NABERS

The Rules

# Embodied Carbon

Version 2.0 — April 2025

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# 1 Introduction

## 1.1 General

### 1.1.1 About NABERS

The National Australian Built Environment Rating System (NABERS) is a performance-based rating system managed by the **National Administrator**.

NABERS ratings are expressed as a number of stars, as follows:

| NABERS rating | Performance comparison |
|---|---|
| 6 stars ★★★★★★ | Market-leading building performance |
| 5 stars ★★★★★ | Excellent building performance |
| 3 stars ★★★ | Market-average building performance |

An accredited NABERS Embodied Carbon rating is awarded when the **National Administrator** certifies a rating completed by an **Assessor**. The **National Administrator** may independently audit the rating and assist in resolving complex technical issues.

This document contains **Rules** for **Assessors** conducting a NABERS Embodied Carbon rating as follows:

a) **Rated area**, see Chapter 4.

b) Building attributes, see Chapter 5.

c) **Land use and land use change**, see Chapter 6.

d) Minimum material coverage, see Chapter 7.

e) Material quantities, see Chapter 8.

f) **Emission factors**, see Chapter 9.

g) **Carbon removals**, see Chapter 10.

h) Transport emissions, see Chapter 11.

i) Construction and commissioning emissions, see Chapter 12.

j) Rating data completeness check, see Chapter 13.

k) Documentation requirements for accredited ratings, see Chapter 14.

### 1.1.2 Building types with an available star rating

The star rating is only available for select building types, due to data availability at the time of rating tool creation. This list will be reviewed regularly by NABERS.

Other eligible building types can still be certified with a verified measure of emissions intensity, even if a star rating is unavailable.

The building types which have a star rating at present are shown in Table 1.1.2.

**Table 1.1.2: Building types with an available star rating**

| Sector | Building types |
|---|---|
| Residential | Apartment building, hotel, student accommodation |
| Office | Office |
| Retail | Retail store, shopping centre, supermarket |
| Industrial | Warehouse, storage facility (not including self-storage buildings), cold store, manufacturing facility |
| Residential aged care and retirement living | See notes in Section 5.3.1 regarding residential aged care and retirement living eligibility |

## 1.2 Interpretation of the Rules and Rulings

These **Rules** are to be read in conjunction with the respective NABERS **Rulings** as they apply to the specific building type. **Rulings** are used to address specific issues that may arise after the publication of the **Rules**.

**Note:** **Rules** texts are amended as required by additional **Rulings** which are published on the NABERS website at www.nabers.gov.au

Where a conflict between these **Rules** and existing **Rulings** is present, the requirements of the **Rulings** take precedence over the **Rules**.

Assessments for an accredited rating must comply with the version of the **Rules** and any relevant **Rulings** current on the day the rating application is lodged to NABERS, unless—

a) the **National Administrator** has specifically approved otherwise in writing; or

b) the assessment is conducted under the terms of a NABERS Commitment Agreement which specifies an earlier version of the **Rules**.

## 1.3 Situations not covered by the Rules

**Assessors** must comply with these **Rules** unless prior approval has been sought and approved by the **National Administrator**.

Where appropriate, **Assessors** may contact the **National Administrator** to propose an alternative methodology, outlining the circumstances and rationale. Prior approval for use is required and may be granted conditionally, on a case-by-case basis and at the **National Administrator**'s discretion.

Procedures not contained within these **Rules** may only be used for a particular rating with prior written approval from the **National Administrator**. Approval to use the same procedure must be sought from the **National Administrator** each time it is proposed to be used. Approval is entirely at the discretion of the **National Administrator**. All written correspondence is required as evidence and should be collected prior to lodging the rating.

## 1.4 How to use this document

The term "**Rules**" refers to a body of works produced by NABERS that specify what must be examined, tested and documented when an **Assessor** conducts a rating. Wherever the term is used in this document from Chapter 3 onwards, it refers to this document, *NABERS The Rules — Embodied Carbon*. Other **Rules** documents mentioned in the text are distinguished from the present document by the inclusion of their title.

Text appearing **teal** and **bold** is a defined term. Defined terms can be found in Chapter 2 of these **Rules** or in the terms and definitions chapter of the respective **Rules** document.

The following formatting conventions may appear in this text:

⚠ Important requirements and/or instructions are highlighted by an information callout box.

**Note:** Text appearing with a grey background is explanatory text only and is not to be read as part of the **Rules**.

**Example:** Text appearing with a green background is intended to demonstrate a worked example of the respective **Rules** section or **Ruling** section.

This is a documentation requirement callout box.

## 1.5 What is new in this version

The following changes are the main updates for this current version:

a) Version 1.0 of the **Rules** contained various information boxes highlighting rules that may change following benchmarking and piloting. These boxes have now been removed and replaced with definitive rules content.

b) *Star ratings – Chapter 1*: A list of building types eligible to receive a star rating has been added. Other building types receive a verified measure of emissions intensity.

c) *Multi-building certification – Chapter 3*: Additional detail has been added to define similarity requirements for buildings to be rated together in one rating.

d) ***Rated area*** *– Chapter 4*: Significant revisions provide detail on how to calculate **FECA** and **UCA**, shared **FECA** and shared **UCA**, and car park **GFA**. The chapter also details how to enter this information into the **NABERS rating input form** so that **rated area** is automatically calculated.

e) *Building attributes – Chapter 5*: Soil conditions and area of external hardstand are no longer required building information.

f) *Building type – Chapter 5*: Retail stores and supermarkets must now have a **GFA** greater than 1,000 $m^2$ to be eligible for a rating. The industrial building type now clarifies that self-storage facilities are not eligible.

g) ***Mixed-use** buildings – Chapter 5*: New content outlines the procedure for determining if a building is **mixed-use**, along with documentation requirements.

h) ***Land use and land use change (LULUC)** – Chapter 6*: The maximum biomass class for a **greenfield** site is now required.

i) *Minimum material coverage – Chapter 7*: Minor changes to Table 7.3 improve practicality of minimum material coverage and streamline minimum material coverage for **mixed-use** buildings.

j) ***Mixed-use** buildings – Chapter 7*: New content contains instructions for ensuring the correct material coverage in a **mixed-use** building.

k) *Product-specific **emission factors** – Chapter 9*: Documentation requirements have changed as follows:

   1) **EPDs** must be valid at the time the material was delivered to site.

   2) **Carbon footprint** declarations must be dated within 5 years of the last delivery of the product to site.

   3) Climate Active Public Disclosure Statements must have a technical assessment date within 1 year of the last delivery of the product to site.

l) *Product-specific **emission factors** for timber – Chapter 9*: Whenever a product-specific **emission factor** is used for a timber product, the **Assessor** must now enter a **stored biogenic carbon** value into the **NABERS rating input form** for that product. The **Assessor** may need to calculate this value manually. A default calculation method is provided.

m) *Claiming **stored biogenic carbon** – Chapter 10*: Significant revisions provide detail how to calculate **stored biogenic carbon**, depending on whether the data source is an **EPD**, **carbon footprint**, or Climate Active Public Disclosure Statement.

A detailed list of the changes between this version 2.0 and the previous version 1.0 is given in Appendix A.

## 1.6 Related documents

The following documents have been referenced within these **Rules**:

a) CEN (2011). EN 15978:2011: Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method. Brussels: European Committee for Standardization.

b) CEN (2019). EN 15804:2012+A2:2019: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Brussels: European Committee for Standardization.

c) CEN (2013) EN 15804+A1:2013: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Brussels: European Committee for Standardization.

d) CEN (2014) EN 16485: Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction.

e) ISO (2018). ISO 14067:2018: Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification. Geneva: International Organization for Standardization.

f) ISO (2019). ISO 21930:2017: Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services. Geneva: International Organization for Standardization.

g) ISO (2015). ISO 25745-2:2015 Energy performance of lifts, escalators and moving walks. Part 2: Energy calculation and classification for lifts (elevators).

h) NABERS (2025): National emission factors database v2025.1: NABERS www.nabers.gov.au/ratings/our-ratings/nabers-embodied-carbon

i) NABERS The Rules — Metering and Consumption v2.5 (2025).

j) Transport Authorities Greenhouse Group (2013) Greenhouse Gas Assessment Workbook for Road Projects

**Assessors** must use the latest version of NABERS Rules and **Rulings** that have been referenced within this document.

# 2 Terms and definitions

This chapter lists the key terms, and their definitions, that are integral to the proper use of this document.

| Term | Definition |
|---|---|
| **acceptable data** | Data which meets the applicable accuracy and validity requirements of these **Rules**. |
| **acceptable estimate** | A project-specific estimate in accordance with a method allowed by these **Rules** and accompanied by a list of assumptions and references.<br><br>**Note:** This is different to the definition of **acceptable estimate** used in other NABERS Rules. |
| **Assessor** | An accredited person authorised by the **National Administrator** to conduct NABERS ratings. |
| **Auditor** | A person employed by or contracted to the **National Administrator** to perform audits of NABERS rating applications. |
| **Bill of Quantities (BoQ)** | Provides detailed information of quantities of materials and description of materials that are used in the construction of a building. Will typically list materials, services and extras associated with the build.<br><br>It may be created in a project at one or more of the below stages of a build:<br><br>a) Pre-tender, typically within bid packages and during contractor selection.<br><br>b) Post-tender, after the construction contract is awarded and during design alterations and the construction phase.<br><br>c) As-built, after construction is complete.<br><br>A cost plan may be sufficient as a **Bill of Quantities** for the purpose of a NABERS Embodied Carbon rating if it contains accurate material quantities in appropriate units of measure (not just dollar values). |

| Term | Definition |
|---|---|
| | A Bill of Materials is a version of a **Bill of Quantities** that focuses on material quantities only, excluding services. A Bill of Materials may be sufficient as a **Bill of Quantities** for the purpose of a NABERS Embodied Carbon rating if it contains accurate material quantities. |
| **biodiesel** | Liquid fuel derived from vegetable oils or animal fats. It has physical properties similar to those of petroleum diesel, but it is a cleaner-burning renewable alternative. **Biodiesel** can be blended with traditional fossil fuel diesel (e.g. 10% **biodiesel** and 90% fossil diesel), or be pure **biodiesel**. |
| **biogenic carbon** | Carbon that originates from biological sources (plants, trees, soil). It can represent a **carbon removal** from the atmosphere (such as in photosynthesis) or a carbon addition (such as in decomposition or combustion). |
| **brownfield** | Land that is reasonably classified as settlement. That is, it has already been developed and therefore has existing urban infrastructure. |
| **cadastral land parcel boundary** | The area defined by any of the following authorities:<br>a) Government of Western Australia – Landgate.<br>b) Queensland Government – Queensland Globe.<br>c) Northern Territory Government – Integrated Land Information System (ILIS).<br>d) ACT Government – Environment, Planning and Sustainable Development Directorate.<br>e) South Australian Government – Land Services SA.<br>f) NSW Government – Spatial Services.<br>g) Victorian Government – Vicmap Property.<br>h) Tasmanian Government – Department of Natural Resources and Environment Tasmania.<br>**Note:** In Australian Territories, this may refer to the right to use boundaries under a Crown lease. |
| **carbon dioxide equivalent ($CO_2e$)** | A unit of measurement used to standardise the global warming effects of various greenhouse gases, in terms of the amount of carbon dioxide that would deliver the same global warming effect. Also see **Global Warming Potential (GWP)**. |

| Term | Definition |
|---|---|
| **carbon emissions** | Emissions of greenhouse gases to the atmosphere, such as from combustion of fossil or biogenic fuels. The NABERS Embodied Carbon rating tool refers to the greenhouse gas emissions covered by the UNFCCC/Kyoto Protocol, as referenced in the GHG Protocol amendment 1a. |
| **carbon footprint** | The total greenhouse gas emissions associated with a defined scope in a given time frame, expressed as **carbon dioxide equivalent ($CO_2e$)**. |
| **carbon neutral certified product** | A third party-certified product that has demonstrated that it has reduced emissions and compensated for all the remaining emissions associated with the product in accordance with the rules of the certification scheme. |
| **carbon offsets** | An action intended to compensate for the emission of **$CO_2e$** into the atmosphere, where the emission is a result of industrial or other human activity. Offsets are achieved by buying verified carbon credits from emissions reduction products or carbon trading schemes. |
| **carbon removal** | The process of removal and storage of carbon dioxide from the atmosphere in carbon sinks (such as forests, woody plants, algae, kelp, mangroves or soils) or through carbon mineralisation. Also referred to as carbon sequestration. |
| **carbon storage** | The storage of carbon captured from the atmosphere for a period of time, resulting in a temporary reduction in the concentration of greenhouse gases in the atmosphere. |
| **Climate Active Product Certification** | An Australian Government accredited scheme that certifies that a product is carbon neutral in accordance with its rules. It provides certifications beyond the product level, however these other certifications are not considered within these **Rules**.<br><br>All Climate Active certifications require a Public Disclosure Statement, which outlines the carbon neutral claims. |
| **development scope** | The scope of development for the rating – either **new building** or **partial rebuild**. |
| **embodied carbon** | **Carbon emissions** across a building's life cycle, excluding **operational carbon**. This includes **upfront embodied carbon**, **use stage embodied carbon** and **end-of-life carbon**, measured as **$CO_2e$**. These emissions stem from the materials and products the building is made from, how they are constructed and installed, and their end-of-life process. |

| Term | Definition |
|---|---|
| **emission factor** | A factor that specifies the kilograms of greenhouse gas emissions (**$CO_2e$**) per unit (e.g. kg, tonne, $m^2$ or $m^3$) of product or material. It is used to calculate the greenhouse gas emissions associated with a product, service or activity. |
| **end-of-life carbon** | The **carbon emissions** associated with deconstruction/demolition (C1), transport from site (C2), waste processing (C3) and disposal (C4) phases of a building, infrastructure, product, or material's life cycle which occur after its use. Also see definition of building lifecycle **modules**. |
| **envelope** | Includes materials that in whole or as part of a system separate the building's interior from exterior (e.g. windows, doors, roof, exterior walls, exterior cladding and curtain wall). |
| **Environmental Product Declaration (EPD)** | A third party-verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of a product or service. **EPDs** are developed in accordance with international standards ISO 14025 and either EN 15804 or ISO 21930. |
| **external works** | Includes carparks, living areas (e.g. outdoor dining, patios, balconies), trafficable hardstands and surfaces (e.g. pathways, overflow carpark, bike cages), kerbs, concrete islands, and retaining walls.<br>Excludes soft landscaping (e.g. gardens, lawns, fields, swales), drainage and stormwater piping. |
| **formwork** | A temporary structure that is used to support wet concrete or other building materials until they are formed into a final shape. |
| **formwork (permanent)** | **Permanent formwork** remains in place after the concrete or other building material has gained adequate strength. It may contribute to the load-carrying capacity of the structure or simply contain the concrete while it is being cast and gaining strength. |
| **Fully Enclosed Covered Area (FECA)** | The sum of all such areas at all building floor levels, including basements (except unexcavated portions), floored roof spaces and attics, garages, penthouses, enclosed porches and attached enclosed covered ways alongside buildings, equipment rooms, lift shafts, vertical ducts, staircases and any other fully enclosed spaces and usable areas of the building, computed by measuring from the normal inside face of exterior walls but ignoring any projections such as plinths, columns, piers and the like which project from the normal inside face of exterior walls. |

| Term | Definition |
|---|---|
| | It shall not include open courts, light wells, connecting or isolated covered ways and net open areas of upper portions of rooms, lobbies, halls, interstitial spaces and the like which extend through the storey being computed.<br><br>Unit of Measurement: Square Metres ($m^2$).<br><br>(Source: Extracted from AIQS, Australian Cost Management Manual, Volume One, 2022) |
| **Global Warming Potential (GWP)** | As defined by the IPCC, **GWP** is a measure of how much heat a greenhouse gas traps in the atmosphere, measured as **carbon dioxide equivalent ($CO_2e$)**. It has been developed to compare the global warming impact of different gases. The **GWP** depends on how effective the gas is at trapping heat and how long it stays in the atmosphere before it breaks down.<br><br>This document uses the International Organization for Standardization and **EPD** community definition of **GWP**, whereby **GWP** is the sum of the IPCC **GWP** of all individual gases directly associated with the production of a product or asset (for further information, see the US Environmental Protection Agency). **GWP** is often broken down into the following:<br><br>a) GWP-fossil (GWP-f or GWPF): **carbon emissions** related to non-biogenic sources.<br><br>b) GWP-biogenic (GWP-b or GWPB): **carbon emissions** related to biogenic sources.<br><br>c) GWP-luluc (GWP-l or GWPL): **carbon emissions** related to **land use and land use change (LULUC)**.<br><br>d) GWP-stored (GWP-s or GWPS): **carbon removals** related to biomass from all sources.<br><br>e) GWP-total (GWP-t or GWPT): the sum of GWP-fossil, GWP-biogenic and GWP-luluc. |
| **greenfield** | Land on which no urban development has previously taken place and the land is reasonably classified as cropland, grassland, forest land or wetland. |
| **Gross Floor Area (GFA)** | **Gross Floor Area** is the sum measured in square metres ($m^2$) of the **Fully Enclosed Covered Area** and **Unenclosed Covered Area.**<br><br>(Source: Extracted from AIQS, Australian Cost Management Manual, Volume One, 2022) |

| Term | Definition |
|---|---|
| **land use and land use change (LULUC)** | **Land use** refers to the total arrangements, activities and inputs undertaken in a certain land cover type (human actions). Used in the sense of the social and economic purposes for which land is managed (e.g. grazing, timber extraction and conservation). **Land use change** refers to a change in the use or management of land by humans, which may lead to a change in land cover. |
| **Life Cycle Assessment (LCA)** | An analysis of the environmental impacts of a product, process or a service for its entire life cycle, considering the raw material extraction, production, manufacture, distribution, use and disposal of a product. |
| **measurement standard for rated area** | The standard used for determining the **Gross Floor Area (GFA)**, **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)** of a **rated premises**. For the purposes of the NABERS Embodied Carbon tool, **GFA**, **FECA** and **UCA** are measured according to the AIQS definition, as per the Australian Cost Management Manual, Volume One, 2022. |
| **mixed-use** | For the purposes of the NABERS Embodied Carbon tool, a building is **mixed-use** if more than 20 % of the **GFA** of the building is not the predominant building type. |
| **modules**<br>**(also known as building life cycle modules)** | European standards (EN 15804+A2:2019) and international standards (ISO 21930:2017) divide the life cycle of a building into **modules**:<br>a) A1 – Extracting and processing raw materials. That is, mining and refining includes processing recycled materials.<br>b) A2 – The transport of above materials to the manufacturer.<br>c) A3 – The process of manufacturing, including all materials, energy, and product inputs and manufacturing waste generation and waste processing up to the point of disposal or recycling (end-of-waste state).<br>d) A4 – Transport from the manufacturer to the building site.<br>e) A5 – Installation at the building site, including all materials, energy, and product inputs and manufacturing waste generation and waste processing up to the point of disposal or recycling (end-of-waste state). |

| Term | Definition |
|---|---|
| | f) B1 to B5 – Use, maintenance, repair, replacement and refurbishment of the building. This is excluded from the rating.<br>g) B6 – Operational energy of the building. This is excluded from the rating.<br>h) B7 – Operational water use of the building. This is excluded from the rating.<br>i) C1 to C4 – End-of-life stages of deconstruction/demolition, transport, waste processing and disposal. This is excluded from the rating. Noting that C1-C4 is embedded in A1-A5 where waste is generated.<br>j) D – Benefits beyond the system boundary associated with reuse recovery and recycling potentials. This is excluded from the rating. |
| **NABERS rating input form** | The rating input form provided by NABERS for use by **Assessors** in the calculation of accredited ratings. |
| **National Administrator** | The body responsible for administering NABERS, in particular the following areas:<br>a) Establishing and maintaining the standards and procedures to be followed in all aspects of the operation of the system.<br>b) Determining issues that arise during the operation of the system and the making of ratings.<br>c) Accrediting **Assessors** and awarding accredited ratings in accordance with NABERS standards and procedures.<br>The functions of the **National Administrator** are undertaken by the NSW Government. |
| **new building** | A building which has reached **practical completion** within the last two years and has achieved its **Occupancy Certificate**. |
| **Occupancy Certificate** | An **Occupancy Certificate** or Occupancy Permit is administered by a licenced Building Certifier when it is deemed that the building complies with various regulatory standards and codes and is safe for occupancy. |
| **Occupancy Certificate date** | The date of issue of the **Occupancy Certificate** for the building. |

| Term | Definition |
|---|---|
| **operational carbon** | The greenhouse gas emissions associated with energy used to operate a building or infrastructure. Often considered as part of energy efficiency measures and the subject of the NABERS Energy rating. |
| **partial rebuild** | A construction exercise of major significance that is comparable to prolonging a building's structural life or expanding its **GFA**. |
| **permanent formwork** | See definition for **formwork (permanent)**. |
| **practical completion** | Achieved when all necessary construction work is complete, defined by the **Occupancy Certificate date**. |
| **rated area** | The final area determined by following the process described in these **Rules**. |
| **rated premises** | The building to be rated. |
| **Rules** | Authoritative document produced by the **National Administrator** that specifies what must be covered by an **Assessor** in order to produce a rating. |
| **Ruling** | An authoritative decision by the **National Administrator** which acts as an addition or amendment to the **Rules**. |
| **stored biogenic carbon** | Carbon dioxide which is stored as **biogenic carbon** within an asset (building) for a minimum of 20 years. |
| **substructure** | The foundational support system constructed beneath ground level. Its main function is to transfer loads from the building to the underlying soil, through direct contact with the supporting terrain. |
| **superstructure** | The component of a building erected above ground level, as the primary supporting structure of the building. This does not include the **envelope**. |
| **Unenclosed Covered Area (UCA)** | The sum of all such areas at all building floor levels, including roofed balconies, open verandahs, porches and porticos, attached open covered ways alongside buildings, undercrofts and usable space under buildings, unenclosed access galleries (including ground floor) and any other trafficable covered areas of the building which are not totally enclosed by full height walls, computed by measuring the areas between the enclosing walls or balustrade (i.e. from the inside face of the **UCA** excluding the wall or balustrade thickness). |

| Term | Definition |
|---|---|
| | When the covering element (i.e. roof or upper floor) is supported by columns, is cantilevered or is suspended, or any combination of these, the measurements shall be taken to the edge of the paving or to the edge of the cover, whichever is the lesser.<br><br>**UCA** shall not include eaves overhangs, sun shading, awnings and the like where these do not relate to clearly defined trafficable covered areas, nor shall it include connecting or isolated covered ways.<br><br>Unit of Measurement: Square Metres ($m^2$).<br><br>(Source: Extracted from AIQS, Australian Cost Management Manual, Volume One, 2022) |
| **upfront embodied carbon** | The **carbon emissions** associated with the materials production and construction phases (**modules** A1-A5) of the life cycle before the building begins to be used. Also known as '**upfront carbon**'. These emissions have already been released into the atmosphere before the building is occupied or the infrastructure begins operation. |
| **use stage embodied carbon** | **Carbon emissions** associated with materials and processes needed to maintain the building or infrastructure during use, such as for refurbishments (**modules** B1-B5). |

# 3 Key concepts and procedures

## 3.1 General

As part of a NABERS rating system, **Rules** provide requirements within the specific rating tools. These **Rules** apply to any building type eligible for a NABERS rating using the NABERS Embodied Carbon rating tools.

After submitting a rating for certification, the **Assessor** must respond to all questions from the **National Administrator** within 10 working days. This is to avoid impacting the certification process.

## 3.2 Eligibility criteria

### 3.2.1 General

A building is considered eligible for a NABERS rating if all of the following eligibility criteria are met:

a) *Building type*: must be one of the building types in Section 5.3.1.

b) ***Development scope***: **new buildings** or buildings undertaking **partial rebuilds** are eligible for a NABERS rating as soon as **practical completion** is achieved.

c) *Material coverage of the premises*: the minimum material coverage for the **development scope** and building type must be met, as described in Chapter 7.

d) *Submission deadline*: the rating submission must occur within two years after **practical completion**.

### 3.2.2 Partial rebuild

An important strategy for reducing **embodied carbon** is to avoid building something. That is, to reuse something that already exists and is fit for purpose.

**Partial rebuild** is a different **development scope** to a **new building**, to enable a distinction between a building that will reuse, at least in part, an existing building.

A certain amount of construction activity is required to be considered a **partial rebuild** project. The project must be approved as a **partial rebuild** by the **National Administrator** prior to an assessment being undertaken.

When seeking approval for a **partial rebuild** certification process, the **Assessor** must provide evidence that demonstrates the extent of the construction work. This may include information such as one or more of the following:

a) The total **Gross Floor Area (GFA)** of the building being retained and the total **GFA** of any new construction.

b) The percentage of total facade area to be replaced.

c) Description of any added structural elements, such as new columns, beams, slabs, or suspended floors to the building as a whole.

d) Some evidence that the project team considered demolishing and/or building a completely **new building**, instead of adapting the building they would like to certify.

A **partial rebuild** is not a refurbishment or a project that only undertakes a scheduled fit-out replacement, because the building materials associated with such projects (i.e. fixtures, fittings, appliances, finishes, temporary partitions) are not within the material inclusions of a **new building** or **partial rebuild** certification. NABERS will investigate fit-out or refurbishment certifications as a separate assessment scope, at a later date.

**Example:** Construction extents that may indicate a project can be considered a **partial rebuild** include the following examples:

a) A building replaces at least 50% of its facade by area.

b) A building undertakes significant structural alterations to expand its **GFA** by at least 25%.

c) A fire damaged building undergoes structural shoring up and replacement of at least 50% of its facade or damaged interior by area.

### 3.2.3 Multi-building certification

It is sometimes appropriate to certify several separate buildings together, as part of one assessment. If a **rated premises** has multiple buildings in one precinct, these buildings can be rated as part of one certification process, provided that—

a) the buildings are on the same site and of similar building type and dimensions;

b) all buildings within the assessment complete construction within a two-year period of each other (noting the submission deadline requirements in Section 3.2.1);

c) the buildings have the same building owner; and

d) all buildings within the rating are designed by the same design team and constructed by the same construction team.

The **Assessor** must enter a description of the buildings into the **NABERS rating input form** and retain evidence that demonstrates the requirements in this section are met. This evidence should be in the form of a site plan and written confirmation, or other similar documentation.

If the **Assessor** is not certain that the buildings meet these criteria, the **National Administrator** must be contacted for approval before lodging the rating.

**Example:** A precinct has two high-rise tower buildings, and one much smaller low-rise building. All buildings in the precinct are not of similar dimensions, so the **Assessor** contacts the **National Administrator** before lodging the rating.

## 3.3 Rating validity

A NABERS Embodied Carbon rating defines the achievement of a building at a certain point in time, determined by the certification date. Unlike other NABERS ratings, there is no identified validity period or expiry date.

## 3.4 Standards for acceptable data and estimates

### 3.4.1 General

An assessment for an accredited NABERS Embodied Carbon rating must be based on the **acceptable data** specified in the **Rules** (including applicable **Rulings**) or as directed by the **National Administrator**.

Data must be of an acceptable standard. The decision process for determining **acceptable data** in Section 3.4.2 must be followed, except where another process is specifically allowed by a provision of these **Rules**.

**Note:** Specific procedures related to standards for **acceptable data** in individual sections of these **Rules** take precedence over the standards in Section 3.4.2. Where specific procedures are followed, the requirement for compliance with Section 3.4.2 is deemed to be satisfied.

### 3.4.2 Acceptable data

If accurate and verifiable as-built data is available, it must be used. Where a section of the **Rules** allows more than one type of data source to be used and no particular priority is given, the following order of priority applies:

a) *As-built data:* As-built data is the highest quality level. This is information gathered or validated after construction of the building. It must be verifiable against documents, such as invoices from building product suppliers, contracts, or legal documents.
b) ***Acceptable estimate**:* An estimate must be specific to the project. The estimate can be made by any appropriate building professional but must be accompanied by a list of assumptions and references. Estimates are only acceptable in certain cases, which are detailed in the relevant chapters.

For both of the above data sources, one of the below data quality conditions must be met:

1) Data obtained directly by the **Assessor** (for example, if the **Assessor** has taken pictures or measurements from the site or completed building plans).
2) Documents or other records provided by a party to an agreement or transaction which can be verified by another party to the same agreement or transaction. For example, contracts or other legal agreements, invoices and delivery dockets.
3) Documents or other records which cannot be independently verified but their authenticity and accuracy is attested to by a credible and responsible person without a conflict of interest.
4) Written information provided by a credible and responsible person, which includes the full name, position and contact details of the person giving the information.

5) Verbal information provided by a credible and responsible person, recorded in writing by the **Assessor** with the full name, position, and contact details of the person giving the information.

## 3.5 Documentation and record-keeping

### 3.5.1 Required documentation

An assessment may be based on copies of original documents such as **bills of quantities**, invoices and other records, as long as the **Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files. Access to original documents is preferred if they are available. Partial copies of original documents must be sufficient to identify the original document including date, title and file name. Monetary values may be redacted from documentation.

### 3.5.2 Record-keeping for auditing purposes

**Assessors** must keep all records on which an assessment is based.

The records kept by **Assessors** must be to such a standard that it would be possible for another **Assessor** or an **Auditor** to accurately repeat the rating using only the documents provided. This includes records of assumptions and all information and calculations used as the basis for **acceptable estimates**. The records kept must be the actual documents used for the assessment or verifiable copies. Summaries or other derivative documents that quote the original source documents are not acceptable, even if prepared by the **Assessor** from original documents.

Digital copies of documents are considered acceptable in all cases.

Records must be kept for seven years from the date the rating application was lodged and be made available for audit on request.

**Note:** **Assessors** remain responsible for ratings they have conducted, even if they move companies.

A list of the usual documentation for a rating is presented in Chapter 14, however, additional documentation may also be required to permit an **Auditor** to accurately repeat the rating using only the documents provided.

## 3.6 Alternative methodologies

**Assessors** may be required to use an alternative methodology for obtaining or interpreting data for an assessment where standard methods outlined in the NABERS **Rules** cannot be applied. At a minimum, the alternative methodology must be equivalent to the preferred method in terms of its results, accuracy and validity.

All alternative methodologies must be approved by the **National Administrator** prior to use. For further information, please contact the **National Administrator**.

# 4 Rated area

## 4.1 General

In NABERS Embodied Carbon ratings, area is used to provide a meaningful comparison of **embodied carbon** among buildings of different sizes.

The overall **rated area** is based on **Gross Floor Area (GFA)** of the **rated premises**, which is the sum of the **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)**. However, a NABERS Embodied Carbon rating requires additional measurements of several different areas within the **rated premises**, including separately measuring the **FECA** and **UCA**.

⚠ Area measurements for a NABERS Embodied Carbon rating are based on **Gross Floor Area (GFA)**, **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)** as defined by the AIQS Australian Cost Management Manual, Volume One, 2022. Other methods of measuring or defining **GFA**, **FECA** or **UCA** are not acceptable.

## 4.2 Determining GFA, FECA and UCA

### 4.2.1 General

Different areas of the **rated premises** must be determined and entered into the **NABERS rating input form** according to Section 4.4. These areas are based on the following area definitions in the AIQS Australian Cost Management Manual, Volume One, 2022:

a) **Gross Floor Area (GFA)**.

b) **Fully Enclosed Covered Area (FECA)**.

c) **Unenclosed Covered Area (UCA)**.

**Note:** **GFA** is the sum of **FECA** and **UCA**.

### 4.2.2 Standard for acceptable data

The **Assessor** must verify that the **GFA**, **FECA** and/or **UCA** have been determined in accordance with the **measurement standard for rated area**, using one of the following methods (listed in order of priority):

a) Official as-built documentation such as a Building Code of Australia report.

b) Reference to a third-party survey or to lease documentation that is explicitly based on the **measurement standard for rated area**.

c) Architectural schedules, in accordance with the **measurement standard for rated area**.

d) Direct measurement from current site plans or scaled prints, measured to the **measurement standard for rated area** (see Section 4.2.3).

e) Site measurements verified by the **Assessor** to have been done to the **measurement standard for rated area** (see Section 4.2.3).

For documentation requirements, see Section 14.2.1.

### 4.2.3 Direct measurement

If the available evidence does not show **GFA**, **FECA** or **UCA** have been measured in accordance with the **measurement standard for rated area**, the **Assessor** may carry out direct measurement from current site plans or scaled prints, or the site itself. This must be measured according to the **measurement standard for rated area**.

⚠ Refer to the definitions of **Gross Floor Area (GFA)**, **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)** in Chapter 2 for guidance on measuring in accordance with the **measurement standard for rated area**.

## 4.3 Allocating shared FECA and UCA

Where a **rated premises** shares part of its **GFA** with another building that is not part of the **rated premises**, such as a separate shared covered car park, the following process must be followed to allocate the shared area:

a) Determine the **GFA** of the **rated premises,** excluding any shared areas, as per Section 4.2.

b) Determine **GFA** of the other building(s) with which the **rated premises** shares **GFA**, excluding any shared areas, as per Section 4.2.

c) Calculate the **GFA** ratio of the **rated premises** to all building(s) that share area(s).

d) Identify all **FECA** which is shared with one or more buildings that are not part of the **rated premises**. Determine the area of the shared **FECA**, as per Section 4.2.

e) Identify all **UCA** which is shared with one or more buildings that are not part of the **rated premises**. Determine the area of the shared **UCA**, as per Section 4.2.

f) Multiply the **GFA** ratio from step c) by the **FECA** of the shared area. This is the portion of the shared **FECA** that is allocated to the **rated premises**.

g) Multiply the **GFA** ratio from step c) by the **UCA** of the shared area. This is the portion of the shared **UCA** that is allocated to the **rated premises**.

**Example:** The **rated premises** shares an internal car park with its wider precinct. The **rated premises** has a **Gross Floor Area (GFA)** of 10,000 m², excluding the car park. The other buildings in the precinct have a total **GFA** of 90,000 m², excluding the car park. Therefore, the total **GFA** of the **rated premises** and the other buildings in the precinct is 100,000 $m^2$, and the rated premises is 10% of the total 100,000 $m^2$ of **GFA**. The **FECA** of the car park is 5,000 $m^2$, so 10 % (500 $m^2$) of the car park area is added to the **FECA** of the **rated premises**.

For documentation requirements, see Section 14.2.1.

## 4.4 Entering area data

### 4.4.1 General

The **Assessor** must enter all relevant area measurements in the following sections into the **NABERS rating input form**.

For documentation requirements, see Section 14.2.1.

### 4.4.2 UCA

The **Assessor** must determine the **UCA** of the **rated premises**, excluding any shared areas, according to Section 4.2.

If there is any **UCA** shared with other buildings, this must be allocated using the method in Section 4.3.

The total **UCA** of the **rated premises** is the sum of these two values and is entered into the **NABERS rating input form** as “Unenclosed covered area (UCA)”.

### 4.4.3 FECA

The **Assessor** must determine the **FECA** of the following areas according to Section 4.2:

a) The total **FECA** of the ground floor, excluding any shared areas. This is entered into the **NABERS rating input form** as “FECA of ground floor”

b) The total **FECA** of all above ground floors, excluding any shared areas. This is calculated by summing the **FECA** of each individual floor above ground, excluding the ground floor. This value is entered into the **NABERS rating input form** as “FECA of floors above ground”.

c) The total **FECA** of all below ground floors, excluding any shared areas. This is calculated by summing the **FECA** of each individual floor below ground, excluding the ground floor. This value is entered into the **NABERS rating input form** as “FECA of floors below ground”.

d) The **FECA** of any areas shared with other buildings, allocated using the method in Section 4.3. This value is entered into the **NABERS rating input form** as “Total shared FECA”.

**Note:** **FECA** is entered for different floor levels separately because this enables the **NABERS rating input form** to check whether the quantities entered for materials are likely to be complete (see Chapter 13 for more information on this process).

### 4.4.4 GFA of car park

If the **rated premises** includes a car park that forms part of the **GFA**, the **Assessor** must determine the **GFA** of the car park according to Section 4.2. This is entered into the **NABERS rating input form** as “Area of carpark included in GFA”

**Note:** If the **rated premises** shares a car park with another building that is not part of the rating, the **Assessor** should contact the **National Administrator** for guidance.

### 4.4.5 Calculator results

Based on the entered area data, the **NABERS rating input form** will automatically calculate the total **FECA** of the **rated premises** and the **rated area**. The total **FECA** is used to determine the building services emissions (see Section 8.6), and the **rated area** is used to calculate the emissions associated with construction and commissioning energy (see Section 12.3).

# 5 Building attributes

## 5.1 General

In NABERS Embodied Carbon ratings, the site location is used to calculate the transport emissions involved in transporting materials to the building site. The building type is used to customise the benchmark to enable fair comparison between different buildings.

The building dimensions and structural methods and material are used by the **NABERS rating input form** to calculate expected material quantities and compare them to the provided inputs. This contributes to the completeness check outlined in Chapter 13.

The **Assessor** must determine the following building attributes:

a) Site location and distance from nearest major city/town.

b) Building type.

c) Building dimensions.

d) Structural methods and material.

## 5.2 Site location

For NABERS Embodied Carbon ratings, the site location is used to locate the building and determine transport emissions. The **Assessor** must verify the site address and enter it into the **NABERS rating input form**.

The **Assessor** must identify the major city nearest to the **rated premises** by road and select this city in the 'Premises details' tab of the **NABERS rating input form**.

A major city is a town that has a population above 100,000 people. A list of major cities is provided in the **NABERS rating input form**. The **Assessor** does not need to determine the population of nearby cities.

The **NABERS rating input form** provides the GPS location for the centre of the city the **Assessor** has selected. The **Assessor** must use this GPS location to determine the distance of the shortest road route from the **rated premises** to the GPS location.

The location of the **rated premises** must be verified by the **Assessor** using the **Occupancy Certificate**, land titles, development or planning documentation.

For documentation requirements, see Section 14.3.1.

## 5.3 Building type

### 5.3.1 General

The building type is used to determine the minimum material coverage for the rating. The **Assessor** must select the building type that represents the majority of the **rated premises**.

The building type of the **rated premises** must be verified by the **Assessor** using the **Occupancy Certificate**, land titles, development approval or planning documentation.

The **Assessor** must select the building type from the following list:

a) Residential, including—
   1) apartment buildings;
   2) hotels; and
   3) student accommodation.
b) Offices.
c) Hospitals.
d) Retail, including—
   1) retail stores with **GFA** larger than 1,000 $m^2$, such as standalone and big box retail;
   2) shopping centres; and
   3) supermarkets with **GFA** larger than 1,000 $m^2$.
e) Industrial, including—
   1) warehouses;
   2) storage facilities (not including self storage);
   3) cold stores; and
   4) manufacturing facilities.
f) Public buildings, including—
   1) schools;
   2) universities;
   3) art galleries and museums;
   4) sports centres; and
   5) libraries.
g) Residential aged care and retirement living.

⚠ Residential aged care and retirement living may or may not be suitable for a NABERS Embodied Carbon rating, depending on the design and layout of the premises. Please contact the **National Administrator** prior to rating a residential aged care or retirement living facility.

If the building type of the **rated premises** is not on this list, please contact the **National Administrator**.

For documentation requirements, see Section 14.3.1.

### 5.3.2 Mixed-use buildings

A building is **mixed-use** if more than 20 % of the **GFA** of the building is not the predominant building type. If a building is **mixed-use**, the **Assessor** must enter the predominant building type into the **NABERS rating input form**. The predominant building type is the type that covers the greatest proportion of **GFA** within the building.

**Example:** The **GFA** of a building is 20,000 $m^2$. 9,000 $m^2$ of the **GFA** is apartments, 6,000 $m^2$ is commercial offices, and 5,000 $m^2$ is a hotel. The predominant building type is apartment.

If more than 20 % of the **GFA** of the building is made up of types that are not eligible for a star rating (see Section 1.1.2), or not eligible to be certified at all (see Section 5.3.1), the **Assessor** must contact the **National Administrator** before starting the rating process. This is to ensure the **Assessor** understands whether the building will be eligible for a star rating, or in the case of non-eligible types, whether it can be certified at all.

The **Assessor** must enter a description of the **mixed-use** building into the **NABERS rating input form**. The description should include a summary of what building types are included in the building, and the **GFA** of each type.

**Note:** The different building types may have different material inclusion requirements. See Section 7.9.

For documentation requirements, see Section 14.3.2.

## 5.4 Building dimensions

### 5.4.1 General

The **Assessor** must enter the following information for the **rated premises**:

a) Building height.

b) Number of floors above ground and below ground.

This information is required for the **NABERS rating input form** to calculate a minimum facade area and a facade to **GFA** ratio. This enables the **NABERS rating input form** to check whether the quantities entered for facade materials are likely to be complete (see Chapter 13 for more information on this process). The information is also used to customise the benchmark to enable fair comparison between buildings of different dimensions.

### 5.4.2 Building height

Building height must be measured from the grade line to the top of the uppermost floor's roof.

### 5.4.3 Number of floors

The **Assessor** must enter the number of floors above ground, not including the floor at ground level.

Intermediate floors that do not extend over the whole ground level floor, and which are partly open and encompassed by the wider building, must not be included in the number of floors above ground. This includes mezzanine floors, and floors such as side offices for warehouses that cover only a portion of the building.

The **Assessor** must enter the number of floors below ground, not including the floor at ground level.

Where the **rated premises** consists of more than one building, with different numbers of floors, the **Assessor** must enter the average number of floors above ground and below ground.

**Note:** Section 3.2.3 requires the buildings in a multi-building certification to be of similar dimensions.

**Example:** An apartment premises consists of 3 towers on one podium. The three towers have 20, 24 and 22 storeys above ground, not including the ground floor. There are 2 floors below ground for each tower. The **Assessor** enters 22 for floors above ground and 2 for floors below ground.

### 5.4.4 Standard for acceptable data

The following are acceptable sources of evidence for the building dimensions of the **rated premises**, listed in order of priority:

a) Land titles, development or planning documentation.

b) Reference to a third-party survey or lease documentation.

c) Architectural schedules.

d) Direct measurement from current site plans or scaled prints.

e) Site measurements verified by the **Assessor**.

The **Assessor** should use the highest priority source available to verify the building height and number of floors. The **Assessor** may use different sources to verify each item as appropriate.

For documentation requirements, see Section 14.3.3.

## 5.5 Structural method and materials

The **Assessor** must determine the following for the **rated premises**:

a) Predominant frame type.

b) Predominant suspended floor type (only required for multi-storey buildings).

This information should be sought from the project's structural engineer, civil engineer, or main contractor.

The **NABERS rating input form** uses the information about the structural method and materials to determine an expected quantity range for key materials such as concrete, reinforcing steel, structural steel and timber.

For documentation requirements, see Section 14.3.4.

# 6 Land use and land use change

## 6.1 General

If a building site was a **greenfield** site when the site was purchased, then a calculation is required to determine the emissions associated with **land use and land use change (LULUC)**.

## 6.2 Process overview

The process for determining the **land use and land use change (LULUC)** is shown in Table 6.2.

**Table 6.2: Determining land use and land use change**

| Step | | Reference |
|---|---|---|
| 1 | Determine whether the site condition at purchase was **greenfield** or **brownfield**. | 6.3 |
| 2 | If the site condition was **greenfield**, identify the landscape type, maximum biomass class, and associated area. | 6.4 |
| 3 | If the site condition was **brownfield**, no further evidence is required. | 6.5 |

## 6.3 Determining site condition at time of purchase

The site condition when the site was purchased must be verified by one of the following methods, listed in order of priority:

a) Reference to a third-party survey or state land title registry, with—

   1) description of the land use; or

   2) satellite photographic evidence of the site, the year directly prior to the land being purchased.

b) Satellite imagery software showing the condition of the site at time of purchase.

c) Reference to a national database such as the Australian Government's Land use of Australia Web Map 2015-16 Australian Land Use and Management (ALUM) Classification v8 dataset.

**Note:** The Australian Government Land use of Australia Web Map uses data from 2015-16 and may be updated from time to time. Due to the data being from 2015-16 (at the time of publishing these **Rules**), it may not always be representative of the land-use directly prior to the land being acquired. However, because potential data sources are limited, this database is considered to be fit-for-purpose despite this known limitation.

On the basis of the above sources, the **Assessor** must determine whether the site was **greenfield** or **brownfield**.

If the site contained any cropland, forest, grassland, or wetland land types prior to site purchase, it must be declared to be **greenfield**.

If the site contained only settlement land, and no cropland, forest, grassland, or wetland at the time of site purchase, the site condition is **brownfield**.

For documentation requirements, see Section 14.4.1.

## 6.4 Greenfield land

### 6.4.1 General

Impacts from **land use and land use change** must be included if the site contained any **greenfield** land at time of purchase. The area of transformed land must be confirmed.

The **Assessor** must ensure that the information accurately reflects the current configuration of the **rated premises** and its land type at the time of site purchase.

### 6.4.2 Confirming the land type

The **Assessor** must confirm what land types were present within the **cadastral land parcel boundary** at the time of site purchase. One or more of the following land types must be selected:

a) *Cropland:* arable and tillage land. Includes annual croplands, dry cropland, dry horticulture, irrigated cropping, intensive horticulture and animal production, perennial croplands. Subsistence agriculture, and shifting cultivation also fall within the cropland category. Mixed systems of cropland and pastureland are also typically included as cropland, as the land's use for forage crops or grazing is temporary.

b) *Forest:* land area with woody vegetation. Broadly speaking, managed lands in this category include plantation forest, native forest, managed resource protection for various reasons including forest fire management and timber extraction. Natural forests are primary forests, and secondary forests following natural regrowth due to land abandonment or afforestation/reforestation.

c) *Grassland:* generally defined by perennial grasses and vegetation structures below the forest land threshold. Systems most commonly used for grazing of native vegetation, grazing modified pastures, irrigated pastures, and withstand regular perturbation from both grazing and fire. Land areas in this category further include rangeland, pastureland, silvopasture, native grasslands and savannahs.

d) *Wetland:* includes perennial lakes, reservoirs, swamps and major water course areas.

e) *Settlement:* developed land including urban intensive areas of residential and industrial infrastructure, including cities, towns and transport networks. Also manufacturing, industry, commercial and communications including airports. Other areas of minimal use, in transition or mining and waste and not classified as cropland, forest, grassland or wetland, as above, is also included.

### 6.4.3 Confirming the maximum biomass class

The **Assessor** must confirm which maximum biomass class (0-7) applies within the **cadastral land parcel boundary**. The approximate location of the **cadastral land parcel boundary** must be found using the state and territory maps provided in Appendix A of the Greenhouse Gas Assessment Workbook for Road Projects. If it is unclear which maximum biomass class the **cadastral land parcel boundary** is located in, the higher number must be used.

**Note:** The Greenhouse Gas Assessment Workbook for Road Projects uses 2012-2013 data to map the maximum biomass class. The data may be updated from time to time. However, because potential data sources are limited, this data is considered to be fit-for-purpose despite this known limitation.

### 6.4.4 Calculating the area

Determine the area of each land type, based on the **cadastral land parcel boundary** area of the **rated premises**.

If there is more than one land type, the **Assessor** must enter the area for each of them.

The area of each land type must be measured by one of the following methods (listed in order of priority):

a) Reference to a third-party survey, State land title registry, deposited plan or registered plan.

b) Direct measurement of the area from current plans, scaled prints or using satellite imagery software within the **cadastral land parcel boundary**.

If the **Assessor** is using satellite imagery to determine land type areas, they should refer to the 'ABARES mapping' table in the 'LULUC EFs' tab of the **NABERS rating input form**. This table maps the names of satellite imagery land types to the land types used by the **NABERS rating input form**.

The **Assessor** must ensure that the information accurately reflects the configuration of the site at the time of purchase.

For documentation requirements, see Section 14.4.1.

## 6.5 Brownfield land

**Brownfield** sites do not need to include **LULUC** impacts.

If any portion of the site is identified as **greenfield**, the site must be treated as **greenfield** and the method outlined in Section 6.4 must be applied.

# 7 Minimum material coverage

## 7.1 General

In NABERS Embodied Carbon ratings, the **Assessor** must confirm the key materials that make up the building. This chapter defines the minimum material coverage that is required for each building type.

The material coverage requirements ensure a standardised, fair, and comparable measurement of buildings of the same type.

## 7.2 Process overview

The **Assessor** must enter the minimum material inclusions that are required for their building type into the **NABERS rating input form**.

The **Assessor** must also allocate each material to the section of the building that it was used in, such as **substructure**, **superstructure** or **envelope**.

## 7.3 Material coverage for each building type

The materials that must be included for each building type are outlined in Table 7.3.

If the building type of the **rated premises** is not on this list, please contact the **National Administrator**.

**Table 7.3: Material inclusions and exclusions by building type**

| Material | Office, residential | Hospital | Public building, residential aged care and retirement living | Retail | Industrial |
|---|---|---|---|---|---|
| Aggregate, fill, asphalt, concrete kerb | ✓ | ✓ | ✓ | ✓ | ✓ |
| Concrete/masonry | ✓ | ✓ | ✓ | ✓ | ✓ |
| Reinforcement | ✓ | ✓ | ✓ | ✓ | ✓ |
| Structural framing | ✓ | ✓ | ✓ | ✓ | ✓ |

| Material | Office, residential | Hospital | Public building, residential aged care and retirement living | Retail | Industrial |
|---|---|---|---|---|---|
| Structural connections (i.e. shear plates, ground anchors) | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Permanent formwork** | ✓ | ✓ | ✓ | ✓ | ✓ |
| Roofing works (framing and cladding) | ✓ | ✓ | ✓ | ✓ | ✓ |
| External walls (framing, cladding, including balustrades, excluding internal lining) | ✓ | ✓ | ✓ | ✓ | ✓ |
| External shading, louvres, walkway coverings (including framing) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Windows/curtain wall | ✓ | ✓ | ✓ | ✓ | ✓ |
| External doors | ✓ | ✓ | ✓ | ✓ | ✓ |
| Internal walls (framing and lining, including glazed partitions) | ✓ | ✓ | ✓ | × | × |
| Stairs | ✓ | ✓ | ✓ | ✓ | ✓ |
| Flooring (e.g. carpet, tiles, access flooring, timber) | ✓ | ✓ | ✓ | ✓ | × |
| Ceiling works (framing and lining, including bulkheads and pelmets) | ✓ | ✓ | ✓ | ✓ | × |
| External pools, patios, recreational areas | ✓ | ✓ | ✓ | ✓ | ✓ |
| External pathways, access roads, hardstands and retaining walls | ✓ | ✓ | ✓ | ✓ | ✓ |
| External fencing railings | × | × | × | × | ✓ |

| Material | Office, residential | Hospital | Public building, residential aged care and retirement living | Retail | Industrial |
|---|---|---|---|---|---|
| Vertical transportation services | ✓ | ✓ | ✓ | ✓ | ✓ |
| Building services (single rate applied based on $m^2$ of total **FECA** as per Section 9.7) | ✓ | ✓ | ✓ | ✓ | ✓ |

## 7.4 Excluded materials

A number of building materials are not included in the minimum material coverage, and the **Assessor** does not need to collect any evidence for these. The following is a list of materials that are excluded for all building types:

a) Non-permanent **formwork** (temporary scaffolding, concrete forming).
b) Fixtures/fittings.
c) Minor fastener nails, bolts, screws.
d) Internal doors – including fire doors.
e) Internal balustrades.
f) Insulation (see **Note**).
g) Waterproofing membrane.
h) Door/window hardware.
i) Adhesives and sealants.
j) Mortar.
k) Signs.
l) Appliances, furniture.
m) Decorative painting and applied finishes.
n) External fixtures, drainage services.
o) Soft landscaping.
p) Shade cloth or fabric.
q) Skirting board.
r) PV and any associated mounting framing.

**Note:** Insulation is included in the material coverage by default if the insulation forms part of a structural insulated panel or plasterboard, or is embedded in some other structural component. This is because in these cases, it is not practical to separate out structural materials from insulation, and the inclusion of this integrated insulation makes a very minor difference to the rating overall. Insulation batts, boards and similar, which only serve the purpose of insulation, are not included in the minimum material coverage.

## 7.5 Allocating materials to building sections

The **Assessor** must allocate all building materials to the building section or activity that it is used for. The building sections and activities are as follows:

a) *Site preparation:* imported fill materials associated with preparing the site prior to the build, such as aggregate, engineered fill, sand and concrete for levelling (non-structural). This does not include the demolition of former buildings.

b) ***Substructure**:* the foundational support system constructed beneath ground level. Its main function is to transfer loads from the building to the underlying soil, through direct contact with the supporting terrain.

c) ***Superstructure:*** the components of a building erected above ground level as the primary supporting structure of the building, not including the **envelope**.

d) ***Envelope**:* the components that separate the inside from the outside of the building. This includes external walls, curtain wall, windows, doors, and roof. Where an **envelope** component is also required for primary support, it must be allocated to the **envelope** (e.g. precast walls that are applied as cladding should be allocated as **envelope**).

e) *Internal:* items including stairs, floors, ceilings and internal walls.

f) ***External works**:* areas outside the building **envelope** that may have a material impact on **upfront carbon** and are directly associated with the building. This includes external car parks, hardstands, external walls and fences, and access roads.

g) *Building services:* components related to delivering mechanical, electrical, plumbing and vertical transportation services.

## 7.6 Repurposed materials

Building materials may be repurposed from a previous structure at the same site or transported from another site.

Building materials that are reused onsite in their original state can be considered materials with zero **embodied carbon** and do not need to be reported in the **NABERS rating input form**. Original state includes ‘making good’.

Building materials that are reused after being reclaimed from another site can also be considered to have zero **embodied carbon**. However, they must have transport emissions added. Therefore, the **Assessor** must enter these materials into the **NABERS rating input form** according to Section 9.5.

Where repurposed building materials are not used in their original state, there may be emissions involved in shoring up or other activities. These emissions are typically insignificant to a building's rating and will therefore usually be considered out of scope. Where an **Assessor** believes that such activities may be significant, that is, greater than 1 % of total **upfront carbon** for the **rated premises**, the **Assessor** must contact the **National Administrator** before lodging the rating. The **Assessor** must provide draft calculations and reasoning for review by the **National Administrator**.

For documentation requirements, see Section 14.5.1.

## 7.7 Demolition impacts

Emissions from the demolition of any buildings or structures that existed previously are not included in the **embodied carbon** calculation.

The material coverage for the **rated premises** begins from when all the previous structures are demolished, and all rubble is cleared from the site.

## 7.8 Partial rebuild

For the rating of a **partial rebuild**, all materials in the minimum material coverage for that building type as per Table 7.3 must be included. Materials that remain unchanged from their original state do not need to be entered as per Section 7.6.

The **Assessor** must enter a brief description of the scope of works for the **partial rebuild** in the **NABERS rating input form**, outlining the key components that have been retained from the existing building. The **Assessor** must retain supporting evidence such as a planning report, Owner's Project Requirements (OPR) or written confirmation from the developer or builder.

For documentation requirements, see Section 14.5.2.

## 7.9 Mixed-use buildings

Where a **rated premises** is a **mixed-use** building, the minimum material coverage for the different building types may differ. Based on the available evidence, the **Assessor** may either—

a) apply the maximum material coverage across all relevant building types; or

b) apply the material coverage for each building type to the relevant areas.

**Example:** An **Assessor** is rating a **mixed-use** premises which contains both office and retail spaces. Table 7.3 identifies that the minimum material coverage for office buildings includes internal walls, but the minimum material coverage for retail buildings does not. The **Assessor** can either:

a) include all internal walls; or

b) only include internal walls from the office areas of the premises.

For documentation requirements, see Section 14.5.3.

## 7.10 Shared elements between buildings

Where a **rated premises** shares elements with another building that is not part of the **rated premises**, the shared elements must be proportionally allocated to the **rated premises**.

A shared element may be part of the **GFA** (e.g. a shared basement), or it might not be part of the **GFA** (e.g. a shared outdoor car park).

The method is as follows:

a) Identify all elements which are shared with one or more buildings that are not part of the **rated premises**.

b) Determine **GFA** of **rated premises,** excluding shared elements, as per Section 4.2.

c) Determine **GFA** of the other building(s) the infrastructure is shared with, excluding the shared elements, as per Section 4.2.

d) Calculate the **GFA** ratio of the **rated premises** to the other building(s).

e) Apply the **GFA** ratio to the quantity of all materials associated with the shared element. This forms part of the minimum material coverage for the **rated premises**.

**Example 1:** The **rated premises** shares an internal car park with its wider precinct. The **rated premises** has a **Gross Floor Area (GFA)** of 10,000 m², excluding the car park. The other buildings in the precinct have a total **GFA** of 90,000 m², excluding the car park. Therefore, the total **GFA** of the **rated premises** and the other buildings in the precinct is 100,000 $m^2$, and the **rated premises** is 10 % of the total 100,000 $m^2$ of **GFA**. 10 % of the quantity of all relevant materials associated with the construction of the car park are allocated to the **rated premises**.

In most cases where there is a shared element, the shared element will be part of the **GFA** of the **rated premises**, and the **Assessor** will already have the **GFA** of all buildings involved, because that is required to calculate the total **rated area**.

However, if the shared element is not part of the **GFA** of the **rated premises**, for example, it is an external area such as hardstand, the **Assessor** may not already have the **GFA** of all the other buildings that share the element. In this case, if the **Assessor** has another type of area measurement such as Gross Lettable Area (GLA), which has been carried out consistently for all of the buildings, they can use that area measurement to define what proportion of the shared element is part of the **rated premises**.

**Note:** The purpose of this option is to help the **Assessor** avoid an impractical requirement for additional area measurement work.

**Example 2:** The **rated premises**, a warehouse, shares an external car park with another warehouse. Because the car park is external, it is not part of the **GFA** of either warehouse. While the other warehouse does not have a **Gross Floor Area (GFA)** available, its Gross Lettable Area (GLA) is 5,000 m². The **rated premises** also has a GLA measurement, conducted using the same method, which totals 8,000 m². As a result, the **rated premises** should be allocated 61.5 % of the relevant materials associated with the construction of the shared car park, based on the proportion of its GLA to the total GLA (8,000 m² out of 13,000 m²).

If the **Assessor** cannot source a consistently measured area type for all buildings involved, they must contact the **National Administrator**. The **National Administrator** may accept an estimate instead of requiring the **Assessor** to conduct an area measurement for additional buildings.

Where allocating by building areas is not possible, such as in cases where the precinct was delivered over multiple years and data is not available, the **Assessor** must contact the **National Administrator** with a proposal for an alternative method before lodging the rating.

For documentation requirements, see Section 14.5.4.

## 7.11 Unique or uncommon building components

A building may have a unique or uncommon component that is not included in the minimum material coverage for that building type in Section 7.3, or in the list of exclusions in Section 7.4. If it is plausible that this component makes a significant (greater than 1 %) contribution to the total **upfront embodied carbon** of the building, the **Assessor** must contact the **National Administrator** for a **Ruling** before lodging the rating.

The **Assessor** should provide draft calculations and reasoning for review by the **National Administrator**.

**Example:**

The roof of the **rated premises** has a decorative 20 m tall steel spire. The spire is not considered structural and does not fit in any other category in the minimum material coverage listed in Table 7.3. However, based on the size of the spire, the **Assessor** believes it may make a significant contribution to the **upfront embodied carbon**. The **Assessor** undertakes an individual calculation assuming the spire is 23 tonnes and made from Company A Galvanised steel **EPD**.

The calculation suggests the steel spire has an **upfront embodied carbon** value of 71,300 kg of **$CO_2e$**. The **rated premises** as a whole has an **upfront embodied carbon** rating of 4,000,000 kg of **$CO_2e$** without the spire. The spire therefore makes a contribution of 1.75 % (71,300 ÷ (71,300 + 4,000,000) of the total **embodied carbon**.

The **Assessor** advises the **National Administrator**. The **National Administrator** approves the **Assessor**'s calculation method and rules that the spire must be included in the rating.

For documentation requirements, see Section 14.5.5.

## 7.12 Additional exclusions

### 7.12.1 General

This section gives some context on items that are excluded from the scope of a NABERS Embodied Carbon rating, that haven't already been covered in this chapter. They are explained here for context because they are managed in different ways by other **life cycle assessment**-based rating tools.

### 7.12.2 Construction equipment

Items temporarily used during construction such as **formwork**, scaffolding and hoardings, are excluded, unless they are left in place permanently. This is because these items are commonly re-used, and if allocated proportionately to a single rating are unlikely to have much impact on the overall rating. Therefore, NABERS Embodied Carbon ratings only include **permanent formwork**.

Construction equipment that is custom built for the project is excluded. This is because evidence of the material quantities that custom equipment is built from is not readily available, and the end use of custom equipment is typically unknown. For example, it may be disassembled and re-used.

### 7.12.3 Corporate functions

Capital goods such as site offices, company offices, company vehicles and IT equipment are excluded. This is because these items are not part of the **rated premises**, will likely be re-used, and are unlikely to have much impact on the overall rating.

### 7.12.4 Non-physical items

Indirect and non-material emissions such as some Scope 3 emissions categories are excluded, for example—

a) professional services for design, engineering, administration, marketing, and insurance;

b) employee commuting, business travel, use of company resources; and

c) capital goods, land assets, and investments.

These items are excluded because information is not readily available, there are many variables involved in trying to measure them, and they are unlikely to have much impact on the overall rating.

# 8 Material quantities

## 8.1 General

This chapter outlines the method the **Assessor** must use to determine the quantities of materials included in a NABERS Embodied Carbon rating.

The **Assessor** may need to carry out quantity unit conversions. This is because materials must be converted to appropriate units to enable multiplication by the relevant **emission factor**.

## 8.2 Process overview

The process for determining the material quantities shown in Table 8.2.

**Table 8.2: Determining material quantities**

| Step | | Reference |
|---|---|---|
| 1 | Obtain **acceptable data** for the quantity of each material included in the minimum material coverage for the **rated premises**, as specified in Chapter 7. | 8.3 |
| 2 | Allocate each material to the appropriate material type and category. | 8.4 |
| 3 | Check the units that the material quantities are measured in and apply an appropriate conversion factor where needed. | 8.5 |
| 4 | Enter information on building services, as applicable. | 8.6 |
| 5 | Specify whether material quantities include waste. | 8.7 |

## 8.3 Acceptable data for material quantities

### 8.3.1 General

To calculate the **carbon footprint** of the materials in the building, the quantity of each material must be determined. At a minimum, a **BoQ** must be provided as per Section 8.3.3, supplemented with as-built evidence as per Section 8.3.4. **Acceptable estimates** according to Section 8.3.5 are permitted as an alternative for certain materials until 1 January 2027.

⚠ Some **BoQs** may not include all materials used in the **rated premises**. This may be due to exclusions in the building contract, or the quantity surveyor preparing separate **BoQs** for different part-owners, or to reflect different funding arrangements within the project. The **Assessor** must ensure they have the full set of evidence for material quantities for the entire **rated premises**.

### 8.3.2 Key materials

Although the **Assessor** must obtain quantities for all materials included in the minimum material coverage, key building materials are critical to an accurate rating and thus require the highest standard of evidence. For NABERS Embodied Carbon ratings, key materials are defined as the following:

a) **Substructure**: all concrete, reinforcing steel, structural steel and structural timber in components including slabs, columns, footings and anchors in the **substructure**.

b) **Superstructure**: all concrete, reinforcing steel, structural steel, structural timber, precast concrete and aluminium in components including framing, suspended floors, columns, beams, rafters and lift shafts.

c) **Envelope**: all external wall and roof cladding and associated framing, curtain wall, windows, precast concrete or prefabricated external wall panels, and brickwork/blockwork.

d) **External works**: all asphalt, pavers, concrete and reinforcing steel, and blockwork associated with **external works**.

e) Any material that uses a product-specific **emission factor** (see Section 9.4).

**Acceptable estimates** are allowed for non-key materials, i.e. anything not listed above. See Section 8.3.5.

### 8.3.3 Bill of Quantities (BoQ)

The **Assessor** must obtain an overall summary of total quantities used in the building. This must be in the form of a **Bill of Quantities (BoQ)**.

A **BoQ** must be a full schedule of material quantities prepared by a costing specialist such as a quantity surveyor, or an estimator within a construction firm.

**BoQs** are developed and updated at various times throughout the design and construction process. The **Assessor** must use the latest version of the **BoQ** and must confirm the date and stage of development that the **BoQ** is from:

a) *As-built **BoQ***: The quantities are representative of final constructed materials, based on as-built drawings and/or models.

b) *Design stage **BoQ***: The quantities have been developed based on design-stage drawings and/or models.

For design stage **BoQs**, supplementary information may be available to outline any changes that have been tracked since the **BoQ** was created. If these changes have been thoroughly tracked by a quantity surveyor or estimator and accurately represent the building after **practical completion**, the design stage **BoQ** will be considered an as-built **BoQ**.

If the **Assessor** is unable to source a **BoQ** for the project, they must contact the **National Administrator** before lodging the rating.

For documentation requirements, see Section 14.6.1.

### 8.3.4 As-built evidence for key materials

The **BoQ** outlines the materials expected to be used in the building but does not confirm their delivery to site. Therefore, evidence must be obtained to verify which materials were delivered and used in the building for all key materials listed in Section 8.3.2.

The following are examples of **acceptable data** sources that can be used to prove which materials were used in the building:

a) Invoices.

b) Delivery dockets.

c) Purchase orders.

d) Returnable schedules. These must include the name, letterhead, or logo of the contractor, and the name of the author of the document. A date of data entry must also be included.

Each form of evidence must include the following details: the date, the specific products used, their quantities (expressed in a unit of measurement other than cost), the manufacturer's name, the product grade or specification, and the project reference (name or site address).

**Note:** Financial information, such as the cost of products, does not need to be submitted to NABERS. Costs can be redacted from the above documents.

For documentation requirements, see Section 14.6.2.

### 8.3.5 Acceptable estimates

During the development of the Embodied Carbon tool, NABERS found that it is currently difficult for **Assessors** to consistently collect as-built evidence for all materials. Therefore, NABERS is allowing design estimates for materials that have a smaller impact on the overall rating, so that industry has some time to work on solving this issue.

When the **Assessor** enters material quantities into the **NABERS rating input form**, they must select whether the evidence provided is an estimated quantity.

⚠ Design estimates will be accepted for building materials that are not listed in Section 8.3.2, until 1 January 2027.

The following types of evidence are acceptable for materials not listed in Section 8.3.2:

a) *Data from **BoQ**:* The latest version of the **BoQ** must be used as per Section 8.3.3, including any variations or changes that have been tracked during the construction process. Any allowances and extra-overs included in the **BoQ** must be included by

the **Assessor**, unless additional evidence is provided to confirm these do not form part of the final constructed building.

b) *Data from Building Information Modelling (BIM):* Models can be based on any stage of design and construction, but the latest model available must be used. Data must be accompanied by a signed, dated and company branded document from the modeller that states compliance with Chapter 8 of the **Rules**.

⚠ BIM data can yield both highly accurate and less accurate material quantities, depending on how consistently building materials have been coded throughout the building model. The **Assessor** must ensure the model is reasonably accurate. This means that the BIM model must include all areas and/or elements that contain the building materials for which the BIM model is being used as evidence. If there are known potential inaccuracies in the BIM model, the **Assessor** must keep a written record of these.

c) *Direct measurement from drawings:* The **Assessor** may determine quantities based on measuring directly from the latest drawing set. Details of these measurements, including workings and calculations, must be retained by the **Assessor** for auditing purposes.

The **Assessor** must retain all data sources in the rating documentation, which show how estimates are determined (e.g. calculations, references, assumptions). Data from the above sources must include the constructed quantities of materials, but not any allowances for waste. Waste is accounted for separately where acceptable design estimates are used. See Section 12.4.1.2 for further information.

For documentation requirements, see Section 14.6.3.

## 8.4 Matching materials to the right material categories

As the **Assessor** enters material quantities into the **NABERS rating input form**, they must ensure the quantities are allocated to the appropriate preset material type and material category.

Material type refers to a broad classification of materials, such as concrete in-situ. Material category provides a more specific classification within a material type, such as concrete with a strength range of >10 to ≤20 MPa.

The **Assessor** must allocate the correct material types and categories because—

a) if the material does not have a product-specific **emission factor**, the **NABERS rating input form** will automatically assign the correct default **emission factor** for the material, based on the category the **Assessor** has categorised it as; and

b) it ensures the **National Administrator** can audit ratings effectively.

Where the **Assessor** believes an appropriate material type and material category does not exist for the material they need to enter, ‘other’ must be selected. See Section 9.6 for further information.

## 8.5 Units and conversions

The **Assessor** may need to carry out quantity unit conversions. This is because materials must be converted to appropriate units to enable multiplication by the relevant **emission factor**.

When adding a material to the **NABERS rating input form**, there will be at least one preset unit of measurement.

There will always be a unit of mass (kg or tonnes). Some materials will have an additional unit of measurement option (e.g. $m^3$). These additional units for materials have been added because they are common practice measurements for the specific material. Where one of these additional units of measurement exists in the **NABERS rating input form**, the conversion into a common unit of measure will be automatically applied. In this case, the **Assessor** does not need to carry out additional conversions.

**Example 1:**

In the **NABERS rating input form**, the **Assessor** can choose whether to enter concrete quantities in kg, tonnes, or $m^3$.

The **emission factor** for concrete is in the units kg**$CO_2e$**/$m^3$.

All quantities the **Assessor** enters in kg and tonnes will be converted automatically into $m^3$, to calculate the **carbon footprint** of the concrete.

Where the **Assessor** has a material quantity that is not in the same unit as one of the default preset options for that material type in the **NABERS rating input form**, the **Assessor** must do one of the following, in order of priority:

a) Where clear conversion parameters are provided for that specific material in the source data the **Assessor** has access to, they must be used to convert the material to one of the preset units of mass in the **NABERS rating input form**.

b) Where the source data does not have any conversion parameters, the **Assessor** must use the common conversions list that is provided in the **NABERS rating input form**.

c) Where the source data doesn't have any conversion parameters, and the **NABERS rating input form** does not have a common conversion option for the material type, the **Assessor** must make a conservative and reasonable estimate and keep a record of what parameters and assumptions they used.

**Example 2:**

The **Assessor** has concrete quantities as 450 $m^2$ of a 180 mm thick suspended slab.

The preset material units in the **NABERS rating input form** are kg, tonnes or $m^3$.

Option a) above is used. The **Assessor** converts 450 $m^2$ of concrete into $m^3$ using the slab thickness (450 $m^2$ × 0.18 m = 81 $m^3$). The **Assessor** enters 81 into the **NABERS rating input form** and selects $m^3$ as the unit.

**Example 3:**

The **Assessor** has reinforcing steel bar and mesh quantities as 105 $m^2$ of SL92 mesh.

The preset material units in the **NABERS rating input form** are kg or tonnes.

Option b) above is used. SL92 steel reinforcing mesh is in the common conversions list in the **NABERS rating input form** as 0.0046 tonne/$m^2$. The **Assessor** calculates 105 $m^2$ × 0.0046 tonne/$m^2$ = 0.48 tonnes. The **Assessor** enters 0.48 into the **NABERS rating input form** and selects tonnes as the unit.

**Example 4:**

The **Assessor** has plasterboard for internal walls as a quantity of 12 units in the **BoQ**, with no further information. The **Assessor** checks with the project team and confirms the supplier of the plasterboard. The supplier confirms that a breakdown of the thicknesses installed is not available.

The preset material units in the **NABERS rating input form** are kg, tonnes or $m^2$ (using an assumed thickness).

Option c) above is used. The **Assessor** finds that plasterboard from the confirmed supplier is supplied in the dimensions of 2,400 mm by 1,200 mm per individual wall sheet, and calculates 2,400 mm by 1,200 mm = 2.88 $m^2$, multiplied by 12 units = 34.56 $m^2$. The **Assessor** enters 34.56 into the **NABERS rating input form** and selects $m^2$ as the unit.

For documentation requirements, see Section 14.6.4.

## 8.6 Building services

### 8.6.1 Mechanical, electrical and plumbing services

The **NABERS rating input form** uses standard default assumptions to estimate the emissions associated with mechanical, electrical and plumbing services. This is calculated based on the total **FECA** and the building services material category that the **Assessor** chooses in the materials tab of the **NABERS rating input form**.

The **Assessor** must select ‘mechanical, electrical and plumbing’ in the materials tab of the **NABERS rating input form**. They must then select the most appropriate building services material category.

If a building is **mixed-use**, the **Assessor** may need to make more than one mechanical, electrical and plumbing services entry in the materials tab, to make sure the most appropriate building services material category is selected for each portion of the **FECA**. If making more than one mechanical, electrical and plumbing entry, the **Assessor** must ensure they have covered the entire **FECA** of the **rated premises**. They must ensure they have selected the most appropriate building services material category for each portion of the **FECA**.

Individual materials such as conduit, air conditioning units and ductwork, that are used for delivering mechanical, electrical or plumbing services to the building, are not included in the minimum material coverage. These must not be entered into the **NABERS rating input form**.

### 8.6.2 Vertical transport services

Vertical transport services are also calculated by the **NABERS rating input form** using standard default assumptions. The **Assessor** must enter the number of lift cars, and the number of individual escalators and travelators. For escalators and travelators, one escalator/travelator from floor A to floor B is considered one unit.

Individual materials for vertical services must not be entered separately unless the **Assessor** has suitable evidence to override the default calculation, as explained in Section 9.7.

 For documentation requirements, see Section 14.6.5.

## 8.7 As-built quantities and construction waste

When the **Assessor** enters material quantities into the **NABERS rating input form**, they must select whether quantity provided includes or excludes wasted material. The **Assessor** must verify whether their material quantity evidence covers—

a) the full amount delivered to site, i.e. including waste; or

b) the constructed amount, i.e. excluding waste.

Any as-built material quantities entered into the **NABERS rating input form** can be assumed to be the total quantities of material delivered to site.

Any **acceptable estimates** for material quantities entered into the **NABERS rating input form** can be assumed to be the constructed quantities. This covers only the amount of material used in the building, excluding any waste generated onsite. For example, a **BoQ** typically only states the quantity of material required to build the building, and no extra allowance for waste. Where the **Assessor** believes that an **acceptable estimate** includes wastage, additional evidence is required to verify this.

For any materials where ‘waste included’ is not selected, the **NABERS rating input form** will apply an additional quantity based on the allocated waste rate. See Section 12.4 for more information on waste rates.

## 8.8 Custom assemblies

The **NABERS rating input form** contains generic facade, window and glazed door options, with accompanying default **emission factors**. The **Assessor** may choose the most appropriate of these and enter quantities based on area ($m^2$).

If the **Assessor** believes the default options do not match the materials used in the building and they have appropriate evidence outlined in this section, they can enter these materials separately and create a bespoke assembly using the custom assembly calculator.

The custom assembly calculator must only be used for assemblies that are delivered to site as an assembly. This is because the calculator includes assumed waste and energy rates associated with the manufacturing process.

When creating a custom assembly, the **Assessor** must enter all framing, glazing and cladding components into the custom assembly tab in the **NABERS rating input form** on a kg per square metre of facade/window/door basis.

The **Assessor** must provide evidence of the material make-up of the custom assembly. The following are examples of **acceptable data** sources:

a) A bill of materials provided by the manufacturer that—

   1) identifies the quantity (kg) of materials, either in quantity per square metre of facade, or the total quantity; and

   2) identifies the name and address of the building where the assembly will be installed; and

   3) for facade assemblies, is accompanied by a separate written confirmation from the builder or subcontractor confirming the total square metres of the facade.

b) Invoices, purchase orders, delivery dockets or similar for all key material inputs into the facade, accompanied by written confirmation from the builder or subcontractor confirming the total square metres of the facade.

All evidence must include—

   1) the name, letterhead, or logo of the contractor;

   2) the name of the author of the document; and

   3) a date of data entry.

For documentation requirements, see Section 14.6.6.

# 9 Emission factors

## 9.1 General

A NABERS Embodied Carbon rating calculates the carbon intensity of a **new building** or **partial rebuild**. To calculate the carbon intensity, the quantity of each included material is multiplied by the **emission factor** for that material.

If the **Assessor** does not have a product-specific **emission factor** for a material, the **NABERS rating input form** will apply a default **emission factor**.

The **Assessor** may use a product-specific **emission factor** for a material used in the building when—

a) they have appropriate evidence of the **emission factor** for that product (e.g. an **Environmental Product Declaration**); and

b) they have evidence that the specific product was used in the building, and in what quantity (e.g. a delivery docket).

## 9.2 Process overview

The **Assessor** must check whether they have the evidence required to use a product-specific **emission factor** for any of the included materials. If so, they can enter those product-specific **emission factors**. If not, default **emission factors** will be used.

**Note:** It is in the interests of the **rated premises** to use product-specific **emission factors** wherever possible because they give a more accurate representation. However, NABERS anticipates that the default **emission factors** will be used frequently, especially during the first couple of years after the rating tool is launched. This should change as more **EPDs** for specific products are published, and as project teams implement systemic processes to collect evidence of specific product use during the construction process.

## 9.3 Default emission factors

The **Assessor** must choose the appropriate type and category for each material they enter into the **NABERS rating input form** as per Section 8.4. The **Assessor** must ensure they choose the material category that is the nearest possible representation of each included material.

The **NABERS rating input form** applies default **emission factors** based on the category the **Assessor** selects for each included material.

**Note:** The default **emission factors**, along with information on how they were developed and how often they are updated, are available on the NABERS website.

## 9.4 Product-specific emission factors

### 9.4.1 General

**Assessors** can enter a product-specific **emission factor**, which will override the default **emission factor** for that material.

A product-specific **emission factor** must only be used when the **Assessor** has as-built data (see Section 8.3.4) showing that this specific material has been used in the building. The evidence must confirm the quantity of the material and identify both the material and manufacturer.

Product-specific **emission factors** cannot be used generally to refer to materials that have similar characteristics.

**Example:**

A 20 MPa concrete with 20 % supplementary cementitious material (SCM) purchased from Concrete Manufacturer A, cannot be used as a product-specific **emission factor** for 20 MPa concrete with 20 % SCM from Concrete Manufacturer B.

### 9.4.2 Standard for acceptable data

The following are acceptable sources of evidence for a product-specific **emission factor**, listed in order of priority:

a) **Emission factor** data for the specific material, derived from a third party-verified process **LCA**. This can be an **EPD** (see Section 9.4.3.1), a **carbon footprint** declaration (see Section 9.4.4) or a **Climate Active Product Certification** (see Sections 9.4.5 and 10.3 for further conditions).

b) Industry average **emission factor** data. This is an average of multiple products similar to the selected material, derived from industry average process **LCAs** such as **EPDs** and **Climate Active Product Certification**. The worst-case scenario **emission factor** must be selected (see Section 9.4.3.3).

c) A NABERS **Ruling**. An **Assessor** can seek a NABERS **Ruling** if product-specific **emission factor** data is provided by a source other than options a) or b) above, if all of the following conditions are met:

   1) It must be a process-based **LCA**.

   2) It must be third-party verified.

   3) It must consider uncertainty.

   4) The **Assessor** must seek a **Ruling** from the **National Administrator** before lodging the rating.

When using a product-specific **emission factor**, the **Assessor** must provide the following information:

1) Upfront **carbon emissions** per unit of material (process detailed in Section 9.4.3.2, 9.4.3.3, 9.4.4.2 and 9.4.5.2).

2) Carbon neutral certifications, if applicable (see Section 10.3).

3) Upfront stored carbon per unit of material, if applicable (see Section 10.4).

For documentation requirements, see Section 14.7.1.

## 9.4.3 Environmental Product Declarations (EPDs)

### 9.4.3.1 Conforming EPDs

An **EPD** can be used as evidence if all of the following conditions are met:

a) It must clearly state in its declaration that it is compliant with ISO 14025 and either EN 15804 or ISO 21930.

b) It must be independently verified. This is sometimes referred to as third-party verified.

c) It must have a valid registration number and validity date. It must be valid at the time of the last delivery to site.

d) It must be published online by an **EPD** programme.

e) An **EPD** for a specific material (i.e. not an industry average **EPD**) must refer directly to the material either by unique product name or code.

f) An industry average **EPD** must additionally comply with Section 9.4.3.3.

The **Assessor** must check the version date (if present) and publication date of the **EPD**. The **Assessor** must use the version of the **EPD** that was valid at the time when the material was delivered to the construction site.

**Note:** An **EPD** has a version date when an updated version of that **EPD** has been published.

**Example:** The **Assessor** has evidence that a certain reinforcing steel bar product was used during construction of the **rated premises**. The steel bar was delivered to the site in January 2024, but the product **EPD** available on the EPD Australasia website has a version date of 5 December 2024. The **Assessor** contacts the steel manufacturer to get the version of the **EPD** that was valid in January 2024.

### 9.4.3.2 Using emission factors from EPDs

In an **EPD**, the unit of measurement for the results must either match the unit selected in the **NABERS rating input form** or be convertible using conversion factors specific to the product and detailed in the **EPD**. This is commonly referred to as the declared unit in **EPDs.**

The **Assessor** must enter GWPT (kg**$CO_2e$**/unit of measure) for **modules** A1-A3 into the **NABERS rating input form**.

**Emission factors** for **modules** A1-A3 for the following indicators, if available, must also be taken from the **EPD**:

a) GWPF (kg**$CO_2e$**/unit of measure).

b) GWPB (kg**$CO_2e$**/unit of measure).

c) GWPL (kg**$CO_2e$**/unit of measure).

d) **Stored biogenic carbon**: see Section 10.4 for detailed instructions on how to enter **stored biogenic carbon** into the **NABERS rating input form**.

#### 9.4.3.3 Industry average EPDs

An industry average **EPD** can only be used if the material used in the **rated premises** is from a manufacturer that has contributed data to the industry average **EPD**. The material needs to match the description of the specific product category covered in the industry average **EPD**.

⚠ Manufacturing data for that manufacturer's materials must have been included in the **EPD**. If the manufacturer has only contributed financially to the development of the industry average **EPD**, that **EPD** must not be used as evidence for the material.

If an **Assessor** is using an industry average **EPD,** the **emission factor** used must be the worst-case **emission factor** in the **EPD**. The worst case **emission factor** is the average **emission factor** multiplied by the maximum variation.

The maximum variation may not be reported in the **EPD** if it is less than 10 %. If the **EPD** simply notes that the maximum variation is '<10%', the **Assessor** must multiply the average **emission factor** by 1.1.

If it is unclear to the **Assessor** whether the average **emission factor** and the maximum variation are both reported in the **EPD**, they must contact the **National Administrator** before lodging the rating.

**Example:**

The **rated premises** contains a treated sawn softwood timber from a manufacturer that is included in an Australian industry **EPD** for sawn softwood.

The industry average **EPD** states that treated sawn softwood timber has an industry average GWPT of 205 kg$CO_2e$/$m^3$ of product.

The **EPD** notes that the maximum GWPT variation across sites of the sawn softwood product is 16 % above the average.

The GWPT to be entered is calculated as 205 multiplied by 1 + 0.16 = 237.8 kg$CO_2e$/$m^3$.

#### 9.4.3.4 Versions of EN 15804 and ISO 21930, and managing differences in data, especially stored carbon data

Standards are updated and amended at times. EN 15804 has two current versions. These are EN 15804+A1 CEN (2013) and the revised version EN 15804+A2 CEN (2019).

The two versions are predominantly the same but differ in several important ways: in the choice of environmental indicators, and in how the **carbon footprint** of bio-based materials such as wood are accounted for. **EPDs** compliant with either version are valid as long as they conform to the requirements laid out in Section 9.4.3.1.

EN 15804+A1 and ISO 21930 may or may not include the stored carbon of a material in GWPT and GWPB. This potential data gap, and how to calculate stored carbon, is discussed in Section 10.4.

## 9.4.4 Carbon footprint declarations

### 9.4.4.1 Conforming carbon footprint declarations

A **carbon footprint** declaration can be used as evidence if all the following conditions are met:

a) It must be compliant with ISO 14067 or PAS 2050.

b) It must be equivalent in system boundary to EN 15804 or ISO 21930.

c) It must refer directly to the material either by unique product name or code.

d) It must be independently verified. This is sometimes referred to as third-party verified.

e) It must be dated within five years before the last delivery of the product to site.

### 9.4.4.2 Using emission factors from carbon footprints

The unit of measurement for the results in the **carbon footprint** must match the unit selected in the **NABERS rating input form**.

The **Assessor** must enter GHG total emissions (kg**$CO_2e$**/unit), equivalent to **modules** A1-A3, for the material into the **NABERS rating input form**.

The **Assessor** must also enter the following indicators (equivalent to **modules** A1-A3), if they are available:

a) GHG net fossil (kg**$CO_2e$**/unit).

b) GHG net biogenic (kg**$CO_2e$**/unit). The **Assessor** may need to calculate this, by subtracting biogenic GHG removals from total biogenic GHG emissions.

c) GHG biogenic removals (kg**$CO_2e$**/unit). This is the **stored biogenic carbon** figure in the **carbon footprint**.

d) GHG net land use change (kg**$CO_2e$**/unit). The **Assessor** may need to calculate this, by subtracting GHG land use change removals from total GHG land use change emitted.

## 9.4.5 Climate Active Public Disclosure Statements

### 9.4.5.1 Conforming Climate Active Public Disclosure Statements

A Climate Active Public Disclosure Statement can be used as evidence if all the following conditions are met:

a) It must be a product certification, specific to the material.

b) It must be certified and published by Climate Active.

c) It must be valid with a technical assessment date within one year of the last delivery of the product to site.

d) It must refer directly to the material, either by unique product name or code.

#### 9.4.5.2 Using emission factors from Climate Active Public Disclosure Statements

The unit of measurement for the results in the Public Disclosure Statement must match the unit selected in the **NABERS rating input form**. This may require conversion from a different unit. The **Assessor** must only use the conversion values that are within the Climate Active document.

The **emission factor** for the product life cycle (equivalent to **modules** A1-A3), GHG total emissions (kg**$CO_2e$**/unit), must be entered into the **NABERS rating input form**.

A Climate Active Public Disclosure Statement may not contain data in a form that enables the **Assessor** to break it down into the equivalent **modules** A1-A3. In this case, the **Assessor** must take a conservative approach and include the undivided **emission factor**, which includes transport and end-of-life emissions.

### 9.4.6 Other emissions data sources

Where an **Assessor** believes that data from a source, not covered elsewhere in this chapter, is an appropriate form of emissions evidence, they must seek a **Ruling** from the **National Administrator** before lodging the rating.

Note that a product-specific **emission factor** must—

a) be proven to be a process-based **LCA**;

b) be third-party verified;

c) consider uncertainty; and

d) cover **modules** A1-A3.

### 9.4.7 Timber product-specific emission factors

For most product types, the **Assessor** must enter total **global warming potential** (GWPT) into the **NABERS rating input form** at a minimum. If the **Assessor** uses a product-specific **emission factor** for a timber product, they must also enter a figure for **stored biogenic carbon**.

This is because GWPT is generally reported as a negative number for timber products, because **stored biogenic carbon** is deducted from the total.

The **Assessor** must enter the **stored biogenic carbon** even if the product with a product-specific **emission factor** is not from a sustainably managed source. If the product is not from a sustainably managed source, the **stored biogenic carbon** figure will be used to calculate GWPT, but it will not be included in the **carbon removals** figure for the rating.

See Sections 10.4.3 and 10.4.4 for details on how to calculate **stored biogenic carbon**.

### 9.4.8 Product-specific emission factors for custom assemblies

If the **Assessor** is claiming a product-specific **emission factor** for any of the components in a custom assembly, as per Section 8.8, evidence must be provided of that material being used by the manufacturer of the assembly, through chain-of-custody documentation specifically for the **rated premises**.

 For documentation requirements, see Section 14.7.2.

## 9.5 Repurposed materials

Where building materials are reused after being reclaimed from another site, the **Assessor** must enter these materials into the **NABERS rating input form** to ensure that transport impacts are accounted for.

To ensure no other emissions are associated with these materials, the **Assessor** must enter the following key inputs:

a) Waste rate: 0 %.

b) GWPT, GWPF, GWPB, GWPS: 0 kg$CO_2e$/unit.

c) Source location: the **Assessor** must choose the closest location to the source site.

**Note:** **Stored biogenic carbon** of repurposed materials is not included (see Section 10.4.6).

## 9.6 Materials that don't match any of the emission factor types

If the **Assessor** needs to enter a material which cannot be matched to one of the default types or sub-types in the **NABERS rating input form**, and it does not have a product-specific **emission factor**, the **Assessor** must use the default **emission factor** for the material type 'other'. The 'other' **emission factor** is a conservative average of all other default **emission factors**. This must be used where there is no appropriate source of emissions data for an unusual material. This may be the case if a new, uncommon, or innovative material has been used in the building.

If the sum of materials categorised as 'other' contributes greater than 1 % of the total **embodied carbon** of the **rated premises**, the **Assessor** must contact the **National Administrator** to determine a **Ruling** on whether the use of the 'other' **emission factor** is appropriate.

## 9.7 Building services

### 9.7.1 Mechanical, electrical and plumbing services

Emissions associated with mechanical, electrical and plumbing services are calculated automatically by the **NABERS rating input form** as described in Section 8.6.1.

Instead of entering **emission factors** or material categories for individual materials associated with mechanical, electrical and plumbing services, the **Assessor** must select the most appropriate building services category from the options provided in the **NABERS rating input form**. If the **Assessor** believes there is no appropriate building services category in the **NABERS rating input form**, they must contact the **National Administrator** before lodging the rating.

### 9.7.2 Vertical transport services

Emissions associated with vertical transport services can also be calculated automatically by the **NABERS rating input form** as described in Section 8.6.2. As an alternative, if the **Assessor** has product-specific **emission factors** as per Section 9.4 (e.g. conforming **EPDs** for the lifts), these may be used instead of the default **emission factors**.

Some lift **EPDs** report **emission factors** using tonne-kilometres (tkm). To calculate the corresponding **emission factor** for the lift as a whole, the **emission factor** per tkm must be multiplied by the total expected tkm for the lift over its service life.

The total tkm for the lift over its service life may be referred to as the transportation performance (TP) or the functional unit (FU). It is calculated by the lift manufacturer according to ISO 25745-2. The **Assessor** must be careful to look for the TP or FU which is the service life, i.e. the average load carried by the lift multiplied by the distance travelled in its lifetime, measured in tkm.

The **EPD** may publish a single **emission factor** value for tkm, or it may publish different values for different usage categories as defined in ISO 25745-2. If multiple values are published, the **Assessor** must select the usage category most appropriate to the lift installation, as detailed in the **EPD** and confirmed by the lift manufacturer or developer.

If the **Assessor** is using a product-specific **emission factor** for a lift, they must also enter the mass of the lift. This is required in order for the **NABERS rating input form** to calculate the transport emissions associated with the lift.

**Example:**

A lift **EPD** provides **emission factors** using tkm. Different **emission factors** are provided for different usage categories.

The A1-A3 **emission factor** for the lift under usage category 3 (UC3) is 9.5 kg**$CO_2e$**/tkm.
The A1-A3 **emission factor** for the lift under usage category 4 (UC4) is 3.2 kg**$CO_2e$**/tkm.

The **EPD** also specifies a total transportation performance of 1,280 tkm under UC3, and 3,810 tkm under UC4. UC4 would reflect higher intensity usage.

The A1-A3 **emission factor** for the lift under UC3 would be calculated as:

$$9.5\,kgCO_2e/tkm \times 1{,}280\,tkm/lift = 12{,}160\,kgCO_2e/lift$$

The A1-**A3 emission factor** for the lift under UC4 would be calculated as:

$$3.2\,kgCO_2e/tkm \times 3{,}810\,tkm/lift = 12{,}192\,kgCO_2e/lift$$

## 9.8 Transport to site

The **NABERS rating input form** uses default **emission factors** to calculate the emissions associated with truck, train and shipping transport.

The **Assessor** cannot alter these **emission factors** because suitable evidence is difficult to acquire and there is not typically much variation in expected emissions. If the **Assessor** believes they are dealing with a special case, such as transportation by electric vehicles, they must contact the **National Administrator** prior to lodging the rating.

Chapter 11 contains information on how transport distances are calculated.

## 9.9 Construction

### 9.9.1 Construction energy

The **NABERS rating input form** uses a default construction and commissioning energy rate to calculate construction emissions. The default rate is based on the **rated area**.

If the **Assessor** has complete records of energy use onsite, this can replace the default construction and commissioning energy rate (further information in Chapter 12).

Electricity **emission factors** are market-based by default and are applied automatically in the **NABERS rating input form**. Where renewable electricity is being claimed (see Section 12.3.3), the **emission factor** associated with its use is zero.

Diesel, petrol, and natural gas **emission factors** are also applied automatically and cannot be changed by the **Assessor**.

**Note:** Emissions for the non-renewable portion of grid electricity are calculated using the national market-based residual mix factor. There is currently no appropriate published source of state market-based residual mix factors. State market-based factors may be used in the future when there is a published source.

### 9.9.2 Construction waste

The **emission factors** for construction waste include the emissions generated during construction, transport to a waste processor, preparing or treating the waste, and disposal of the waste. The **NABERS rating input form** provides the **emission factors** for individual waste types (see Section 12.4). The **Assessor** cannot change these **emission factors**.

# 10 Carbon removals

## 10.1 General

The NABERS Embodied Carbon rating certificate includes a Carbon Removal Indicator. The Carbon Removal Indicator shows the amount of carbon removed from the atmosphere due to materials used in the **rated premises**. The purpose of this is to recognise that the use of some materials inherently removes carbon from the atmosphere, either directly through the inherent properties of the material, or indirectly through verified carbon credit schemes.

The indicator displays two types of **carbon removals**. These are—

a) **carbon offsets** associated with materials that have been certified as carbon neutral products; and

b) carbon stored in specific materials.

The Carbon Removal Indicator is a standalone indicator. **Carbon removals** are reported separately to the total **embodied carbon** result in the NABERS rating report and certificate. **Carbon removal** does not impact the NABERS Embodied Carbon star rating or the reported emissions intensity.

This chapter outlines how the emissions data entered into the **NABERS rating input form** determines the result shown in the Carbon Removal Indicator.

## 10.2 Process overview

For **carbon offsets** and **stored biogenic carbon** to be included in the Carbon Removal Indicator, the **Assessor** must enter the correct carbon neutral and stored carbon data into the **NABERS rating input form**.

## 10.3 Claiming carbon neutral materials

A material will only be recognised as carbon neutral in the NABERS Embodied Carbon rating if the **Assessor** has used a product-specific **emission factor** for a Climate Active certified product as per Section 9.4.5.

Climate Active is the only carbon neutral certification scheme that the NABERS Embodied Carbon tool currently accepts. If the **Assessor** believes any other carbon neutral certification scheme should be allowed for a material in the **rated premises**, they must contact the **National Administrator** prior to lodging the rating.

**Carbon neutral certified products** can only be claimed for individual building materials, and only cover the emissions associated with the extraction, processing and manufacture of the product (i.e. **modules** A1-A3).

For documentation requirements, see Section 14.8.1.

# 10.4 Claiming stored biogenic carbon in materials

## 10.4.1 General

The **Assessor** can only claim **stored biogenic carbon** if a timber, biomass or paper material is sourced from a sustainably managed forest, certified by one of the following schemes:

a) Forest Stewardship Council (FSC).

b) Responsible Wood as part of the Programme for the Endorsement of Forest Certification (PEFC).

If the **Assessor** believes another forest management scheme should be accepted by NABERS, they must contact the **National Administrator** before lodging the rating.

**Note:** The requirement for materials to be sourced from an established sustainable forest management certification scheme is in line with EN 15804 CEN (2019) and its sub-product category rules EN 16485:2014.

For documentation requirements, see Section 14.8.2.

## 10.4.2 Material longevity

**Stored biogenic carbon** can only be claimed when the material is to be installed and remain in the building for more than 20 years.

For this reason, **stored biogenic carbon** must not be claimed for timber flooring such as laminate, hybrid, and hardwood floors, because flooring is likely to be replaced within 20 years.

## 10.4.3 Calculating stored biogenic carbon

### 10.4.3.1 General

**Stored biogenic carbon** can be claimed for a material when the **Assessor** has entered a product-specific **emission factor** as per Section 9.4. The **EPD**, **carbon footprint** or **Climate Active Product Certification** must confirm the material is sourced from a sustainably managed forest.

When an **Assessor** uses a product-specific **emission factor** for a timber product, they must also enter a figure for **stored biogenic carbon**. See Section 9.4.7.

**Stored biogenic carbon** is reported in different ways in **EPDs**, **carbon footprints** and Climate Active Public Disclosure Statements. In addition, the **Assessor** may need to convert kg of carbon to kg**$CO_2e$**. This section contains examples of what the **Assessor** might see in each of these document types. If the **Assessor** is not able to determine the **stored biogenic carbon** based on the examples here, then they must use the default calculation method outlined in Section 10.4.4.

The amount of **stored biogenic carbon** in a material must be entered as kg**$CO_2e$**/unit of measure of the material (i.e. the material unit of measure that has been entered into the **NABERS rating input form**).

If the amount of **stored biogenic carbon** in the product is given in units of kg of carbon, the **Assessor** must convert this to kg$CO_2e$. To do the conversion, the **Assessor** must use the amount of **stored biogenic carbon** in the product, in kg, and multiply it by 44/12, the molar ratio of carbon dioxide to carbon.

**Example:**

A specific cross laminated timber (CLT) beam is being used in the **rated premises**. It has an acceptable **EPD** stating a **stored biogenic carbon** content of 0.4 kg of carbon per kg of CLT beam.

The **EPD** clearly identifies the timber is from a sustainably managed source.

The **stored biogenic carbon** is calculated multiplying 0.4 kg of carbon by the molar ratio 44/12 = 1.47 kg of $CO_2e$.

1.47 kg of $CO_2e$/kg of product is allocated to the 12 tonnes of CLT beam in the **NABERS input rating form**.

The overall **carbon storage** for the CLT beam material is 12 tonnes × 1000 kg/tonne × 1.47 kg$CO_2e$/kg = 17,640 kg$CO_2e$.

#### 10.4.3.2 Finding stored biogenic carbon in an EPD

The **stored biogenic carbon** of a product is referred to as BCC-prod in an **EPD**. **Stored biogenic carbon** content in packaging must not be included. The **stored biogenic carbon** of packaging is referred to as BCC-pack.

The use of BCC-prod and BCC-pack has only recently become consistent in **EPDs**, now that reporting of **stored biogenic carbon** content is mandatory. In older **EPDs** (e.g. those compliant with EN 15804+A1 and ISO 21930), **stored biogenic carbon** may be provided in general text in the **EPD**, or in a diagram. For the **Assessor** to use this value, the **EPD** must clearly state that the **stored biogenic carbon** is stored in the product. If the **Assessor** is unsure, they must estimate the **stored biogenic carbon** stored as per Section 10.4.4.

#### 10.4.3.3 Finding stored biogenic carbon in a carbon footprint

The **Assessor** must look for the GHG biogenic removals value in a **carbon footprint**. If this is not reported separately, the **Assessor** must calculate **stored biogenic carbon** using the method in Section 10.4.4.

#### 10.4.3.4 Finding stored biogenic carbon in a Climate Active Public Disclosure Statement

Emissions are not separated into fossil, biogenic, land use change and so forth in Climate Active Public Disclosure Statements. If the **Assessor** uses Climate Active for a timber product, they must calculate **stored biogenic carbon** using the method in Section 10.4.4.

### 10.4.4 Unknown carbon storage

Where the **Assessor** has a product-specific **emission factor** for a timber product, but the **stored biogenic carbon** is unknown, the **Assessor** must calculate an **acceptable estimate** and enter it into the **NABERS rating input form**.

The calculation for the estimated carbon content in kg**$CO_2e$** per kg of timber product is given by Formula 10.4.4. This value can then be multiplied by the timber product density to calculate an **acceptable estimate** for **stored biogenic carbon**.

**Formula 10.4.4**

$$Estimated\ carbon\ content\ (kg\ CO_2e/kg) = (1 - water\ content) \times biogenic\ carbon\ content\ of\ dry\ matter \times \frac{44}{12}$$

Where the water content is published in the **EPD**, **carbon footprint**, or Climate Active Public Disclosure Statement, this must be used. If the water content is not known, an assumed water content of 10 % must be used.

If the **EPD**, **carbon footprint**, or Climate Active Public Disclosure Statement does not state the **stored biogenic carbon** content of the absolutely dry wood, an assumed value of 50 % must be used.

Where the assumed values are used, the carbon stored in a timber product is (1 – 0.1) × 0.5 × 44/12 = 1.65 kg of **$CO_2e$**/kg of timber product, multiplied by the timber product density.

This value can then be multiplied by the timber product density to calculate an **acceptable estimate** for **stored biogenic carbon** on a density basis.

**Example 1:**

500 kg of softwood timber is used in the **rated premises** and entered into the **NABERS rating input form**.

It has an **EPD** which includes a value for GWPT, GWPF, GWPB and GWPL, but does not have a value for BCC-prod.

The **EPD** notes that the moisture content of the softwood timber is 12 % (0.12).

According to Formula 10.4.4, the carbon content value is calculated as (1 – 0.12) × 0.5 × (44/12) = 1.61 kg**$CO_2e$**/kg.

The **Assessor** enters 1.61 into the **NABERS rating input form** as the **stored biogenic carbon value**, since the **EPD** values are on a per kg of softwood timber basis.

The **NABERS rating input form** will assign a total of 805 kg**$CO_2e$** to the softwood timber used in the **rated premises** (1.61 kg**$CO_2e$**/kg × 500 kg).

**Example 2:**

20 $m^3$ of a timber product is used in the **rated premises** and entered into the **NABERS rating input form**.

It has an **EPD** confirming that its density is 400 kg/$m^3$. The **EPD** includes GWPT on a per $m^3$ basis, but does not include the moisture content or a BCC-prod value for the timber product.

Since assumed water content and **biogenic carbon** content values will be used, Formula 10.4.4 simplifies to 1.65 kg**$CO_2e$**/kg of product.

The carbon content per $m^3$ of this timber is 1.65 kg**$CO_2e$**/kg × 400 kg/$m^3$ = 660 kg**$CO_2e$** /$m^3$.

This value is entered into the **NABERS rating input form** as the **stored biogenic carbon** of the timber product.

The **NABERS rating input form** will assign a total of 13,200 kg**$CO_2e$** to the timber product (660 kg**$CO_2e$** × 20 $m^3$).

### 10.4.5 Claiming stored biogenic carbon when a NABERS default emission factor has been used

If a NABERS default **emission factor** has been used for a material, then **stored biogenic carbon** must only be claimed for that material if the **Assessor** has evidence that it is sourced from a sustainably managed forest as per Section 10.4.1. The **Assessor** must select in the **NABERS rating input form** that the material is sustainable forest certified. The default **stored biogenic carbon** value is then applied automatically.

If the **Assessor** does not have evidence that the material is sourced from a sustainably managed forest, the **NABERS rating input form** will apply zero **stored biogenic carbon** for that material.

### 10.4.6 Repurposed materials

**Carbon storage** cannot be claimed for repurposed materials. This is because it cannot be reliably proven that recycled or repurposed timber was sourced from a sustainable forest, or that the **stored biogenic carbon** within the timber has not been claimed by another project, which would potentially lead to double-counting of the stored carbon.

### 10.4.7 Cement re-carbonation

Cement re-carbonation is excluded from **carbon storage** and the Carbon Removal Indicator because it is considered in the use phase of a building. It is therefore outside the life cycle **modules** considered in this tool.

# 11 Transport emissions

## 11.1 General

Transport emissions are the emissions associated with transporting building materials from their place of manufacture to the building site. The **Assessor** may use the NABERS default transport model to calculate transport emissions or enter specific transport data.

**Note:** Section 5.2 contains information on how the **Assessor** defines the location of the **rated premises**.

## 11.2 Process overview

By default, the **NABERS rating input form** uses a transport model specific to each material type, to automatically calculate transport distances.

The **Assessor** may enter specific location data to replace the default transport model if they have appropriate evidence.

The **NABERS rating input form** applies default transport **emission factors** to the default transport model or specific location data to calculate the associated transport emissions.

## 11.3 Default transport data

In the **NABERS rating input form**, all materials are assigned with a default transport model, which automatically calculates the transport distance for the material to reach the **rated premises** based on the site location data entered as per Section 5.2.

The default transport **emission factors** (see Section 9.8) are then applied to these distances to calculate the transport emissions for each material.

The default transport model cannot be used for materials which have product-specific emission factors. If a product-specific **emission factor** is being used, the **Assessor** must enter a source location for that material as per Section 11.4.

## 11.4 Project-specific transport data

### 11.4.1 General

If the **Assessor** has appropriate evidence of the source location for a material, they may use this instead of the default transport model for the material. Default transport **emission factors** are applied to the distances travelled from the actual source location as per Section 9.8.

For materials that are sourced from within Australia, if the **Assessor** has evidence of the source location by major city, the source location may be entered into the **NABERS rating input form**.

For materials that are sourced internationally, if the **Assessor** has evidence of the source location by geographical region, the source location may be entered into the **NABERS rating input form**.

If entering a source location, the **Assessor** must select from the Australian major cities and international regions listed in the **NABERS rating input form**. The location options in the **NABERS rating input form** are based on where manufacturing typically takes place within Australia, and the location of major international ports. If the **Assessor** believes that a source location they need to use is not listed in the **NABERS rating input form**, they must contact the **National Administrator** before lodging the rating.

The following are acceptable sources of evidence for the source location of a material:

a) Invoices, receipts, or chain of custody documentation clearly showing source location.

b) A signed letter from the supplier, with supplier letterhead, clearly showing the source location.

For documentation requirements, see Section 14.9.1.

### 11.4.2 Default assemblies

In the case of default assemblies (e.g. curtain wall, windows and doors), a source location cannot be entered, and the default transport model must be used. This is because assemblies are made up of multiple materials, with a variety of source locations.

### 11.4.3 Source location when there is downstream processing

Source location is defined as the location of the exit gate of the manufacturing facility where the material is ready for distribution to a downstream fabricator or processor, intermediary party, or direct to the building site.

In the case of all treated steel and aluminium based materials, such as powder coated extruded aluminium and galvanised steel, this means that the source location is the manufacturer of the raw steel or aluminium input. The source location is not the facility where extrusion, powder coating or galvanising occurs.

### 11.4.4 Source location as defined by an EPD

Where the **Assessor** has entered a material that has an **EPD** into the **NABERS rating input form**, the source location is defined as the exit gate of the manufacturing facility according to the **EPD**. In the case of an **EPD**, the source location may be a fabricator, galvaniser, sheet metal works facility or other processor.

If an **EPD** has multiple sites of production, the closest site to the **rated premises** must be used, unless the **Assessor** knows that another production facility in the **EPD** was used for this specific material. In that case, the actual production facility location must be used.

# 12 Construction and commissioning emissions

## 12.1 General

Construction and commissioning emissions are the emissions associated with building the **rated premises** and ensuring its systems are operable and fit-for-purpose. This includes the energy use during construction, emissions associated with waste generated on-site and emissions associated with how that waste is managed to its end-of-life.

## 12.2 Process overview

The **NABERS rating input form** calculates a default construction and commissioning energy rate based on the **rated area** as per Section 12.3.1.

If the **Assessor** has complete records and evidence of energy use on-site as per Section 12.3.2, they may use this data instead of the default construction and commissioning energy rate.

Renewable energy purchased from off-site sources such as GreenPower can be entered as per Section 12.3.3.

For each material entered into the **NABERS rating input form**, the **Assessor** must identify whether the material quantity includes or excludes waste as per Section 12.4.1. This is the amount of material which is brought to site but not used in the building, because it is an offcut, out of specification, or in excess.

The **NABERS rating input form** provides a default waste rate for each material type, as outlined in Section 12.4.2.1. If the **Assessor** has a complete record of the actual waste quantity for a material type or waste stream as per Section 12.4.2.2, they may use that in place of the default waste rate.

The **NABERS rating input form** also provides a default end-of-life scenario for each material type, as outlined in Section 12.4.3.1. This takes into account the breakdown of waste being recycled, used for energy recovery or disposed to landfill.

If the **Assessor** has a complete record for the actual end-of-life scenario for a material type or waste stream as per Section 12.4.3.2, they may use this data instead of the default end-of-life scenario.

## 12.3 Energy

### 12.3.1 Default construction and commissioning energy

#### 12.3.1.1 New buildings

If the **Assessor** does not have complete evidence for construction and commissioning energy use, the **NABERS rating input form** multiplies the **rated area** by a default construction and commissioning energy **emission factor**.

#### 12.3.1.2 Partial rebuilds

The default construction and commissioning energy **emission factor**, based on the **rated area** of the premises, does not apply to **partial rebuild** ratings.

If the **Assessor** has complete records of energy used on-site, covering the entire construction period, this can be used as per Section 12.3.2.

If a default rate is required, the **Assessor** must contact the **National Administrator** for a determination on how to estimate construction and commissioning energy, before lodging the rating.

### 12.3.2 Project specific construction and commissioning energy

#### 12.3.2.1 General

If the **Assessor** has complete records of all energy used on-site, covering the entire construction period, this data may be used instead of the default rate.

The construction period starts when all previous structures are demolished, and all rubble is cleared from the site. The date that demolition ended must be determined by the **Assessor** through a letter provided by the construction contractor or an independent party such as a government works approval office. The construction period ends when the building reaches **practical completion.** The date of **practical completion** is determined by the **Occupancy Certificate date**.

Complete records of energy consumption must be obtained for all the following energy sources, if they were used on-site during the construction period:

a) Diesel.

b) Petrol.

c) Electricity (grid).

d) Off-site renewable electricity (i.e. GreenPower or other grid-sourced renewables).

e) Natural gas.

f) LPG.

**Biodiesel** is not included in the minimum energy coverage. If **biodiesel** is used on-site, the **Assessor** must contact the **National Administrator** for a **Ruling** prior to lodging the rating.

#### 12.3.2.2 Standard for acceptable data

The following are acceptable sources of evidence for site-specific construction and commissioning energy:

a) Energy bills that cover all energy use during the period in which construction and commissioning occurred.

b) Other records that clearly show the amount of energy use and the date of sale such as—

   1) purchase orders;

   2) invoices;

   3) receipts of sale; or

   4) Climate Active Building Certification (Public Disclosure Statement).

For documentation requirements, see Section 14.10.1.

## 12.3.3 Renewable energy

### 12.3.3.1 Off-site renewable electricity purchasing

Renewable electricity from the following sources can be used in a NABERS Embodied Carbon rating:

a) Accredited GreenPower.

b) Voluntarily surrendered Large-scale Generation Certificates (LGCs) from electricity generated from renewable off-site generators.

**Note 1:** Refer to Section 10.4 of *NABERS The Rules — Metering and Consumption* for more information on off-site renewable electricity purchasing options.

The following are acceptable sources of evidence for off-site renewable electricity purchasing:

1) GreenPower included on electricity bills for on-site energy consumption.

2) Separate purchases of GreenPower, also referred to as de-coupled GreenPower, accompanied by written confirmation that the GreenPower purchase was used for the project.

3) Evidence from the Renewable Energy Certificate (REC) Registry that LGCs have been voluntarily surrendered for the project.

4) LGCs included on electricity bills for on-site energy consumption, clearly marked as voluntary surrender.

**Note 2:** Renewable Energy Certificates and LGCs often appear under the ‘environmental charges’ section of an electricity bill. These are surrendered by the utility as part of their regulatory obligations and are not considered voluntarily surrendered.

The total amount of off-site renewable electricity claimed must not exceed the total amount of electricity used by the **rated premises** during the construction period.

Renewable electricity incurs an **emission factor** of zero while any remaining grid electricity uses the national market-based residual mix factor. The amount of renewable electricity claimed must not exceed the amount of grid electricity consumed.

**Note 3:** State market-based residual mix factors are not currently available. They may be incorporated into the NABERS Embodied Carbon tool in the future.

For documentation requirements, see Section 14.10.2.

#### 12.3.3.2 On-site renewable energy generation

Renewable energy generated on-site and consumed on-site (e.g. solar lights) is not entered into the **NABERS rating input form**. Use of on-site renewable energy improves the NABERS Embodied Carbon rating indirectly by reducing the amount of grid consumption.

## 12.4 Waste

### 12.4.1 General

#### 12.4.1.1 Material quantities with waste included

Where the **Assessor** identifies that construction waste is included in the stated quantity, (such as where as-built evidence is used for a material), the **NABERS rating input form** uses the material waste rate to assign a portion of the delivered material as waste. This is because the material quantity already includes waste, since it reflects the full amount of material delivered to the site.

**Example:**

The **Assessor** has invoices showing 105 tonnes of bar reinforcing steel was delivered to site.

The **Assessor** enters 105 tonnes of bar reinforcing steel into the **NABERS rating input form** and selects the option confirming that this quantity includes waste.

The **NABERS rating input form** uses 105 tonnes of bar reinforcing steel as the total amount of material brought to site. It automatically assigns 5 tonnes of the 105 tonnes as waste, because the default material waste rate for reinforcing steel is 5 % of the constructed mass, and the **Assessor** has not entered a specific waste rate for this material type.

#### 12.4.1.2 Material quantities with waste excluded

If the **Assessor** uses data that is not the total delivered material quantity, the **NABERS rating input form** uses the material waste rate to add the waste amount to the entered material quantity. This is because the material quantity does not reflect the full amount of material delivered to the site.

**Example:**

The **Assessor** has used the **BoQ** as an **acceptable estimate** for the quantity of stone pavers. The material quantity is 15 tonnes.

The **Assessor** enters 15 tonnes of stone pavers into the **NABERS rating input form** and selects the option confirming that this quantity excludes waste.

The default material waste rate for stone pavers is 10 %. The **NABERS rating input form** calculates that 16.5 tonnes of stone pavers were delivered to site (15 tonnes × 1.1). It automatically assigns 1.5 tonnes of the stone pavers as waste.

## 12.4.2 Waste rates

### 12.4.2.1 Default waste rates

If the **Assessor** does not have complete evidence of the actual waste rate of a material, the **NABERS rating input form** applies a default waste rate as a percentage of the constructed quantity for each material type.

### 12.4.2.2 Project-specific waste rates

If the **Assessor** has complete evidence of the actual waste quantity of a material, this may be used instead of the default waste rate.

The following are acceptable sources of evidence for waste rates:

a) Purchasing records such as purchase orders, invoices, and receipts of sale that clearly show the amount of material brought to site and the amount of material identified by the same name/type sent offsite as waste or for recycling.

**Example:** A purchase order might show 115 tonnes of plasterboard brought to site and 10 tonnes taken away by a waste management company. The waste rate for this material is calculated as the proportion of constructed material that is additionally wasted, and is therefore entered as 9.5 % (10 divided by 105). The material quantity entered for the plasterboard is 115 tonnes, and the ‘waste included’ option is selected.

b) Site construction waste reports or compiled waste records, including all waste collected during the construction period. This must be completed by a waste contractor, or by another person for government compliance requirements.

In the **NABERS rating input form**, waste rates can be applied by material type or by material waste class.

For documentation requirements, see Section 14.10.3.

## 12.4.3 End-of-life rates

### 12.4.3.1 Default end-of-life rates

NABERS uses default end-of-life scenarios for each material type. The end-of-life scenarios are—

a) recycle;

b) energy recovery; and

c) landfill.

Each material has a default rate for each end-of-life scenario.

#### 12.4.3.2 Project-specific end-of-life rates

If the **Assessor** has a record of the end-of-life scenario for a material type or material waste class, they may use this instead of the default scenario for that material.

When entering an end-of-life scenario for a material, the **Assessor** must ensure that the different rates for that material total to 100 % (i.e. recycle rate + energy recovery rate + landfill rate = 100 %). If the documented end-of-life scenario rates do not sum to 100 %, the **Assessor** must take a conservative approach and enter the remaining percentage as a landfill rate.

**Example 1:**

If the **Assessor** has evidence that 70 % of glass waste is sent for recycling, but no further information is available, they must assume the remaining 30 % goes to landfill.

The following are acceptable sources of evidence for end-of-life scenarios:

a) Gate/tipping weighbridge receipts.

b) Purchasing records (e.g. purchase orders, invoices, receipts of sale).

c) Signed letter from waste contractor/waste facility/recycling facility detailing the end-of-life breakdown of materials they receive from site. These can be facility-wide values from the waste contractors (i.e. they recycle 80 % of inert concrete at a facility level) but must be broken up into an identifiable waste type that matches the material type (as per the examples below).

The evidence must clearly show the waste type that corresponds to the specific material quantity and its end-of-life scenario.

**Example 2:**

10 tonnes of waste plasterboard are discarded into an inert waste skip, removed by a contractor, and sent to landfill. The contractor provides tipping weighbridge dockets indicating that the inert waste from the site was sent to landfill. Consequently, 100 % to landfill must be entered into the **NABERS rating input form**.

**Example 3:**

10 tonnes of waste plasterboard are discarded into a separate ‘plasterboard and plaster’ bulk bag, and are then removed by a contractor. The contractor provides tipping weighbridge dockets showing a discrete line item for 8 tonnes of plasterboard being sent from the site to a gypsum recycling plant. As a result, 80 % can be recorded in the **NABERS rating input form** as recycled, while the remaining 20 % must be entered as landfill.

**Example 4:**

10 tonnes of waste plasterboard mixed in with other ‘construction waste’ is being removed by a contractor and sent to a transfer station. The transfer station operator provides a signed letter that says 60 % of its construction waste is recovered for recycling and 40 % is sent to landfill, noting that plasterboard is considered recyclable and contributes to the facility’s 60 % inert rubble recycling rate. 60 % can therefore be entered as recycled and 40 % entered as landfill.

For documentation requirements, see Section 14.10.4.

# 13 Rating data completeness check

## 13.1 General

When the **Assessor** has finished entering data into the **NABERS rating input form**, a completeness check takes place automatically. The completeness check shows the **Assessor** if there are any inputs that are outside the normal expected range, so that the **Assessor** can double-check whether they have entered all the rating data correctly.

This chapter outlines the process of the completeness check. The purpose of the check is to help ensure the **Assessor** enters complete and accurate data.

## 13.2 Material completeness check

A material completeness check is automatically done by the **NABERS rating input form**. It checks the material quantities and other completeness check information added by the **Assessor** against the expected ranges of material quantities for a similar building. The expected ranges of material quantities are calculated from the following building attributes:

a) Building dimensions (Section 5.4).

b) Structural methods and materials (Section 5.5).

## 13.3 Justification of failed completeness check

The purpose of the completeness check is to help the **Assessor** ensure their data is accurate and complete.

Where the completeness check indicates that data does not meet the expected range or value, the **Assessor** must enter a brief description detailing why they believe this is the case, or why a result outside the expected range is reasonable for this building.

For documentation requirements, see Section 14.11.1.

# 14 Documentation requirements for accredited ratings

## 14.1 General

The **Assessor** must keep all records on which an assessment is based, including any specific guidance or approvals given by the **National Administrator**. Data retained for audit must be in a form which facilitates reviews and makes anomalies easily apparent.

Access to original documents is preferred if they are available. Copies of original documents may be used as evidence as long as the **Assessor** is satisfied that they are, or can be verified to be, true and complete records of the original documents or files.

Information may be contained in many different formats. The purpose of the documentation is to provide an acceptable, credible source of the required information. In some instances, specific document types may be unnecessary for an individual rating. However, under different rating circumstances, the specific document types may carry multiple items of information required for the rating. The qualifying factor is that the documentation contains the required information from an acceptable source.

The information in Sections 14.2 to 14.11 is required for a rating. It is organised based on the divisions of previous chapters (see Chapters 4 to 13). All the required information should be obtained from the building owner or main contractor.

Individual ratings may require additional information or documentation depending on the individual circumstances of the **rated premises**.

All evidence must clearly link to the project, with details of the project's name and/or address, and must be dated.

## 14.2 Documentation required for Chapter 4: Rated area

| Topic | Requirements | Documentation |
|---|---|---|
| 14.2.1 Rated area | Section 4.2<br>Section 4.3<br>Section 4.4 | *Required information*<br>The **Assessor** must retain evidence of the **Gross Floor Area (GFA)**, **Fully Enclosed Covered Area (FECA)** and **Unenclosed Covered Area (UCA)** determined to the **measurement standard for rated area** for the following, as applicable:<br>a) The **rated premises**. |

| | | |
|---|---|---|
| | | b) **FECA** and **UCA** shared with other buildings.<br>c) **GFA** of other buildings which share area with the **rated premises**.<br>d) **GFA** of car parks.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following, in order of priority:<br>1) Official as-built documentation such as a Building Code of Australia report.<br>2) Third-party surveys or lease documentation.<br>3) Architectural schedules.<br>4) Direct measurement from current site plans or scaled prints.<br>5) Site measurements verified by the **Assessor**.<br>All of the documentation listed above must be made to/based on the **measurement standard for rated area**. |

## 14.3 Documentation required for Chapter 5: Building attributes

| Topic | Requirements | Documentation |
|---|---|---|
| 14.3.1 Site location and building type | Section 5.2<br>Section 5.3.1 | *Required information*<br>The **Assessor** must retain evidence of the site address and the building type.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) **Occupancy Certificate**.<br>b) Land titles.<br>c) Development approval or planning documentation. |
| 14.3.2 Mixed-use buildings | Section 5.3.2 | *Required information*<br>The **Assessor** must retain evidence of what building types are included in the building, and the **GFA** of each type.<br>*Documentation examples* |

| | | |
|---|---|---|
| | | Documentation that can be used as evidence includes the following:<br>a) Official as-built documentation such as a Building Code of Australia report.<br>b) Third-party surveys or lease documentation.<br>c) Architectural schedules.<br>d) Direct measurement from current site plans or scaled prints.<br>e) Site measurements verified by the **Assessor**.<br>**Note:** The **GFA** of each building type does not need to be verified according to Section 4.2.2, as long as the overall **GFA** is verified. |
| 14.3.3 Building dimensions | Section 5.4 | *Required information*<br>The **Assessor** must retain evidence for the following:<br>a) Building height.<br>b) Number of floors.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following, in order of priority:<br>1) Land titles, development approval or planning documentation.<br>2) Third-party surveys or lease documentation.<br>3) Architectural schedules.<br>4) Direct measurement from current site plans or scaled prints.<br>5) Site measurements verified by the **Assessor**. |
| 14.3.4 Structural methods and materials | Section 5.5 | *Required information*<br>The **Assessor** must retain evidence detailing the predominant frame type and predominant suspended floor type.<br>*Documentation examples* |

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|---|---|---|
| | | Documentation that can be used as evidence includes correspondence with the project's structural engineer, civil engineer or main contractor. |

## 14.4 Documentation required for Chapter 6: Land use and land use change

| Topic | Requirements | Documentation |
|---|---|---|
| 14.4.1 Land use and land use change | Section 6.3<br>Section 6.4 | *Required information*<br>The **Assessor** must retain evidence for the following:<br>a) Whether a site is **brownfield** or **greenfield**.<br>b) The pre-construction land type(s), if the site is **greenfield**.<br>c) The site maximum biomass class, if the site is **greenfield**.<br>d) The site area for each land type, if the site is **greenfield**.<br>*Documentation examples*<br>Documentation that can be used as evidence for the site condition and land type includes the following, in order of priority:<br>1) Third-party survey or state land title registry with description of the land use or satellite photographic evidence, the year directly prior to the land being acquired.<br>2) Satellite imagery software showing the extent of the site within the **cadastral land parcel boundary**.<br>3) National database such as the Australian Government's Land use of Australia Web Map.<br>Documentation that can be used as evidence for the maximum biomass class includes the state or territory map from Appendix A of the Greenhouse Gas Assessment Workbook for Road Projects.<br>Documentation that can be used as evidence for the site area includes the following, in order of priority:<br>i) Third-party survey, State land title registry, deposited plan or registered plan. |

| | | |
|---|---|---|
| | | ii) Direct measurement from current plans, scaled prints or using satellite imagery software within the **cadastral land parcel boundary**. |

## 14.5 Documentation required for Chapter 7: Minimum material coverage

| Topic | Requirements | Documentation |
|---|---|---|
| 14.5.1 Repurposed materials | Section 7.6 | *Required information*<br>The **Assessor** must retain evidence of all material quantities that have been reused from another site.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Invoices.<br>b) Delivery dockets.<br>c) Purchase orders.<br>d) Returnable schedules, that must include name of letterhead or logo of the contractor, author (must be appropriate sub-contractor representative), and date of data entry.<br>Documentation must identify the specific products used, source location, material quantity, unit of measure and the building section it was used in. |
| 14.5.2 Partial rebuild | Section 7.8 | *Required information*<br>The **Assessor** must retain evidence supporting the scope of the **partial rebuild** and their summary of the reused components.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Planning report.<br>b) Owner's Project Requirements (OPR).<br>c) Written confirmation from the developer or builder. |

| | | |
|---|---|---|
| 14.5.3 Mixed-use buildings | Section 7.9 | *Required information*<br>The **Assessor** must retain evidence to support their exclusion of any materials that are not required for certain building types.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) **BoQ**, showing material quantities split by building types or areas that relate to the different building types.<br>b) Building information modelling accompanied by a signed, dated and company branded document stating compliance with Chapter 8 of the **Rules**. The latest BIM model available must be used.<br>c) Direct measurement, using mark-ups of the plans/wall schedules, to show how the **Assessor** determined the quantities.<br>d) As-built quantity evidence from the material supplier, showing which area of the building the material was delivered for. For example, if different parts of the building were constructed at different times, the delivery date could be reasonable evidence of what was used in a certain portion of the building.<br>e) An area weighting based on as-built quantity evidence. |
| 14.5.4 Shared elements between buildings | Section 7.10 | *Required information*<br>The **Assessor** must retain evidence of the **Gross Floor Area (GFA)** or other consistent area measurement for the following, if applicable:<br>a) The **rated premises**, excluding shared elements.<br>b) Other buildings which share elements with the **rated premises**, excluding shared elements.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following, in order of priority: |

| | | |
|---|---|---|
| | | 1) Official as-built documentation such as a Building Code of Australia report.<br>2) Third-party surveys or lease documentation.<br>3) Architectural schedules.<br>4) Direct measurement from current site plans or scaled prints.<br>5) Site measurements verified by the **Assessor**.<br>Documentation for **GFA** must be made to/based on the **measurement standard for rated area**. |
| 14.5.5 Unique or uncommon building components | Section 7.11 | *Required information*<br>Any material that is not included in the minimum material coverage, but the **Assessor** expects may have a significant impact, must be approved by the **National Administrator** before lodging the rating.<br>*Documentation examples*<br>Documentation that can be used as evidence must include—<br>a) the **Assessor**'s calculations and supporting evidence; and<br>b) written approval from the **National Administrator**. |

## 14.6 Documentation required for Chapter 8: Material quantities

| Topic | Requirements | Documentation |
|---|---|---|
| 14.6.1 Bill of Quantities (BoQ) | Section 8.3.3 | *Required information*<br>The **Assessor** must retain evidence of all material quantities used in the **rated premises**. The document must identify accurate material quantities in appropriate units of measure (not just dollar values). It must be prepared by a costing specialist such as—<br>a) a quantity surveyor; or<br>b) an estimator within a construction firm.<br>*Documentation examples* |

| | | |
|---|---|---|
| | | Documentation that can be used as evidence includes the following:<br>1) As-built **BoQ**.<br>2) Design stage **BoQ**.<br>3) Design stage **BoQ** with sufficient tracked changes to be considered as-built. |
| 14.6.2 As-built evidence for key materials | Section 8.3.4 | *Required information*<br>The **Assessor** must retain evidence of delivery for all key materials.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Invoices.<br>b) Delivery dockets.<br>c) Purchase orders.<br>d) Returnable schedules, including name of letterhead or logo of the contractor, author (must be appropriate sub-contractor representative), and date of data entry.<br>Documentation must be dated and state the specific products used, the quantities in a unit of measurement other than cost, the name of the manufacturer, the product grade or specification, and the project reference, name or site address. |
| 14.6.3 Acceptable estimates | Section 8.3.5 | *Required information*<br>The **Assessor** must retain evidence of all **acceptable estimates**, including how they were calculated, or the reference used to determine them.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) **BoQ**.<br>b) Building information modelling accompanied by a signed, dated and company branded document stating compliance with Chapter 8 of the **Rules**. |

| | | |
|---|---|---|
| | | c) Direct measurement from drawings including workings, calculations, and any assumptions. |
| 14.6.4 Units and conversions | Section 8.5 | *Required information*<br>The **Assessor** must retain evidence of all conversions and parameter assumptions as they relate to any material quantity being converted manually by the **Assessor**.<br>*Documentation examples*<br>Documentation that can be used as evidence includes **Assessor** notes. |
| 14.6.5 Building services | Section 8.6 | *Required information*<br>The **Assessor** must retain evidence of the number of lift cars and individual escalators and travelators, unless product-specific **emission factors** are used for vertical transport services.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) **BoQ**.<br>b) Floor plans.<br>c) Purchase orders. |
| 14.6.6 Custom assemblies | Section 8.8 | *Required information*<br>The **Assessor** must retain evidence of the material make-up of the custom assembly.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) A bill of materials provided by the manufacturer that—<br>1) identifies the quantity (kg) of materials, either in quantity per square metre of facade, or the total quantity; and<br>2) identifies the name and address of the building where the facade will be installed; and |

| | | |
|---|---|---|
| | | 3) is accompanied by a separate written confirmation from the builder or subcontractor confirming the total square metres of the facade.<br>b) Invoices, purchase orders, delivery dockets or similar for all key material inputs into the facade, accompanied by written confirmation from the builder or subcontractor confirming the total square metres of the facade.<br>All documentation must include—<br>1) the name, letterhead, or logo of the contractor;<br>2) the name of the author of the document; and<br>3) a date of data entry. |

## 14.7 Documentation required for Chapter 9: Emission factors

| Topic | Requirements | Documentation |
|---|---|---|
| 14.7.1 Product-specific emission factors | Section 9.4 | *Required information*<br>For all materials using product-specific **emission factors**, the **Assessor** must retain evidence of—<br>a) the product-specific **emission factor**; and<br>b) the claimed material being used in the **rated premises** and its quantity.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>1) Compliant **EPD**, **carbon footprint** or Climate Active documentation.<br>2) As-built evidence as per Section 14.6.2. |
| 14.7.2 Custom assemblies | Section 9.4.8 | *Required information*<br>If claiming product-specific **emission factors** for facade material, the **Assessor** must retain evidence of—<br>a) the product-specific **emission factor**;<br>b) the claimed material being used in the **rated premises**; and either— |

| | | |
|---|---|---|
| | | 1) the quantity of materials per square metre of facade; or<br>2) the total quantity of materials used in the facade and the total square metres covered by the facade.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>1) Compliant **EPD**, **carbon footprint** or Climate Active documentation.<br>2) Evidence of material use as per Section 14.6.2. |

## 14.8 Documentation required for Chapter 10: Carbon removals

| Topic | Requirements | Documentation |
|---|---|---|
| 14.8.1 Claiming carbon neutral materials | Section 10.3 | *Required information*<br>The **Assessor** must retain evidence showing that the specific material was used in the building and was a **carbon neutral certified product** valid with a technical assessment date within one year of the delivery date.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Climate Active Public Disclosure Statement for a carbon neutral product certification.<br>b) As-built evidence as per Section 14.6.2. |
| 14.8.2 Claiming carbon storage in materials | Section 10.4 | *Required information*<br>The **Assessor** must retain evidence showing that the specific material used in the building was a product sourced from a sustainably managed forest.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Compliant **EPD**.<br>b) FSC or PEFC certification details, including license number. |

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|---|---|---|
| | | c) As-built evidence as per Section 14.6.2.<br>d) A record of any calculations the **Assessor** has carried out as per Section 10.4.3 or Section 10.4.4. |

## 14.9 Documentation required for Chapter 11: Transport emissions

| Topic | Requirements | Documentation |
|---|---|---|
| 14.9.1 Source location | Section 11.4 | *Required information*<br>If overriding default transport distances for a material, the **Assessor** must retain evidence of the source location of the material. The source location must be defined as per Section 11.4.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Invoices, receipts, or chain of custody documentation clearly showing source location.<br>b) A signed letter from the supplier, with supplier letterhead, clearly showing the source location.<br>c) **EPD** showing source location. |

## 14.10 Documentation required for Chapter 12: Construction and commissioning emissions

| Topic | Requirements | Documentation |
|---|---|---|
| 14.10.1 Project-specific construction and commissioning energy | Section 12.3.2 | *Required information*<br>If overriding the default construction and commissioning energy emissions, the **Assessor** must retain evidence that details—<br>a) the total quantity of energy used; and<br>b) the dates for the start and end of the construction period (**practical completion**).<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following: |

| | | |
|---|---|---|
| | | 1) Energy bills that cover all energy use during the period in which construction and commissioning occurred.<br>2) Other records from a third party that clearly show the quantity of energy use and the time period of use or sale (e.g. purchase orders, invoices, receipts of sale, Climate Active Public Disclosure Statements).<br>3) A letter provided by the construction contractor or an independent party such as a government works approval office, showing the date the construction period started.<br>4) **Occupancy Certificate**. |
| 14.10.2 Off-site renewable electricity purchasing | Section 12.3.3.1 | *Required information*<br>The **Assessor** must retain evidence of any off-site renewable energy purchases, and evidence that the renewable electricity was allocated to the **rated premises** for the period in which construction and commissioning occurred.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Electricity bills for the site address during the construction period, clearly indicating a quantity of accredited GreenPower or voluntary surrender of LGCs.<br>b) For separate GreenPower purchases—<br>1) proof of the GreenPower purchase;<br>2) invoice(s) that clearly document GreenPower accredited energy, or other documentation from the GreenPower Provider confirming that the energy is accredited through the GreenPower program; and<br>3) written confirmation from the developer or construction company that the GreenPower purchase was used for the **rated premises** for the period in which construction and commissioning occurred. |

| | | |
|---|---|---|
| | | c) For separate voluntary surrender of LGCs for a single site, evidence from the REC Registry of confirmed LGC surrender including—<br>1) date of purchase;<br>2) date of LGC creation;<br>3) volume of LGCs surrendered;<br>4) LGC certificate numbers (or range);<br>5) site address; and<br>6) period of electricity consumption for which the LGCs have been surrendered.<br>d) For LGCs surrendered in bulk for multiple premises or periods—<br>1) evidence from the REC Registry of confirmed LGC surrender including date of purchase, date of LGC creation, volume of LGCs surrendered and LGC certificate numbers (or range); and<br>2) evidence that an independent third-party audit has been conducted to confirm the allocation of LGCs to different sites or periods.<br>**Note:** The address of the building and period of electricity consumption can be entered in the 'surrender note' field of the REC Registry. |
| 14.10.3 Project-specific waste rates | Section 12.4.2.2 | *Required information*<br>If overriding default construction waste rates, the **Assessor** must retain evidence that details the quantity of material brought to site and the quantity of material leaving site as waste.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Purchasing records (e.g. purchase orders, invoices, receipts of sale) that clearly show the amount of material brought to site and the amount of material identified by the same name/type sent offsite. |

| | | |
|---|---|---|
| | | b) Construction waste reports or compiled waste records completed by a waste contractor or for government compliance. |
| 14.10.4 Project-specific end-of-life rates | Section 12.4.3.2 | *Required information*<br>If overriding default end-of-life scenarios for a material, the **Assessor** must retain evidence of the end-of-life pathways taken by the individual material and the percentage of each scenario rate.<br>*Documentation examples*<br>Documentation that can be used as evidence includes the following:<br>a) Gate/tipping weighbridge receipts.<br>b) Purchasing records (e.g. purchase orders, invoices, receipts of sale for waste tipping/management).<br>c) Signed letter from waste contractor/waste facility/recycling facility detailing the end-of-life breakdown of materials they receive from site. |

## 14.11 Documentation required for Chapter 13: Rating data completeness check

| Topic | Requirements | Documentation |
|---|---|---|
| 14.11.1 Justification of failed completeness check | Section 13.3 | *Required information*<br>The **Assessor** must retain evidence that supports their explanation for the failed completeness check.<br>*Documentation examples*<br>Any documentation that has been provided as part of evidence in Sections 14.2 to 14.10 can be included, such as—<br>a) as-built **BoQ**;<br>b) drawings;<br>c) schedules, receipts, etc. |

# Appendix A List of changes

The following tables list the changes to the content of *NABERS The Rules — Embodied Carbon v1.0* (November 2024) in order to produce this version 2.0.

| **Chapter 1: Introduction** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 1.1 General | 1.1.1 About NABERS | The original content from Section 1.1 General has been moved into a subsection 1.1.1 *About NABERS*, to allow for the addition of a new subsection 1.1.2 *Building types with an available star rating*. |
| N/A | 1.1.2 Building types with an available star rating | New section. |
| 1.4 How to use this document | | Removed V1.0 boxes here and elsewhere in the document. |
| 1.5 What is new in this version | | Included latest changes. |
| 1.6 Related documents | | Added *ISO 25745-2:2015* and *Greenhouse Gas Assessment Workbook for Road Projects*. |

| **Chapter 2: Terms and definitions** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 2 Terms and definitions | | Added a definition for mixed-use buildings. |

| **Chapter 3: Key concepts and procedures** |
|---|

| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
|---|---|---|
| 3.2.1 Eligibility criteria | | Minor wording updates. |
| 3.2.3 Multi-building rating | 3.2.3 Multi-building certification | Added more details on eligibility for a multi-building certification. |
| 3.4 Standards for acceptable data and estimates | | Minor wording updates. |

| **Chapter 4: Rated area** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 4.1 General | | Updated to clarify that as part of the GFA measurements, the Assessor must determine FECA, UCA, and the other area measurements as noted in Chapter 4. |
| 4.2 Process overview | N/A | Section removed. |
| 4.3 Determining Gross Floor Area | 4.2 Determining GFA, FECA and UCA | Updated heading and text to reflect broader focus on different measurement types. |
| N/A | 4.2.1 General | New section. |
| 4.3.1 Standard for acceptable data | 4.2.2 Standard for acceptable data | Renumbered section. |
| 4.3.2 Direct measurement | 4.2.3 Direct measurement | Renumbered section. |
| 4.3.3 Mixed-use buildings | N/A | Removed section. |

| | | |
|---|---|---|
| 4.4 Allocating shared GFA | 4.3 Allocating shared FECA and UCA | Updated heading and methodology to reflect the new requirement to calculate FECA and UCA separately. |
| 4.5 Calculate the rated area | 4.4 Entering area data | This has been updated with detail on how the Assessor must determine UCA (Section 4.4.2), FECA (Section 4.4.3), and car park GFA (Section 4.4.4), and how the NABERS rating input form processes this data to arrive at total FECA and total rated area (Section 4.4.5). |
| 4.6 Determining GFA of internal car parks | N/A | Replaced by Section 4.4.4 *GFA of car park*. |

| **Chapter 5: Building attributes** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 5.1 General | | Removed soil conditions and area of external hardstand from required building information. |
| 5.2 Site location | | Updated so that the Assessor must find the distance from the building site to the city centre of the nearest major city, instead of the GPO of the nearest major city. |
| 5.3.1 General | | Updated the retail building type to note that GFA must be larger than 1,000 $m^2$ for retail stores and supermarkets.<br>Updated the industrial building type to note that self storage facilities cannot be rated. |
| 5.3.2 Mixed-use buildings | | All new content. This section now contains the procedure for figuring out if a building is mixed-use, and what documentation is required. |
| 5.4 Soil conditions | N/A | Removed section. |
| 5.5 Building dimensions | 5.4 Building dimensions | Renumbered section. |

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|---|---|---|
| 5.5.1 General | 5.4.1 General | Removed requirement for measuring GFA of different floors – this is now in Chapter 4. |
| 5.5.3 Number of floors | 5.4.3 Number of floors | The method for determining number of floors has changed. |
| 5.5.4 GFA | N/A | Removed section – this information is now in Chapter 4. |
| 5.5.5 Standard for acceptable data | 5.4.4 Standard for acceptable data | Removed reference to GFA, as that is now covered in Chapter 4. |
| 5.6 Area of external carpark, hardstand and pavement | N/A | Removed section. |
| 5.7 Structural method and materials | 5.5 Structural method and materials | Renumbered section. |

| **Chapter 6: Land use and land use change** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 6.4.1 General | | Minor wording updates. |
| N/A | 6.4.3 Confirming the maximum biomass class | New section. |
| 6.4.3 Calculating the area | 6.4.4 Calculating the area | Added information on how to convert satellite imagery land types to the land types required for a NABERS rating. |

| **Chapter 7: Minimum material coverage** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |

| | | |
|---|---|---|
| 7.3 Material coverage for each building type | | Some changes to the detail of *Table 7.3: Material inclusions and exclusions by building type*, such as minor changes to what materials are included, and improved material descriptions.<br>Materials that are not required for any building type have been removed from the table and listed in Section 7.4. |
| N/A | 7.4 Excluded materials | New section. |
| 7.4 Allocating materials to building sections | 7.5 Allocating materials to building sections | Some information on building services has been removed, because it is covered in Section 8.6. |
| 7.5 Repurposed materials | 7.6 Repurposed materials | Renumbered section. |
| 7.6 Demolition impacts | 7.7 Demolition impacts | Renumbered section. |
| 7.7 Partial rebuild | 7.8 Partial rebuild | Renumbered section. |
| 7.8 Mixed-use buildings | 7.9 Mixed-use buildings | All new content. This section now contains the instructions for ensuring the correct material coverage in a mixed-use building. |
| 7.9 Shared elements between buildings | 7.10 Shared elements between buildings | Renumbered section. |
| 7.10 Materials of likely significance | 7.11 Unique or uncommon building components | Updated heading. |
| 7.11 Exclusions | 7.12 Additional exclusions | Updated heading. |

## Chapter 8: Material quantities

| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
|---|---|---|
| 8.3.2 Key materials | | Updated the key material descriptions to make them clearer. |
| 8.3.4 As-built evidence for key materials | | Minor wording updates. |
| 8.3.5 Acceptable design estimates | 8.3.5 Acceptable estimates | Added clarification that the Assessor must state whether material quantities are estimated. |
| 8.4 Matching materials to the right material categories | | Minor wording updates. |
| 8.5 Units and conversions | | Minor wording updates. |
| 8.6 Building services | | This section has been re-organised into two sections: 8.6.1 *Mechanical, electrical and plumbing services*, and 8.6.2 *Vertical transport services*. Section 8.6.1 contains new information on how to enter MEP services into the NABERS rating input form, and how to handle MEP in mixed-use buildings. |
| 8.7 As-built quantities and construction waste | | This section has been completely revised, with all new content. |
| N/A | 8.8 Custom assemblies | New section. |

| **Chapter 9: Emission factors** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 9.4.1 General | | Minor wording updates. |
| 9.4.2 Standard for acceptable data | | Removed option for Published emissions data from a Climate Active Public Disclosure Statement. Hybrid LCAs are no longer permitted under a NABERS Ruling. Product-specific emission factors no longer need to be publicly available under a NABERS Ruling. |

| | | |
|---|---|---|
| 9.4.3.1 Conforming EPDs | | Edited to require an EPD to be valid at the time when the material was delivered to the construction site. |
| 9.4.3.3 Industry average EPDs | | Edited to note that if an industry average EPD doesn't contain the maximum variation, the Assessor must assume it is 10%. |
| 9.4.4.1 Conforming carbon footprint declarations | | Edited to require carbon footprint to be dated within 5 years of the last delivery of the product to site. |
| 9.4.5.1 Conforming Climate Active Public Disclosure Statements | | Edited to require technical assessment date to be within 1 year of the last delivery of the product to site. |
| N/A | 9.4.7 Timber product-specific emission factors | New section. |
| N/A | 9.4.8 Product-specific emission factors for custom assemblies | New section. |
| N/A | 9.5 Repurposed materials | New section. |
| 9.5 Materials that don't match any of the emission factor types | 9.6 Materials that don't match any of the emission factor types | Renumbered section. |
| 9.6 Building services | 9.7 Building services | Renumbered section. |
| 9.6.1 General | 9.7.1 Mechanical, electrical and plumbing services | Slightly edited so that mechanical, electrical and plumbing is the focus of this section. |

| | | |
|---|---|---|
| 9.6.2 Vertical transport | 9.7.2 Vertical transport services | Updated to note that if the Assessor is using a product-specific emission factor for a lift, they must also enter the mass of the lift. This is required to calculate the transport emissions associated with the lift. |
| 9.7 Custom glazed facades and doors | N/A | Removed section. Section 8.8 now contains all of the information about materials in custom assemblies. |

| **Chapter 10: Carbon removals** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 10.4 Claiming carbon storage in materials | 10.4 Claiming stored biogenic carbon in materials | Updated heading. |
| 10.4.2 Claiming carbon storage when a product-specific emission factor has been used | N/A | This content has been taken into Section 10.4.3 *Calculating stored biogenic carbon* |
| 10.4.3 Claiming carbon storage when a NABERS default emission factor has been used | 10.4.5 Claiming stored biogenic carbon when a NABERS default emission factor has been used | This section contains new instructions on how to enter this information into the NABERS rating input form. |
| 10.4.4 Material longevity | 10.4.2 Material longevity | Renumbered section. |

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|---|---|---|
| 10.4.5 Calculating stored carbon | 10.4.3 Calculating stored biogenic carbon | This section has been re-written with a lot more detail on how to calculate stored biogenic carbon, depending on whether the data source is an EPD, carbon footprint, or Climate Active Public Disclosure Statement. |
| 10.4.6 Unknown carbon storage | 10.4.4 Unknown carbon storage | This section has been updated with more technical detail in the examples for how to calculate carbon storage. |
| N/A | 10.4.6 Repurposed materials | New section. |

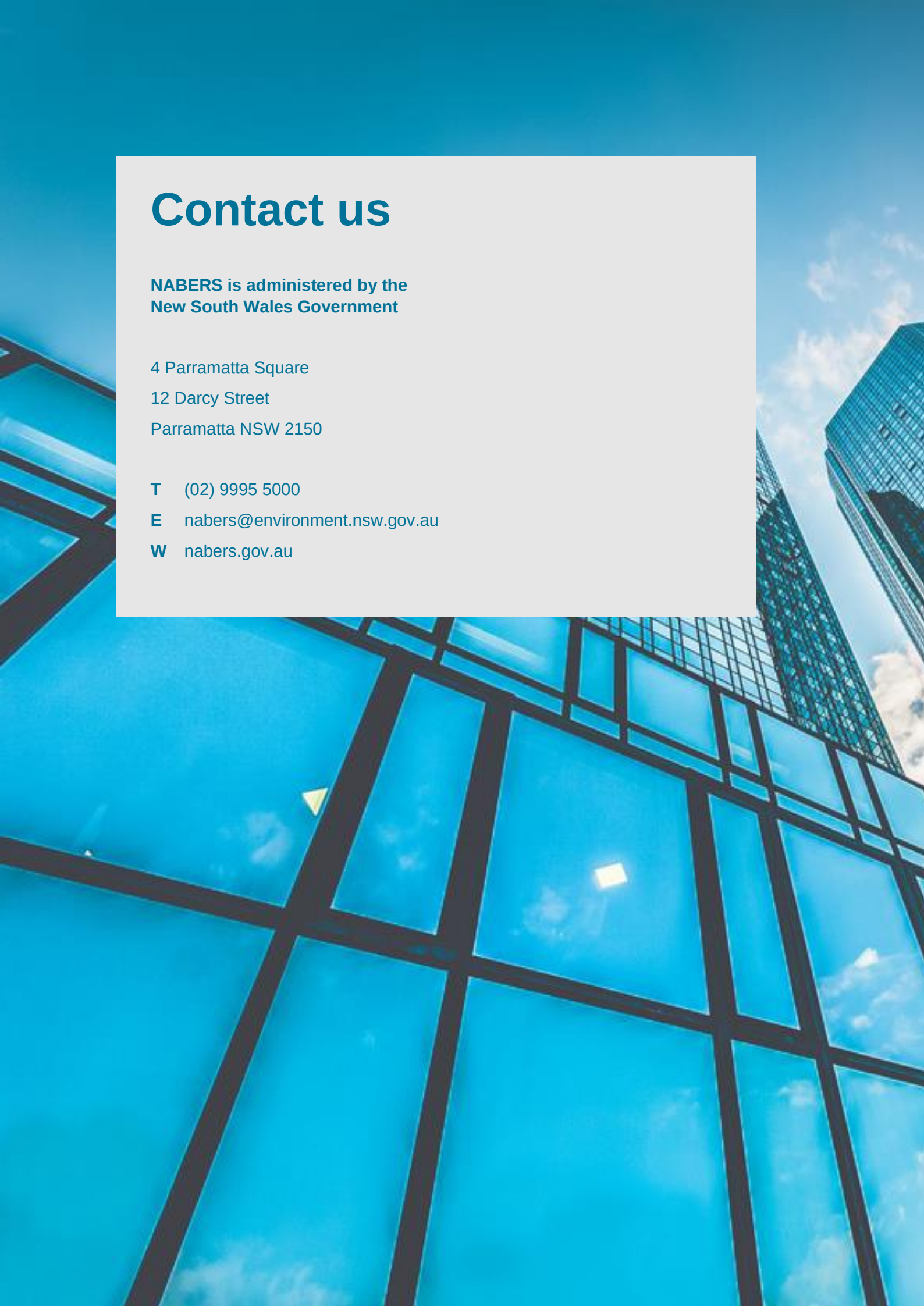
| **Chapter 11: Transport emissions** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 11.3 Default transport data | | Updated to note that default transport model cannot be used for materials that have product-specific emission factors. |
| 11.4.2 Assemblies | 11.4.2 Default assemblies | Updated heading. |

| **Chapter 12: Construction and commissioning emissions** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 12.2 Process overview | | Updated to note that the Assessor must identify whether each material quantity includes or excludes waste. |
| 12.3.3.1 Off-site renewable energy purchasing | | Clarified that the total off-site renewable electricity claimed must not exceed the actual electricity used. |
| 12.4.1 Default material waste rates | 12.4.1 General | Updated heading and content to reflect general treatment of all waste rates. |

| | | |
|---|---|---|
| 12.4.2 Project specific waste rates | 12.4.2 Waste rates | This section now deals separately with default waste rates and project-specific waste rates. |
| 12.4.3 End-of-life rates | | Reuse has been removed as an end-of-life scenario. |

| **Chapter 13: Rating data completeness check** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 13.2 Material completeness check | | Removed area of external carpark and hardstand from the list of information used for data checks. |

| **Chapter 14: Documentation requirements for accredited ratings** | | |
|---|---|---|
| **Version 1.0** (old version) | **Version 2.0** (current version) | **Changes made** |
| 14.4 Documentation required for Chapter 6 | | Added the evidence required for determining maximum biomass class. |
| 14.5 Documentation required for Chapter 7 | | Added the evidence required to support exclusion of materials for certain building types in a mixed-use building. |
| 14.6 Documentation required for Chapter 8 | | Added the evidence required for material makeup of custom assemblies (moved from Section 14.7). |



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