.

64 Other conditions may also be met that are not shown here.

65 Scope 3 categories are either required, as determined in Buildings-C8 and Table 2 in the SBTi Buildings Criteria, and must be included in the target boundary to meet SBTi general criteria for scope 3 and coverage requirements, or they are optional categories that the entity has chosen to set targets on.

66 Companies may choose or be required to set separate targets using the SBTi cross-sector methods or other sector criteria/standards. These targets are not addressed in this worked examples document.

Worked example 6: How to set a fixed intensity target for high turnover portfolios

Company X is a real estate development and investment company with headquarters in Austria. They acquire, renovate and sell retail and office buildings in Central Europe. They have a buildings portfolio turnover ratio of over 70% (meeting the qualification conditions introduced in Section 6.4.3 in this explanatory document).

To set a fixed intensity near-term target for their in-use operational emissions for the timeframe of 2021-2029, they would have to:

1. Calculate their GHG inventory for the base year.
2. Choose the target year intensity for each relevant building typology and geography:
   - Open the SBTi Buildings Target-Setting Tool.
   - Navigate to the In-Use NT Targets tab.
   - Select the relevant geography in Section A2.
   - Select the relevant building typology in Section A3.
   - Navigate, by scrolling down, to the target modeling data table in Section A5.
   - In this table, the user would scroll to the year 2029.
   - The sector carbon intensity row forms their fixed intensity target for the selected building typology and geography.
3. To calculate the target for a portfolio with multiple building typologies and/or geographies, Company X shall calculate the target year intensity weighted average using base year activity data.

	Base year activity (m^2)	Target year 2029 sector carbon intensity (the CRREM pathway) ($kgCO_2e/m^2$)
Office, Austria	100,000	19.43
Retail high street, Austria	120,000	23.53
Retail warehouse, Austria	80,000	17.21

The weighted average of the target year 2029 intensity for this portfolio is 20.48 $kgCO_2e/m^2$, which is the target intensity of the portfolio.

Target wording for Company X:

> "Company X commits to reducing its scope 1, 2 and 3 in-use operational GHG emissions of owned and leased buildings to 20.48CO_2e per m^2 or below in 2029 target year."

APPENDIX E. WORKED EXAMPLES FOR FIs

FIs should refer to the relevant sections (including appendices) of the SBTi Financial Institutions Near-Term Criteria and SBTi Financial Institutions Science-Based Targets Explanatory Document in order to set asset-level targets using the available methods. The worked examples below do not include all aspects of target-setting[67], instead focusing on where there are differences from existing target-setting processes for FIs.

> **Note**
>
> The examples below are simplified to illustrate the criteria and recommendations set out in the SBTi Buildings Criteria. Real world portfolios are expected to contain a greater number and complexity of assets.

Worked example FI1: Bank investing in commercial real estate and residential mortgages

Brief business activity description including asset classes	FI X is a UK bank, focusing primarily on: - Consumer mortgages. - Commercial real estate: - In its chosen base year, 25% of its portfolio is direct equity investment into buildings, with the bank acting as an owner-lessor; 75% of its portfolio is direct investment into buildings where the bank is a minority equity shareholder with no operational control.
Is the FI required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	FI X satisfies Buildings-C1 and is required to set relevant buildings sector targets.

67 For example, attribution of emissions, data inputs, data quality considerations etc.

<table>
<tr>
<td>Is the FI required to set an upfront embodied emissions target as per Buildings-C2?</td>
<td>
Targets on financed upfront embodied emissions are optional for FIs (e.g., lending to finance new construction or the acquisition of a new building for an owner). FI X chooses not to set targets on any financed upfront embodied emissions.

As an owner-lessor that has acquired new buildings (in scope 3 categories 1-14), the FI tests whether it meets the threshold in Buildings-C2:

<table>
<tr><th></th><th>2021
(Target base year)</th><th>2022</th><th>2023</th></tr>
<tr><td>Number of new buildings acquired in the year</td><td>3</td><td>0</td><td>0</td></tr>
<tr><td>Total scope 1, 2 and 3 category 1-14 emissions[63] (tCO_2e)</td><td>50,000</td><td>14,000</td><td>13,000</td></tr>
<tr><td>Upfront embodied emissions (tCO_2e)</td><td>39,000</td><td>0</td><td>0</td></tr>
<tr><td>% of total scope 1, 2 and 3 category 1-14 emissions</td><td>78%</td><td>-</td><td>-</td></tr>
</table>

In one of the previous three years, upfront embodied emissions from acquisitions of new buildings exceeded 20% of total scope 1, 2 and 3 category 1-14 emissions in any one year (2021); therefore, the FI shall use the Buildings Criteria to set targets (on its activities as an owner-lessor) and also set a separate target on upfront embodied emissions (on its activities as an owner-lessor).

The FI chooses to use the buildings sector-specific absolute reduction method to set a target on its upfront embodied emissions.
</td>
</tr>
<tr>
<td>Intended user classification</td>
<td>FI: Covering financed emissions from its lending activity (consumer mortgages) and minority direct investments into buildings.

Owner-lessor: Covering activities where FI X is an owner-lessor of buildings, as part of its commercial real estate portfolio.</td>
</tr>
<tr>
<td>Near-term target</td>
<td>The FI sets a near-term target.</td>
</tr>
<tr>
<td>Base year and target year</td>
<td>The FI chooses a near-term target timeframe of 2021-2028.</td>
</tr>
</table>

Asset class coverage and applicable methods	FI - Consumer mortgages: • Minimum coverage requirement: Optional. • Applicable methods: SDA. FI - Commercial real estate: • Minimum coverage requirement: 67% of base year activity (m^2) or financed emissions. • Applicable methods: SDA.
Whole building approach	FI: FI X shall abide by the 'whole building approach' when collecting in-use operational emissions data on its mortgages and commercial real estate portfolios. Estimated data shall be used where measured data is not available. Owner-lessor: FI X shall abide by the 'whole building approach' for its operational emissions in scope 1, 2 and 3, including category 13 "downstream leased assets" from tenant-controlled spaces, for the buildings where FI X is an owner-lessor.
Required scope 3 categories	Owner-lessor: • Category 2 "capital goods" (upfront embodied emissions of new buildings acquired). • Category 13 "downstream leased assets" (tenant emissions from the 25% of the commercial real estate portfolio where FI X is the owner-lessor of buildings). FI: Category 15 investments (100% of mortgage portfolio and 75% of the commercial real estate portfolio, where the FI is a minority shareholder in the buildings).
Asset geography – in-use operational emissions	UK.
Asset typologies – in-use operational emissions	FI - Consumer mortgages: Residential single-family; residential multi-family. FI - Commercial real estate: Office. Owner-lessor: Office.
Headline target	FI: FI X's portfolio targets cover 70.0% of its total investment and lending activities by total assets as of 2021. Owner-lessor: • FI X commits to reduce scope 1, 2 and 3 in-use operational GHG emissions of buildings by 48.4% per m^2 by 2028 from a 2021 base year. • FI X also commits to reduce upfront embodied absolute scope 3 emissions of new buildings by 24.7% over the same timeframe.
Asset class specific target communication	FI: FI X commits to reduce its commercial real estate and consumer mortgage portfolio GHG emissions 47.9% per m2 by 2028 from a 2021 base year.

Worked example FI2: Asset manager with minority investments in real estate instruments (companies and funds)

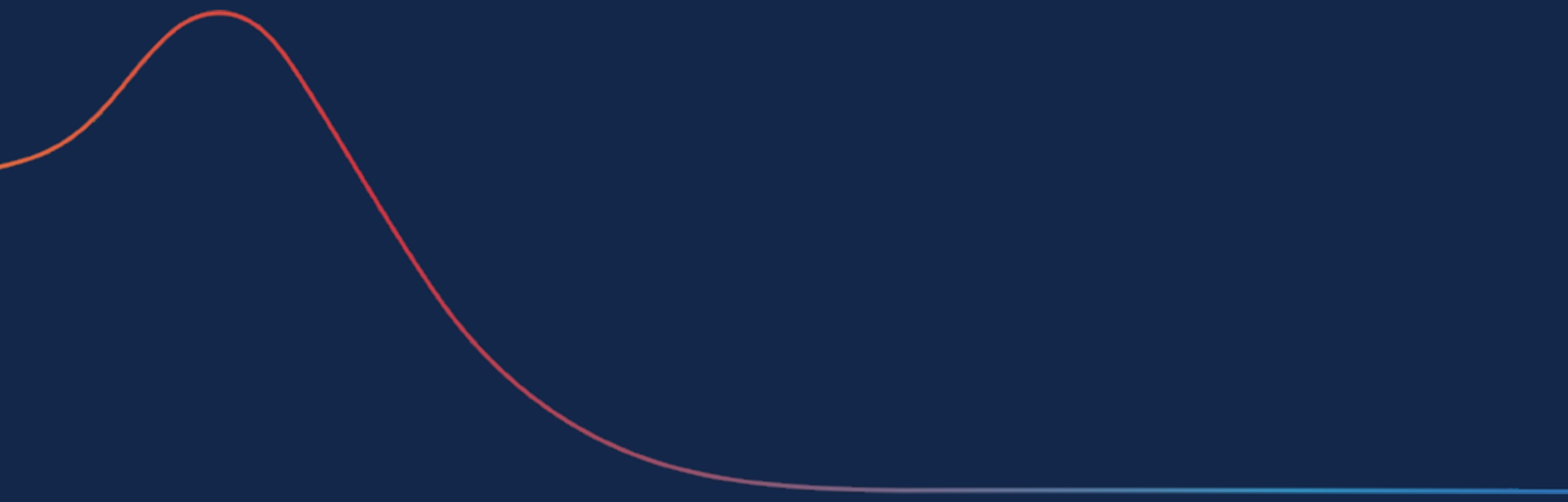
Brief business activity description including asset classes	FI X is a small European asset manager with investments in the real estate sector, specifically:
	- Listed equity real estate portfolio:
	  - Minority investment in Company A, a French property developer/house-builder. The company has multiple sites undergoing development but scope 3 category 11 lifetime in-use operational emissions and scope 3 category 2 "capital goods" for upfront embodied emissions from buildings are only included at practical completion; only buildings that reach practical completion in the chosen base year are included in the financed emissions baseline for these emissions categories, for the purpose of target setting.
	  - Minority investment in Company B, a property manager operating in Nigeria (10 offices and 10 hotels) and Kenya (5 offices).
	- Listed real estate fund portfolio:
	  - Minority investment in Fund A, a European real estate fund with owned industrial warehouse property assets across Austria, Spain and Portugal.

Is the FI required to set a whole building in-use operational emissions target (scopes 1, 2 and 3) as per Buildings-C1?	The FI does not satisfy any of the conditions in Buildings-C1 with its buildings-related in-use operational emissions in scopes 1, 2 and 3 categories 1-14. It is, however, required to set targets on its financed emissions in scope 3 category 15. The scope 1 and 2 emissions may still form part of the FI's target boundary, as per existing in the SBTi Financial Institutions Near-Term Criteria.
Is the FI required to set an upfront embodied emissions target as per Buildings-C2?	The FI does not satisfy any of the conditions in Buildings-C2 with its upfront embodied emissions of newly constructed buildings scope 3 categories 1-14. Targets on financed upfront embodied emissions are optional for FIs (e.g., lending to finance new construction or the acquisition of a new building for an owner). FI X chooses not to set targets on any financed upfront embodied emissions.
Intended user classification	FI.
Near-term target	The FI sets a near-term target.
Base year and target year	The FI chooses a near-term target timeframe of 2022-2028.

Asset class coverage and applicable methods	Listed equity real estate portfolio:[68] **Company A (developer):** Asset classification: Equity ⟶ Common and preferred stock of corporates and SMEs ⟶ All other sectors (listed companies) Minimum coverage requirement: 100% Applicable methods: Portfolio Coverage and Temperature Rating*. *Portfolio company A is a developer. The buildings in-use operational SDA is not an applicable method for this portfolio company to set targets on its required target boundary (lifetime in-use operational emissions). Therefore, for FI X, only engagement target-setting methods are applicable for this investment. **Company B (property manager):** Asset classification: Equity ⟶ Common and preferred stock of corporates and SMEs ⟶ All other sectors (listed companies). Minimum coverage requirement: 100% Applicable methods: SDA, Portfolio Coverage and Temperature Rating. Listed real estate fund portfolio: **Fund A:** Asset classification: Real estate ⟶ Investment in real estate funds (listed and private) ⟶ Real estate assets. Coverage required: 67% of base year activity (m^2) or financed emissions. Applicable methods: SDA.
Whole building approach	FI X shall abide by the 'whole building approach' when collecting in-use operational emissions data on the underlying assets held by the companies and funds in its portfolio. Estimated data shall be used where measured data is not available.
Required scope 3 categories	Category 15: Investments (Company A and B, and Fund A).
Asset geography – in-use operational emissions	Listed equity real estate portfolio: **Company A**: N/A as engagement targets shall be used. **Company B**: Other – as there are no country-specific pathways for Nigeria or Kenya in the target-setting tool. Listed real estate fund portfolio: **Fund A**: Austria, Spain, Portugal.

68 FIs shall use the SBTi Financial Institutions' Near-Term Criteria to determine the relevant asset classes and applicable methods.

Asset typologies – in-use operational emissions	Listed equity real estate portfolio: **Company A**: N/A as engagement targets shall be used. **Company B**: Other – as there are no country-specific pathways for Nigeria or Kenya in the target-setting tool. Listed real estate fund portfolio: **Fund A**: Industrial distribution warehouse – warm.
Headline target	FI X's portfolio targets cover 51.0% of its total investment and lending activities by total assets under management as of 2022.
Asset class specific target communication	Financial asset class level targets: 1 FI X commits to 100% of its listed equity portfolio by invested value setting SBTi validated targets by 2028 from a 2022 base year. 2 FI X commits to reduce GHG emissions from the real estate sector within its listed equity portfolio 59.5% per m^2 by 2028 from a 2022 base year. 3 FI X commits to reduce GHG emissions from the real estate sector within its listed fund portfolio 53.0% per m^2 by 2028 from a 2022 base year.



For general information and technical queries contact us at:
info@sciencebasedtargets.org

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