NET ZERO™ BUILDINGS STANDARD

NET ZERO CARBON BUILDING OPERATIONS

VERSION 1.0

Net Zero Buildings
Net zero carbon building operations

NZGBC
TE KAUNIHERA HANGANGA TAUTAIAO

CHANGE LOG

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INTRODUCTION

This standard for **Net Zero™ Buildings certification** set out the requirements for an **existing** building's operations to be certified as net zero carbon[1] in alignment with ISO 14064-1:2006[i] and NZGBC-compiled standards. It was developed by the New Zealand Green Building Council to allow organisations to make confident net zero carbon claims for their property or portfolio of properties.

Existing buildings are defined as those that have 12 months of available operational data.

CONTEXT

Buildings have a significant role to play in bringing about a low carbon economy. A report by Thinkstep[ii] showed that the construction and operation of buildings and infrastructure is responsible for around 20% of New Zealand's domestic emissions (net of emissions from traded goods). About half of this is from the construction of buildings and infrastructure and half from direct emissions in the operation of buildings. Further emissions originate in buildings such as waste generation.

There is a gathering momentum worldwide for countries and organisations to commit to being net zero carbon by 2050 in the wake of the Paris Agreement of 2015. New Zealand, along with 196 other countries, agreed to make ambitious cuts in **greenhouse gas** emissions consistent with holding the increase in the global average temperature to well below 2°C above pre-industrial levels.

The NZGBC is part of a global net zero carbon project to inspire action from the Green Building Council network towards this transition. The project was initiated with the following goals:

- 100% of buildings must operate at net zero carbon by 2050

  Existing buildings require not only an acceleration of current renovation rates, but these renovations must be completed to a net zero carbon standard so that all buildings are net zero carbon in operation by 2050.

- All new buildings must operate at net zero carbon from 2030

  Net zero carbon buildings must become standard business practice as soon as possible, so we build right from the start; avoid the need for future major retrofits; and prevent the lock-in of carbon emitting systems for decades to come.

[1] Net zero carbon means net zero **carbon dioxide *equivalent*** and includes all sources of greenhouse gas emissions associated with the operation of a building.

OVERVIEW OF REQUIREMENTS

To achieve Net Zero Buildings certification, applicants must:

1) Measure emissions associated with the building's electricity consumption, on site combustion of fossil fuels (e.g. gas, coal and diesel) and refrigerant leakage over a period of 12 months.
2) Measure emissions associated with the consumption of resources in the operation of the building. All emissions sources contributing more than 1% of overall emissions must be included. This might include for example operational waste to landfill.
3) Demonstrate that the building has managed and reduced **Scope 1 and 2** energy emissions by benchmarking the building against others of a similar type, achieving minimum energy performance benchmarks as laid out in this standard. This can be done through NABERSNZ or the greenhouse gas emission methodology from Green Star Performance.
4) Produce a **carbon reduction plan** for the building. This must include a plan, where relevant, to phase out the combustion of fossil fuels for space and hot water heating on-site by 1 January 2025. In practice this means having a plan to transition away from fossil fuel space and hot water heating such as gas heating (typical in the North Island) and coal heating (in the South Island). Other forms of on-site fossil fuel combustion such as gas kitchens (electric-only commercial kitchens are now viable) and diesel generators will need to be phased out by 2030[2].
5) Offset any remaining emissions with credible **carbon offsets**.
6) Produce a public report to communicate progress on emissions reduction activities and offsetting as part of a **net zero carbon building operations** claim for those buildings.

What is required to make a submission for Net Zero Buildings certification:

Scope of Emissions

This standard is designed to be used for **building operations**. This means that net zero carbon claims made following certification only apply to **operational emissions**. In the context of a building, operational emissions are those generated from the day-to-day running of the building. This includes **all Scope 1** and **2** emissions, but may also include some **Scope 3** emissions such as those generated from operational waste, water consumption and disposal and depending on their **materiality.**

Emissions from energy (including **embodied emissions** in materials) used to construct, fit out, renovate or upgrade the building, are not considered part of a building's operational **greenhouse gas inventory** and are not covered under Net Zero Buildings certification.

This Net Zero Buildings certification only covers **greenhouse gas** emissions. Other environmental impacts of the building do not need to be assessed to be certified. To assess wider environmental impacts and the management of a building, please refer to programmes such as Green Star Performance.

[2] Exemptions will be made for emergency services required by regulation such as diesel fire protection pumps and generators for buildings supplying emergency services.

A note on new built buildings

Embodied energy from construction materials and processes will be covered by a Net Zero Buildings certification for new buildings which will be developed and published separately. New built buildings will be required to measure, reduce and offset emissions associated with the construction of the building and then, in addition, achieve Net Zero Buildings for building operations as defined under this standard (at a minimum 18 months after achieving a Code Compliance Certificate (CCC) and once 12 months operational data is available) before being able to be certified as net zero. New buildings will also need to demonstrate that they do not combust fossil fuels on-site.

Base building and whole building certification

This standard can be used to certify buildings for **base building** certification or **whole building certification**:

- Net Zero Buildings **whole building certification**: making a net zero carbon claim for a whole building requires a building's total emissions to be measured and offset. This includes all emissions from base building services and emissions from occupants and their operations. All building types can achieve Net Zero Buildings certification (not only those that are owned and occupied by the same entity); for example, commercial office buildings, universities, hotels, some multi-unit residential buildings and public buildings.
- Net Zero Buildings **base building certification**: making a net zero carbon claim for base buildings requires the emissions from the building's core services (air conditioning, common area and external lighting, hot water, lifts, car parking or similar) to be measured and offset. Base building certification does not require tenant or occupant emissions to be considered. Examples of building types include tenanted commercial buildings or industrial facilities where the building's core services are clearly sub-metered separately from tenant loads and are provided by the building owner.

The **base building** category is provided as a stepping-stone towards whole building certification and provides the property sector with an alternative option to begin a Net Zero Buildings journey.

Geographic boundary

The geographic boundary refers to the physical and spatial boundary of the building. The geographic boundary sets the basis for determining what are considered direct emissions and indirect emissions.

The geographic boundary of the asset must be determined as the building in its entirety. A building with multiple uses, such as an office with hotel and retail spaces, must be considered as one entity. Where an applicant is seeking a whole building rating tenanted parts of the building must also be included in the geographic boundary.

HOW TO MAKE A SUBMISSION

Building owners[3] may register a building for Net Zero Buildings certification by submitting the latest registration form to the NZGBC and agreeing to the terms and conditions – these are on the NZGBC website. To achieve and maintain a valid Net Zero Buildings certification, the applicant must annually:

Measure	The **Emissions Boundary** is the project boundary established **below:** • All buildings must be spatially differentiated and clearly distinct. • Buildings in their entirety can be assessed. • Buildings should have a reasonable site boundary that includes all contiguous land associated with and that supports the building's typical operations.
	Scope 1 - 3 emissions are deemed relevant to all buildings.
	Any emissions source that constitutes 1 per cent or more of the total greenhouse gas inventory is considered to be material. In applying the 1 per cent materiality threshold, the total amount of emissions to be excluded must not exceed 5 per cent of the total greenhouse gas inventory.
	Shared services may be apportioned between the sharers of the service in accordance with the Green Star Technical Manual v3.2 - Guidelines for shared services.
	The Base Year for initial **Net Zero Buildings** certification is the Measurement period.
Manage	Demonstrate that building emissions are being managed and reduced by achieving the minimum energy performance requirement of a 4 Star NABERSNZ whole building/base building rating, or at least 8 out of 20 points (base building) or 9 out of 23 points (whole building) in the 'Greenhouse Gas Emissions' Credit of Green Star Performance. Demonstrate that you have a plan to reduce emissions further including the phase out of all fossil fuel consumption for space and hot water heating on site by 2025 and all other fossil fuel consumption by 2030.
Mitigate	Cancel **carbon offset** units to compensate for remaining emissions
Report	Complete the Net Zero Buildings submission template, relevant calculators and provide supporting documents. The Public Report template must be filled out and made publicly available to communicate progress on emissions reduction activities and offsetting as part of a **net zero carbon** claim. Applicants are required to report annually to maintain **Net Zero Buildings** certification
Audit, offsetting and certification	The NZGBC Certified Assessor or other approved auditor will assess the **greenhouse gas inventory** and offsets cancelled.

[3] Tenants are also encouraged to ask their building owner to register for the Net Zero Buildings certification and certify.

TIMING OF MEASUREMENT PERIOD

Applicants must specify a measurement period for the Net Zero Buildings certification. The measurement period is 12 consecutive months from which data will be drawn for the purposes of the project's assessment.

A measurement period of 12 consecutive months must be identified within 4 months of registration for Net Zero Buildings certification. This measurement period must commence no earlier than 15 months prior to registration and end no longer than 24 months post-registration. Once the measurement period is identified, the project needs to submit documentation for assessment no later than 4 months after the end of the measurement period.

VALIDITY PERIOD

A Net Zero Buildings certification is valid for a period of 12 months as shown on the certificate issued to successful applicants. Applicants may only make claims of Net Zero Buildings whole or base building operations certification status and make use of the appropriate Net Zero Buildings certification brandmark for the building during the validity period, after which buildings will need to resubmit for certification.

MAINTAINING CERTIFICATION

Where applicants are submitting for a Net Zero Buildings certification, to maintain the certification, the building will need to be re-registered for Net Zero Buildings certification at the end of the 12 month validity period.

All information required to be submitted for Net Zero Buildings certification will need to be resubmitted, including the full 12 months of carbon emissions data and public report *every year*. Any carbon reduction plan submitted for a rating will, however, be valid for 3 years and can be resubmitted for subsequent ratings.

EMISSIONS DEEMED TO BE RELEVANT

The following emissions sources are deemed to be relevant to all buildings:

- All Scope 1 emissions (direct emissions within the geographic boundary of the building) from building operations, with the exception of emissions from shared services (see below) which may be apportioned.
- All Scope 2 emissions (emissions from the generation of purchased electricity, heat, cooling and steam; i.e. energy produced outside the geographic boundary of the building but used within the building) from building operations.
- Scope 3 emissions from electricity consumption and fuel use (indirect emissions from the extraction, production and transport of fuel burned at generation, and the indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network) from building operations.
- Scope 3 emissions from waste, water supply and wastewater treatment

Other emissions sources are relevant and must be included when any two of the following conditions are met (adapted from the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004)):

- the Scope 3 emissions from a particular source are likely to be large relative to the building's Scope 1 and Scope 2 emissions
- the emissions from a particular source contribute to the building's greenhouse gas risk exposure (i.e. will the impacts of climate change pose a serious risk to the viability of this emission source over a specified timeframe)

- the emissions from a particular source are deemed relevant by key stakeholders
- the responsible entity has the potential to influence the reduction of emissions from a particular source
- the Scope 3 emissions are from outsourced activities that were previously undertaken within the building's boundary or from outsourced activities that are typically undertaken within the boundary for comparable buildings.

Important note: All emissions assessed as relevant must be included within a building's emission boundary. Emissions that are determined as not relevant can be excluded from the emissions boundary. Excluded emissions should be disclosed in the public reporting documents.

The following *Green Star – Performance* resources and guides are available to support buildings targeting **Net Zero Buildings** certification.

GREEN STAR PERFORMANCE CREDITS

If applicants are targeting a Green Star Performance rating, certain Green Star Performance credits will already result in the gathering of data that may be useful for the Net Zero Buildings certification. These credits include:

- Greenhouse Gas Emissions
- Potable Water
- Waste from Operations, and
- Refrigerant Impacts

Transport emissions (for example for staff commuting, taxi services, fleet cars etc) are considered relevant to include in a building's **greenhouse gas inventory** but are not mandatory to include. NZGBC encourages projects to include these emissions. A methodology to do this will be developed in future versions of the standard.

CALCULATORS

Projects seeking a Net Zero Buildings certification should use the Net Zero Buildings calculator and complete the Greenhouse Gas, Potable Water, Waste and Refrigerant tabs.

Depending on the pathway to demonstrate the minimum energy performance requirement, the Greenhouse Gas calculator for Green Star Performance will also need to be completed to fulfil the requirements in Part 3 of this standard. Calculators and calculator guides can be found on the NZGBC website.

SUBMISSION TEMPLATE

Submission Templates are a required form of documentation which project teams use to outline how compliance requirements have been met. The NZGBC has created a Net Zero Buildings Submission Template for buildings targeting Net Zero Buildings certification, which includes the following;

- Project Boundary;
- Measurement period;
- Summary of **Scope 1-3 emissions**;
- Emissions reduction measures;
- Summary of offsets cancelled; and
- Public Report

Applicants are required to submit this document with supporting documentation to the NZGBC for assessment.

ELIGIBILITY CRITERIA

Eligibility criteria for Net Zero Buildings certification are:

- The building or buildings must be a complete and permanent structure.
- The building or buildings must have been operating under normal operating conditions for at least the last 12 months.
- All buildings must be spatially differentiated and clearly distinct. Buildings in their entirety can be assessed. Buildings should have a reasonable site boundary that includes all contiguous land associated with and that supports the building's typical operations.
- A building requires at least one (1) full time equivalent occupant to occupy the space during the 'measurement period'.
- All registered premises must comply with all Environmental and Occupational Health & Safety Laws.
- All Net Zero Buildings registered buildings must commit to sharing their building energy and water usage data with the NZGBC.

PART 1: PREPARE GREENHOUSE GAS INVENTORY: SCOPE 1 AND 2 EMISSIONS

AIM OF REQUIREMENT

To document **Scope** 1 and 2 **greenhouse gas** emissions from the rated building during the specified measurement period.

SUMMARY OF WHAT'S REQUIRED

1	**Scope 1 and 2 greenhouse gas inventory**	**Document 12 months of consumption data covering Scope 1 and 2 emissions for the certified building**

DETAIL OF WHAT'S REQUIRED

1.0 General Requirement

Applicants for Net Zero Buildings certification must document 12 months of consumption data covering **Scope 1 and 2** emissions for the certified building. **Scope** 1 and 2 emissions are:

- **Scope 1**: direct emissions of **greenhouse gas** emissions on site including metered gas, fuels bought and combusted on site such as diesel, coal and LPG and refrigerant leakage and release.
- **Scope 2**: indirect emissions from imported energy such as metered electricity used on site.

1.0.1 Measurement Period

It is required to collect data to calculate the building's **greenhouse gas inventory** for a full year before achieving Net Zero Buildings certification. This year is known as the **measurement period**. The first measurement period is typically selected to be the **base year**, upon which ongoing emissions reductions are measured.

The **measurement period** requires data for 12 months prior to Net Zero Buildings certification. It is equivalent to the full year of data collection and accounting that is required for the purpose of achieving a Net Zero Buildings certification.

Note that the term measurement period is taken from ISO14064 and is equivalent to the "performance period" defined under Green Star Performance and the "rating period" defined under NABERSNZ.

1.1 Net Zero Buildings certification submission

Where applicants are submitting data for assessment as part of an application for Net Zero Buildings certification the relevant **Scope 1 and 2** emissions must be collected and entered into the Net Zero Buildings calculator. These emissions will include all metered electricity and gas consumption and all other fossil fuels combusted on site such as diesel, coal and LPG among others.

Under part 3 of this standard, applicants are required to demonstrate that the building meets a minimum building performance standard. This is benchmarked against the **greenhouse gas** emissions credit in Green Star Performance under the version of the rating tool in operation at the time of registration.

The **greenhouse gas** emissions credit under Green Star Performance has 4 different pathways (A, B, C or D) depending on the type of data available. These are used to input data to demonstrate achievement of the minimum performance requirement.

The following gives a brief overview of the different pathways:

1.1.1 Pathway A: NABERSNZ

Buildings that are comprised of 80% or greater office space and account for more than 2000m^2 net lettable area must have a NABERSNZ rating (either base building or whole building) that is valid *during* the measurement period, but not necessarily *coincident* with the measurement period[4]. As a result, the 12 months of data that have been used to assess the building under NABERSNZ (called the **rating period**) may not always coincide with the measurement period and therefore separate utility data covering the measurement period must be entered into the GHG emissions tab of the Net Zero Buildings calculator.

1.1.2 Pathways B, C and D

Projects that are not eligible for NABERSNZ must use pathways B, C or D (in order of preference) to document their energy-related carbon emissions. Each of these pathways use to input data to demonstrate compliance with the certification requirements. Refer to the Green Star Performance calculators and calculator guides for more information.

For projects that are not seeking a Green Star Performance certification separate from their Net Zero Buildings, the completed Green Star Performance credit 15 calculator and evidence must be provided in the submission.

For projects that are seeking a Green Star Performance certification, when the minimum number of points required by Net Zero Buildings is awarded in Credit 15 by the Certified Assessors, this is deemed to comply with Part 3 of the Net Zero Buildings standard. A certificate or final scorecard should be submitted to validate this.

1.1.3 Refrigerant Leakage

Greenhouse gas emissions from refrigerant leakage are also required to be reported under **Scope 1** emissions. These are captured in the Refrigerant tab of the Net Zero Buildings calculator. Net Zero

[4] Of course, it is possible to register the Net Zero Buildings measurement period to be coincident with the NABERSNZ rating period, but this is not strictly required.

Buildings certification only requires reporting of total refrigerant leakage and does not require any minimum requirement. There is therefore no minimum Total System Direct Environmental Impact (TSDEI) or Ozone Depletion Potential (ODP) standard for the purposes of Net Zero Buildings certification.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Net Zero Buildings Calculators
Green Star Performance 15B, 15C or 15D calculator
Energy consumption source information for the building seeking certification. For example, copies of electricity, gas and other energy bills, metered data, operational variables, etc.
NABERSNZ certificate, rating report and copies of electricity, gas and other energy bills, metered data, etc.

FURTHER GUIDANCE

Emission factors

Net Zero Buildings calculator, **greenhouse gas** emission and refrigerant impacts tabs convert energy consumption and refrigerant leakage data into **greenhouse gas** emissions by way of **emission factors**.

These factors are referenced from the current Ministry for the Environment guidance – "Measuring Emissions: A Guide for Organisations (currently 2022)". Note this is updated with every updated issue of this Ministry for the Environment (MfE) guidance.

It should be noted that although **greenhouse gas** emissions are published on NABERSNZ certificates, these are normalised (to make them comparable with similar buildings) and use MBIE **emission factors** rather than MfE factors) that are an average of the past 10 years rather than for a single year. For this reason, the NABERSNZ published carbon emissions are unlikely to accord with any emissions documented as part of a Net Zero Buildings certification and should not be referenced in any Net Zero Buildings certification submission.

Net Zero Buildings certified supply chains

If the building's **greenhouse gas inventory** includes an activity or product in its supply chain that has been certified as net zero carbon the emissions of the activity or product have already been accounted for and offset and these emissions do not need to be offset a second time for the purposes of Net Zero Buildings certification.

A **carbon neutral** activity or product in a building's supply chain could include the use of products and services (e.g. retail electricity or water supplies) certified as net zero carbon.

The use of the activity or product must still be reported (in the form of **activity data**) to ensure transparency and completeness of the **greenhouse gas inventory**.

For example, if **carbon neutral** retail electricity is used, the **greenhouse gas inventory** for the building would record the amount of electricity used with an associated **emission factor** specific to that supplier. The carbon offsets associated with that product would then be noted when reporting on carbon offsets for the purposes of certification.

An activity or product that claims to be **carbon neutral** (or similar such as net zero carbon) but is not formally certified as net zero carbon is not considered to have a zero emissions impact for a building's **greenhouse gas inventory**. This includes suppliers of energy that claim to be from 100% sources of renewable energy.

Scope 1 and 2 emissions associated with transport

Emissions from transport are currently wholly excluded from Net Zero Buildings certification. This means that **Scope 1** emissions from, for example petrol purchased for fleet cars, may be excluded from the **greenhouse gas inventory**. Similarly, electricity consumed in electric vehicle charging systems (**Scope 2**) may be excluded if this is clearly sub-metered.

Scope 1 and 2 emissions associated with building process loads

A base building certification will normally only account for sources of emissions that are in the building owner's control such as heating, cooling and ventilation systems and common area lighting and lifts. A whole building certification must include all sources of **Scope 1 and 2** emissions from the building with the exception of process loads which may be excluded if appropriately sub-metered. Process loads are defined in ASHRAE 90.1:

> *energy consumed in support of a manufacturing, industrial, or commercial process other than conditioning spaces and maintaining comfort and amenities for the occupants of a building.*

Loads specifically provided for the amenity of the building occupants such as tenant small power (e.g. for computer systems), tenant lighting, IT systems, swimming pool heating and ventilation systems are not considered process loads and shall be included in any whole building or base building certification as appropriate.

Scope 1 and 2 emissions from external sources

Greenhouse gas emissions arising from activities outside of the building but within the boundary of the building's title such as from car park lighting must be included in the inventory if they are directly associated with the occupants and visitors to the building and are in the control of the building owner or occupier. Where a building being certified shares these outside services with other buildings these emissions may be shared on a pro-rata basis calculated on respective floor area. Emissions not directly associated with occupants or visitors to the building such (e.g. land use change, forestry plantations etc) should be excluded.

PART 2: PREPARE GREENHOUSE GAS INVENTORY: SCOPE 3 EMISSIONS

AIM OF REQUIREMENT

To document **greenhouse gas** emissions that occur as a result of the activities of the building but occur from sources outside the building's geographic boundary during the specified measurement period.

SUMMARY OF WHAT'S REQUIRED

2	**Scope 3 greenhouse gas inventory**	Document 12 months of data covering **Scope 3** emissions for the certified building

DETAIL OF WHAT'S REQUIRED

2.0 General Requirement

Applicants for Net Zero Buildings certification must document 12 months of data covering **Scope 3** emissions for the certified building. **Scope 3** emissions include all indirect emissions that occur as a result of the activities of the building, but that occur from sources outside the building's geographic boundary, except for electricity consumption (**Scope 2** indirect emission).

2.0.1 Water, wastewater and waste emissions

Emissions from water, wastewater and operational waste emissions are deemed relevant. Applicants for Net Zero Buildings certification must supply 12 months of water, wastewater and operational waste data covering the measurement period.

For a Net Zero Buildings certification, Net Zero Buildings calculator water, wastewater and operational waste tabs should be used.

2.0.2 Electricity and fuels

Emissions also include emissions associated with the transmission and distribution of electricity, gas and other fuels used in the building. These should be included in any submission of the overall **greenhouse gas inventory**.

2.0.3 Current exclusion of transport emissions

Emissions from transport, such as occupant and visitor commuting, are deemed relevant. However, due to current lack of robust data collection and calculation methods, inclusion may not be practicable or technically feasible at this time.

2.0.4 Materiality assessment

An emissions source that constitutes 1 per cent or more of the total **greenhouse gas inventory** is considered to be material.

If a relevant emissions source is estimated to be material, it must be included within the emissions boundary, unless justification can be provided to demonstrate that such quantification would not be technically feasible, practicable or cost effective relative to its significance.

Emissions sources that are relevant but estimated to constitute less than 1 per cent of the total **greenhouse gas inventory** can be excluded from the emissions boundary.

In applying the 1 per cent materiality threshold, the total amount of emissions to be excluded must not exceed 5 per cent of the total **greenhouse gas inventory**.

To estimate materiality of these emissions sources, tools based on input–output analysis can be useful.

Responsible entities are encouraged to include, measure and report as many emissions sources as possible, regardless of an emissions source's materiality. Data for emissions sources that are deemed as immaterial (contributing less than 1 per cent to the **greenhouse gas inventory**) may still be included in the **greenhouse gas inventory**. The following methods can be used if primary data cannot be sourced with approval via a Technical Question:

- taking an initial measurement as a basis for projecting emissions for future years of that source; or
- estimating and projecting an emissions source (e.g. using input-output analysis tools or approximation through extrapolation.)

Where a relevant emissions source is estimated to be material, but accurate data is not yet available, a data management plan should be developed to outline how more rigorous quantification can be achieved within a reasonable timeframe. This could include setting in place appropriate data collection processes and negotiating with stakeholders who have access to accurate data.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Net Zero Buildings submission calculator
Water, wastewater and waste consumption source information for the building seeking certification. For example, copies water bills, waste collection receipts, etc.
Other relevant consumption source information etc for **Scope 3** emissions deemed material

FURTHER GUIDANCE

Net zero carbon certified supply chains

If the building's **greenhouse gas inventory** includes an activity or product in its supply chain that has been certified as net zero the emissions of the activity or product have already been accounted for and offset and these emissions do not need to be offset a second time for the purposes of Net Zero Buildings certification.

A **carbon neutral** activity or product in a building's supply chain could include the use of products and services (e.g. retail electricity or water supplies) certified as net zero carbon.

The use of the activity or product must still be reported (in the form of **activity data**) to ensure transparency and completeness of the **greenhouse gas inventory**.

For example, if **carbon neutral** retail electricity is used, the **greenhouse gas inventory** for the building would record the amount of electricity used with an associated **emission factor** specific to that supplier. The carbon offsets associated with that product would then be noted when reporting on carbon offsets for the purposes of certification.

An activity or product that claims to be **carbon neutral** (or similar such as net zero carbon) but is not formally certified as net zero carbon is not considered to have a zero emissions impact for a building's **greenhouse gas inventory**. This includes suppliers of energy that claim to be from 100% sources of renewable energy.

PART 3: MANAGE SCOPE 1 AND 2 EMISSIONS

AIM OF REQUIREMENT

To reduce energy demand and **greenhouse gas** emissions from buildings and reduce the need to construct further sources of renewable energy either on-site or on the New Zealand electricity grid.

Summary of what's required

Four pathways are offered for showing that the building meets a minimum performance standard:

3.1	Green Star Performance Pathway A	Minimum of 8 out of 20 points (base building) or 9 out of 23 points (whole building) in the 'Greenhouse Gas Emissions' Credit of Green Star Performance using the **NABERSNZ** Pathway. In practice this means the achievement of a 4 Star base building or whole building rating.
3.2	Green Star Performance Pathway B	Minimum of 8 out of 20 points (base building) or 9 out of 23 points (whole building) in the 'Greenhouse Gas Emissions' Credit of Green Star Performance using the **building energy baselines** pathway
3.3	Green Star Performance Pathway C	Minimum of 8 out of 20 points (base building) or 9 out of 23 points (whole building) in the 'Greenhouse Gas Emissions' Credit of Green Star Performance using the **peer group of comparable buildings** pathway.
3.4	Green Star Performance Pathway D	Minimum of 8 out of 20 points (base building) or 9 out of 23 points (whole building) in the 'Greenhouse Gas Emissions' Credit of Green Star Performance using the **Longitudinal Benchmarking** pathway (historical baselining).

DETAIL OF WHAT'S REQUIRED

3.0 General Requirement

Applicants for Net Zero Buildings certification must demonstrate that the building meets a minimum standard of performance prior to the application of **carbon offsets**. Four (4) pathways are offered for showing compliance based on credit 15 of Green Star Performance.

Each of the pathways requires a minimum performance for the building as per the table above. This demonstrates that the building's emissions are better than average for that particular building type normalising for factors such as local climate, occupancy and operating hours.

For buildings seeking Net Zero Buildings certification, the following gives a summary of the four different pathways.

3.1 Pathway A: NABERSNZ

NABERSNZ is a national system for rating the energy efficiency of office buildings. It is an independent tool from the NSW Government in Australia, licensed and adapted for New Zealand by EECA and the NZGBC.

Buildings that are comprised of 80% or greater office space and account for more than 2000m^2 net lettable area must use this pathway for Net Zero Buildings certification or justify an alternate pathway by submitting a technical question.

3.2Pathway B: Building energy baselines

Smaller office buildings or other building types should where possible use pathway B. This compares the building's carbon emissions against a national baseline (benchmark). At present benchmarks are available for the following building types:

- Standalone Office - Base Building
- Standalone Office - Whole Building
- Retail Shopping Centres - Whole Building (sum of base buildings + retail tenancies, excluding Supermarkets)
- Retail Standalone - Whole Building (e.g. Big Box Retail and small standalone buildings, excluding Supermarkets)

Other benchmarks may be developed for New Zealand in due course and these will be available for use when updated in the Green Star Performance calculator.

3.3 Pathway C: Peer group of comparable buildings

Buildings for which Green Star Performance does not have benchmarks should make use of Pathway C: This compares the building's carbon emissions against a peer group of comparable buildings. The applicant will need to source 3 years' of relevant data from the comparable buildings and enter this into the 15C calculator.

3.4 Pathway D:

Finally, Pathway D may be used where the applicant does not have access to a peer group of comparable buildings. This pathway compares the building's carbon emissions against five concurrent years of historical energy performance data from within the past 10 years of operation for the building seeking certification.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Green Star Performance 15B, 15C or 15D calculator
Where following Pathway A: NABERSNZ Certificate and copies of electricity, gas and other energy bills, metered data, etc.
Where following Pathways B, C or D: Energy consumption source information for the building seeking certification. For example copies of electricity, gas and other energy bills, metered data, etc.

FURTHER GUIDANCE

Net zero carbon certified supply chains

While net zero carbon rated supply chains (such as electricity) may be used in the final **greenhouse gas inventory** the purpose of the criteria in this section is that the building itself meets a minimum standard of performance prior to the application of offsets. For this reason, neither **carbon offsets** nor net zero carbon certified electricity (nor any other supplied fuel) may be used to demonstrate performance under NABERSNZ or the **greenhouse gas** emission credit in Green Star Performance.

PART 4: PREPARE AN EMISSIONS REDUCTION STRATEGY

AIM OF REQUIREMENT

To have a comprehensive plan to reduce carbon emissions from the building including, in particular, to transition the building away from on-site combustion of fossil fuels.

Summary of what's required

4	Emissions reduction strategy	Existing buildings must provide a comprehensive emissions reduction strategy that includes the phase out of all fossil fuels combusted on site

DETAIL OF WHAT'S REQUIRED

4.0 Emissions reduction strategy

The emissions reduction strategy must identify the emissions reduction measures to be undertaken and the quantity of emissions expected to be reduced over a specified timeframe, where this can be quantified.

At the end of each reporting year, the responsible entity should review its success in achieving emissions reductions. The emissions reduction strategy should be revised accordingly, and plans made for emissions reduction actions for the following year.

The emissions reduction strategy should include emissions reductions that have been achieved or have commenced over time. Planned emissions reduction activities may also be included. The emissions reduction strategy may include **Scope 3** emissions sources that are difficult to quantify even if they have been excluded from the building's emissions boundary.

A summary or outline of the emissions reduction strategy must be included in the annual Public Disclosure Summary or other public report (see Part 6).

New buildings

New buildings that have not been in operation a minimum of 18 months after achieving a Code Compliance Certificate (CCC) or don't have 12 months of operational data available must provide a coherent plan to phase out the combustion of fossil fuels for space and hot water heating by 2025 and all remaining fossil fuels[5] such as gas kitchens and diesel generators by 2030.

For the avoidance of doubt fossil fuels are those derived from ancient living organisms such as diesel, gas, coal and LPG. Biomass, landfill gas, sewage treatment plant gas and biogases are permitted in Net Zero Buildings.

[5] With the exception of any systems required by regulation such as diesel fire protection pumps or back-up generators required for emergency services such as in a hospital.

The plan must include:

- An inventory of all fossil-fuel consuming equipment on-site
- Engineering feasibility reports setting out how the equipment could be replaced with non-fossil fuel burning equivalents. The report should include costs and benefits.
- A proposed replacement timeline

A note on new buildings

The net zero carbon requirements for new buildings will be published separately. New buildings that have not been in operation a minimum of 18 months after achieving a Code Compliance Certificate (CCC) or don't have 12 months of operational data available, will also require an operational emissions reduction strategy, however they will also need to demonstrate that they do not include any permanently installed equipment designed for the combustion of fossil fuels at the time of certification.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Comprehensive emissions reduction strategy, including plan to phase out the combustion of fossil fuels by 2025

FURTHER GUIDANCE

Emissions reduction activities

Maintaining a comprehensive **greenhouse gas inventory** can help an organisation to better understand the sources of **greenhouse gas** emissions and to identify the most cost-effective opportunities for reducing emissions. Once a **greenhouse gas inventory** has been measured, reductions in emissions can be calculated by comparing changes in the **greenhouse gas inventory** over time relative to a base year.

Net Zero Buildings certification requires that emissions reduction activities are undertaken within the building's operations where possible, before compensating for emissions through the purchase and **cancellation** of **carbon offset** units (Section 5).

Disclosing emissions reduction initiatives and reporting on achievements contributes to transparency and is in line with carbon management best practices.

Energy efficiency

The consumption of energy is the principal source of emissions in a building. Through targeting efficiency upgrades, the consumption of energy should be decreased as far as practicable overtime. Energy efficiency actions could include:

- upgrading building systems or improving the building envelope
- optimising building operations, such as through a recommissioning process
- substituting products or inputs with those that are less energy intensive.

Onsite renewable energy generation – Scope 2

Scope 2 emissions from imported electricity consumed by the building can be reduced by generating renewable electricity onsite, such as through:

- installing or building integrated photovoltaic systems to provide electricity to the building.
- using solar hot water systems to reduce gas or electricity use.
- procuring electricity through onsite wind turbines.

Note that only electricity generated and used within the building and therefore reducing metered electricity consumption may contribute to the **greenhouse gas inventory**. Data from export meters must be disregarded.

Other emissions reduction activities

Other emissions reduction activities include those targeting waste, water use, wastewater treatment and transport emissions. Specific actions could include:

- encouraging reduction of water consumption (and leaks) and wastewater generation through the installation of water-efficient fittings such as dual flush toilets, water-efficient appliances such as washing machines and water pressure reduction valves
- encouraging source separated recycling of both dry commingled recyclables (paper, cardboard, aluminium) and organics, and organising a collection service for these waste streams
- substituting transport fuel products with those that are less emissions intensive (e.g. biodiesel and bioethanol).

PART 5: MITIGATE

AIM OF REQUIREMENT

To credibly offset net **greenhouse gas** emissions through carbon credits sourced through projects or schemes that meet the principles of the Toitū Envirocare net carbonzero programme requirements.

SUMMARY OF WHAT'S REQUIRED

Two pathways are offered for showing compliance:

5.1	Toitū Envirocare pre-approved carbon credits	Toitū Envirocare provides the offset service by cancelling credits from a portfolio of pre-approved projects, on an appropriate registry. **Cancellation** is performed in compliance with Toitū Envirocare net carbonzero programme requirements.
5.2	Independently sourced carbon credits	Carbon credits are purchased from projects that meet the Toitū Envirocare net carbonzero programme requirements. These offsets must then be transferred to Toitū Envirocare relevant registry account. Cancellation is then performed by Toitū Envirocare in compliance with the net carbonzero programme requirements

DETAIL OF WHAT'S REQUIRED

5.0 Emissions reduction strategy

Once the building's net carbon footprint has been calculated and verified the equivalent (rounded up to the nearest whole) carbon credits must be sourced.

Toitū Envirocare pre-approved carbon credits pathway

If choosing the Toitū Envirocare carbon credits pathway, participants need to contact Toitū Envirocare and request the offset service. Toitū Envirocare will then provide the fee for service and complete the **cancellation** on your behalf. Organisations following Pathway 1 can be assured that they are accessing credits that are already pre-approved as compliant with the net carbonzero programme, thus minimising the time and effort required for the Mitigate part of this certification process.

Cancellation on a public registry

The carbon credit must be cancelled on a public registry.

When sourcing carbon credits from Toitū Envirocare this is done by Toitū Envirocare in their accounts held with the appropriate registries, in compliance with the net carbonzero programme requirements.

Independently sourced carbon credits pathway

If sourcing carbon credits independently, participants need to submit details about the proposed carbon credit project directly to Toitū Envirocare for approval. The information required usually includes a Project Development Document, Project Validation Report, Verification Report, and the name of the registry where the carbon credits are listed. Other evidence may be requested in order to approve the offset source. A project assessment fee by Toitū will be charged to cover costs of the assessment. This is separate to the NZGBC Net Zero Buildings certification process.

The following criteria (which are subject to regular updates in the net carbonzero programme documentation) is a summary of what is considered in the approval process of carbon credit projects, and can be a useful guide when sourcing credits from the market.

PRINCIPLES	EXPLANATION
Additionality (and Baseline)	The emissions reductions are in addition to reductions that would have occurred under business as usual (including compliance obligations) against a realistic baseline and could not have happened without the incentives provided to the offset programme.
Permanence	The emissions reductions are permanent and there are measures in place to replace any reversal. Removals through forest sequestration will remain for 100 years or more. Where a government approved scheme has permanence of less than 100 years with an option to renew for increased periods, the owner of the project can demonstrate that it has voluntarily opted for the 100 year period.
(Avoidance of) Leakage	There has been no increase in emissions outside the project boundary that occurred as a direct result of the implementation of the project.
Measurable	The emissions reductions have been accurately quantified and monitored using approved measurement methodologies based on international best practice or government approved methodologies.
Verifiable	The offset projects have been validated and the emissions reductions have been verified by independent qualified third parties against international standards recognised by ICROA.
Transparency	The Project Design Document, Validation and Verification reports, Disclosure statements or other equivalent documents are listed on the appropriate public registry.
Traceable	The carbon credits can be traced via unique serial numbers from the originating project to retirement/cancellation on the appropriate public registry that meets international best practice for accounting and transactions.
No Forward Purchasing	The offset, and subsequent **carbon neutral** claim, can be substantiated because the emissions reductions have been certified and issued to the relevant public registry by the appropriate authority.
Vintage	The offsets were created post 2012 (since the beginning of the Second Kyoto Commitment Period 2013-2020). Under the Paris Agreement (2021-2030), the offsets were created post 2021. Kyoto Commitment Period 2 units may be used until the completion of the true-up period provided they are removed from the national **greenhouse gas** accounts.
Equivalence	The measurement of both emissions and emissions reductions/removals has used consistent measurement methodology (equivalent timeframes and emissions conversion factors).
(Avoidance of) Double Counting	The offsets are not able to be claimed by multiple parties; i.e. the emissions reduction cannot be claimed by one party and sold as a carbon credit by another party.
Carbon Rights	There is an unambiguous owner of the emissions reductions who has the right to sell the carbon credits.
Additional considerations	Additional considerations may be applied on a case-by-case basis if deemed to be material to reputational risk of the carbon zero programme and it's clients.

Those seeking Net Zero Buildings certification should note that the Toitū Envirocare principles are subject to periodic reviews. If the reporting entity is following Pathway 2 it is the responsibility of the

reporting entity to ensure the carbon credits sourced are in line with the most up to date Toitū Envirocare net carbonzero programme requirements. They will also need to ensure that the credits sourced meet the requirements of a public registry.

Cancellation on a public registry

The carbon credit must be cancelled on a public registry via an account held by Toitū Envirocare.

If sourcing carbon credits independently, the reporting entity will need to inform the carbon credit supplier of the relevant Toitū Envirocare registry account number to transfer the credits.

Once the credits have been received into the Toitū Envirocare account the reporting entity will be notified.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Purchase agreement of independently sourced carbon credits (if applicable)

FURTHER GUIDANCE

What is a carbon credit?

One carbon credit is equivalent to one tonne of **carbon dioxide equivalents** (**greenhouse gases**).

Carbon credits are issued to defined projects that either:

- Avoid **greenhouse gas** emissions through projects such as renewable energy generation,
- Reduce emissions through projects such as energy efficiency initiatives, and
- Sequester or store carbon through methods such as regeneration of native forest (natural sequestration), or engineered solutions (such as carbon capture and storage technology)

What is a registry?

A registry is a mechanism to transfer credits between suppliers and publicly cancel the credits. They provide public traceability to origins of credit creation via published documents and avoid double counting. Examples of registries include Gold Standard, NZETR (NZ Emissions Trading Register), and the ANREU (Australian National Registry of Emissions Units). Each registry has their own conditions on what type of credits they will accept.

Building owned by a net zero carbon organisation

If the reporting entity is a net zero carbon certified organisation, the emissions already offset within the organisation boundaries will not be required to be offset. The reporting entity will still need to report all emissions as gross emissions for the Net Zero Buildings certification however, net emissions

will be less than gross emissions. Only net emissions are required to be offset which prevents double counting

PART 6: REPORT

AIM OF REQUIREMENT

To transparently report the emissions, emission reduction strategy and any offsetting activities for the building in order to give confidence in any net zero carbon claims made.

SUMMARY OF WHAT'S REQUIRED

6	**Public report**	An annual report must be made publicly available to communicate progress on emissions reduction activities and offsetting as part of the Net Zero Buildings certification.

DETAIL OF WHAT'S REQUIRED

6.0 Public report

An annual report must be made publicly available to communicate progress on emissions reduction activities and offsetting as part of a **net zero carbon** claim. Annual reporting keeps the public and other interested parties informed in an open and transparent manner and communicates achievements in managing emissions.

The annual public report must include the following:

- the total gross and net **greenhouse gas** emissions of the building for the measurement period (taking into account any renewable energy and certified **carbon neutral** activities) and an explanation of any significant changes that are not attributed to emissions reduction actions
- reporting of emissions sources excluded from the emissions boundary (especially from activities that stakeholders would expect to be included) and any plans to improve the consistency and completeness of the **greenhouse gas inventory** in the future
- a summary of the emissions reduction activities undertaken in accordance with the emissions reduction strategy and the resulting quantity of emissions reduced (where this can be quantified)
- records to prove that sufficient offset units have been cancelled to offset the building's emissions (e.g., the name of the registry in which the units were cancelled and the project type and serial numbers of the relevant units).

The public report must be in the format of a Public Report template. A template of the public report is provided on registration for Net Zero Buildings certification. The public report (or information contained within) will be automatically published on the NZGBC's website when certification has been granted.

DOCUMENTATION REQUIREMENTS

The following documentation must be submitted:

Document
Net Zero Buildings Submission template
Completed Public Report

APPENDIX A: GLOSSARY

Activity data	Source data that quantifies an emissions-generating activity, such as fuel usage and electricity consumption, and that can be used to determine greenhouse gas emissions.
Additionality	A requirement that a project or activity results in carbon abatement that is unlikely to occur in the ordinary course of events in the absence of the project or activity, including due to any existing commitment or target publicly agreed by the entity responsible for issuing the units. Abatement must not be double counted under another system.
Base year	The reference year (calendar, financial or other) from which changes in emissions can be tracked over time. This is usually a year's worth of emissions data that is audited before certification is granted.
Building operations	One of the criteria for determining the inclusion and exclusion of emissions from a building's greenhouse gas inventory. Emissions generated from the day-to-day running of a building are considered to be part of the building operations.
Cancellation	Transfer of a unit to a cancellation account so that it may not be used for any further purpose. Also known in some schemes as 'retirement'.
Carbon dioxide equivalence (CO_2-e)	A standard measure that takes account of the global warming potential of different greenhouse gases and expresses the effect in a common unit.
Carbon neutral	A situation where the net emissions associated with an activity are equal to zero because emissions have been reduced and offset units cancelled to fully account for all emissions.
Carbon Offset	A reduction in emissions of carbon dioxide or other greenhouse gases made in order to compensate for emissions made elsewhere. Offsets represent reductions of greenhouse gases or removals of greenhouse gases from the atmosphere by sinks, relative to a business-as usual baseline. Offset units are tradeable and can be used to negate (or offset) all or part of another entity's emissions.
Eligible offset	An offset unit that has been deemed to meet the carbon zero criteria.
Embodied emissions	Greenhouse gas emissions associated with the construction phase (as opposed to the operational phase) of a building's life. Embodied emissions typically also include the replacement and maintenance of building components over the building's life.
Emission factor	A factor that specifies the kilograms of CO_2-e emissions per unit of activity.

Emissions reduction plan	Comprehensive report detailing and quantifying a building's sources of emissions and strategies and business cases for reducing emissions.
Existing building	A building that has been in operation for a minimum of 18 months after achieving a Code Compliance Certificate (CCC) or has 12 months of operational data available.
Geographic boundary	The physical and locational border that separates a building or a precinct from other areas not considered a part of that same building or precinct. The geographic boundary is the main criterion for defining the emissions boundary of a building or precinct. Refer to Section 2.3.1 for further details.
New Zealand Green Building Council (NZGBC)	The New Zealand Green Building Council (NZGBC) is the New Zealand's authority on sustainable buildings and communities. The NZGBC's mission is to accelerate the transformation of New Zealand's built environment into one that is healthy, liveable, productive, resilient and sustainable. The NZGBC works with industry and government to encourage policies and programs that support its mission. The Council educates thousands of people each year on how to design and deliver sustainable outcomes for New Zealand's buildings and communities and it operates New Zealand's only national, voluntary, holistic rating systems for sustainable buildings and communities – Green Star and Homestar.
Greenhouse gases (GHG)	The atmospheric gases responsible for causing global warming and climate change. The Kyoto Protocol lists six greenhouse gases – carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6) – with the addition of Nitrogen Trifluoride (NF3) from the beginning of the protocol's second commitment period.
Greenhouse gas inventory	A measure of the greenhouse gas emissions attributable to an activity. A greenhouse gas inventory can relate to the emissions of an individual, household, organisation, product, service, event, building or precinct. This can also be known as a carbon footprint or **greenhouse gas inventory**.
Material	The status of an emissions source when it constitutes 1 per cent or more of the total **greenhouse gas inventory**. Refer to Section 2.3.1 for further details.
Offsetting	The activity of cancelling offset units.
Operational Emissions	Carbon dioxide emissions generated from the day-to-day running of the building either directly emitted in the building, emitted as a result of the activities of the building but occur from sources outside the building's geographic boundary during the specified measurement period.

Rating period	The continuous 12-month period covered by the data used for NABERS Energy and Water ratings.
Responsible entity	The organisation or person (with appropriate delegation to sign on behalf of the organisation) that has taken responsibility for making a carbon neutral claim or seeking carbon neutral certification.
Scope	The categorising of emissions sources into direct and indirect sources.
Scope 1 emissions	The release of greenhouse gases into the atmosphere as a direct result of activities occurring within a responsible entity's control (or geographic boundary).
Scope 2 emissions	The release of greenhouse gases into the atmosphere from the consumption of electricity, heating, cooling or steam that is generated outside of a responsible entity's control (or geographic boundary).
Scope 3 emissions	Greenhouse gases emitted as a consequence of a responsible entity's activities but emitted outside the responsible entity's control (or geographic boundary).
Terms and conditions	Terms and Conditions for Certification of a Net Zero Buildings and Use of the Certification Trademark which stipulate the obligations for certification and for the use of the certification **Trademark**.

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REFERENCES

[i] ISO 14064-1:2018 – Greenhouse Gas Emissions and Removals Quantification and Reporting
[ii] https://www.thinkstep.com/content/hidden-building-pollution-exposed-new-report