INFRASTRUCTURE
NET ZERO

A solid foundation:

A common definition for net zero infrastructure and how to get there

Brought to you by

Infrastructure Net Zero is a collaborative effort aimed at coordinating and reporting on Australia's infrastructure's journey to net zero emissions. This initiative acknowledges the collective responsibility for decarbonisation and aims to efficiently use shared time, resources, and expertise to advance key initiatives for sustainable policy change and industry innovation.

The Australian Sustainable Built Environment Council (ASBEC) is the primary organisation for those committed to sustainable development in Australia. Its members consist of industry associations, NGOs, and government representatives focused on the planning, design, and operation of the built environment, considering its social and environmental impacts.

Technical Partners

Established in 2002, Green Building Council of Australia (GBCA) is the nation's authority on sustainable buildings, communities and cities. Our vision is for healthy, resilient and positive places for people. Our purpose is to lead the sustainable transformation of the built environment. GBCA represents more than 550 individual companies with a combined annual turnover of more than $46 billion.

Established in 2008, the Infrastructure Sustainability Council (ISC) is dedicated to advancing sustainability in infrastructure through collaborative efforts. We help generate social, environmental and economic returns for society by working closely with industry to embed sustainability in every aspect of our horizontal infrastructure and benefit people living in Australia, Aotearoa New Zealand and beyond.

Funding provided by

The CEFC is Australia's specialist climate investor, helping cut emissions in the race towards net zero by 2050. It invests in the latest technologies to generate, store, manage and transmit clean energy. Its discounted asset finance programs help put more Australians on the path to sustainability, in their homes and on the road. CEFC capital is also backing the net zero transformation of our natural capital, infrastructure, property and resources sectors, while providing critical capital for the emerging climate tech businesses of tomorrow. With access to more than $32 billion from the Australian Government, the CEFC invests to deliver a positive return for taxpayers.

We would like to acknowledge the significant contribution of Mott MacDonald, our report sponsors for the initial Discussion Paper. Mott MacDonald is a global, employee-owned engineering, management and development consultancy. We use our global climate expertise to build decarbonisation and climate resilience into projects, investment plans, business strategies and delivery, unlocking economic and commercial, reputational and operational benefits. Our experience includes co-authoring PAS 2080: 2016 and the updated PAS 2080:2023.

Authors

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Extensive support provided by:

- Infrastructure NSW
- Infrastructure Australia
- The Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Contents

Executive Summary

1. A summary of the first consultation paper can be found in Appendix A of this paper.

Achieving net zero in infrastructure requires a shared understanding of what net zero means and the infrastructure sector's role in managing and reducing carbon emissions.

Various standards, such as *The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard* (GHG Protocol Corporate Standard) and *PAS 2080:2023 Carbon Management in Buildings and Infrastructure* (PAS 2080), provide essential guidance. However, confusion often arises due to a lack of clarity on how these standards apply in practice.

Australia already has made inroads on the components of a common definition.

Our first consultation paper[1] revealed that most of infrastructure is using a common framework. It also revealed broad-based agreement on the need for a common definition.

This paper:

- outlines the need for the infrastructure sector to transition to net zero.
- presents key definitions to understand in the context of net zero and infrastructure.
- provides a common definition for net zero.
- summarises best practice carbon measurement and management standards.
- provides guidance on when to adopt relevant best practice carbon measurement and management standards.
- discusses the benefits of adopting consistent standards and approaches to carbon measurement and reporting.

What we've agreed on:

A common definition of net zero (as per PAS 2080)

"Reduction of anthropogenic greenhouse gas emissions to zero or to a residual level that is consistent with reaching net zero emissions in eligible 1.5 °C pathways (hence time-bound) and neutralising the impact of residual emissions (if any) by removing an equivalent volume of carbon."

The following frameworks provide guidance for managing GHG emissions:

- GHG protocol standards, relevant for organisational or entity emissions.
- PAS 2080:2023, relevant for managing carbon across the lifecycle of a project. It is supported by RICS Whole life carbon standard, EN 15978, and EN17472.

Rating tools like Green Star, NABERS, and IS can help projects report and reduce their emissions.

There is a significant overlap in policy across all states supporting the reduction of carbon in the sector.

Key terminology

Many of these definitions have been adapted from PAS 2080. More information can be found in PAS 2080:2023 Carbon Management in Buildings and Infrastructure | BSI, including further clarifying notes for definitions.

Term	Definition
Infrastructure	See page 10 of this paper.
Net zero	See page 9 of this paper.
Built environment	Refers to buildings and infrastructure.
Greenhouse gas (GHG) emissions	Total mass of greenhouse gases released to the atmosphere over a specified period of time, that in excess are responsible for climate change.
Carbon dioxide equivalent (CO2e)	Unit for comparing the radiative forcing of greenhouse gases (GHGs) to carbon dioxide.
Greenhouse gas (GHG) assessment	Process of calculating the total amount of GHG emissions and removals due to the delivery, use, operation, maintenance, demolition and/or reuse of assets and/or networks.
Carbon management	Assessment, reduction and removal of greenhouse gas emissions during the planning, optioneering, design, delivery, operation, use, end of life (and beyond) of new, or the management of existing, assets, networks and/or systems.
Carbon reduction	Process of minimising greenhouse gas emissions in the development of new, or the refurbishment of existing, assets or networks.

Term	Definition
Whole life carbon	The total greenhouse gas emissions and removals associated with the creation, operation, maintenance and end-of-life disposal of an asset. This includes upfront carbon as well as in-use emissions (from maintenance, repair, refurbishment and operation of the asset), end-of-life disposal, and benefits and loads beyond the system boundary (e.g. avoided material production from utilisation of recycled or reused products).
Upfront carbon emissions	The greenhouse gas emissions and removals associated with the creation of an asset, network, or system up to practical completion. This includes the emissions associated with the production and transportation of materials and construction related emissions.
Embodied carbon emissions	The greenhouse gas emissions and removals associated with the creation, maintenance and end-of-life disposal of an asset.
Operational carbon emissions	The greenhouse gas emissions generated from operational energy, operational water, and other operational processes.
Enabled carbon/user carbon emissions	The greenhouse gas emissions associated with users' utilisation of an asset, network or system, and the service it provides during operation.

1

The need for net zero infrastructure

The need for the infrastructure sector to transition to net zero

Why net zero matters

The Paris Agreement has set a global net zero target for 2050 to limit warming to 1.5°C above pre-industrial levels.

According to the IPCC, global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.[1]

On the role of infrastructure

The built environment plays a major role in achieving this goal because it is responsible for 57% per cent of Australia's greenhouse gas (GHG) emissions.

Operating and embodied emissions from buildings and infrastructure are almost one third of Australia's total carbon emissions, and with enabled emissions, the built environment would be responsible for over half of all the country's emissions.[2]

Because of this, the Australian Government has developed a series of strategies for reducing our country's sectorial emissions, including from transport and infrastructure.[4]

1. Paris Agreement

2. Embodied Carbon Projections for Australian Infrastructure and Buildings, 2024, Infrastructure Australia.

3. This figure does not include emissions from the resources sector. See p8 of the above report for what is excluded.

4. Section 4 of this paper includes a more detailed description of the Sectorial plans.

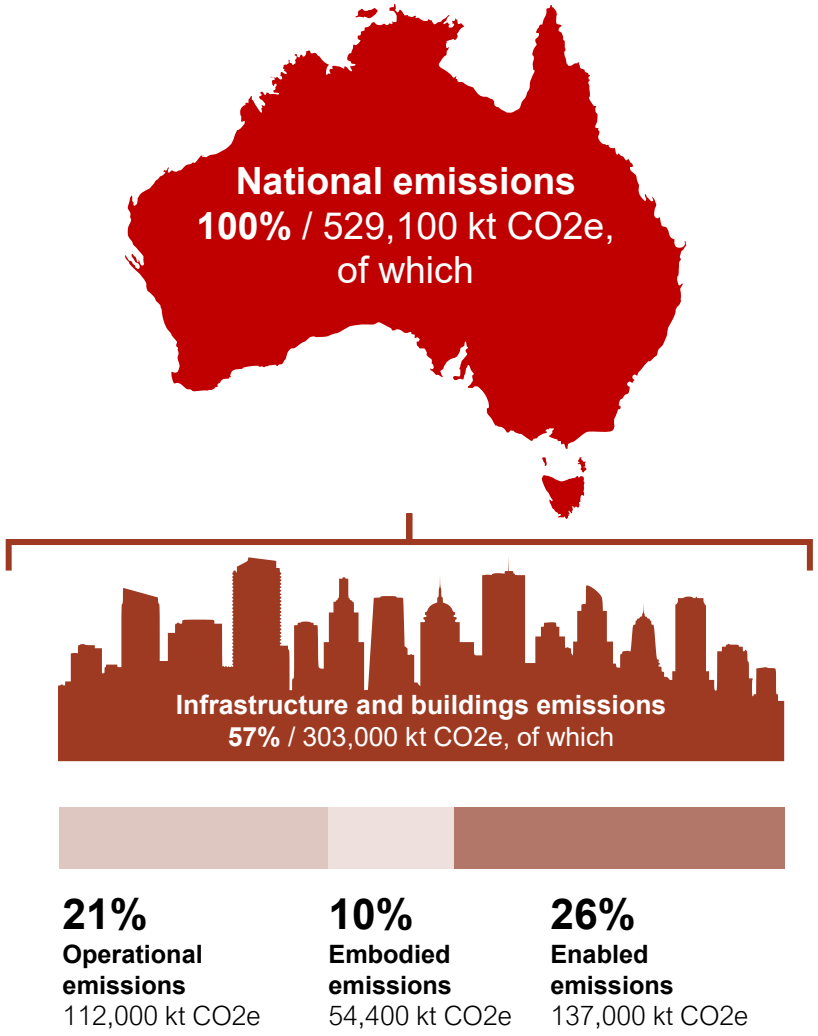


Figure 1 (left) Carbon emission projections for Australian infrastructure and buildings, 2023. Source: Embodied Carbon Projections for Australian Infrastructure and Buildings, 2024, Infrastructure Australia.

Note 1: Enabled emissions have been defined in this study to exclude primary industry (mining, agriculture, and forestry). If included credits from the Land Use sector (88 Mt CO2e) the total national emissions would be 441,100 kT CO2e).

Note 2: that this figure is based on a hybrid analysis and gross emissions of 529,100kt CO2e, not the official net figure.

2

Defining net zero & what it means for infrastructure

Defining net zero & what it means for infrastructure

Based on an extensive consultation process in 2024[1] and its adoption by infrastructure bodies in Australia, this paper proposes to use the definition by the PAS 2080:2023 Carbon Management in Buildings and Infrastructure standard (PAS 2080:2023).

The broad alignment of Australian infrastructure policies and industry initiatives around this definition will enhance consistency, comparability, and accountability in emissions reduction efforts. This alignment supports national decarbonisation goals and ensures infrastructure development follows global best practices.

PAS 2080:2023 is the best practice standard for carbon management and reduction within the infrastructure sector. It defines net zero as:

"Reduction of anthropogenic greenhouse gas emissions to zero or to a residual level that is consistent with reaching net zero emissions in eligible 1.5 °C pathways (hence time-bound) and neutralising the impact of residual emissions (if any) by removing an equivalent volume of carbon."[2]

This definition is in line with the global IPCC definition[3] and focuses first on reduction and then removal of residual emissions, if any. The Intergovernmental Panel on Climate Change (IPCC) states that net zero is required by 2050 to limit global warming to 1.5°C.[4]

Infrastructure NSW (INSW) aligns with PAS 2080:2023 in its *Decarbonising Infrastructure Delivery Policy*[5] and *Embodied Carbon Measurement for Infrastructure: Technical Guidance*[6]. Infrastructure Victoria recommended adoption of PAS 2080:2023 in its advice to the Victorian Government.

The Australian, state and territory governments are collaborating to improve national harmonisation of carbon management and measurement.

In June 2024, the Infrastructure and Transport Ministers' Meeting (ITTM) agreed to a nationally consistent approach for measuring embodied carbon in transport infrastructure projects, called the *Embodied Carbon Measurement for Infrastructure: Technical Guidance (National Measurement Guidance)*[7]. This ITTM document aligns with PAS 2080:2023 guidance for measurement and reporting.

The National Australian Built Environment Rating System's (NABERS) Embodied Carbon Tool is aligning with EN 15978 life cycle assessment standard for buildings which is aligned with measurement and reporting guidance in PAS 2080.

Industry led initiatives, such as the Infrastructure Sustainability (IS) and Green Star Rating Tools, also align their net zero strategies and asset level performance benchmarks with PAS 2080:2023.

1. A summary of the first consultation paper can be found in Appendix A of this paper.

2. PAS 2080:2023 Carbon Management in Buildings and Infrastructure| BSI. Additional notes on this definition can be found in the PAS 2080 document.

3. Annex I Glossary In: Climate Change 2023: Synthesis Report. IPCC, Geneva, Switzerland, pp. 119-130, doi:10.59327/IPCC/AR6-9789291691647.002.

4. Summary for Policymakers — Global Warming of 1.5 ºC

5. Decarbonising Infrastructure Delivery | Infrastructure NSW

6. Decarbonising Infrastructure Delivery | Infrastructure NSW

7. Working with states and territories to decarbonise infrastructure and transport | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

What do we mean by infrastructure?

PAS 2080:2023 defines infrastructure as:

"Basic physical and organisational structures, facilities, equipment and services needed for the operation of a society or organisation, or the services and facilities necessary for an economy to function."[1]

Infrastructure is the physical bricks and mortar, systems, networks and services that a country, state, organisation or community uses to allow communities, the environment and the economy to function.

Infrastructure Australia has classified infrastructure projects[2] in Australia across 4 broad sectors[3]:

- **Transport,** includes assets, systems and services for moving vehicles, people, or goods such as roads, bridges, airports, ports, aviation, shipping etc...
- **Utilities,** includes the components of generation, transmission and distribution of
  - Electricity, transmission wires, power plants, substations, etc.
  - Water, systems of water supply, water resource management, flood management, proper sewage and drainage systems, coastal restoration infrastructure, etc.
  - Data such as telephone networks, broadband network, transmission lines, networks, WiFi services and consumer and industry end use, etc.
- **Resources,** includes oil & gas extraction, ports, minerals facilities, processing, refining of fuels, hydrogen and similar. This typecast also includes the mining, manufacturing and refining of metals, resources, and chemicals, etc.[4]
- **Buildings,** offices, retail centers, apartments schools, hospitals, and other built assets used for commercial, residential, and social and community purposes.

Note: The terms social Infrastructure is used to group building projects that tend to have a social or community purpose, and are typically, but not always, managed by government entities, or support government outcomes.

Guidance for the building sector, including for social infrastructure, has already been developed by GBCA and ASBEC, and more information can be found on their websites.

1.PAS 2080:2023 Carbon Management in Buildings and Infrastructure | BSI

2. Supporting appendices, Infrastructure Market Capacity Report, Infrastructure Australia, 2024.

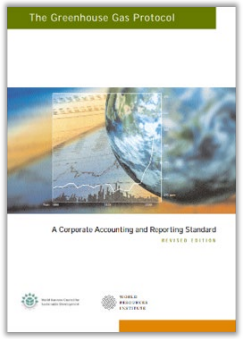
3. The report further breaks down the sectors other types and typecasts, but for purposes of this report, the 4 types suffice.

4. It is noted that the previous figure of 57% of emissions (see page 7) comes from infrastructure and buildings, excluding the emissions from the resources sector.

3

Carbon related frameworks for infrastructure

Carbon related frameworks used in the infrastructure sector



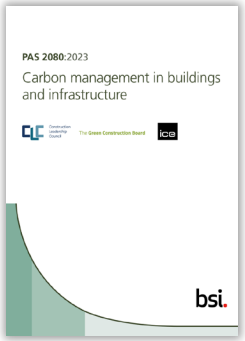
Greenhouse Gas (GHG) Protocol

Purpose: **Global framework that is frequently used for company level reporting, that encompasses Scope 1, Scope 2 and Scope 3 GHG emissions**

Inception date: 1990

Additional information: Used as a framework for almost all global reporting frameworks such as Taskforce for Climate related Financial Disclosures (TCFD), accounting standards, green bonds and the Australian Sustainable Reporting Standards(ASRS).

See page 13 for more information.



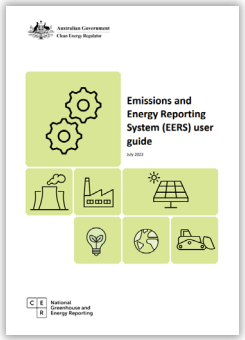
PAS 2080

Purpose: **Global specification framework that is used for infrastructure projects, that is mapped against lifecycle stages and supported by life cycle assessment based standards**

Inception date: 2016

Additional information: PAS 2080:2023 Carbon Management in Buildings and Infrastructure is used by infrastructure bodies around the world. It is supported by additional documents, such as EN 15978 and EN 17472 as well as the RICS Whole life carbon assessment for the built environment (RICS WLC).

See page 14 for more information.



NGERS

Purpose: **Australia's regulatory framework for reporting energy & operational GHG emissions (scope 1 & 2), where companies and facilities meet certain thresholds**

Inception date: 2007

Additional information: National GHG and Energy Reporting Scheme (NGERS) is used as the reporting mechanism under the National Greenhouse and Energy Reporting Act 2007 and Safeguard Mechanism.

See page 19 for more information.

About the GHG Protocol

1. Corporate Standard | GHG Protocol

2. Corporate Value Chain (Scope 3) Standard | GHG Protocol

Note: there are seven GHG protocol standards in total. Standards & Guidance | GHG Protocol

The mission of the Greenhouse Gas Protocol (GHG Protocol) is to develop internationally accepted greenhouse gas accounting and reporting standards and tools, and to promote their adoption in order to achieve a low emissions economy worldwide.

The GHG Protocol divides a company's emissions into three different scopes:

1. **Scope 1 – Direct GHG emissions:** Emissions from operations that are owned or controlled by the reporting company.

2. **Scope 2 – Electricity indirect GHG emissions:** Emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by the reporting company.

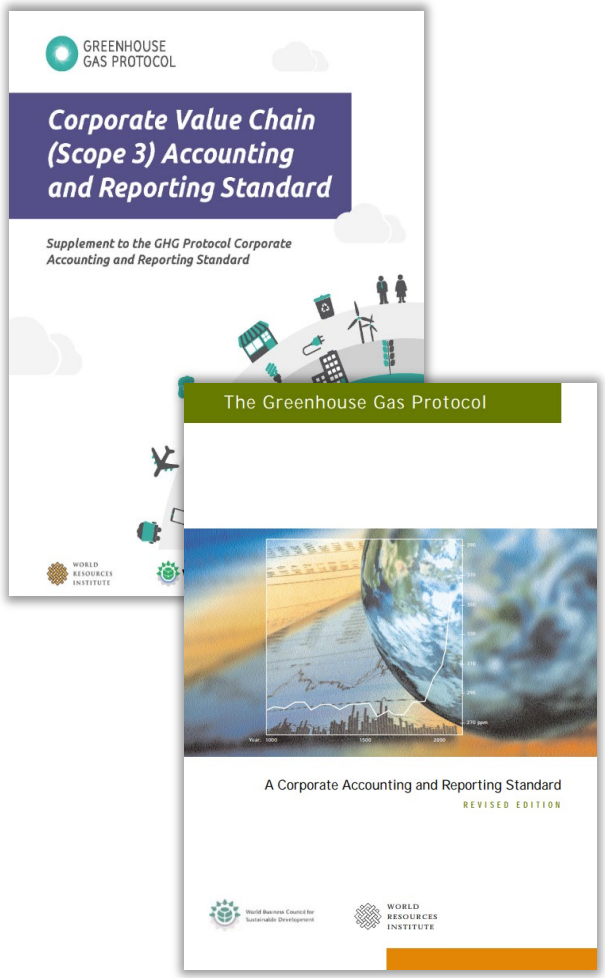
3. **Scope 3 – other indirect GHG emissions:** Other indirect emissions (not included in scope 2), that occur in the value chain of the reporting company because of the company's activities but come from sources they do not own or control.

The GHG Protocol has produced a collection of standards, protocols and guidelines that provide a framework for organisations (sometimes referred to as companies or entities) to measure and report their GHG emissions.

Two important GHG protocol documents for the infrastructure sector are:

- ***The GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol Corporate Standard)***[1] which provides requirements and guidance for organisations preparing a GHG emissions inventory.

- ***The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (GHG Protocol Scope 3 Standard)***[2] which provides requirements and guidance for organisations preparing a GHG emissions inventory that includes indirect emissions resulting from value chain activities (i.e., scope 3 emissions). The primary goal of this standard is to provide a standardised step-by-step approach to help companies understand their full value chain emissions impact in order to focus company efforts on the greatest GHG reduction opportunities, leading to more sustainable decisions about companies' activities and the products they buy, sell, and produce.



About PAS 2080

1. PAS 2080:2023 Carbon Management in Buildings and Infrastructure | BSI

2. 2023-03-29-pas_2080_guidance_document_april_2023.pdf

3. EN 15978 Sustainability of construction works – Assessment of environmental performance of buildings Calculation method

4. BS EN 17472 Sustainability of construction works – Sustainability assessment of civil engineering works – Calculation methods

5. RICS Whole life carbon assessment (WLCA) for the built environment

PAS 2080 is a specification for whole life carbon management when delivering projects in the buildings and infrastructure.

PAS 2080 supports the transition to a net zero carbon economy by 2050 and requires close collaboration across value chain members. It defines their contribution towards the net zero transition by developing and implementing, in a collaborative manner, the PAS 2080 carbon management process.

Targeted at leaders and all members of value chain organisations (asset owners/managers, designers, constructors and product/material suppliers) responsible for delivering built assets and networks, **PAS 2080 provides a common process for the built environment value chain on how to manage whole life carbon in projects and programs of work.**

There are two PAS 2080 documents, both of which are important for the infrastructure sector:

- ***PAS 2080:2023 Carbon management in Buildings and Infrastructure (PAS 2080)*** [1] Specification of carbon management in the built environment and specification of value-chain members responsibilities for carbon management in the built environment.
- ***Institution of Civil Engineers (ICE) Guidance Document for PAS 2080*** [2] Practical guidance on implementing carbon management by all value chain members in delivering projects/programs of work. Case studies and worked examples of carbon management components.

PAS 2080 draws on guidance from *EN 15978 Sustainability of construction works – Assessment of environmental performance of buildings Calculation method (EN 15978)*[3] and *EN 17472 Sustainability of construction works – Sustainability assessment of civil engineering works – Calculation methods (EN 17472)*[4] as well as the *RICS Whole life carbon assessment for the built environment (RICS WLC)* [5]. See next page for more information about these.

About EN 15978, EN 17472 and RICS WLC

1. EN 15978 Sustainability of construction works – Assessment of environmental performance of buildings Calculation method

2. BS EN 17472 Sustainability of construction works – Sustainability assessment of civil engineering works – Calculation methods

3. Whole life carbon assessment (WLCA) for the built environment

4. Decarbonising Infrastructure Delivery | Infrastructure NSW

PAS 2080 refers to underlying life cycle assessment based standards for measurement and reporting, specifically EN 15978[1] and EN 17472[2]. RICS Whole life carbon assessment for the built environment (RICS WLC) [3] is based on the same standards and goes into more specific detail on calculation assumptions and reporting format. Use of these standards can provide consistency in measurement and reporting across buildings and infrastructure.

The EN 15978, EN 17472, and RICS Whole Life Carbon Assessment standards provide a framework for measuring and reporting environmental impacts across the life cycle of buildings and infrastructure.

They divide a built asset's life into stages:

Product (A1-A3), Construction (A4-A5), Use (B1-B8), End-of-Life (C1-C4), and Beyond Life Cycle (D), ensuring consistent assessment of embodied and operational carbon.

EN 15978 focuses on buildings, while EN 17472 applies to infrastructure, both establishing environmental performance calculation rules.

The RICS WLC assessment provides a standardised methodology for carbon measurement and reduction, supporting net-zero strategies. Together, these standards guide sustainable decision-making by embedding life cycle thinking, promoting transparency, and driving carbon reduction in the built environment.

The INSW and ITMM embodied carbon measurement guidance documents[4] align with these life cycle stages and modules for reporting templates, aiming to support data aggregation and development of future benchmarks.

Measuring carbon for infrastructure projects

PAS 2080 draws from EN 15978, EN 17472, and RICS WLC by adopting their whole life carbon approach (A1–C4 and beyond-life-cycle D stages) and ensuring consistency in carbon measurement across buildings and infrastructure.

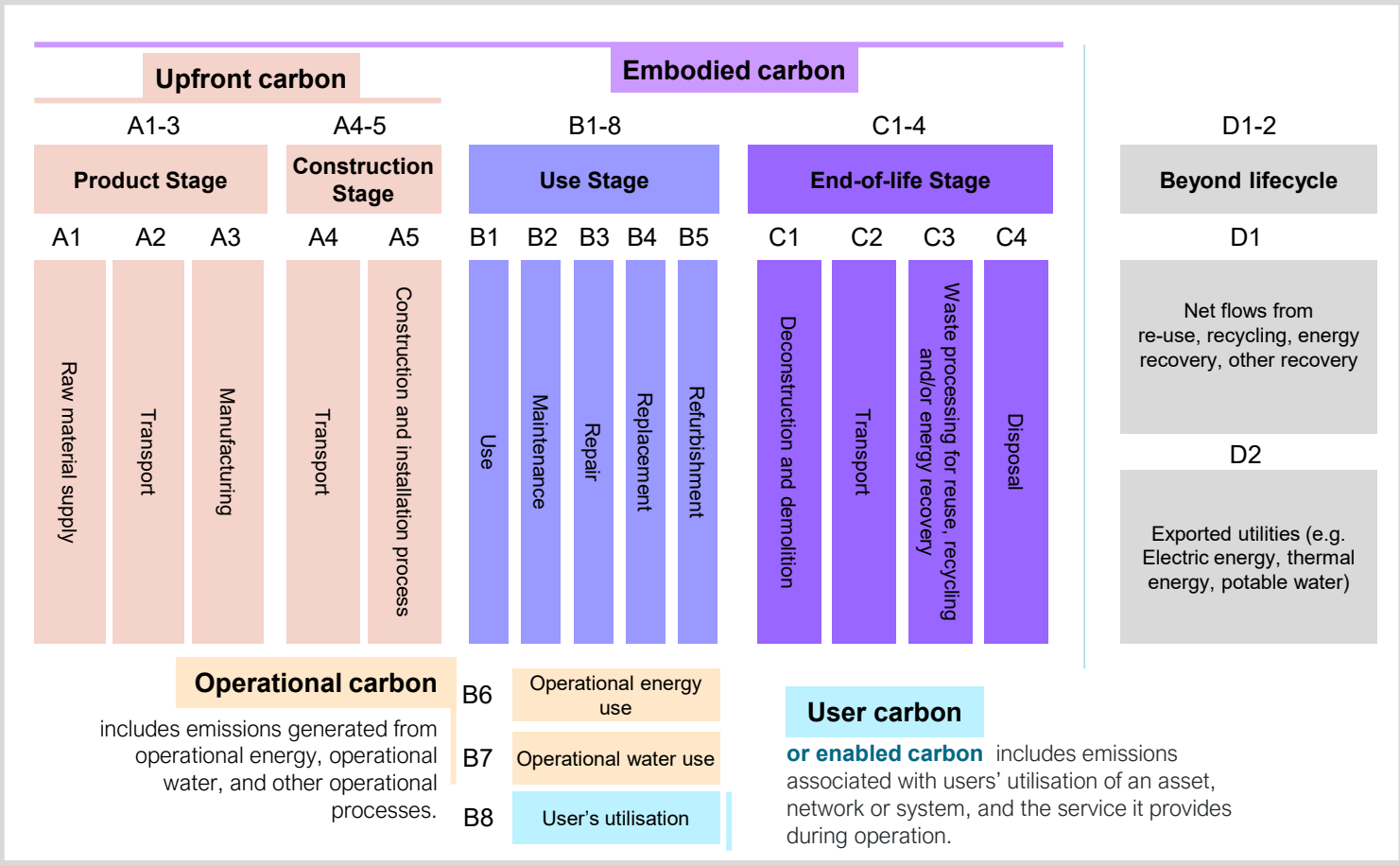


Fig 2. Lifecycle stages of civil engineering works assessment, (BS EN 17472 Sustainability of construction works – Sustainability assessment of civil engineering works – Calculation methods)

Whole life carbon

The total greenhouse gas emissions and removals associated with the creation, operation, maintenance and end-of-life disposal of an asset. This includes upfront carbon as well as in-use emissions (from maintenance, repair, refurbishment and operation of the asset), end-of-life disposal, and benefits and loads beyond the system boundary (e.g. avoided material production from utilisation of recycled or reused products).

Embodied carbon is the greenhouse gas emissions and removals associated with the creation, maintenance and end-of-life disposal of an asset.

Upfront carbon is the carbon emissions and removals associated with the creation of an asset, network, or system up to practical completion. This includes the emissions associated with the production and transportation of materials and construction related emissions.

Net zero for infrastructure projects and infrastructure entities/ organisations

1. A building or infrastructure asset is part of a network, which in turn is part of a system. The control of decision-making sits with different members of the value chain, but some of them often have greater ability to influence decarbonisation, depending on the level at which they are operating.

Within the infrastructure sector, there is a strong focus on reducing GHG emissions at the project level, which is then reflected at the asset, network and systems level.

Consideration of emissions at every stage of the asset life cycle - planning, design, construction and operations - is required to ensure the transition to net zero.

PAS 2080:2023 provides detailed guidance on net zero-aligned decisions made by all infrastructure sector organisations at all stages of the asset life cycle.

PAS 2080:2023 emphasises that asset owners/managers need to prioritise target-setting and carbon reduction measures for the project and/or programme of works that align to and support the transition to net zero carbon as set out at the system or network level.[1]

Key considerations in applying PAS 2080:2023 to drive decarbonisation and align with net zero at the project level are:

- The focus on whole life carbon management and alignment to net zero transition when delivering projects and programs
- The need for action at each stage of infrastructure development, such that all value chain members identify the activities that result in carbon emissions or removals within their control and influence (whether at the asset, network or systems level)
- The importance of close collaboration across value chain members
- The application of the carbon reduction hierarchy (avoid, switch, improve)
- Implementation of appropriate governance and decision-making structures.

For organisations and entities: Scope 1, 2 and 3 emissions should be measured and reported, which may include a combination of emissions related to infrastructure projects, as well as other entity emissions. These should be reported as per the GHG Protocol (and where applicable meet NGERs reporting and safeguarding requirements plus any other organisational obligations).

For projects: PAS 2080:2023 and the supporting Guidance Document for PAS 2080 provide accurate guidance on how to measure and report carbon emissions over the lifecycle of the asset.

There are other detailed reporting frameworks (e.g. GRESB) that use either, or a mixture of, the GHG Protocol and PAS 2080:2023 to satisfy financiers, rating tools, or other contractual obligations.

When to use the GHG Protocol and PAS 2080

1. Standards & Guidance | GHG Protocol

2. PAS 2080:2023 Carbon Management in Buildings and Infrastructure | BSI

The GHG Protocol standards[1] and PAS 2080[2] complement each other, providing tools to manage infrastructure related carbon. The GHG Protocol helps organisations to understand their specific sphere of control, while PAS 2080 helps manage emissions related to a whole asset, network or sector (system).

	Organisational based frameworks e.g. GHG Protocol	Building and infrastructure specific frameworks, e.g. PAS 2080
Outcome	Carbon emissions inventory for reporting. Clear delineation between organisation/entity control and responsibility.	A strategy to design, build, and operate low-carbon infrastructure.
Key users	Organisations or entities needing GHG accounting for compliance, reporting, or sustainability goals.	Asset owners, engineers, designers, contractors, and suppliers aiming to reduce carbon footprints in projects.
Purpose	Provides a standardised framework for measuring and reporting greenhouse gas (GHG) emissions.	Focuses on actively reducing whole life carbon in infrastructure projects. More appropriate for funding investment decisions and policy making decisions at the economy level.
Application	Used for carbon accounting and disclosure in infrastructure organisations/entities (e.g., reporting corporate emissions from projects).	Used for carbon management and reduction in the design, procurement, and delivery of infrastructure. Also used for investment appraisals, government policy, sector wide decarbonisation strategies
Scope	Corporate, product, and value chain (Scope 1, 2, and optionally 3) emissions across all sectors.	Buildings and infrastructure specific – covering planning, design, construction, and operation.
Methodology	Defines accounting rules for direct (Scope 1), indirect (Scope 2), and value chain (Scope 3) emissions.	Promotes a systems-based approach to reduce emissions across the project lifecycle and with consideration of the project's impact on emissions at the network and system level.

About NGERS

1. Federal Register of Legislation - National Greenhouse and Energy Reporting (Measurement) Determination 2008

2. NGER reporting guides | Clean Energy Regulator

The NGER Act 2007 is a framework for the reporting of greenhouse gas emissions, energy production, and energy consumption by corporations in Australia.

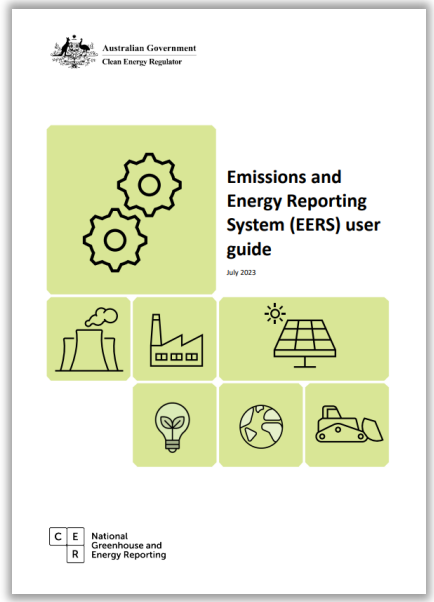
The Act supports Australia's transition to a lower-carbon economy by ensuring transparent and consistent data collection. It requires businesses that meet certain thresholds to report their emissions and energy use, promoting accountability and informed policy-making for emissions reduction.

Targeted at corporations, government bodies, and industries with significant energy use and emissions, the NGER Act establishes a national reporting framework.

It provides a consistent approach to monitoring greenhouse gas emissions and energy data to support policy and regulatory decisions aimed at reducing environmental impact.

There are two key components of the NGER framework, both essential for compliance and emissions management:

- ***NGER Measurement Determination*** [1] Defines the methodologies for measuring and reporting emissions and energy data to ensure accuracy and comparability.
- ***NGER Reporting Guidelines*** [2]
  A series of guidelines provides practical guidance for corporations on compliance requirements, reporting processes, and obligations under the Act, including case studies and reporting templates.



Rating tools driving measurement of carbon in infrastructure projects

1. IS Rating Scheme

Developed by the Infrastructure Sustainability Council, the IS Rating Scheme[1] is a comprehensive rating system for evaluating the sustainability performance of infrastructure across the life cycle of infrastructure assets.

The rating scheme is composed of five rating tools:

- IS Strategic Planning, for the strategic phase of infrastructure planning
- IS Detailed Planning, for the detailed phase of infrastructure planning
- IS Design & As Built, for the design and construction phases of new infrastructure assets and major upgrades (over $100M capex)
- IS Essentials, for the design and construction phases of new infrastructure assets and major upgrades ($5M to $100M capex)
- IS Operations, for infrastructure assets and networks in operation

There are over 415 rated assets valued at close to $390 billion from all infrastructure sectors – transport, communications, water, energy, waste, social and blue and green infrastructure.

IS rating tools drive and reward decisions and actions towards Net Zero across the infrastructure life cycle.

The Planning tools require consideration of carbon impacts, including cost of carbon, in strategic and detailed options assessment and reward planned reductions in emissions across the life cycle via net zero alignment strategies, carbon budgets, and procurement scoping and targets. Embodied, operational and enabled emissions are all considered in the planning phases.

The Design & As Built, Essentials and Operations tools drive and reward carbon reductions in the following aspects:

- Energy efficiency during construction, operations and maintenance
- Renewable energy development during construction and operations
- Materials life cycle impacts in construction, operations and maintenance phases
- Asset specific emission source reductions
- Emissions offsetting (up to 100% of residual)

The IS Rating Tools also include optional Innovation Challenges related to Certified Carbon Neutrality, High Clinker Substitution and Contributing to a Circular Economy via reporting, reductions and use of measures such as the Material Circularity Indicator (MCI). These Challenges reward emerging best practice and raise the bar for business-as-usual practices.

Rating tools driving measurement of carbon in infrastructure projects

1. Green Star Rating System

Developed by the Green Building Council of Australia, Green Star[1] is a holistic rating system for buildings, including social infrastructure, fitouts, and masterplanned precincts.

The rating system is composed of five rating tools:

- Green Star Communities, for new and existing masterplanned precincts
- Green Star Buildings, for new buildings and major refurbishments
- Green Star Performance, for buildings in operation
- Green Star Fitouts, for new fitouts
- Green Star Homes, for new single-family dwellings.

There are over 5730+ rated assets from all sectors of the built environment. Ratings have been awarded to airports, train stations, hospitals, schools, laboratory buildings and logistic centers.

All Green Star rating tools include 'Climate Positive' requirements.

The pathway is designed to help both project teams and industry achieve their net zero target. All projects are required, to achieve a certification, to meet stringent reduction targets on:

- Energy efficiency (at least 10% better compared to code)
- Upfront embodied carbon reductions of at least 10% (calculated per module A)
- Electrification of all building services
- Renewable energy requirements

These targets become more stringent over time. The targets have been communicated well in advance (since 2020), with all projects being required to achieve the stringent targets from 2026 onwards.

Green Star also includes an optional 'Life-cycle impacts' credit, which rewards whole life-cycle assessment of a building and reporting the results.

In an upcoming update in 2025, Green Star will introduce a circularity metric credit, recognising and rewarding reductions using either a Material Circularity Indicator (MCI) or a Circular Transition Indicator (CTI). This aims to move industry to consider more sophisticated approaches to in-use and end-of-life rather than simple life-cycle analysis.

Rating tools driving measurement of carbon in infrastructure projects

1. NABERS Embodied Carbon

Developed by the New South Wales Government, NABERS (National Australian Built Environment Rating System) [1] is a performance-based rating system for buildings, measuring environmental impacts such as energy, water, indoor environment quality, waste, and embodied carbon.

There are five NABERS rating tools:

- NABERS Energy, for operational energy efficiency of buildings
- NABERS Water, for water usage and management of buildings
- NABERS Indoor Environment, for occupant health and comfort of buildings
- NABERS Waste, for waste generation, recycling and resource recovery of buildings
- NABERS Embodied Carbon, for upfront carbon emissions in construction and refurbishment of buildings.

There are over 12,000 NABERS ratings across commercial offices, shopping centres, hotels, data centres, apartments, and more. Ratings have also been awarded to hospitals, schools, and industrial buildings.

The NABERS Embodied Carbon rating tool measures, verifies, and compares the upfront embodied carbon (module A) of new buildings and partial rebuilds.

It focuses on emissions from materials and construction before the building is occupied, which can account for up to 80% of a building's lifetime embodied emissions. It includes emissions from the superstructure, substructure, envelope, and building services.

Buildings eligible for a rating include residential buildings, offices, industrial facilities, shopping centers, and educational institutions. Ratings can be applied up to two years after practical completion.

As part of the development of the tool, NABERS developed a series of standardised conservative emissions profiles for typical building materials. When the actual carbon content of the materials used is unknown, these factors must be used. The conservative values aim to encourages the use of Environmental Product Declarations (EPDs) for accurate material emissions. These conservative values are also helpful as they enable for material comparability.

The tool was developed in collaboration with industry partners and aligns with international standards. It has received approval from the NABERS National Steering Committee and endorsement from all states and territories. It is expected to be released in 2025.

Coverage of lifecycle modules by rating tool

This table (right) shows how distinct rating tools address distinct lifecycle modules.

Further information on which specific credits in the IS and Green Star rating tools address each module can be found in Appendix B.

	Infrastructure sectors each tool can be used for	Embodied carbon			Operational	Enabled	Supplementary
		Upfront (A1-A5)	Use (B1-B5)	End-of-life (C1-C4)	Operational (B6-B7)	User (B8)	Beyond lifecycle (D1-D2)
IS Rating – Planning	Energy, transport, telecommunications, water, non-building social infrastructure (excl. hospitals, schools)	○	○	○	○	○	○
IS Rating – D&AB / Essentials	Energy, industry, transport, water, non-building social infrastructure (excl. hospitals, schools)	○	○	○	○	○	○
IS Rating - Operation	Energy, transport, telecommunications, water, non-building social infrastructure (excl. hospitals, schools)		○	○	○	○	○
Green Star Buildings & Green Star Communities v2	Social infrastructure buildings (e.g. hospitals, stadiums, schools), transport stations (e.g. metro) & precinct developments	●	○	○	●	○	
NABERS Embodied Carbon	Social infrastructure buildings	Δ					

Legend:

● – Mandated reporting and reductions to achieve rating

O – Contains voluntary credits which have reporting and reduction requirements

Δ – Mandated reporting of emissions to achieve rating

4

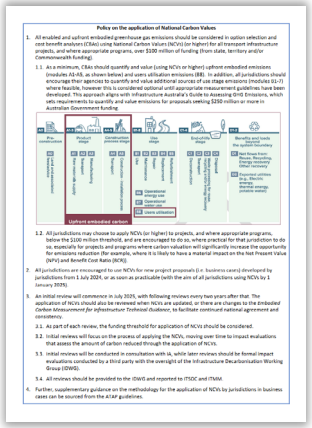
Australia’s net zero policies and guidance

Key national infrastructure policies & guidance driving action across Australia

1. Policy on the application of the national carbon values

2. Embodied Carbon Measurement for Infrastructure: Technical Guidance (National Measurement Guidance)

3. Guide to assessing greenhouse gas emissions | Infrastructure Australia


Policy on the application of National Carbon Values

1. All enabled and upfront embodied greenhouse gas emissions should be considered in option selection and cost benefit analyses (CBAs) using National Carbon Values (NCVs) (or higher) for all transport infrastructure projects, and where appropriate programs, over $100 million of funding (from state, territory and/or Commonwealth funding).

1.1. As a minimum, CBAs should quantify and value (using NCVs or higher) upfront embodied emissions (modules A1–A5, as shown below) and users utilisation emissions (B8). In addition, all jurisdictions should encourage their agencies to quantify and value additional sources of use stage emissions (modules B1–7) where feasible, however this is considered optional until appropriate measurement guidelines have been developed. This approach aligns with Infrastructure Australia's Guide to Assessing GHG Emissions, which sets requirements to quantify and value emissions for proposals seeking $250 million or more in Australian Government funding.

Upfront embodied carbon

1.2. All jurisdictions may choose to apply NCVs (or higher) to projects, and where appropriate programs, below the $100 million threshold, and are encouraged to do so, where practical for that jurisdiction to do so, especially for projects and programs where carbon valuation will significantly increase the opportunity for emissions reduction (for example, where it is likely to have a material impact on the Net Present Value (NPV) and Benefit Cost Ratio (BCR)).

2. All jurisdictions are encouraged to use NCVs for new project proposals (i.e. business cases) developed by jurisdictions from 1 July 2024, or as soon as practicable (with the aim of all jurisdictions using NCVs by 1 January 2025).

3. An initial review will commence in July 2025, with following reviews every two years after that. The application of NCVs should also be reviewed when NCVs are updated, or there are changes to the *Embodied Carbon Measurement for Infrastructure Technical Guidance*, to facilitate continued national agreement and consistency.

3.1. As part of each review, the funding threshold for application of NCVs should be considered.

3.2. Initial reviews will focus on the process of applying the NCVs, moving over time to impact evaluations that assess the amount of carbon reduced through the application of NCVs.

3.3. Initial reviews will be conducted in consultation with IA, while later reviews should be formal impact evaluations conducted by a third party with the oversight of the Infrastructure Decarbonisation Working Group (IDWG).

3.4. All reviews should be provided to the IDWG and reported to ITSOC and ITMM.

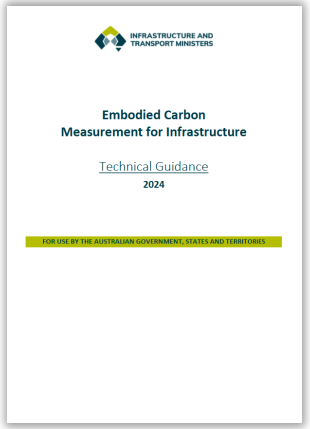
4. Further, supplementary guidance on the methodology for the application of NCVs by jurisdictions in business cases can be sourced from the ATAP guidelines.

Policy on the application of the national carbon values[1]

Infrastructure Australia & Infrastructure and Transport Ministers' Meetings (ITMM)

In December 2023, ITMM approved a nationally consistent set of carbon values (NCVs) for use in transport infrastructure project decision making. The values will be required for proposals assessed by Infrastructure Australia that seek more than $250 million in Commonwealth funding.

In June 2024, ITMM agreed on the use of the NCVs by jurisdictions in the assessment of business cases for transport infrastructure. The joint policy document states in principle agreement that upfront and enabled emissions should be considered as part of the cost benefit analysis for transport infrastructure projects receiving over $100 million in government funding, with a recommended commencement date of 1 January 2025 or earlier.

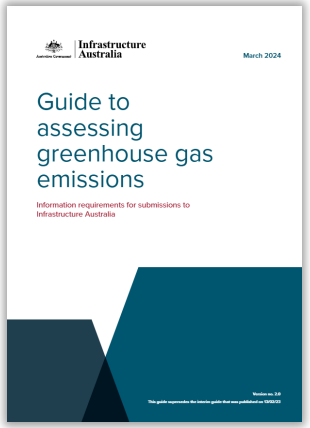


Embodied Carbon Measurement for Infrastructure: Technical Guidance (National Measurement Guidance)[2]

Infrastructure and Transport Ministers' Meetings (ITMM)

In June 2024, ITMM agreed a nationally consistent approach for valuing embodied carbon for use in transport infrastructure projects, called the *Embodied Carbon Measurement for Infrastructure: Technical Guidance* (National Measurement Guidance). The National Measurement Guidance supports consistency and harmonisation across all Australian jurisdictions by providing common methodology, assumptions, approach to data use, and reporting approaches for embodied carbon.

Use of a consistent measurement approach will enhance the accuracy of carbon valuation in business case options, as well as enable consistent carbon measurement within the context of setting any commercial and technical requirements. In turn, a nationally consistent measurement approach supports industry action to reduce emissions and can facilitate benchmarking and target setting for transport infrastructure projects.



Guide to assessing greenhouse gas emissions[3]

Infrastructure Australia

Infrastructure Australia's guide sets out how proponents of infrastructure proposals must account for and value greenhouse gas emissions when seeking project evaluation. It details the information required at each submission stage (from defining the problem to preparing a detailed business case), emphasising the need to quantify emissions across materials, construction, and operations, and to incorporate these costs into any cost-benefit analysis.

The document provides recommended carbon values for monetizing emissions and underscores alignment with net zero or interim targets. It also highlights the importance of managing climate-related risks, offering guidance on how projects should report and plan for emissions reduction initiatives as well as potential induced demand effects.

Examples of infrastructure state policies & guidance driving action in Australian states

1. Decarbonising infrastructure delivery policy

2. Embodied Carbon Measurement for Infrastructure: Technical Guidance (NSW version)

3. Opportunities to reduce greenhouse gas emissions of infrastructure

4. Sustainability Manual

Note: for more state policies and guidance, see Appendix C.

Report	Published by:	
Decarbonising infrastructure delivery policy[1]	Infrastructure NSW	The Decarbonising Infrastructure Delivery Policy provides guidance to delivery agencies on managing upfront carbon in public infrastructure projects. This policy applies to all NSW Government building projects valued over $50 million and linear infrastructure projects valued over $100 million. Key aspects of the policy include prioritising actions to reduce carbon emissions at every stage of a project (Carbon Reduction Hierarchy), providing a consistent approach to measuring embodied carbon emissions (Measurement Guidance), and enhancing the skills and knowledge of government and industry professionals (Capability Building). The policy is part of a broader effort to achieve net zero emissions in the infrastructure sector and includes a roadmap developed in collaboration with Transport for NSW (TfNSW).
Embodied Carbon Measurement for Infrastructure: Technical Guidance (NSW version)[2]	Infrastructure NSW	Released in April 2024, this technical guidance provides a standardised technical framework for measuring and reporting embodied carbon across NSW infrastructure projects. It details specific requirements for embodied carbon measurement and reporting in line with PAS 2080:2023 and other lifecycle assessment-based standards. Its aim is to provide consistency in carbon assessment data which supports tracking of NSW Government agency emissions and development of future benchmarks. The guidance specifies how carbon data should be presented across the stages of the infrastructure delivery lifecycle, from business case to practical completion.The National Measurement Guidance (above) was adapted from the INSW Embodied Carbon Measurement for Infrastructure Guidance.
Opportunities to reduce greenhouse gas emissions of infrastructure[3]	Infrastructure Victoria	This report advises the Victorian Government on integrating carbon considerations into infrastructure planning, design, construction, maintenance, and end-of-life. It identifies three core principles—prioritising existing or low-build solutions, aligning with best practices, and setting clear reduction targets—and makes recommendations. These include adopting a adopting a carbon management standard like PAS 2080:2023 to measure and manage carbon emission, using a carbon value, updating business case and procurement guidelines, embedding carbon reporting in contracts, and supporting industry innovation. Acting now can cut costs, boost productivity, and help Victoria meet its emissions goals. Includes a supporting technical paper which compares carbon standards and tools being used in Victoria and other jurisdictions.
Sustainability Manual[4]	Department for Infrastructure and Transport South Australia	This manual provides a clear, lifecycle-based framework to embed sustainability in infrastructure projects, emphasising embodied-carbon accounting and alignment with PAS 2080. It requires early carbon assessments, the Carbon Reduction Hierarchy to guide design and construction choices, and dedicated Carbon Management Plans. Each value-chain member (designers, contractors, suppliers) is responsible for measuring and reducing emissions from materials extraction (embodied carbon) through operation and end-of-life. Whole life carbon must be considered in options analysis and included in cost benefit analyses, through monetisation of GHG emissions using the national carbon values provided in Infrastructure Australia's Guidance Note – Valuing emissions for economic analysis. The manual further covers circular economy principles, green infrastructure objectives, and climate resilience planning, ensuring these measures are integrated into design and tracked via formal sustainability plans and progress reports. By following these requirements, projects meet PAS 2080 standards, reduce carbon footprints, and support a net-zero transition.

Review of lifecycle coverage by select guides

This table (right) shows examples of the coverage of requirements and guidance for carbon assessment as part of distinct infrastructure department policies.

Note:

Modules B1-B5 can contain both embodied and operational carbon components. RICS Whole Life Carbon 2nd Edition requires that these are clearly identified where 'operational carbon' relate to operational expenditure and 'embodied' components to capital expenditure.

	Embodied carbon			Operational	Enabled	Supplementary
	Upfront (A1-A5)	Use (B1-B5)	End-of-life (C1-C4)	Operational (B6-B7)	User (B8)	Beyond lifecycle (D1-D2)
Infrastructure Australia Guide to assessing greenhouse gas emissions. Information requirements for submissions to Infrastructure Australia	●	●		●	●	
Infrastructure and Transport Ministers Embodied Carbon Measurement for Infrastructure - Technical Guidance	●	O	O	O	O	O
Infrastructure NSW Decarbonising Infrastructure Delivery Policy and Measurement Guidance	●	O	O	O	O	O

Legend:

● - Module required

O - Module optional (e.g., recommended or "should be considered")

Other infrastructure policies driving action in Australia

More details on these policies can be found in Appendix C.

Information on QLD and NT policies can also be found in Appendix C.

Western Australia

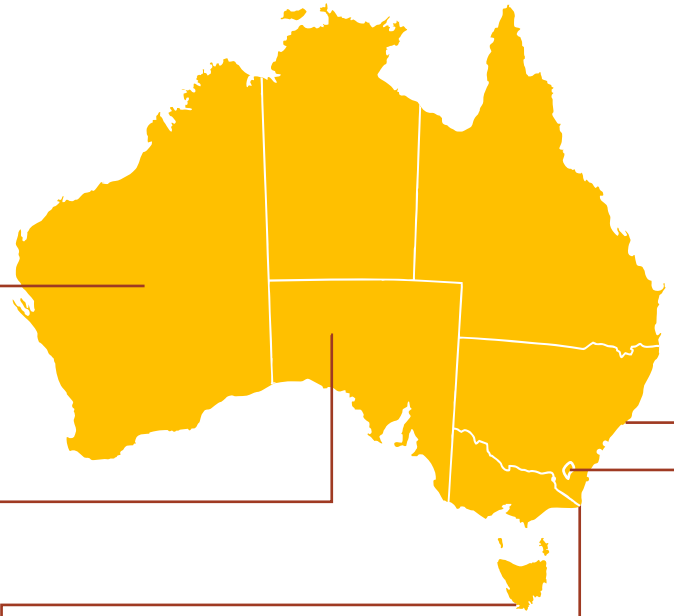
- Climate Policy, 2020 and Climate Bill, 2023
- Sectoral Emission Reduction Strategy (SERS)
- State Infrastructure Strategy
- WA Treasury Corporation ESG commitment and Sustainable Bond Framework
- Strategic Asset Management Framework (SAMF) Policy
- Transport Portfolio ESG Framework and Sustainable Infrastructure Policy and Guidance
- Main Roads WA Net Zero Roadmap
- Westport ESG Strategy
- METRONET Sustainability Strategy

South Australia

- South Australia's Net Zero Strategy 2024-2030:
  - Action 11.2 - Develop a South Australian Government infrastructure decarbonisation policy
  - Action 15.4 - Deliver low emissions infrastructure and operations
- Sustainable Procurement Policy

Tasmania

- Tasmanian Sectoral Emissions Reduction and Resilience Plans 2024-29
- Renewable Energy Action Plan
- Renewable Hydrogen Action Plan
- Tasmania's Climate Change Action Plan 2023-25
- Transport Emissions Reduction and Resilience Plan (2024-29)
- Tasmanian Walk, Wheel, Ride Policy



New South Wales

- Decarbonising Infrastructure Delivery Roadmap
- Sustainable Infrastructure Program
- Net Zero and Climate Change Policy
- NSW Climate Change (Net Zero Future Act) 2023
- NSW Government Guide to Cost-Benefit Analysis
- TPG24-34 Carbon emissions in the Investment Framework (TPG-24)

Australian Capital Territory

- ACT Infrastructure Plan - Climate Action, Energy and Environment
- The ACT Climate Change Strategy 2019-2025
- The Territory Plan 2023
- ACT Sustainable Buildings Pathway
- Suburban Land Agency (SLA) Sustainability Strategy
- Electrification of Government Gas Assets program
- Zero Emission Government Facility Guidelines
- Minimum Standard for Rental Properties
- Low carbon concrete policy

Victoria

- Clean economy workforce development strategy 2023-2033
- Victoria's Climate Science Report 2024
- Zero emissions vehicle roadmap
- Victoria's zero emission bus transition plan
- Gas substitution roadmap update 2024
- Transport infrastructure decarbonisation
- Victoria's climate change strategy
- Greener Government Buildings
- Whole of Victorian Government emissions reduction pledge
- Opportunities to reduce greenhouse gas emissions of infrastructure
- Digital technology and infrastructure productivity
- Towards 2050 – Gas infrastructure in a net zero emissions economy
- Transition opportunities: Coal to Offshore Wind
- Renewable Homes Construction Training program
- Environmental sustainability and clean economy initiatives

ASBEC report

Our Upfront Opportunity: Australia's policy roadmap to reduce upfront embodied carbon in the built environment

Creating a shared vision and supporting policy ecosystem for buildings and infrastructure

The Australian Sustainable Built Environment Council's (ASBEC) report on embodied carbon "Our upfront opportunity" provides a detailed overview of the measures required to reduce carbon emissions in the built environment, including infrastructure.

The report outlines the need to reduce upfront embodied carbon by 60–75% by 2035, in alignment with Australia's Net Zero commitment, with an effective reduction to zero by 2050. This target recognises that as the electricity sector decarbonises, embodied carbon will account for an increasing share of the total lifetime emissions of building and infrastructure projects.

Key aspects of the report related to infrastructure include:

Policy and Regulatory Frameworks

- An aligned, nationally consistent policy approach for the built environment is proposed, establishing clear signaling and emissions reduction pathways and providing certainty for long-term infrastructure planning and design

Data, Methodology, and Reporting

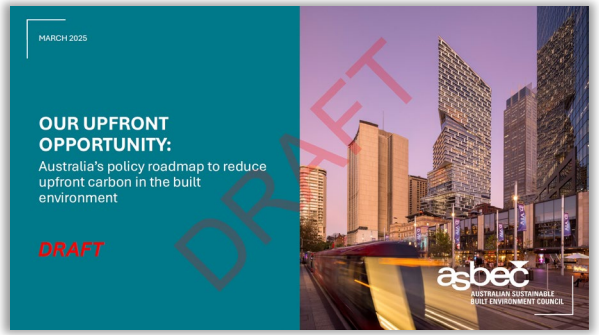
- Investment in aligned national frameworks and tools is necessary to baseline, measure, benchmark, disclose, and reduce embodied carbon consistently across infrastructure projects.
- The development of a unified methodology and a common database is emphasised to ensure consistent measurement and reporting of carbon emissions in infrastructure. This enables data aggregation and development of carbon intensity benchmarks to enable earlier measurement, comparisons and budget or target setting.

Industry and Supply Chain Considerations

- The report highlights the importance of incentivising manufacturers to reduce emissions through technology transitions and low-emissions manufacturing practices. It also seeks government support for manufacturers to understand and disclose the embodied carbon of their materials and products through Environmental Product Declarations (EPDs).
- For infrastructure, there is a focus on promoting design and construction practices that minimise material use and enhance the reuse, repurposing, or refurbishment of existing assets, thereby reducing the need for new construction and its associated emissions.

Procurement, Funding, and Project Delivery

- Adjustments to government funding, tendering, and procurement processes are recommended to incorporate minimum embodied carbon standards and transition towards fossil-fuel free transport and construction processes, providing clear signals to the market.
- The report suggests exploring mechanisms such as a Carbon Border Adjustment Mechanism for building and construction products, which could support the competitiveness of low-carbon products in the infrastructure sector.
- A nationally consistent set of carbon values for consideration in transport infrastructure project decision making has been agreed by Australia's Infrastructure and Transport Ministers Meeting (ITMM). ITMM also agreed to a nationally consistent approach for measuring embodied carbon for use in transport infrastructure projects



5

Conclusion

Conclusion

The transition to net zero in infrastructure demands a shared understanding of its definition and the sector's role in reducing carbon emissions. While various international standards provide guidance, their practical application has been a source of confusion. However, Australia has made significant progress, with broad agreement on the need for a common framework.

This paper establishes a clear definition of net zero, outlines best practice carbon measurement and management standards, and provides guidance on their adoption. By aligning with frameworks such as the GHG Protocol and PAS 2080:2023, and leveraging rating tools like Green Star, NABERS, and IS, the sector can achieve consistency in carbon measurement and reporting. Additionally, strong policy support across states reinforces this direction. A unified approach will enable the infrastructure sector to make meaningful progress towards net zero emissions.

What we've agreed on:

A common definition of net zero (as per PAS 2080)

"Reduction of anthropogenic greenhouse gas emissions to zero or to a residual level that is consistent with reaching net zero emissions in eligible 1.5 °C pathways (hence time-bound) and neutralising the impact of residual emissions (if any) by removing an equivalent volume of carbon."

The following frameworks provide guidance for managing GHG emissions:

- GHG protocol standards, relevant for organisational or entity emissions.
- PAS 2080:2023, relevant for managing carbon across the lifecycle of a project. It is supported by RICS Whole life carbon standard, EN 15978, and EN17472.

Rating tools like Green Star, NABERS, and IS can help projects report and reduce their emissions.

There is a significant overlap in policy across all states supporting the reduction of carbon in the sector.

Appendix A

Appendix A Defining Infrastructure Net Zero consultation

An initial Discussion Paper (Defining Infrastructure Net Zero, 2024) presented a draft definition of Net Zero for Infrastructure which aimed to cover the entire infrastructure sector, as well as individual projects / assets at each stage of the infrastructure lifecycle.

The Discussion Paper presented an overarching net zero definition and an infrastructure-specific definition:

- 'Net Zero' for the sector: Achieving an overall balance between GHG emissions produced and GHG emissions taken out of the atmosphere.
- 'Net Zero' for Infrastructure: Where the sum total of all Scope 1, 2 and 3 related GHG emissions, including operational, embodied, and enabled emissions, over the infrastructure lifecycle are minimised, meet local carbon targets, and with residual 'offsets,' equals zero.

The paper also reviewed industry's previous work on net zero, which was used in the development of this paper.

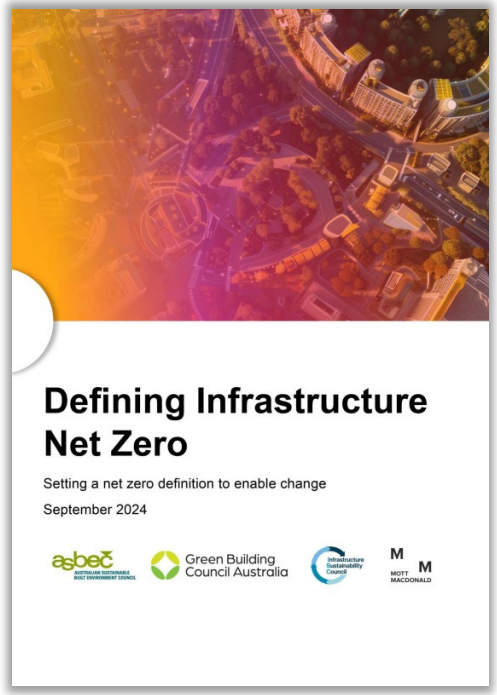
The purpose of the paper was to seek feedback from key stakeholders across the infrastructure sector on the definition of net zero for infrastructure.

While the feedback from consultation strongly supported the value of a shared definition, the concept of a single definition to cover all aspects of the infrastructure sector was challenged.

Consultation feedback clearly highlighted a preference for using existing global frameworks, with 83% of respondents suggesting the use of PAS 2080 for measuring asset level carbon emissions.

Key elements of the feedback highlighted:

- Challenges in a single definition of infrastructure net zero that applies to the infrastructure sector collectively, including individual sub-sectors as well as a particular infrastructure projects, assets or networks.
- The need to avoid double-counting and recognise different boundaries for assets and organisations, and an individual actor's unique ability to control/influence emissions.
- Desire for alignment with the global Intergovernmental Panel on Climate Change (IPCC) definition for net zero, and with PAS 2080's focus on infrastructure value chain responsibilities, whole life carbon emissions considerations and measurement and reporting boundaries.
- Need to focus on reducing absolute emissions, prioritising reduction at source.
- Importance of avoiding greenwashing and ensuring that offsetting of residual emissions is last resort.



Appendix B

Detailed information for Green Star rating tools

This table (right) shows which Green Star credits address which lifecycle modules.
Green Star Rating System

	Embodied carbon			Operational	Enabled	Supplementary
	Upfront (A1-A5)	Use (B1-B5)	End-of-life (C1-C4)	Operational (B6-B7)	User (B8)	Beyond lifecycle (D1-D2)
Green Star Buildings & Green Star Communities v2 credits	Upfront Carbon Emissions	Lifecycle Impacts	Lifecycle Impacts	Energy Use	Lifecycle impacts	-

Information on the credits

Energy Use

This mandatory credit requires showing a reduction of energy consumption of at least 10% over the requirements of the national construction code. It measures kWh/m^2.

The credit reductions start at 10% which is mandatory for all ratings. Higher ratings (5 Star and 6 Star) require a reduction of 20% to be awarded those ratings. The highest reduction awarded is a 30% reduction.

Upfront carbon emissions

This mandatory credit requires showing an upfront carbon reduction of at least 10% over a reference building. The reference is set based on the upfront carbon modelling guide released for each rating tool. It measures kgCO_2/m^2.

The credit reductions start at 10% which is mandatory for all ratings. Higher ratings (5 Star and 6 Star) require a reduction of 20% to be awarded those ratings. The highest reduction awarded is a 40% reduction.

This credit served as the basis of the NABERS Embodied Carbon methodology. Once NABERS Embodied carbon is introduced, this credit will be amended to reflect any methodology changes and the NABERS benchmarks.

Why does Green Star Focus on upfront carbon instead of also including module B and C?

Upfront carbon calculations are based on real and as-accurate-as-possible information. That is, they are based on real quantities of materials and as close to actual emissions factors. For upfront carbon, there are no needed assumptions – just these two numbers, whereas for module B and C, there are significant data gaps and assumptions required.

Upfront carbon emissions are by far the largest source of emissions from products and materials and construction activities (close to 70 to 80%). Focusing on reducing these now is important as they happen at the time of construction and cannot be changed later.

Upfront carbon is also a good indication of potential future *use* and *end-of-life* carbon for most materials in buildings. Reducing the upfront carbon, in most cases, results in a reduction of overall carbon for the other stages.

Lifecycle impacts

This voluntary credit rewards modelling reductions across life-cycle impacts when compared to standard practice. The modelling must be done in accordance with EN15978. It considers seven impact indicators including embodied water, land extraction impacts, eutrophication, and ozone depletion potential.

Detailed information for IS rating scheme

This table (right) shows which IS credits address which lifecycle modules. IS Rating Scheme

Information on credits can be found on the following page.

	Pre-construction	Embodied carbon			Operational	Enabled	Supplementary
	A0	Upfront (A1-A5)	Use (B1-B5)	End-of-life (C1-C4)	Operational (B6-B7)	User (B8)	Beyond lifecycle (D1-D2)
IS Rating – Planning	Ecn-1 Ene credits (1-3)	Ecn-1 Ene credits (1-3) Rso-1	Ecn-1 Ene credits (1-3) Rso-1	Ecn-1 Rso-1	Ecn-1 Ene credits (1-3) Rso-1	Ecn-1 Ene credits (1-3)	Ecn-1 Ene-3
IS Rating – D&AB / Essentials	Ecn-1 Ene credits (1-3)	Ecn-1 Ene credits (1-3) Rso-1; Rso-6	Ecn-1 Ene credits (1-3) Rso-1; Rso-6	Rso-5	Ecn-1; Ene credits (1-3) Rso-1; Rso-6	Ecn-1	Ecn-1
IS Rating – Operation	-	-	Ene credits Mat-1; Mat-2	Was-3	Ene credits (1-3) Mat-1; Mat-2	Ene-1; Ene-2	Ene-1; Ene-2

Legend (refer to IS credits):

Ecn – Economic – Options assessment category (IS v2.1)

Ene – Energy and carbon category (IS v2.1 & IS v1.2)

Rso – Resource efficiency and management category (IS v2.1)

Mat – Materials category (IS v1.2)

Was – Waste category (IS v1.2)

Detailed information for IS rating scheme

Information on the credits

Credit Name	Phases	Carbon Reduction / Net Zero Focus
• **Options Assessment and Significant Decisions (Ecn-1)**	Planning, Design, As Built	Carbon considerations (and cost of carbon) included in options assessment and whole of life costing - including non-build solutions.
Energy & Carbon credits: • **Energy and Carbon Monitoring and Reduction (Ene-1)** • **Use of Renewable Energy (Ene-2)** • **Net Zero Strategy and Offsetting / Offsetting (Ene-3)**	Planning, Design, As Built, Operations	Establishment of a carbon baseline and carbon reduction targets and incorporation into the project scope Modelling and monitoring energy use and relevant carbon emissions for capital and operational carbon emissions Implementation of emission reduction and renewable energy opportunities Development of a net zero alignment strategy (Ene-3 Planning) that considers: • All material capital, operational and user carbon sources • Broader net zero commitments at an organisational, local, state and national level • The carbon reduction hierarchy – avoid, reduce, substitute, offset
Materials use and resource efficiency credits: • **Resource Strategy Development (Rso-1)** • **Adaptability and End of Life (Rso-5; Was-3)** • **Material Life Cycle Impact Measurement and Management (Rso-6; Mat-1&2)**	Planning, Design, As Built, Operations	Development of a resource efficiency strategy and action plan that conveys baseline information relevant to resource use, and outlines resource efficiency opportunities and expectations for each phase of the infrastructure lifecycle (considering end of life and disassembly) Establishment of performance targets and appropriate management plans that include circular economy and emission reduction outcomes Modelling and monitoring material's lifecycle impacts using the IS Materials Calculator (or equivalent) Beneficial reuse of resource outputs. Adaptability and end of life planning resulting in sustainable disassembly of infrastructure assets at end of life

Appendix C

Appendix C Net zero policies and guidance

Thanks to contributing jurisdictions for their input into the following policy summary.

Notes on Northern Territory (NT) and Queensland (QLD) policies:

Northern Territory

These policies are currently under consideration of the government, The Northern Territory Government's Climate Change Response: Towards 2050 provides a policy framework that will enable the Northern Territory to strategically manage climate change risk and opportunities. It is a whole of government response and partnership with all Territorians.

Responding to climate change is a complex challenge, and this framework is the starting point in a transition that will take decades. The Territory Government will develop a series of time-bound action plans to articulate the key strategies and priority actions the Territory Government will implement to help deliver on the objectives of this framework. The first of these plans will ensure that the Territory Government builds the foundations required for long-term action on climate change in the Territory. A culture of continual improvement will ensure that plans are responsive to new scientific information, national and international policy settings, advances in technology and new emissions reduction opportunities. The Territory Government will be accountable for its delivery of the objectives of this Climate Change Response by reporting annually to the Legislative Assembly. This response will be reviewed in 2025.

Queensland

The Queensland Government is committed to working with industry sectors to develop achievable and practical plans to reduce emissions and reach Net Zero by 2050.

Further information regarding the Government's approach to emissions in key sectors will become available as the plans are developed.

Policy/Guidance material	Organisation	Notes
Federal		
Infrastructure Policy Statement (IPS)	Australian Government	The Infrastructure Policy Statement, released in November 2023, defines how the Australian Government will partner with stakeholders to deliver nationally significant land transport infrastructure projects. Sustainability is one of three strategic themes which will be used to guide future investment decisions. Decarbonisation of the transport sector through the design, construction and operation of transport infrastructure will contribute to meeting national emissions reductions targets. The Australian Government will support infrastructure projects which provide lower emissions transport choices and will also work with state and territory counterparts to encourage the use of lower emissions materials in infrastructure construction.
Federation Funding Agreement schedule 2024-2029	Australian Government	Under the recently agreed Federation Funding Agreement Schedule (FFAS), the Australian Government and the states and territories have agreed to reduce transport and infrastructure embodied emissions to support Australia's commitment to net zero by 2050, in alignment with the IPS, by leveraging their joint investment as part of the delivery of land transport infrastructure. This may include increasing national consistency, where appropriate, and the use of recycled materials in land transport infrastructure projects. The FFAS is reviewed and updated every five years.
Guide to Assessing Greenhouse Gas emissions	Infrastructure Australia	As a result of changes to Infrastructure Australia's governing legislation, all infrastructure proposals submitted to Infrastructure Australia must consider their impact on GHG emissions targets. The Guide to Assessing Greenhouse Gas emissions describes what information needs to be provided, sets requirements for measuring and valuing emissions in economic analysis and outlines other key considerations.

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Policy on the application of the national carbon values	Infrastructure Australia & ITMM	In December 2023, ITMM approved a nationally consistent set of carbon values (NCVs) for use in transport infrastructure project decision making. The values will be required for proposals assessed by Infrastructure Australia that seek more than $250 million in Commonwealth funding. In June 2024, ITMM agreed on the use of the NCVs by jurisdictions in the assessment of business cases for transport infrastructure. The joint policy document states in principle agreement that upfront and enabled emissions should be considered as part of the cost benefit analysis for transport infrastructure projects receiving over $100 million in government funding, with a recommended commencement date of 1 January 2025 or earlier.
Embodied Carbon Measurement for Infrastructure: Technical Guidance (National Measurement Guidance)	ITMM	In June 2024, ITMM agreed a nationally consistent approach for measuring embodied carbon for use in transport infrastructure projects, called the Embodied Carbon Measurement for Infrastructure: Technical Guidance (National Measurement Guidance). The National Measurement Guidance supports consistency and harmonisation across all Australian jurisdictions by providing common methodology, assumptions, approach to data use, and reporting of embodied carbon in line with PAS2080:2023 and other life cycle assessment-based standards. Use of a consistent measurement approach will enhance the accuracy of carbon valuation in business case options, as well as enable consistent carbon measurement within the context of setting any commercial and technical requirements. In turn, a nationally consistent measurement approach supports industry action to reduce emissions, and can facilitate benchmarking and target setting for transport infrastructure projects.
Embodied Carbon Projections for Australian Infrastructure and Buildings	Infrastructure Australia	Infrastructure Australia's Embodied Carbon Projections for Australian Infrastructure and Buildings report forms part of its broader advice to support the Australian Government's decarbonisation priorities and objectives. Using data sourced from Infrastructure Australia's Market Capacity program, this report quantifies a

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		baseline of the upfront embodied carbon in Australia's built environment. It does this by estimating the carbon impact of the forward-looking construction pipeline for building and infrastructure from 2022–23 to 2026–27.
Australian Capital Territory		
Minimum Standard for Rental Properties	ACT Government	The standard requires all rental properties in the ACT, including public and community housing, to have a minimum level of ceiling insulation. This will help people save on energy bills, as well as increase thermal comfort and contribute to climate change resilience.
The Territory Plan 2023	ACT Government	New planning rules to improve electrification, climate adaptation and resilience outcomes were implemented as part of the 2023 Territory Plan. These include new requirements for electric vehicle charging and urban tree canopy, clearer planning pathways for batteries and hydrogen and the introduction of urban heat provisions.
ACT Infrastructure Plan - Climate Action, Energy and Environment	ACT Government	The Climate Action, Energy and Environment Infrastructure Plan Update outlines infrastructure projects necessary to deliver a resilient and environmentally responsible net-zero future for Canberra.
ACT Sustainable Buildings Pathway	ACT Government	The ACT Sustainable Buildings Pathway is a ten-year pathway to lead the ACT towards international best practice on environmentally sustainable and climate resilient buildings.

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Suburban Land Agency (SLA) Sustainability Strategy	ACT Government	The Suburban Land Agency (SLA) is committed to building smart, sustainable suburbs and urban renewal developments. The SLA Sustainability Strategy is designed to help Canberra become a sustainable city, while at the same time meeting growing housing needs. Through four themes of 'Resilient Communities', 'Zero Emissions Suburbs', 'Responsible Consumption and Production' and 'Healthy, Prosperous and Inclusive Places', the Strategy is used to guide all projects and sets priorities to ensure SLA places built now will be resilient, healthy and have a lower impact on the environment for the future thriving communities they need to support.
Electrification of Government Gas Assets program	ACT Government	The Electrification of Government Gas Assets Program (EoGGA) involves gas asset replacement works and coordination of associated electricity network upgrade works, which are required for the electrification of over 1,000 gas assets in facilities owned and operated by the ACT Government. The purpose of this program is to assist in the transition of ACT facilities off fossil fuel gas in line with emissions reduction targets.
Zero Emission Government Facility Guidelines	ACT Government	The Guidelines are directed towards ensuring new ACT Government buildings and facilities are fossil-fuel-gas free, including new leases. The Guidelines apply to a range of ACT Government buildings.
Low carbon concrete policy	ACT Government	From 1 January 2025, phase 1 of the low carbon concrete policy will commence. The policy will require designers, engineers and builders to provide options for using low carbon concrete in government projects, including detailed specifications where applicable.

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The ACT Climate Change Strategy 2019-2025	ACT Government	The ACT Climate Change Strategy 2019-2025 takes an integrated approach to climate change policy by bringing together adaptation, resilience and emissions reduction.
New South Wales		
State Infrastructure Strategy 2022-2042	INSW	The State Infrastructure Strategy 2022-2042 outlines the NSW Government's goal of achieving Net Zero emissions by 2050 and a 50% reduction by 2030, emphasising the need for policies and initiatives to support investment in clean energy and reduce emissions from state assets and infrastructure.
Decarbonising Infrastructure Delivery Policy	INSW	The Decarbonising Infrastructure Delivery Policy provides guidance to delivery agencies on managing upfront carbon in public infrastructure projects. This policy applies to all NSW Government building projects valued over $50 million and linear infrastructure projects valued over $100 million. Key aspects of the policy include prioritising actions to reduce carbon emissions at every stage of a project (Carbon Reduction Hierarchy), providing a consistent approach to measuring embodied carbon emissions (Measurement Guidance), and enhancing the skills and knowledge of government and industry professionals (Capability Building). The policy is part of a broader effort to achieve net zero emissions in the infrastructure sector and includes a roadmap developed in collaboration with Transport for NSW (TfNSW).
Embodied Carbon Measurement for Infrastructure: Technical Guidance (NSW version)	NSW	Released in April 2024, this technical guidance provides a standardised technical framework for measuring and reporting embodied carbon across NSW infrastructure projects. It details specific requirements for embodied carbon measurement and reporting in line with PAS2080:2023 and other lifecycle assessment-based standards.

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		Its aim is to provide consistency in carbon assessment data which supports tracking of NSW Government agency emissions and development of future benchmarks. The guidance specifies how carbon data should be presented across the stages of the infrastructure delivery lifecycle, from business case to practical completion. The National Measurement Guidance (above) was adapted from the INSW Embodied Carbon Measurement for Infrastructure Guidance.
Decarbonising Infrastructure Delivery Roadmap	INSW & TfNSW	The Decarbonising Infrastructure Delivery Roadmap sets out key initiatives for 2024-2026 towards decarbonising infrastructure delivery.
Sustainable Infrastructure Program	TfNSW	The Sustainable Infrastructure Program is a four-year program created to streamline and drive decarbonisation and circularity on transport infrastructure projects through practical changes at the project level. It focuses on digital solutions and early-stage project lifecycle changes to reduce carbon emissions. The program aligns with the broader 2026 Decarbonising Infrastructure Delivery Roadmap and Transport's Net Zero and Climate Change Policy.
Net Zero and Climate Change Policy	TfNSW	The Net Zero and Climate Change Policy outlines Transport for NSW's commitment to achieving Net Zero emissions. Key infrastructure targets include 100% renewable energy for operational electricity by 2025, fossil fuel-free construction and maintenance by 2040, and Net Zero in annual embodied emissions by 2045. The policy emphasises integrating emissions reduction and climate risk management into planning, decision-making, and procurement processes.

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NSW Climate Change (Net Zero Future Act) 2023	NSW	The NSW Climate Change (Net Zero Future) Act 2023 legislates the state's approach to addressing climate change, aiming for Net Zero emissions by 2050. Key elements of the Act include emissions reduction targets of 50% from 2005 levels by 2030, 70% by 2035, and Net Zero by 2050. It establishes guiding principles for climate action that consider impacts, opportunities, and the need for action in NSW, and creates the Net Zero Commission, an independent body to monitor, review, and advise on progress towards these targets.
NSW Government Guide to Cost-Benefit Analysis Technical note to NSW Government Guide to Cost-Benefit Analysis TPG23-08 Carbon value in cost-benefit analysis	NSW	This NSW Government Guide to Cost-Benefit Analysis sets out how to undertake cost-benefit analysis (CBA) for NSW government initiatives. The Guide includes a section on carbon valuation, and provides a framework for incorporating the cost of carbon emissions into CBAs.
TPG24-34 Carbon emissions in the Investment Framework (TPG-24)	NSW	TPG24-34 was released by NSW Treasury in December 2024. It provides guidance on the integration of carbon emissions valuation into cost-benefit analyses (CBA) for NSW Government investment proposals. The framework aligns with NSW's legislated emissions reduction targets and utilises standardised carbon shadow prices. The guidance applies to major capital projects exceeding $100 million, as well as other projects where emissions significantly impact decision-making. It emphasizes whole-of-life carbon consideration, requiring agencies to account for emissions within NSW and those from imported materials consumed locally. This includes those from construction, operation, asset users and end-of-life.
South Australia		

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South Australia's Net Zero Strategy 2024-2030: Action 11.2 - Develop a South Australian Government infrastructure decarbonisation policy LINK	South Australian Government (Infrastructure SA, supported by DIT)	In December 2024 the State Government released South Australia's Net Zero Strategy 2024-2030 to communicate the government's objectives, policy priorities and actions to reduce greenhouse gas emissions across the economy. It outlines 60 actions over the short, medium and long term, representing policies, programs and other initiatives to reduce, limit or prevent emissions. The Strategy includes an action assigned to Infrastructure SA (supported by the Department for Infrastructure and Transport (DIT)) to develop a South Australian Government infrastructure decarbonisation policy to manage greenhouse gas emissions across the asset lifecycle and inform government investment decisions. Updates to infrastructure planning and assessment frameworks will consider embodied, operational and enabled emissions, including through application of consistent carbon values to whole-of-life emissions.
South Australia's Net Zero Strategy 2024-2030: Action 15.4 - Deliver low emissions infrastructure and operations	South Australian Government (DIT, Renewal SA and Department for Environment and Water)	Government agencies will use specifications and contract tools to help drive low emissions design, construction, operation and maintenance of infrastructure. Where feasible, agencies will encourage the use of low and zero emissions technology and materials and will support recycling and reuse as part of a more circular economy.
Sustainable Procurement Policy	South Australian Government (DIT)	The South Australian State Government's Sustainable Procurement Policy aims to: • identify sustainability risks and opportunities as part of procurement planning • include appropriate requirements in tender and contract documents.
Tasmania		

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Transport Emissions Reduction and Resilience plan 2024-29.	Tasmanian Government	Tasmania's first five-year Emissions Reduction and Resilience plans (Plans) for each sector were published in November 2024. The six sectoral plans include Agriculture, Industrial Processes and Product Use, Energy, Transport, Land Use, Land Use Change and Forestry (LULUCF) and waste. The Industrial Processes and Product Use Plan includes a focus on reducing emissions and building resilience in the manufacturing sector, as well as flow on effects in the building and construction sector through supporting the production of low-emissions materials. The Energy and Transport Plans include a focus on supporting infrastructure for reducing congestion and supporting the demand for electric vehicles in Tasmania. The LULUCF Plan includes a focus on supporting the use of locally-sourced wood products in place of more emissions intensive building and construction materials. The Tasmanian Government is offering grant funding to expand Tasmania's statewide public electric vehicle (EV) fast charging network as part of the Transport Emissions Reduction and Resilience plan 2024-29. Eligible organisations can apply for individual grants of up to $50,000, with a dollarmatched co-contribution from recipients, to cover the upfront cost of purchasing and installing or upgrading existing electric vehicle fast charging infrastructure in Tasmania for public use.
Renewable Energy Action Plan	Tasmanian Government	The Tasmanian Government has committed to increase its renewable energy output by 200 per cent based on 2022's renewable energy figures. So, in 2040, Tasmania aims to produce twice as much clean power as we did in 2022. The Tasmanian Energy and Infrastructure Workforce Advisory Committee was established to oversee the implementation of the Energising Tasmania initiative. The $16.1 million Energising Tasmania Program will support Tasmania to develop a skilled workforce equipped with the expertise needed for the Battery of the Nation initiative, Project Marinus, a Tasmanian renewable

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		hydrogen industry, and other related infrastructure projects in Tasmania. Energising Tasmania is now fully underway.
Tasmanian Renewable Hydrogen Action Plan	Tasmanian Government	The Tasmanian Renewable Hydrogen Action Plan sets out a vision for how we can harness the opportunity to develop a world class hydrogen industry. The vision is for Tasmania to become a leader in large-scale green hydrogen production and domestic use and export. The Tasmanian Government will work with local infrastructure providers to assess infrastructure requirements associated with renewable hydrogen developments. This will include working with TasNetworks to assess the network requirements at identified sites including the Bell Bay Advanced Manufacturing Zone and exploring options for minimising network costs. Developing a renewable hydrogen industry in Tasmania would mean that hydrogen could be used to decarbonise the infrastructure sector through producing clean chemicals, alumina and low carbon liquid fuels as well as fuelling heavy vehicles used to transport materials.
Tasmania's Climate Change Action Plan 2023-25	Tasmanian Government	The Climate Change Action Plan 2023-25 sets out to guide Government actions to maintain the state's net zero status. This status is largely due to the carbon sink from the state's management of its forest estate, and longstanding investment in renewable electricity generation (particularly hydro). The state acknowledges that this profile cannot be guaranteed into the future and further action is needed to reduce emissions across all sectors. The Action Plan sets out the government's climate change initiatives and priority actions to improve information and knowledge about climate change, reduce emissions and build resilience.
Transport Emissions Reduction and Resilience Plan (2024-29)	Tasmanian Government	The Transport Emissions Reduction and Resilience Plan 2024-29 is the first legislated Plan for the transport sector under the Climate Change (State Action) Act 2008. The plan sets out to improve the transport system and support the transition to low and zero emissions technology. The vision is to transition the transport sector to net zero through the increased use of low and zero emissions vehicles, as well as increasing public and active transport.

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Tasmanian Walk, Wheel, Ride Policy	Tasmanian Government	The Tasmanian Walk, Wheel, Ride Policy 2024 includes all forms of active transport and active travel, across departmental infrastructure and transport services projects. Emphasising the importance of early consideration of walking, wheeling and riding within departmental projects and activities. These are all considered more sustainable and lower emission generating forms of transport, along with providing a range of other social, health, cultural, environmental and economic benefits.
Victoria		
Clean economy workforce development strategy 2023-2033	Victorian Department of Jobs, Skills, Industry and Regions	The Clean Economy Workforce Development Strategy 2023–2033 is a 10year planning and investment framework to prepare the state's workforce for a net zero future. It provides a foundation for the training pathways needed to meet the growing demand for skills as Victoria moves towards net-zero emissions by 2045.
Victoria's Climate Science Report 2024	Victorian Government	The report builds on the 2019 report, which remains a relevant component of our scientific evidence base. This up-to-date climate science can be used by decision-makers across businesses, the community and government, to improve research, risk assessments and planning for climate resilience. It also highlights ways to minimise the impacts of climate change if global emissions achieve a low emissions scenario.
Zero emissions vehicle roadmap	Victorian Government	The Zero Emissions Vehicle roadmap, released in 2021, aims for half of all light vehicle sales inVictoria to be zero emissions vehicles by 2030. The roadmap remains in effect until 2030. It was supported by a $100 million package of initiatives, including a target of 50% of all new light vehicle sales to be zero emissions vehicles by 2030. The roadmap included a zero emission public transport bus trial. It also requires all new public transport buses to be zero emissions from 2025.

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Victoria's zero emission bus transition plan	Victorian Government	Victoria's zero emission bus transition plan, released in November 2024, guides the switch from diesel powered to zero emission buses over time
Gas substitution roadmap update 2024	Victorian Government	The Gas Substitution Roadmap Update 2024, released in December 2024, supports more new and existing homes to become all-electric, stronger consumer protections, and fairer network charges. It also commits to working with business and industry and ensuring secure, affordable gas and electricity supply. The roadmap was first released in 2022 and updated in 2023.
Transport infrastructure decarbonisation	Victorian Government	The Victorian Infrastructure Delivery Authority published the Transport Infrastructure Decarbonisation plan in 2024. The plan commits to decarbonise corporate operations and projects.
Victoria's climate change strategy	Victorian Government	Victoria's climate change strategy, released in 2021, aims to achieve a net-zero emissions Victoria by 2050. The strategy supports the transition to a clean energy economy, technological innovation, and businesses and communities to adopt more efficient practices and technologies.
Greener Government Buildings	Victorian Government	The Greener Government Buildings program supports energy efficiency improvements of existing government buildings. Since 2009 it has funded energy efficiency and renewable energy upgrades across 35 projects, achieving annual savings of $27 million and abating over 132,000 tonnes of greenhouse gas emissions per year.
Whole of Victorian Government emissions reduction pledge	Victorian Government	The *Whole of Victorian Government emissions reduction pledge* was published in May 2021. It requires all new government office buildings and tenancy fit-outs to have a minimum 5-Star energy efficiency rating, and a 6-Star

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		rating from 2025. The government has to preference leases for higher-rated buildings and buildings with a Green Lease Schedule.
Opportunities to reduce greenhouse gas emissions of infrastructure	Infrastructure Victoria	This report explains how the Victorian Government can update policies, guidelines and procedures to make carbon emissions count in infrastructure decision-making. This includes planning, design, construction, maintenance and the end-of-life of Victoria's infrastructure. The advice identifies 3 principles and makes 10 recommendations, each with clear actions. They can guide how the Victorian Government plans, sources, delivers and maintains its infrastructure on the path to net zero.
Digital technology and infrastructure productivity	Infrastructure Victoria	Infrastructure Victoria commissioned the Digital technology and infrastructure productivity report from Arup which identifies skills as a barrier for some technology uptake. Key findings included a new workforce of specialists will be needed to support the increased use of digital technologies across the infrastructure sector (productivity focused).
Towards 2050 – Gas infrastructure in a net zero emissions economy	Infrastructure Victoria	This report looks at the future of gas infrastructure as Victoria moves to net zero emissions by 2050. At the request of the Victorian government, Infrastructure Victoria explored scenarios to help Victoria make the most of its gas infrastructure and future changes. Infrastructure Victoria made 11 recommendations for the Victorian Government. These aim to reduce emissions, manage risk, lower cost and create jobs and opportunities.
Transition opportunities: Coal to Offshore Wind	Energy Australia	Energy Australia worked with TAFE Gippsland. State Electricity Commission is supporting attraction, training and retention of skilled renewable energy workforce and is developing a Centre of Training Excellence.

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Renewable Homes Construction Training program	Victorian Government	The Victoria Government announced the Renewable Homes Construction Training program on 17 June 2024. The program is investing $1 million to deliver training on the design and construction of energy efficient homes to be started later in 2024.
Environmental sustainability and clean economy initiatives - Clean Economy Skills Labs and Sustainable Building Design Sill Sets.	Victorian Government	The Victorian Government announced $9 million in funding to build skills in environmental sustainability and the clean economy. This includes establishing 3 Clean Economy Skills Labs and co-designing with RMIT University 3 new Sustainable Building Design Sill Sets.
Western Australia		
Climate Policy, 2020 and Climate Bill, 2023	Dept, of Water and Environmental Regulation	The Climate Policy includes the commitment to net zero by 2050, and actions to begin decarbonising different government agencies and sectors. The Climate Bill sitting in parliament and expected to be passed after State elections commits the Government to interim emissions reduction targets for the State, annual emissions reporting and implementation and updates of the Sectoral Emissions Reduction Strategy (SERS).
Sectoral Emission Reduction Strategy (SERS)	Dept. Water and Environmental Regulation	Outlines the State Government Plan to achieve the State target of net zero emissions by 2050 across different sectors.
State Infrastructure Strategy	Infrastructure WA	Foundations for a Stronger Tomorrow outlines the state's significant infrastructure needs and priorities. It provides a long-term vision and infrastructure outlook underpinned by 6 strategic opportunities and 10 strategy objectives and is divided into broad infrastructure types categorised as 7 cross-cutting themes and 9

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		infrastructure sectors. It reaches across WA's 10 regions, to identify both build and non-build solutions such as policy reforms and priority projects and programs. Throughout the development of the Strategy and its extensive consultation process, a number of core themes were identified that underpin Infrastructure WA's (IWA) recommendations. These core themes include: • Managing demand for infrastructure through prevention, early intervention and pricing • Improving the quality and consistency of strategic infrastructure planning and processes • Addressing climate change • Implementing data sharing and other tools to support infrastructure planning and investment decision making • Optimising the existing infrastructure asset base • Identifying major infrastructure project and programs. The Strategy identifies 93 recommendations to improve the foundations of the state's infrastructure system – addressing areas for improvement and best practice approaches to support the planning and delivery of appropriate infrastructure.
WA Treasury Corporation ESG commitment and Sustainable Bond Framework	WA Treasury Corporation (WATC)	Includes sustainable bond framework for several low carbon and sustainable infrastructure investments including: • Renewable energy and battery storage • Active transport infrastructure • Public transport (METRONET) infrastructure • Low carbon LED street lighting • Renewable powered desalination plant

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		Electric vehicle charging infrastructure and EV rebate purchase.
Strategic Asset Management Framework (SAMF) Policy	Dept. of Treasury WA	References the UN Sustainable Development Goals and ISC definition of sustainability. Document developed in line with the SAMF should address how best to plan, design and deliver assets from a long-term whole of life perspective.
Transport Portfolio ESG Framework and Sustainable Infrastructure Policy and Guidance	Transport Portfolio WA	The ESG Framework includes an analysis of sustainability initiatives and impacts across the portfolio identifying eleven key material topics and objectives. These have been aligned to the relevant UN Sustainable Development Goals and include actions around climate action, emissions reduction and sustainable resource use. The Sustainable Infrastructure Policy and guidance commits the Transport Portfolio to strengthen sustainable resource use and decarbonisation of life cycle impacts from energy, water and materials across transport infrastructure and assets. A knowledge hub, CircleZero, is being developed to support the implementation of the Policy through sharing of case studies, material guides, supplier mapping and training webinars. This will go live in April 2025.
Main Roads WA Net Zero Roadmap	Main Roads WA	Supporting the Whole of Government 2030 Greenhouse Gas (GHG) emissions reduction target of 80 per cent below 2020 levels and will achieve emissions reduction on our Scope 1 and 2 emissions by actively reducing emissions as quickly as possible. Lower operational emissions through electrification and energy efficient activities. Contribute and support the transition to renewable energy in all aspects of our business.
Westport ESG Strategy	Westport	Westport commits to deliver positive long-term benefits for the natural and physical environment, create opportunities for social advancement, and make decisions which benefit Western Australians with strong, transparent governance and reporting.

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		Key objectives outlined in the Strategy include improved environmental outcomes underpinned by a Working with Nature approach, a net zero port and supply chain by 2050, as well as a circular economy focused reducing, reusing, and recovery during construction. The Strategy builds upon Westport's previous work and aligns with the United Nations Sustainable Development Goals as well key State Policies, including Supporting Continuous Improvement in ESG Outcomes for Western Australia.
METRONET Sustainability Strategy	METRONET	Include objectives, targets and outcomes for life cycle energy, carbon and resource use across the program. In line with the State Government's Climate Policy to achieve net zero GHG emissions by 2050, energy efficiency and carbon reduction initiatives will be implemented.

INFRASTRUCTURE NET ZERO

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