Infrastructure Sustainability Council

IS Impact Notes
Net Zero

Overview

As signatories of the Paris Agreement, Australia and New Zealand have greenhouse gas emission targets of net zero by 2050 with interim reduction targets of 43% by 2030 and 51 to 55% by 2035 respectively. Strategies, policies and implementation actions are emerging across the public and private sectors, including within the infrastructure sector.

The Infrastructure Sustainability Council acknowledges the importance of infrastructure in the achievement of net zero targets. This Impact Note describes how the IS Rating Scheme helps organisations and project teams account for and reduce whole-of-life carbon emissions when planning, designing, delivering and operating infrastructure projects - in line with national and local targets and relevant industry frameworks (e.g. PAS 2080).

According to the IPCC (2023), net zero is achieved when the amount of greenhouse gas emissions going into the atmosphere are balanced by its removal over a specified period. To meet the urgency of the climate crisis with action, efforts towards enabling and accelerating a net zero future are required. Successful decarbonisation of the built environment requires a system-wide approach that not only considers carbon, but that also encompasses other sustainability impacts such as resilience, circular economy and biodiversity. As most infrastructure projects built today will still be operating in 2050 and beyond, it is critical for the industry to act now and reduce emissions at every stage of the infrastructure lifecycle.

What is the issue?

Globally, infrastructure is responsible for 79% of all greenhouse gas emissions and accounts for 88% of all adaptation costs (UNOPS, 2021). In Australia, it is estimated up to 70% of greenhouse gas emissions are directly attributable to or influenced by the infrastructure sector. In New Zealand, that figure is around 47%. With many countries experiencing the increasing effects of climate change, intensified efforts are required to meet the interim reduction and net zero targets, aligning to the UN Paris Agreement's goal of limiting global temperature rise to well below 2°C above pre-industrial levels.

Decarbonising the infrastructure sector is essential for achieving these targets. To effectively address infrastructure requirements and reduce whole-of-life emissions, a shift in current practices is necessary. Beyond focusing on energy use, materials consumption and design changes, it is important to recognise the enabling role that infrastructure has in society and in the economy. Key actions include considering 'no-build' solutions, prioritising initiatives that avoid or reduce user-related and operational emissions, applying a cost of carbon, adopting sustainable procurement frameworks, assessing carbon emissions throughout the infrastructure lifecycle, and promoting industry and government collaboration and knowledge sharing. These strategies are successful pathways for achieving infrastructure sector decarbonisation.

How can you deliver impact?

Taking positive action

Organisational leadership is critical in achieving net zero. In addition to taking action at the project / asset level (see below), the following actions are key organisational enablers of a net zero future:

1. Develop a net zero strategy and plan that commits to industry leadership and incorporates reduction goals, targets and priorities across the value chain.

2. Ensure all organisational decisions incorporate wide-scale decarbonisation or net zero policies - adopting the PAS 2080 standard and meeting regulatory policy requirements (e.g. INSW Decarbonising Infrastructure Delivery Policy).

3. Map, measure and publicly report on greenhouse gas emissions and reduction performance across the organisation's value chain - applying relevant quantification standards such as the GHG Protocol, EN 15804, EN 17472 and EN 15978.

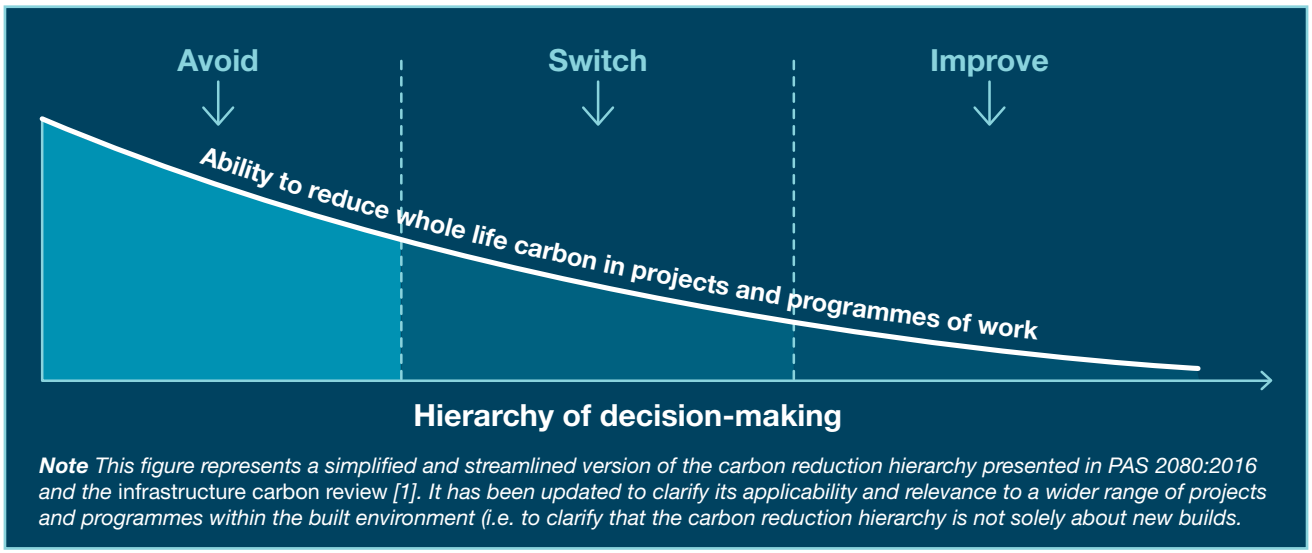
4. Collaborate in ambitious initiatives towards net zero (e.g. the Infrastructure Net Zero Initiative), that bring together government and industry to achieve net zero outcomes, build supply chain capability and unify efforts towards the sector's decarbonisation.

Driving outcomes with the IS Rating Scheme

Relevant IS Credits

The IS Rating Scheme is designed to recognise and reward the sustainability performance of infrastructure assets across their entire lifecycle. Projects using the IS Rating tools have made significant progress in reducing infrastructure asset lifecycle emissions. For instance, between FY18 to FY24, use of the IS Rating resulted in 23,545,975 tCO2e of lifecycle energy emissions avoided and 1,352,812 tCO2e lifecycle materials emissions avoided.

For infrastructure to be sustainable, it must be planned, designed, built, operated and maintained with consideration of environmental, social, economic and governance impacts, while addressing identified community needs and objectives. The PAS 2080 Standard highlights the importance of making decisions to maximise carbon reduction at every infrastructure lifecycle stage (and not just in new builds), identifying co-benefits like resilience and biodiversity, and promoting collaboration across the value chain:



Note *This figure represents a simplified and streamlined version of the carbon reduction hierarchy presented in PAS 2080:2016 and the* infrastructure carbon review *[1]. It has been updated to clarify its applicability and relevance to a wider range of projects and programmes within the built environment (i.e. to clarify that the carbon reduction hierarchy is not solely about new builds.*

Figure 1 The carbon reduction hierarchy from PAS 2080:2023

The following IS Rating Tool credits provide key indicators and guidance that inform and reward progress to net zero at the project / asset level:

IS Rating Tool – focus area	Relevant IS v2.1 Credits (IS v1.2 listed below)	Key points to consider across the infrastructure lifecycle (Planning, Design & As Built and Operations)
Leadership and management	• **Lea-1** Integrating Sustainability • **Lea-2** Risks and opportunities • **Lea-3** Knowledge Sharing **IS v1.2 credits:** Man-1, Man-2 Man-3, Man-4, Man-5, Man-6	**IS credits reward:** • Establishment of sustainability objectives and targets focused on alignment with net zero – related to options assessment, energy use, materials / products, design solutions, residual emissions • Public reporting of sustainability performance against stated net zero goals • Identification and assessment of risks and opportunities related to low carbon and climate change impacts • Knowledge sharing (e.g. project outcomes on net zero, innovative practices to minimise emissions) via case studies, conference proceedings, or journal articles
Sustainable procurement	• **Spr-1** Sustainable Procurement and Strategy • **Spr-2** Supplier Assessment and Selection • **Spr-3** Contract and Supplier Management **IS v1.2 credits:** Pro-1, Pro-2, Pro-3, Pro-4	**IS credits reward:** • Implementation of a sustainable procurement strategy that integrates net zero considerations, including: - Specification of low embodied carbon or recycled products and services - Specification of products with EPDs or third-party sustainability labels - Sourcing local materials - Suppliers required to demonstrate fossil fuel free or more efficient transportation - Feedback, incentives and rewards to suppliers committed to sustainability targets - Supplier contracts with clauses related to net zero • Annually monitoring, reviewing and documenting progress against sustainable procurement objectives and targets
Options Assessment and Significant Decisions	• **Ecn-1** Options Assessment and Significant Decisions **IS v1.2 credits:** Man-7	**IS credits reward:** • Inclusion of carbon considerations (and cost of carbon) in options assessment and Whole of Life costing including non-build solutions
Materials use and resource efficiency	• **Rso-1** Resource Strategy Development • **Rso-4** Resource Recovery and Management • **Rso-5** Adaptability and End of Life • **Rso-6** Material Life Cycle Impact Measurement and Management • **Rso-7** Sustainability Labelled Products and Supply Chains **IS v1.2 credits:** Mat-1, Mat-2	**IS credits reward:** • 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) • Development of an adaptability strategy or management plan that considers end of life reuse or recyclability opportunities • Use of materials with EPDs and sustainability labels • Beneficial reuse of resource outputs

IS Rating Tool – focus area	Relevant IS v2.1 Credits (IS v1.2 listed below)	Key points to consider across the infrastructure lifecycle (Planning, Design & As Built and Operations)
Energy and Carbon	• **Ene-1** Energy and Carbon Monitoring and Reduction • **Ene-2** Use of Renewable Energy • **Ene-3** Net Zero Strategy and Offsetting / Offsetting **IS v1.2 credits:** Ene-1, Ene-2	**IS credits reward:** • 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
Resilience	• **Res-1** Climate and Natural Hazards Risks • **Res-2** Resilience Planning **IS v1.2 credits:** Cli-1, Cli-2	**IS credits reward:** • The implementation of treatment options associated with climate change and natural hazard risks • The implementation of treatment options to manage acute shocks and stresses that will impact the project and related assets • These efforts align with a net zero or decarbonisation strategy that recognises the interdependencies and synergies between decarbonisation and resilience
Ecology	• **Eco-1** Ecological Protection and Enhancement **IS v1.2 credits:** Eco-1, Eco-2	**IS credits reward:** • The realisation of opportunities that address the project's impacts on ecological values and achieve net ecological gain outcomes • These efforts align with a net zero or decarbonisation strategy that recognises the interdependencies and synergies between decarbonisation and biodiversity
Innovation	• **Inn-1** Innovation **IS v1.2 credits:** Inn-1	**IS credits reward:** • Innovations related to materials, technologies and approaches focused on avoiding and reducing carbon emissions. • Achievement of Innovation Challenges, including: IC-1 Carbon Neutrality, IC-2 High Clinker Substitution, IC-4 Sustainable Suppliers and ISupply, IC-5 Contributing to a Circular Economy
Workforce Sustainability	• **Wfs-4** Sustainable Site Facilities	**IS credits rewards:** • The implementation of sustainable site accommodation facilities that reduce environmental impacts and support site worker wellbeing with a focus on internal environment quality, energy use, water use, and resource efficiency

Sustainable Procurement Actions for Impact

The incorporation of environmental, social, economic and cultural factors in procurement drives positive change. Procurement actions can accelerate emissions reduction and the achievement of net zero aligned targets in infrastructure. Actions outlined here are rewarded in the Sustainable Procurement and Leadership categories within the IS Planning, Design & As Built and Operations Ratings.

Action 1: Develop a net zero strategy and identify partnerships for net-zero success

Early action towards emissions reduction is essential to reaching net zero. During the planning phase, collaboration among various stakeholders provides an opportunity to embed a net zero aligned strategy that helps to address material sustainability impacts within the project's supply chain prior to detailed design.

Active engagement with key contractors, designers and suppliers helps identify design approaches, construction methods and products that will deliver innovative solutions to emission reductions over the asset's lifecycle.

Action 2: Include net zero considerations in the procurement strategy or management plan

Procurement and sustainability teams must work together to reflect net zero commitments in procurement specifications and proposed evaluation criteria. A robust procurement strategy or management plan that integrates net zero can result in low carbon project outcomes and significantly transform the project's supply chain. For instance, the project can prioritise low carbon and recycled materials, implement design changes to minimise the need of new resources, select high quality materials and components that are easily repairable to extend the asset's lifespan, develop waste reduction initiatives, and establish partnerships with industry or suppliers.

As a result, the project can promote the decarbonisation of the supply chain, foster innovation and capability building, support local suppliers and communities, realise carbon and cost savings, and facilitate the communication of best practices and net zero advocacy.

Action 3: Implement net zero-related supplier selection criteria and performance requirements

Supplier engagement is critical to achieve net zero, as it plays a key role in assessing and mitigating supply chain emissions. Procurement teams must implement selection criteria that reflect the sustainability priorities of the project. For example, projects may seek suppliers that offer products with Environmental Product Declarations (EPDs) or sustainability labels. Criteria and performance requirements should encourage suppliers to improve their sustainability impact over time. Projects may prioritise suppliers that are committed to align with state or national sustainability policies or those that have set Science Based Targets (SBTi) to be achieved within a specific timeframe.

During the procurement process, providing suppliers with feedback on their performance and improvement areas, and offering incentives for those who exceed expectations, fosters collaboration, drives behaviour change and delivers improved outcomes.

Net zero and nature-based and place-based solutions

There is no net zero without nature

There is growing momentum to design nature-based and place-based solutions in infrastructure delivery, as they increase resilience, equity, productivity and liveability in our communities and ecosystems. These approaches are crucial in tackling climate change and achieving net zero at the systems level. Creating infrastructure influenced by the local context integrates cultural, environmental, and community values, as reflected in the Pla-1 Strategic Context and Pla-2 Urban and Landscape Design credits. A holistic approach ensures infrastructure fits its setting, respects its surroundings, and contributes to sustainability and regeneration.

It is estimated that nature-based solutions (e.g. coastal ecosystem management through mangrove restoration) could contribute to 37% of the total climate mitigation needed by 2030 to stabilise global warming below 2°C, while simultaneously restoring, conserving and enhancing natural ecosystems, and enabling the provision of additional ecosystem services such as food, soil health, clean air, water, recreation, and protection from natural hazards.

Effective place-based solutions for net zero integrate all urban systems - buildings, infrastructure, utilities, transport, water, waste, and digital technologies. These solutions are based on the principles of co-design, systems thinking and innovation:

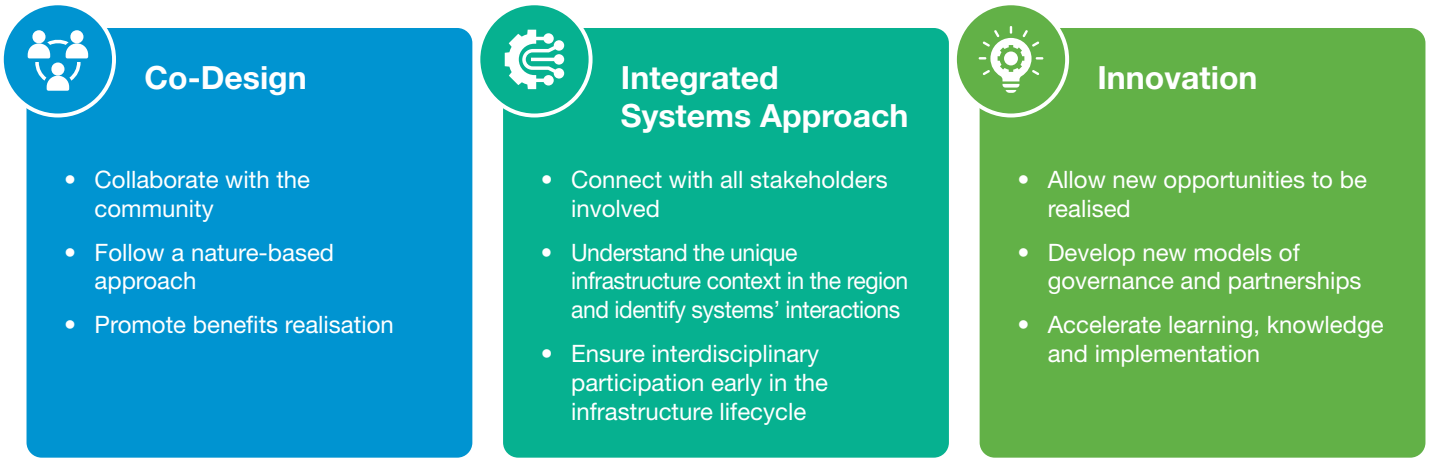


Figure 2. Co-design principles

Examples of place-based and nature-based practices:

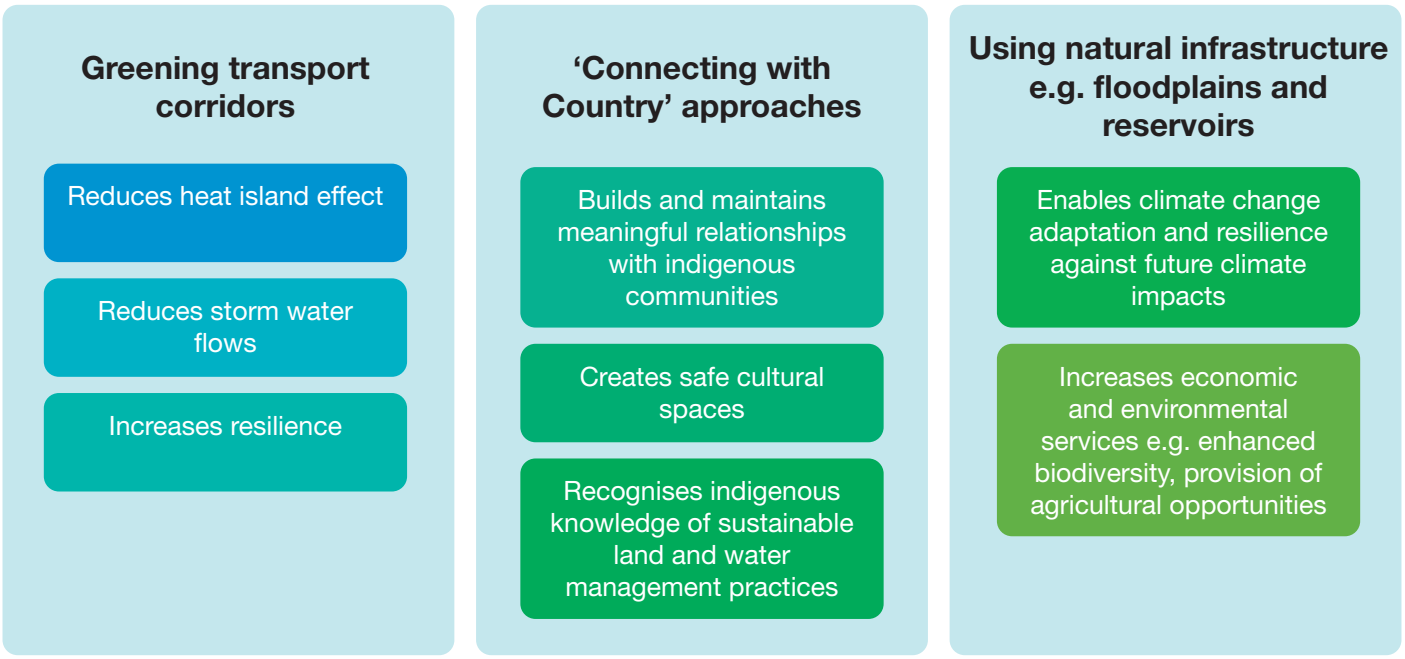


Figure 3. Examples of place-based practices that contribute to net zero

Initiatives & Case Studies

Infrastructure Net Zero Initiative

The Infrastructure Net Zero initiative, initiated by the ISC and now hosted by ASBEC, promotes collective action to decarbonise Australia's infrastructure, aligning resources and expertise to drive lasting policy change and innovation. Its primary objective is to meet or exceed the national targets of a 43% reduction by 2030 and Net Zero by 2050.

Infrastructure Net Zero has worked with industry stakeholders and policymakers to publish *A solid foundation: A common definition for net zero infrastructure and how to get there*. This document outlines a shared understanding of what net zero means and the sector's role in managing and reducing carbon emissions.

IS Impact Report – Case Studies

This annual report demonstrates the impacts that the ISC and its ecosystem of member organisations and stakeholders deliver. For instance, IS As Built certified projects avoided more than 23.5 million tCO2e between FY18-FY24. Additionally, member case studies - such as InfraBuild's steel products that deliver up to 38% reductions on embodied carbon, and Holcim's new low-carbon concrete that offers 30-70% lower carbon emissions - demonstrate achievements, innovation, and success across the industry.

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The Journey to Net Zero

This report is a 'call to action' for the government and industry to explore opportunities for and address the need to decarbonise the transport sector. It was sponsored by ARUP and prepared by KPMG for Roads Australia, the Australasian Railway Association and the Infrastructure Sustainability Council. The report makes the following recommendations:

1. Create a national, strategic approach to transport and infrastructure, with a focus on placemaking to meet the community's long-term needs
2. Introduce policies and investment that promote the development of efficient, sustainable, and resilient transport systems, including a move to ensure all new infrastructure projects incorporate net zero emissions targets
3. Enable collaboration, capacity building and education at all stages of the process and advocate for new approaches to procurement
4. Implement governance structures, processes and approaches to drive transparency and sound decision making to support the decarbonisation of transport systems
5. Adopt and promote technology solutions that optimise asset design, construction and operation of road and rail fleets.

The report includes 29 case studies showcasing innovative and effective solutions that demonstrate the progress of the transport sector to achieve a low carbon economy by 2050.

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Place Based Approaches to Net Zero

This report, produced by Mott MacDonald in partnership with the Infrastructure Sustainability Council, outlines how applying a place-based approach to net zero goals and targets enhances the effectiveness of infrastructure solutions. Tailoring solutions to unique contexts, mobilising local resources, and accelerating community buy in, lead to successful low or no carbon outcomes.

The report includes local and international case studies focusing on partnerships, place-based governance, systems thinking, local community empowerment, digitalisation, and place-based solutions for transport, utilities, urban planning. The report's key message is that building capability, fostering collaboration, and integrating sustainability as a core component on the infrastructure agenda, can accelerate the results towards tackling climate change.

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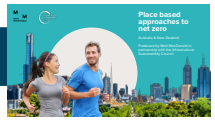

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