

Improving public sector Asset Management practice to address Climate Change risks




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/ DESIGN FOR A BETTER FUTURE

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Abstract

Governments across Australia are mandating consideration of climate change risk through their asset management policies. However, how can asset management capabilities of public sector agencies be improved to achieve this?

This paper details the approach and learnings from WSP in supporting Governments in Australia and internationally in developing guidance to improve asset management practice through asset life cycle considerations to address the impacts of climate change, while maintaining sustainable and resilient assets for communities.

1. Introduction

Government assets operate in a dynamic environment and are exposed to climate risks which could impact service delivery, cause damage to historical, cultural and heritage assets, and the community. Without climate change risk being an integral part of the organisation's asset management capability, the impacts of climate change can lead to:

- Greater risk of asset failures stemming from climate-related hazards leading to reduced levels of performance and greater service disruption
- Rising costs associated with managing these risks and ensuring agencies continue to meet required levels of service
- Potential reputational damage or stranded assets due to a lack of action to reduce emissions or continued dependence on fossil fuels
- Access barriers for operators, maintainers and the delivery of new infrastructure, due to extreme weather events.



2. The need for climate change action by asset managers

The asset portfolios of Governments across Australia are the most significant contributor to Australia's Greenhouse Gas (GHG) emissions with 70% of Australia's annual emissions estimated to be directly attributed to or influenced by infrastructure assets (CEFC, 2020). The health impacts of climate change are increasingly being recognised by health bodies (Ying Zhang, 2020). The health sector and emergency services are responding to more severe heatwaves, severe storms, severe bushfire smoke and mental health consequences of natural disaster events (BOM and CSIRO, 2020). For example, during the 2008-09 summer heatwave in Victoria, 374 people died (State of the Environment, 2016).

Climate change is exposing the Australia's economy and financial systems to significant risk. In 2019, the Reserve Bank of Australia, the Australian Prudential Regulation Authority and the Australian Securities and Investments Commission all recognised climate risk as

increasing financial risk. The potential fiscal risk for governments has been demonstrated by Sweden's central bank (Riksbank) divestment of Queensland and WA bonds based on state climate footprints, which accounted for about 8% of Sweden's foreign currency reserves (Financial Times, 2019).

Through mature asset management practice, government assets play an important role in mitigating the impact of emissions, heat and natural disasters. Governments in Australia are now recognising that an appropriate response to climate change risk requires robust infrastructure lifecycle planning and a whole of government approach (NSW Government, 2022; WA Government, 2022; Victorian Government, 2021). That is the foundation of modern asset management practice (ISO, 2014). Asset management decisions that do not consider and respond to climate risks may lead to fiscal, health, economic and social repercussions at a national, state and local level.



3. Key concepts and definitions to help understand context

There needs to be a clear and common understanding of climate change concepts and terminology by asset managers to ensure the vernacular of asset management practice is aligned with climate science. This section outlines key climate change concepts and associated terminology that are used in this paper and are important in understanding the organisational context for an asset management system.

3.1 CLIMATE CHANGE

Climate change refers to long-term shifts in temperature and weather patterns that is attributed to human activity, primarily the burning of fossil fuels and emission of greenhouse gases that trap heat in the atmosphere.

3.2 CLIMATE CHANGE RISK AND OPPORTUNITIES

The Taskforce on Climate-related Financial Disclosures (TCFD) is a globally recognised advocacy body for climate-related risk management and disclosure (TCFD, 2017). TCFD divides climate change risks into physical and transition risks. TCFD also recognise that climate change and the transition to a low carbon economy may result in opportunities for organisations and asset owners when considered in strategic planning and risk management.

Physical risks: Physical risks refer to the direct exposure of assets or services to climate-related hazards. Physical risks can be either:

- **Acute** - resulting from climatic events including the increased frequency and or severity of extreme weather events such as floods or east coast lows.
- **Chronic** - arising from longer-term climatic changes such as higher average temperatures or lower than average rainfall resulting in drought.

Assets located in climate-sensitive locations, that rely on consistent water supply or are dependent on third parties who are also exposed to climate change such as electricity providers are most at risks.

Transition risks: Transition risks refer to impacts associated with the transition to a low-carbon economy. Transition risks may arise from:

- **Policy and legal risks** - the potential for changes in policy and regulation that could impact business operations and the associated liability from failure to comply. For example, the introduction of a tax on carbon or emission reduction targets.
- **Technology risks** - the potential of technology changes that enable a lower-carbon economy to disrupt business as usual. This could include risks associated with not being prepared for the electrification of assets, shift to electric vehicles and distributed energy systems, or robust monitoring and control systems.
- **Market risks** - the risk of loss in revenue, value, and/or performance due to financial market and economic disruption. This includes shifts in supply and demand of key resources (e.g. consumer demands, commodity availability), the viability of financial models, and insurance and finance evaluation methods.
- **Reputation risks** - arising from customer or community perception of your organisation public (e.g. distrust and lack of confidence). This could result in lost revenue, additional expenditure (e.g. corporate affairs), and increasing scrutiny of climate change related actions.

Transition risks may not be within the direct control of asset managers, therefore ownership and action on transition risks may require collaboration across government departments and agencies.

Climate change opportunities: Climate change and the transition to a low carbon economy may result in opportunities for asset owners. The TCFD describes a range of climate change opportunities including resource efficiency, energy source, products and services, markets and resilience. Some examples of climate change opportunities that may be applicable to asset owners include resource efficiency measures that lead to long-term operational savings, new market opportunities to increase revenue or enhanced resilience through on-site self-supply and storage of energy.

3.3 CLIMATE CHANGE MITIGATION VS ADAPTATION

Addressing physical and transition climate change risks requires an understanding of the difference between climate change mitigation and adaptation.

- **Climate change mitigation:** Refers to actions that reduce greenhouse gas emissions that are causing climate change. For example, procuring renewable energy or selecting low carbon products.
- **Climate change adaptation:** Refers to proactive measures implemented to enhance the resilience of an asset or service to physical climate change risks. For example, increasing drainage capacity to account for projected increases in rainfall intensity or increasing the ambient operational temperature of plant and equipment.

3.4 CIRCULAR ECONOMY

The principles of circular economy include designing out waste and pollutants, keeping materials in productive use and recovering and returning materials traditionally considered to be waste products to circulation at the end of their service life. A truly circular economy extends beyond recycling or the use of recycled products as it aims to keep resources at their highest value possible for continual reuse and enables economic growth through productive use of natural resources. A circular economy plays an important role in climate change mitigation as it encourages the efficient use of resources.

3.5 GREENHOUSE GAS EMISSIONS

Greenhouse gases (GHG) are gases that contribute to the greenhouse effect in the atmosphere. The GHG Protocol, an internationally recognised standard for the measurement and management of greenhouse gas emissions, defines greenhouse gas emissions under 3 scopes. These include:

- **Scope 1:** Direct emissions – emissions produced by sources that are owned or controlled by an organisation. An example includes fuel combusted onsite.
- **Scope 2:** Electricity indirect greenhouse gas emissions – emissions associated with the consumption of electricity. The physical emissions therefore occur at the location where the electricity is generated.
- **Scope 3:** Other indirect greenhouse gas emissions – emissions generated as a result of activities of an organisation, however, occur from sources not owned or operated by them. Examples include extraction and production of purchased materials and the transportation of materials and waste.

4. National and global review of current practice

Leveraging WSP's existing domestic and global expertise in asset management and climate change risk, WSP reviewed evidence from interstate and international jurisdictions on embedding climate change resilience, emissions reductions and circular economy principles into asset management practices. An overview of the key findings from the review concluded:

- Limited number of government policies and guidelines were identified that integrated climate change risk assessment, emissions reductions and circular economy requirements to inform asset management capability improvement.
- Most asset management guidelines focused on physical risks with some consideration of transitional risks related to a shift to a net zero economy, with limited consideration of market and technology shifts, reputational risk, and legal risk due to changing climate change policy and regulation.
- A number of jurisdictions have broad guidelines that can be applied to asset management, such as (CSIRO, 2018; ICMP, 2018), and also acknowledge the important role that asset managers play in the monitoring, data collection and review of the climate risk assessment process (NSW Treasury, 2019).
- The Climate Change and Asset Management Framework from British Columbia (Union of British Columbia Municipalities, n.d.) is a leading example of how climate change can be integrated into an organisation's asset management framework.

OBSERVATIONS FROM NSW AND VICTORIA

Based on WSP's experience, the following observations are reflective of the challenges currently faced by State agencies in NSW and Victoria:

- Mixed levels of climate change risk knowledge and approaches, and often not aligned to competencies for asset management
- Climate change risks are not consistently integrated into asset lifecycle planning and asset risk evaluation
- Reliance on Building Code of Australia to address natural hazard risks
- Limited consideration of infrastructure interdependencies across state, local and private ownership and use
- Further clarity and awareness needed for asset managers to locate reliable government climate data
- Limited understanding of future operating and maintenance liabilities resulting from climate change risks impacting existing and pipeline of new assets

A number of policies and guidelines are currently in development by the NSW and Victorian state governments to address these challenges through improved asset management practice under their respective state Asset Management Policies (VIC Department of Treasury and Finance, 2016; NSW Treasury, 2019).



5. Embedding climate change in asset management practice

ISO 55001 Asset management fundamentals provide an important starting point for embedding climate change action in asset management practice. The following section provides guidance on the key areas of asset management practice (as aligned to ISO 55001) in need of most improvement for climate change response.

5.1 LEADERSHIP AND SUPPORT

| FOCUS AREA | GUIDANCE |
|--------------------------------------|---|
| Governance and responsibility | <p>Provide suitable governance to understand and manage the climate change risks to assets and service delivery, and appropriately delegate responsibilities, for example</p> <ul style="list-style-type: none"> · organisational formal terms of reference include climate change consideration across relevant organisational functions and asset accountability · independent assurance to validate climate change risks are being appropriately managed |
| Resourcing | <p>Provide suitable resourcing to understand and manage the climate change risks across asset lifecycle (including service delivery), for example:</p> <ul style="list-style-type: none"> · percentage of staff who have received climate change-related training · assessment of current supply chain's ability to meet climate change requirements · communities of practice, and participation in climate change thought leadership events |
| Monitoring | <p>Asset Management decisions consider climate change risks that are supported by evidence, adopting climate change-related metrics, KPIs and targets. Such as, potential cross-sector metrics and KPIs for climate-related risks associated with water, energy, land use, and waste management</p> |

5.2 PLANNING

| FOCUS AREA | GUIDANCE |
|---|---|
| Asset Management Objectives and Strategy | <p>Establish asset management objectives and strategy that incorporates robust consideration of climate change risks across the asset lifecycle, for example:</p> <ul style="list-style-type: none"> • commitment by leadership team to meet the organisation's climate change objectives • climate-related targets that align with government legislation and policies • decision-making criteria that incorporates physical and transition climate change risks |
| Business Case Development | <p>Business cases consider and respond to climate change risks, for example:</p> <ul style="list-style-type: none"> • consideration of climate change risks to identify a preferred infrastructure investment • cost benefit framework and analysis fit-for-purpose to evaluate climate change risks • cost estimates reflect asset lifecycle delivery including risk allocation and assumptions for managing uncertainty associated with climate change risk |
| Risk and contingency planning | <p>Establish a process for managing climate change risks that is integrated with the organisational risk framework, for example:</p> <ul style="list-style-type: none"> • climate-related risks and opportunities are evaluated and prioritised as part of existing asset management risk management processes • adopt a fit-for-purpose climate risk and vulnerability assessment methodology for the organisation • use of real options provide an organisation low regret measures to respond to different climate change scenarios |
| Acquisition | <p>Adequately consider climate change requirements when acquiring new assets and suppliers, or renewing existing assets, for example:</p> <ul style="list-style-type: none"> • involve staff with climate change expertise, or responsibilities to achieve climate change related outcomes, in procurement decision making processes • understanding the scope of procurement packages and their ability to address climate change risks and opportunities in collaboration with suppliers • embedding climate-related targets, emission reduction, and adaptation measures into procurement contracts • a climate-related tender evaluation indicator should be included that considers the tenderer's approach to meeting the project's climate-related objectives and targets • third party sustainability rating frameworks can be used to drive outcomes during project delivery and validate performance |

5.3 OPERATION (INCLUDING MAINTENANCE AND DISPOSAL)

| FOCUS AREA | GUIDANCE |
|----------------------------------|---|
| Monitoring and Prevention | <p>Establish processes to identify, monitor and record the condition of the organisation's assets to proactively manage asset performance failures due to climate change, for example:</p> <ul style="list-style-type: none"> · regularly assess the vulnerability of existing assets to identify how climate change will impact levels of service, risks, and costs · evaluate transition risks through developing an emissions inventory for assets and services based on climate-related metrics |
| Maintenance | <p>Consider climate change impacts in the context of risks, costs, and service objectives to develop integrated (across asset classes and locations) maintenance interventions, for example:</p> <ul style="list-style-type: none"> · track climate-related metrics, KPIs and targets · assess how climatic change (based on identified asset vulnerabilities) will impact the ability to deliver levels of service · evaluate the costs and benefits of maintenance interventions in consideration of climate change risk emission reduction and adaptation |
| Disposal | <p>Have a process for appropriately disposing assets that considers climate change and circular economy principles, for example:</p> <ul style="list-style-type: none"> · evaluate climate risks introduced by asset decommissioning and opportunities to improve resilience on the site · repurposing decommissioned assets for alternative uses to prolong the asset's life · salvaging components for reuse in proposed investments, such as structural steel elements or plant or equipment still within operating design life · transporting products and materials to a resource recovery facility that can recycle these into new products, such as crushing concrete for reuse in road base · transporting organic waste to a facility that can convert it into alternative products or use it as a feedstock in a composting or waste-to-energy plant |

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