Buildings Criteria

The Buildings Eligibility Criteria of the Climate Bonds Standard & Certification Scheme

Published for Issuance

NOTE: These Criteria can be used to certify Use-of-Proceeds Instruments and Assets, and also in some circumstances, Sustainability-Linked Debt Instruments and Entities per the Climate Bonds Standard v4.0

Revision	Date	Summary of Changes
Rev. 2.1	07 December 2023	Final for Issuance
Rev. 2.0	September 2023	Draft for public review. Updates to New Buildings to include embodied carbon, GHG assessment rules and alignment with the EU Taxonomy and alignment with 1.5-degree pathway
Rev. 1.1	13 April 2023	Revisions to enable Entity Certification and SLD Certification in line with release of CBS v4.0
Rev. 1.0	July 2022	Final for Issuance

Acknowledgements

Climate Bonds gratefully acknowledges the Technical and Industry Working Group members who provided their time and expertise during the development of these Criteria. Members are listed in ***Appendix B: TWG and IWG members*** at the end of this document.

Special thanks are given to ***Ché Wall*** of Flux Consultants the lead specialist co-ordinating the development of the Criteria through the Technical Working Group.

Definitions

Applicant: The term or name for any potential bond issuer, or non-financial corporate entity that might seek certification under the Buildings Criteria.

Capital Expenditure (CAPEX): Funds used by a company to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment.

Certified Entity: The entity or part thereof which is being certified under the Climate Bonds Standard. Currently, Entity Certification is limited to non-financial Entities or segregated segments thereof, for which the Climate Bonds Initiative has Climate Bonds Standard Sector Criteria for Entity Certification.

Climate Bonds Initiative (Climate Bonds): An investor focused not-for-profit organisation, promoting large-scale investments that will deliver a global low carbon and climate resilient economy. Climate Bonds seeks to develop mechanisms to better align the interests of investors, industry and government to catalyse investments at a speed and scale sufficient to avoid dangerous climate change.

Climate Bonds Standard (CBS): A screening tool for investors and governments that allows them to identify green bonds the proceeds of which are being used to deliver climate change solutions. This may be through climate mitigation impact and/or climate adaptation or resilience. The CBS is made up of two parts: the parent Climate Bonds Standard and a suite of sector specific eligibility Criteria. The parent standard covers the certification process and pre- and post-issuance requirements for all certified bonds, regardless of the nature of the capital projects. The Sector Criteria detail specific requirements for assets identified as falling under that specific sector. The latest version of the CBS is published on the Climate Bonds website.

Climate Bonds Standard Board (CBSB): A board of independent members that collectively represents $34 trillion of assets under management. The CBSB is responsible for approving (i) Revisions to the CBS, including the adoption of additional sector Criteria, (ii) Approved verifiers, and (iii) Applications for Certification of a bond under the CBS. The CBSB is constituted, appointed, and supported in line with the governance arrangements and processes as published on the Climate Bonds website.

Climate Bond Certification: allows the applicant to use the Climate Bond Certification Mark in relation to that bond. Climate Bond Certification is provided once the independent CBSB is satisfied the bond conforms with the CBS.

Commercial building: A building that is intended to generate a profit, either from capital gain or rental income. There are sub-categories of Commercial Buildings, including offices, shopping centres and hotels.

Critical interdependencies: The asset or activity's boundaries and interdependencies with surrounding infrastructure systems. Interdependencies are specific to local context but are often connected to wider systems through complex relationships that depend on factors 'outside the asset fence' that could cause cascading failures or contribute to collateral system benefits.

Energy Efficiency: A term used to describe reduction in energy required to provide products and services

Emissions Factor: A term used to describe GHG emissions intensity of the energy consumed in a building. For electricity, location-based factors must be used. Where available, users (customer) mix Emissions Factors must be used. Market methods and purchase of off-site green power are not considered.

Emission Performance: A term used to describe emissions intensity and associated emissions reductions of a building. This is expressed in terms of kg of CO2e per square meter determined from total emissions divided by net lettable floor area.

Emissions Intensity: A quantitative figure expressed as kgCOe/ m^2, or kgCO2e/sq^2.

Emissions Performance Target: A quantitative emissions intensity figure falling on or below the emissions performance trajectory and is expressed as $kgCO2e/m^2$ or $kgCO2e/sq^2$

General Corporate Purpose Bond: a bond the proceeds of which are not ringfenced for specific assets or activities, but which finance general OPEX and CAPEX of a company without disclosing the exact uses. SLBs are examples of general corporate purpose bonds.

Green Bond: A green bond is a bond of which the proceeds are allocated to environmental projects or expenditures. The term generally refers to bonds that have been marketed as green. In theory, green bonds proceeds could be used for a wide variety of environmental projects or expenditures, but in practice they have mostly been earmarked for climate change projects.

Industry Working Group (IWG): A group of key organisations that are potential applicants, verifiers and investors convened by Climate Bonds. The IWG provides feedback on the draft sector Criteria developed by the TWG before they are released for public consultation.

Investment Period: The interval between the bond's issuance and its maturity date. Otherwise known as the bond term or tenor.

Operating Expenditure (OPEX): Expense a business incurs through its normal business operations. Often abbreviated as OPEX, operating expenses include rent, equipment, inventory costs, etc.

Residential building: A building that is used or suitable for use as a dwelling.

Sustainability-Linked Debt (SLD): Any debt instrument for which the financial and structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ ESG objectives. Such objectives are measured through predefined KPIs and assessed against predefined performance targets. Proceeds of SLD are intended to be used for general purposes.

Technical Working Group (TWG): A group of key experts from academia, international agencies, industry and NGOs convened by Climate Bonds. The TWG develops the Sector Criteria - detailed technical criteria for the eligibility of projects and assets as well as guidance on the tracking of eligibility status during the term of the bond. Their draft recommendations are refined through engagement with finance industry experts in convened Industry Working Groups (see below) and through public consultation. Final approval of Sector Criteria is given by the CBSB.

Use-of-Proceed (UoP) Bond: a bond the proceeds of which are ringfenced for specific assets and activities. Green bonds, blue bonds, and transition bonds are examples of UoP bonds.

Whole Life Carbon Assessment (WLCA): an assessment of the sum total of all building-related emissions over a building's entire life.

Table of Contents

List of Figures

List of Tables

List of Boxes

1 Introduction

1.1 The Climate Bonds Standard

Investor demand for climate bonds is strong and is expected to increase in line with the delivery of quality products into the market. However, investor concerns about the credibility of green labelling are also growing. Standards, assurance & Certification will be essential to improve confidence and transparency, which in turn will enable further strong growth in the market.

Today, the Climate Bonds Standard and Certification Scheme is an easy-to-use screening tool that provides a clear signal to investors and intermediaries on the climate integrity of Certified Climate Bonds. Proposals are currently under consultation to also expand certification to entities with climate integrity.

A key part of the Standard is a suite of sector-specific eligibility Criteria. Each sector-specific Criteria sets climate change benchmarks for that sector that are used to screen debt instruments, assets and/ or entities, so that only those that have climate integrity, either through their contribution to climate mitigation, and/or to adaptation and resilience to climate change, will be certified.

These sector-specific Criteria are determined through a multi-stakeholder engagement process, including TWG and IWG, convened and managed by Climate Bonds, and are subject to public consultation. Finally, they are reviewed and approved by the Climate Bonds Standard Board (CBSB).

The second key part of the Climate Bonds Standard (CBS) is the overarching Climate Bonds Standard v4.0. This documents the cross-sectoral criteria all certified instruments/ assets/ entities must meet, in addition to meeting the sector specific Criteria.

1.2 Environmental scope of the Buildings Criteria

Currently, the Buildings Criteria address climate change mitigation only.

1.3 What can be certified under the Buildings Criteria

Use-of-Proceeds[1] instruments and Assets, and in some circumstances Sustainability-Linked Debt Instruments and Entities can be Certified using these Criteria. These Certifications are based on the emissions performance of the underlying residential and/or commercial buildings and/ or the built environment, depending on the focus.

1.4 Documents supporting these Criteria

This Criteria Document provides all the requirements that must be complied with for building related assets and projects to be awarded Climate Bonds Certification. The purpose is to provide instruction to issuers and verifiers about the requirements that must be met. The Criteria Documents is supported by a Background document that captures the various dialogues and inputs and substantiates the reasoning behind the requirements set in the Building Criteria.

The Criteria are developed through a consultative process with Technical Working Groups (TWGs) and Industry Working Groups (IWGs), and through public consultation. The TWGs comprise academic and research institutions, civil society organizations, multilateral banks and specialist consultancies whereas IWGs are represented by industry experts including potential bond issuers and investors. A period of public consultation offers the opportunity to any member of the public to comment on the Criteria.

Buildings-specific information to support Applicants and Verifiers is available at Buildings criteria page as follows:

[1] Use-of-Proceeds (UoP) is used as shorthand throughout this document for a variety of targeted finance instruments, including green loans, repos, and asset-backed securities. Annex 1 of the Climate Bonds Standard v4.0 details the full list of instruments that can be certified.

- Buildings Criteria Brochure.pdf (climatebonds.net) a 2-page summary of the Building Criteria
- Background Paper the rationale behind the Building Criteria
- FAQs (FAQ's)
- Methodology for Establishing Low Carbon Trajectories: a guidance document for developing thresholds in new markets.
- Methodology for Establishing Proxies: a guidance documents for developing proxies in new markets.
- Methodology for Calculating Emissions Retrofits: a guidance documents for determining the emissions upgrade requirement.

In addition, the following cross cutting information to support Applicants and Verifiers is available as follows:

- The Climate Bonds Standard v4.0: contains the requirements of the overarching CBS
- The Climate Bonds Standard v4.0 Entity and Sustainability-Linked Debt Checklist documents: provides further information on the cross-sectoral requirements for Entity and Sustainability-Linked Debt Certification respectively.

For more information on Climate Bonds and the Climate Bonds Standard and Certification Scheme, see www.climatebonds.net.

1.5 Revisions to these Criteria

These Criteria will be reviewed on a regular basis, at which point the TWG will take stock of the deals that are printed in the early stages and any developments in improved methodologies and data that can increase the climate integrity of future deals. As a result, the Criteria are likely to be refined over time, as more information becomes available. Certification will not be withdrawn retroactively from bonds certified under earlier versions of the Criteria.

2 Scope of the Buildings Criteria

2.1 In scope

All eligibility assessments for Certification are based on the emissions performance of the underlying building(s) and/ or of the built environment project depending on the focus of the Applicant. ***Table 1*** indicates which types of Certification are available for which focus areas. The associated Criteria are discussed in ***Section 3***. Additional overarching guidance on Sustainability-Linked Debt and Entity Certification is given in ***Section 4***.

Subject to meeting those Criteria, **Table 2** illustrates what is eligible for Certification under each Certification type.

See also the Climate Bonds Standard v4.0 for any cross sectoral requirements for Use-of-Proceeds, Sustainability-Linked Debt, Asset or Entity Certification. These cross sectoral requirements must be met in addition to the buildings-specific requirements described in this document.

It is the Applicant's responsibility to provide the information to prove compliance with each component of these Criteria. Verifiers must include this information in the scope of verification.

For Use-of-Proceeds and Asset Certification, where the certification portfolio includes several separately identifiable projects, expenditures, or groups of assets, these criteria must be met for each separately identified project or asset grouping. Applicants should determine these project boundaries, which may be based on geographical and/or supply chain linkages.

To guide the interpretation of *Table 1*:

●	A green circle indicates these assets, when fully described and documented, automatically meet the Criteria requirements, with no further disclosure or documentation required.
■	An orange square indicates that the eligibility of these assets is conditional on meeting specific requirements. These requirements are described in more detail in *Section 3.*
▲	A red triangle indicates that these assets are not eligible for certification, either because they are incompatible with a low carbon or climate-resilient economy or because determining their eligibility is outside the mandate of the Building Criteria. The justifications for exclusions are presented in the Background document.
n/a	Indicates that Certification Criteria are not available at this time

Table 1: Eligible Certifications under the Buildings Criteria

Buildings sub-sector	Mitigation Criteria (UoP and Asset Cert.)	Mitigation Criteria (Entity and SLD Cert.)	Adaptation & Resilience
Residential Buildings A building or portfolio of buildings where more than half of the floor area is used or suitable for use for dwelling purposes, including but not limited to the follow sub-categories of residential buildings: • Single family • Multi-family • Rentals	■	n/a	n/a
Commercial Buildings A building or portfolio of buildings where more than half of the floor area is used for commercial purposes and are intended to generate a profit, either from capital gain or rental income. There are sub-categories of Commercial Buildings, including but not limited to: • Offices • Schools & Campuses • Shopping centres & retail • Hotels	■	■	n/a
Industrial Buildings A building or facility dedicated to the manufacturing, altering, repairing, cleaning, washing, breaking-up, adapting or processing any article • Manufacturing facility • Agriculture/livestock facilities • Energy generation facilities	▲	n/a	n/a
Built environment Projects or activities that are not specifically buildings related, but are part of the wider built environment, such as street lighting upgrade projects refer to projects that achieve energy performance improvements through the application of energy efficiency measures and components that relate to the built environment	■		n/a

Table 2: What is eligible for Certification under each certification type

Certification type	Certification based on eligible building	Certification based on eligible built environment project
Use-of-Proceeds Certification	• Origination or refinancing of loans or mortgages, including portfolios • Capital costs of performance upgrades • Operating expense of ongoing maintenance • Building cost or value	• Capital costs of performance upgrades • Operating expense of ongoing maintenance
Asset Certification	• Building asset(s)	n/a
Entity Certification	• The building management entity / the buildings management business segment. Note, construction entities/ business segments are not currently eligible for Certification.	n/a
Sustainability-Linked Debt Certification	• Sustainability-Linked Debt instruments whose climate mitigation performance targets represent the eligible building management activity	n/a

2.2 Alignment with other Sector Criteria

Table 3: Alignment with other Climate Bonds Standard Sector Criteria

Potential Use-of-Proceeds	Sector Criteria
Energy infrastructure buildings	Building supporting the generation, distribution, and/or transmission of electricity and heat are subject to the corresponding Energy Criteria
Transport infrastructure buildings	Buildings supporting the manufacturing of low carbon transport modalities or infrastructure (i.e. bus stations, rail stations) are subject to the corresponding Low Carbon Transport Criteria.
Water infrastructure buildings	Buildings supporting the processing and distribution of water or otherwise support water-based infrastructure are subject to the corresponding Water Criteria.
ICT infrastructure buildings	Buildings supporting the ICT are subject to the corresponding ICT Criteria.
Waste Management infrastructure buildings	Buildings supporting the collection, handling, or processing of municipal solid waste are subject to the corresponding Waste Management Criteria.
Land Use infrastructure buildings	Buildings supporting the management of agriculture, forestry, ecosystem conservation & restoration, fisheries, or associated supply chains are subject to the corresponding Agriculture, Forestry, Fisheries, and Land Use Criteria
Industry infrastructure buildings	Building supporting the manufacturing, production, or processing of products/goods are subject to Industrial Criteria (under development)
Steel	Buildings, commercial and/or residential, that are not solely dedicated to a steel production facility. For example, office buildings for staff
Cement	Buildings, commercial and/or residential, that are not solely dedicated to a cement production facility. For example, office buildings for staff.

3 Eligibility Criteria for buildings and built environment projects

3.1 Mitigation Component

There are two routes to eligibility for Certification of Use-of-Proceeds instruments, Assets, Sustainability Linked Debt instruments and Entities relating to buildings and/ or the built environment;

1. Absolute Performance Improvement Pathway (***Section 3.2***), OR
2. Relative Performance Improvement Pathway (***Section 3.3***)

The decision tree below illustrates these eligibility pathways. ***Pathway 1*** can be used for Certifications relating to buildings/ buildings portfolios. ***Pathway 2*** can be used for Certifications relating to buildings/ building portfolios and also those relating to built environment projects.

All new construction must be designed ***fully electric*** (*viz*. without reliance on any form of fossil fuels) and with infrastructure for supporting electric mobility (charging facilities). In addition to this New Buildings are subject to reporting on Whole Life Carbon Assessment (WLCA)[2] (or Life Cycle Assessment (LCA)) where no operational pathway is in place. This WLCA must be undertaken meeting the Greenhouse Gas (GHG) protocol accounting recommendations (including Scope 3 emissions). All disclosures be presented alongside a statement of data quality underpinning the assessments. Detailed information on this is provided in ***section 3.4***.

Section 3 provides all relevant information relating to Use-of-Proceeds financial instruments and Asset Certification. The Entity (company level) certification and eligibility for Sustainability Linked Debt instruments are covered in Section 4.

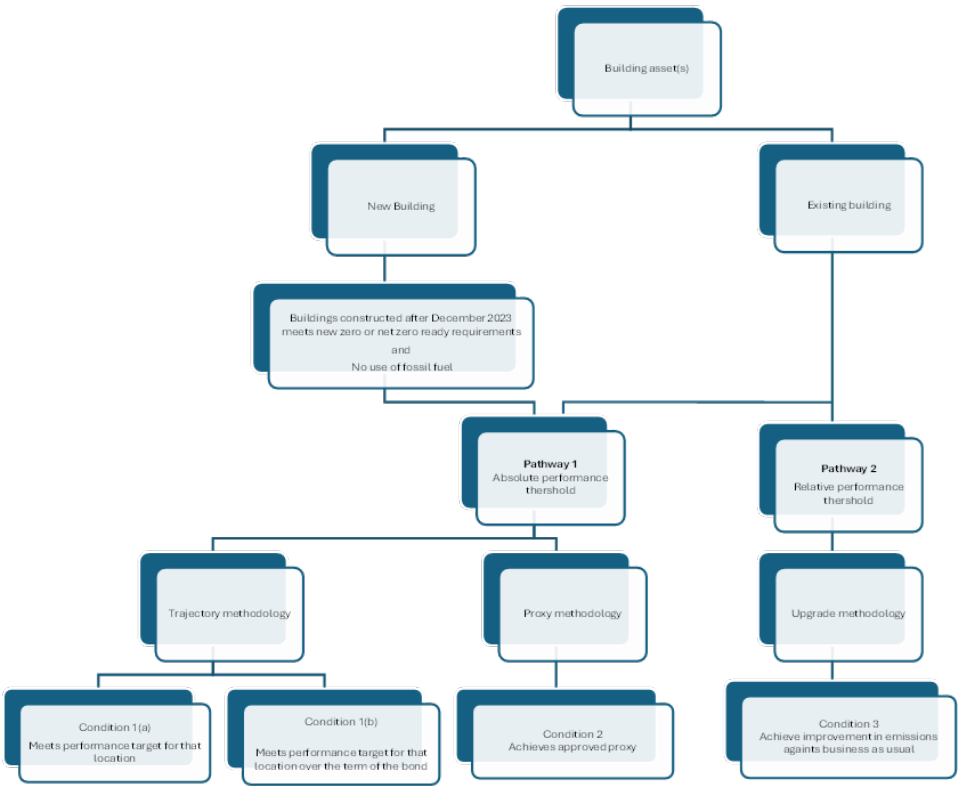

Figure 1: Certification pathways

[2] [3] Reporting on Life Cycle Assessment and accounting for GHG Scope 3 emissions is introduced now to make the market aware and be prepared for what should be delivered. There will be a transition/grace period for the same and reporting and accounting along with a data quality statement will start on or after 1st January 2025.

3.2 Pathway 1: Absolute Performance Threshold

Applicants have two options to establish compliance with the absolute performance threshold:

- **Condition 1** - Quantitative Threshold: Emissions intensity of the building achieves the appropriate performance target for buildings in that location,
- **Condition 2** - Qualitative Proxy: Rating of the building achieves the Climate Bonds approved proxy

The key strength of the Criteria is how emission intensity performance requirements are calibrated to local market conditions, taking into account differences in climate zones, prevailing market practices and inherent greenhouse intensities of the fuel supply. To prevent the Criteria from being undermined by layers of approximations and adjustments, each city is explicitly benchmarked, and the emission intensity threshold set against a common percentile.

To ensure that Climate Bonds Certification achieves significant scale and environmental impact, the emissions intensity is set against the top 15 per cent of buildings in a city. This serves as an initial baseline that is used to create a linear trajectory to zero carbon emissions by 2050, producing performance targets that become more stringent year-on-year. Emissions performance thresholds and trajectories will be set for specific building types (e.g. offices, hotels, shopping centres) in a city due to the meaningful variations in energy consumption and therefore emissions of different building types. This approach is referred to as ***Condition 1***.

Condition 1, while inherently simplistic, still remains out of reach for some cities and for some building types where the data simply does not exist in any reliable form. In such markets, existing instruments such as building standards, codes, and rating schemes can be leveraged as proxies for buildings in that market. This alternative approach is referred to as ***Condition 2***.

In markets where both options are available, ***Condition 1*** is the preferred approach. As ***Condition 2*** is meant to serve as an interim solution until data becomes available.

3.2.1 Condition 1(a)

Condition 1(a): Meets performance target sets by low carbon trajectory for asset in that location.

<table>
<tr><th colspan="4">Requirement: Mitigation Component</th></tr>
<tr><th>Component</th><th>Requirement</th><th colspan="2">Demonstration of compliance</th></tr>
<tr><td>Mitigation</td><td>The asset or portfolio of assets shall meet the emissions performance target calibrated to the specific city or region.</td><td>For portfolios
The issuer certifying a portfolio of assets shall:
report the bond term;
report the emissions intensity target for the bond established by the low carbon trajectory and bond term;
report the emissions intensity of the portfolio of assets.</td><td>For individual buildings
The issuer certifying an individual asset shall:
report the bond term;
report the emissions intensity target for the bond established by the low carbon trajectory and bond term;
report the emissions intensity of the portfolio assets.</td></tr>
<tr><td colspan="4"> 
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</table>

Explanation

The "Emissions Performance Target" an issuer has to satisfy is determined based on an "emissions performance trajectory" that starts with an "initial baseline emissions performance" of the top 15% of buildings in a city and declines to zero GHG emissions in 2050.

The emissions performance target is the emissions intensity figure at which the mid-point of the bond intersects the emissions performance trajectory and reported as $kgCO2e/m^2$. The emissions performance trajectory is location and building sector specific.

The "emissions performance target" is expressed on an annual basis in kgCO2e terms and represents a level of carbon intensity (with net lettable square meters as the denominator for most building types). For instance, the emissions performance target for Sydney offices may be 78.2 $kgCO2e/m^2$ per annum for a 10-year bond issued in 2015.

The "initial baseline emissions performance" is established using available emissions performance data (see notes in ***Box 1*** below) on a representative sample of buildings in a city or region. Once set, it is not expected to be updated unless in exceptional circumstances. The two key circumstances that warrant a recalibration of initial baseline emissions performance are (1) when the size and quality of the underlying data set improves significantly and (2) when there is significant decarbonisation of the grid. Climate Bonds will undertake a review every 3 years, to check for these two circumstances and whether they warrant a recalibration of initial baseline performance. The Trajectory Methodology document on the buildings website provides details on the statistical methodology applied to establish the "initial baseline emissions performance".

Box 1: Emissions Intensity data and calculation methodology

Notes on emissions intensity data and calculation methodology

1. Emissions performance of individual buildings should be specified using an appropriate denominator ($kgCO_2e/m^2$). While Climate Bonds has established that net lettable floor area is appropriate for most building types including offices, alternative denominators more appropriate for specific building types (e.g. rooms for hotel buildings) may be applied. Climate Bonds will provide guidance on alternative denominators as research is developed for specific building types.
2. Emissions performance data must relate to the operational performance of buildings rather than modelled performance.

Emissions performance data must relate to the same emissions boundary as the target. Climate Bonds commonly uses landlord emissions boundaries to align with the boundaries of ownership and control that exist in the building sector. ***Box 2*** provides guidance on the Emission boundaries. If data is only available that does not align to the emissions boundaries of the emissions performance target, a reasonable assumption may be made to adjust for boundary differences.

Box 2: Emissions boundary

Guidance on Emission boundaries

Emissions performance targets and performance requirements are commonly provided for a landlord's emissions boundary.

Landlord energy loads (also known as base building energy loads) typically comprise the energy consumed by landlord-owned plant and equipment that are required to service the building and are not controlled by the building's tenants. Such energy end uses include:

- Heating, ventilation and air conditioning
- Lifts and escalators
- Car park lights and ventilation
- Common area light and power
- Exterior lighting and signage

Landlord loads excludes energy end uses that are controlled by the building's tenants, such as:

- Lighting within tenant areas
- Tenant power
- Tenant supplementary cooling
- Tenant data facilities

In markets that commonly disclosure whole building emission boundaries, alternative emissions targets may be published. Where whole building targets are used, all emissions associated with the energy used in the operation of the building and the tenants use of the building must be included.

Exception cases:

The approach to emissions boundary differs for certain commercial buildings, as opposed to that of office buildings. These include:

- Hotels
- Supermarkets
- Universities buildings

In these cases, Climate Bonds captures the energy related emissions of the operations attributed to the commercial buildings listed above. This is done so as these commercial buildings are traditionally delivered as core shell buildings, meaning they are provided without HVAC, lighting and plumbing services, as these are all to be provided by the building (typology) tenant according to their needs. Given this, the landlords portion of load becomes irrelevant, and the hotels/supermarkets/university building's portion of energy captures all material loads, including air conditioning, ventilation, lighting, cold rooms, refrigerators display cabinets, etc. This is to ensure it is still consistent with the general approach of the emissions associated with the equipment owned and operated by the party/asset being financed.

To avoid the risk and uncertainty associated with year-on-year moving performance targets (implied by a declining emissions performance trajectory), fixed targets are established at the midpoint of the bond's term along the trajectory (see ***Box 3*** for example using Sydney offices). Adopting this approach means that performance targets become more stringent the later the bond is issued and the longer the bond term.

Box 3: Fixed targets at the midpoint of bond terms

Establishing fixed targets at the midpoint of bond terms - Sydney offices example

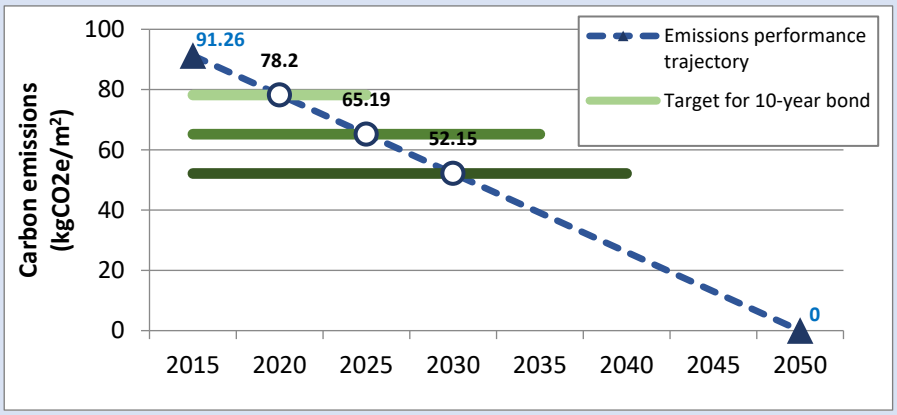

Chart 1: Targets for different bond terms for Sydney offices

The emissions performance trajectory for Sydney offices starts with an initial baseline emissions performance of 91.2 $kgCO_2e/m^2$ and declines to zero carbon emissions in 2050 (blue line in ***Chart 1***).

Fixed targets are derived from this emissions performance trajectory using the midpoint of the bond term (white circular markers along the blue line). For instance, the midpoint for a 10-year bond issued in 2015 is 2020. The target for such a bond is 78.2 $kgCO_2e/m^2$, where the midpoint of the bond's term (2020) meets the emissions performance trajectory. The targets for longer bond terms such as 20 years and 30 years are established in a similar manner using the midpoints, leading to targets of 65.2 $kgCO_2e/m^2$ and 52.2 $kgCO2e/m^2$ respectively.

It can be observed from the chart that the longer the bond term, the stricter the target to achieve certification. This is also the case the later bonds are issued (e.g. year 2020 or 2030 instead of 2015).

Climate Bonds has developed and made available on its website an easy-to-use CO2 Target Calculator that enables issuers to ascertain the performance targets that must be satisfied in order to gain certification in their cities. The Calculator automatically

calculates the performance target an issuer has to satisfy based on the year the bond issued, the length of the bond term, the building type and city the building is located.

Buildings in location with very low carbon electricity distribution networks are assessed with an energy intensity target. The use of an energy intensity target insulates reporting from the relatively large changes in emissions intensity that can be caused by modest changes to the consumer mix Emissions Factor of the electricity supply. Very low carbon electricity distribution is benchmarked as the local distribution network having a consumer mix emissions factor of less than 0.1 kgCO2e/kWh. (See ***Box 4*** for detailed explanation).

Application for a portfolio of buildings

An issuer seeking certification will most likely have a portfolio of buildings covering different building types in different cities. The performance target that the issuer on a portfolio basis will have to satisfy is a weighted average of the different targets of building types and cities in the pool.

This weighted average will be calculated based on net lettable area, which Climate Bonds has established as the most appropriate denominator for most building types including offices. Where a different denominator is applied, the weighted average will be calculated based on that alternate denomination. This approach of aggregating buildings in a bond portfolio is known as the Full Aggregation Method.

Box 4: Energy efficiency targets for very low carbon electricity distribution networks.

Establishing Energy efficiency targets in locations with very low emissions factor

Where location-based consumer emissions factor for electricity use are significantly lower than fossil fuel use, Climate Bonds applies an energy intensity target. The threshold for using an energy intensity target is when the consumer (also known as the supplier) mix of the network electricity is equal to or lower than 0.1 kgCO2/kWh in the previous three years.

The energy intensity target is different from the emissions performance trajectory. No trajectory is applied, and the energy intensity target is set at an absolute threshold regardless of the tenure of the bond.

The target is established is calibrated from the Climate Bonds emissions benchmark in a very low carbon location, for a building that is 100% powered by electricity. The electricity target is measured in kilowatt hours of delivered or consumed energy per square meter of net lettable area. Climate Bonds will review the energy intensity targets periodically to ensure they remain appropriately calibrated.

Example:

The emissions factors for consumers of electricity supplied by the distribution network in France is 0.047 kgCO2/kWh (AIB 2021 residual mix results). Climate Bonds energy intensity target for offices in France[1] are:

- Paris: 89.79 kWh/m^2
- Marseille: 82.8 kWh/m^2
- Lyon: 92.4 kWh/m^2
- Toulouse: 86.8 kWh/m^2

[1] This varies in response to climatic variations

Methodology for determining the Energy efficiency targets:

The methodology for the energy targets is a simple at the emission baseline (set at 15% of market) converted to electricity on the basis on no fossil fuel use. Using the same Paris:

1. Emissions baseline: 4.22 kg/m2.annum
2. Emissions Factor for Electricity: 0.047 kg.CO2/kWh (Baseline year AIB 2018 Residual Mix Results)

Energy target = [1] / [2] = 4.22/0.047 = 89.79 kWh/m^2 per annum

Box 5: Worked example for an eligible asset/portfolio

Worked example for an eligible asset/portfolio

Overview of the project:

A new office building comprising 35 levels, offering 60,000m^2 of premium grade offices accommodating approximately 7,000 people is built in Brisbane, Australia.

The office building includes:

- Zero carbon in operation
- Powered by 100% renewable electricity (no use of fossil fuel and fully electrified)
- Reporting and accounting for WLCA (Scope 1, 2 and 3)
- Scope 1 and 2 already in net positive pathway
- Scope 3 net positive emissions by 2030.
- Zero waste landfill by 2030
- The on-site parking is made EV infrastructure ready.

The office building has received a 6-star Green Star Buildings certification - the highest standard and rating in available in the Green Star Buildings.

Certification eligibility under Climate Bonds Low-carbon buildings criteria

The asset has taken the Condition 2 (Achieves a Climate Bonds approved proxy) under pathway 1 (absolute performance threshold) as per Section 3 of this document. The asset has satisfied the criteria according to the new additional criteria for New Buildings as detailed out in section 4.3 of this document.

3.2.2 Condition 1(b)

Condition 1(b): Will achieve equivalent performance over the bond term

Requirement: Mitigation Component			
Component	Requirement	Demonstration of compliance	
Mitigation	*Condition 1(b)* requires that buildings achieve a certain level of emission intensity reductions over the life of the bond to be eligible for certification. It allows for bind financing of building retrofits where planned reductions in emissions intensity may take place over time.	**For portfolios** The issuer certifying a portfolio of assets shall: • have a contract or agreement with a certified energy auditor demonstrating the assets emissions intensity shall be improved over the term of the bond such that its end performance is equivalent to the performance requirements under *Condition 1(a)*.	**For individual buildings** The issuer certifying an individual asset shall: • have a contract or agreement with a certified energy auditor demonstrating the assets emissions intensity shall be improved over the term of the bond such that its end performance is equivalent to the performance requirements under *Condition 1(a)*.
			

Explanation

The Climate Bonds Initiative is aware not all issuers start from the same set of building assets under management. In order to account for this and remain applicable to all potential issuers as well as incentivise the decarbonisation of building stock through deep retrofits, the criteria have been designed to allow for compliance with the performance threshold over the term of the bond.

An asset or portfolio of assets that do not currently meet the relevant Climate Bond's low carbon trajectory, may be certified as a Term Conformance Bond as long as its carbon performance over the bond's term is equivalent to that of an asset or portfolio or assets performing at or below the low carbon trajectory.

There are two options for which an asset or portfolio or assets may be classified as a Term Conformance Bond:

1. Gradual improvement over the bond's term - measured against Climate Bond's city trajectory ("Gradual Improvement - City") (**Box 5**)
2. Front-loaded improvement in initial years and then maintained performance ("Front- loaded improvement") (***Box 4***)

These two options are described in detail with the use of examples in the subsequent sections. Both options require annual monitoring and verification. These are best illustrated using the examples described in **Box 5**.

Box 6: Required Performance Improvement

Performance improvement required by Condition 1(b)

Under ***Condition 1***, an office building for a 10-year bond in Sydney is eligible for certification only if it meets the performance target of 78.2kgCO_2e/m^2 at the start of the bond term (year 2015) and maintains this performance over the remaining term (black horizontal line in ***Chart 2***).

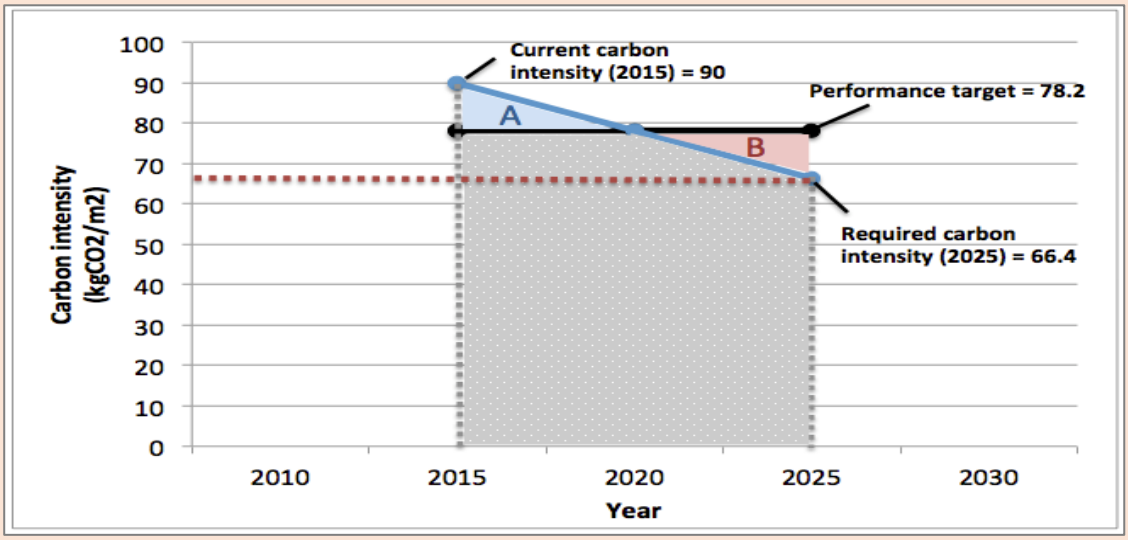

Chart 2: Performance improvement for 10-year Sydney bond example

An office building that currently exceeds this performance target of 78.2kgCO_2e/m^2 can however achieve certification against ***Condition 1(b)*** as long as its performance is improved such that the average performance over the life of the bond is equivalent to 78.2kgCO_2e/m^2 (blue declining line in ***Chart 2***).

It can be observed in ***Chart 2*** that the improving building achieves an aggregate performance (area under the blue line) that is equivalent to that achieved by a building hitting the target of 78.2kgCO_2e/m^2 every year (area under the black line) such that area of triangle A is equivalent to that of triangle B in the chart.

While ***Chart 2*** provides an example of an office building that achieves a constant rate of performance improvement over the bond term, the issuer does not have to follow this trajectory and has the flexibility to decide the timing of the performance improvement. As long as the average performance of the improving building is equivalent to the performance target under Option A of ***Condition 1***, it does not matter when the performance improvement is undertaken.

Another option to demonstrate term conformance is what is known as front loaded emissions performance improvement. Instead of gradual improvement (the previous option), our asset portfolio can front-load its carbon improvement in the initial five years and maintain that carbon intensity over the remaining 15 years (See ***Chart 3***).

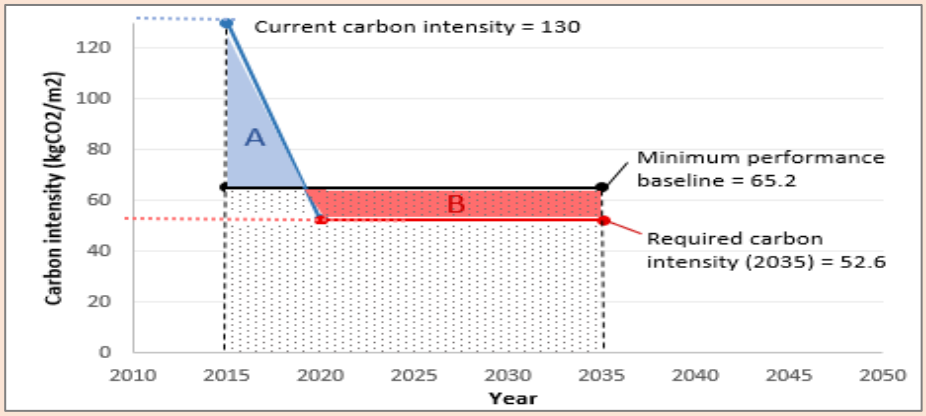

Chart 3: Performance improvement for 20-year Sydney bond example

To achieve the same carbon performance (over the bond's term) as the minimum performance portfolio, our asset portfolio has to achieve a carbon intensity of 52.6kg CO_2e/ m^2 in five years (Year 2020 assuming the bond is issued in Year 2015) and maintain that over the remaining term of the bond.

The carbon intensity target of 52.6 $kgCO2e/m^2$ calculated such that the area in area A is equivalent to the area in area B in ***Chart 3*** (so that the carbon performance of our asset portfolio is equivalent to that of the minimum performance portfolio over the bond's term).

Application for a portfolio of buildings

An Applicant seeking certification will most likely have a portfolio of buildings covering different building types in different cities. The performance target that the issuer on a portfolio basis will have to satisfy is a weighted average of the different targets of building types and cities in the pool.

This weighted average will be calculated based on area, which Climate Bonds has established as the most appropriate denominator for most building types including offices. Where a different denominator is applied, the weighted average will be calculated based on that alternate denomination. This approach of aggregating buildings in a bond portfolio is known as the Full Aggregation Method. It is applied when emissions performance data for buildings in a city are available to establish emissions performance trajectories.

3.2.3 Condition 2

Condition 2: Achieves a Climate Bonds approved proxy

Requirement: Mitigation Component			
Component	Requirement	Demonstration of compliance	
Mitigation	The asset must achieve a pre-approved Climate Bonds approved proxy, relevant to the location of the asset. See list of approved proxies • Commercial • Residential	**For portfolios** The issuer certifying a portfolio of assets shall: • List of all assets in the portfolio and the corresponding Climate Bonds approved proxy(s) leveraged	**For individual buildings** The issuer certifying an individual asset shall: • The name of the Climate Bonds approved proxy used
			

Explanation

In the absence of emissions performance data, Climate Bonds will establish "proxies" for buildings by leveraging existing instruments such as building standards, codes, and rating schemes. Examples include Europe's Energy Performance Certificates, Minimum Energy Performance Standards, or third-party schemes.

Issuers seeking to apply other instruments will need to perform similar statistical analysis on their proposed proxies to demonstrate to Climate Bonds the ability of proxies to position buildings in the top 15 per cent and for how long this proxy remains representative of this threshold. Climate Bonds encourages issuers to propose alternative proxies and have established guidance for issuers wishing to undertake the statistical work. Climate Bonds will also undertake its own efforts to establish proxies for priority investment markets. The most up-to-date list of Climate Bonds approved proxies is available on the website.

Limitation on the bond term

As ***Condition 2*** is meant to serve as an interim solution until emissions performance data becomes available, a limit is placed on the term of bonds certified against this option. The bond term is capped at 10 years.

Application for a portfolio of buildings

An issuer seeking bond certification will most likely have a portfolio of different buildings. To be certified against ***Condition 2***, each building in the issuer's portfolio must satisfy the Climate Bonds approved proxy. This is known as the Simple Aggregation Method whereby each building included in the pool must be compliant in its own right.

Application for a new buildings and existing building completed after January 2020 date

Any new buildings satisfying an Approved Proxy must also meet the net zero requirements and use not fossil fuel for normal operations, regardless of whether the requirements are noted in the approved proxy.

3.3 Pathway 2: Relative Performance Improvement

Bond issuers have two options to establish compliance with the relative performance improvement:

3.3.1 Condition 3

Condition 3 - Quantitative Improvement: Achieves a retrofit improvement in emissions intensity against pre-retrofit baseline

Requirement: Mitigation Component			
Component	Requirement	Demonstration of compliance	
Mitigation	The asset must achieve a post retrofit upgrade of 30-50% dependent on the term of the bond. It allows for bond financing of building retrofits where planned reductions in emissions intensity may take place over time.	**For portfolios** The issuer certifying a portfolio of assets shall: • Have a contract or agreement with a certified energy auditor demonstrating the assts emissions intensity shall be improved over the term of the bond such that its end performance is equivalent to the upgrade performance requirements determined by the term of the bond • Report pre-retrofit emissions intensity • Report post-retrofit emission intensity • Report percent improvement achieved	**For individual buildings** The issuer certifying an individual asset shall: • Have a contract or agreement with a certified energy auditor demonstrating the assets emissions intensity shall be improved over the term of the bond such that its end performance is equivalent to the upgrade performance requirements determined by the term of the bond • Report pre-retrofit emission intensity • Report post-retrofit emissions intensity • Report percent improvement achieved
		Certifiable	

Explanation

Certifications requires that a contract or agreement already be in place with a contractor to undertake the emissions reduction works.

Condition 3 allows the certification of projects that seek improvement in emissions intensity through the application of energy efficiency measures and fuel switching technologies that relate to the built environment (e.g. LED lights, heat pumps, micro combined heat and power, renewable micro-generation, etc.).

The methodology is agnostic to types of measures and technologies. As long as the measures and technologies to be applied in the project lead to the required improvement in emissions intensity, the project is eligible for certification.

A minimum improvement in emissions intensity of 50% is required for bond terms of 30 years and 30% for bond terms of 5 years. Between 5 years and 30 years, the minimum improvement required is derived based on the linear trajectory between 30% for 5 years and 50% for 30 years. For bond terms below 5 years, the minimum improvement is equivalent to that required for 5-year bonds (30%). These requirements are depicted in ***Box 7*** below.

Issuers must be able to quantify to Climate Bonds the performance improvement of upgrades or retrofits. [Confirm level of detail required in contract or agreement and whether there is a standardised framework that can be leveraged].

Box 7: Emissions Intensity Improvement Requirements

Minimum emissions intensity improvement requirements

The 50% minimum improvement for 30 years has been derived from analysis of data in the Australian cities of Sydney and Melbourne, along with consideration of local rating tools in both Australia and the USA.

In Australia, a carbon emissions reduction of approximately 50% is required to move from a 2-star NABERS rating (below average performance) to a 4.5-star NABERS rating (very good performance). Similarly, Energy Star (based on whole building data) in the US requires a 51% carbon emissions reduction to move from the bottom 15th percentile to top quartile and a 53% carbon emissions reduction to move from median performance to top 5th percentile.

The 30% minimum improvement for 5 years has been established based on industry practice for Energy Service/Saving Companies (ESCO) contracts, where best practice tends towards a 30% performance improvement.

For bond terms between 5 years and 30 years, the minimum improvement required is derived based on the linear trajectory between 30% for 5 years and 50% for 30 years (depicted in ***Chart 4*** below). Bond terms below 5 years are expected to deliver a 30% performance improvement and no less.

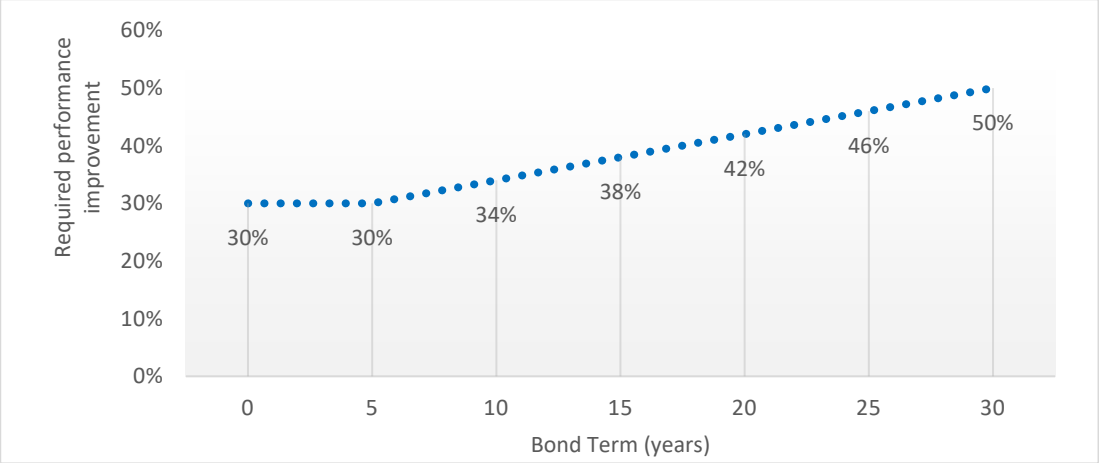

Chart 4: Minimum improvement requirement over life of bond

Note: Application for a portfolio of projects

An issuer seeking bond certification will most likely have a portfolio of different projects.

Such an issuer with multiple projects can aggregate them into one portfolio and it is the aggregated portfolio that must satisfy the required minimum improvement in emissions rather than each project included in the pool having to comply in its own right.

Note: Application for projects commencing after 2026 date

Any improvement works must also not involve equipment of appliance that use fossil fuels, except to the extent that the improvement works result is such appliance and equipment being decommissioned.

3.4 Additional requirements for new buildings

All New buildings (commercial and residential) constructed after 2023 are additionally required to deliver the following requirements which will have three parts:

1. **No fossil fuels** are used for heating, hot water, cooking, or on-site electricity generation
2. The building provides necessary infrastructure to support **electric mobility** where on-site car parking is provided.
3. Shift to all **electric buildings (electrification)**

Additionally, the New Buildings are also required to report on the following:

4. Reporting on **Whole Life Carbon Assessment:**

Please refer to ***section 3.5*** for thresholds pertaining to steel and cement.

Table 4: New Buildings Requirements

Condition	Requirement
No fossil fuels	New buildings need to be delivered without inbuilt redundancy of systems and liability for future investment to operate net-zero emission with fully decarbonised energy supply infrastructure. Many countries and states have implemented plans to accelerate the decarbonisation of energy supply infrastructure and continued dependency on fossil fuels will lock-in and new buildings into increased GHG emissions until such time as fossil fuel consuming plant and equipment is replaced. The following end use cannot use fossil fuels: • Heating, ventilation, and air conditioning • Hot Water • Cooking • On-site generation of electricity for non-emergency power
Enabling Electric mobility	Buildings have an important role to place in the facilitation of the transition to electric mobility. Providing the necessary infrastructure for electric vehicle charging in buildings is an important marked enabler, particular in residential buildings. The following essential infrastructure is the minimum required where **car parking is included** within a building: • Residential buildings – full parking (100%) • Commercial buildings - a minimum of 25% of the total parking area EV vehicles include cars, motorcycles, and bicycles.
Whole Life Carbon Assessment	Reporting and accounting on Whole Life Carbon Assessment (WLCA) will be made mandatory for construction of New Buildings for both commercial and residential buildings. This reporting will follow the EN 15978 methodology or international equivalence. This will take place for all new buildings from 01 January 2026. Details of scope and relevant information can be found in Appendix A.
Commercial Buildings:	As Climate Bonds already has established operational low carbon pathways for the operational greenhouse gas emissions impact of commercial buildings (around the globe, covering specific countries/cities in a region). Where Climate Bonds already has operation targets and reporting requirements of operational energy impacts, the operational phase is excluded from WLCA to avoid additional cost and limits additional reporting of embodied carbon to: • Module A, • Module C (where the property/asset is demolished for a New Building) and • Module D

Condition	Requirement
	Note: *Modules C + D will be required for European countries only.*
Residential Buildings:	Climate Bonds has recognised various proxies that are focused on emissions for residential buildings around the globe, catering to specific countries/cities in a region, Hence, it will look at: • Module A, • Module B - B6, 7 and 8 that cover the operational emissions • Module C (where the property/asset is demolished for a New Building) and • Module D ***Note:*** *Modules C + D will be required for European countries only.*

Note: *In emergency situations, resulting in extended interruptions to power supply (natural disasters or any other emergency situations, backup generators can be utilised.*

Further information and details can be found in the Emergency Power Backup guideline.

3.5 Cross-cutting sector: Steel and Cement

3.5.1 Steel

The construction industry is one of the most important steel-using industries, accounting for more than 50% of world steel demand[3]. Low carbon steel remains a critical requirement to ensure building's embodied carbon objectives are met. The WLCA reporting requirements (effective from 01 January 2026), require that Low Carbon steel meets the thresholds set out below.

The emissions intensity values must be reported, by using the weighted average of primary and secondary intensity steel at date of the bond inception (available from suppliers) and will need to at no time be above 2.0 kg/t steel and reduce over time in line with the pathway indicated below (effectively always remaining below the Primary steel pathway).

- Primary and Secondary thresholds: *Table 13, section 5.3.3*

Table 13: Threshold values forming the emissions pathway for all steel production companies

IEA NZE Trajectory		
Year	Primary Intensity (t CO2/t steel)	Secondary Intensity (t CO2/t steel)
2020	2.38	0.75
2025	2.09	0.54
2030	1.81	0.32
2035	1.35	0.22
2040	0.90	0.12
2045	0.51	0.12
2050	0.12	0.12

Note: a linear trajectory is assumed between these date points

Source: Rocky Mountain Institute (RMI)[42]

- Reduction pathway: *Figure 7, section 5.3.3*

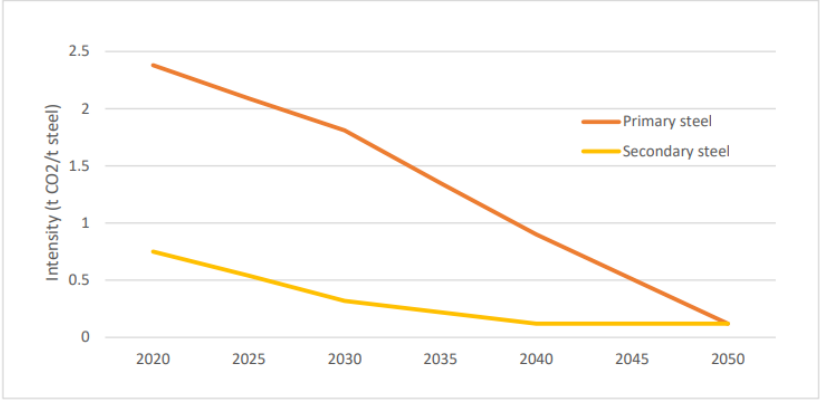

Figure 7: The emissions pathway for all steel production companies (scope 1 & 2 emissions combined)[41]

Further worked examples and context is available in the Steel Criteria document.

[3] www.worldsteel.org/steel-topics/steel-markets/buildings-and-infrastructure

3.5.2 Cement

Cement is a primary ingredient of concrete and accounts for almost 40% of the materials (by weight) in the construction industry. The WLCA reporting requirements (effective from 01 January 2026), require that Low Carbon concrete, meets the thresholds set out below.

Equivalent emissions intensities comparable to those set out in the Climate Bonds Cement Criteria are required. The emissions thresholds for cement are provided below:

as outlined in the cement criteria document should be followed. This is outlined in section 4.2 of the cement criteria document along with worked examples, for more information please see here.

- The cement emission threshold used (in concrete production) must meet those provided : *Table 5, section 5.2*

Table 5. Threshold values forming the emissions pathway for all cement production facilities

Year	Carbon intensity ($t CO_2$/ t cementitious product)	Year	Carbon intensity ($t CO_2$/ t cementitious product)	Year	Carbon intensity ($t CO_2$/ t cementitious product)	Year	Carbon intensity ($t CO_2$/ t cementitious product)
2020	0.469	2028	0.384	2036	0.253	2044	0.107
2021	0.458	2029	0.374	2037	0.234	2045	0.089
2022	0.448	2030	0.363	2038	0.216	2046	0.071
2023	0.437	2031	0.345	2039	0.197	2047	0.054
2024	0.427	2032	0.326	2040	0.179	2048	0.036
2025	0.416	2033	0.308	2041	0.161	2049	0.018
2026	0.406	2034	0.289	2042	0.143	2050	0.000
2027	0.395	2035	0.271	2043	0.125		

Note: Pathway based on a starting point (in 2020) of the EU Taxonomy thresholds for cement. Trajectory of the Science-Based Targets Initiative sectoral decarbonisation pathway applied to this starting point to reach net zero by 2050. Full methodology in the Background Paper.

- Plant level reduction pathway: *Table 5, section 5.2*

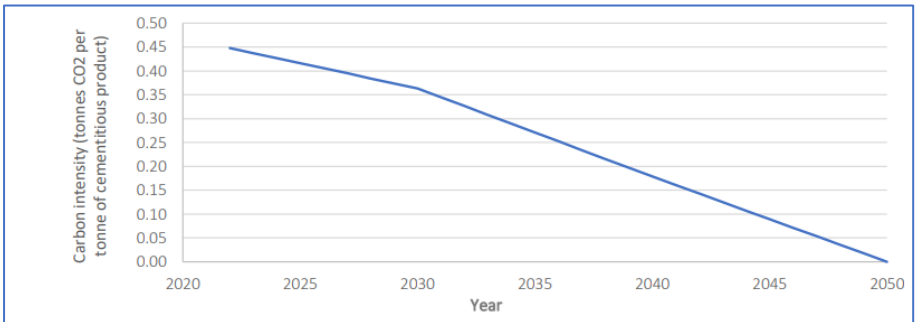

Figure 4. Emissions pathway for all cement production facilities

Note: *At this time, reporting thresholds (emission intensities) are only provided for cement.*

Equivalent concrete emission values are not calculated, but can be calculated using a suitable dilution factor

[concrete emission intensity = 90% cement + other[4]]

[4] Environmental impact of concrete - Wikipedia

4 Certification of Entities and Sustainability-Linked Debt (SLD)

Section 4.1 describes the Criteria for a property management company or a business segment focused on property management. Per ***Table 1***, Entity Certification is available only for those entities managing portfolios of commercial buildings. Assessment of eligibility is based on the emissions intensity pathways only, i.e. Option 1(a) as described in Section 3.2.1.

Section 4.2 for criteria for an SLD instrument issued by such a company.

See also the Climate Bonds Standard v4.0 for the cross sectoral requirements for Entity and SLD Certification relating to Transition Plans and Disclosure for the Certified Entity and requirements in respect of the Parent Group (if any). These cross sectoral requirements must be met in addition to the building-specific requirements described here.

Note: The Climate Bonds Standard allows for the certification of only part of a company or group of companies (the 'Certified Entity'), or SLD that relates to only part of a company or group of companies. See the Climate Bonds Standard v4.0 for full details. This flexibility enables the certification of, for example, a subsidiary dedicated to commercial property management, separate from the certification of other segments or subsidiaries of the company dedicated to residential property management or any other economic activity.

4.1 Certification of Entities

Two levels of Entity Certification are available, described in ***Table 4*** along with the respective certification requirements.

Table 4: Levels of Entity Certification

Certification Level	Entity Certification Requirements
Level 1: "Aligned"	At the time of certification, the Certified Entity's commercial building portfolio meets the emissions performance target calibrated to the specific city or region (or a weighted average thereof), and their future Performance Targets to 2050 continue to meet those declining emissions performance pathways (in line with **Condition 1(a)** in ***Section 3.2.1***)*
Level 2: "Transition"	At the time of certification, the Certified Entity's commercial building portfolio *does not* meet the emissions performance target calibrated to the specific city or region (or a weighted average thereof), but their future Performance Targets align by 30 December 2030 and will continue to meet them after that date (in line with **Condition 1(a)** in ***Section 3.2.1***.)*

(*) Note: The emissions intensity thresholds over time describe a smooth linear line over time. In reality, decarbonisation may likely result in step changes in emissions levels. To reflect this, the Performance targets should align with the emission intensity threshold every three years as a minimum, but annual alignment is not required.

4.2 Certification of Sustainability Linked Debt (SLD)

Two levels of SLD Certification are available, described in ***Table 5*** along with the respective certification requirements.

Table 5: Levels of SLD Certification

Certification Level	SLD Certification Requirements
Level 1: "Aligned"	At the time of certification the commercial building portfolio represented by the Performance Targets linked to the SLD meets the emissions performance target calibrated to the specific city or region (or a weighted average thereof), and their future Performance Targets to 2050 continue to meet those declining emissions performance pathways (in line with **condition 1(a)** in ***Section 3.2.1***.)*
Level 2: "Transition"	At the time of certification the commercial building portfolio represented by the Performance Targets linked to the SLD *does not* meet the emissions performance target calibrated to the specific city or region (or a weighted average thereof), but their future Performance Targets align by 30 December 2030 and will continue to align that date (in line with **condition 1(a)** in ***Section 3.2.1***.)*

(*) Note: The emissions intensity thresholds over time describe a linear line over time. In reality, decarbonisation may likely result in step changes in emissions levels. To reflect this, the Performance targets should align with the emission intensity threshold every three years as a minimum, but annual alignment is not required.

Accounting and reporting on GHG Protocol Scope 3 emissions

Companies are required to report on Scope 3 emissions. These combined emissions intensities must meet the sector-specific guidance requirements, as set out in the GHG Protocol Corporate Value Chain (Scope 3) accounting and Reporting Standard.

The above is to be used in conjunction with the building's specific Technical Guidance for Calculating Scope 3 Emissions document while undertaking the calculations in-line with the GHG protocol methodology. Data Quality report underpinning the assessment is made mandatory, this is made to ensure over time, companies should seek to improve the data quality of the inventory by replacing lower quality data with higher quality data as it becomes available.

Appendix A: Whole life cycle assessment scope in Buildings

Table 1: Life cycle assessment for commercial and residential assets

System boundary (Figure 1)	Building element groups**	Floor area	Reference study period	Impact categories***
Requirement for Commercial Buildings: It constitutes the building life cycle stages, which includes: 1. Product stage (A1- A3) 2. Construction stage (A4 - A5) 3. End of life (C1 - C4) 4. Beyond system boundary: Reuse, Recycle, Recovery (D)[5] Requirement for Residential Buildings: Same as commercial buildings, additionally it requires reporting on operational carbon where necessary	Required building elements: 1. Facilitating works - Including demolition 2. Substructure 3. Super structure (frame) 4. Super structure (envelope) 5. Super structure (Internal elements) Internal finishes - wall, floor and ceiling	Gross floor area (GFA) - this GFA definition are country/region specific. (This is commonly used for calculating operational energy (B6) where it is known as conditioned area that refers to the areas heated)	50 - 60 years. (But local regulations can vary in which case that can be adopted)	Global warming potential (GWP)

Note: * Following the relevant EN 15978 standard or international equivalence.

** Building services/MEP, fittings, furnishings and equipment are not defined as it varies widely globally, if required by local/national legislation then they can be included in the building element group.
Note: The structure is often associated with upfront embodied carbon. However, when a whole life carbon assessment is undertaken, frequently replaced items such as mechanical, electrical, and plumbing (MEP) systems, play a significant role.

*** Only Global warming potential will ve required but if a local/national law requires other impact categories (as listed below) then that will be adopted.

Other impact categories include:

- Ozone depletion
- Photochemical ozone creation
- Acidification
- Eutrophication
- Abiotic depletion, minerals and metals
- Abiotic depletion, fossil fuels
- Total use of energy
- Use of fresh water
- Waste processing

[5] This requirement is only for EU Countries according to the EU Taxonomy

Figure 1: Building Life cycle stages for defining system boundary

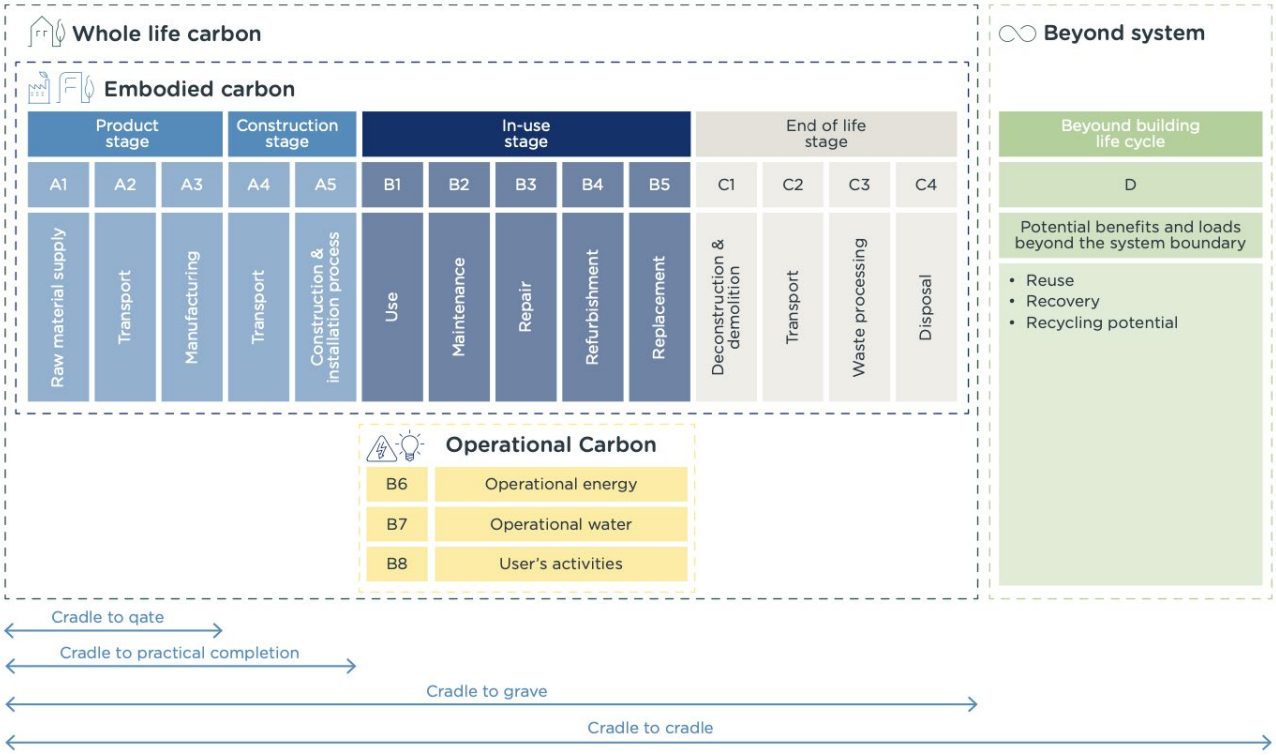

Table 2: Scope of WLCA under Climate Bonds Initiative low-carbon Buildings criteria

Scope for	Reporting on
Whole Life Carbon Assessment (WLCA)	Mandatory reporting of WLCA for: • New Buildings built on or after 2025(?) - For new build assets, buildings, or infrastructure civil works all life cycle stages must be assessed, including module D, and all building elements or infrastructure elements within the project site boundary must be included in WLCA. This includes any facilitating works and site preparation inside and outside of the asset footprint within the site boundary. • Demolition/deconstruction of existing asset for the purpose of New Buildings - When any full/part demolition or deconstruction of an existing structure is required to facilitate the construction of a new asset within the designated boundary, the emissions associated with that demolition or deconstruction should be included in the WLCA in sub module of module A5 which are classified into 4 parts (A5- (1-4)).
Scope of Modules	• **Module A:** A0 - A5 • **Module C:** C1 - C4 (where applicable) • **Module B:** B6 - B8 (where applicable)
Key project stages to undertake WLCA	• Adopt as written in EN 15978 or RICS Guidance/international equivalence
Recommend steps to carry out WLCA	• Adopt as written in EN 15978 or RICS Guidance/international equivalence
Spatial Boundary	• A WLCA should consider all construction works relating to the project, including any demolition or deconstruction, facilitating works and site preparation required for building the asset, and external works within the site boundary. The site boundary should be in line with the intended

Scope for	Reporting on
	use of the built asset, including all areas associated with the project that are integral to its operations. A town planning red line can serve as the site boundary where appropriate.
Element category for building assessments	• All buildings are made up of building elements, that are grouped into categories such as foundations, superstructure, envelope, and services. Please refer to Table 1.
Material impacts	• Choosing Low-carbon Environmental product declaration (EPD) - this provides detailed information about specific products that improve the accuracy of buildings LCA, and comparative analysis can be carried out to be better informed.
Area measurement	Floor areas from the following sources must be used and clearly stated in the WLCA, in the following order and/or subject to availability at different project phases: • BIM Model • Bill of Quantities (BoQ) or cost plan • Consultants drawing
Material quantity	A WLCA must cover all the items listed in a projects BoQ, cost plan, or as identified in other records (3D models, drawings or specifications, etc) (Refer to Table 2). Material quantities from the following sources must be used for each phase, and their source clearly stated.

Appendix B: TWG and IWG members

Technical Lead Advisor:	
Ché Wall	Director, Flux Consultants

TWG Members			
Alan Yates	Technical Director - Sustainability, BRE Group	**Panama Bartholomy**	Director, Investor Confidence Project (Environmental Defence Fund)
Alex Rathmell	Director, EEVS Insight	**Paolo Zancanella**	Officer, European Commission (Joint Research Centre)
Annie Degen	Special Adviser Long Term Finance, UNEP Finance Initiative	**Peter Sweatman**	Chief Executive, Climate Strategy & Partners
Ché Wall	Director, Flux Consultants	**Prashant Kapoor**	Principal Industry Specialist, International Finance Corporation
Chris Botten	Programme Manager, Better Buildings Partnership	**Robert Cohen**	Technical Director, Verco
Johannes Kreissig	Vice President Building & Construction, thinkstep	**Simon Brooker**	Executive Director, Clean Energy Finance Corporation (CEFC)
John Dulac	Buildings Sector Lead - Energy Technology and Policy, International Energy Agency (IEA)	**Tatiana Bosteels**	Head of Responsible Property Investment, Hermes Real Estate
Jorge Chapa	Head of Market Transformation, Green Building Council of Australia (GBCA)	**Teun van den Dries**	Founder & CEO, GeoPhy
Loïs Moulas	CEO, Observatoire de l'Immobilier Durable	**Victor Rojas**	Project Lead, Investor Confidence Project (Environmental Defense Fund)
Oliver Rapf	Executive Director, Buildings Performance Institute Europe		

IWG Members			
Grace Tam	Director - Debt markets Clean Energy Finance Corporation (CEFC)	**Hugh Garnett**	IIGCC, United Kingdom
Isabelle Schatz	Blkb Switzerland	**Szymon Smolarek**	ING Hipotec, Poland
David Sellars	First Mac, Australia	**Alison Chan**	Metrics
Laura Conigliaro	Jupiter AM, United Kingdom	**Begum Gursoy**	Sustainalytics, European Union
Pip Best	EY, New Zealand	**Karl Downey**	SBTi, United Kingdom
Frans Baas	Vestada, The Netherlands		
Jennifer Cooper	Brookfield, Australia		