

Infrastructure in a world moving to net zero

Australia is committed to achieve net zero carbon emissions by 2050. Every part of the economy must focus on its piece to achieve this goal as a nation. Infrastructure is no exception.

Government investment in infrastructure is at record levels. The projects being delivered today will be in operation for decades to come. They form a significant part of the broader construction sector. State and Federal governments shape the vast majority of the nation's public infrastructure investments. Governments have an obligation to use their position to not only deliver infrastructure and services, but to also drive policy outcomes in support of the nation's net zero policy goals. Governments have the potential to transform the way the market responds, and as it does, this will flow through to supply chains supporting the infrastructure and services sectors.

The Business Council encourages governments to collaborate with industry in consideration of some key questions relating to the impact of net zero:

1. How should governments recognise the emissions of a project under construction?
2. How should emissions be identified and addressed in strategic planning and business cases for projects under consideration, and how does this shape the pipeline of infrastructure projects?
3. How can the infrastructure pipeline be used to trigger the evolution of a low-carbon materials supply chain?
4. How can the choice of infrastructure assets contribute to a lower carbon economy? Most of the emissions associated with infrastructure projects will occur due to the activity they enable through their use.

This note highlights some simple first steps that governments should consider.

Addressing Embodied Carbon

The delivery of infrastructure requires substantial inputs. Products like steel, wood, cement and concrete, bitumen and asphalt, and glass. The emissions generated in the production of these materials, together with carbon produced during the delivery of the project, form its 'embodied carbon' footprint.

These emissions cannot be discounted as insubstantial. Inclusive of emissions generated across the construction materials supply chain, it is estimated that building construction makes up around 10 per cent of global emissions, with other construction activities making up a further 10 per cent¹.

As a major procurer of infrastructure governments have a role to reduce the carbon footprint of this supply chain. Consideration needs to be given to how materials and construction methods with lower carbon emissions can be worked into public projects. The goal should be to reduce and eventually replace high emissions products and processes.

In the materials space, governments need to develop an understanding of where these materials are suitable for use. How they fit with existing material standards. Their cost premium. Their maintenance requirements. Their availability and maturity today, and their future potential. This is necessary so they can act as informed clients and procurers.

Many of these materials are still in their infancy. But as model clients, governments can and should work towards their broader procurement and eventual adoption at scale. Given the size of the current infrastructure pipeline, this work needs to be progressed with some urgency, so that emissions produced during the planned future build are reduced.

There is also work to do on the emissions produced during the actual construction process. Alternatives to conventional power and diesel for construction activities, such as the electrification of equipment, need to be part of the picture examined.

Economic (cost benefit) evaluation of alternative materials and methods should also be undertaken to quantify the cost effectiveness of various solutions in reducing emissions. Economically efficient carbon reduction approaches should be identified and recommended, so that taxpayer funds are spent judiciously. This process will need to be regularly updated as processes mature, and costs reduce.

Recommendation 1

The nation's infrastructure bodies should be tasked with working rapidly to identify the pathway for adoption of low-carbon materials on public projects. They should also identify viable opportunities for reducing emissions during construction. Cost premiums should be evaluated against effectiveness in reducing emissions, so that economically beneficial solutions are supported.

Recognising Carbon Emissions in Business Cases

The average life of a non-dwelling construction – such as offices, schools, hospitals, and roads – is estimated by the Australian Bureau of Statistics to be 54 years². Much of the major infrastructure governments build will be in operation well beyond this. With the 2050 net zero timeframe less than 30 years away, the operational life of today's projects are well within that space of time.

To support the national goal of net zero emissions, the whole-of-life emissions produced due to every long-lived project must be taken into consideration as part of decision-making processes.

¹ United Nations Environment Programme (2021). 2021 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector.

² Australian Bureau of Statistics (2021). Australian System of National Accounts: Concepts, Sources and Methods 2020-21 financial year.



A project's business case is where detailed options analysis is undertaken, resulting in a preferred project for recommendation to decision makers. An understanding of the greenhouse gas emissions from the delivery, operation, and flow on impacts of a project's options should be available to inform this. This should include embodied and construction emissions, mode shifts, network impacts, and direct operational emissions. This ensures the carbon impact of a project during its life will be considered before a recommendation is made.

Australia should look overseas to find good practice examples to follow and adapt. In the UK, the PAS2080 standard on Carbon Management in Infrastructure is being adopted. This is one specific area that merits further examination.

Consideration of emissions could be included in the overall economic benefit-cost analysis of a project. This may already occur in some jurisdictions or on some projects. It is important that any value assigned to carbon adequately reflects its environmental externality costs. There is evidence that the economic values assigned to carbon used in Australia as part of the benefit-cost analysis are lower than those used in other jurisdictions. This has the potential to underweight the impact of carbon emissions, skewing investment metrics such as the benefit cost ratio. There is also a case for articulating the emissions produced of each option (against the base case) as a standalone analysis in the business case.

Finally, if lower-carbon materials or different construction equipment or methods with higher cost premiums are used, this is also the appropriate place to factor them into the project's baseline budget. The business case process confirms the investment budget and should therefore have any such costs factored in.

The Business Council does not intend for this process to become a significant source of additional business case production cost and time. Analysis will need to be based on a methodology that is credible without being burdensome. We also believe it is important for there to be a nationally consistent approach to this task, so that business cases are comparable across jurisdictions.

Recommendation 2

Federal and state treasuries should together develop a consistent approach to presenting whole-of-life emissions from project options as part of the business case development process.

Procurement processes that consider the supply chain disruption of the shift to net zero

Changes to the development of projects to reflect net zero will necessarily shape the supply chains of industry who will look to respond to the signals from Australian governments. For example, shifts to lower-carbon materials and assessing of lifecycle emissions will drive change in the solutions that industry puts forward to government. This may well disrupt conventional supply chains, which will need to adapt to these revised priorities. Industry will need clear guidance from government on how this changed approach will impact on their bids.

Industry players will seek to develop a competitive advantage through supply chains innovations to adapt to the greater focus on net zero. It will not be without cost, and so governments will need to be very clear on what outcomes are being sought, and over what timeframe. For industry to follow this lead, to make investment and take risk, there needs to be confidence that governments understand what is required to achieve these outcomes.



As supply chains transform, the cost of transition may well exacerbate existing inflationary pressures on the construction sector and industry more broadly. With the value for money equation for projects in a net zero environment shifting, governments must be willing to consider that in the near term at least, the cost of delivery may increase. In evaluating changed materials or altered delivery approaches, it is important to ensure that such changes are tested from a cost benefit perspective (as addressed in Recommendation 1).

Procurement processes should be revised to take this into consideration. This will mean revising the value for money assessment framework, understanding how emissions will be measured and evaluated in procurements, and articulating how far this should flow through to supply changes.

Recommendation 3

Federal and state treasuries should together review procurement processes to reflect the shift to net zero, in the context of the outcomes from the work on materials and delivery methods by the nation's infrastructure bodies (Recommendation 1). They should consult with industry to examine the potential impacts and costs of transition to achieve these aims.

