



101 Climate-related Reporting Using the TCFD Framework: An Unexpected Driver of Climate Action

Matt Raeburn, Beca

Disclosure of climate-related risks and financial impacts, using the Task Force on Climate-Related Disclosures framework, is being mandated and otherwise incentivised in New Zealand. By encouraging robust climate-related disclosures for investors and other financial decision-makers, TCFD reporting is poised to become an unexpected driver of climate action economy-wide.

Using behaviour-changing incentives in climate change policy over regulation has yet to result in significant action on emissions mitigation or adaptation. But reporting using the Task Force on Climate-Related Disclosures (TCFD) framework uses a hybrid approach that will drive ambitious climate action in Aotearoa New Zealand and beyond.

Created to inform investors of publicly traded companies, the TCFD framework has been widely adopted for reporting climate-related risks, opportunities, and financial impacts. TCFD reporting will soon be mandatory across much of New Zealand's economy, with the Zero Carbon Act also incentivising TCFD disclosures for the public sector and lifeline utilities. TCFD requirements include transition and adaptation planning supported by climate scenario analysis.

In this presentation, Matt will explain how TCFD reporting, by encouraging robust climate-related disclosures for investors and other financial decision-makers, is poised to become an unexpected driver of climate action economy-wide.

102 Environmental Enhancement: Life Beyond Protection

Bridget Robinson & Elisa Chillingworth, HEB Construction

Regulations, guidelines and expectations have evolved since the nineties to produce fundamentals for environmental control in construction. If adhered to, basic environmental protection can be achieved. But what happens when we want more? When protection just isn't enough? A focus on moving toward holistic, sustainable environment enhancement; life beyond protection.

Like many aspects in construction, there has been a drive to 'do better' in the environmental space. No longer is environmental control a nice to have, a waste of money, a we won't get caught or a but do we have to? Regulators, clients and experienced constructors all understand and expect that environmental controls are established, maintained and work successfully in not only limiting negative outcomes but de-risking a project and ensuring successful compliance. The next phase of this evolution is to not only protect but enhance our environment, ensuring that local biodiversity is encouraged to thrive in and near our work sites. Here, we detail real world examples of how we are working to implement a sustainable, consistent approach to environmental enhancement, including successful breeding of native species, expansion of native flora and involvement of the local community. Never has there been more of an opportunity for dirty construction to change its spots and be leaders in environmental enhancement.

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103 The Missing Link: Embodied Emissions Estimation

Chris Cameron, Pattle Delamore Partners (PDP)

Tools are emerging for calculating embodied and operational greenhouse gas emissions in projects. Examples include ISCA, Moata, and LCAQuick. In this talk, I'll explore the direction and possibilities of this rapidly evolving field including for project optioneering, project estimating, and detailed job carbon calculation.

The calculation of both embodied and operational greenhouse gas emissions is likely to become a requirement for capital projects and reporting across a wide spectrum of industries, projects and sectors (including in the public sector). It is also being driven by the increasing cost of carbon, leading to higher costs to achieve low-carbon outcomes. Some tools already exist but more are likely to emerge, particularly tools that are integrated into project cost estimation, and into job pricing software. An additional component for some sectors to consider are so-called 'enabled' emissions (i.e., those that are enabled by the project, such as more vehicle travel induced from construction of new roads). Here, we will take a broad dive into the current state-of-play for such tools and explore how they may evolve over time. International examples and directions will be discussed to help assess how New Zealand can learn from current best practice elsewhere.

104 Protect and Restore: how Auckland Transport is Improving the Environment

Cathy Bebelman, Auckland Transport

Auckland Transport is improving the environment, one road at a time, through implementing the new Environment Action Plan: Hiikina te Wero. Progress is tracked through an online portal and GIS with the goal of annual reporting.

In December 2021 Auckland Transport launched Hiikina te Wero: the AT Environment Action Plan. This is the first time that the threads of Auckland Transport's environmental work have been woven together into a single document. The plan was developed in collaboration with mana whenua and establishes targets, to be delivered over ten years, across five key areas. The transparent approach connects the environmental improvements with climate change mitigation and adaptation programmes within AT. This evidence-based approach to the management of transport infrastructure and its interaction with the environment is being tracked using a data portal, which contractors directly access to record materials, waste, water, fuel and energy. AT will report annually on its progress.

105 Improved Understanding of Climate Risk and Response

Chris Cameron, Pattle Delamore Partners (PDP)

Organisations are increasingly focusing attention on climate risk reporting for climate related financial disclosures, and to prepare for the upcoming RMA reform. In this presentation we will look at innovative geospatial methods to assess future likely climate risks across a range of domains, and examine adaptation response options.

For effective long-term climate change decision making across environmental, social, cultural and economic domains, several key elements are needed, including:

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- An understanding of how climate change is most likely to affect an organisation, place, or activity (e.g., will higher temperatures allow for that activity to continue?)
- The wider implications of climate change for society (e.g., how might it affect land-use and socio-economic patterns?)
- Reasonable estimates for the likely costs of both impacts and responses (for protection, accommodation, and retreat).

Government, tertiary institutions, councils and private organisations are all commencing assessments of climate risk. Geospatial analysis based on a range of high-quality data is coming to the fore as the primary mechanism to assess such risks. While we have data on projected climatic changes, these must first be translated into risk metrics for each domain, before response options can be examined. We discuss key aspects of this approach and review several tools that have been developed overseas.

106 Adapting Auckland's Transport

Ashishika Sharma, Auckland Transport

An overview of Auckland Transport's climate adaptation plans to manage AT's assets located within hazard areas.

Auckland Transport's climate adaptation plans establish a framework for the management of AT's assets located within the hazard areas in the short and medium term that is cognizant of the need to adapt in the long term.

A Climate Change Risk Assessment for AT's assets identified one hundred and seventy risks, further broken into asset risks, service delivery risks and health and safety risks. High level adaptation options were identified for the top forty identified risks.

A pilot project of "deep dive" adaptation planning and decision making is being undertaken for AT's assets located the Beachlands, Maraetai and Matingarahi. A description of the potential impacts of coastal erosion, inundation, and inland flooding on AT's assets in these areas and the climate change adaptation approaches in the short, medium and long term, including triggers and thresholds, will be identified. Based on the findings from the pilot project further areas of interest will be identified and a combination of approaches will be undertaken for each of the ten highest priority risks in the ATCCRA, with a framework developed for managing all of AT's assets within hazard areas.

108 De-carbonising Infrastructure – Councils Lead New Zealand's Carbon Crunch

Steve Couper, Mott MacDonald

The substantial contribution of embodied carbon into infrastructure as part of New Zealand's total GHG emissions is routinely underestimated. New tools and new ways of planning, designing & constructing are required to better monitor, manage, and ultimately minimise the carbon impact of capital works programmes. The impact of embodied carbon on New Zealand's total GHG emissions is often underestimated. Recent work by Watercare and Auckland Council has identified that up to half their total emissions can come from capital projects. This impact will only increase as New Zealand's

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electricity grid is further de-carbonised and user-carbon from sources such as transportation reduces. Local councils are leading the charge towards a carbon neutral future. Several have declared climate emergencies, and many have announced ambitious carbon reduction targets.

However, a lack of tools to robustly evaluate embodied carbon and assess alternatives has been a critical gap. LGNZ & Mott MacDonald have been working to support New Zealand infrastructure providers with a robust and user-friendly mechanism to measure, monitor and ultimately minimise embodied carbon, through the Moata Carbon Portal. Built around PAS 2080 (the global standard for embodied carbon management) the portal is a digital platform that enables global best practice in design, construction, and equipment procurement to be shared across New Zealand's public infrastructure sector.

109A Less is More

Paul Thomas, HEB Construction

In recent years international studies have shown a significant reduction in the user and operational carbon emissions of infrastructure assets. This, however, is not the case for capital carbon emissions - the data shows that capital carbon emissions are increasing. This presentation will explore what the drivers behind this are and look at some areas where change can be implemented to support the reduction in capital carbon emissions.

Capital carbon emissions are increasing year on year. This is, of course, being driven by population growth and the need to provide critical infrastructure to communities. But crucially there is a second aspect that is enabling capital carbon emissions to increase - design.

The efficient and low carbon design of infrastructure assets is being impacted by a number of factors such as contract procurement models; reluctance to address conservative safety and serviceability limit states; lack of planning; reluctance to adopt low carbon materials or simply 'lazy' design.

What has worked internationally and what are the 'low hanging fruit' that will get the ball rolling in New Zealand?

110 Design for Climate Change Sustainability and Resilience - Does this Need to Cost More?

Pathmanathan Brabhakaran, WSP

Everyone assumes that design for climate change sustainability and resilience will cost more... in terms of money and carbon emissions! Really? What is needed is a paradigm shift in our thinking and an integrated focus on sustainability and resilience. Public works engineers can make the greatest impact - will we act? Climate change requires a twin response... (1) enhancing resilience to impacts from already increasing severe weather events, and will continue at least in the short - medium term, and (2) arrest-reverse climate change through reducing embodied carbon and emissions through our actions as public works engineers.

Enhancing resilience to climate change should be coupled with resilience to other natural hazards such as earthquakes. In terms of life cycles this would reduce our emissions in the long term.

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There is an inherent assumption that designing for climate change and resilience will cost more in terms of embodied carbon and constrained finances. In reality, climate change sustainability and resilience does not necessarily need to cost more! The presentation will illustrate through case studies that what is needed is a paradigm shift in our thinking... with an early integrated focus on sustainability and resilience across what we do.

111 Optimising Carbon Footprints

Phillipa O'Shea, Downer

As an environmentally conscious organisation, Downer tracks and reports on its energy consumption and CO₂e emissions and has introduced a range of initiatives to reduce their impact. Their largest annual contributor is in the Infrastructure Services division with a spotlight on maintenance activities.

In 2016 New Zealand was one of 185 countries that signed up to the UNFCCC agreement to reduce global warming by 2 degrees C by reducing carbon dioxide equivalent emissions (CO₂e). The energy sector, which includes transport, is the second largest contributor at 40% of total emissions with agriculture being the largest. The decision to sign up to this commitment will have an impact on all Road Controlling Authorities and policy requirements.

5 years ago, Downer started to assess the CO₂e emissions for road maintenance activities to understand their carbon footprint and impact over the life cycle of each treatment method. An example of initial findings suggested that Stabilisation has 10% lower impact than a Digout. However, looking at the whole life cycle Stabilisation has double the CO₂e impact.

The calculation of these carbon footprints is reliant on accurate data. The project's aim was to validate the data collected through our plant system to see whether it could be relied on to quantify CO₂e emissions for maintenance activities in the future. In short, the answer is yes it can. Now to take this thinking to the next level.

112A Realising Carbon Reduction Opportunities in Infrastructure - Converting Opportunities into Real Savings

Sam Turner & Clare Harvey, Beca

The focus on developing low carbon infrastructure brings an increased emphasis on identification and adoption of low carbon solutions by providers. However, realising low carbon opportunities is challenging with infrastructure development processes predicated to deliver cost-effective, durable solutions. We explore the practicalities of realising low carbon opportunities on infrastructure projects.

The increased focus on developing low-carbon infrastructure brings an increased emphasis on the identification and adoption of low-carbon solutions by infrastructure providers of all types. There is a willingness to explore and adopt an increasing number of low-carbon solutions into the construction and operation of infrastructure. However, many more opportunities for reduction are less easily adopted and require a longer-term approach.

The development processes we use to design, build, and operate infrastructure have evolved to support the delivery of cost-effective infrastructure. Durability, lifecycle, maintenance, and operational matters are all predicated on cost efficiency. This can make realising

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low (or lower) carbon solutions challenging.

Infrastructure providers looking to develop low-carbon products are encouraged to consider how they can adapt their processes and approaches to realise more opportunities through things like early industry engagement, technical standards, procurement, and delivery.

In this presentation, we explore the practicalities (with examples) of realising low-carbon opportunities on infrastructure projects.

112B An Overview of Options for Land Transport Decarbonisation

Zoe Burkitt, WSP

In this presentation I will be comparing various Land Transport decarbonisation initiatives at a high level and aim to answer the following questions:

- What are the decarbonisation options available?
- How do they stack against each other in realising New Zealand's climate goals?
- What are the barriers to their implementation?

A carbon zero 2050 is a key goal of the New Zealand government and one of the outcomes in Waka Kotahi's Sustainability Action Plan. To enable these expectations to be met, agencies like Waka Kotahi need to understand their contributions to GHG emissions and put in place initiatives to reduce them over time. To better understand the available options and their potential, WSP together with Waka Kotahi have begun collating information for lower carbon options for land transport which is primarily split into:

- Infrastructure development
- Maintenance
- Operations
- Emergency works
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This exploratory exercise involved reviewing:

- Carbon initiatives being explored for existing projects
- International literature review of opportunities
- Implementation of carbon saving initiatives used in previous projects