

# BUILDINGS SECTOR SCIENCE BASED TARGET SETTING GUIDANCE

Version 1.5 - **DRAFT**

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## ACKNOWLEDGEMENTS

This guidance document was developed by PwC on behalf of the Science Based Targets initiative (SBTi). The SBTi is a global body enabling businesses to set ambitious emissions reductions targets in line with the latest climate science. It is focused on accelerating companies across the world to halve emissions before 2030 and achieve net-zero emissions before 2050.

The SBTi mobilizes companies to set science-based targets and boost their competitive advantage in the transition to the net-zero economy. The SBTi is a collaboration between CDP, the United Nations Global Compact, World Resources Institute, and World Wide Fund for Nature (WWF), and is one of the We Mean Business Coalition commitments.

### Technical partnerships

The SBTi developed the guidance, sectoral pathways and accompanying tool in technical partnership with PwC, Carbon Risk Real Estate Monitor (CRREM), Ramboll, and dss+. PwC is a leading professional service network, and developed this guidance document for the SBTi. CRREM provides the real estate industry science-based decarbonization pathways for in-use operational emissions. The SBTi's partner in developing the embodied emissions pathways is Ramboll, a global engineering, architecture and consultancy company. The target-setting tool was developed together with dss+.

We would like to acknowledge the SBTi Technical review team: Aamir Khan, Howard Shih, Fernando Rangel Villasana, Ginger Kowal, Caitlin Blitzer, and Phoebe Holmes.

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# 1 INTRODUCTION

## 1.1 Introduction to science-based targets

Science-based targets (SBTs) specify how much and how quickly a company would need to reduce its greenhouse gas (GHG) emissions in order to align with the goals of the Paris Agreement.

Statistic call-out: Buildings account for 33% of today's global CO<sub>2</sub> emissions when both operational emissions and embodied emissions of materials are taken into account. (IEA, 2022)

The buildings sector has a very large emissions footprint. It is responsible directly and indirectly for approximately one-third of global CO<sub>2</sub> emissions (IEA, 2022). In 2021, around 8% of global energy- and process-related emissions were related to the use of fossil fuels in buildings, around 19% to the generation of electricity and heat used in buildings, and a further 6% were related to the embodied emissions of buildings - the manufacture of cement, steel, and aluminum used for construction (IEA, 2022). Beyond CO<sub>2</sub>, fugitive emissions from fluorinated GHGs are also a significant, and growing, source of emissions for the buildings sector. According to a 2020 estimate, hydrofluorocarbons (HFCs), which represent around 80% of fugitive emissions, accounted for 8% of buildings sector emissions (Hu et al., 2020).

Additionally, it is expected that global floor area will increase significantly in the future, by around 20% to 2030, with more than 80% of this area growth predicted to be in developing and emerging economies (IEA, 2022). This area is equivalent to more than the whole built floor area of North America (IEA, 2022). 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). With fossil fuel demand in the sector growing at an average rate of 0.7% since 2010, and 35% of total buildings energy consumption still covered by fossil fuels in 2021, it is clear that the sector's energy intensity needs to follow a steep decline to align with a Net Zero by 2050 scenario (IEA, 2022). Thus, this decade is crucial to designing and enforcing the measures necessary to decarbonize the sector.

In order to successfully address the contribution of buildings and their construction to global GHG emissions, emission reductions need to be made across the sector's entire value chain. The purpose of this guidance document and its accompanying target-setting tool is to provide the variety of actors along the buildings value chain with the resources they need to set 1.5°C-aligned near- and long-term decarbonization targets. This document provides the scientific basis for sector-specific 1.5°C pathways, as well as guidance on target-setting for in-use operational emissions and embodied emissions.

The document is structured as follows:

- Section 1 gives an overview of the development of the guidance and its use.
- Section 2 provides the context behind near-term, long-term and net-zero science-based targets.
- Section 3 explains the scientific basis for buildings sector 1.5°C decarbonization pathways, the sector-specific intensity convergence approach (SDA)<sup>1</sup>, as well as defining key elements of the pathways, namely the intended users and building typologies within the scope of the guidance.
- Section 4 provides a summary of the guidance criteria and recommendations.
- Section 5 provides clarifications on GHG accounting practices for the buildings sector.
- Section 6 forms the main part of this guidance on target-setting. It includes 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, and requirements on setting near-term scope 3 targets for each intended user.
- Section 7 is a supplement chapter intended to provide additional guidance for Financial Institutions (FIs) in setting targets, as their interactions with the buildings sector differ compared to other guidance users. The criteria and recommendations in section 6 also apply to FIs.

## 1.2 Overview of the development process

The SBTi developed the sectoral pathways, accompanying tool, and this guidance in technical partnership with four organizations: Carbon Risk Real Estate Monitor (CRREM), dss+, Ramboll, and PwC. 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 this guidance document on emissions accounting, target-setting, and reporting to help real estate companies set ambitious near- and long-term science-based targets.

A transparent multi-stakeholder development process is central to all SBTi sector projects. The Buildings project is accompanied by an Expert Advisory Group (EAG) composed of 32 organizations from industry, civil society and academia to provide detailed input during the development of this guidance and tool. The complex nature of the buildings value chain heightened the need for a holistic understanding of the sector, and therefore a diverse range of inputs and expertise was sought via the EAG's composition. EAG members were selected and invited to join the group based on their

<sup>1</sup> The sector-specific intensity convergence approach was previously known as the 'sectoral decarbonization approach'. This document uses the abbreviation of the former name for cohesiveness with other SBTi resources.

geographic location, expertise, relationship to the sector and, with regards to corporates and FIs, ambition to align their targets with the latest climate science.

**Figure 1. Expert Advisory Group member organizations**

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

The SBTi is grateful for the engagement and input from EAG members. Overall, the EAG’s role was advisory, and final sign-off for deliverables will be by the SBTi. Therefore, opinions expressed within this document may not represent the views of every EAG organization.

The SBTi’s buildings project is primarily funded by the Laudes Foundation.

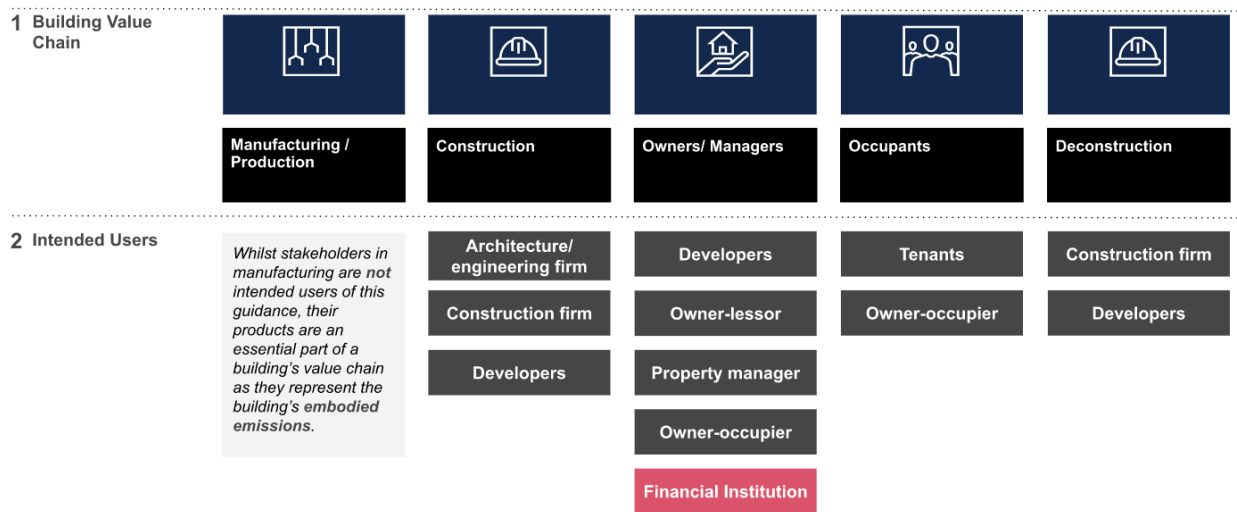
Public consultation will be held from 16 May to 16 July 2023 to obtain feedback and input from stakeholders on this guidance document and the accompanying target-setting tools.

### 1.3 Intended users of this guidance from across the buildings value chain

The buildings sector value chain contains a broad array of actors that must work together to achieve the sector’s decarbonization goals. This guidance aims to resolve the challenges related to setting

science-based targets for companies and financial institutions at key stages along the sector’s value chain. It achieves this by assessing buildings beyond their day-to-day functional use, considering them as products as well as financial assets. This accounts for users of this guidance involved in all parts of a building’s life cycle, starting from conceptualization of a building’s design to financing, development, construction, management, and occupation of the building throughout its lifetime - outlined below in Figure 2. Therefore, this guidance addresses the corporate as well as financial sector, providing guidance on how to set science-based targets depending on the relationship to the buildings.

**Figure 2. Intended users within the buildings value chain**



SBTi's approach as outlined in this document is aimed at target-setting on GHG inventories at the corporate or financial institution level, in line with the GHG protocol. This is distinct to asset level approaches.

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, or regional ones like Australia's Green Star, Germany's DGNB or Singapore's Green Mark, help verify that buildings are designed, built, and operated to a high standard. Reporting and benchmarking frameworks likeGRESB can help those achievements be translated to emissions level reporting that can be used to show compliance with SBTi's pathways. Reporting Standards like RICS 'Whole-life Carbon Assessment' help track emissions across an asset's life, with programs like WorldGBC's Global Commitment for Net Zero Buildings help ensure that entities are committed and in alignment with net zero carbon goals.

The two accounting approaches (building-level vs. entity-level) are complementary, and both can lead to ambitious decarbonization. However, their differences can sometimes lead to challenges, for example where emissions reported at the building-level do not aggregate to the entity-level. SBTi will work further with these programmes to drive alignment and uptake, and feedback on how best to improve the complementarity of the two approaches is welcomed during the public consultation.

The buildings sector guidance aims to adhere to the GHG Protocol, offer helpful interpretation of it, and deviate only where necessary.

A notable exclusion from the scope of intended users of this guidance are upstream manufacturing entities such as raw material producers (e.g. cement and steel) and intermediate product processors and transporters. While their products are intrinsic to the buildings sector, and are involved in setting embodied emission targets, these entities are beyond the scope of the buildings sector guidance. They are recommended to seek target-setting guidance from the sector-agnostic [Net-Zero Standard](#) or from sector-specific guidance documents where relevant, such as [Steel](#) and [Cement](#).

For details on the specific categories of intended users in this guidance, including descriptions of their roles and responsibilities to aid in classification, see [section 3.5.1](#).

## 1.4 How does this guidance change target-setting requirements compared to previous practice?

The SBTi already offered 2°C and well-below 2°C pathways for residential and commercial buildings prior to publication of this detailed guidance, and many companies have already set targets using these. To further advance science-based decarbonization in this sector, the SBTi Buildings Guidance aims to codify and clarify the criteria already being applied by companies and the SBTi target validation team when assessing and validating SBTs in this sector. Additionally, it was designed to align to the latest [SBTi Criteria and Recommendations for Near-Term Targets](#), [SBTi Corporate Net-Zero Standard](#), and 1.5°C ambition<sup>2</sup>.

With the SBTi's increased ambition for near-term targets to align to 1.5°C, as well as the need 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. The in-use operational pathways, and this guidance document,

<sup>2</sup> According to the [SBTi Criteria and Recommendations for Near-Term Targets](#) (v5.1, 2023), existing targets should be recalculated if there are significant changes that could compromise relevance and consistency of the existing target, or at least every 5 years. The publication of this guidance does not oblige companies with existing targets to update these, although they are strongly encouraged to increase their ambition to 1.5°C and set net-zero targets.



abide by the “whole building approach”<sup>3</sup>, ensuring that a building’s complete operational energy consumption from landlord and tenant-controlled spaces are included within a user’s target boundary (irrespective of whether they are the landlord, tenant, finance provider, or other relevant buildings value chain player). This approach raises ambition in the sector and ensures parties across a building’s value chain take ownership to reduce its energy consumption. Further details are provided in [section 5.1](#).

In addition, with the publication of this guidance the SBTi is increasing the emphasis on management and decarbonization of embodied emissions, which have historically lacked global sectoral decarbonization pathways. Through a collaboration with Ramboll, the SBTi has developed the first set of 1.5°C-aligned embodied emissions pathways for the global buildings sector, allowing science-based targets to be set on embodied emissions for a larger number of companies and financial institutions.

Companies must follow requirements for target setting and minimum ambition levels as indicated in this sector-specific guidance at the latest, 6 months after the sector guidance publication.

Targets must be modeled using the latest version of methods and tools approved by the initiative. Targets modeled using previous versions of the tools or methods can only be submitted to the SBTi for validation within 6 months of the publication of the revised method or sector-specific tools.

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<sup>3</sup>The “whole building approach” means that a building’s complete operational energy consumption from landlord and tenant-controlled spaces are included within a user’s target boundary and reported on a regular basis. This shall not be confused with Whole (Building) Life Carbon, which means addressing emissions through a building’s life cycle.

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

The SBTi [Net-Zero Standard](#) was published in October 2021. It was developed to guide corporate organizations towards a state of alignment with the goals of the Paris Agreement. Additionally, the SBTi launched v1.1 of the [Financial Sector Science-Based Targets Guidance](#) in August 2022, which includes guidance for FIs to set science-based targets on their investment and lending activities, for certain sectors where methods are available. Both of these documents set out three key elements which make up a net-zero target:

- (i) near-term SBTs
- (ii) long-term SBTs; and
- (iii) neutralization of any residual emissions

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

- A near-term SBT has a timeframe of 5-10 years.
- A long-term SBT shows the degree of emission reductions needed for companies to reach net-zero before 2050.

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

Full criteria and explanations can be found in the SBTi [Net-Zero Standard](#) and [Criteria](#).

## 3 BUILDINGS DECARBONIZATION PATHWAYS

To create tools that companies can use to calculate SBTs, three steps are followed by the SBTi:

- The global carbon budget and its [allocation to the buildings sector](#) is determined.
- Emissions pathways describing a plausible decarbonization trajectory that fits within the sector budget are chosen or developed, for in-use operational and upfront embodied emissions respectively, based on a comparison with the IEA Net-Zero scenario and discussion with the EAG.
- Target setting methods such as the sector-specific intensity convergence approach (SDA) are used to translate the sector pathway into company targets.

### 3.1 Overview of the sector-specific intensity convergence approach (SDA)

The [SDA](#)<sup>4</sup> is a target-setting methodology allowing companies to model physical intensity GHG reduction targets that align with the sector-specific pathway of an underlying climate scenario. It allocates the global carbon budget to different sectors, taking into consideration the inherent differences among sectors, such as relative growth of sector, dependencies on economic and population growth, and mitigation potential. Within each sector, companies 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.

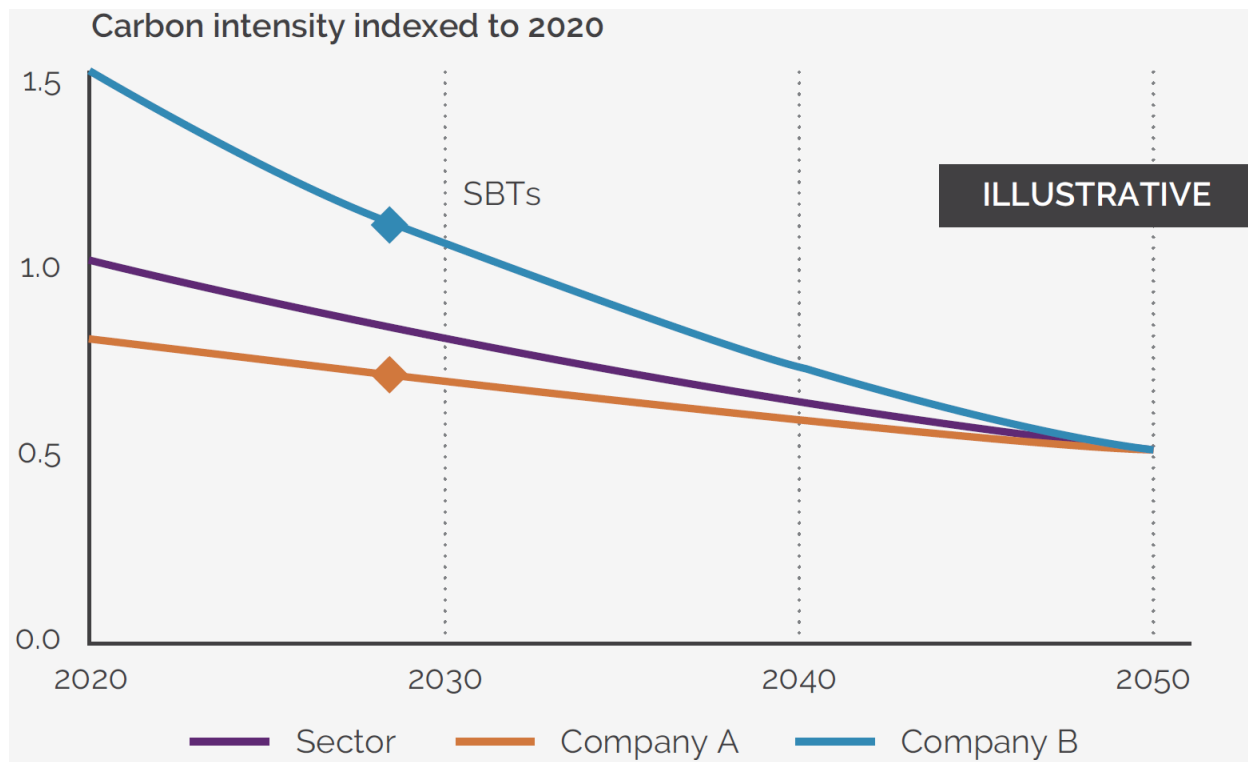
Using the SDA, annual emissions pathways are divided by forecasted industry activity to define an emissions intensity curve. Targets are set by assuming that all companies converge to the same intensity level as the sector average by the year 2050. SBTs are set in the near term (5 to 10 years) along 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 (Figure 3).

The further a company is above the curve in the base year, the more stringent the percentage intensity reduction required. If the company has a greater growth forecast compared to the sector growth in the pathway, steeper emission intensity reductions will be required. Thus, a company's particular situation is considered in calculating the emissions intensity target required. It is important to note that deviations from the SDA emission intensity curves are not made for portfolios with low emissions in their base year, in order to maintain the rigor of science-based target setting.

<sup>4</sup> Formerly known as the Sectoral Decarbonization Approach (SDA), terminology updated April 2023.

The SDA is used for sectors that have a dedicated decarbonization pathway. The cross-sector absolute reduction method<sup>5</sup>, or absolute reduction more generally, which requires absolute emissions reductions at a fixed annual rate (for near-term SBTs the minimum reduction is calculated as a linear reduction rate (e.g., 4.2% p.a.), can be used by most sectors, especially those that do not have a sector-specific pathway. However, it is important to note that the buildings sector is an exception, as its sector-specific pathways are more ambitious than the cross-sector pathway due to the available technological advancements which allow the buildings sector to decarbonize faster than others. Therefore, companies operating in the buildings sector must adhere to sector-specific requirements for target-setting and minimum ambition levels as indicated in this guidance.

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



<sup>5</sup> Formerly known as the cross-sector absolute contraction approach.

### 3.2 Why does the buildings sector warrant dedicated guidance and pathways?

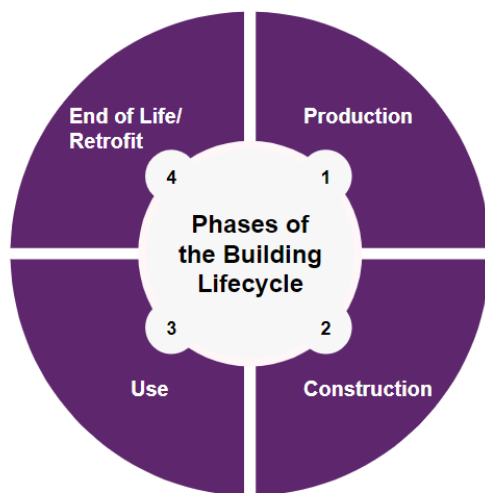
Decarbonizing the buildings sector is critical for meeting the objectives of the Paris Agreement, as this sector is responsible for a significant portion of global emissions. There are three compelling reasons why the buildings sector warrants dedicated pathways:

1. The vast scale of emissions from the buildings sector: buildings account for 34% of today's global CO<sub>2</sub> emissions when both operational emissions and embodied emissions of materials are taken into account (IEA, 2022). Additionally, building floor area is set to grow approximately 75% over 2020-2050 (IEA, 2021), meaning CO<sub>2</sub> emissions will rise dramatically if no decarbonization efforts are made in the sector.
2. Buildings have a complex and varying emissions profile throughout their lifetime giving them a unique distribution of emissions compared to other sectors' outputs, and are constructed in a variety of typologies with varying uses which differ by geographic regions, and thus differentiated pathways are needed to set meaningful decarbonization targets.
3. Due to the large and diverse ecosystem of stakeholders in the buildings sector, along with the complexities arising from financing, development, ownership, and operation of buildings distinct considerations are required in developing decarbonization target-setting methodologies.

### 3.3 The lifecycle of buildings

The figure below outlines the main phases of a building's life cycle.

**Figure 4. Phases of the building life cycle**



**Table 1. Definitions of the phases of a building's life cycle**

| PHASE               | DEFINITION  | EMISSION SOURCE EXAMPLES <sup>6</sup>  |
|---------------------|---|--|
| <b>Production</b>   | 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, and the fabrication and packaging of buildings products and materials.  | <ul style="list-style-type: none"> <li>• Mining and processing of metal ores</li> <li>• Calcination of limestone in the production of cement</li> </ul>                |
| <b>Construction</b> | The process of building a structure, which involves the planning, design, procurement, transport 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. | <ul style="list-style-type: none"> <li>• Freight transport</li> <li>• Onsite heavy equipment</li> <li>• Site energy consumption</li> </ul>                             |
| <b>Use</b>          | A building's operational life phase. During this period, the building is ready for use, regardless of whether it is continuously occupied.  | <ul style="list-style-type: none"> <li>• Energy use in the building</li> <li>• Refrigeration and cooling systems</li> </ul>  |
| <b>Retrofit</b>     | The introduction of new materials, products and technologies into an existing building to reduce the energy needed to occupy that building. Retrofitting and deep energy renovation are increasingly deemed as pivotal actions in the building sector's decarbonization.  | <ul style="list-style-type: none"> <li>• Freight transport</li> <li>• Renovation site energy consumption</li> <li>• Manufacturing of construction materials</li> </ul> |
| <b>End of life</b>  | The dismantling, destroying, wrecking, or removal of buildings or structures.   | <ul style="list-style-type: none"> <li>• Transport of materials off-site</li> <li>• Site energy consumption</li> </ul>   |

A building might influence the production, substitution, or reduction of emissions beyond its life cycle. These emissions are part of the circular economy, where energy is reused, recycled and recovered

<sup>6</sup> Non-exhaustive.

beyond the building's system boundary. However, these emissions are currently beyond the scope of science-based target-setting.

### 3.3.1 Whole life carbon

In the past, the buildings sector has focused on operational energy reduction, driven in part through building regulations, planning requirements, and sustainability assessment rating schemes. Over the last decade, regulation and sustainability rating schemes like DGNB and Green Star also incorporated embodied emissions (DGNB, 2020; GBCA, 2018). Since then, legislation and action addressing both operating and embodied emissions is rapidly becoming more common, with Australia, Denmark, Finland, France, Netherlands, New Zealand and Sweden, in addition to several major cities, all outlining requirements to address both as part of planning and regulation.

However, SBTi recognises that more can be done to systematically tackle embodied emissions, and to encourage ambitious reductions that align with 1.5°C carbon budgets. The buildings sector globally is increasingly moving towards performing whole life carbon assessments for all stages of the project life cycle and using the assessments as aids to inform planning, design, and procurement of low-emissions buildings (i.e. RICS, 2023).

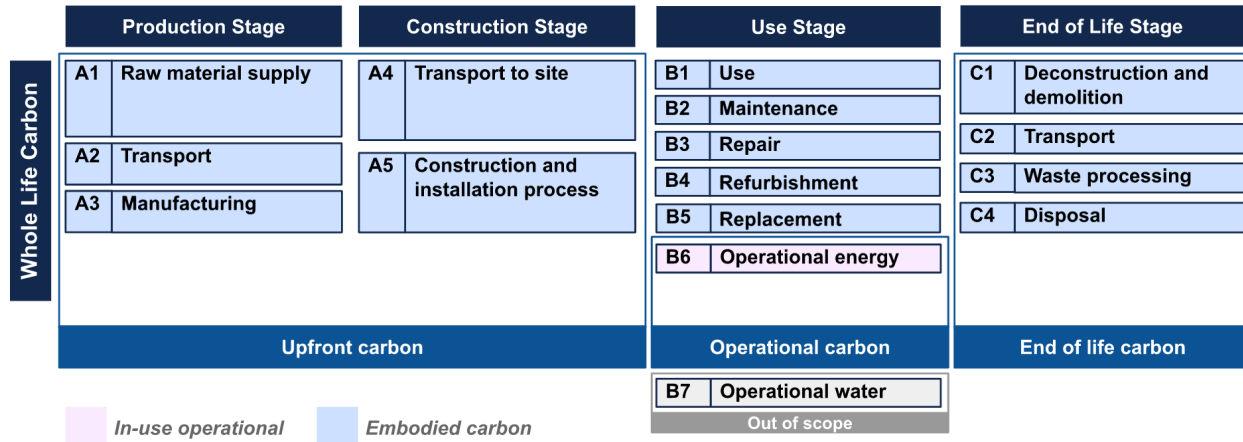
To support the sector to take a holistic view on emissions from buildings, in this guidance, the SBTi has provided target-setting guidance and methods to allow users to set targets on their embodied emissions at a portfolio level.

## 3.4 Sector carbon intensity pathways

### 3.4.1 Emissions pathways for the buildings sector

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. It is up to individual users, based on their user type and business activities, to determine whether they require use of both sets of pathways when setting targets. Further details on the activities required to set targets on are found in [section 6.2](#). Details of how the pathways were developed can be found in the [Appendix](#).

Figure 5. Diagram illustrating buildings life cycle and stages adapted from EN 15978 (2011)



### 3.4.1.1 In-use operational emissions

In-use operational emissions are emissions associated with the operation of a building in its use stage, i.e. the energy needed to heat, cool, and power them (B6), as illustrated in Figure 5.

### 3.4.1.2 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 occur throughout different life cycle stages of a building, as illustrated in Figure 5.

Embodied emissions therefore include emissions from the production and construction stages (A1-A5), also referred to as upfront embodied emissions, use stage emissions (B1-B5 only, excluding modules B6 and B7), and end of life stage emissions (C1-C4) as represented in Figure 5 above.

The SDA pathway developed for this project concerns 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. Therefore, for the targets set using the available methods for upfront embodied emissions to create meaningful change, companies are expected to take into consideration sufficiency measures. For more details on the development of the pathway, please see [section 11.3.2](#).



It is estimated that for a modern building, over its whole lifetime, 50% of emissions are due to its embodied emissions, with 32% upfront embodied emissions, and 19% use stage and end-of-life emissions (WBCSD, 2023). These figures highlight the importance of taking into consideration embodied emissions to fully address the decarbonization of the buildings sector. Thus, the developments in accounting and managing of embodied emissions arising from this SBTi project are an important step towards this.

The inclusion of embodied emissions in target-setting helps bridge the SBTi coverage gap between the production of construction raw materials, covered in sectoral guidance documents such as the [SBTi Cement Guidance](#) and the [SBTi Steel Guidance](#), and the 'end products' of the buildings sector. Thus, despite manufacturing industries not being included as intended users of this guidance, the embodied emissions pathway demonstrates the intrinsic relationship between those industries and the buildings sector, and the key role emissions reductions from construction material companies play in meaningful decarbonization of the built environment. This novel pathway thus incentivizes a cross-sectoral drive to decarbonization by allowing the inclusion of emissions from raw material production in scope 3 of the buildings sector companies.

### 3.5 Definition of the sector covered by the pathways

This subsection will address the boundaries of the buildings sector guidance in terms of intended users, building typologies, and the mapping of a buildings' life cycle.

#### 3.5.1 Intended users

##### 3.5.1.1 Overview of Intended users

The buildings sector is broadly a heterogenous, complex sector with various entities spread across the buildings value chain. However, as all users within this sector engage with one 'product', i.e. buildings, a common unique 1.5°C pathway is viable. The pathways are customized for building typologies and specific countries<sup>7</sup>, influencing the necessary targets themselves. To account for large variability in emission responsibilities and sources, this document will provide guidance on the process of setting targets for an array of intended users. The aim has been to approach this sector holistically by including users from each key stage of a buildings' value chain. A notable exclusion from the scope of intended users of this guidance are upstream manufacturing entities such as raw material producers and intermediate product processors and transporters. They are recommended to seek target-setting

<sup>7</sup> Country-level pathways available only for the in-use operational emissions pathway.

guidance from the sector-agnostic Net-Zero Standard or from sector-specific guidance documents where relevant

Acknowledging that legal and geographic factors may affect particular users' classification, this guidance addresses the following user categories:

- Architecture/ engineering company
- Construction company
- Developer
- Tenant
- Owner-occupier
- Owner-lessor
- Property manager
- Financial institution (FI)\*

\*The financial sector's largest impact comes from its investment and lending activities (scope 3 category 15 Investments) and therefore it is imperative that targets for this sector encompass such activities. As guidance for FIs follows separate GHG accounting protocols and FIs' interactions with the buildings value chain is sufficiently different to the other users listed, target-setting guidance for these intended users is provided in a dedicated section ([section 7](#)).

### 3.5.1.2 Definitions, roles and responsibilities

The user categories outlined below have been designed to encapsulate the range of stakeholders found in the buildings value chain. The list and definitions are non exhaustive. Users have discretion in selection which user category best describes their company's activities, roles, and responsibilities within the buildings sector. The roles and responsibilities listed are indicative only, and are provided as examples of activities to help intended users understand if and how this guidance 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 2. Definitions of the intended users of this guidance, their roles and responsibilities**

| USER                                      | DEFINITION  | ROLES AND RESPONSIBILITIES <sup>8</sup>   |
|---|---|---|
| <b>Architecture / engineering company</b> | An entity whose business involves the preparation or modification of a design/ blueprint/ plan/ schematic/ prototype which informs the development of a building. | <ul style="list-style-type: none"> <li>● Design</li> <li>● Conceptualization</li> <li>● Planning</li> <li>● Project management</li> <li>● Producing construction documentation</li> <li>● Structural quality control</li> <li>● Site analysis and assessment</li> </ul>   |
| <b>Construction company</b>               | An entity whose business is the construction, renovation, or structural alteration of a building, in whole or in part.  | <ul style="list-style-type: none"> <li>● Construction site management</li> <li>● Site analysis and assessment</li> <li>● Project management</li> <li>● Preparing site for construction (which may include demolition of pre-existing structure)</li> <li>● Purchasing construction materials</li> </ul>                         |
| <b>Developer</b>                          | An entity which contracts for the construction of a building with the intent to either own or transfer ownership <sup>9</sup> .                                   | <ul style="list-style-type: none"> <li>● Project planning and design</li> <li>● Site selection</li> <li>● Financing of project</li> <li>● Construction management</li> <li>● Regulatory compliance</li> <li>● Risk management</li> <li>● Post-construction operations to ensure building is suitable for target user</li> </ul> |
| <b>Owner-occupier</b>                     | An entity that has ownership and operational control of the building, as they are occupying it or employing its use.  | <ul style="list-style-type: none"> <li>● Legal ownership of building</li> <li>● Operational control of building</li> <li>● Property management</li> </ul>   |
| <b>Owner-lessor<sup>10</sup></b>          | An entity that has ownership of the   | <ul style="list-style-type: none"> <li>● Financial management</li> </ul>  |

<sup>8</sup> Non-exhaustive.

<sup>9</sup> For assessing whether a project qualifies as a new construction, refer to the 'new construction' definition in GRESB Reference Guide (GRESB, 2022).

<sup>10</sup> For the avoidance of doubt, both public and private-sector entities are intended users of this guidance.

| USER                    | DEFINITION  | ROLES AND RESPONSIBILITIES <sup>8</sup>  |
|-------------------------|---|--|
|                         | <p>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 lease type, an owner-lessor will exert varying levels of operational control over the building.</p> | <ul style="list-style-type: none"> <li>● Financial ownership</li> <li>● Legal compliance</li> <li>● Authority over property management</li> <li>● Authority over contract management</li> <li>● Authority over tenant relations and leasing decisions</li> <li>● Authority over investment management of the building</li> <li>● Leasing the property</li> <li>● Rent collection</li> <li>● Contract management and legal compliance</li> <li>● Financial management of building operations</li> <li>● Tenant relations and communication</li> <li>● Risk management</li> <li>● Property inspections</li> <li>● Repairs and maintenance</li> <li>● Facilitating and brokering sale of property, including the listing of properties</li> </ul> |
| <b>Tenant</b>           | <p>An entity, to whom a lease is granted, which occupies a property without ownership of the building, in whole or in part.</p>   | <ul style="list-style-type: none"> <li>● Use of building</li> <li>● Payment of rent</li> <li>● Compliance with building rules and regulations</li> <li>● Reporting of maintenance issues</li> <li>● Payment of energy consumption<sup>11</sup></li> <li>● Operational control of building</li> </ul>   |
| <b>Property manager</b> | <p>An entity whose business involves acting as an agent overseeing the operations of a building without the requirement of occupying or</p>   | <ul style="list-style-type: none"> <li>● Leasing the property</li> <li>● Rent collection</li> <li>● Contract management and legal compliance</li> </ul>  |

<sup>11</sup> Dependent on the utility arrangement with the landlord.

| USER                                       | DEFINITION   | ROLES AND RESPONSIBILITIES <sup>8</sup>  |
|--|--|--|
|  | <p>owning the property. This includes those providing transaction-related services. e.g. brokers, estate agents, facilities managers.</p>  | <ul style="list-style-type: none"> <li>• Financial management of building operations</li> <li>• Tenant relations and communication</li> <li>• Risk management</li> <li>• Property inspections</li> <li>• Repairs and maintenance</li> <li>• Facilitating and brokering sale of property, including the listing of properties</li> </ul>  |
| <p><b>Financial institution (FI) *</b></p> | <p>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.<sup>12</sup></p> | <ul style="list-style-type: none"> <li>• FI which directly invests in a real estate asset or in a private or public real estate entity</li> <li>• FI with operational control of a real estate asset</li> <li>• FI which indirectly invests into real estate assets through investment (loan or equity) into listed or unlisted (private) real estate companies, REITs or mortgages</li> </ul> |

\*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 read the relevant sections of this guidance for both Corporates ([section 6](#)) and FIs ([section 7](#)) 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 Criteria.

### 3.5.1.3 User classification

In practice, the building sector is composed of entities whose roles and responsibilities span across the buildings value chain, and across the above defined users. Some users may find that they cannot place themselves firmly within one category of user. For such entities, it is recommended that they utilize the

<sup>12</sup> Definition of a FI provided in SBTi [Financial Sector Science-Based Targets Guidance](#) (v1.1, 2022).

methods described in this guidance to the extent that they relate to their activities. This might result in them categorizing themselves as multiple user types across the process of target-setting and following this guidance. Care should be taken to ensure that the activity is matched as closely as possible to one of the intended users' remits.

### Box 1. Examples of intended user classifications

**Example 1:** *An entity 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:** *An entity which develops and constructs buildings would classify as a developer and construction company. If the entity also owns its own corporate offices, it would be further classified as an owner-occupier. If the entity also leases some floor space in a building from a lessor, it would be further classified as a tenant.*

**Example 3:** *An FI which directly owns and leases out real estate while also managing indirect investments in real estate would classify as both an owner-lessor, following corporate ([section 6](#)) guidelines for target-setting, and an FI, following FI ([section 7](#)) guidelines for target-setting.*

## 3.5.2 Building typologies and geographic location

Buildings with common characteristics can be categorized into individual 'typologies'. The buildings sector guidance provides separate emissions pathways for available typologies and geographic locations for in-use operational emissions and upfront embodied emissions<sup>13</sup>.

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

### 3.5.2.1 Building typologies covered by this guidance

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<sup>13</sup> The upfront embodied emissions pathways are currently only available at a global level.

**Table 3. Building typologies covered by the in-use operational emissions pathway**

| BUILDING TYPOLOGY                        | SUB-TYPE        | DESCRIPTION <sup>14</sup>  |
|--|-----------------|--|
| <b>Office</b>                            |                 | Includes free-standing offices, office terraces, unattributed office buildings and office parks.   |
| <b>Retail</b>                            | 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.   |
| <b>Hotel</b>                             |                 | Includes hotels, motels, youth hostels, lodging, and resorts.  |
| <b>Industrial distribution warehouse</b> | 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 around the outskirts of cities. |
|  | Cold storage    |  |
| <b>Healthcare</b>                        |                 | 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.   |
| <b>Medical office</b>                    |                 | Offices specifically used for the purpose of medical administration, secondary research or other purposes, exclusive of the property types specified for Healthcare center.  |

<sup>14</sup> Adapted from GRESB real estate assessment (GRESB, 2023).

| BUILDING TYPOLOGY                       | SUB-TYPE      | DESCRIPTION <sup>14</sup>   |
|---|---------------|---|
| <b>Lodges, leisure &amp; recreation</b> |               | Includes lodging, sports club houses, gyms, sports stadia, indoor sports arenas, halls, swimming pools, theaters and auditoria. |
| <b>Residential</b>                      | Multi-family  | Refers to multi-family residential buildings.   |
|   | Single-family | Refers to single-family residential buildings.  |

**Table 4: Building typologies covered by the embodied emissions pathway**

| BUILDING TYPOLOGY  | DESCRIPTION  |
|--------------------|--|
| <b>Retail</b>      | Retail refers to properties used for commercial purposes that are primarily focused on selling goods and services directly to consumers. 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. |
| <b>Office</b>      | Includes free-standing offices, office terraces, unattributed office buildings and office parks.   |
| <b>Residential</b> | 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.   |
| <b>Other</b>       | Typology which covers buildings not aligned to the above three categories.   |

### 3.5.2.2 Geographies covered by this guidance

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 sub-section below.

### 3.5.2.2.1 In-use operational emissions

The SBTi Buildings Target-Setting Tool offers a range of geographic options for users to choose from, including a number of EU countries, non-EU countries, subregions of Australia and a selection of major cities in the United States. Please see the buildings tool for the full list of available geographies to choose from. For guidance on selecting a pathway when an asset is not located within one of these geographies, see [section 6.4.3.3](#).

### 3.5.2.2.2 Embodied emissions

The embodied emissions pathway provides global level data. This is due to there not being a strong justification for sub-global pathways, with the industry being projected to converge globally towards 2050, and due to current data availability. The SBTi may choose to update and expand the available geographies, and accompanying emissions pathways, in the future.

## 3.6 Levers to decarbonize buildings portfolios

Emissions scenarios describing paths for the buildings sector to reach the level of deep decarbonization required by the 1.5°C goal point to a wide range of opportunities to reduce emissions (IEA, 2021). Highly energy efficient buildings are ready to be scaled up today, reducing CO<sub>2</sub> emissions and cutting energy bills.

Levers already being implemented across the buildings value chain include low-carbon design, the use of low-carbon building materials, switching to renewable sources of electricity and the installation of electric heat pumps which are almost four times more efficient than conventional boilers (IEA, 2021) and up to three times less expensive than green hydrogen (Weidner et al., 2023).

The adoption of circularity principles in the way we design buildings is also a key decarbonization lever and could reduce global carbon emissions from building materials by 38% in 2050, due to a reduced demand for steel, aluminum, cement and plastic (Ellen Macarthur Foundation, 2020). Research has shown that up to 25% of materials in residential buildings slated for decommissioning or deconstruction can be reused, while up to 70% can be recycled in some form (RICS, 2020). Redevelopment and

renovations of the existing building stock to answer to the changed demand also serves as a sufficiency measure in the industry by reducing the need for newly constructed buildings.

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 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 by 2030 (IEA, 2021).

## 4 SUMMARY OF SECTOR-SPECIFIC CRITERIA AND RECOMMENDATIONS

In the context of the criteria and this guidance, the term “**shall**” is used to describe requirements related to relevant criteria and accounting guidance, whereas the term “**should**” is used to describe recommendations. The SBTi recommendations are important for transparency and best practices, but are not required.

### 4.1 Buildings Sector Criteria and Recommendations

| TOPIC  | CRITERIA     | DESCRIPTION  |
|--|--------------|--|
| <b>Use of buildings sector guidance</b>                  | Buildings-C1 | Companies operating in the buildings sector shall adhere to sector-specific requirements and recommendations for target-setting and minimum ambition levels as indicated in this document.   |
| <b>Use of in-use operational emissions buildings SDA</b> | Buildings-C2 | Companies shall use the buildings in-use operational emissions SDA to set scope 1 and 2 targets for their buildings related activity, with the exception of construction companies that shall use the cross-sector absolute reduction method (1.5°C) for their scope 1 and 2 emissions.  |
| <b>Ambition level of buildings SDA</b>                   | Buildings-C3 | Where the buildings SDA is used (operational and embodied), be it for scope 1, 2, or 3 emissions, the ambition level shall be 1.5°C.   |
| <b>Decarbonization pathway selection (SDA)</b>           | Buildings-C4 | Companies shall adhere to the guidance on choosing an appropriate pathway (selecting building typology for both SDAs in <a href="#">section 6.4.3.1</a> ; selecting geographic region for in-use operational emissions SDA only in <a href="#">section 6.4.3.3</a> ) when using the SDA (in-use operational and upfront embodied). |
| <b>Whole building approach</b>                           | Buildings-C5 | Companies shall quantify and assess all GHG emissions (including fugitive emissions) of buildings in operation, irrespective of the organizational boundaries or control   |

| TOPIC   | CRITERIA      | DESCRIPTION  |
|---|---------------|--|
|   |               | <p>approaches used by various stakeholders in their corporate reporting.</p> <p>Further, they shall include all GHG emissions, (including fugitive emissions) for their required emissions sources as defined in this document, when developing a baseline and setting targets.</p> <p>This is referred to as the whole building approach (see <a href="#">section 5.1</a> for further details).</p> |
| <b>Fugitive emissions</b>                         | Buildings-C6  | Companies shall include fugitive emissions in their target boundary, for all building typologies. Where data is not collected on fugitive emissions, companies shall provide an estimate and disclose their estimation methodology.  |
| <b>Required near-term scope 3 coverage</b>        | Buildings-C7  | Where a scope 3 category is listed as required for inclusion within a user's target boundary, the company must include these emissions in their target, irrespective of whether total scope 3 emissions represent >40% of total scope 1 + 2 + 3 emissions. Companies must still adhere to <a href="#">SBTi general criteria C4</a> .   |
| <b>Upfront embodied emissions</b>                 | Buildings-C8  | Users which are the first owner/purchaser of a new building upon practical completion, and entities which finance the construction or first purchase of a new building, shall set a scope 3 target covering the upfront embodied emissions of new buildings.   |
| <b>Location-based accounting</b>                  | Buildings-C9  | Users shall use only the location-based accounting approach when considering electricity use for the purposes of calculating a base year, setting a target, or tracking performance against a SBT irrespective of whether the electricity use is in the user's scope 2 or scope 3.   |
| <b>Lifetime estimates in use of sold products</b> | Buildings-C10 | Users accounting for scope 3 category 11 use of sold products shall disclose the building lifetimes used and their rationale.  |

| TOPIC  | CRITERIA      | DESCRIPTION   |
|--|---------------|---|
| <b>Buildings which have changed typology</b> | Buildings-C11 | Target-setting for emissions from assets that have undergone a change in use type shall be set using their most recent typology classification. If, within a portfolio, more than 15% of the total floor area has changed use type within a two year period, the user shall recalculate and rebaseline their portfolio targets.   |
| <b>Fossil fuel phase-out</b>                 | Buildings-C12 | Companies setting buildings targets are required to publicly commit to no installation of new fossil fuel heating and cooking in users' buildings portfolios from 2025. Commitment language will be publicly disclosed by the user, and should take the following form: "[Company X] commits to no new fossil fuel heating and cooking installations in our buildings portfolio from 2025". |

| TOPIC   | RECOMMENDATION | DESCRIPTION   |
|---|----------------|---|
| <b>Information on absolute emissions reductions</b> | Buildings-R1   | In order to demonstrate that intensity targets also lead to absolute emissions reductions, and to demonstrate progress through optimization of material use, companies whose targets are expressed in intensity terms are recommended to publish the absolute emissions reductions that will be achieved by their targets.  |
| <b>Floor area</b>                                   | Buildings-R2   | For the calculation of intensities, which require a consistent floor area definition as a denominator, the floor area definition used should be used as consistently as possible throughout a company's GHG accounting.<br><br>Companies should use the International Property Measurement Standard (IPMS), specifically IPMS 2: Office or Residential to determine the asset floor area. Any divergence from IPMS 2 must be explained. |

| TOPIC   | RECOMMENDATION | DESCRIPTION   |
|---|----------------|---|
| <b>Lifetime estimates in used of sold products</b>        | Buildings-R3   | Users accounting for scope 3 category 11 the use of sold products should use a minimum building lifetime of 60 years in their calculations.   |
| <b>Target recalculation</b>                               | Buildings-R4   | <p>Existing targets should be recalculated if there are significant changes that could compromise relevance and consistency of the existing target, or at least every 5 years.</p> <p>Companies should consider significant changes in the typology and geographical composition of portfolios when determining whether a recalculation of targets is required.</p>   |
| <b>Misinterpreting divestment as emissions reductions</b> | Buildings-R5   | Companies should provide disclosure, as suggested in this guidance document, on how emissions reductions have been achieved.  |
| <b>Energy efficiency improvements</b>                     | Buildings-R6   | <p>Companies setting targets for building portfolios are recommended to publicly commit to making energy efficiency improvements in users' buildings portfolios in line with CRREM's energy-reduction pathways. Commitment language will be publicly disclosed by the user, and should take the following form: "[Company X] commits to making energy efficiency improvements in their buildings portfolio by 2030 in line with CRREM's energy-reduction pathways".</p> |

## 4.2 Additional Criteria and Recommendations for Financial Institutions

FIs shall adhere to the relevant criteria and recommendations in [4.1](#) when submitting their targets for validation. These sector-specific criteria are **in addition** to the SBTi for FI sector-criteria. The SBTi strongly recommends that FIs thoroughly review the [SBTi Financial Sector Science-Based Targets Guidance](#) and [Criteria and Recommendations for Financial Institutions](#) before target development.

| TOPIC  | CRITERIA        | DESCRIPTION  |
|--|-----------------|--|
| <b>Portfolio target boundary and methods</b> | Buildings-FI-C1 | FIs shall adhere to <a href="#">Table 12</a> (and any deviations outlined in this guidance), in order to determine the scope classification of emissions under different investing/lending scenarios and whether these shall be included in the target boundary.   |
| <b>Whole building approach</b>               | Buildings-FI-C2 | FIs shall include all emissions from the entire building in GHG accounting in accordance with the whole building approach.   |
| <b>Control approach</b>                      | Buildings-FI-C3 | For the purposes of delineating emissions for scopes for accounting of financed emissions (scope 3 category 15) in the real estate sector, FIs shall impose the PCAF Standard. In practice, this amounts to using an operational control approach over the whole building and an attribution method based on a proportional share. |
| <b>Embodied emissions</b>                    | Buildings-FI-C4 | Financial institutions providing finance for the construction of new buildings shall include all GHG emissions from upstream processes (upfront embodied emissions) in their target boundary (using the buildings upfront embodied emissions SDA to set targets).  |

| TOPIC                     | RECOMMENDATION  | DESCRIPTION   |
|---------------------------|-----------------|---|
| <b>Embodied emissions</b> | Buildings-FI-R1 | Where data on embodied emissions (at any life cycle stage) are readily available for existing buildings, FIs should include these in their emissions reporting. |

## 5 ACCOUNTING FOR BUILDINGS-RELATED EMISSIONS

Companies must perform their scope 3 emissions screening according to SBTi Criteria and the GHG Protocol Scope 3 Standard. In addition to the general SBTi Criteria, guidance users should consult the guidelines in this section regarding the prerequisites associated with buildings-related GHG accounting.

This guidance applies to all intended users, focusing on accounting and reporting of emissions for operational and embodied emissions across all phases of the building life cycle. It closely aligns with the GHG Protocol, as well as other accounting standards relating to buildings-related emissions (Table 5). In rare cases, where minor deviation from existing guidance (e.g. GHG Protocol) is necessary for context reasons, these are explained below. Additionally, where sector interpretation of existing guidance was required, these have been addressed and clarified for the purposes of standardization and comparability of SBTs.

Nevertheless, 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 to be reported: companies must perform their own screening of their scope 3 emissions according to the [SBTi Criteria and Recommendations for Near-Term Targets](#):

***SBTi general criteria C9 – Scope 3 screening: Companies must complete a scope 3 inventory covering gross scope 3 emissions for all its emissions sources as set out as the minimum boundary<sup>15</sup> of each scope 3 category per the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.***

**Table 5. Scope 3 accounting guidelines for intended users of the guidance.**

| AUTHOR              | DOCUMENT  | APPLICABILITY AND RELEVANCE FOR INTENDED USERS                         |
|---------------------|---|--|
| <b>GHG Protocol</b> | <a href="#">Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting</a> | <ul style="list-style-type: none"> <li>• All intended users</li> </ul> |

<sup>15</sup> For a definition of the minimum boundaries of scope 3 categories and emissions sources that fall outside the minimum boundaries, see Table 5.4 of the [GHG Protocol Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#), p.35 (2011).



| AUTHOR                    | DOCUMENT   | APPLICABILITY AND RELEVANCE FOR INTENDED USERS   |
|---------------------------|--|--|
|                           | <a href="#">Standard</a><br><br><a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> |  |
| <b>UKGBC</b>              | <a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a>   | <ul style="list-style-type: none"> <li>● Architecture and design firms/ Engineering firms</li> <li>● Construction firms</li> <li>● Developers</li> <li>● Owner-lessors</li> <li>● Owner-occupiers</li> </ul> |
| <b>ENCORD</b>             | <a href="#">A Guide to reporting against the Greenhouse Gas Protocol for construction companies</a>  | <ul style="list-style-type: none"> <li>● Construction firms</li> </ul>   |
| <b>PCAF, GRESB, CRREM</b> | <a href="#">Accounting and Reporting of GHG Emissions from Real Estate Operations - Technical Guidance for the Financial Industry</a>  | <ul style="list-style-type: none"> <li>● FIs</li> </ul>  |
| <b>PCAF</b>               | <a href="#">Financed Emissions: The Global GHG Accounting &amp; Reporting Standard Part A (v2.0, Dec 2022)</a>   | <ul style="list-style-type: none"> <li>● FIs</li> </ul>  |
| <b>SBTi</b>               | SBTi Buildings Guidance (current document): <a href="#">section 5.2</a> and the <a href="#">Appendix</a>   | <ul style="list-style-type: none"> <li>● Architecture and design firms/ Engineering firms</li> </ul>   |

SBTs are based on the emissions calculated and reported by the company. Given the importance of this data, companies should strive to use the best and most complete data available in their GHG emissions accounting. To set a buildings sector target, companies must first calculate their buildings-related emissions (i.e., buildings-related base-year emissions determined by following the GHG Protocol).

Subsequently, the users shall apply the same GHG accounting approach for all interim reporting years through to the target year, for consistency purposes.

For more details on the justifications for these accounting categorizations, please see [section 11.6 in the Appendix](#).

## 5.1 Whole building approach

Depending on the organizational boundary and the consolidation approach a company chooses when accounting for GHG emissions, a company may report their buildings-related emissions in their scope 1, 2, or 3 with emissions from the same building often falling across more than one scope. For example, in GHG accounting for buildings, tenant-related emissions, which are a significant source of a building's operational energy use, typically fall under scope 3 emissions for building owners.

Critically, the buildings sector in-use operational emissions pathways, and this guidance document, abide by the “whole building approach” (PCAF/GRESB/CRREM, 2023), ensuring that a building's complete operational energy consumption from landlord and tenant-controlled spaces are included within a user's target boundary (irrespective of whether they are the landlord, tenant, finance provider, or other relevant buildings value chain player). Therefore, whole building in-use operational emissions shall be included as a mandatory requirement for the purpose of target-setting.

This approach raises ambition in the sector and ensures parties across a building's value chain take ownership to reduce its energy consumption and support decarbonization. Scope delineation between scopes 1, 2 and 3 becomes irrelevant in this case, since all operational emissions of the property are taken into account and included in a user's target boundary.

## 5.2 Clarifications of accounting practices for architecture and design firms

GHG accounting and reporting guidance for architecture and engineering firms has to date been open to interpretation, to some extent, in particular in specifying whether their ‘product’ is a building or the blueprint designs of a building. This guidance aims to provide clarity in such areas, by explaining the GHG inventory boundaries of its intended users, specifically tailored to buildings-related activities.

The principle which underpins the clarifying decisions made is whether an intended user has meaningful responsibility and influence over the resulting buildings-related emissions. Thus, this guidance highlights that architecture and engineering firms are able to influence the initial design of a

building in a way that ultimately affects its upfront embodied emissions, as well as use-phase emissions. In particular, these users have influence over the sufficiency of the constructed building and the choice of materials required.

Therefore, architecture and engineering firms shall account for the in-use operational emissions (associated with energy use) resulting from the use of their designed buildings in their emissions inventory under scope 3 category 11 use of sold products.

### 5.3 Market-based vs. location-based approach

Under the GHG Protocol Scope 2 Guidance (and, consequently, the SBTi) companies are required to report scope 2 emissions using both methods, but choose one for their target-setting:

- 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 purposefully chosen.

Both approaches have their benefits but also face unique challenges:

- The market-based method enables businesses to use their purchasing power to accelerate the deployment of renewable energy. However, with market-based accounting there is a risk of double-accounting of renewable energy use as well as incentivizing energy procurement over energy efficiency. There is also a growing concern with some companies using low-impact instruments that do not drive real-world emissions reductions.
- Using the location-based method, company's energy reductions are put into the spotlight. Location-based accounting has a potential drawback in that companies can account for local grid decarbonization that is unrelated to the companies' own procurement practices and investments and it may even disincentivize procuring off-site renewable energy production (SBTi, 2022b).

Further, in the buildings sector, allocation of a building's emissions can fall into the scope 1, 2, or 3 of a landlord's or tenant's GHG inventory. This can result in emissions from purchased energy being reported under the reporting (or target-setting) company's scope 3, where market-based approaches are not permitted, according to the GHG Protocol.

For the purposes of setting a SBT for emissions from buildings, companies shall only use the location-based accounting approach to calculate base year emissions and to track performance against a science-based target.

## 5.4 Partial occupancy

Buildings often have vacant space - i.e. are not fully occupied. While reporting of emissions should reflect actual performance (PCAF/GRESB/CRREM, 2023), irrespective of occupancy, normalization can be useful for cases in which like-for-like comparisons are important, such as benchmarking, risk management, or target-setting where GHG intensity metrics are normalized to account for vacant space. Intensities derived from consumption data of partially vacant buildings using the entire building floor areas as the basis for the intensity calculations could be misleading since they imply better efficiency than actual performance.

Therefore, normalization may be applied for the purposes of setting SBTs. If normalization is applied, 'average annual vacancy' should be used. However, the normalization must be applied upwards. That is, vacancy may be assumed to go down (increasing future energy demand), but vacancy may not be assumed to go up (decreasing future energy demand).

Individual building vacancy rates can fluctuate over a building's lifetime and can occur for a number of reasons, such as when a building is being held for sale or is undergoing refurbishment works. In line with existing reporting frameworks for the building sector (e.g. GRESB), companies should report vacancy rates in their annual disclosures.

For tenants, if the user leases a building for only part of the reporting year, they shall account for emissions from the portion of the year that the building was leased.

## 5.5 Lifetime estimates for scope 3 category 11 "use of sold products"

When calculating emissions from scope 3 category 11 "Use of sold products", the total lifetime emissions of sold products are required to be accounted for. Companies that produce more durable products with longer lifetimes 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 report relevant information such as product lifetimes and emissions intensity metrics to demonstrate product performance over time.

For architects and engineering firms as well as developers, new buildings are treated as a ‘product’ and the scope 1 and 2 emissions (module B6; energy use in a building’s life cycle) of future building occupiers should be included in the user’s scope 3 reporting the year in which the building is sold. The future energy use should be modeled for the lifetime of the building, typically nominated as 60 years (UKGBC, 2019). For existing buildings, this guidance recommends that these emissions are not accounted for by the building seller at the point of transfer<sup>16</sup>.

Given the extended lifespan of buildings and the wide variation in building lifetimes reported, as well as the absence of a formal approach for determining building lifetimes, users accounting for scope 3 category 11 use of sold products should use a minimum building lifetime of 60 years in their calculations and shall disclose the lifetime estimates they are using and their rationale.

## 5.6 Accounting for upfront embodied emissions by first owners

Existing guidance for the buildings sector recommends the disclosure of upfront embodied emissions for developers, as well as the first owner/purchaser of a building (UKGBC, 2019).

When the first building owner sells the building, all subsequent owners will have significantly limited influence over the already emitted upfront embodied emissions and therefore are not required to account for the upfront embodied emissions of the purchased building in their emissions inventory.

### Box 2. Example of a first owner

*Developer A contracts Construction Company B to construct a new office building. Financial Institution C provides a loan to Developer A to finance the project. Developer A sells the office building to Company D who is the first owner/purchaser of the building and occupies it for their own use. In this example, all companies and the FI would be required to account for the upfront embodied emissions from the construction of the new office building in their emissions inventory.*

There can be many different actors and entities involved in the sale or transfer of a building. Should a building pass through one or more companies (e.g. holding companies or other parties involved in the transaction) between the developer and the intended ‘first owner’, this owner, who is responsible for the purchase of the building and the associated emissions released to the atmosphere, should account for

<sup>16</sup> “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 CRE sector to gather accurate data on whole life impacts for existing buildings” (UKGBC, 2019).

the upfront embodied emissions associated with the building in their emissions inventory even if they may not be the first owner verbatim.

## 5.7 Optional accounting considerations for franchisors

Similarly to architecture and design firms and developers, franchisors are another category of company with a significant level of influence over the design and construction, and therefore the lifetime emissions of, a building. Typically, the design and materials used in the construction of a new building owned as part of a franchise arrangement are mandated by the franchisor, not the end franchisee, who typically owns the building. Examples of common buildings that can be found under franchise licenses 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”.*

In order 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 companies which have the necessary influence during the design and construction phases, for the purposes of setting SBTs it is recommended that franchisors should include upfront embodied emissions and lifetime in-use operational emissions from franchisee buildings in their scope 3 category 14 emissions inventory, reported in the year of completion for newly constructed franchisee buildings.

## 5.8 Data quality

Companies calculating their emissions inventory to set buildings sector targets should follow data quality guidelines provided by the GHG Protocol. Additional guidance on data quality issues for scope 3 emissions is provided in Chapter 7 of the [GHG Protocol Value Chain \(Scope 3\) Standard](#).

In developing their annual inventories, companies must use data that is the most granular and representative of the actual buildings-related emissions. Companies should collect high-quality data from suppliers and other value chain partners for scope 3 activities deemed most relevant and/or strategically targeted for GHG reductions.

Default activity data is acceptable but is less accurate and limits a company's ability to track performance and progress toward targets. The source and potential uncertainty of the adopted default data should therefore be clearly disclosed.

Companies can have targets in place while continuing to improve their reporting through collaboration with other stakeholders along the buildings value chain. Any adjustments to accounting methods should be disclosed and implemented in accordance with the GHG Protocol. Any impact of those adjustments on the company's targets should be assessed in line with [SBTi Criteria and Recommendations for Near-Term Targets](#), which call for target recalculation when major changes in inventories occur.

## 6 HOW TO SET A SCIENCE-BASED TARGET

### 6.1 Overview

Companies are invited to familiarize themselves with the GHG Protocol, as it forms the basis of the following guidance and criteria. Furthermore, users are invited to consult the SBTi cross-sector resources, the [SBTi How-To Guide](#) or [SBTi Getting Started Guide](#), followed by reviewing the requirements of target-setting in the [SBTi Criteria and Recommendations for Near-Term Targets](#) or [Net-Zero Standard Criteria](#). To understand these requirements in more depth, companies should then review the [Target Validation Protocol for Near-term Targets](#) and use the SBTi Buildings Target-Setting Tool to begin developing targets.

This section provides additional guidance for the buildings sector and users along the value chain to set SBTs. Four steps are described:

1. **Determine target boundaries, scopes and target-setting methods:** Review the generic SBTi Criteria and this sector-specific guidance 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 this guidance.
3. **Construct targets:** Model target(s) using the SBTi Buildings Target-Setting Tool. Additional targets may also be needed to address emissions not covered by the in-use and/or upfront embodied emissions targets to meet the [SBTi Criteria and Recommendations for Near-Term Targets](#) and can be modeled using the standard [SBTi tools](#).
4. **Submit targets to the SBTi:** Send a completed [Target Submission Form to the SBTi](#).

## 6.2 Step 1: Determine scopes, target boundaries 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.

- Decide whether to set a near-term target only, or a net-zero target (which requires a near-term and a long-term target).
- Decide on a base year and target year for each target. Near-term targets must have a timeframe of 5-10 years from the date of submission, and the long-term target year must be 2050 or sooner. Rules for this can be found in the [SBTi Criteria and Recommendations for Near-Term Targets](#) and [Net-Zero Standard Criteria](#).
- Determine if a scope 3 target is either desired/optional or required. See sector-specific guidance below.
- Set target boundaries: i.e., which emissions will be included according to the [SBTi Criteria and Recommendations for Near-Term Targets](#), [Net-Zero Standard Criteria](#) and the sector-specific guidance below.
- Determine which target-setting method will be used for each target.

### 6.2.1 Required target boundary

General criteria on the scopes required is set out in the [SBTi Criteria](#) and [Net-Zero Standard Criteria](#). In summary:

#### For near-term targets:

- A maximum of 5% of scope 1 and 2 emissions can be excluded from a user's GHG inventory. However, 100% of the resulting scope 1 and 2 inventory must be included in the target.
- If a company's relevant scope 3 emissions are 40% or more of total scope 1, 2, and 3 emissions, a scope 3 target is required. The target must cover at least 67% of scope 3 emissions.
- All companies involved in the sale or distribution of natural gas and/or other fossil fuels shall set a 1.5°C-aligned scope 3 target over well-to-wheel use of sold product emissions, irrespective of the share of these emissions compared to the total scope 1, 2 and 3 emissions of the company.

#### For long/term (net-zero) targets:

- Scopes 1, 2 and 3 shall be included. A maximum of 5% of scope 1 and 2 emissions can be excluded from a user's GHG inventory. However, 100% of the resulting scope 1 and 2 inventory must be included in the target. The coverage shall be at least 90% for scope 3.



### 6.2.1.1 Target-setting considerations for emissions across the building life cycle stages and value chain

Buildings sector guidance users may carry out their business activities across the buildings life cycle and perform the roles of multiple value chain players. In real estate, a single company can perform activities across multiple stages and to varying degrees depending on their specialisms and contracts with customers. For example, an integrated real estate company may be involved in constructing new developments, leasing out standing buildings they own to tenants, managing properties on behalf of other owners, or acting as an investor into real estate assets, potentially through indirect investments into real estate companies. Guidance users should follow the target-setting guidance and recommendations for each user category they fit into.

### **6.2.2 Near-term scope 3 targets**

Required and recommended scope 3 categories are included in the sections below, by user type. It is important to note that guidance on target boundaries is distinct from GHG accounting and reporting requirements. All required and recommended categories in the tables below should be included in the user's GHG emissions inventory, irrespective of inclusion in the target boundary. For more detail on GHG accounting guidance for the buildings sector, please refer to [section 5](#).

#### 6.2.2.1 Required near-term scope 3 categories

For the purposes of setting SBTs, users must include certain scope 3 category emissions in their target boundaries. Required categories for each user have been determined by understanding their materiality to a particular user type and also the level of influence the user has to reduce these emissions, in line with their business model. The details of which emissions must be included within a particular user's target boundary are provided in Table 6.

Required emissions categories shall be included in a user's target boundary, irrespective of whether total scope 3 emissions represent >40% of total scope 1 + 2 + 3 emissions<sup>17</sup>.

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<sup>17</sup> 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.

**Table 6. Required near-term scope 3 categories for buildings sector guidance users**

| INTENDED USER                                 | SCOPE 3 CATEGORY                                     | EMISSIONS (EXAMPLES)  |
|---|--|---|
| <b>Architecture &amp; engineering company</b> | Category 11: Use of sold products                    | Lifetime in-use operational emissions of designed buildings.  |
|   | Category 1: Purchased goods and services             | Embodied emissions of materials purchased and used to construct new buildings, as occurred in the reporting year.                           |
| <b>Construction company</b>                   |  | Embodied emissions of materials used in maintenance, repair, replacement, or refurbishment of buildings, as occurred in the reporting year. |
|   | Category 3: Fuel and energy related activities       | Construction site activities (can occur across the buildings life cycle, modules A, B, or C).   |
|   | Category 4: Upstream transportation and distribution | Construction site activities (can occur across the buildings life cycle, modules A, B, or C).   |
|   | Category 5: Waste generated in operations            | Construction site activities (can occur across the buildings life cycle, modules A, B, or C).   |
|   | Category 2: Capital goods <sup>19</sup>              | Upfront embodied emissions of new buildings developed.  |
| <b>Developers<sup>18</sup></b>                | Category 11: Use of sold products                    | Lifetime in-use operational emissions of any buildings sold.  |

<sup>18</sup> Where a developer constructs a building to own or manage it in the long term, rather than sell it to a buyer, the building is not treated as a product and the guidance provided here does not apply. This is on the basis that the leased spaces within the building are treated as the entity's product and so they should use the guidance for owner-lessor (UKGBC, 2019).

<sup>19</sup> See section [6.2.2.4](#) for further clarification on inclusion in the target boundary.

| INTENDED USER                 | SCOPE 3 CATEGORY  | EMISSIONS (EXAMPLES)   |
|-------------------------------|---|--|
| <b>Owner-occupier</b>         | Category 2: Capital goods   | Upfront embodied emissions of new buildings purchased - only if first owner of a building (see <a href="#">section 5.6</a> for further details).   |
| <b>Owner-lessor</b>           | Category 2: Capital goods   | Upfront embodied emissions of new buildings purchased - only if first owner of a building (see <a href="#">section 5.6</a> for further details).   |
|                               | Category 13: Downstream leased assets   | In-use operational emissions in tenant-controlled spaces (where not already in scope 1, 2, or other scope 3 category).   |
| <b>Tenant</b>                 | Category 8: Upstream leased assets  | In-use operational emissions from the operation of assets that are leased by the tenant in the reporting year and not already included in their scope 1 or scope 2 inventories (i.e. emissions from lessor-controlled spaces). |
| <b>Property manager</b>       | Category 11: Use of sold products (or Category 13: Downstream leased assets <sup>20</sup> ) | In-use operational emissions in buildings managed for clients, as occurred in the reporting year (where not in scope 1, 2, or other scope 3 category).   |
| <b>Financial institutions</b> | Category 15: Investments  | Whole building in-use operational emissions of buildings in the FI's portfolio, as occurred during the reporting year.   |
|                               |   | Upfront embodied emissions of buildings purchased or financed - only if first owner of a building or financing the development/ construction of a new building (see <a href="#">section 5.6</a> for further details).          |

<sup>20</sup> Some property managers may choose to include emissions from tenant-controlled spaces in scope 3 category 13 (downstream leased assets) instead of category 11, under interpretation of the [GHG Protocol Corporate Value Chain Scope 3 Accounting and Reporting Standard](#) (2011). In this case, the same principles would apply to the user's target boundary i.e. category 13 would be required for these users.

### 6.2.2.2 Recommended near-term scope 3 categories

Table 7 outlines the emissions categories which are recommended for users to include in their target boundary. These emissions should be included in the target boundary, however they are not required. There are two main scenarios in which these emissions are to be included in a user’s target boundary:

1. Where a company’s scope 3 emissions are >40% of total scope 1 + 2 + 3 emissions, and the required emissions categories (Table 6) do not make up at least 67% of scope 3 emissions coverage, the recommended emissions categories may be used to achieve the minimum coverage.
2. The scope 3 category is considered material to the business, and the user decides to include it to their target boundary regardless of the threshold coverage.

**Table 7. Recommended near-term scope 3 categories for buildings sector guidance users**

| INTENDED USER                                 | SCOPE 3 CATEGORY                                    | EMISSIONS (EXAMPLES)   |
|---|---|--|
| <b>Architecture &amp; engineering company</b> | Category 12: End of life treatment of sold products | End of life embodied emissions of designed buildings.  |
| <b>Construction company</b>                   | Category 11: Use of sold products                   | Lifetime in-use operational emissions of delivered buildings.  |
|   |   | Lifetime embodied emissions of materials used in-use phase of delivered buildings i.e. renovation of designed buildings. |
|   | Category 12: End of life treatment of sold products | End of life embodied emissions of delivered buildings.   |
| <b>Developers<sup>21</sup></b>                | Category 11: Use of sold products                   | Lifetime in-use embodied emissions of sold buildings i.e. renovation of designed buildings.                              |

<sup>21</sup> UKGBC, 2019: Where a developer constructs a building to own or manage it in the long term, rather than sell it to a buyer, the building is not treated as a product and the guidance provided here does not apply. This is on the basis that the leased spaces within the building are treated as the entity’s product and so they should use the guidance for owner-lessor.

| INTENDED USER              | SCOPE 3 CATEGORY                                    | EMISSIONS (EXAMPLES)   |
|----------------------------|---|--|
|                            | Category 12: End of life treatment of sold products | End of life embodied emissions for any buildings sold.   |
| <b>Owner-occupier</b>      | Category 1: Purchased goods and services            | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment, as occurred in the reporting year.  |
| <b>Owner-lessor</b>        | Category 1: Purchased goods and services            | Embodied emissions of materials and services used in 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 used in maintenance, repair, replacement, or refurbishment in tenant-controlled spaces, as occurred in the reporting year, where not already in scope 1, 2, or other scope 3 category <sup>22</sup> . |
| <b>Tenant</b>              | Category 1: Purchased goods and services            | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in tenant-controlled spaces, as occurred in the reporting year.  |
| Property manager           | Category 1: Purchased goods and services            | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in managed spaces, as occurred in the reporting year.  |
| Financial institution (FI) | Category 15: Investments                            | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment, as occurred in the reporting year.  |

An overview of the types of emissions and their recommended target approach is in [section 6.2.3](#).

<sup>22</sup> Embodied emissions during the use phase do not form part of the minimum boundary for this category and are therefore recommended only.

### 6.2.2.3 Other scope 3 emissions

For scope 3 emissions outside the required target boundary set out in Table 6, general SBTi criteria stipulate that if a company's scope 3 emissions account for more than 40% of a company's total (scope 1 + 2 + 3) emissions, the company shall set a near-term scope 3 target. The coverage must be at least 67%. The required and recommended categories from Table 6 and Table 7 can be included to meet the minimum scope 3 coverage requirement.

### 6.2.2.4 Setting upfront embodied emissions targets on new building portfolios

#### **Developers**

For developers, the building is treated as a 'capital good' and emissions from the extraction, production, and transportation of the new building, including all emissions related to the construction of the building, shall be included in the developer's target boundary under scope 3 category 2 capital goods, the year in which the building reaches practical completion and is considered 'developed'<sup>23</sup>.

#### **First owner/purchaser**

For the purposes of setting SBTs, intended users that are the first owner/purchaser of a new building shall set targets on the upfront embodied emissions of new buildings purchased in the year in which the buildings were purchased. Similarly, financial institutions that finance the construction of new buildings (e.g. commercial real estate lending) shall set an upfront embodied emissions target. There are often multiple entities that could be categorized as a first owner/purchaser of a building and these all should adhere to the guidance on including upfront embodied emissions in their target boundary as applicable to 'first owners/purchasers' in this guidance.

For details on the accounting for upfront embodied emissions by first owners, please see [section 5.6](#).

#### **Target-setting exemption for infrequent purchases of new buildings**

Building owners (occupiers and lessors) and FIs that can demonstrate their business model does not involve regularly buying/financing new buildings do not need to set an upfront embodied emissions target.

**Example:** Consider Company X, a marketing company, that completes purchase of their new corporate headquarters in their chosen base year for setting SBTs. The only other space they occupy is leased space for regional teams, and company growth plans suggest they will be

<sup>23</sup> Note, this categorization and timing is purely for the purposes of target setting. This does not change how upfront embodied emissions are reported on (i.e. annually during development) or categorized by developers in their corporate GHG inventories.

purchasing any buildings during the period of their near-term commitment. The company is therefore exempt from setting an upfront embodied emissions target, despite purchasing a newly constructed building in their target base year.

### 6.2.2.5 Optional recommendations for near-term scope 3 targets for franchisors

While there are no requirements for franchisors included in this document, the SBTi recommends franchisors to include the following optional categories in their target boundary:

- Upfront embodied emissions of new buildings developed as franchises.
- In-use operational emissions of franchised buildings (where not already in scope 1, 2, or other scope 3 category).

For more details on the inclusion of optional recommendations for franchisors, please see [section 5.7](#).

## **6.2.3 Target-setting methods**

Permitted target-setting methods for scope 1, 2 and 3 emissions for buildings sector users are laid out in Table 8. The SBTi recommends using the most ambitious method that leads to the earliest reductions and the least cumulative emissions.

### 6.2.3.1 Minimum ambition levels

#### In-use operational emissions

From the date of publication of the buildings sector guidance, targets set using the buildings in-use operational emissions SDA covering whole building in-use operational emissions (S1 + 2 + 3) must be aligned to 1.5°C<sup>24</sup>.

Targets on in-use operational emissions where these fall in other scope 3 categories (e.g. scope 3 category 11 use of sold products) must also be aligned to 1.5°C, at the latest six months after publication of the buildings sector guidance.

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<sup>24</sup> Targets set using the CRREM and SBTi developed in-use operational emissions SDA are 1.5°C aligned.

### Upfront embodied emissions

From the date of publication of the buildings sector guidance, targets set using the buildings upfront embodied emissions SDA covering upfront embodied emissions (scope 3 category 2) must be aligned to 1.5°C. This approach raises the ambition for upfront embodied emissions, which could previously be included in SBTs aligned to a well-below 2°C scenario using the cross-sector absolute reduction method. Targets set on upfront embodied emissions using other methods (see Table 8) are permitted where these meet at least 1.5°C ambition levels.

### 6.2.3.2 Target-setting for whole building in-use operational emissions (scopes 1, 2 and 3)

Companies shall use the buildings in-use operational emissions SDA to set targets on their whole building in-use operational emissions, such as tenant-controlled areas or so-called base building emissions, irrespective of emissions categorization as scope 1, 2, or 3 due to organizational boundaries, control approaches, leasing arrangements, or how utilities are procured. Accounting for the building's emissions in this way, they can be referred to as the 'whole building in-use operational emissions'.

For non-buildings related processes such as company cars, fleet vehicles etc. companies must use the cross-sector absolute reduction approach or other relevant SBTi sector guidance to set scope 1 and 2 targets. Where the whole building in-use operational emissions SDA can be used, it must be used, as it is more ambitious than the cross-sector absolute reduction method, given the faster rate of decarbonization the buildings sector can achieve compared to other sectors. An exception to this is where buildings-related in-use operational emissions are less than 5% of a company's scope 1 + 2, where companies could use the cross-sector absolute reduction 1.5°C approach to cover all scope 1 and 2 for target setting.

Notably, though the delineation between scopes 1, 2, and 3 is less relevant when considering whole building emissions, there is a distinction between particular scope 3 categories. Namely, the buildings in-use operational emissions SDA is based on a building's annual operational energy emissions in the use phase. For some scope 3 categories, for example scope 3 category 11 use of sold products, the in-use operational emissions of a building are calculated over its *lifetime*, rather than annually, in accordance with the GHG Protocol<sup>25</sup>. In these cases, the buildings in-use operational emissions SDA cannot be used and another target-setting method should be used, as discussed in Table 8.

<sup>25</sup> GHG Protocol, Chapter 11. See [section 5.5](#) for further details.



In addition, construction companies shall not use the buildings in-use operational SDA, and instead shall use the cross-sector absolute reduction method for all scope 1 and 2 emissions. The scope 1 and 2 of construction companies includes emissions from construction site activities that could relate to the embodied emissions of a new building being constructed, existing buildings undergoing refurbishment, or non-buildings related construction projects (e.g. infrastructure). It is therefore not practical for construction companies to determine the share of their scope 1 and 2 emissions that is attributable to floor area (m<sup>2</sup>) of a completed building, which is necessary to use the SDA for whole building in-use operational emissions.

Targets to actively source renewable electricity at a rate that is consistent with 1.5°C scenarios are an acceptable alternative to scope 2 emission reduction targets (see the [SBTi Criteria](#)). As for all near-term SBTs, all scope 1 and 2 emissions from a company's GHG inventory must be included in the target boundaries, across all methods<sup>26</sup>.

### 6.2.3.3 Target-setting for upfront embodied emissions

The SBTi has developed two target-setting methods for companies to set targets on upfront embodied emissions for newly constructed buildings (or for FIs financing the construction or purchase of a newly constructed building). Relevant guidance users have a choice between the two methods. In line with minimum ambition levels in 6.2.3.1, both methods are more ambitious than the 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 goal of the buildings sector guidance.

#### **Buildings upfront embodied emissions SDA**

As described in section 11.3.2, the sector pathway for upfront embodied emissions allows guidance users to set an emissions intensity reduction target that converges to a sector-specific intensity. It is derived from the 1.5°C upfront embodied emissions pathway developed by Ramboll and SBTi for the buildings sector.

#### **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 minimum, consistent with a sector-specific pathway. In this case the 1.5°C upfront embodied emissions pathway developed by Ramboll and SBTi (see 11.3.2 for further details). For the buildings sector the minimum annual

<sup>26</sup> A maximum of 5% of scope 1 and 2 emissions can be excluded from the company's GHG inventory but all scope 1 and 2 inventory emissions should be included in the target.

reduction is 3.1% annually, or 31% by 2030, whichever is higher. This method is currently only applicable to upfront embodied emissions, as stated in Table 8 below<sup>27</sup>.

#### 6.2.3.4 Permitted target-setting methods

The permitted target-setting methods for scope 1, 2 and 3 emissions are outlined in Table 8. The SBTi recommends using the most ambitious method that leads to the earliest reductions and the least cumulative emissions.

Scope 3 near-term targets may be set using one of **five** approaches: cross-sector absolute reduction, economic intensity reduction, physical intensity convergence (SDA), physical intensity reduction, or supplier/customer engagement targets.

Scope 3 long-term targets may be set using one of **four** approaches: cross-sector absolute reduction, economic intensity reduction, physical intensity convergence (SDA), or physical intensity reduction.

If physical intensity reduction is chosen, floor area must be used as the denominator for in-use and embodied emissions of buildings.

General rules are found in the [SBTi Criteria and Recommendations for Near-Term Targets](#) and [Net-Zero Standard Criteria](#). Sector-specific guidance can be found in the table below.

**Table 8. Permitted target-setting methods for relevant scope categories.**

| SCOPE  | EMISSIONS COVERED (EXAMPLES)  | TARGET-SETTING METHODS   | USER SPECIFIC GUIDANCE   |
|--|---|--|--|
| <b>Scopes 1, 2 and 3 (cat 8, 13, 14) for whole building in-use</b> | Operational energy use in buildings, as occurred in the reporting year. | Buildings in-use operational SDA method for buildings-related activity | Construction companies <b>shall not</b> use buildings in-use operational SDA method and must use the cross-sector absolute |

<sup>27</sup> This target-setting method is not currently available as a feature in the building target-setting tool for public consultation. It will be added to the tool before publication of the final guidance document and tool.

| SCOPE                        | EMISSIONS COVERED (EXAMPLES)   | TARGET-SETTING METHODS   | USER SPECIFIC GUIDANCE  |
|------------------------------|--|--|---|
| <b>operational emissions</b> |  |  | reduction method (1.5°C) for scope 1 and 2 emissions targets.   |
| <b>Other scope 1 and 2</b>   | Direct emissions (e.g., from burning of fuels) and purchased or acquired electricity, steam, heat and cooling. | Cross-sector absolute reduction (1.5°C) for all other scope 1 and 2 e.g. company cars, fleet vehicles.   |   |
| <b>Other scope 3</b>         | Category 1:<br>Purchased goods and services.   | <p><b>For in-use embodied emissions:</b></p> <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (well-below 2°C)<sup>28</sup></li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul> <p><b>For upfront embodied emissions:</b></p> <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C or well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul> | Construction companies should <b>not</b> use the buildings upfront embodied SDA. They may use other relevant SBTi sector methods <sup>29</sup> (e.g. Cement) to set separate targets for each building material if this forms a relevant portion of their total emissions. They may also use the other target-setting methods listed to the left. |
|                              | Category 2:<br>Capital goods   | <ul style="list-style-type: none"> <li>• Buildings upfront embodied SDA</li> <li>• Buildings sector-specific</li> </ul>  |   |

<sup>28</sup> Requiring the well-below 2°C method for in-use embodied emissions can help to encourage renovations over new building construction as this method requires less steep emissions reductions than the buildings upfront embodied SDA.

<sup>29</sup> [SBTi sector-specific project resources](#).

| SCOPE | EMISSIONS COVERED (EXAMPLES)                         | TARGET-SETTING METHODS  | USER SPECIFIC GUIDANCE   |
|-------|--|---|--|
|       |  | <ul style="list-style-type: none"> <li>absolute reduction method</li> <li>• Cross-sector absolute reduction (1.5°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul>  |  |
|       | Category 3: Fuel and energy related activities       | <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C <b>or</b> well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> <li>• Engagement targets</li> </ul>                                      |  |
|       | Category 4: Upstream transportation and distribution | <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C <b>or</b> well-below 2°C)</li> <li>• Other SBTi sector methods</li> <li>• Economic intensity</li> <li>• Physical intensity</li> <li>• Engagement targets</li> </ul> |  |
|       | Category 5: Waste generated in operations            | <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C <b>or</b> well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> <li>• Engagement targets</li> </ul>                                      |  |
|       | Category 11: Use of sold products                    | <p><b>For in-use embodied emissions:</b></p> <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul>                                       | Property managers <b>shall</b> use the buildings in-use operational SDA method to set targets on in-use operational emissions in managed spaces. |

| SCOPE | EMISSIONS COVERED (EXAMPLES)                        | TARGET-SETTING METHODS  | USER SPECIFIC GUIDANCE |
|-------|---|---|------------------------|
|       |   | <p><b>For in-use operational emissions:</b></p> <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C or well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul> |                        |
|       | Category 12: End of life treatment of sold products | <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C or well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul>   |                        |
|       | Category 13: Downstream leased assets               | <p><b>For in-use embodied emissions:</b></p> <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> </ul>             |                        |
|       | Category 14: Franchises                             | <p><b>For in-use operational emissions:</b><br/>Buildings in-use operational SDA</p> <p><b>For upfront embodied emissions:</b><br/>Buildings upfront embodied SDA</p>   |                        |
|       | Category 15: Investments                            | See <a href="#">section 7</a>   |                        |

| SCOPE | EMISSIONS COVERED (EXAMPLES) | TARGET-SETTING METHODS  | USER SPECIFIC GUIDANCE |
|-------|------------------------------|---|------------------------|
|       | Other scope 3 categories     | <ul style="list-style-type: none"> <li>• Cross-sector absolute reduction (1.5°C or well-below 2°C)</li> <li>• Economic intensity</li> <li>• Physical intensity</li> <li>• Engagement targets</li> </ul> |                        |

### 6.2.3.5 Additional commitments for buildings target setting

In addition to the GHG accounting and science based target setting methods of buildings-related emissions, the SBTi has additional commitments for users in the buildings sector to a) encourage the reduction of primary energy demand rather than supplying inefficient buildings with renewables, and b) avoid the lock-in of fossil technology. These commitments below are a complementary step in the target-setting and validation process.

1. The SBTi requires the implementation of fossil fuel phase-out commitments.
2. The SBTi recommends the implementation of energy efficiency commitments.

#### Fossil fuel phase-out commitment

A commitment to no new fossil fuel heating and cooking installations<sup>30</sup> in users' buildings portfolios<sup>31</sup> from 2025 is an additional requirement for buildings target setting and SBTi validation. Users setting targets for their building portfolios would be required to publicly commit to this criterion. Commitment language should take the following form:

*"[Company X] commits to no new fossil fuel installations in their buildings portfolio from 2025."*

#### Energy efficiency commitment

A commitment to making energy efficiency improvements in users' buildings portfolios in line with CRREM's energy-reduction pathways is an additional recommendation for buildings target setting and

<sup>30</sup> This commitment is focused on oil and gas systems used for heating, cooking, and hot water. Emergency back-up power systems, such as those used by hospitals, are exempt from this commitment.

<sup>31</sup> This commitment applies to all new installations, both for new buildings and existing buildings (as their prior systems expire).

SBTi validation. Companies setting buildings sector targets are recommended to publicly commit to this criterion. Commitment language should take the following form:

*“[Company X] commits to making energy efficiency improvements in their buildings portfolio by 2030 in line with CRREM’s energy-reduction pathways”.*

### Box 3. Setting an energy efficiency commitment

*A user who decides to make this commitment would:*

1. Access the [CRREM risk assessment tool](#),
2. Navigate to the Targets tab.
3. Set the Global warming target to ‘1.5°C’.
4. Select a Country if in the EU, if not in the EU, CRREM international pathways would need to be entered into the tool manually.
5. Select a Type of use corresponding to their building typology.
6. Refer to the Whole building energy intensity pathway table in the same tab,
7. The energy intensity (in kWh/m<sup>2</sup>/yr) for the year 2030 would form your energy efficiency target, i.e.
8. A user with ‘retail, high street’ buildings in the Netherlands would commit to achieving an energy intensity of 149.2 kWh/m<sup>2</sup>/yr in their buildings portfolio in 2030.

## 6.2.4 Fugitive emissions

### Background and context

The buildings sector is a major source of fugitive emissions from fluorinated gasses (also known as F-gasses). According to Hu et al. (2020) Hydrofluorocarbons (HFCs) account for 8% of global building sector GHG emissions as of 2017, with HFCs typically accounting for approximately 80% of F-gas emissions in buildings. Under the GHG Protocol all GHGs should be included in a company’s inventory. Further, 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<sup>32</sup>.

<sup>32</sup> Fugitive emissions may be categorized in scope 1 or scope 3 of a particular user, depending on the ownership, leasing arrangements, and control over the building in question. Whichever scope the emissions are categorized under, they shall be included within the target boundary.

### Including fugitive emissions for buildings sector SBTs

The decarbonization pathway used to develop the in-use operational emissions SDA contains all GHGs, including F-gasses (GHG pathway as developed by CRREM). 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.

For further details on fugitive emissions in the buildings sector see [Appendix 11.4](#).

## 6.3 Step 2: Calculate emissions inventory

In this step, companies should collect data for emissions and floor areas for their base year and most recent year, applying the criteria below regarding emissions included, building typology and geography, utility arrangements etc.

All GHG accounting for target-setting shall follow the [SBTi Target Validation Protocol for Near-term Targets](#), the [GHG Protocol Corporate Accounting and Reporting Standard](#) and the accounting principles set out by this guidance in [section 5](#).

### Which data points are necessary for companies to use the buildings in-use and/or embodied emissions SDA?

For setting a target using the SDA, users' inventories should contain the following data:

- Base year emissions (in-use and/or embodied emissions)
- Base and target year floor area
- Floor area in each building typology covered by the pathways
- Floor area in each geographical region covered by the in-use pathways

#### 6.3.1 SDA intensity denominator

The intensity pathway for the SDA and therefore scope 1, 2 and 3 target calculations shall be in terms of tCO<sub>2</sub>e/m<sup>2</sup>.



### 6.3.1.2 Floor area

To ensure accuracy in estimating intensity-based indicators using floor area, it is necessary to specify the parameters for appropriate floor area measurement.

Companies submitting targets for validation to the SBTi shall disclose the method by which they aggregate emissions based on various data reported to them. For absolute emissions, it is simply a matter of addition and attribution. For the calculation of intensities (e.g. when using the buildings in-use operational and upfront embodied SDAs), which require a consistent floor area definition as a denominator, the floor area definition used should be used as consistently as possible throughout their GHG accounting.

Companies should use the International Property Measurement Standard (IPMS), specifically IPMS 2: Office or Residential to determine the building floor area. For any reporting and accounting using floor area descriptions, their use and divergence from IPMS 2 must be explained.

GRESB uses the term GFA (Gross Floor Area), which, while closely aligned to IPMS 2 specifications, is less prescriptive. GRESB guidance states that GFA “can exclude outdoor/exterior areas as well as indoor parking,” with specific rules pertaining to the inclusion or exclusion of indoor parking that depend on the particular asset. In line with the guidance above, if unable to use a stricter definition, such deviations must be disclosed.

### **6.3.2 Selecting a representative base year**

Companies need to establish a base year to track emissions performance consistently and meaningfully over the target period. Considerations for the selection of a base year can be found in the [SBTi Corporate Manual](#).

Base year emissions should be representative of a company’s typical emissions profile. Companies can assess representativeness by comparing inventories and business activity levels over time. If it is difficult to identify a single year that is representative, companies should instead average GHG data over multiple consecutive years to form a more representative base period that smooths out unusual fluctuations in emissions. For example, market conditions might distort the number of buildings sold by a developer and thus the emissions (attributed to the use of sold products) in a given year (e.g. 2020). In response, the developer could average emissions over 2019, 2020, and 2021.

The selected base year shall be kept consistent across scope 1,2 and 3 for use of the pathways and all buildings-related target-setting, irrespective of the method used to calculate a base year.

### 6.3.2.1 Assets entering the portfolio during the base year

For buildings acquired during the chosen base year, the requirements for inclusion in the target boundary are:

- **If being acquired to sell**, the owner shall include emissions proportional to the period that they have held the asset during the reporting year. For example, if the building was acquired 9 months into the base year, the user shall include emissions from 25% of the floor area in the base year emissions activity.
- **If being acquired for occupancy or leasing**, the owner shall include emissions for the entire reporting year. This is deemed an expansion of facilities and to ensure that the base year is representative of subsequent future portfolio activity, not including emissions from the building over the whole year would imply greater efficiency than actual annual performance.

## 6.4 Step 3: Develop targets

To construct their SBTs, companies should follow these steps:

1. Collect data for floor area forecasts to the target year.
2. Input the emissions inventory data from the previous steps into the target-setting tools to calculate the reductions required for valid targets for scope 1, 2 and 3 following the additional guidance and examples in this guidance.
3. Decide on target wording according to the SBTi [submission form](#) and the guidance and examples given in this guidance.

### 6.4.1 Guidance on target setting

Target-setting guidance and a selection of worked examples, covering all users, are provided in the [Appendix](#).

## 6.4.2 Combined-scope targets

Targets submitted covering annual whole building in-use operational emissions will in many cases and by their nature include combined scopes 1+2+3. These targets will be calculated using the buildings in-use operational emissions SDA; individual components of these targets do not need to be submitted for validation.

As per general SBTi 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. See [SBTi Criteria and Recommendations for Near-Term Targets](#), [Net-Zero Standard Criteria](#) and [Target Validation Protocol for Near-term Targets](#).

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 t CO<sub>2</sub> / t cement and t CO<sub>2</sub> / m<sup>2</sup> floor area cannot be aggregated as intensity targets as the denominators are different, whereas two absolute targets could be aggregated into one.
- Where intensity targets are converted to absolute targets, it is required to also report the underlying intensity targets or sub-targets.

## 6.4.3 Using the SBTi Buildings Target-Setting Tool

The 1.5°C buildings pathways are integrated into SBTi's Buildings Target-Setting Tool. The tool contains instructions for how it should be used.

### 6.4.3.1 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 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 must input its own projected floor area for the specific building typology and geography for its target year;

- For upfront embodied emissions, the company must input its projected newly constructed floor area for the specific building typology for its target year.

Care should be taken to choose the correct inputs, as your company's growth rate relative to the global sector rate will affect the intensity target calculated.

### 6.4.3.2 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.

Where a building's type is not covered by the existing definitions provided, a Default pathway is available in the tool<sup>33</sup>.

Companies submitting targets should provide an explanation in the Target Submission Form for each asset where a default pathway is used. The Other 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.

When using the 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. The proportional floor areas by typology must sum to the total floor area of the mixed-use building.

#### **Box 4. Approach for mixed-use assets in the buildings target-setting tool**

*Building A has a total floor area of 20,000 m<sup>2</sup>, and its use is split as follows:*

- *90% of floor area is used as an office.*
- *10% of floor area is used as retail space.*

<sup>33</sup> Please note that the Default -pathway is not incorporated in the tool available in the public consultation.

*The user is looking to set an in-use operational emissions target for their portfolio (for simplicity, their portfolio consists only of Building A). When calculating their base year floor area inventory for 'Section A4: Enter emissions and activity data' in the tool, they will input 18,000 m<sup>2</sup> (90% 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 2,000 m<sup>2</sup> (10% of Building A's floor area) to their total retail floor area.*

Total floor area in base year

### Embodied emissions

Four embodied emissions typologies are provided in the SBTi Buildings Target-Setting Tool: Residential, Office, and Retail. 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 'retail').

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 Target Submission Form for each asset where the default pathway is used. The default pathway shall not be used where another appropriate pathway is applicable.

When using the 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. The proportional floor areas by typology must sum to the total floor area of the mixed-use building (see [Box 4](#) for an example).

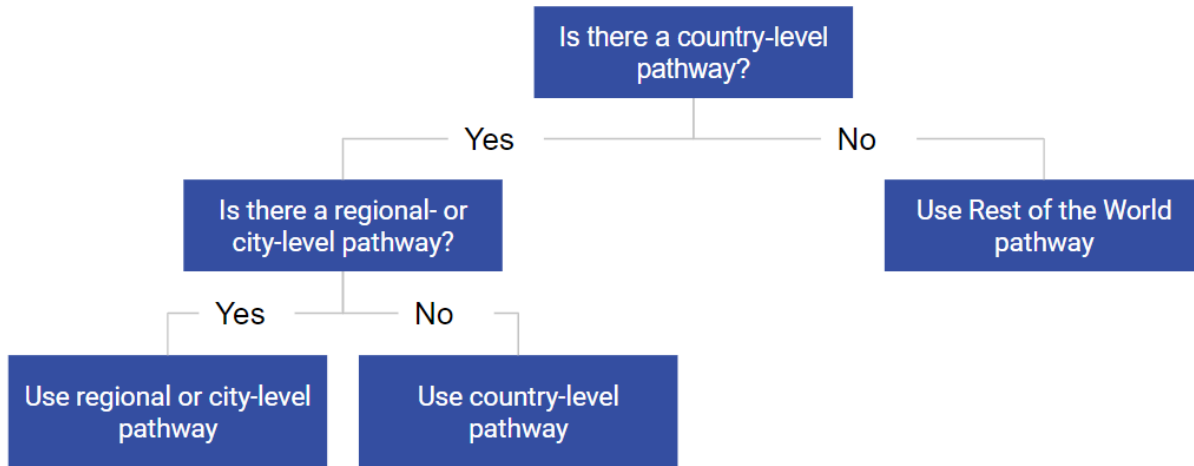
### 6.4.3.3 Selecting a building's geography

#### 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, a Default pathway is available (applicable to all building types)<sup>34</sup>. 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.

<sup>34</sup> Please note that the Default-pathway is not incorporated in the tool available in the public consultation.

**Figure 6. Selecting the pathway based on geographical location.**



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

The SBTi may choose to update and expand the available building geographies, 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

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

#### 6.4.3.4 Optional target aggregation

Companies whose portfolios contain assets in more than one geography and/or typology can aggregate their targets to obtain prorated reduction targets for their portfolios. Instructions for how to calculate aggregated results are available in the ‘Optional-Aggregator’ tab of the tool.

### 6.4.4 Examples of target calculation and wording

#### Target wording example

*“Company X commits to reduce scope 1, 2 and 3 GHG emissions from in-use operational emissions of*

*owned and leased buildings by xx.x% per m<sup>2</sup> by 2030 from a 2021 base year.”*

*“Company X also commits to reduce scope 3 GHG emissions from upfront embodied emissions xx.x% per m<sup>2</sup> within the same timeframe.”*

*“Company X further commits to reduce absolute scope 3 GHG emissions from in-use embodied emissions xx.x% within the same timeframe.”*

Further worked examples to be added after public consultation.

### Long-term target-setting

The SBTi Buildings Target-Setting Tool will serve target-setting until 2050. The [Net-Zero target Setting Tool](#) should be used for long-term target setting if the buildings decarbonization pathways are not utilized.

## 6.5 Step 4: Submit targets to the Science Based Targets initiative

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.

### 6.5.1 Updating a target

When a company changes the target-setting methods used compared to its previous targets, they shall demonstrate that the ambition level (in terms of the relative reduction in absolute and intensity emissions, and target-year emissions level) of the new targets are as ambitious or more ambitious than the company’s targets previous to the update. This increased ambition shall be clearly evident to users reading the target wording.

#### 6.5.1.1 Recalculation and target validity

According to the SBTi general criteria, existing targets should be recalculated if there are significant changes that could compromise relevance and consistency of the existing target, or at least every 5 years. Please refer to C33 in the [SBTi Net-Zero Corporate Standard](#) for what changes shall trigger a target recalculation. 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.

The buildings sector has additional characteristics that users should consider when determining what constitutes significant changes or adjustments as outlined above, these are:

- Significant changes in the building typology composition of portfolios.
- Significant changes in the geographical composition of portfolios.

### 6.5.1.2 Revised CRREM pathways

In future CRREM may update the buildings sector's decarbonization pathways to align to the latest climate science. There may be a lag between updates to CRREM's pathways and the SBTi buildings in-use operational SDA and target-setting tool. In all cases, users shall use the latest version of the SBTi Buildings Target-Setting Tool available on the [SBTi buildings website](#) when developing their targets.

### 6.5.1.3 Updating targets for buildings which have changed typology

With the rate of retrofitting and reuse of materials in the buildings sector expected to increase, there is likely to be an increasing number of buildings whose use or typology will change. Therefore:

- Target setting for emissions from buildings that have undergone a change in use type must be set using their most recent typology classification.
- If, within a portfolio, more than 15% of the total floor area has changed use type since the base year, the user must recalculate and rebase their portfolio targets.

## **6.5.2 Acquisitions and divestments**

It is important that acquisitions and divestments are addressed in this target-setting guidance, as multiple buildings sector users are 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.

### 6.5.2.1 Addressing the risk of misinterpreting divestments as emissions reductions

In general, acquisitions and divestments should not be used as a lever for decarbonization for an individual company as they do not contribute to lower emissions (either through energy efficiency or a reduced number of new buildings being built) for the sector as a whole<sup>35</sup>. Efforts should be made to

<sup>35</sup> It could be argued that an investor could reasonably use divestment, or the threat of it, from a particular region where the electricity grid is not decarbonizing in line with expectations as a lever to put pressure on policymakers to act.



decrease the energy intensity of existing buildings in the period they are held by a user, and to ensure that new developments are built with increased energy efficiency as a focus, from the design stage through to actual use.

There are many possible reasons for the divestment of individual assets, of which the emission-profile is just one element. Nevertheless, there is a risk that the divestment of a high-emitting asset could be misinterpreted by stakeholders as an emissions reduction, rather than the asset having simply left the company's inventory boundary. Such an action simply shifts the ownership of the high-emitting asset from one party to another, without addressing the emissions performance of the building itself. In this sense, divestment can be seen as a form of 'carbon leakage' whereby the emissions associated with a particular asset move from one domain to another, rather than being reduced in absolute terms.

To address these concerns and improve transparency around this issue, and to ensure an understanding of the real world impact of investor's actions, users should provide disclosure regarding:

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

Metrics and indicators reported can be both quantitative and qualitative or narrative based. They should be developed depending on data availability, completeness and quality and with a view to ensuring the comparability between measurements. These disclosures address the calls for increased transparency around intra-portfolio decarbonization, without antagonizing divestment itself as an activity within the sector.

### 6.5.2.2 Grace periods when acquiring an existing building

A grace period of up to two years may be used from the time a building is acquired, or a portfolio of buildings in the case of the acquisition of a company, and enters a company's portfolio<sup>36</sup>. The purpose of a grace period is to provide building owners and managers sufficient time for retrofitting and efficiency improvements and consolidation of emissions data.

- Companies may exclude emissions from acquired buildings from their baseline for up to two years<sup>37</sup>. It is recommended that these emissions are still reported on during the grace period for transparency.

<sup>36</sup> Users can select a grace period up to and including two years (e.g. 12 months, 18 months, 24 months etc.). The chosen grace period duration, once set, must be consistently applied in all cases where a grace period is used.

<sup>37</sup> Under a grace period, the acquisition of an existing building will therefore not trigger a target recalculation, as defined by SBTi C33 (SBTi Net Zero Corporate Standard, 2021).

- The grace period shall start immediately from the date of acquisition. Grace periods can be used in conjunction with all target-setting methods referenced in this guidance.
- The grace period shall not apply for newly constructed buildings where the intended user is the first owner or financing the construction of a new building.

### 6.5.2.3 Target-setting for users with high turnover portfolios

The process of acquiring or divesting buildings adds complexity to the issue of rebaselining of targets. This is due to the differences in the rate of acquisitions, divestments, and hold periods across different business models and investment strategies. Users in the buildings sector operate with a variety of business models, which range from a high level of turnover of buildings within a single year and an unstable asset portfolio from one year to the next, to a stable set of assets with little to no change in the portfolio's composition of buildings assets over time. Users with a high level of turnover in their portfolios may find other target-setting methods challenging for the following reasons:

1. A reduced ability to influence individual asset improvement due to short asset hold periods.
2. Owners may find it difficult to collect reliable whole building emissions data (including tenant emissions) on the performance of their buildings assets. Data may also be fragmented or incomplete, making it challenging to establish a baseline for setting targets and monitoring progress.
3. A frequent requirement to rebaseline and recalculate targets due to regular changes in the portfolio (as outlined in [section 6.5.1.1](#)) and as buildings assets enter and leave the portfolio.

To account for these challenges, this target-setting guidance allows corporates and financial institutions whose business model is reliant on a high turnover of assets (conditions below) to set **fixed intensity targets** aligned to sectoral decarbonisation pathways (for in-use operational emissions and upfront embodied emissions). This method requires companies to meet a specific emission intensity performance of their portfolio in the target year and exempts users from target recalculation in the intervening period.

This method works as follows (see [worked example 7](#) for an example on how to set targets):

- Users shall set a target year in-use operational emissions intensity target and an upfront embodied emissions intensity target in line with the in-use operational emissions pathway and the upfront embodied emissions pathway respectively, which are available in the SBTi Buildings Target-Setting Tool.

- Users shall ensure that their portfolio emissions intensity is at or below the ambition level set by the pathway for each individual year within the target period<sup>38</sup>.
- Users shall report their annual portfolio emissions intensity.

To qualify for this target-setting method, the following conditions must 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, e.g.<sup>39</sup>:
  - The user is a real estate value fund, acquiring older buildings which are typically less efficient and regenerating them by refurbishment or redevelopment over a short period of time before divesting a large portion 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 buildings portfolio turnover ratio of over 70% which is projected to continue over the next 5-10 years.

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<sup>38</sup> This requirement is designed to mitigate against users delaying decarbonization actions until the target year.

<sup>39</sup> Non-exhaustive.

## 7 ADDITIONAL GUIDANCE FOR FINANCIAL INSTITUTIONS

*[The SBTi strongly recommends that FIs thoroughly review this guidance document in full, including sections 1-6, before developing their targets. The criteria and recommendations in section 4.1 also apply to FIs.]*

*[This sector-specific guidance for FIs, including any criteria and recommendations in section 4.2, are in addition to the criteria and recommendations provided in the [SBTi Financial Sector Science-Based Target Setting Guidance](#).]*

*[Development of the SBTi's Financial Sector Net Zero Target Setting Guidance is currently ongoing. This will raise the ambition for FIs setting science-based targets. FIs will not be able to submit targets for validation under the buildings sector guidance, criteria, and recommendations until after the Financial Sector Net Zero guidance is released in Q4 2023/early 2024.]*

### 7.1 Introduction and target audience

#### 7.1.1 The role of financial institutions in the buildings sector

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, bringing new residential and commercial buildings to the market and redeveloping existing ones. 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 enable property management and maintenance to look after and improve properties 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<sup>40</sup> 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.

<sup>40</sup> 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.

## 7.1.2 Context and target audience for this guidance

This section builds on existing SBTi guidance ([Financial Sector](#) and [Private Equity Sector](#)) to provide buildings sector-specific guidance and target validation criteria and recommendations for FIs. These criteria and recommendations are relevant to GHG emissions inventory and target boundary selection to enable FIs to set targets for their investments and lending activities related to the buildings sector, aligned to a sector-specific 1.5°C decarbonization pathway.

This section also denotes where this framework deviates from or goes beyond these existing standards for setting targets on FIs' investment and lending activities. For detailed guidance on setting targets as an FI, refer to the SBTi's [Financial Sector Science-Based Targets Guidance](#) and [Private Equity Sector Science-Based Targets Guidance](#) respectively.

The target audience for this framework are FIs. 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 or assets comes from the activities described above. In practice, the primary audience includes universal banks, asset managers, asset owners (pension funds, closed-end funds, insurance companies, private equity including venture capital), 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
- Corporate loans
- Equity (investment)
- Fixed income (investment)
- Residential mortgages

Asset classes beyond this list are currently out of scope. Bilateral and multilateral development financial institutions (e.g., the World Bank) are not the primary audience of the guidance.

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 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.

For FIs that are interested in understanding the overall exposure to emissions of their portfolios, they may use PCAF methods to conduct a portfolio-wide emissions screening and prioritize which part of a portfolio to focus on for target-setting (i.e., asset classes and sectors). Following this prioritization, FIs measure emissions associated with their investing and lending activities to determine the emission baselines from which emission-based SBTs are set.

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.

### 7.2.2 Approaches to setting scope 3 portfolio targets

The SBTi supports three methods for FIs to set targets on their investment and lending portfolios: the sector-specific intensity convergence (SDA) method, the SBT Portfolio Coverage Approach, and the Temperature Rating Approach. The SBTi developed [criteria](#) specific to these three methods (FI-C15 - FI-C16), which are used to assess the targets set using these methods. 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 three methods, the SDA is the only approach that requires emissions measurement on an asset class 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, in order to set a target on their real estate activities as one sector-based target, this approach is not recommended by the SBTi. If an asset class approach is not deemed to be appropriate for an FI, they should contact the SBTi to discuss an appropriate approach to target-setting. 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 6.5.2.3](#) for further details.

The SBT 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. SBT Portfolio Coverage is a financial sector analogue to supplier engagement targets for “real economy” companies’ scope 3 emissions. The Temperature Rating Approach expands the scope of the SBT Portfolio Coverage Approach 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 a SBT submission. Table 9 below provides an overview of the methods by relevant asset class, followed by a description of each method.

**Table 9. Portfolio target-setting methods for FIs<sup>41,42</sup>**

| ASSET CLASS   | METHOD                 | DESCRIPTION   | POTENTIAL TARGET OUTPUT EXAMPLE  |
|---|------------------------|---|--|
| <b>Mortgages (consumer loan)</b>                    | SDA                    | Emissions-based physical intensity targets are set for residential buildings’ intensity and total GHG emissions.                              | Emissions-based physical intensity targets are set for residential buildings’ intensity and total GHG emissions.                       |
| <b>Real estate</b>                                  | SDA                    | Emissions-based physical intensity targets are set for residential and/or nonresidential buildings’ intensity and total GHG emissions.        | Emissions-based physical intensity targets are set for residential and/or nonresidential buildings’ intensity and total GHG emissions. |
| <b>Corporate instruments (equity, bonds, loans)</b> | SBT Portfolio Coverage | FIs commit to having a portion of their borrowers and/or investees set their own SBTi-approved science-based targets such that the FI is on a | Financial Institution A commits to 60% of its listed equity portfolio by outstanding value setting SBTi validated targets by 2025.     |

<sup>41</sup> Table presented as shown in SBTi Financial Sector Target Setting Guidance (2023, not yet released).

<sup>42</sup> Electricity project finance is not shown in this table as not relevant for this guidance.

| ASSET CLASS | METHOD             | DESCRIPTION   | POTENTIAL TARGET OUTPUT EXAMPLE   |
|-------------|--------------------|---|---|
|             |                    | linear path to 100% portfolio coverage by 2040 (in consistent emissions or monetary terms).   |   |
|             | Temperature Rating | This approach enables FIs to determine the current temperature rating of their portfolio and take actions to align their portfolios to ambitious long-term temperature goals by engaging with portfolio companies to set ambitious targets. | <p>Financial Institution A commits to align its scope 1 + 2 portfolio temperature score by invested value within other sectors of its corporate bond portfolio from 2.9°C in 2021 to 2.6°C by 2025.</p> <p>Financial Institution A commits to align their scope 1 + 2 + 3 portfolio temperature score by invested value within other sectors of its corporate bond portfolio from 3.2°C in 2021 to 2.8°C by 2025.</p> |

## 7.2.3 Compiling a GHG inventory

### 7.2.3.1 Setting organizational and operational boundaries for financial institutions

As a first step to compile a GHG inventory, an FI should define its organizational boundary by selecting a single consolidation approach as defined by the GHG Protocol based on a range of institution-specific considerations. The chosen consolidation approach should be applied consistently across its institutional structure. The boundaries of its SBTs must align with the organizational boundaries of the GHG inventory.

FIs can finance and invest in buildings 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). This has implications for how emissions are allocated to emissions scopes and categories within the GHG accounting and reporting for each stakeholder. 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 (majority equity share or controlling partner) of real estate will follow the GHG Protocol Corporate Standard, whereby the consolidation approach will match the objectives of the reporting of the FI (PCAF/GRESB/CRREM, 2023).

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 appropriate financial share metric (PCAF/GRESB/CRREM, 2023). This approach does mean that the emissions from a single building can sometimes be distributed across scope 1, 2 and 3 classifications.

Further, in order to simplify target-setting, the SBTi Financial Sector Science-Based Targets Guidance requires FIs to use the operational control or financial control approach when accounting for their emissions and include all investment and lending activities in scope 3, category 15 (financed emissions).

However, in order to increase comparability, between and within FIs, and to reduce the incidence of double counting and completely missed emissions, for the purposes of delineating emissions for scopes for accounting of financed emissions (scope 3 category 15) in the real estate sector, FIs shall impose the [PCAF Standard](#). In practice, this amounts to using an **operational control** approach 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 and the accounting and reporting of GHG emissions in the real estate sector.

Therefore, for the purposes of setting SBTs:

- Where an FI is an owner of a building (occupier or lessor) they should refer to [section 6](#) for guidance on target-setting, following the GHG Protocol Corporate Standard. These emissions are not considered financed emissions.
- Where an FI finances real estate through investment or lending activities and where they do not have control over the building asset, they should refer to the guidance in this section. These emissions are considered scope 3 category 15 financed emissions.

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

### 7.2.3.2 Market-based vs. location-based for financial institutions

As stated in [section 5.3](#), FIs are required to use **only** the location-based method when accounting for in-use operational emissions associated with electricity use for investments related to the buildings sector. For investments in other sectors, FIs may use the market-based or location-based method, in accordance with [FI-C13](#).

### 7.2.3.3 Whole building approach for financial institutions

FIs shall include all emissions from the entire building in GHG accounting ("whole building approach"). This requires the quantification and assessment of all 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. In essence, this ensures that emissions from energy use in the base building, shared services, common areas, tenant spaces etc. are included in the target boundary. This is referred to as the whole building approach (PCAF/GRESB/CRREM, 2023). See [section 5.1](#) for further information.

### 7.2.3.4 Accounting for emissions from real estate for financial institutions

Table 10 summarizes the ways in which FIs finance real estate and how this affects the accounting of emissions from their investments into buildings assets.

**Table 10. Accounting for emissions for FIs financing real estate<sup>43</sup>**

| INVESTOR / LENDER ACTIVITY  | USE OF ASSET  | GHG EMISSIONS CLASSIFICATION FOR THE INVESTOR / LENDER   | GHG EMISSIONS ACCOUNTING FOR TARGET SETTING   |
|---|---|--|---|
| <p><b>Directly</b> invests (equity) into a real estate asset and is a <b>majority</b> equity shareholder or controlling partner in a joint venture.</p> | <p>Investor occupies the building they own, for their own use (e.g. own offices).</p>                           | <p>Direct emissions are scope 1 and indirect emissions are scope 2 for the investor.</p>   | <p>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 <a href="#">section 6</a> for guidance on how to set targets as an owner-occupier. The investor shall abide by the whole building approach.</p>  |
|   | <p>Investor acts as a lessor.</p>   | <p>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).</p> | <p>Investors shall follow the GHG Protocol Corporate Standard, whereby the consolidation approach will match the reporting objectives of the FI. See <a href="#">section 6</a> for guidance on how to set targets as an owner-lessor. The investor shall abide by the whole building approach, ensuring that both lessor- and tenant-controlled emissions are included within the target boundary<sup>44</sup>.</p> |
| <p><b>Directly</b> invests (equity) into real estate asset and is a <b>minority</b> equity shareholder</p>  | <p>The use of proceeds is <b>known</b>, however, the investor/lender <b>cannot</b> dictate how the asset is</p> | <p>Considered financed emissions and accounted for in the investor’s scope 3 cat 15</p>  | <p>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</p>  |

<sup>43</sup> Adapted from PCAF/GRESB/CRREM, 2023.

<sup>44</sup> Scope 1 and 2 and scope 3 categories 1-14.

| INVESTOR / LENDER ACTIVITY  | USE OF ASSET  | GHG EMISSIONS CLASSIFICATION FOR THE INVESTOR / LENDER   | GHG EMISSIONS ACCOUNTING FOR TARGET SETTING   |
|---|---|--|---|
| <b>or</b><br><br>any <b>debt investment</b> into a real estate asset (acting as a lender), <b>including mortgages</b> .   | used.   | (investments).   | building approach, accounting for their proportional share of whole building emissions.   |
| <b>Indirect investment</b> into a real estate asset (e.g. through investment into a real estate company, REIT, or fund listed or unlisted, business loans, corporate bonds etc.). | The use of proceeds is <b>unknown</b> , therefore the investor <b>cannot</b> dictate how the asset is used. | Considered financed emissions and accounted for in the investor / lender's scope 3 cat 15 (investments). | 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.<br><br>The investor/lender shall abide by the whole building approach, accounting for their proportional share of whole building emissions, even if these are categorized in the investee's scope 3. |

### 7.2.3.5 Operational and embodied emissions for financial institutions

For this phase of the project, global embodied emissions pathways to 2050 include emissions from upstream processes only, relating to emissions from product manufacture and construction of new buildings. See [section 3.4.1.2](#) for further guidance on this topic. The SBTi will continue to monitor developments in the literature and available datasets in order to develop embodied emissions pathways covering other life cycle stages, such as in-use and end-of-life embodied emissions. Therefore, FIs financing the construction of new buildings shall include all GHG emissions from upstream processes (referred to as 'upfront embodied emissions' throughout this guidance) in their target boundary.

As first owners, financiers, and investors have significant influence over the whole-life emissions of a building during its design and development, this requirement is intended to incentivize the design and construction of buildings with lower whole life-GHG emissions. See [section 5.6](#) for further details. All subsequent owners, financiers, and investors into a building will have a significantly reduced level of influence over the building’s upstream carbon (UKGBC, 2019); therefore they are recommended but not required to include these emissions in their target boundary.

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.

Where data on embodied emissions (at any life cycle stage) are readily available for existing buildings, FIs should include these in their emissions reporting (Buildings-FI-R1).

**Table 11a. Extract of Table 6 from [section 6.2.2](#) (Required near-term scope 3 categories for buildings sector guidance users**

| INTENDED USER              | SCOPE 3 CATEGORY         | EMISSIONS (EXAMPLES)  |
|----------------------------|--------------------------|---|
| Financial institution (FI) | Category 15: Investments | Whole building in-use operational emissions of buildings in the FI’s portfolio, as occurred during the reporting year.  |
|                            |                          | Upfront embodied emissions of buildings purchased or financed - only if first owner of a building or financing the development/ construction of a new building (see <a href="#">section 5.6</a> for further details). |

**Table 11b. Extract of Table 7 from [section 6.2.2](#) (Recommended near-term scope 3 categories for buildings sector guidance users)**

| INTENDED USER              | SCOPE 3 CATEGORY         | EMISSIONS (EXAMPLES)  |
|----------------------------|--------------------------|---|
| Financial institution (FI) | Category 15: Investments | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment, as occurred in the reporting year. |

## 7.2.4 Defining the boundary of portfolio targets

*[The activities and their required coverage below are subject to change following the publication of the SBTi Financial Sector Net-Zero Target Setting Guidance in Q4 2023/Q1 2024.]*

*[The text in sub-section 7.2.4 is taken largely from the SBTi Financial Sector Science Based Targets updated guidance with only minor modifications; this is expected to be released in 2023.]*

To seek validation from the SBTi, FIs shall follow [SBTi Criteria for FIs](#) FI-C15 and FI-C16 to set target(s) on their investment and lending activities. Depending on the composition of their portfolios, an FI may be able to meet FI-C16 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 (see [Table 12](#)):

1. **Required activities**, if relevant, shall be included in the target boundary. For example, FIs shall include at least 67% of base year activity (in m<sup>2</sup> or financed emissions) from direct investment in real estate assets in the target boundary (if relevant).
2. **Optional activities** that FIs may include in the target boundary<sup>45</sup>. There is no minimum coverage requirement on optional activities, and FIs may cover as much of these activities as they wish. For example, FIs that wish to set targets on the optional category of residential mortgage loans should use the SDA and could determine the target boundary themselves.

<sup>45</sup> Over time, SBTi may update “optional activities” to be required, depending on factors such as changes in availability of data or FIs’ readiness to set targets on certain asset classes.

These activities are deemed optional as they can be impractical to set targets for, given challenges such as unavailability of data or short-term period of an investment/loan.

3. **Out-of-scope activities** that cannot be covered by available methods or do not apply to the project audience. Asset classes not listed in [Table 12](#) are likely also out of scope.

**For asset managers, FI-C15 and FI-C16 also apply to funds managed under discretionary mandates.** The SBTi recommends but does not require that banks' asset management divisions follow [Table 12](#) to set targets on these funds. If banks decide to exclude their asset management divisions from their parent company-level targets, they should disclose this exclusion in the target wording for transparency and comparability. [Table 12](#) is all-encompassing and may not apply to certain FIs. If a FI invests solely or mainly in optional asset classes, they should contact the SBTi to discuss a minimum target coverage boundary of these asset class(es) for the portfolio targets to be considered credible.

The SBTi has devised minimum target coverage requirements for mortgage REITs and private equity firms described below, which are two exceptions to Table 12:

Mortgage REITs that invest in residential and commercial mortgages, residential mortgage-backed securities and commercial mortgage-backed securities shall, at a minimum, cover 67% of residential mortgages by base year activity in square meters.

Private equity firms are recommended to use the SBT portfolio coverage approach to cover all private equity investments, regardless of the percentage share the firm has in its investees. The SBT portfolio coverage method is encouraged given that private equity firms often have more influence over their investees compared to other FIs. If private equity firms have equity investments in real estate companies or funds, 100% of these shall be covered either within the boundary of the SBT portfolio coverage target, or a separate target using the SDA. For the time being, private debt and venture capital are considered optional for private equity firms.



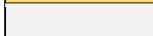
The SBTi aims to strike the right balance between robustness and practicality for the criteria. Factors such as data availability, FIs' level of influence, and sectors' contribution to climate change have been taken into consideration when determining if an activity should be required and the corresponding minimum coverage requirements. As more data becomes available, methods become more mature, and FIs gain more experience in target-setting, the SBTi may revise [Table 12](#) through the annual criteria update process. FIs may also set additional targets to increase the coverage of targets on their portfolios as methods become available for additional asset classes and sectors. [Table 12](#) below presents these three categories of activities, the minimum coverage for required activities (only relevant to required activities), and applicable method(s) for each activity type:

- **When only one method is listed**, it means that it is the only applicable method for the specific financial activity. For example, only the SDA can be applied to residential mortgage portfolios.
- **When multiple methods are listed**, FIs may choose one or more of the methods to set targets that collectively meet the specific minimum coverage requirement for these products. For example, FIs may use both the SDA (for sectors where the method is available) and the temperature rating methods to collectively cover 100% of their corporate bonds portfolios.

While the SBTi has determined required activities that FIs shall include in the target boundary, FIs may still set targets on optional activities if these activities are deemed significant. For instance, while residential mortgage has been determined as an optional activity in the current project phase, FIs with significant mortgage holdings are still encouraged to include this asset class in their targets.

**Table 12. Required, optional, and out-of-scope activities and applicable methods**

Legend

|                     |   |
|---------------------|---|
| Required Activities |    |
| Optional Activities |   |
| Out of Scope        |  |



| Asset Class     | Sub-asset class   | Sector / Market Specifications                        | Minimum Coverage Requirement <sup>a</sup>                      | Applicable Methods <sup>b</sup> |
|-----------------|---|---|--|---------------------------------|
| Consumer loan   | Residential mortgages   | Real estate   | Optional <sup>c</sup>  | SDA                             |
|                 | Motor vehicle loans   | Transport   | n/a  | n/a                             |
|                 | Other consumer loans  | n/a   | n/a  | n/a                             |
| Project finance | Electricity generation project finance (direct or via funds)                            |   | 100% of base year activity (kWh)                               | SDA                             |
|                 | Other project finance (e.g., infrastructure projects/assets)                            |   | n/a  | n/a                             |
| Corporate loan  | Long-term (more than one year) corporate <sup>d</sup> loans                             | Electricity generation (listed and private companies) | 100% of base year activity (kWh)                               | SDA                             |
|                 |   | Fossil fuel (listed and private companies)            | 95% of base year loan value or financed emissions              | SDA <sup>e</sup> / PC / TR      |
|                 |   | All other sectors (listed companies)                  | 67% of base year loan value or financed emissions <sup>f</sup> | SDA / PC / TR                   |
|                 |   | All other sectors (private companies)                 | Optional   | SDA / PC / TR                   |
|                 | Long-term (more than one year) SME <sup>g</sup> loans                                   | Fossil fuel (listed and private companies)            | 95% of base year loan value or financed emissions              | SDA <sup>e</sup> / PC / TR      |
|                 |   | FIs (listed and private companies)                    | 67% of base year loan value or financed emissions              | SDA / PC / TR                   |
|                 |   | All other sectors (listed and private companies)      | Optional   | SDA / PC / TR                   |
|                 | Short-term corporate <sup>d</sup> and SME <sup>g</sup> loans (one year or less, such as | All sectors (listed and private companies)            | Optional   | SDA / PC / TR                   |

|                        |  |   |   |               |
|------------------------|--|---|---|---------------|
| Equity<br>(investment) | Listed equity: common and preferred stock of corporates <sup>d</sup> and SMEs <sup>g</sup> (direct holdings)           | All sectors (listed companies)              | 100%  | SDA / PC / TR |
|                        | Private equity (direct and co-investments)   | All sectors (private companies)             | Optional <sup>h</sup>   | SDA / PC / TR |
|                        | via Funds (e.g., exchange traded funds, mutual funds, hedge funds, fund of funds, other collective investment schemes) | All sectors (listed companies)              | 100%  | SDA / PC / TR |
|                        |  | All sectors (private companies)             | Optional  | SDA / PC / TR |
|                        |  | With unknown underlying assets <sup>i</sup> | Optional  | SDA / PC / TR |
| Real estate            | Direct investment in real estate assets (for own use or investment purposes)   |   | 67% of base year activity (m <sup>2</sup> ) or financed emissions | SDA           |
|                        | Commercial real estate asset loans (residential and service buildings) <sup>j</sup>                                    |   | 67% of base year activity (m <sup>2</sup> ) or financed emissions | SDA           |
|                        | Investment in real estate funds (listed and private)   | REITs and real estate companies (listed)    | 100%  | SDA / PC / TR |
|                        |  | Real estate assets                          | 67% of base year activity (m <sup>2</sup> ) or financed emissions | SDA           |
|                        |  | REITs and real estate companies (private)   | Optional  | SDA / PC / TR |

|   |   |   |   |                            |
|---|---|---|---|----------------------------|
| Fixed income<br>(investment)  | Corporate <sup>d</sup> bonds (direct holdings and via funds)  | All sectors (listed companies)                        | 100%  | SDA / PC / TR              |
|   |   | All sectors (private companies)                       | Optional  | SDA / PC / TR              |
|   | SME <sup>e</sup> bonds (direct holdings and via funds)  | Fossil fuel (listed and private companies)            | 95% of base year loan value or financed emissions | SDA <sup>d</sup> / PC / TR |
|   |   | Financial institutions (listed and private companies) | 67% of base year loan value or financed emissions | SDA / PC / TR              |
|   |   | All other sectors (listed and private companies)      | Optional  | SDA / PC / TR              |
|   | via Funds   | With unknown underlying assets <sup>f</sup>           | Optional  | SDA / PC / TR              |
|   | Supranational, sovereign, sub-sovereign (including municipal), government, and agency bonds (direct holdings or via funds)  | n/a   | n/a   | n/a                        |
| Securitized fixed income: including asset-backed securities, mortgage-backed securities, covered bonds (direct holdings or via funds) | n/a   | n/a   | n/a   |                            |
| Other   | Advisory services (e.g., mergers and acquisitions), debt and equity securities underwriting, insurance underwriting, brokerage services, commodities, credit guarantees, transaction services | n/a   | n/a   | n/a                        |

**Footnotes to Table 12:**

- A. In case of any ambiguity over which minimum coverage requirement applies for a particular activity and its sector/market specifications, the stricter criteria shall apply.

- B. SDA = Sectoral Decarbonization Approach<sup>46</sup>; PC = Portfolio Coverage; TR = Temperature Rating.
- C. As an exception to this table, mortgage REITs shall cover at a minimum of 67% of residential mortgages by base year activity in square meter.
- D. For the purposes of Table 12, “corporate” includes FIs. For example, corporate bonds include bonds issued by FIs.
- E. For companies in the fossil fuel sector, the SDA will only be available once the SBTi Oil & Gas sector guidance is published. In the meantime, FIs may set Portfolio Coverage or Temperature Rating targets. For Portfolio Coverage, FIs may set targets but the validation of oil & gas companies is currently paused until the SBTi Oil & Gas sector guidance is published.
- F. The 67% applies to companies in all other<sup>46</sup> sectors, not per sector. It is optional to include SMEs in the calculation of the 67% coverage threshold. The calculation of financed emissions should include scope 1 and 2 GHG emissions of portfolio companies, and where applicable, scope 3 GHG emissions. Scope 1, 2 and 3 emissions shall be included at a minimum for oil and gas and automotive sectors.
- G. As the definition of SMEs can vary from region to region, FIs may use their own definitions of SMEs to interpret this category. For companies, the SBTi provides a streamlined target validation route for SMEs, where an SME is defined as a non-subsidiary, independent company with fewer than 500 employees. FIs interested in engaging SMEs to set SBTs and whose threshold for SMEs is higher than 500 employees (e.g., 1,000 employees) may have to direct their SME clients to the regular SBTi validation route.
- H. As an exception to this table, private equity firms shall cover their private equity investments per the SBTi Private Equity Sector Science Based Target Setting Guidance, as well as other relevant asset classes, as detailed in [Table 12](#).
- I. This optionality is restricted to cases where the investment strategy precludes transparency on the underlying holdings (e.g. some hedge funds).

<sup>46</sup> The Sectoral Decarbonization Approach (SDA) was renamed as the Sector-specific Intensity Convergence in May 2023. The table is yet to be updated. Both are used throughout this document.

- J. Commercial real estate loans refer to all loans for the purchase, refinance, construction, or rehabilitation of real estate (i.e., residential and service buildings) that are not provided to consumers.

General purpose loans to REITs or real estate companies can be included under “all other sectors” of corporate loans.

## 7.2.5 Description of methods to set portfolio targets

This section provides an overview of methods available to set targets on FIs’ investment and lending portfolios in the buildings sector.

### 7.2.5.1 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<sub>2</sub>e per tonne product produced e.g. cement). For buildings, this metric is metric tonne CO<sub>2</sub>e per m<sup>2</sup> of floor area. In the buildings sector, two distinct decarbonization pathways utilizing the SDA method were developed, one for in-use operational emissions and another for upfront embodied emissions. For further details on how the SDA has been developed and applied to the buildings sector, see [section 3](#) of this guidance document.

The SDA is the only applicable method for several asset classes, as specified in Table 12. 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 for FI](#) guidance for further detail 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](#).

Calculating the portfolio emission 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 etc. This can be through direct (equity) investment into a property or through lending for commercial real estate.

Targets on a real estate portfolio are set using the 1.5°C in-use operational and upfront embodied emissions (for first owners or financers of newly constructed buildings, if relevant) 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 buildings assets.

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 consumer mortgages

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).

Targets on a mortgage portfolio are set using the in-use operational and upfront embodied emissions decarbonization pathways (for first owners or financers of newly constructed buildings, if relevant<sup>47</sup>), disaggregated by building typology and geography accordingly. FIs shall abide by the whole building approach when accounting for the emissions of the household.

Targets on upfront embodied emissions for retail lenders who provide mortgage loans to consumers buying a new home are optional<sup>48</sup>.

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.

<sup>47</sup> For consumer mortgage loans, 'first owner' refers to the retail lender providing the mortgage and not the consumers purchasing the residential building.

<sup>48</sup> Self-build mortgages are an exception to this. Retail lenders (FIs) providing self-build mortgages should set a target on upfront embodied emissions for newly constructed buildings.

### **SDA for corporate instruments (real estate companies)**

This methodology covers corporate loans, equity (investment), real estate (*except* sub-asset classes: direct investment in real estate assets; commercial real estate asset loans), and fixed income (investment). Targets are set on relevant “Required Activities” in [Table 12](#).

Regarding the emissions scopes of investee/borrower companies that shall be included in the targets, FIs shall abide by the approach set out by user type in [section 6.2.2](#) including, at a minimum, the required scope 3 emissions categories for that user type. For instance, FIs’ targets on lending to property managers must include their scope 1 and 2 emissions, as well as scope 3 category 11 ‘use of sold products’ for in-use operational emissions in buildings managed for clients. An exception to this is when the investee/borrower is categorized as a architecture/engineering company, a developer, or a construction company; for investments into these user types, FIs must use an engagement approach to set SBTs (Portfolio Coverage or Temperature Rating) and cannot use the buildings SDAs<sup>49</sup>. FIs’ targets for operational and embodied emissions shall not be combined and must be set separately.

#### **7.2.5.2 Other target-setting methods: Portfolio Coverage for Corporate Instruments (real estate companies)**

FIs may use the SBT Portfolio Coverage method to set targets on their corporate instrument asset classes, including corporate loans, equity (investment), real estate, and fixed income (investment) (see relevant “Required Activities” in [Table 12](#)) 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 [SBTi for FIs](#) guidance section 5.4.2 for further details on using this method.

FIs’ borrowers and/or investees that are in scope of the buildings sector as defined in [section 3](#), shall follow the latest buildings sector criteria and recommendations for companies to set targets.

#### **7.2.5.3 Other target-setting methods: Temperature Rating for Corporate Instruments**

FIs may use the Temperature Rating Approach to address and cover corporate instruments, including corporate loans, equity (investment), real estate, and fixed income (investment) (see relevant “Required Activities” in [Table 12](#)). Under this approach, FIs determine the current temperature score of their portfolio based on the public GHG emissions reduction targets of their investees. It enables FIs to set targets to align their base year portfolio temperature score to a long-term temperature goal. This

<sup>49</sup> This is because these user types must set targets on certain emissions categories using non-SDA methods as part of their minimum requirements for SBTs (for example, 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 included in the buildings in-use operational SDA, FIs cannot use the SDA method for financing activities of these user types).

approach can be used on its own or with the other methods to collectively meet the minimum coverage for all “Required Activities”. See [SBTi for FIs](#) guidance section 5.4.3 for further details on using this method.

FIs’ borrowers and/or investees that are in scope of the buildings sector as defined in [section 3](#), shall follow the latest buildings sector criteria and recommendations for companies to set targets.

#### 7.2.5.4 Approaches to set targets on other scope 3 categories

*[The approach for other scope 3 targets below is subject to change following the publication of the SBTi Financial Institutions Net Zero Guidance in Q4 2023/Q1 2024.]*

For FIs to focus their efforts on their investment and lending activities, the SBTi only recommends but does not require that FIs measure emissions and set targets on scope 3, categories 1–14. See [SBTi for FIs](#) guidance section 5.5 for further details.

As an exception, FIs acting as owner-lessors shall include whole building emissions, including tenant-related emissions, in their target boundary as stated in this guidance.

### 7.3 How to communicate science-based targets and tracking progress

General [SBTi for FIs criteria and recommendations](#) are applicable, specifically section 6 on Reporting Requirements. Refer to section 6 of the [Financial Sector Science Based Targets Guidance](#) for further details.

In addition, FIs are also recommended to disclose their emissions reductions in line with Buildings R-6. Refer to [section 6.5.2.1](#) in the buildings sector guidance for further guidance on this topic.

### 7.4 Target recalculation and validity

General [SBTi for FIs criteria and recommendations](#) are applicable, specifically section 7 on Recalculation and Target Validity.

FIs should also refer to [section 6.5.1.1](#) of the buildings sector guidance for further guidance on this topic.



## 8 WORKED EXAMPLES AND TARGET WORDING

### 8.1 General worked examples

#### Worked example 1<sup>50</sup>: Owner-occupier

|   |  |
|---|--|
| Brief business activity description   | Company X is a professional services firm operating in Europe. It owns one building in the UK (A) and one in Germany (B).                  |
| Intended user classification  | Owner-occupier   |
| Near-term or long-term target   | Near-term  |
| Is the company required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)? | Yes  |
| Is the company required to set an upfront embodied emissions target?                                      | No. An upfront embodied emissions target is not required as Company X is not the first owner of its buildings                              |
| Other near-term scope 3 targets <sup>51</sup>   | Category 1: purchased goods and services (general procurement)<br>Category 5: waste generated in operations<br>Category 6: business travel |
| Asset geography - in-use operational emissions  | Building A: UK<br>Building B: Germany  |

<sup>50</sup> The companies in the following worked examples may also be required to set additional commitments as part of their target submission and validation. These are not discussed here. See section 6.2.3.5 for further details on additional commitments.

<sup>51</sup> Scope 3 categories are either required, as determined by Table 6, or is included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

|   |   |
|---|---|
| Asset geography -<br>upfront embodied<br>emissions    | N/A   |
| Asset typologies -<br>in-use operational<br>emissions | Building A: Office<br>Building B: Office  |
| Asset typologies -<br>upfront embodied<br>emissions   | N/A   |
| Target aggregation and<br>communication               | <p><i>Company X commits to reduce scope 1, 2, and 3 GHG emissions from in-use operational emissions of owned buildings by 65.5% per m<sup>2</sup> by 2030 from a 2021 base year.</i></p> <p><i>Company X also commits to reduce absolute scope 3 GHG emissions 25% within the same timeframe.</i></p> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only
- The company chooses a near-term target timeframe of 2021-2030
- The company is required to set a near-term in-use operational emissions target covering whole building operational emissions, using the buildings in-use operational SDA method
- As the company's scope 3 emissions are greater than 40% of total scope 1 + 2 + 3, it must include additional scope 3 categories to achieve the minimum coverage requirement. It chooses to use the cross-sector absolute reduction 1.5°C or well-below 2°C method.

### In-use operational emissions:

| Building Type & Location | Emissions and Floor Area data          |                              |  | Target - 1.5C                |  |             |  |             |
|--------------------------|--|------------------------------|--|------------------------------|--|-------------|--|-------------|
|                          | Base year                              |                              |  | Target year                  | 2030                                   |             |  |             |
|                          | In-Use Emissions [kgCO <sub>2</sub> e] | Floor Area [m <sup>2</sup> ] | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | Floor Area [m <sup>2</sup> ] | In-Use Emissions [kgCO <sub>2</sub> e] | % reduction | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | % reduction |
| Office   United Kingdom  | 5,000,000                              | 40,000.00                    | 124.97   | 40,000.00                    | 2,077,699.7                            | 58.4%       | 51.94  | 58.4%       |
| Office   Germany         | 1,500,000                              | 20,000.00                    | 74.96  | 40,000.00                    | 607,797.6                              | 59.5%       | 15.19  | 79.7%       |
|                          | 6,500,000                              | 60,000                       | 108.3  | 80,000                       | 2,685,497                              | 58.8%       | 39.69  | 65.5%       |

Screenshot from the Optional-Aggregator tab of the buildings tool

### Other scope 3 emissions:

Screenshots of ACA targets are not shown.

### Worked example 2: Tenant

|   |  |
|---|--|
| Brief business activity description   | Company X is a food production company operating in Europe. The company leases one floor of an office building in France (A) as well as leasing two warehouses for production, one in France (B) and one in Belgium (C). |
| Intended user classification  | Tenant   |
| Near-term or long-term target   | Near-term  |
| Is the company required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)? | Yes, covering emissions from tenant and landlord-controlled spaces.  |
| Is the company required to set an upfront embodied emissions target?                                      | No.  |

|   |   |
|---|---|
| Other near-term scope 3 targets <sup>52</sup>   | Category 1: purchased goods and services<br>Category 4: upstream transportation & distribution  |
| Asset geography - in-use operational emissions  | Building A: France<br>Building B: France<br>Building C: Belgium   |
| Asset geography - upfront embodied emissions    |   |
| Asset typologies - in-use operational emissions | Building A: Office<br>Building B: Industrial distribution warehouse, cold<br>Building C: Industrial distribution warehouse, cold  |
| Asset typologies - upfront embodied emissions   |   |
| Target aggregation and communication            | <i>Company X commits to reduce scope 1, 2, and 3 GHG emissions from in-use operational emissions of leased buildings by 53.7% per m<sup>2</sup> by 2028 from a 2022 base year.</i><br><br><i>Company X also commits to reduce absolute scope 3 GHG emissions 17.5% within the same timeframe.</i> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only
- The company chooses a near-term target timeframe of 2022-2028
- The company is required to set a near-term in-use operational emissions target covering whole building operational emissions, using the buildings in-use operational SDA method. This includes scope 3 category 8 emissions from landlord-controlled areas.
- As the company's scope 3 emissions are greater than 40% of total scope 1 + 2 + 3, it must set further scope 3 targets to achieve the minimum coverage requirement. Following a screening exercise, the company chooses to include purchased goods and services (including in-use

<sup>52</sup> Scope 3 categories are either required, as determined by Table 6, or included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

embodied emissions) and upstream transportation and distribution in its scope 3 target boundary, both using the cross-sector absolute reduction well-below 2°C method.

### In-use operational emissions:

| Building Type & Location            | Emissions and Floor Area data          |                              |  | Target - 1.5C                |  |             |  |             |
|-------------------------------------|--|------------------------------|--|------------------------------|--|-------------|--|-------------|
|                                     | Base year                              |                              |  | Target year                  | 2028                                   |             |  |             |
|                                     | In-Use Emissions [kgCO <sub>2</sub> e] | Floor Area [m <sup>2</sup> ] | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | Floor Area [m <sup>2</sup> ] | In-Use Emissions [kgCO <sub>2</sub> e] | % reduction | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | % reduction |
| Office   France                     | 500,000                                | 5,000.00                     | 99.80  | 7,000.00                     | 265,986.4                              | 46.8%       | 38.00  | 61.9%       |
| Distrib. Warehouse - COLD   France  | 1,100,000                              | 50,000.00                    | 22.00  | 60,000.00                    | 616,653.7                              | 43.9%       | 10.28  | 53.3%       |
| Distrib. Warehouse - COLD   Belgium | 1,500,000                              | 50,000.00                    | 29.99  | 60,000.00                    | 839,059.0                              | 44.1%       | 13.98  | 53.4%       |
|                                     | 3,100,000                              | 105,000                      | 29.5   | 127,000                      | 1,721,699                              | 44.1%       | 13.36  | 53.7%       |

Screenshot from the Optional-Aggregator tab of the buildings tool.

### Other scope 3 emissions:

Screenshots of ACA targets not shown.

### Worked example 3: Architecture company

|   |   |
|---|---|
| Brief business activity description   | Company X is an architecture company operating in the Middle East. They operate in four offices, of which they own three and are tenants in one. Company X primarily designs office buildings and residential multi-family homes. |
| Intended user classification  | Architecture/engineering company<br>Owner-occupier<br>Tenant  |
| Near-term or long-term target   | Near-term   |
| Is the company required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)? | Yes, covering emissions from spaces where Company X is an owner-occupier and where it is the tenant, covering tenant and landlord-controlled spaces.  |

|   |   |
|---|---|
| <p>Is the company required to set an upfront embodied emissions target?</p> | <p><u>Architecture company</u><br/>No. However, Company X completes the designs of new buildings each year for their clients and chooses to include the estimated end of life embodied emissions of each new building they design that year (which are optional).</p> <p><u>Owner-occupier</u><br/>No. The buildings the company owns are existing buildings and were not purchased new in the base year. The company also has no plans to purchase new buildings in the period covering its near-term target<sup>53</sup>. Therefore, the company does not need to set an upfront embodied emissions target for buildings it owns.</p> <p><u>Tenant</u><br/>No</p> |
| <p>Other near-term scope 3 targets<sup>54</sup></p>                         | <p><u>Architecture company:</u><br/>Company X is required to include a target covering scope 3 category 11: use of sold products, covering the estimated lifetime whole building in-use operational emissions from designed buildings.</p>  |
| <p>Asset geography - in-use operational emissions</p>                       | <p>For designed buildings: Global (across the Middle East)<br/>For buildings owned and occupied: Global (Lebanon)<br/>For buildings where they are a tenant: Global (Egypt)</p>   |
| <p>Asset geography - upfront embodied emissions</p>                         | <p>N/A</p>  |
| <p>Asset typologies - in-use operational emissions</p>                      | <p>For buildings designed: Office and Residential Multi-Family<br/>For buildings owned and occupied: Office<br/>For buildings where they are a tenant: Office</p>   |

<sup>53</sup> If the company did acquire a new building during the target period, this may trigger a recalculation of its baseline and targets. See section [6.5.1.1](#) for more details.

<sup>54</sup> Scope 3 categories are either required, as determined by Table 6, or included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

|   |  |
|---|--|
| Asset typologies -<br>upfront embodied<br>emissions | N/A  |
| Target aggregation and<br>communication             | <p><i>Company X commits to reduce scope 1, 2, and 3 GHG emissions from in-use operational emissions of owned buildings and leased space by 67.3% per m<sup>2</sup> by 2030 from a 2021 base year.</i></p> <p><i>Company X also commits to reduce absolute scope 3 GHG emissions from lifetime in-use operational emissions of its designed buildings by 25% over the same timeframe.</i></p> <p><i>Company X further commits to reduce the absolute scope 3 GHG emissions from embodied emissions from the end of life treatment of its designed buildings by 25% over the same timeframe.</i></p> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only
- The company chooses a near-term target timeframe of 2021-2030
- The company is required to set a near-term in-use operational emissions target covering whole building operational emissions, using the buildings in-use operational SDA method. This includes scope 3 category 8 emissions from landlord-controlled areas.
- The company is required to set a near-term target covering lifetime in-use operational emissions from designed buildings, using the cross-sector absolute reduction 1.5°C or well below 2°C method.
- The company also decides to set a separate voluntary near-term scope 3 target covering embodied emissions from the end of life treatment of designed buildings, using the cross-sector absolute reduction 1.5°C or well below 2°C method.

## In-use operational emissions:

### Section A1. Enter preferred units (also applies to calcs of Upfront Embodied Target)

|  |                                    |                       |                |
|--|------------------------------------|-----------------------|----------------|
| <b>m<sup>2</sup> &amp; kgCO<sub>2</sub>e</b> | <small>("tons" are metric)</small> | <b>Required Input</b> | <b>Results</b> |
|--|------------------------------------|-----------------------|----------------|

### Section A2. Select geography

|  |  |                   |           |   |
|--|--|-------------------|-----------|---|
| <input type="radio"/> Europe <input checked="" type="radio"/> NON-Europe | <small>"Default" not yet available</small> | <b>Sub-region</b> | <b>OK</b> | <small>See "AUS zones" tab for climatic zones in Australia.</small> |
| <b>Mexico</b>  | <b>OK</b>                                  | N/A               |           |   |

### Section A3. Select building type

|               |           |  |
|---------------|-----------|--|
| <b>Office</b> | <b>OK</b> | <small>Refer to guidance document for details on building types.</small> |
|---------------|-----------|--|

### Section A4. Enter emissions and activity data

|  |   |   |   |
|--|---|---|---|
| <b>Select base year</b>                          | <b>2021</b>   |   |   |
| <b>In-Use Operational emissions in base year</b> | <b>125,000.0</b>  | <small>kgCO<sub>2</sub>e</small>  | <b>0.125</b> <small>kton CO<sub>2</sub>e</small>  |
| <b>Floor area in base year</b>                   | <b>1,500.0</b>  | <small>m<sup>2</sup></small>  | <b>0.002</b> <small>million m<sup>2</sup></small> |
| <b>Base-year intensity</b>                       | <b>82.78</b>  | <small>kgCO<sub>2</sub>e / m<sup>2</sup></small>  |   |
| <b>Select target year</b>                        | <b>2030</b>   | <small>Target year must be at least 5 years and at most 10 years from the current year.</small> |   |
| <b>Floor area in target year</b>                 | <b>2,000.0</b>  | <small>m<sup>2</sup></small>  | <b>0.002</b> <small>million m<sup>2</sup></small> |
|  | <input type="checkbox"/> <small>Use "fixed market share" method</small> |   | <b>N/A</b> <small>million m<sup>2</sup></small>   |

## Result:

|                        |   | <b>Base year<br/>2021</b> | <b>Target year<br/>2030</b> | <b>% Reduction<br/>2021 - 2030</b> |
|------------------------|---|---------------------------|-----------------------------|------------------------------------|
| <b>Office   Mexico</b> | <b>Total in-use emissions</b>             | <b>125,000.00</b>         | <b>54,123.36</b>            | <b>56.7%</b>                       |
|                        | <b>Overall in-use emissions intensity</b> | <b>82.78</b>              | <b>27.06</b>                | <b>67.3%</b>                       |

## Scope 3 lifetime in-use operational emissions:

Screenshots of ACA targets are not shown.

## Worked example 4: Equity REIT (owner-lessor)

### Brief business activity description

REIT X is a small REIT that owns a chain of shopping malls operating in the USA. It owns six malls across three states. It leases individual commercial units (shops) to tenants. Depending on the leasing arrangement and the mall layout, in some cases Company X procures utilities centrally and in other cases this is controlled by the tenant (tenant's scope 1 and 2, and REIT X's scope 3 category 13 emissions). REIT X also



|   |   |
|---|---|
|   | leases office space for its company offices.  |
| Intended user classification  | Owner-lessor<br>Tenant  |
| Near-term or long-term target   | Near-term   |
| Is the company required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)? | Yes, covering emissions from spaces where REIT X is a tenant (leased office space for corporate activities) including upstream scope 3 category 8 emissions from lessor-controlled spaces, and whole building operational energy from the six shopping malls it owns and leases out, including downstream scope 3 category 13 emissions from tenant-controlled spaces.  |
| Is the company required to set an upfront embodied emissions target?                                      | No. The malls were purchased as existing assets so no upfront embodied emissions target is required as the company was not the first owner.   |
| Other near-term scope 3 targets <sup>55</sup>   | <u>Owner-lessor</u><br>Category 1: Purchased goods and services covering embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in owner-controlled spaces, as occurred in the reporting year<br><br>Category 13: Downstream leased assets covering in-use embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in tenant-controlled spaces, as occurred in the reporting year. |
| Asset geography - in-use operational emissions  | USA, New York: 2<br>USA, Houston: 2<br>USA, Chicago: 2  |
| Asset geography - upfront embodied  | N/A   |

<sup>55</sup> Scope 3 categories are either required, as determined by Table 6, or included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

|   |   |
|---|---|
| emissions                                       |   |
| Asset typologies - in-use operational emissions | Retail - shopping center  |
| Asset typologies - upfront embodied emissions   | N/A   |
| Target aggregation and communication            | <p><i>REIT X commits to reduce scope 1, 2 and 3 GHG emissions from in-use operational emissions of owned and leased space by 58.0% per m<sup>2</sup> by 2030 from a 2021 base year.</i></p> <p><i>REIT X also commits to reduce absolute scope 3 GHG emissions from in-use embodied emissions in owned spaces and tenant-controlled areas by 25% over the same timeframe.</i></p> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only.
- The company chooses a near-term target timeframe of 2021-2030.
- The company is required to set a near-term in-use operational emissions target covering whole building in-use operational emissions, using the buildings in-use operational SDA method. This includes scope 3 category 8 and 13 emissions.
- The company also decides to set a separate voluntary near-term scope 3 target covering in-use embodied emissions of spaces owned and tenant-controlled spaces, using the cross-sector absolute reduction well below 2°C method.

### In-use operational emissions:

| Building Type & Location              | Emissions and Area Stock data          |                              |  | Target - 1.5C                |  |              |  |              |
|---------------------------------------|--|------------------------------|--|------------------------------|--|--------------|--|--------------|
|                                       | Base year                              |                              |  | Target year                  | 2030                                   |              |  |              |
|                                       | In-Use Emissions [kgCO <sub>2</sub> e] | Area Stock [m <sup>2</sup> ] | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | Area Stock [m <sup>2</sup> ] | In-Use Emissions [kgCO <sub>2</sub> e] | % reduction  | Carbon Intensity [kgCO <sub>2</sub> e/m <sup>2</sup> ] | % reduction  |
| Office   USA - New York               | 500,000                                | 4,000.00                     | 125.00   | 6,000.00                     | 282,377.6                              | 43.5%        | 47.06  | 62.3%        |
| Retail Shopping Mall   USA - New York | 3,500,000                              | 50,000.00                    | 70.00  | 60,000.00                    | 2,023,729.5                            | 42.2%        | 33.73  | 51.8%        |
| Retail Shopping Mall   USA - Houston  | 6,000,000                              | 100,000.00                   | 60.00  | 125,000.00                   | 3,316,393.3                            | 44.7%        | 26.53  | 55.8%        |
| Retail Shopping Mall   USA - Chicago  | 7,500,000                              | 100,000.00                   | 75.00  | 125,000.00                   | 3,462,905.2                            | 53.8%        | 27.70  | 63.1%        |
|                                       | <b>17,500,000</b>                      | <b>254,000</b>               | <b>68.9</b>  | <b>316,000</b>               | <b>9,085,406</b>                       | <b>47.8%</b> | <b>28.73</b>   | <b>58.0%</b> |

Screenshot from the Optional-Aggregator tab of the buildings tool.

### Other scope 3 emissions:

Screenshots of ACA targets are not shown.

### Worked example 5: Developer and property manager

|                                     |  |
|-------------------------------------|--|
| Brief business activity description | <p>Company X is a real estate developer and property manager operating in Sweden. They develop sports and leisure centers and also offer property management services for the properties once sold or to other sports and leisure facilities as clients. The company owns one office building which it uses as a corporate headquarters.</p> <p>In the base year Company X completed development on four projects. Three of them were sold in that reporting year. One remains unsold.</p> <p>In the base year Company X provides property management for 40 properties.</p> |
| Intended user classification        | <p>Developer</p> <p>Property manager</p> <p>Owner-occupier</p>   |
| Near-term or long-term target       | Near-term  |
| Is the company                      | Yes, covering emissions from owned and managed spaces.   |

|  |   |
|--|---|
| required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)? |   |
| Is the company required to set an upfront embodied emissions target?                       | Yes. Company X is a developer and therefore has responsibility over the upfront embodied emissions of their newly developed properties <sup>56</sup> , once completed.  |
| Other near-term scope 3 targets <sup>57</sup>  | <u>Developer:</u><br>Category 11: use of sold products (lifetime in-use operational emissions of any buildings sold).   |
| Asset geography - in-use operational emissions   | All assets: Sweden  |
| Asset geography - upfront embodied emissions   | All assets: Sweden  |
| Asset typologies - in-use operational emissions  | <u>Developer:</u><br>Lodges/ Leisure & Recreation: three sold projects<br><br><u>Property manager:</u><br>Lodges/ Leisure & Recreation: 40 managed properties<br><br><u>Owner-occupier:</u><br>Office: one building |
| Asset typologies - upfront embodied  | <u>Developer:</u><br>Other: three completed sport/leisure developments  |

<sup>56</sup> The building is treated as a 'capital good' and emissions from the extraction, production, and transportation of the new building, including all emissions related to the construction of the building, should be included in the developer's target boundary under scope 3 category 2 capital goods, the year in which the building reaches practical completion and is considered 'developed'.

<sup>57</sup> Scope 3 categories are either required, as determined by Table 6, or included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

|                                      |  |
|--------------------------------------|--|
| emissions                            |  |
| Target aggregation and communication | <p><i>Company X commits to reduce scope 1, 2 and 3 GHG emissions from in-use operational emissions of owned buildings and managed spaces by 71.2% per m<sup>2</sup> by 2030 from a 2021 base year.</i></p> <p><i>Company X also commits to reduce scope 3 GHG emissions from upfront embodied emissions in new buildings developed by 53.8% per m<sup>2</sup> over the same timeframe.</i></p> <p><i>Company X further commits to reduce absolute scope 3 GHG emissions from lifetime in-use operational emissions of buildings sold by 25% over the same timeframe.</i></p> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only.
- The company chooses a near-term target timeframe of 2021-2030.
- The company is required to set a near-term in-use operational emissions target covering whole building in-use operational emissions, using the buildings in-use operational SDA method. This includes scope 3 category 11 emissions for operational energy use in managed spaces.
- The company is also required to set a near-term scope 3 target covering upfront embodied emissions for new buildings developed, using the buildings upfront embodied SDA method.
- The company is further required to set a near-term scope 3 target covering lifetime in-use operational emissions from buildings sold. It chooses the cross-sector absolute reduction 1.5°C or well below 2°C method to set this target.

### In-use operational emissions:

| Building Type & Location   | Emissions and Floor Area data           |                              |   | Target - 1.5C                |   |              |   |              |
|----------------------------|---|------------------------------|---|------------------------------|---|--------------|---|--------------|
|                            | Base year                               |                              |   | Target year                  | 2030                                    |              |   |              |
|                            | In-Use Emissions [kgCO <sub>2</sub> -e] | Floor Area [m <sup>2</sup> ] | Carbon Intensity [kgCO <sub>2</sub> -e/m <sup>2</sup> ] | Floor Area [m <sup>2</sup> ] | In-Use Emissions [kgCO <sub>2</sub> -e] | % reduction  | Carbon Intensity [kgCO <sub>2</sub> -e/m <sup>2</sup> ] | % reduction  |
| Office   Sweden            | 40,000                                  | 2,000.00                     | 19.90   | 2,000.00                     | 15,593.5                                | 61.0%        | 7.80  | 60.8%        |
| Leisure / Lodging   Sweden | 600,000                                 | 24,000.00                    | 24.99   | 35,000.00                    | 244,420.6                               | 59.3%        | 6.98  | 72.1%        |
|                            | <b>640,000</b>                          | <b>26,000</b>                | <b>24.6</b>   | <b>37,000</b>                | <b>260,014</b>                          | <b>59.4%</b> | <b>7.05</b>   | <b>71.2%</b> |

Screenshot from the Optional-Aggregator tab of the buildings tool.

## Upfront embodied emissions:

### Section B1. Select building type

|       |   |                |         |
|-------|---|----------------|---------|
| Other | Refer to guidance document for details on building types. | Required Input | Results |
|-------|---|----------------|---------|

### Section B2. Enter emissions and activity data (Units of measure specified in In-Use Targets - section A1)

|   |   |  |                              |
|---|---|--|------------------------------|
| Select base year                        | 2021  |  |                              |
| Upfront Embodied emissions in base year | 6,000,000.0   | kgCO <sub>2</sub> e  | 6.000 kton CO <sub>2</sub> e |
| Floor area in base year                 | 10,000.0  | m <sup>2</sup>   | 0.010 million m <sup>2</sup> |
| Base-year intensity                     | 599.40  | kgCO <sub>2</sub> e / m <sup>2</sup>   |                              |
| 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               |   |  |                              |
|   | <input checked="" type="checkbox"/> Use "fixed market share" method |  | 0.016 million m <sup>2</sup> |

## Results:

### Section B3. Review target modelling results

#### Target modelling results - 1.5C (Upfront Embodied)

|                 |                                      | Base year<br>2021 | Target year<br>2030 | % Reduction<br>2021 - 2030 |
|-----------------|--------------------------------------|-------------------|---------------------|----------------------------|
| Other buildings | Total embodied emissions             | 6,000,000.00      | 4,301,172.18        | 28.3%                      |
|                 | Overall embodied emissions intensity | 599.40            | 276.98              | 53.8%                      |

## Other scope 3 emissions:

Screenshots of ACA targets are not shown.

## Worked example 6: Construction company

|                                     |   |
|-------------------------------------|---|
| Brief business activity description | Company X is a construction company specializing in residential multi-family properties in Spain. It leases office space for its corporate headquarters, located in Madrid. |
| Intended user classification        | Construction company<br>Tenant  |
| Near-term or long-term target       | Near-term   |

|  |   |
|--|---|
| <p>Is the company required to set a whole building in-use operational emissions target (scopes 1, 2, and 3)?</p> | <p>Yes. As a tenant of office space, Company X must set whole building in-use operational emissions targets covering emissions from tenant and landlord-controlled spaces.</p>  |
| <p>Is the company required to set an upfront embodied emissions target?</p>                                      | <p>Yes, but not using the upfront embodied SDA.</p> <p>Company X constructs new buildings as a regular part of their business model, and maintains an inventory of the upfront embodied emissions incurred each year it works on the construction of a new building.</p> <p>Company X also estimates the embodied emissions relating to the end of life treatment of constructed buildings. In the base year 20 buildings reach practical completion. There are 45 ongoing construction projects during the base year.</p> <p>The company is also involved in retrofitting, refurbishment, and renovations of buildings. Company X completed retrofitting, refurbishment, and renovation work on 10 buildings in the base year.</p> |
| <p>Other near-term scope 3 targets<sup>58</sup></p>  | <p><u>Construction company</u></p> <p>Category 1: purchased goods and services (embodied emissions of materials purchased and used to construct new buildings (upfront embodied)).</p> <p>Category 1: purchased goods and services (embodied emissions of materials used in maintenance, repair, replacement, or refurbishment of buildings (in-use embodied)).</p> <p>Category 3: fuel and energy related activities (construction site activities (can occur across the buildings life cycle, modules A, B, or C)).</p> <p>Category 4: upstream transportation and distribution (construction site</p>  |

<sup>58</sup> Scope 3 categories are either required, as determined by Table 6, or included in the target boundary to meet general SBTi scope 3 criteria and coverage requirements, or an optional scope 3 category the entity has chosen to set targets on.

|   |  |
|---|--|
|   | <p>activities (can occur across the buildings life cycle, modules A, B, or C).</p> <p>Category 5: waste generated in operations (construction site activities (can occur across the buildings life cycle, modules A, B, or C).</p>   |
| Asset geography - in-use operational emissions  | <p><u>Tenant</u><br/>Spain</p>   |
| Asset geography - upfront embodied emissions    | N/A  |
| Asset typologies - in-use operational emissions | <p><u>Tenant</u><br/>Office</p>  |
| Asset typologies - upfront embodied emissions   | N/A  |
| Target aggregation and communication            | <p><i>Company X commits to reduce scope 1, 2 and 3 GHG emissions from in-use operational emissions of leased buildings by 58.7% per m<sup>2</sup> by 2030 from a 2022 base year.</i></p> <p><i>Company X further commits to reduce absolute scope 3 GHG emissions from fuel and energy related activities, upstream transportation and distribution, waste generated in operations, and in-use embodied emissions by 25% by 2030 from a 2022 base year.</i></p> <p><i>Company X further commits to reduce the absolute scope 3 GHG emissions from upfront embodied emissions by 25% over the same timeframe.</i></p> |

This company decides what target boundaries and approaches it will use:

- The company decides to set a near-term target only.
- The company chooses a near-term target timeframe of 2022-2030.



- As a tenant, the company is required to set a near-term in-use operational emissions target covering whole building operational emissions, using the buildings in-use operational SDA method. This includes scope 3 category 8 emissions from landlord-controlled areas.
- The company is required to set a near-term scope 3 target covering embodied emissions of materials purchased and used to construct new buildings and renovate existing buildings. It chooses to use the cross-sector absolute reduction well-below 2°C method.
- The company is also required to set near-term scope 3 targets covering fuel and energy related activities, upstream transportation and distribution, and waste generated in operations. The company chooses to set a combined target on these emissions using the cross-sector absolute reduction 1.5°C or well-below 2°C method.

### In-use operational emissions:

#### Section A1. Enter preferred units (also applies to calcs of Upfront Embodied Target)

|                                      |                                    |                |         |
|--------------------------------------|------------------------------------|----------------|---------|
| m <sup>2</sup> & kgCO <sub>2</sub> e | <small>("tons" are metric)</small> | Required Input | Results |
|--------------------------------------|------------------------------------|----------------|---------|

#### Section A2. Select geography

|   |   |
|---|---|
| <input checked="" type="radio"/> Europe <input type="radio"/> NON-Europe <small>*Default* not yet available</small> | Sub-region  |
| Spain <span>OK</span>   | OK  |
|   | N/A <small>See "AUS zones" tab for climatic zones in Australia.</small> |

#### Section A3. Select building type

|                        |  |
|------------------------|--|
| Office <span>OK</span> | <small>Refer to guidance document for details on building types.</small> |
|------------------------|--|

#### Section A4. Enter emissions and activity data

|   |  |   |                              |
|---|--|---|------------------------------|
| Select base year                          | 2022   |   |                              |
| In-Use Operational emissions in base year | 200,000.0  | kgCO <sub>2</sub> e   | 0.200 kton CO <sub>2</sub> e |
| Floor area in base year                   | 8,000.0  | m <sup>2</sup>  | 0.008 million m <sup>2</sup> |
| Base-year intensity                       | 24.97  | kgCO <sub>2</sub> e / m <sup>2</sup>  |                              |
| Select target year                        | 2030   | <small>Target year must be at least 5 years and at most 10 years from the current year.</small> |                              |
| Floor area in target year                 | 9,000.0  | m <sup>2</sup>  | 0.009 million m <sup>2</sup> |
|   | <input type="checkbox"/> Use "fixed market share" method |   | N/A million m <sup>2</sup>   |

### Result:

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

|                |                                    | Base year<br>2022 | Target year<br>2030 | % Reduction<br>2022 - 2030 |
|----------------|------------------------------------|-------------------|---------------------|----------------------------|
| Office   Spain | Total in-use emissions             | 200,000.00        | 92,899.46           | 53.6%                      |
|                | Overall in-use emissions intensity | 24.97             | 10.32               | 58.7%                      |

### Other scope 3 emissions:

Screenshots of ACA targets are not shown.

### Worked example 7: How to set a fixed intensity target for high turnover portfolios

A user who has met the qualification conditions in [section 6.5.2.3](#) who has a building typology of e.g. 'residential' trying to set a fixed intensity target for their upfront embodied emissions for 2030 would:

1. Open the SBTi Buildings Target-Setting Tool.
2. Navigate to the *Embodied Targets* tab.
3. Set their *building type* to 'Residential' in Section B1.
4. Set Base year in Section B2 (this does not impact target).
5. Navigate, by scrolling down, to the *target modeling data* table in Section B3.
6. In this table, the user would scroll to column 2030.
7. The *sector carbon intensity* row forms their fixed intensity target, i.e. 264 kgCO<sub>2</sub>e/m<sup>2</sup>.
8. For the years up to the target date where the user shall ensure that their portfolio emissions intensity is at or below the ambition level set by the pathway they would do the same but for the preceding years, i.e. for 2026 ensuring they are at or below 354.7 kgCO<sub>2</sub>e/m<sup>2</sup>.

A user would follow the same process for setting in-use operational targets, instead referring to the *in-use targets* tab and with the additional selection of a *geography*<sup>59</sup>. Additionally, fixed intensity targets would be individual per building type and geography, aggregation is not required.

## 8.2 Financial institution worked examples

FIs should refer to the relevant sections (including appendices) of the [Financial Sector Science Based Targets Guidance](#) in order to set asset-level targets using the available methods. The worked examples below do not include all aspects of target-setting<sup>60</sup>, instead focusing on where there are differences from existing SBTi for FI target-setting processes.

**NOTE:** The examples below are simplified examples to illustrate the principles, criteria, and recommendations set out in this guidance document. Real world portfolios are expected to contain a greater number and complexity of assets.

<sup>59</sup> The selection of a geography is not currently relevant for embodied targets as the pathways are global.

<sup>60</sup> For example, attribution of emissions, data inputs, data quality considerations etc.

## Worked example F1: UK bank investing in commercial real estate and residential mortgages

|  |  |
|--|--|
| <p>Brief business activity description including asset classes</p> | <p>Financial Institution X is a medium sized UK bank, focusing primarily on:</p> <ul style="list-style-type: none"> <li>• <b>Consumer mortgages.</b></li> <li>• <b>Commercial real estate</b> (in its chosen base year, 25% of its portfolio are buildings that are directly owned, with the bank acting as an owner-lessor; 75% of its portfolio is minority investments into buildings, as direct investments where the bank has no operational control).</li> </ul> |
| <p>Intended user classification</p>                                | <p>Financial institution (FI)</p>  |
| <p>Near-term or long-term target</p>                               | <p>Near-term</p>   |
| <p>Asset class coverage and applicable methods</p>                 | <p><u>Consumer mortgages:</u><br/>Coverage required: Optional<br/>Applicable methods: Sector-specific intensity convergence</p> <p><u>Commercial real estate:</u><br/>Coverage required: 67% of base year activity (m<sup>2</sup>) or financed emissions<br/>Applicable methods: Sector-specific intensity convergence</p>   |
| <p>Whole building approach</p>                                     | <p>Financial Institution X shall abide by the whole building approach when collecting emissions data on its mortgages and commercial real estate portfolios. Estimated data must be used where measured data is not available.</p> <p>Scope 1, 2 and 3 emissions from the buildings in the owner-lessor part of the portfolio (details not shown as part of this worked example).</p>  |
| <p>Near-term target for own operations</p>                         | <p>Financial Institution X must also set a near-term target covering emissions from its own operations as per general <a href="#">SBTi FI criteria</a> (details not shown as part of this worked example).</p>   |
| <p>Required scope 3 categories</p>                                 | <p>Category 15: Investments (100% of mortgage portfolio and 75% of commercial real estate portfolio, where the FI is a minority shareholder in the</p>   |

|   |  |
|---|--|
|   | buildings asset).<br><br>Category 13 emissions from the 25% owner-lessor part of the portfolio for tenant-controlled emissions (details not shown as part of this worked example).   |
| Optional scope 3 Cat 1-14                                       | Not shown as part of this worked example   |
| Is the FI required to set an upfront embodied emissions target? | <u>Consumer mortgages:</u> No - in its chosen base year, the bank issued no self-build mortgages.<br><br><u>Commercial real estate:</u> No - not considered a first owner/purchaser or financier of these assets (existing buildings). |
| Asset geography - in-use operational emissions                  | UK   |
| Asset geography - upfront embodied emissions                    | Global   |
| Asset typologies - in-use operational emissions                 | <u>Consumer mortgages:</u><br>Residential single-family 95%<br>Residential multi-family 5%<br><u>Commercial real estate:</u><br>Office 50%<br>Hotel 50%  |
| Asset typologies - upfront embodied emissions                   | <u>Consumer mortgages:</u><br>Residential 100%<br><br><u>Commercial real estate:</u><br>N/A  |
| Headline target   | Financial Institution X commits to achieve SBTs in its mortgages and commercial real estate portfolio by 2028 from a 2021 base year.   |

|   |   |
|---|---|
|   | <p>Financial Institution X's portfolio targets cover 70% of its total investment and lending activities by outstanding exposure as of 2021.</p>   |
| <p>Asset level target communication</p> | <p><b>NOTE:</b> The below targets could be aggregated by the company. They are shown in full here for completion.</p> <p>Financial Institution X commits to reduce GHG emissions from in-use operational emissions from its UK Residential Single-Family mortgage portfolio by 49% per square meter by 2028 from a 2021 base year.</p> <p>Financial Institution X commits to reduce GHG emissions from in-use operational emissions from its UK Residential Multi-Family mortgage portfolio by 43% per square meter by 2028 from a 2021 base year.</p> <p><b>NOTE:</b> The below targets could be aggregated by the company. They are shown in full here for completion.</p> <p>Financial Institution X commits to reduce its commercial real estate portfolio (office) GHG emissions from in-use operational by 44% per m<sup>2</sup> by 2028 from a 2021 base year.</p> <p>Financial Institution X commits to reduce its commercial real estate portfolio GHG (hotel) emissions from in-use operational by 40% per m<sup>2</sup> by 2028 from a 2021 base year.</p> |

### Worked Example F2: Asset manager with minority investments in real estate instruments (companies and funds)

|  |   |
|--|---|
| <p>Brief business activity description including asset classes</p> | <p>Financial Institution X is a small asset manager with investments in the real estate sector, specifically:</p> <ul style="list-style-type: none"> <li>● <b>Listed equity real estate portfolio:</b> <ul style="list-style-type: none"> <li>○ Minority investment in <b>Company A</b> is a French property developer/house-builder (in its chosen base year 100% of the buildings are new construction. The company has multiple</li> </ul> </li> </ul> |
|--|---|

|                                    |  |
|------------------------------------|--|
|                                    | <p>sites undergoing development but as cat 11 lifetime operational emissions and cat 2 capital goods for upfront embodied emissions from buildings are only included at practical completion, only buildings that reach <i>practical completion</i> in the chosen base year are included in the financed emissions baseline for these emissions categories).</p> <ul style="list-style-type: none"> <li>○ Minority investment in <b>Company B</b> is a property manager operating in Nigeria (10 offices and 10 hotels) and Kenya (5 offices).</li> <li>● <b>Listed real estate fund portfolio:</b> <ul style="list-style-type: none"> <li>○ Minority investment in <b>Fund A</b>, a European Real Estate fund with owned industrial warehouse property assets across Austria, Spain, and Portugal.</li> </ul> </li> </ul>   |
| Intended user classification       | Financial institution (FI)   |
| Near-term or long-term target      | Near-term  |
| Asset class and applicable methods | <p><u>Listed equity real estate portfolio</u><br/> <b>Company A (developer):</b> equity&gt;listed equity&gt;all sectors (listed companies):<br/>         Coverage required: 100%<br/>         Applicable methods: PC/TR*</p> <p>*The portfolio company 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 (e.g. lifetime in-use operational emissions). Therefore, for an FI, only engagement target-setting methods are applicable.</p> <p><b>Company B (property manager):</b> equity&gt;listed equity&gt;all sectors (listed companies):<br/>         Coverage required: 100%<br/>         Applicable methods: SDA/PC/TR*</p> <p><u>Listed real estate fund portfolio</u><br/> <b>Fund A:</b> Real estate&gt;investment in real estate funds&gt;real estate assets:</p> |

|   |  |
|---|--|
|   | Coverage required: 67% of base year activity (m <sup>2</sup> ) or financed emissions<br>Applicable methods: SDA  |
| Whole building approach   | Financial Institution X shall abide by the whole building approach when collecting emissions data on the underlying assets held by the companies and funds in its portfolio. Estimated data must be used where measured data is not available.   |
| Near-term target for own operations                             | Financial Institution X is also required to set a near-term target covering emissions from its own operations as per general <a href="#">SBTi FI Criteria</a> (details not shown as part of this worked example).  |
| Required scope 3 categories                                     | Category 15: Investments (Company B, Fund A)   |
| Optional scope 3 Cat 1-14                                       | Not shown in this worked example   |
| Is the FI required to set an upfront embodied emissions target? | <p><u>Listed equity real estate portfolio</u><br/> <b>Company A:</b> No. The developer must follow the relevant buildings target-setting guidance criteria and recommendations when setting its own SBT.<br/> <b>Company B:</b> No. The property manager does not own/is not first owner for any of the buildings in its portfolio.</p> <p><u>Listed real estate fund portfolio</u><br/> <b>Fund A:</b> Yes. The fund is involved in purchasing/financing new building construction and is the first owner of several newly constructed buildings in its chosen base year.</p> |
| Asset geography - in-use operational emissions                  | <p><u>Listed equity real estate portfolio</u><br/> <b>Company A:</b> N/A<br/> <b>Company B:</b> Global</p> <p><u>Listed real estate fund portfolio</u><br/> <b>Fund A:</b> Austria, Spain, Portugal</p>  |
| Asset geography - upfront embodied                              | <p><u>Listed real estate fund portfolio</u><br/> Global</p>  |

|   |   |
|---|---|
| emissions                                       |   |
| Asset typologies - in-use operational emissions | <p><u>Listed equity real estate portfolio</u><br/> <b>Company A:</b> N/A<br/> <b>Company B:</b> Global (services)</p> <p><u>Listed real estate fund portfolio</u><br/> <b>Fund A:</b><br/>         Industrial Distribution Warehouse - Warm</p>   |
| Asset typologies - upfront embodied emissions   | <p><u>Listed equity real estate portfolio</u><br/> <b>Company A:</b> N/A<br/> <b>Company B:</b> N/A</p> <p><u>Listed real estate fund portfolio</u><br/> <b>Fund A:</b> Other</p>   |
| Headline target                                 | <p>Financial Institution X commits to achieve SBTs in its listed equity and real estate fund portfolios by 2030 from a 2022 base year. Financial Institution X's portfolio targets cover 41% of its total investment and lending activities by total assets under management as of 2022.</p>  |
| Asset level target communication                | <p><u>Financial asset class level targets:</u></p> <ol style="list-style-type: none"> <li>1. Financial Institution X commits that 100% of its listed equity portfolio within the real estate sector by m<sup>2</sup> will have set science-based targets by 2030.</li> <li>2. Financial Institution X further commits to reduce GHG emissions from upfront embodied emissions from its listed real estate fund portfolio by 25% per square meter by 2030 from a 2022 base year.</li> <li>3. Financial Institution X further commits to reduce GHG emissions from in-use operational emissions from its listed real estate fund portfolio by 35% per square meter by 2030 from a 2022 base year.</li> <li>4. Financial Institution X also commits to reduce GHG emissions from in-use operational emissions from its listed equity real estate portfolio by 32% per square meter by 2030 from a 2022 base year.</li> </ol> <p><u>Underlying targets:</u></p> |



1. Financial Institution X commits to reduce GHG emissions from in-use operational emissions from its listed real estate fund portfolio by 35% per square meter by 2030 from a 2022 base year.
  - a. Financial Institution X commits to reduce GHG emissions from in-use operational emissions from Industrial Distribution Warehouses in Austria by 30% per square meter by 2030 from a 2022 base year.
  - b. Financial Institution X commits to reduce GHG emissions from in-use operational emissions from Industrial Distribution Warehouses in Spain by 34% per square meter by 2030 from a 2022 base year.
  - c. Financial Institution X commits to reduce GHG emissions from in-use operational emissions from Industrial Distribution Warehouses in Portugal by 26% per square meter by 2030 from a 2022 base year.

## 9 GLOSSARY

| TERM                         | DEFINITION   |
|------------------------------|--|
| <b>ARA</b>                   | Absolute Reduction Approach  |
| <b>CO<sub>2</sub></b>        | Carbon dioxide   |
| <b>CO<sub>2</sub>E</b>       | Carbon dioxide equivalent  |
| <b>CRREM</b>                 | Carbon Risk Real Estate Monitor  |
| <b>EAG</b>                   | Expert Advisory Group  |
| <b>EMBODIED EMISSIONS</b>    | The greenhouse gas (GHG) emissions, measured in carbon dioxide equivalents (CO <sub>2</sub> e), associated with materials and construction processes throughout the whole life cycle of a building |
| <b>F-GAS</b>                 | Fugitive gasses  |
| <b>FI</b>                    | Financial institution  |
| <b>FLAG</b>                  | Forest, Land and Agriculture   |
| <b>GFA</b>                   | Gross floor area   |
| <b>GHG</b>                   | Greenhouse gas   |
| <b>GRESB</b>                 | Global Real Estate Sustainability Benchmark  |
| <b>HVAC</b>                  | Heating, ventilation and air conditioning  |
| <b>IEA</b>                   | International Energy Agency  |
| <b>IPCC</b>                  | Intergovernmental Panel on Climate Change  |
| <b>IPMS</b>                  | International Property Measurement Standard  |
| <b>OPERATIONAL EMISSIONS</b> | Emissions associated with the operation of a building in its use stage   |

|                |  |
|----------------|--|
| <b>PC</b>      | Portfolio coverage                           |
| <b>PCAF</b>    | Partnership for Carbon Accounting Financials |
| <b>RICS</b>    | Royal Institution of Chartered Surveyors     |
| <b>REIT</b>    | Real estate investment trust                 |
| <b>SBT</b>     | Science-based target                         |
| <b>SBTi</b>    | Science Based Targets initiative             |
| <b>SME</b>     | Small and medium-sized enterprises           |
| <b>T&amp;D</b> | Transmission and distribution                |
| <b>TR</b>      | Temperature Rating                           |

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## 11 APPENDIX

### 11.1 Choice of emissions scenarios for 1.5°C

Emissions scenarios for SBT-setting should meet the 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 (they should have a strong internal logic).

In 2015, the Science Based Targets initiative (SBTi) developed the Sector-specific intensity convergence approach, a scientifically-informed method for companies to set GHG reduction targets necessary to stay within a 2°C temperature rise above pre-industrial levels. This led to the development of a 2°C and a well-below 2°C pathway.

However, the Paris Agreement and the recent [IPCC 6th Assessment Report](#) have highlighted the need to keep warming within a 1.5°C temperature rise. The new methodologies, tools and guidance will build on the previously developed sector-specific intensity convergence methodology for buildings to develop 1.5°C-aligned resources.

In particular, the buildings project aims to achieve three objectives:

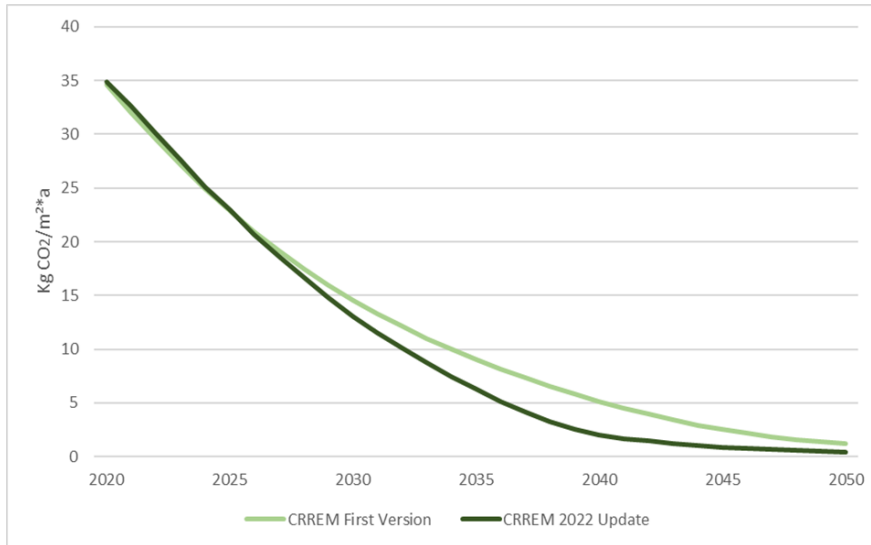
1. Establish a global pathway for buildings' in-use operational emissions aligned with 1.5°C.
2. Establish a global pathway for buildings' upfront embodied emissions aligned with 1.5°C.
3. Issue guidance on emissions accounting and reporting as well as target setting and validation.

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

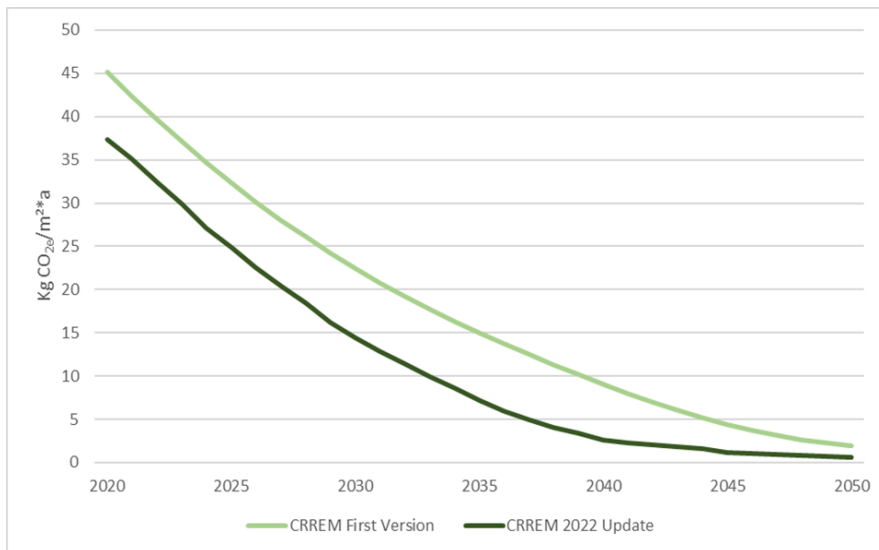
### 11.2 Details underlying the emissions scenarios: sector activity

The CRREM in-use operational emissions pathway provides data for CO<sub>2</sub> emissions from the buildings sector globally (Figure 7), as well as for cement production volumes (Figure 8).

**Figure 7. Graph showing the global carbon emission pathways on square meter basis (CO<sub>2</sub>-only) of 1.5°C scenario (CRREM, 2023)**



**Figure 8. Graph showing the global building sector CO<sub>2</sub>e intensity pathways (CRREM, 2023)**





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

The figure below shows the default pathway for the upfront embodied emissions of new buildings using a grandfathering based downscaling approach, corrected for renovation.

**Figure 9. Graph showing the decarbonization pathway for embodied CO<sub>2</sub> emissions in buildings, using scenario AR6 IPCC C1, grandfathering, corrected for renovation. (SBTi embodied emissions pathway development description, 2023)**

**Figure 61 Decarbonisation pathway for embodied CO<sub>2</sub> emissions in buildings: scenario AR6 IPCC C1, grandfathering, corrected for renovation**



### 11.3 Development of 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<sub>2</sub> (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<sub>2</sub> at the global level by 2050, under the assumption of at least 1-4 GT CO<sub>2</sub> removal per year by

2050. Within this framework, the SBTi developed a cross-sector emissions corridor that covers CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O 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. Therefore, the SBTi set out to develop 1.5°C-aligned science-based target setting methodologies, tools and guidance for companies in the building sector and other stakeholders for in-use operational emissions, as well as the first pathway for upfront embodied emissions.

### 11.3.1 In-use operational emissions pathway

#### 11.3.1.1 Technical partnership with CRREM

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 building sector more granular pathways reflecting geographical location and typology, the SBTi embarked on a partnership with CRREM in January 2022 to provide a set of 1.5° aligned pathways in-use operational emissions pathways.

CRREM has been providing the industry with appropriate science-based carbon reduction pathways at building, portfolio and company level and with financial risk assessment tools to cost-effectively manage carbon mitigation strategies, offering technical experience in the area. Their objective is to optimize the buildings sector's investments in energy efficient retrofits by making risks more transparent and by unveiling opportunities for property owners and investors. They aim to do so through providing the industry with tools to assess 'stranding' risks, applicable GHG-reduction pathways according to the Science-Based Targets Initiative, and reporting templates, which will contribute to accelerating the decarbonization of the EU building stock. Therefore, their aims and expertise aligned with the goals of the SBTi's buildings project.

The SBTi and CRREM technical teams have worked together to ensure that their 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 over August-September 2022. The methodology was assessed in comparison to the relevant literature, methodological choices were subjected to sensitivity analyses, and limitations to the method were identified.

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)<sup>61</sup>. 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'](#), published on 12th of January 2023.

### 11.3.2 Embodied emissions pathway

The SBTi has developed the upfront embodied emissions pathways together with Ramboll. The supplementary SBTi Pathway Development Description document outlines in detail the process of developing the SBTi upfront embodied emissions pathways. The document, available on the [SBTi buildings website](#), includes information regarding:

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

Please refer to the supplementary document for further details.

### 11.3.3 Sufficiency considerations in the pathways

It is important to note that country pathways calculated using the SDA do not consider sufficiency, which refers to the reduction or optimization of floor area per capita, as a mitigation method.

## 11.4 Fugitive emissions in the buildings sector

Among non-CO<sub>2</sub> GHGs, F-gas emissions are the most relevant in the buildings sector. The U.S. EPA summarizes F-gasses as follows<sup>62</sup>:

*The five main types of fluorinated GHGs are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3), and other fully fluorinated greenhouse gasses. These fluorinated GHGs can be emitted from F-gas production as*

<sup>61</sup> IEA (2021), Net Zero by 2050

<sup>62</sup> EPA, Fluorinated greenhouse gas emissions and supplies reported to the GHGRP (2022).

*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<sup>63</sup>. According to Hu et al. (2020)<sup>64</sup>, HFCs account for 8% of global building sector GHG emissions as of 2017. HFCs typically account for approximately 80% of F-gas emissions in buildings. HFCs are the most relevant F-gas in the building sector because of their use in refrigeration, cooling, heat pump operation, and fire suppression. HFC emissions have increased steadily since 1990, when they were first adopted as substitutes for ozone-depleting chemicals per the Montreal Protocol. F-gas emissions in the buildings sector occur primarily via fugitive emissions during the installation, use, and disposal phase. Improper practices during installation and removal can increase the likelihood of fugitive emissions.

From 1990 to 2017, F-gas emissions from the Kyoto Protocol Annex parties increased by 46% at an annual growth rate of 1.4%<sup>65</sup>. In the same time period, F-gas emissions in non-Annex parties tripled at an annual growth rate of 12%. Non-Annex parties, defined as developing economies, have surpassed Annex parties to become the largest source of F-gas emissions. 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.

It can be argued that, in the buildings sector, F-gas emissions represent a large enough proportion of total sector emissions that their exclusion cannot be reasonably justified based on the 5% significance threshold for companies that is outlined in SBTi's cross-sector criteria<sup>66</sup>.

CRREM's downscaling methodology for the buildings sector aims to account for non-CO<sub>2</sub> GHGs such as F-gasses by implementing a tripartite pathway: CO<sub>2</sub>-only, non-CO<sub>2</sub> GHGs, and all GHGs. This approach allows for buildings sector pathways and company targets that accurately account for F-gas emissions.

Practical barriers to including F-gasses in buildings sector targets:

<sup>63</sup> 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

<sup>64</sup> 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>

<sup>65</sup> Annex & non-Annex parties defined by Kyoto Protocol: (UNFCCC, Parties & Observers, 2020).

<sup>66</sup> Science Based Targets initiative. SBTi Criteria and Recommendations. Version 5.0, October 2021. <https://sciencebasedtargets.org/resources/files/SBTi-criteria.pdf>

- **Data quality issues:** Specifically missing data and incomplete data present barriers to including F-gas emissions in company targets. In order to develop accurate sectoral pathways, F-gas emissions must be disaggregated first by economic sector, and then by category of gas (e.g. HFCs, PFCs, etc.). Uncertainty ranges for individual F-gasses at the global level remain very high, largely due to insufficient data or poor data quality. Even if data sources are reliable, if they are not decomposed by sector it can be difficult to determine the share of gasses to be allocated to the building sector.
- **Variation at the asset level:** Some buildings emit very few F-gasses compared to others that emit a lot. The deviation among individual assets can be very high. Some property-types, especially retail buildings, record up to 20% or more of the overall global warming potential resulting from F-gasses due to refrigerant losses<sup>67</sup>.
- **Usability of target-setting guidance:** Adopting a tripartite methodology for CO<sub>2</sub>, non-CO<sub>2</sub> GHGs, and all GHG pathways in the buildings sector would further complicate target-setting for companies required to set targets using multiple decarbonization pathways.

## 11.5 Target-setting methods for embodied emissions

Increasing focus on upfront embodied emissions is a key goal of the buildings sector guidance.

The SBTi has developed two target-setting methods for companies to set targets on upfront embodied emissions for newly constructed buildings (or for FIs financing the construction or purchase of a newly constructed building). Relevant guidance users have a choice between the two methods. Both methods are more ambitious than the generic well-below 2°C absolute reduction method.

### 11.5.1 Upfront embodied emissions SDA

As described in [section 11.3.2](#) this sector pathway for upfront embodied emissions allows guidance users to set an emissions intensity reduction target that converges to a sector-specific intensity. It is derived from the Ramboll upfront embodied emissions pathway for the buildings sector.

<sup>67</sup> Accounting and reporting CO<sub>2</sub>e emissions according to the GHG Protocol and the Global Reporting Initiative requires proper tracking of F-gasses (World Resource Institute, WBCSD, 2018).

## 11.6 Clarifications of GHG Accounting for the Buildings Sector

| INTENDED USER  | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE   | EMISSIONS CATEGORY                | CONTEXT   |
|--|--------------|--|--|-----------------------------------|---|
| <b>Architecture and design firms / engineering firms</b> | GHG Protocol | <a href="#">Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard</a><br><br><a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> | Lifetime in-use operational emissions of designed buildings                                    | Category 11: Use of sold products | <p>The GHG Protocol defines this category as including ‘emissions from the use of goods and services sold by the reporting company in the reporting year. A reporting company’s scope 3 emissions from use of sold products include the scope 1 and scope 2 emissions of end users. End users include both consumers and business customers that use final products’.</p> <p>Thus, lifetime emissions can be classified as use-phase emissions of the final product of these firms, which is the constructed building. It is important for these emissions to be accounted for as architecture/engineering companies are able to influence the construction of a building in a way that ultimately affects its use-phase emissions.</p> |
|  |              |  | Lifetime in-use embodied emissions of designed buildings i.e. renovation of designed buildings | Category 11: Use of sold products |   |
|  |              |  | Upfront embodied emissions of designed buildings   | Category 11: Use of sold products |   |

| INTENDED USER             | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE  | EMISSIONS CATEGORY                                  | CONTEXT   |
|---------------------------|--------------|--|---|---|---|
|                           |              |  |   |   | architecture firm's product (the blueprint or plan) is the construction of the building. Therefore, the use of the product includes the emissions associated with its construction.   |
|                           | UKGBC        | <a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a>   | End of life embodied emissions of designed buildings  | Category 12: End of life treatment of sold products | This categorization uses the same reasoning as the one found in the UKGBC guidance for developers, which states that 'the building is treated as a 'product' and the end-of-life treatment of the building (module C) should be included in the developer's scope 3 reporting the year in which the building is sold.'                                      |
| <b>Construction firms</b> | GHG Protocol | <a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> | Embodied emissions of materials purchased and used to construct new buildings (upfront embodied)                          | Category 1: Purchased goods and services            | This category is described as 'all upstream (i.e., cradle-to-gate) emissions from the production of products purchased or acquired by the reporting company in the reporting year. Products include both goods (tangible products) and services (intangible products)'. Examples of such purchases in the document are 'e.g. materials, components, parts'. |
|                           |              |  | Embodied emissions of materials used in maintenance, repair, replacement, or refurbishment of buildings (in-use embodied) |   |   |

| INTENDED USER | PUBLISHER            | DOCUMENTS  | EMISSIONS SOURCE  | EMISSIONS CATEGORY                                   | CONTEXT  |
|---------------|----------------------|--|---|--|--|
|               |                      |  | emissions)  |  |  |
|               | GHG Protocol         | <a href="#">Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard</a> | Construction site activities (can occur across the buildings life cycle, modules A, B, or C)                            | Category 3: Fuel and energy related activities       | As per the GHG Protocol.   |
|               |                      |  | Construction site activities (can occur across the buildings life cycle, modules A, B, or C)                            | Category 4: Upstream transportation and distribution | As per the GHG Protocol.   |
|               |                      |  | Construction site activities (can occur across the buildings life cycle, modules A, B, or C)                            | Category 5: Waste generated in operations            | As per the GHG Protocol.   |
|               | GHG Protocol & UKGBC | <a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp;</a>                      | Lifetime embodied emissions of materials used in-use phase of delivered buildings i.e. renovation of designed buildings | Category 11: Use of sold products                    | The GHG Protocol states that: 'A reporting company's scope 3 emissions from use of sold products include the scope 1 and scope 2 emissions of end users. End users include both consumers and business customers that use final products.' In this case, the product is the constructed building. This categorization uses the |



| INTENDED USER                  | PUBLISHER    | DOCUMENTS   | EMISSIONS SOURCE   | EMISSIONS CATEGORY                                  | CONTEXT  |
|--------------------------------|--------------|---|--|---|--|
|                                |              | <a href="#">Reporting Standard</a><br><br><a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a>                      | Lifetime in-use operational emissions of delivered buildings | Category 11: Use of sold products                   | same reasoning as the one found in the UKGBC guidance for developers, which states that ‘The building is treated as a ‘product’ and the scope 1 and 2 emissions (energy use; module B6) of future building occupiers should be included in the developer’s scope 3 reporting the year in which the building is sold’. In this case, the building is not sold, but constructed. |
|                                | UKGBC        | <a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a>  | End of life embodied emissions of delivered buildings        | Category 12: End of life treatment of sold products | This categorization uses the same reasoning as the one found in the UKGBC guidance for developers, which states that ‘the building is treated as a ‘product’ and the end-of-life treatment of the building (module C) should be included in the developer’s scope 3 reporting the year in which the building is sold.’   |
| <b>Developers<sup>68</sup></b> | GHG Protocol | <a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp;</a> | Upfront embodied emissions of new buildings developed        | Scope 3<br>Category 2:<br>Capital goods             | Capital goods are defined by the GHG Protocol as ‘final products that have an extended life and are used by the company to manufacture a product; provide a service; (...). Examples of capital goods include equipment, machinery, buildings, facilities, and vehicles.’ The service provided by a developer is the sale of a building. Therefore the                         |

<sup>68</sup> Where a developer constructs a building to own or manage it in the long term, rather than sell it to a buyer, the building is not treated as a product and the guidance provided here does not apply. This is on the basis that the leased spaces within the building are treated as the entity’s product and so they should use the guidance for owner-lessor.

| INTENDED USER  | PUBLISHER | DOCUMENTS  | EMISSIONS SOURCE  | EMISSIONS CATEGORY   | CONTEXT   |
|--|-----------|--|---|--|---|
|  |           | <a href="#">Reporting Standard</a>   |   |  | <p>construction of a building is used to manufacture the service provided by a developer.</p> <p>Thus, the building is treated as a 'capital good' and emissions from the extraction, production, and transportation of the new building, including all emissions related to the construction of the building, should be included in the developer's target boundary under scope 3 category 2 capital goods, the year in which the building reaches practical completion and is considered 'developed'.</p> |
|  | UKGBC     | <a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a> | Lifetime in-use operational emissions of any buildings sold | Category 11: Use of sold products  | 'The future energy use should be modeled for the lifetime of the building'.   |
| Lifetime in-use embodied emissions of sold buildings i.e. renovation of designed buildings |           |  | Category 11: Use of sold products                           | 'The future energy use should be modeled for the lifetime of the building'.                      |   |
| End of life embodied emissions for any buildings sold                                      |           |  | Category 12: End of life treatment of sold products         | 'The building is treated as a 'product' and the end-of-life treatment of the building (module C) |   |

| INTENDED USER                            | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE  | EMISSIONS CATEGORY                       | CONTEXT   |
|--|--------------|--|---|--|---|
|  |              |  |   |  | should be included in the developer's scope 3 reporting the year in which the building is sold.'  |
| <b>Owner-lessors and owner-occupiers</b> | GHG Protocol | <a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> | In-use operational emissions in tenant-controlled spaces (where not in scope 1, 2, or other scope 3)  | Category 13: Downstream leased assets    | This category is defined as including 'emissions from the operation of assets that are owned by the reporting company (acting as lessor) and leased to other entities in the reporting year that are not already included in scope 1 or scope 2. This category is applicable to lessors (i.e., companies that receive payments from lessees).'              |
|  |              |  | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in owner-controlled spaces, as occurred in the reporting year (in-use embodied emissions) | Category 1: Purchased goods and services | This category is described as 'all upstream (i.e., cradle-to-gate) emissions from the production of products purchased or acquired by the reporting company in the reporting year. Products include both goods (tangible products) and services (intangible products)'. Examples of such purchases in the document are 'e.g. materials, components, parts'. |
|  | GHG Protocol | <a href="#">Corporate Value Chain (Scope 3) Accounting and Reporting Standard -</a>  | Embodied emissions of materials and services used in maintenance, repair,   | Category 13: Downstream leased assets    | According to the GHG Protocol Technical Guidance, 'A company may account for products leased to customers in the same way it accounts for products sold to customers'.  |

| INTENDED USER  | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE   | EMISSIONS CATEGORY          | CONTEXT   |
|----------------|--------------|--|--|-----------------------------|---|
|                |              | <a href="#">Supplement to the GHG Protocol Corporate Accounting and Reporting Standard</a> | replacement, or refurbishment in tenant-controlled spaces, as occurred in the reporting year, where not already in scope 1 and 2 (in-use embodied emissions) |                             | The minimum boundary for category 11: Use of sold products contains the optional 'indirect use-phase emissions of sold products over their expected lifetime'. Therefore, similarly to the accounting of indirect emissions for use of sold products, in-use embodied emissions in tenant-controlled spaces should be included in category 13. Additionally, in keeping with the Use of Sold Products guidance, these emissions should not form part of the minimum boundary for category 13, and are therefore recommended only. |
|                | UKGBC        | <a href="#">UKGBC Guide to Scope 3 Reporting in Commercial Real Estate</a>                 | Upfront embodied emissions of new buildings purchased - only if first owner of a building (see <a href="#">section 5.6</a> for further details)              | Category 2: Capital goods   | The UKGBC clarifies: 'The building is treated as a 'capital good' and emissions from the extraction, production, and transportation of the new building should be included in the purchaser's scope 3 reporting the year in which the building is purchased. The emissions from the extraction, production, and transportation of the building are considered aligned with LCA modules A1 to A5 (as per the EN 15978 standard), also referred to as 'upfront carbon'.'  |
| <b>Tenants</b> | GHG Protocol | <a href="#">Corporate Value Chain (Scope 3)</a>  | In-use operational emissions from the  | Category 8: Upstream leased | Scope 3 category 8 description: Operation of assets leased by the reporting company (lessee)  |

| INTENDED USER            | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE   | EMISSIONS CATEGORY                       | CONTEXT   |
|--------------------------|--------------|--|--|--|---|
|                          |              | <a href="#">Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard</a>                               | operation of assets that are leased by the tenant in the reporting year and not already included in their scope 1 or scope 2 inventories (i.e. emissions from lessor-controlled spaces)            | assets                                   | in the reporting year and not included in scope 1 and scope 2 – reported by lessee.<br><br>Included in this guidance:<br>Minimum boundary - The scope 1 and scope 2 emissions of lessors that occur during the reporting company’s operation of leased assets (e.g., from energy use).  |
|                          | GHG Protocol | <a href="#">Technical Guidance for Calculating Scope 3 Emissions - Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment in tenant-controlled spaces, as occurred in the reporting year (in-use embodied emissions) | Category 1: Purchased goods and services | This category is described as ‘all upstream (i.e., cradle-to-gate) emissions from the production of products purchased or acquired by the reporting company in the reporting year. Products include both goods (tangible products) and services (intangible products)’. Examples of such purchases in the document are ‘e.g. materials, components, parts’. |
| <b>Property managers</b> | GHG Protocol | <a href="#">Technical Guidance for Calculating Scope 3 Emissions -</a>   | Embodied emissions of materials and services used in   | Category 1: Purchased goods and services | This category is described as ‘all upstream (i.e., cradle-to-gate) emissions from the production of products purchased or acquired by the reporting   |

| INTENDED USER | PUBLISHER | DOCUMENTS   | EMISSIONS SOURCE  | EMISSIONS CATEGORY                | CONTEXT  |
|---------------|-----------|---|---|-----------------------------------|--|
|               |           | <a href="#">Supplement to the Corporate Value Chain (Scope 3) Accounting &amp; Reporting Standard</a> | maintenance, repair, replacement, or refurbishment in managed spaces, as occurred in the reporting year (in-use embodied emissions) |                                   | company in the reporting year. Products include both goods (tangible products) and services (intangible products). Examples of such purchases in the document are 'e.g. materials, components, parts'.   |
|               |           |   | In-use operational emissions in buildings managed for clients (where not in scope 1, 2, or other scope 3)                           | Category 11: Use of sold products | 'This category includes emissions from the use of goods and services sold by the reporting company in the reporting year.' In the case of property managers, the viability of a managed building's use is the 'sold product' of property managers, therefore emissions associated with the subsequent use of the building should be reported in this category. However, some property managers may choose to include emissions from tenant-controlled spaces in scope 3 category 13 (downstream leased assets) instead of category 11, under interpretation of the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011). In this case, the same principles and recommendations apply to the user's target boundary. |

| INTENDED USER | PUBLISHER                 | DOCUMENTS   | EMISSIONS SOURCE   | EMISSIONS CATEGORY       | CONTEXT   |
|---------------|---------------------------|---|--|--------------------------|---|
| FIs           | PCAF, GRESB, CRREM & PCAF | <a href="#">Accounting and Reporting of GHG Emissions from Real Estate Operations - Technical Guidance for the Financial Industry</a> | Whole building in-use operational emissions of buildings in the FI's portfolio, as occurred during the reporting year  | Category 15: Investments | The PCAF/GRESB/CRREM technical guidance and the PCAF technical guidance provide guidance on the accounting and reporting of GHG emissions in the real estate sector, specifically for financial institutions. |
|               |                           | <a href="#">Financed Emissions: The Global GHG Accounting &amp; Reporting Standard Part A (v2.0, Dec 2022)</a>                        | Upfront embodied emissions of buildings purchased or financed - only if first owner of a building or financing the development/ construction of a new building (see <a href="#">section 5.6</a> for further details) | Category 15: Investments |   |
|               |                           |   | Embodied emissions of materials and services used in maintenance, repair, replacement, or refurbishment, as  | Category 15: Investments |   |

| INTENDED USER | PUBLISHER | DOCUMENTS | EMISSIONS SOURCE   | EMISSIONS CATEGORY | CONTEXT |
|---------------|-----------|-----------|--|--------------------|---------|
|               |           |           | occurred in the reporting year (in-use embodied emissions) |                    |         |

### Optional GHG accounting for franchisors<sup>69</sup>

| USER CATEGORY | PUBLISHER    | DOCUMENTS  | EMISSIONS SOURCE   | EMISSIONS CATEGORY      | CONTEXT  |
|---------------|--------------|--|--|-------------------------|--|
| Franchisors   | GHG Protocol | <a href="#">GHG Protocol Corporate Value Chain Accounting Reporting Standard</a> | Upfront embodied emissions of new franchises developed                     | Category 14: Franchises | Franchisors are able to influence the initial design of a franchise in a way that ultimately affects its emissions. Therefore, it is recommended that they include the emissions resulting from the use of their franchise designs if they believe it is relevant and material in their business in that they have sufficient control over the specifications. |
|               |              |  | In-use operational emissions in franchisee-controlled spaces (where not in | Category 14: Franchises | The GHG Protocol states that the minimum boundary for franchisors includes ‘the scope 1 and 2 emissions of franchisees that occur during the operation of franchises’.   |

<sup>69</sup> While franchisors are encouraged to use this guidance to set buildings-related science-based targets, they are not a distinct user category. Please see section 4.5 for more details.



| USER<br>CATEGORY | PUBLISHER | DOCUMENTS | EMISSIONS<br>SOURCE              | EMISSIONS<br>CATEGORY | CONTEXT |
|------------------|-----------|-----------|----------------------------------|-----------------------|---------|
|                  |           |           | scope 1, 2, or other<br>scope 3) |                       |         |

**END**