PERFORMANCE AUDIT

7 SEPTEMBER 2021

Managing climate risks to assets and services

NEW SOUTH WALES AUDITOR-GENERAL'S REPORT

audit office
OF NEW SOUTH WALES

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We conduct financial or 'attest' audits of state public sector and local government entities' financial statements. We also audit the Consolidated State Financial Statements, a consolidation of all state public sector agencies' financial statements.

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Following a financial audit the Audit Office issues a variety of reports to entities and reports periodically to Parliament. In combination, these reports give opinions on the truth and fairness of financial statements, and comment on entity internal controls and governance, and compliance with certain laws, regulations and government directives. They may comment on financial prudence, probity and waste, and recommend operational improvements.

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GPO Box 12
Sydney NSW 2001

The Legislative Assembly
Parliament House
Sydney NSW 2000

The Legislative Council
Parliament House
Sydney NSW 2000

In accordance with section 38E of the *Government Sector Audit Act 1983,* I present a report titled **'Managing climate risks to assets and services'.**

Margaret Crawford
Auditor-General for New South Wales
7 September 2021

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Section one

Managing climate risks to assets and services

Executive summary

According to the Intergovernmental Panel on Climate Change in 2021, each of the last four decades has been successively warmer and surface temperatures will continue to increase until at least the mid-century. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology (BoM) have reported that extreme weather across Australia is more frequent and intense, and there have been longer-term changes to weather patterns. They also report sea levels are rising around Australia increasing the risk of inundation and damage to coastal infrastructure and communities.

According to the Department of Planning, Industry and Environment (the Department), in New South Wales the impacts of a changing climate, and the risks associated with it, will be felt differently across regions, populations and economic sectors. The Department's climate projections indicate the number of hot days will increase, rainfall will vary across the state, and the number of severe fire days will increase.

The NSW Government is a provider of essential services, such as health care, education and public transport. It also owns and manages around $365 billion in physical assets (as at June 2020). More than $180 billion of its assets are in major infrastructure such as roads and railway lines.

In NSW, climate risks that could directly impact on State agencies' assets and services include flooding, bushfires, and extreme temperatures. In recent years, natural hazards exacerbated by climate change have damaged and disrupted government transport, communications and energy infrastructure. As climate risks eventuate, they can also increase hospital admissions when people are affected by poorer air quality, and make social housing dwellings or schools unsafe and unusable during heatwaves. The physical impacts of a changing climate also have significant financial costs. Taking into account projected economic growth, NSW Treasury has estimated that the fiscal and economic costs associated with natural disasters due to climate change will more than triple per year by 2061.

The Department and NSW Treasury advise that leading practice in climate risk management includes a process that explicitly identifies climate risks and integrates these into existing risk management, monitoring and reporting systems. This is in line with international risk management and climate adaptation standards. For agencies to manage the physical risks of climate change to their assets and services, leading practice identified by the Department means that they need to:

- use robust climate projection information to understand the potential climate impacts
- undertake sound climate risk assessments, within an enterprise risk management framework
- implement adaptation plans that reduce these risks, and harness opportunities.

Adaptation responses that could be planned for include: controlling development in flood-prone locations; ensuring demand for health services can be met during heatwaves; improving thermal comfort in schools to support student engagement; proactive asset maintenance to reduce disruption of essential services, and safeguarding infrastructure from more frequent and intense natural disasters.

According to NSW Treasury policy, agencies are individually responsible for risk management systems appropriate to their context. The Department and NSW Treasury have key roles in ensuring that agencies are supported with robust information and timely, relevant guidance to help manage risks to assets and services effectively, especially for emerging risks that require coordinated responses, such as those posed by climate change.

This audit assessed whether the Department and NSW Treasury are effectively supporting NSW Government agencies to manage climate risks to their assets and services. It focused on the management of physical risks to assets and services associated with climate change.

Conclusion

The Department of Planning, Industry and Environment (the Department) has made climate projections available to agencies since 2014, but provided limited guidance to assist agencies to identify and manage climate risks. NSW Treasury first noted climate change as a contextual factor in its 2012 guidance on risk management. NSW Treasury only clarified requirements for agencies to integrate climate considerations into their risk management processes in December 2020.

The Department has not delivered on a NSW Government commitment for a state-wide climate change adaptation action plan, which was meant to be completed in 2017. Currently many State agencies that own or manage assets and provide services do not have climate risk management in place.

Since 2019, the Department and NSW Treasury have worked in partnership to develop a coordinated approach to supporting agencies to manage these risks. This includes guidance to agencies on climate risk assessment and adaptation planning published in 2021.

More work is needed to embed, sustain and lead effective climate risk management across the NSW public sector, especially for the State's critical infrastructure and essential services that may be exposed to climate change impacts.

The NSW Government set directions in the 2016 NSW Climate Change Policy Framework to 'manage the impact of climate change on its assets and services by embedding climate change considerations into asset and risk management' and more broadly into 'government decision-making'.

The Department released climate projections and has made information on projected climate change impacts available since 2014, but this has not been effectively communicated to agencies. The absence of a state-wide climate change adaptation action plan has limited the Department's implementation of a coordinated, well-communicated program of support to agencies for their climate risk management.

NSW Treasury is responsible for managing the State's finances and providing stewardship to the public sector on financial and risk management, but it did not consistently apply dedicated resourcing to support agencies' climate risk management until late 2019. NSW Treasury estimates the financial costs of climate-related physical risks are significant and will continue to grow.

The partnership between the Department and NSW Treasury has produced the 2021 Climate Risk Ready NSW Guide and Course, which aim to help agencies understand their exposure to climate risks and develop adaptation responses. The Guide maps out a process for climate risk assessment and adaptation planning and is referenced in NSW Treasury policy on internal audit and risk management. It is also referenced in NSW Treasury guidance to agencies on how to reflect the effects of climate-related matters in financial statements.

There is more work to be done by the Department on maintaining robust, accessible climate information and educating agencies in its use. NSW Treasury will need to continue to update its policies, guidance and economic analyses with relevant climate considerations to support an informed, coordinated approach to managing physical climate risks to agencies' assets and services, and to the State's finances more broadly.

The effectiveness of the Department and NSW Treasury's support involves the proactive and sustained take-up of climate risk management by State agencies. There is a key role for the Department and NSW Treasury in monitoring this progress and its results.

1. Key findings

The Department has not delivered on the NSW Government commitment for a state-wide adaptation action plan, limiting a coordinated approach to supporting agencies to manage climate risks

The Department did not deliver a state-wide adaptation action plan, which was a commitment in the 2016 NSW Climate Change Policy Framework to be completed in 2017.

All other Australian States and Territories have released an adaptation strategy or similar to coordinate efforts across government, industry and the community. Such strategies generally incorporate actions to support agencies manage the physical risk of climate change to assets and services. The proposed NSW adaptation action plan was to support adaptation efforts across community, industry and government, and to include actions specific to supporting agencies. Its absence has limited the Department's implementation of a coordinated, well-communicated program of support to agencies for their climate risk management.

Priority investment areas related to minimising climate change impacts were flagged in the Draft Climate Change Fund Strategic Plan 2017–22. This document was published by the NSW Government in 2016, but never released as final.

With the establishment of the Climate Risk Steering Group in mid-2019, administered by the Department and chaired by NSW Treasury, more coordinated forms of support for agencies are in development and early implementation.

The Department can demonstrate a robust approach to developing climate projections

Climate projections are a key means of understanding the potential impacts of climate change, which is an important step in the climate risk assessment process. The NSW and ACT Regional Climate Modelling (NARCliM) is a NSW Government-led partnership that provides climate projections across the State. The first full version of NARCliM (v1.0) was released by the Department on the AdaptNSW website in 2014.

The Department's approach to generate the projections has been tested and supported by an expert evaluation. The Department undertook a range of other quality assurance activities, including engaging with experts and stakeholders. It has also been collaborating in research partnerships with universities and other jurisdictions since 2012.

The Department released an interim version of NARCliM (v1.5) to users of its climate data portal in early 2021. This version is based on the most recent global climate models available at the time of development. It includes enhancements such as two future emission scenarios and many additional variables. It is working on the next version that will use the latest (2020) global climate models. NARCliM (v2.0) should be available in 2022. Updating NARCliM requires significant resourcing, including substantial computational power and time.

The Department's approach to communicating its climate information, including educating agencies about the climate projections, has been insufficient

The NARCliM projections are included in the NSW Government's Common Planning Assumptions, making them the source of climate information that State agencies should use to prepare proposals, plans or strategies. The Department is yet to provide clear guidance to agencies on what NARCliM emission scenarios should be used in different decision-making contexts.

The Department's communication plans on climate projections have been insufficient as they have not clearly documented how it will educate agencies in the use of NARCliM since its first release in 2014. Of the 13 government entities examined as part of the audit,[1] only four were using NARCliM. NARCliM (v1.0) is based on 2007 global climate models and still relevant for agencies to use, but this timeframe has limited its perceived utility and uptake among some staff.

[1] We examined 13 government entities for the audit, including three entities within the Planning, Industry and Environment cluster and ten external NSW Government agencies. Of these 13, nine are major asset holding entities.

In mid-2020, the Department commissioned an overall strategy for its climate change information, including for the AdaptNSW website. These strategies are focused on community, researchers, local government and business, and do not clarify the Department's approach to educating and upskilling agency staff. There is also no detail on implementation responsibilities and timeframes.

Agencies with significant assets and services have not conducted climate risk assessments and the support for this has been insufficient

The Department's support to agencies to use its climate projections to identify climate risks to assets and services has been limited. The Department has delivered forums, workshops, and advice to agencies, in addition to the AdaptNSW website, but has not applied dedicated resourcing to a structured mechanism for guiding agencies in developing climate risk assessments. NSW Treasury has a stewardship role in public sector risk management, but it had not defined or resourced its role in supporting agencies to manage climate risks until late-2019.

Nine of 13 government entities that we examined as part of the audit had not completed climate risk assessments for their assets and services. A lack of technical capacity to use climate projections to develop risk assessments was raised as a key issue. The value of physical assets held by these nine entities was around $120 billion, as at June 2020.

These results are consistent with surveys of agencies that the Department conducted in 2015 and the Department and NSW Treasury conducted in 2018, which showed low levels of climate risk management maturity across agencies and highlighted limited progress in managing climate risks.

Within the Planning, Industry and Environment cluster, the approach to considering climate risk in risk registers was not as comprehensive as expected. Climate risk was identified in two of nine risk registers (from 2020) in which we expected to see a consideration of the physical impacts of a changing climate on the relevant assets or services.

Most agencies do not have plans to adapt to climate risks and the Department's support for this has been insufficient

According to the Department and NSW Treasury, and in line with international standards, effective climate risk management includes adaptation planning. But the Department has delivered limited support to other agencies to use climate information to develop appropriate responses.

To date, consistent with the 2015 and 2018 survey findings, most agencies have not developed adaptation plans to respond to climate risks to their assets and services. Of the 13 government entities that we examined only three had developed adaptation plans. A factor described as limiting their progress was not being able to effectively communicate climate risk information, and the need for adaptation planning, to senior leaders in their agency.

Within the Planning, Industry and Environment cluster, the Crown Land division and the Land and Housing Corporation (LAHC) have significant assets that are exposed to climate risks. Crown land covers about 42 per cent of the State land area, including significant coastal land and infrastructure.[2] The LAHC, which owns most of the social housing portfolio, needs to maintain the thermal comfort of its properties to limit the risk of heat stroke and other poor health outcomes for residents. These entities do not have adaptation plans to manage climate risks to their assets and services.

By way of contrast, and following a request by the NSW Minister for the Environment in 2014, the National Parks and Wildlife Service (NPWS), which is part of the Department, developed the NSW National Parks Climate Change Strategy in 2018. This adaptation strategy identifies priorities and proactive management actions for NPWS assets and operations. The Department advises that significant resourcing and support from internal experts were deployed to develop this strategy.

[2] Most Crown land is managed by leaseholders or statutory land managers, including other government agencies and local councils, which may also own assets located on these lands. The Department is responsible for overseeing and providing governance over Crown land managers.

The Department could do more to leverage its land use planning role to ensure agencies and communities are resilient to climate change

The 2016 NSW Climate Change Policy Framework set directions for embedding climate change consideration in government decision-making. The Department's role in land-use planning, guiding development controls, and building regulations, can affect a wide range of decisions by State agencies, and local government. The Department has not taken adequate steps, resulting in weaknesses in the planning system that create a risk that climate change will not be adequately considered by agencies.

- The Department's regional planning documents, including District Plans of Greater Sydney, reference climate change, but this information is yet to be consistently translated into guidance for local councils. This is critical to ensure development is more resilient to climate change.
- The Department's Guide for Council's Local Strategic Planning Statements (LSPS), which set out the 20-year vision for land-use in a local area, does not refer to 'climate change' and how it should be considered.
- The Department's guidance on preparing Local Environmental Plans (LEPs) for councils does not mention climate change and the Standard Instrument for preparing LEPs only briefly mentions climate change in relation to flooding. All 143 council LEPs mention climate change but this is just in relation to flood planning. This means that councils' Development Control Plans are at risk of not considering climate change.

The Department also administers the Building Sustainability Index (BASIX), which is a sustainable planning measure to drive reductions in residential water and energy use. The Department is not considering the future impacts of climate change in updates to the BASIX targets for energy and thermal comfort, which we are advised are under review in 2021.

The Department and NSW Treasury produced the Climate Risk Ready NSW Guide and Course in 2021 to improve support for agencies' climate risk management

To improve support to agencies, the Department in partnership with NSW Treasury published a Climate Risk Ready NSW Guide (CRR Guide) in March 2021. They also developed an accredited Course that commenced in February 2021 with funded places for 100 agency staff.

The Guide and Course aim to help agency staff to, 'lead, influence and enable' climate risk assessment and adaptation planning, with a focus assessing and responding to physical climate risks. The CRR Guide maps out a process for climate risk assessment and adaptation planning for agencies to follow. It includes practical resources such as a Climate Risk Maturity Health Check Tool and a Climate Risk Assessment Tool.

The Guide is referenced in the NSW Treasury Policy Paper on Internal Audit and Risk Management (TPP 20-08) and in guidance on how to reflect the effects of climate-related matters in financial statements. The Guide also states that it is aligned to relevant NSW Treasury policy papers on risk and asset management.

The Guide and Course were released in early 2021, four years after the 2016 NSW Climate Change Policy Framework. Staff from 17 agencies have enrolled in the course, and it is too soon to comment on the impacts of this work.

NSW Treasury has updated some relevant policies and guidance with climate-related considerations, but key gaps remain

NSW Treasury produced the 2021 Intergenerational Report technical paper on physical climate risks, which should be useful information for supporting agencies' climate risk management. It indicates that the fiscal and economic costs per year associated with natural disasters will more than triple by 2061.

According to NSW Treasury, its approach to updating guidance and policy papers ('TPP') with climate considerations has been driven by the potential financial exposure these risks present to the State. NSW Treasury's Internal Audit and Risk Management Policy (TPP20-08), Asset Management Policy (TPP19-07), Risk Management Toolkit (TPP12-03), and the Cost Benefit Analysis guidelines (TPP17-03), all refer to a need for agencies to consider climate risk, but key gaps remain.

- There is a risk that climate change will not be effectively considered in agencies' asset management plans, given it is unclear this will be part of the assurance process for these plans under TPP19-07.
- Guidance to State Owned Corporations, which are major infrastructure holders and service providers, does not mention climate change, and these agencies are not covered by the TPP20-08 or TPP19-07.
- NSW Treasury's Annual Reporting and Compliance Checklist for agencies does not mention climate change, although there is scope to do this.
- Steps for finalising draft guidance on resilience in infrastructure planning, developed by NSW Treasury and Infrastructure NSW in 2019, are unclear. This is a potentially key source of guidance to agencies when considering climate risk.

In March 2021, NSW Treasury produced guidance to agencies about reflecting the effects of climate-related matters in financial statements which links to the CRR Guide. This NSW Treasury guidance is not binding but is intended to support agencies to comply with mandatory obligations under existing accounting standards. As a general guidance document, it may not provide sufficiently specific guidance to help agencies identify material climate-related risks and determine the appropriate disclosures in their financial statements.

There has been some oversight of the Department and NSW Treasury's support for agencies but no confirmed approach to monitoring progress or reporting on outcomes

The Department and NSW Treasury's progress in delivering support to agencies for climate risk management has been overseen by the interagency Climate Risk Steering Group. The group is administered by the Department and chaired by NSW Treasury.

The Department and NSW Treasury have provided updates to the Asset and Liability Committee (ALCO) on climate risk since April 2018. The ALCO is chaired by NSW Treasury and provides advice on State Significant Financial Risks and Other Significant Risks.

In June 2019, extreme weather was listed by the ALCO as a State Significant Financial Risk (SSFR). In December 2019, extreme weather risk was renamed as climate risk by the ALCO and listed as a SSFR, which required the Department and NSW Treasury to report annually on its management. These agencies provided updates to ALCO in December 2019 and in June and August 2020. Subsequently, climate risk was categorised as an Other Significant Financial Risk in April 2021, which requires 'periodic' reporting. It is unclear under what conditions this periodic reporting will be activated. There is a risk that climate-related matters receive less specific attention and will not be subject to reporting at the ALCO at least once a year.

In April 2021, the Secretaries Board endorsed the Department and NSW Treasury to develop a roadmap to coordinate responses to climate risks to government operations and services. This endorsement provides for executive oversight of the roadmap, and the Department and NSW Treasury plan to report annually to the Secretaries Board on their support to agencies for climate risk management.

There is limited information on how the Department and NSW Treasury intend to routinely monitor the progress of agencies with implementing the CRR Guide or developing climate risk 'maturity' more broadly. The Department has advised that it plans to survey agencies' take-up of climate risk assessment planning in 2021 and every three years thereafter. The Department and NSW Treasury are also revising the terms of reference of the Climate Risk Steering Group to clarify its role, including in relation to monitoring and reporting.

No plans are in place to report progress to stakeholders or the public on how effectively State agencies are managing climate risks to their assets and services. The effectiveness of the Department and NSW Treasury's supports, and implementation of a coordinated approach, involves proactive and sustained take-up of climate risk management by State agencies.

2. Recommendations

By December 2021, the Department and NSW Treasury should, in partnership:

1. Enhance the coordination of climate risk management for State agencies' assets and services by:
    a) developing the proposed roadmap to improve agencies' capability to manage climate risks, including an agreed program of actions that are relevant and proportionate to identified risks, with delivery targets and reporting
    b) implementing a clearly resourced plan to expand the reach of the Climate Risk Ready NSW Guide and Course across agencies, and periodically improve its content
    c) ensuring agencies have access to relevant, robust information on the physical climate risks, and associated costs.

By December 2022, the Department should:

2. Strengthen supports that improve agencies' management of physical climate risks to their assets and services by:
    a) ensuring regional climate modelling (NARCliM v2.0) is released, and that climate projection information is updated on the climate data portal and Adapt NSW website
    b) implementing a targeted education strategy on using climate projections and a feedback mechanism for agencies' climate risk assessments and adaptation plans.
3. Monitor the progress of agencies in managing physical climate risks to their assets and services, especially the use of NARCliM and take-up of the Climate Risk Ready NSW Guide and Course. This should include three-yearly surveys and reporting on progress.
4. Comprehensively review its land-use planning and development guidance, and the Building Sustainability Index (BASIX) requirements, and identify opportunities to promote climate risk management.

By December 2022, NSW Treasury should:

5. Strengthen its guidance to agencies on climate risk-related matters, including by updating the Risk Management Toolkit (TPP12-03), clarifying requirements for State Owned Corporations, and adding a climate risk management attestation requirement in the Annual Reporting and Compliance Checklist.
6. Coordinate the finalisation of guidance on resilience in infrastructure planning related to natural hazards, maintaining its alignment with NSW Treasury's business case guidelines, in conjunction with relevant agencies.
7. Review how effectively climate risks have been considered in the assurance of agencies' asset management plans (according to the Asset Management Policy, TPP19-07), and take steps to address gaps in conjunction with relevant agencies.

8. Monitor how effectively agencies are reflecting the effects of climate-related matters in their financial statements, and determine whether the existing NSW Treasury guidance is sufficiently clear, and if agencies require further support.

By June 2023, the Department should:

9. Deliver a climate change adaptation action plan for the State, which includes actions that support agencies to manage the physical climate risks to their assets and services, reflecting commitments in the 2016 NSW Climate Change Policy Framework.

By June 2023, the Department and NSW Treasury should:

10. Implement climate risk management across their respective clusters, in line with the Climate Risk Ready NSW Guide. This should include adopting an enterprise-wide climate risk statement; allocating oversight to a central role (such as a climate risk officer); and integrating climate risk assessment into risk management, monitoring and reporting systems.

1. Introduction

1.1 About climate change

'Climate change' is defined by the Australian Academy of Science as is a change in the pattern of weather, and related changes in oceans, land surfaces and ice sheets, occurring over time scales of decades or longer.

According to the US National Aeronautics and Space Administration (NASA), 2016 and 2020 were the warmest years on Earth since records began in 1880, continuing a long-term trend of rising global temperatures. The ten warmest years on this record have occurred since 2005, with the seven most recent years being the warmest.

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios, according to the Intergovernmental Panel on Climate Change (IPCC). The IPCC states that, 'the continued emission of greenhouse gases will cause further warming and long-lasting changes in the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems.' According to IPCC, it is also very likely that heatwaves will occur more often and last longer, and that extreme precipitation will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and the sea level will rise.

Climate change in Australia

According to the Bureau of Meteorology, Australia's climate has warmed on average by 1.44°Celcius (± 0.24 °C) since national records began in 1910. There has been an increase in the frequency of extreme heat events and, in southeast Australia, a decline in rainfall since the late 1990s. There has also been an increase in extreme fire weather, and in the length of the fire season, across large parts of the country since the 1950s, especially in southern Australia.

Looking ahead, the Commonwealth Scientific and Industrial Research Institute (CSIRO) projects that Australia will continue to see increases in air temperatures, more heat extremes, and fewer cold extremes. It also predicts that a continued decrease in cool season rainfall across southern and eastern Australia is likely to lead to more time in drought, yet more short and intense heavy rainfall. As a result, the CSIRO predicts an increase in the number of dangerous fire weather days and a longer fire season for southern and eastern Australia. Further sea level rise and continued warming and acidification of the oceans will also occur around Australia.

Climate change in New South Wales

Consistent with these trends, the climate in New South Wales (NSW) is already changing. Extreme weather events are becoming more frequent and intense, and long-term changes to weather patterns are observed. For example, the Bureau of Meteorology found that 2019 was the driest and warmest year on record for NSW. Most of the State received much less rainfall than usual, with the northeast and far-west particularly dry. The Bureau also noted that heatwaves in January 2019 brought very high temperatures, and large fires from September onward caused extensive damage and persistent smoke.

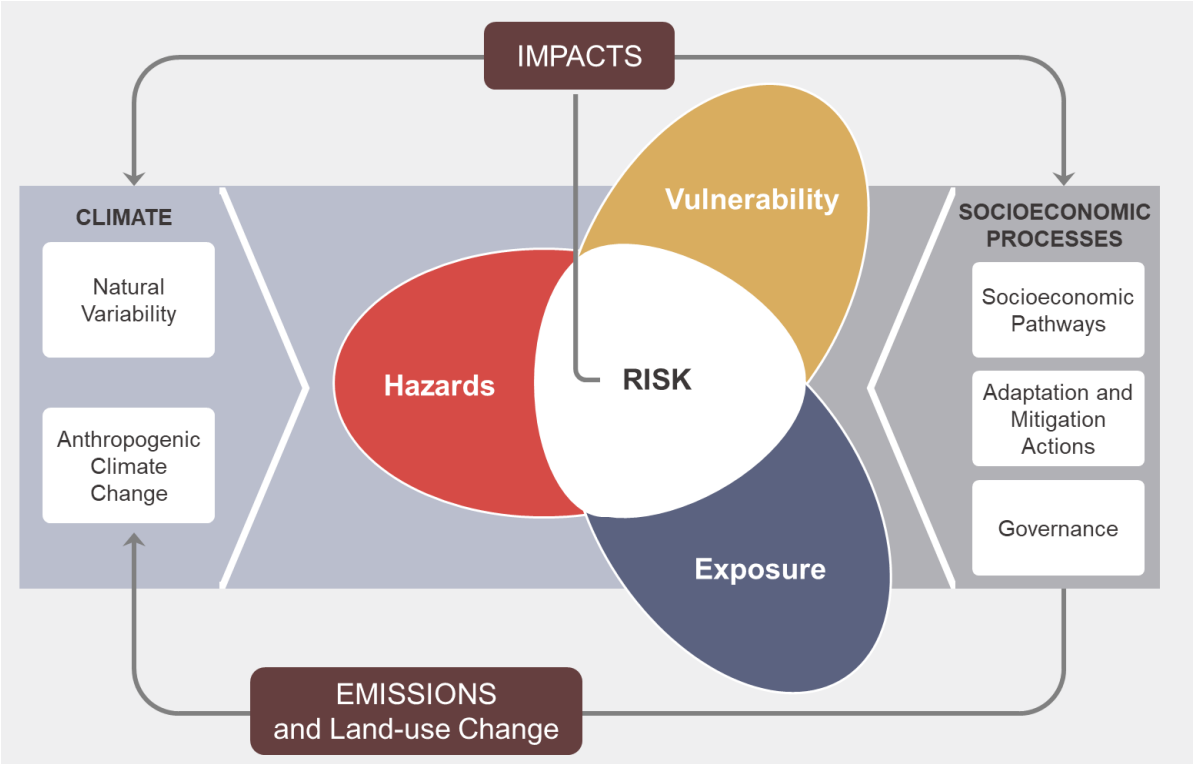
According to the Department, maximum and minimum air temperatures are also predicted to increase in NSW. Based on the Department's climate projections, there will be more hot days and fewer cold nights. The number of severe fire danger days is also projected to increase in summer and spring across the State, while changes in rainfall will vary across regions.

1.2 Climate risk and exposure in New South Wales

Defining climate risks

International standards define risk as the effect, positive or negative, of uncertainty on objectives. In the context of climate, as illustrated in Exhibit 1, risks result from the interaction of vulnerabilities, hazards and exposures to changes in climate variables, which gives rise to impacts.

Exhibit 1: The relationship between climate risks and impacts



Source: IPCC summary for policy makers.

A changing climate generates three types of climate risks.

- **Physical risks** due to the direct impacts of extreme weather and changed climatic conditions on the environment, society and the economy: for example, on natural resources, on assets and infrastructure, on supply and service chains, and on markets.
- **Transition risks** due to the impacts of policy and regulatory changes, and changes in community expectations, investor and market behaviour, in response to climate change—including with a move to a low-carbon economy.
- **Liability risks** associated with people or businesses seeking compensation for losses they may have incurred from climate change, including as a result of physical or transition risks, and associated with litigation against organisations including governments that may not have responded sufficiently to climate risks.

As this audit is focused on the physical risks of climate change (see section 1.5 on the audit scope), typical examples of these risks to public assets and services are illustrated in Exhibit 2.

Exhibit 2: Examples of physical climate risks to assets and services

Climate variable	Risks due to impacts on assets	Risks due to impacts on services
Increased average air temperatures	• More material degradation to facades, structures and surfaces	• Buildings don't maintain their thermal comfort: less productivity from heat stress • Increased demand on energy system leading to blackouts
More heatwaves	• Heat damage to infrastructure • Loss of biodiversity and ecosystem function	• More days unsafe for outdoor work and sport: less productivity; less demand for recreation facilities • Greater demand for community and emergency services due to heatstroke
More intense storms	• Storm and hail damage to buildings, transport and other infrastructure	• Water supply and sewerage systems not meeting performance standards • Increased demand on emergency services
More frequent and intense bushfires	• Fire and smoke damage to infrastructure and public spaces • Loss of cultural heritage sites	• Energy, transport and communications network failure: less effective emergency service responses
Lower water availability/drought	• Degraded water infrastructure, such as cracking pipes • Reduced quality of natural assets, such as soil and vegetation	• Water supply systems not meeting performance standards • Greater demand for mental health services in drought conditions
Sea level rises	• Damage to inundated infrastructure • Coastal erosion affecting land and buildings	• Contaminated water sources from saltwater intrusion affecting supply quality • Reduced drainage capacity, increased maintenance costs

Source: Audit Office of NSW 2021 based on CRR guide, Towards a Resilient Sydney Adaptation Review Paper 2014, Climate Change Impacts on Coastal Communities (CoastAdapt).

Challenges to understanding climate risks

Climate risks differ from some other types of risks because of the difficulty in quantifying their probability. This does not mean there is uncertainty that the climate is changing, but rather that historical climate data is of limited use in identifying when and how the future climate will impact on the environment, society and economy.

Decision makers may not know exactly when or how a climate change impact will have a particular consequence for their organisation. This makes robust information about climate vulnerabilities, hazards and exposures important: for example, so that decision makers can distinguish between natural hazards under previous climatic conditions, and risks related to a changing climate under a range of potential future conditions.

One way to assess the implications of a changing climate is to consider different future climate scenarios. Scenarios do not aim to predict the future but highlight elements of possible future(s): for example, different potential futures given different concentrations of greenhouse gases. The IPCC has established four emission pathways (Representative Concentration Pathways, or RCPs) that can be used as the basis of climate scenario analysis.[3] It is considered good practice to consider multiple scenarios when conducting climate risk assessments.

The Task Force on Climate-related Financial Disclosures (TCFD) reflects the need to respond to these information challenges. The TCFD aims to promote a consistent approach to the disclosure of financial information about 'material' climate (physical, transitional and liability) risk. It recommends that organisations use a scenario with a 2°Celsius global average temperature rise above pre-industrial levels (as a minimum), plus other scenarios.

Exhibit 3: Elements of the TCFD approach to disclosing information on climate risks

The TCFD was established in 2015 by the G20 Financial Stability Board. In 2017, the TCFD developed a voluntary framework for climate-related financial disclosure that recognises the material financial implications of climate risks, and the need for financial information to be disclosed to support decision-making.

It set out four recommendations about how to do this relating to governance, strategic, risk management and metrics that are applicable to organisations across sectors and jurisdictions.[4]

Given the need for forward-looking assessments of climate-related risk (rather than reliance on historical data), the TCFD highlights the importance of scenario analysis and recommends their use.

The TCFD has also noted the potential financial impacts of physical climate risks, for example:

- reduced revenue from decreased production e.g. transport network interruptions to supply chains
- reduced revenue and higher costs from decreased productivity e.g. heat stress impacts workforce safety
- write-offs and early retirement of assets e.g. damage to property in locations at risk of natural hazards
- increased operating and capital costs e.g. inadequate water supply for hydroelectricity, irrigation and consumption; damage to facilities
- increased insurance premiums and potential for reduced availability of insurance on assets in high-risk locations.

Source: Audit Office of NSW 2021 adapted from Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017).

In Australia, broad industry support has emerged for financial reporting on climate risks so there is more useful information for investors and shareholders—this includes from the Australian Securities and Investment Commission, the Australian Prudential Regulation Authority (APRA), the Governance Institute of Australia, and the Australian Institute for Company Directors.

In December 2018, the Australian Accounting Standards Board (AASB) and Auditing and Assurance Standards Board (AUASB) issued a joint bulletin on climate risk disclosures. This guidance, updated in 2019, states a need to describe how material climate risks have been considered in the preparation of financial statements and can therefore be subject to audit. This guidance states that it represents the, 'International Accounting Standards Board's best practice interpretation of materiality, and that entities in Australia are already being subject to lawsuits regarding lack of disclosure'. In April 2021, APRA released draft guidance to financial institutions on managing the financial risks of climate change.

[3] In its 2014 Fifth Assessment Report, the Intergovernmental Panel on Climate Change released a new set of scenarios called Representative Concentration Pathways (RCPs). Each RCP provides a possible emissions trajectory over time (generally up to 2100). They are: RCP 8.5 - No mitigation: emissions continue rising at current rates (may exceed 4 °C); RCP 6.0 - Some mitigation: emissions rise to 2080 then fall (likely to exceed 2 °C); RCP 4.5 - Strong mitigation: emissions stabilise at half today's levels by 2080 (more likely than not to exceed 2 °C); RCP 2.6 - Aggressive mitigation: Emissions halved by 2050 (not likely to exceed 2 °C).

[4] Globally, there is wide voluntary uptake of the TCFD recommendations. As of 2021, more than 2,300 organisations across 86 countries support the TCFD. Some governments have also started to embed the TCFD recommendations into policy and guidance.

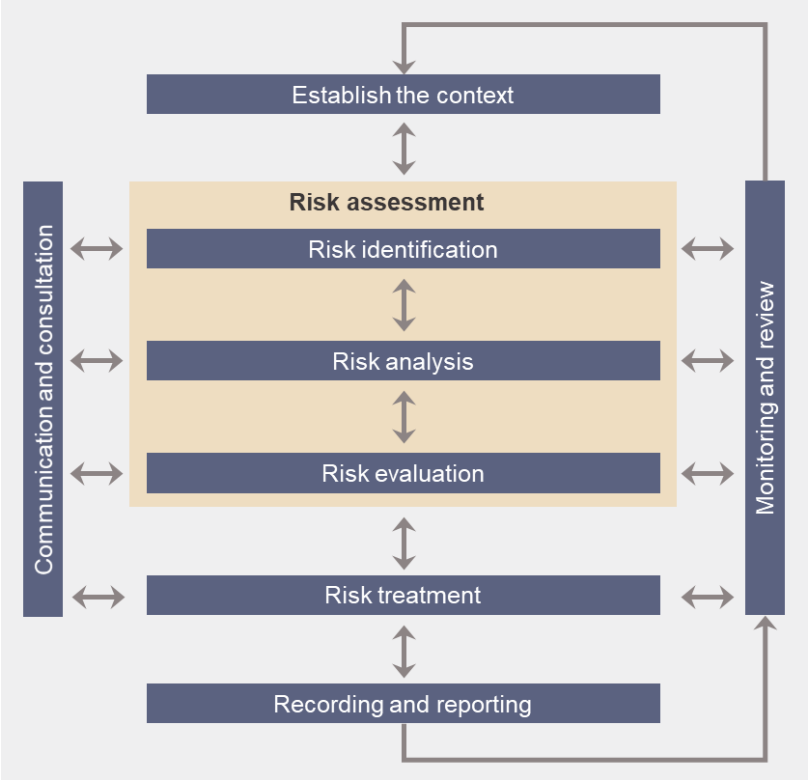
1.3 Climate risk management for the State's assets and services

The NSW 2040 Economic Blueprint, produced by NSW Treasury in 2019, recognises climate change as a challenge to the economic success of the State, along with issues such as ageing population, high energy costs, disruptive technology, tax inefficiencies, trade tensions, and biodiversity threats.

Notwithstanding the uncertainty of climate change impacts that may be felt differently across regions, populations and economic sectors in NSW, managing risks according to international standards means managing the effect of uncertainty. This is to provide reasonable assurance that objectives will be met, and includes addressing threats and opportunities.

Consistent with international standards, the risk management process set out in NSW Treasury policy (TPP12-03) requires that agencies establish the risk context, identify, analyse and evaluate the risk, and treating the risk. As shown in Exhibit 4, this also involves communicating, and monitoring and reviewing the risk assessment and treatment actions.

Exhibit 4: Risk management process



Source: ISO Risk Management 31000, TPP 12-03a NSW Treasury 2012.

Effective risk management, and financial management of assets and services more broadly, is a core requirement for all NSW public sector agencies. According to NSW Treasury's Internal Audit and Risk Management Policy for the General Government Sector (TTP 20-08), climate change is a 'contemporary emerging risk' that should be considered as part of an agency's existing risk management framework and processes.

NSW Treasury has the lead role in setting these standards and providing guidance to agencies (see section 1.5 for detail).

Adaptation planning as part of climate risk management

Broadly there are two types of response strategies to climate risk, both noted in the 2016 NSW Climate Change Policy Framework:

- adaptation strategies, which are focused on building resilience and reducing vulnerabilities to the impacts of climate change
- mitigation strategies, which are focused on reducing the drivers of climate change, such as emission reduction.

Approaches to climate risk management that align with international standards include treating the risks as part of the overall management process. The international standard on climate change adaptation (ISO14090:2019) notes that effects of climate change can be considered 'climate risks' due to a failure to respond, or an inappropriate response, to the opportunities or threats of these changes.

As this audit is about adaptation strategies to manage the physical climate risks to assets and services, relevant adaptation examples are provided in Exhibit 5. These illustrate the wide range of potential actions available to governments, many of which require coordinated planning.

Exhibit 5: Examples of climate change adaptation actions

Focus	Adaptation examples
Organisational adaptive capacity	• Build evidence of climate risks to the organisation, its assets and services. • Build capacity of executives and the board to evaluate climate risks and adaptation priorities. • Liaise with insurers to develop proactive measures to reduce material climate impacts.
Regulatory and policy updates	• Improve land use planning e.g. incorporating contingencies or restricting development in high-risk areas. • Update design standards to increase passive cooling in buildings, more public green space. • Reduce water demand by increasing efficiency and reuse.
Asset management and critical infrastructure	• Safeguard infrastructure against extreme heat, bushfire or flooding e.g. by placing cables underground, upgrading or relocating electricity assets. • Fortify coastal and off-shore infrastructure against inundation or flood e.g. fortifying a beach to maintain the current shoreline and avoid damage to sea-front houses and public infrastructure. • Improve asset maintenance and protection for extreme weather e.g. install lightning protection. • Build assets to maintain its level of service for the climate scenario expected at the end of its life e.g. bridge is designed and constructed with capacity for climate change.
Emergency management and business continuity	• Work with critical infrastructure and service providers to understand system interdependencies and develop an action plan to minimise the duration and frequency of disruptions. • Update early warning systems and evacuation procedures. • Educate the community, including high risk areas and groups.
Staff health and wellbeing	• Prepare a heatwave or extreme heat response plan. • Flexible working to allow staff to vary work hours in extreme events.

Source: Audit Office of NSW based on CRR Guide; 'What is adaptation to climate change?' Coast Adapt Website 2021; Engineering Policy 170: Climate Change Risk Assessment Methodology (Queensland Government, March 2020).

1.4 Requirements and NSW Government commitments related to climate risk management including adaptation

The NSW Government is a provider of essential services that also owns and manages around $365 billion in physical assets (as at June 2020). More than $180 billion of its assets are in major infrastructure such as roads and railway lines. Climate risks that could directly impact on State agencies' assets and services include flooding, bushfires, and extreme temperatures. As these risks eventuate, they could damage and disrupt assets and service provision.

State agencies are responsible for managing their own risks, including climate risks, under NSW Treasury policies in line with the *Government Sector Finance Act 2018*. At the same time, the Department and NSW Treasury have specific responsibilities for delivering on 'state outcomes' (listed below). Climate change risk needs to be effectively managed if the Department and NSW Treasury are to deliver on their state outcomes, respectively.

The NSW 2021 State Plan, released in 2011, identified actions to 'minimise the impact of climate change' including through developing climate projections and improving community resilience. In 2016, the then Office of Environment and Heritage[5] released the NSW Climate Change Policy Framework in 2016. The aim of the framework is stated as follows.

> 'Maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change.'

The NSW Climate Change Policy Framework outlines the commitments to act on climate change and guides policy and programs by setting out long-term objectives, State government roles, policy directions and implementation steps. In relation to climate risk management and adaptation, the framework identified NSW Government's operational role is to 'assess and effectively manage climate change risk to government assets and services'. The framework also included:

- as a policy direction, 'the government will manage the impact of climate change on its assets and services by embedding climate change considerations into asset and risk management'
- as an implementation step, the government will, 'investigate how to embed consideration of climate change mitigation and adaptation across government operations including service delivery, infrastructure, purchasing decisions and regulatory frameworks'.

The NSW Climate Change Policy Framework committed to developing climate change action plans to implement the policy directions in the framework and give effect to 'potential actions' in the Draft Climate Change Fund Strategic Plan 2017–22.

One of these plans, to be developed by 2017, was an 'adaptation action plan', that would focus on climate change adaptation to reduce costs to public and private assets and private assets, reduce impacts on health and wellbeing, manage impacts on natural resources, ecosystems and communities, and take advantage of opportunities to grow adaptation services.

[5] Core functions of the former Office of Environment and Heritage that are relevant to this audit transitioned to the Department of Planning, Industry and Environment in the April 2019 Machinery of Government changes.

Role of the NSW Department of Planning, Industry and Environment

Department, along with Planning, Industry and Environment cluster entities, manage significant public assets and services including Crown lands, social housing and National Parks. The Department and its cluster entities are also responsible for delivering on identified state outcomes. Specifically:

- a strong and liveable NSW
- maximum community benefit from government land and property
- resilient and sustainable environment and energy
- sustainable and productive regional industries and communities
- sustainable and secure water resources.

The Department is responsible for the governance and administration of the Climate Change Fund and administers some climate change resilience programs under the fund.[6]

The Department has the lead role in establishing and disseminating climate projections to inform State agencies and communities. Since 2011 it has led a climate modelling project called NARCliM (NSW and ACT Regional Climate Modelling). The project now involves a partnership with the Australian Capital Territory and South Australian Governments, and the Climate Change Research Centre at the University of New South Wales.

The Department also has responsibilities for land use planning policies and guidance. It is involved in assessing and determining development proposals including for state significant projects, regional strategic planning, and guiding local government. It sets sustainability targets for new residential dwellings. State government assets and services may be more or less exposed to climate risks depending on these land use policy settings and guidance.

Role of the NSW Treasury

NSW Treasury is responsible for the management of the State's finances, guiding public sector performance and good practice, and providing direction on accounting policy, risk management and legislative issues. It also monitors significant financial risks to the State's balance sheet via the Asset and Liability Committee (ALCO).

The state outcomes for the NSW Treasury cluster are:

- Economic performance: A strong, resilient and diverse economy
- Fiscal performance: A sustainable fiscal environment to enable delivery of outcomes
- Public sector performance: Stewardship of the public sector performance and financial management system to enable delivery of outcomes.

NSW Treasury develops policies and guidelines that are relevant to the process of 'embedding climate change consideration in government decision-making'. This includes on topics such as financial reporting and implementing accounting standards; internal audit and risk management; asset management; business cases and cost benefit analyses; outcomes budgeting and performance monitoring; and evaluation. Since 2012, NSW Treasury guidance to agencies on risk management has noted that climate change is part of the context in which they operate, and which should be considered in the risk management process.

[6] The Climate Change Fund was established in 2007 to, among other aims, address the impacts of climate change and increase public awareness and acceptance of climate change. The fund is administered by the Department. One of the three key programs under the Fund is aimed at 'increasing resilience to a changing climate'.

The Sustainable Finance Steering Committee (SFSC), established in 2020, has a role of helping NSW Treasury identify, monitor and manage the State's climate-related risks. It is also intended to engage with government entities and key stakeholders on sustainable finance issues, such as entities' ability to manage the potential impacts of climate change on their assets and liabilities. The SFSC consists of senior members from the Department, Treasury, iCare and NSW Treasury Corporation.

Like the Department, NSW Treasury is represented on the Climate Change Fund Program Implementation Steering Committee. This committee provides input on the strategic direction and prioritisation of fund activities, and the development of action plans.

NSW Treasury also produces the NSW Intergenerational Report every five years. This identifies long-term economic and social trends, opportunities and risks to enable 'the government of the day to take the necessary action to provide the highest possible standard of living for all our citizens into the future.' The most recent report was released by the Treasurer in June 2021.

1.5 About this audit

This audit assessed whether the Department and NSW Treasury are effectively supporting agencies to manage climate risks to their assets and services.

It addressed the following:

- Has the Department effectively developed climate projections and supported agencies to use these projections?
- Are the Department and NSW Treasury supporting agencies to identify climate risks to their assets and services, and develop appropriate responses?

This audit is focused on risk management and adaptation planning related to the physical risks of climate change. It is focused on the risks to physical assets and services, but comments on climate risks to the State's finances where this is contextually relevant.

The term 'agency' in this report is defined as an agency under section 2.4 of the *Government Sector Finance Act 2018.* This includes State Owned Corporations.

For further detail see Appendix three.

The Auditor-General's 2018 performance audit on managing risks in the NSW public sector

Our 2018 audit, 'Managing risks in the NSW public sector: risk culture and capability', found scope to improve how agencies communicate about risks, and use risk registers to support decision-making. We recommended that NSW Treasury review the scope of its risk management guidance and identify additional guidance, training or activities to improve risk culture across the NSW public sector.

2. Supporting agencies and the status of climate risk management

Prior to 2021, support provided by the Department of Planning, Industry and Environment (the Department) to agencies for managing physical climate risks to their assets and services has been limited. NSW Treasury has a stewardship role in public sector performance, including risk management, but has not had a defined role in working with the Department on climate risk matters until mid-2019. The low capacity of agencies to undertake this work has been known to NSW Government through agency surveys by the Department in 2015 and by the Department and NSW Treasury in 2018.

The support delivered to agencies around climate risk management, including risk assessment and adaptation planning, has been slow to start and of limited impact. The Department's capacity to implement a coordinated approach to supporting agencies has also been limited by the absence of a state-wide adaptation strategy and related action plan.

In 2021, products were released by the Department and NSW Treasury with potential to improve support to agencies on climate risk assessment and adaption planning (that this, Climate Risk Ready NSW Guide and Course, which provides links to key NSW Treasury polices). The Department and NSW Treasury are now leading work to develop a more coordinated approach to climate risk management for agencies' assets and services, and building the resilience of the State to climate risk more broadly.

2.1 Support to agencies and its impact to date

Agencies with significant assets and services have not conducted climate risk assessments and support for this has been insufficient

The Department’s support to agencies to manage climate risks to their assets and services has been limited. NSW Treasury did not apply dedicated resourcing to support agencies' climate risk management until late 2019, with the establishment of the Sustainable Finance team. These factors have created a risk that agencies' will be unable to prepare for and manage the physical risks from climate change.

Most of the 13 entities examined for this audit (ten agencies external to the Department and three entities within the Planning Industry and Environment cluster), had not completed climate risk assessments across their assets and services. These entities included nine major asset holders identified as a priority by the Department: the value of physical assets held by these entities was around $120 billion, as at June 2020. These results are consistent with surveys, conducted by the Department in 2015 and by the Department and NSW Treasury in 2018, that found low levels of capacity across agencies to undertake this work.

Among the 13 entities that we examined, a key issue raised for not progressing climate risk assessments was low awareness of the NARCliM projections and the information on the Department’s AdaptNSW website. Some agencies we examined were aware of the resources but lacked internal technical capacity to use them. In these interviews, we also observed that there was no consistent view as to a difference between identifying risks related to natural hazards and identifying risks related to climate change, and how such differences should be assessed and managed.

The Department has not applied dedicated resourcing to a structured mechanism for guiding agencies in developing climate risk assessments. Since 2014, the Department’s support has primarily involved the information on the AdaptNSW website, a newsletter published three or four times per year, annual forums, and workshops for agency staff. The Department also advises it has provided one-on-one advice to agencies if they request it.

Of the ten agencies external to the Department that were examined for the audit, fewer than half indicated that they have identified climate change as a risk at the enterprise risk level. There was not a shared sense of how climate risk should be communicated, and whether it should it appear at an enterprise level or another organisational level.

In risk registers across the Planning, Industry and Environment cluster, consideration of climate risk was not as comprehensive as expected. Climate change impacts were only identified as a physical risk to assets and/or services in two of the 21 risk registers from 2020 that we examined. We expected to see consideration of climate change in at least nine relevant risk registers, such as those relating to property, recreational infrastructure, and public spaces. The impact of climate change on program delivery and business operations (e.g. on strategic water planning, on delivering on biodiversity-related objectives, and on achieving adaptation and resilience objectives) was noted in another five risks registers.

Most agencies do not have plans to adapt to climate risks and the Department's support to facilitate this has been insufficient

According to the Department and NSW Treasury, and in line with international standards, effective climate risk management includes adaptation planning. To date, and most agencies have not developed adaptation plans to respond to climate risks to their assets and services. These risks are significant and will continue to grow: accounting for projected economic growth, NSW Treasury has estimated that fiscal and economic costs each year associated with natural disasters will more than triple by 2061.

Our interviews with ten external agencies and three entities in the cluster found that five had developed, or were developing, adaptation plans. A factor described as limiting their progress was not being able to effectively communicate the need for adaptation planning to senior leaders. Again, this is consistent with the 2015 and 2018 survey findings about low levels of agency capacity to undertake climate risk management.

The Department has delivered limited support to agencies to use climate information to develop appropriate responses to climate risks. The Department advises it has provided ad hoc feedback on adaptation plans to agencies that request it, but it has not applied resources to a systematic approach. It is also unclear whether or how outputs from the Department-led NSW Adaptation Research Hub have been used to inform guidance to agencies on adaptation planning. [7]

Within the Department cluster, there are significant gaps in adaptation planning. For example, there are no adaptation plans for its Crown Lands division or for the Land and Housing Corporation.

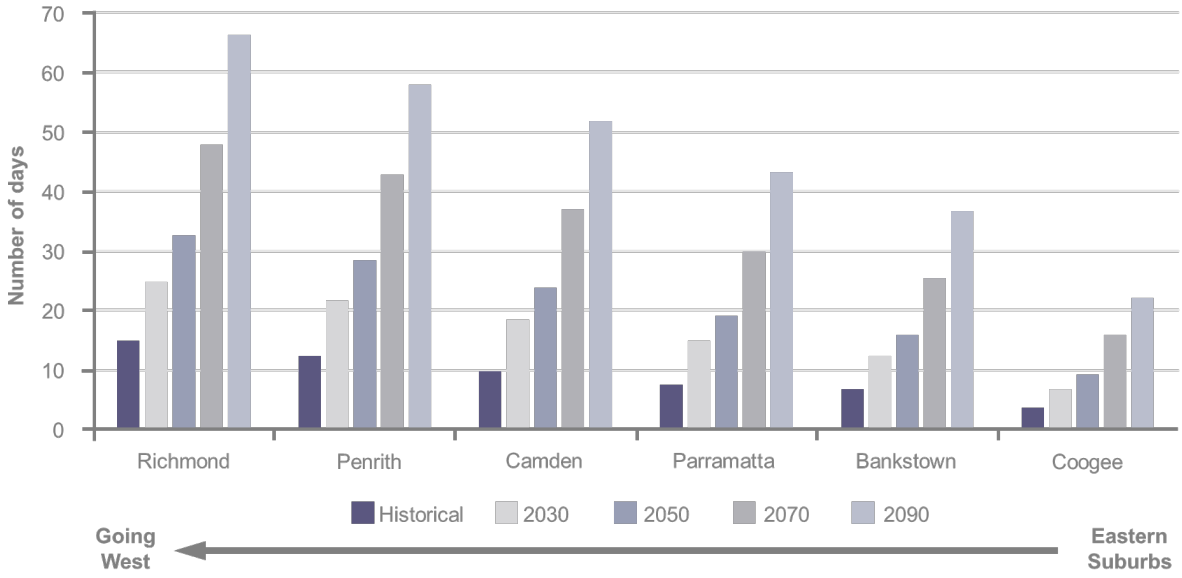
- Crown lands cover about 42 per cent of the State land area, including significant coastal land and infrastructure. In addition to Crown land that is owned and managed by the Department, its Crown Lands division is responsible for overseeing and providing governance of Crown land managers.[8] Crown lands will be increasingly exposed to climate risks, including risks associated with sea level rises. According to the CSIRO, sea levels have risen by around 25cm since 1880 and continue to rise.

  The 2021 Crown Lands Strategic Plan does list expanding green space, sustainable quality of life, and climate change resilience as a priority for the next ten years. The strategy contains some high-level commitments but does not quantify these.
- The Land and Housing Corporation (LAHC), which owns around $50 billion of the social housing portfolio, needs to maintain the thermal comfort of its properties to limit the risk of heat stroke and other poor health outcomes for social housing residents. According to the Department, significant increases in the number of heatwaves are projected for most of NSW in the future. This means that LAHC housing will be increasingly exposed to risks associated with heat waves.

[7] The NSW Adaptation Research Hub is a Department-led collaboration with NSW universities and climate experts which started in 2013 to 'produce relevant and practical research to directly inform the decision-making of NSW agencies and communities'.
[8] Crown Land managers are leaseholders or statutory land managers including other government agencies and local councils, which may also own assets located on these lands.

Exhibit 6 illustrates how climate change impacts may look different across the Greater Sydney region over the forthcoming decades, with the number of days of 35 °C being highest in western parts of the metropolitan area.

Exhibit 6: Projected days of 35 degrees Celsius in selected locations over time



Note: This analysis assumes emission projections under the current policy scenario.

Source: Landcom (based on Ooge et al 2018).

That adaptation plans for these Planning, Industry and Environment cluster entities have not been developed is consistent with the absence of completed climate risk assessments: risk assessment needs to inform adaptation planning.

The National Parks and Wildlife Service did, however, develop the NSW National Parks Climate Change Strategy in 2018. This is discussed in section 2.2.

2.2 Strategy to coordinate adaptation planning and support agencies' adaptive capacity

The Department has not delivered on the NSW Government commitment for a state-wide adaptation action plan, limiting a coordinated approach to supporting agencies to manage climate risks

The Department has not delivered a state-wide adaptation action plan. This was a commitment in the 2016 NSW Climate Change Policy Framework for it to be completed in 2017.

The Department did develop a draft adaptation action plan in 2017 but this was not finalised. The proposed NSW adaptation action plan was to cover adaptation actions to reduce costs to public and private assets, reduce impacts on health and wellbeing, manage impacts on natural resources, ecosystems and communities, and take advantage of opportunities to grow adaptation services. Within this broad scope, actions specific to supporting agencies climate risk management were to be included.

The Department has also not delivered, or led in conjunction with other key agencies, a broader adaptation strategy for the State. All other Australian States and Territories have released adaptation strategy or similar to coordinate efforts across government, industry and the community. Based on this, such a strategy in NSW could have assisted the Department in supporting adaptation planning in State agencies, and promoted broader state-wide adaptation priorities for government, industry and the community. It could have also outlined expectations and accountability, including roles and responsibilities within and across agencies, resourcing and timeframes.

The absence of an overall adaptation strategy, and a state-wide action plan, means that the Department's climate risk and adaptation-related activities (including its supports to agencies on the physical risks of climate change) have been occurring for at least four years (2017-current) without strategic direction, strong levers for coordination across agencies, and clear resourcing towards defined outcomes.

The Draft Climate Change Fund Strategic Plan 2017–22, published in 2016, is referenced in the NSW Climate Change Policy Framework. It contains potential actions (including those related to adaptation) which were to be given effect through the development of action plans committed to in the Framework. These actions are listed in the following exhibit.

Exhibit 7: Relevant potential actions for an adaptation action plan

Relevant potential actions in the Draft Climate Change Fund Strategic Plan 2017–22 are listed under the priority investment area, 'Preparing for a changing climate: Minimise impacts of climate change in New South Wales'. These actions included:

- prepare best-practice guides, tools and targeted training to help government agencies identify and manage climate change risks
- support government agencies to meet their requirement to undertake initial climate risk assessments and develop appropriate responses
- develop a framework for reporting government agencies' adaptation initiatives to foster best practice
- update and enhance the state-wide climate projections developed with NARCliM, including projections for longer time periods and under different emissions scenarios
- produce hazard maps and reports for key hazards, such as flood, bushfire, drought and heat, to help decision makers understand risks
- identify risks to critical public infrastructure, such as energy, water, transport and health infrastructure and options to manage these future risks.

Source: Draft Climate Change Fund (CCF) Strategic Plan 2017–22, OEH 2016.

We note that the Draft Climate Change Fund Strategic Plan was never released by the NSW Government as a 'final', though the published draft is cited in the NSW Climate Change Policy Framework. Both the Department and NSW Treasury sat on the Climate Change Fund Steering Committee, along with other agencies, with the role of providing input on the prioritisation of activities and development of an action plan.

Climate change is referenced in a range of NSW Government strategic planning documents including the State Infrastructure Strategy 2018–38, Future Transport 2056, the Greater Sydney Regional Plan 2018, the Marina Estate Management Strategy 2018–2028, and regional and district plans produced by the Department. These have been produced for different purposes, and to what extent these references translate into climate change being 'embedded' in government decision-making is unclear.

There is also evidence that the NSW Climate Change Council has not been engaged as expected, but it could have informed the State's adaptation priorities. The Council was established in 2004 by the NSW Government to provide independent, expert advice on climate change related matters. It may have been a source of expertise on risk management adaptation responses relevant to agencies' assets and services. We understand that the Council is still in place, but has not been engaged recently.

The Department has been progressing activities related to communities' climate resilience, but lacked focus on supporting agencies' climate risk management until recently

The Department has been progressing activities related to communities' climate resilience by developing the Regional Preparedness Operational Plan 2018–21, and through the 'Helping Communities become more Resilient to Climate Change (CRCC) program', which started in November 2018. But these are not clearly focused on actions to support agencies' climate risk management.

- The Regional Preparedness Operational Plan 2018–21, produced by then Office of Environment and Heritage, is a plan for a program intended to support local decision makers from across government (local and state) to implement actions that enable their region to build resilience to the impacts of climate change. It does list some activities relevant to supporting State agencies[9], but there is no explanation of how these supports are to be prioritised alongside a range of general community and industry related activities.
- A Program Board for the CRCC program was set up in February 2019 with representatives from key branches across the Department including Climate Resilience and Net Zero Emissions, and Climate and Atmospheric Science. But no overall plan for this program has been finalised. The draft plan includes potential outcome indicators.

Prior to the release of the Climate Risk Ready NSW Guide and Course in 2021, resourced support for agencies does not appear to have been a priority.

By way of contrast, in particular cases when the Department has prioritised relevant activities, notable outputs have been achieved. The National Parks and Wildlife Service developed the NSW National Parks Climate Change Strategy in 2018, following a request from the NSW Minister for the Environment in 2014. The Strategy maps out adaptation pathways and actions for the protection of nature conservation, assets, Aboriginal and historic heritage, fire management, pest and weed management and customers. The Department advises that significant resourcing and support were provided by its experts to develop the Strategy.

Draft regional water strategies have also been developed by the Department, along with a draft state-wide water strategy in 2021. These refer to climate change, the need to consider its impacts in long-term water resource planning and management, and NARCliM (see section 3 for detail about the Department's development and communication of climate projections). We understand that further work is required before these water strategies are finalised.

There is also further work required before the data being used by the Department in the regional water strategies (that is, specialised hydrological modelling that incorporates the use of NARCliM) is incorporated into updates to water sharing plans. Water sharing plans are a statutory obligation under the *NSW Water Management Act 2000*, and set rules for how water is allocated between different users. Water sharing plans are also a key input to water resource plans, which are required and assessed by the Murray Darling Basin Authority under rules in the Commonwealth Basin Plan 2012.

A Department-led project aims to help agencies identify infrastructure-related climate risks and adaptation opportunities, but faces challenges to its success

The Department commenced the Cross-Dependency Initiative (XDI) NSW in 2020 following a Sydney XDI pilot that ran from 2017 to 2020. There is more groundwork to be done before the XDI NSW project is fully functioning.

The XDI NSW project involves partnering between agencies that own or operate critical infrastructure. It aims to bring together hazard maps, climate projections, engineering data and financial analysis to identify infrastructure interdependency risks, and assist agencies undertake collaborative adaptation planning.

[9] Activities listed in the 2018 plan include surveys of agencies' climate risk assessment, establishing a risk management reporting mechanism, preparing best practice guides, and expanding a pilot that identifies infrastructure interdependencies to climate risks.

In late 2020, the XDI NSW project produced ‘State of Asset Resilience' (SOAR) reports related to agencies' education, health, power, transport, water and council infrastructure. While these reports do not identify infrastructure interdependences, they do aggregate hazards at the asset portfolio level and could be used by agencies to inform strategies to prioritise investments.

Some agencies we examined for the audit have used the XDI NSW platform to generate reports on their assets and some others are not aware of it. The Department is involved in discussions to support relevant agencies in how to understand and use this information, and it is represented on the XDI Technical Advisory Committee that is kept informed of updates to NARCliM.

The development and initial stages of XDI NSW are funded through the Climate Change Fund. Separate funding has not been allocated to support agencies' use the XDI platform to produce climate risk assessments for their infrastructure. The cost and features of the proposed user-pays funding model appears likely to limit its take-up and therefore limit agencies’ (and local councils’) ability to identify and prioritise climate risks to their assets and services. There is also a need to establish appropriate governance and data sharing protocols between participating agencies. The Department has sought external legal advice on these data sharing protocols.

The evaluation of the Sydney XDI pilot (draft in 2020) indicated that a further expansion of the approach would require NSW Government support and advocacy.

2.3 Development of a coordinated approach to support agencies' climate risk management

The Climate Risk Ready NSW Guide and Course, developed by the Department with support from NSW Treasury, are designed to assist agencies manage climate risks

The Department and NSW Treasury published a Climate Risk Ready (CRR) NSW Guide for agencies in March 2021. It is accompanied by the CRR Course that commenced in February 2021 with 100 funded places for agency staff. The Course is accredited with a Registered Training Organisation as Nationally Recognised Training.

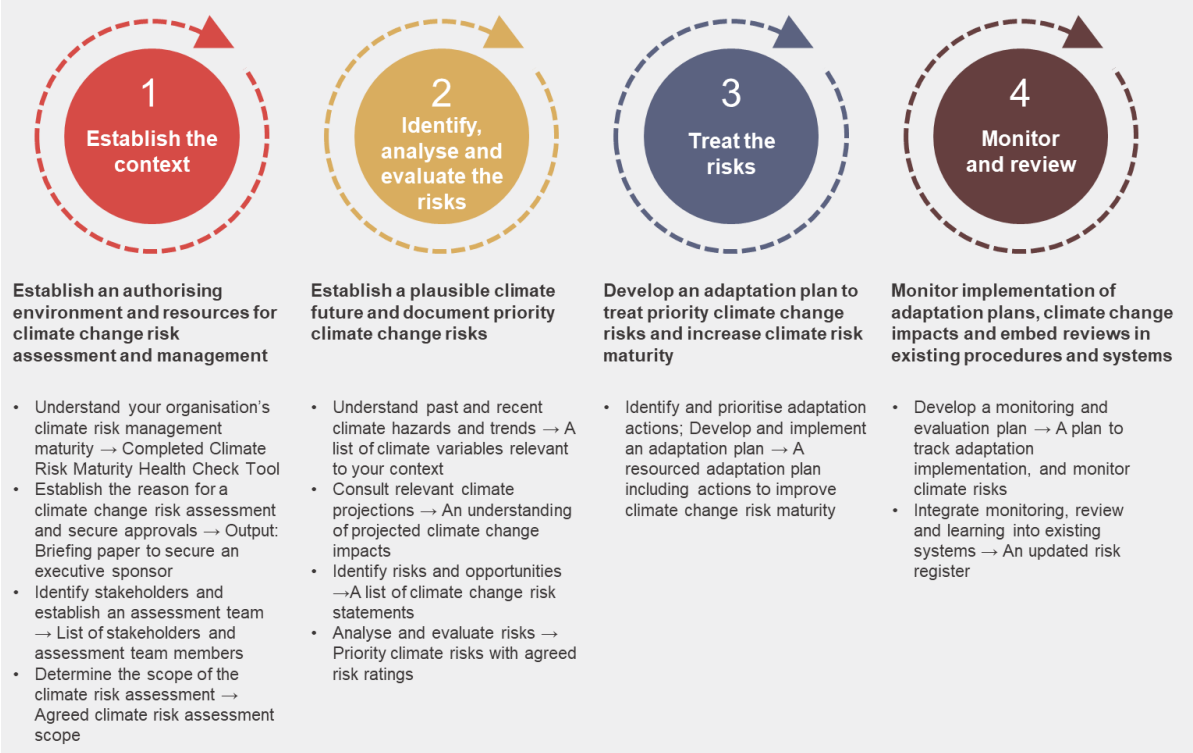
The Department and NSW Treasury developed the CRR Guide and Course following a pilot and agency consultations, but the products were released four years after relevant commitments in the 2016 NSW Climate Change Policy Framework. The release of the Guide was also a year after initially planned (in March 2020, according to the Climate Risk Steering Group's terms of reference, see Exhibit 9). As such, it is too soon to comment on its outcomes for agencies.

The CRR products do, nonetheless, represent a major new initiative intended to support agencies' use of climate projections, climate risk assessments, and adaptation planning. They are a key output of the partnership between the Department and NSW Treasury through the Climate Risk Steering Group since mid-2019. The Guide was endorsed by the Secretaries of both Departments in early 2021.

The CRR products have a specific focus on physical climate risk and include practical resources for agencies such as a Climate Risk Maturity Health Check Tool and a Climate Risk Assessment Tool. The CRR Guide cites ISO31000 ‘Risk Management – Guidelines’ and ISO14091 ‘Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment’, although it does not cite ISO14090 ‘Adaptation to climate change — Principles, requirements and guidelines’. NSW Treasury advises the CRR Guide is aligned to both standards.

The CRR Guide's process for climate risk assessment and adaptation planning for agencies to follow is summarised in Exhibit 8 below.

Exhibit 8: Process steps for climate risk assessment and management, CRR Guide



Source: Audit Office of NSW 2021 adapted from CRR Guide 2021.

Importantly, for directing agencies' engagement with key NSW Treasury policies, the CRR Guide also states that it is aligned to the Internal Audit and Risk Management Policy (TPP20-08) and the Risk Management Toolkit (TPP12-03), and it references the Asset Management Policy (TPP19-07) and a range of other NSW Treasury policy papers and guidance.

In turn, TPP20-08 (which was updated in December 2020) now cites climate-related risks as a 'contemporary emerging risk'. Under this mandatory policy, climate-related risks should now be considered by agencies when identifying types of risks that might impact their ability to achieve objectives. The TPP20-08 also states that 'model' audit and risk committees should seek assurance from management that emerging risks (such as climate risk) are being identified and addressed. It directs agencies to use the CRR Guide for specific advice.

NSW Treasury advises that TPP20-08 has been communicated to the sector through various forums including committees for cluster Audit and Risk Committee Chairs, Chief Risk Officers and Chief Audit Executives.

The Department and NSW Treasury will need to continue to build a consistent and systematic process for this work so that it is embedded and sustained in the operations of agencies. A Climate Risk Management Policy Framework, which was committed to but not delivered by the Climate Risk Steering Group, could inform such a process.[10]

[10] The Department has advised that some outcomes identified in that proposed policy framework were incorporated into the CRR Guide, and others will form part of a proposed roadmap of actions to better identify and respond to climate risk across government operations, which is in development.

The Department and NSW Treasury are now leading a more coordinated approach to supporting agencies' climate risk management

The Department and NSW Treasury established an interagency Climate Risk Steering Group in mid-2019 to guide the progression of support for agencies in managing climate risks. The Group met six times between August 2019 and December 2020, and has overseen the production and endorsement of the CRR Guide and Course.

Exhibit 9: The Climate Risk Steering Group

An interagency Climate Risk Steering Group (Steering Group) was established in mid-2019 by the NSW Treasury and the Department to: 'champion and guide progression of the NSW Government's agenda to assess, manage and disclose climate-related risks to government's infrastructure, physical assets and services; and to report progress to financial and risk committees.'

Its objectives include:

- To provide sector-specific insights and guidance on initiatives to improve government preparedness to manage climate-related risks, and support scalability of initiatives.
- To facilitate and champion implementation of initiatives to identify, manage and disclose climate-related financial and other risks across NSW Government.
- To develop recommendations and reporting to the Asset and Liability Committee and relevant financial and risk committees.

The Steering Group is chaired by NSW Treasury and administered by the Department. According to its Terms of Reference, the group is intended to run to December 2021.

Key deliverables of the group were to develop a practical climate risk management guide and course by March and June 2020, respectively, and a 'Climate Risk Management Policy Framework' in March 2020.

Source: NSW Inter-agency Climate Risk Steering Group Terms of Reference provided by NSW Treasury 2020.

As noted in the Terms of Reference and quoted in Exhibit 9, the Steering Group is intended to run until December 2021. The Department and NSW Treasury are working with members of the Steering Group on plans to extend its terms of reference to June 2022.

In a related development in April 2021 the Secretaries Board endorsed a Department and NSW Treasury joint-proposal that a roadmap be developed to better identify and respond to climate risk across whole-of-government operations. The Department and NSW Treasury have proposed that this work is undertaken to achieve following outcomes:

- consistency and transparency in the identification of, and responses to, climate risk across government activities
- increased cluster capability to implement climate risk-related policies and procedures
- alignment of sector-specific responses to a whole-of-State approach.

This proposed roadmap, to be developed with Secretary-level oversight, is intended to articulate an agreed program of priority actions for delivery by relevant government units, against which progress will be tracked. The plan to establish governance that involves senior executives is likely to be critical for sustaining and embedding this action across agencies.

NSW Treasury also advised it is developing a Climate Coordinated Strategy that has a focus on managing climate risks and opportunities on the NSW balance sheet. This draft strategy has been developed for internal purposes and requires further work, but reportedly maps activities across the NSW Government to respond to a changing climate, and makes recommendations on next steps for alignment with the Task Force on Climate-Related Financial Disclosures. It aims to cover four high level risks to the State: to funding, of significant unbudgeted expenditure associated with increased physical climate risks, to reputation, and environmental and social risks.

The 2021 NSW Treasury guidance provides some examples but may not be sufficiently specific to help agencies identify material climate-related risks

In March 2021, NSW Treasury produced guidance for agencies about how to reflect the effects of climate-related matters in financial statements. This is designed to assist in making more consistent information available to decision-makers about climate risks and impacts.

The guidance provides examples of financial impacts of climate-related matters and states that, when preparing financial statements, agencies should consider:

- what amounts presented or disclosed in the financial statements could reasonably be impacted by climate-related risks
- whether users could reasonably expect that climate-related risks could affect disclosures reported in the financial statements, and have indicated the importance of such information to their decision-making
- the impact of climate-related risks and other emerging risks on key assumptions made in preparing the financial statements, that are material, and what disclosures should be made in respect of those assumptions.

This NSW Treasury guidance includes links to the CRR Guide, which in turn references the 2019 guidance from the Australian Accounting Standards Board on assessing the materiality of climate-related financial risks for the purpose of disclosure in financial statements. The NSW Treasury guidance is not binding but is intended to support agencies to comply with mandatory obligations under existing accounting standards. As a general guidance document, it may not provide sufficiently specific guidance to help agencies identify material climate-related risks and determine the appropriate disclosures in their financial statements.

3. Developing and communicating climate projections to agencies

Climate projections are a key means of understanding the potential impacts of climate change, which is an important step in the climate risk assessment process. The Department of Planning, Industry and Environment (the Department) used a robust approach to develop its climate projections (NARCliM). The full version of NARCliM (v1.0) is based on 2007 models[11] and while still relevant, this has limited its perceived usefulness and uptake. The process of updating these projections requires significant resourcing. The Department has made recent updates to enhance the currency and usefulness of its climate projections. NARCliM (v2.0) should be available in 2022.

While climate projections have been available to agencies and the community more broadly since 2013–14, the Department has not been effective in educating the relevant data users within agencies in how to use the information for climate risk assessments and adaptation planning.

The absence of a strategy focused on this is significant and has contributed to the current low levels of climate risk assessment uptake across agencies (see section 2). Agencies are required to use the climate projections developed by the Department when developing long term plans and strategies as part of the NSW Government Common Planning Assumptions.

3.1 Approach to developing climate projections

The Department can demonstrate a robust approach to developing climate projections

According to the Department, climate projections are a key means of understanding the potential impacts of climate change. NARCliM is a NSW Government-led partnership that provides regional climate projections across the State. The first full version of NARCliM (v1.0) was released by the Department on the AdaptNSW website in 2014 and is based on global climate models dating from 2007. This remains the primary version on the AdaptNSW website that is readily accessible to agencies.

The Department's approach to generate the projections has been tested and supported by an expert evaluation. The Department acquitted the feedback from the NARCliM evaluation and undertook a range of other activities to support its rigor, including implementing quality assurance processes, engaging with experts and stakeholders.[12] Peer reviewed scientific publications have used the NARCliM outputs, which further supports the approach.

The Department has been collaborating in research partnerships with universities and other jurisdictions inform the development of the climate projections since 2012–13. The Department signed memorandums of understanding with the South Australian Government in 2019 and the Australian Capital Territory Government in 2020 for further improving the science used in the development of climate change projections. The Department also continues to participate in a Cross-Jurisdictional Community of Practice for Climate Science, with representatives from all Australian jurisdictions, which was established in 2019.

The 2019–20 Climate Change Fund annual report highlighted the Department’s collaborations and progress towards a national approach to climate modelling.

[11] The Department advises the 2007 global climate models were released to users by the Intergovernmental Panel on Climate Change in 2010.

[12] A Scientific Rigour Position Statement is in place to help ensure that the Department's science, undertaken or commissioned, meets globally accepted standards for scientific rigour. NARCliM is compliant with CORDEX - a World Climate Research Program framework to evaluate regional climate model performance through a set of experiments aiming at producing regional climate projections.

The Department released an interim version of its climate modelling in 2021 and is producing further enhancements

NARCliM (v1.0), based on global climate models from 2007, is the Department's most accessible source of regional climate projection information. The Department released enhanced projections (NARCliM v1.5) to users of the NSW Climate Data Portal in early 2021. This version is based on the global climate models that were the most recently released at the time of its development i.e. the models released in 2014. The Department is currently working on an updated version of NARCliM (version 2.0) which will use the latest global climate models released in 2020. This should be available in 2022.

The process of producing new versions of NARCliM is challenging for the Department because of the significant resourcing, including substantial computational power and time. For example, the data processing for NARCliM (v1.0) required one Petabyte in 2014.

NARCliM (v1.0) uses one emissions scenario (SRES A2)[13], which presents a relatively high emission 'business as usual' climate change scenario. The Department advises it selected this scenario for cost-effectiveness reasons, given the considerable data processing resources required for regional climate modelling.

NARCliM (v1.5) enhancements include two future climate scenarios; additional variables to understand wind gusts, storm surge, and drought (over 70 variables in total); and continuous climate simulations from 1950–2100. By way of contrast, NARCliM (v1.0) includes only one scenario and defined date ranges, that is: projections for the ‘near future’ (2020 to 2039) and the ‘far future’ (2050 to 2069). Many of these enhancements were made by the Department in response to evaluation findings, stakeholder consultation and requests from users.

The Department has also undertaken testing, expert and stakeholder engagement, and peer reviews, for NARCliM (v1.5). The Department advises that this version does not replace the original version (that is, v1.0), but should be used in conjunction for comparison. NARCliM (v1.5) is available for no charge to users who register on the NSW Climate Data Portal and to users who submit data requests.

Expert and stakeholder feedback has been sought and considered for improvements to NARCliM (v2.0) through the Department's NARCliM Technical Working Group with representatives from a number of agencies and a university.

3.2 Approach to communicating and educating agencies about climate projections

Climate projections are accessible to agencies, but some information has not been updated and there is limited awareness and use of this information

Climate projections based on NARCliM (v1.0) have been accessible to agencies, and the community, on the AdaptNSW website and NSW Climate Data Portal since 2014.[14] The Department is yet to update the AdaptNSW website content with the outputs of NARCliM (v1.5).

The Department has not updated some AdaptNSW website content (for example, regional and issues-based climate change 'snapshots') since these were initially released in 2013. Specific information about climate projections has not been substantively updated since 2014. The Department has indicated it will update these when the next version of NARCliM (v2.0) is released in 2022.

[13] Special Report on Emissions Scenario (SRES) was commissioned by IPCC. The A2 scenario is at the higher end of scenarios (one of the 'worst cases' if there is a 'business-as-usual' approach with limited action reducing greenhouse emissions). SRES A2 has been preferred in some cases because it gives more information for understanding impacts and adaptations.

[14] The Department also makes this information available in practical forms such as interactive mapping, newsletters and summary papers (for example, regional and issues-based 'snapshots').

We interviewed agency staff who were potential data users, given their roles related to climate risk management. These staff represented 13 entities[15] and included agencies with critical assets or services. But engagement with the climate projections among these staff and for their agencies/ entities was mixed. Six of the 13 had little or no awareness of the NARCliM projections and how to use them, four were using NARCliM, and three were using projections from other sources such as the CSIRO data or via consultants.

Some agency staff reported that the Department's use of only one climate scenario in NARCliM (v1.0), and that this had not been fully updated since 2014, has limited the usefulness and perceived currency of this data.

Another issue noted in interviews was that agencies have been waiting for more guidance from the Department about to use the NARCliM projections before engaging with the information. This was due to concerns that the projections, and related climate information on the AdaptNSW website, do not consistently meet their needs: for example, agencies may need a range of emission scenarios to understand the range of risks, and to test for investment at different levels.

As noted, the Department has taken steps to address agencies' concerns through the release of NARCliM (v1.5). But this has only been available since early 2021 to users of the NSW Climate Data Portal.[16] Moreover, the Department has not provided guidance to agencies on how to use each NARCliM (v1.5) emission scenario, and over what time periods. It is unclear whether the more extreme scenario (resulting in higher projected temperatures) should be used to test the integrity of existing assets, or should be used for planning future assets and services, or used for both. The 2021 CRR Guide also has limited information for agencies on which NARCliM emission scenarios they should be using when considering climate risks in different decision-making contexts.

This lack of guidance is relevant as the Department's climate projections from NARCliM are listed under the NSW Government's Common Planning Assumptions, which are the 'agreed information assets' for use by State agencies to prepare proposals, business plans and strategies that rely on projections. NSW Treasury advises that use of the Common Planning Assumptions is required, unless agencies have documented an appropriate reason for not using them

Within the Department, the Water Group was provided with early access to the NARCliM (v1.5) data for use in the development of projections of future rainfall, streamflow and water storage levels. This is in addition to data from long-term paleo-historical climate record. Some concerns have been raised about the lack of a coordinated approach across the Department in using the NARCliM projections.

The Department advises that it plans to update the AdaptNSW website and climate snapshots based on the comprehensive NARCliM (v2.0) projections in 2022. It has also committed to producing other outputs such as state-wide maps and data for natural hazards under climate change scenarios (such as flooding, coastal erosion and lightning strike). The Department advises that NARCliM (v1.5) needed to be completed prior to commencing the development of these maps, which are now to be delivered by June 2022.

The Department's approach to communicating its climate information, including educating agencies about the climate projections, has been insufficient

The Department's communications plans on climate projections have been insufficient because they have not clearly documented how it will educate agencies in the use of NARCliM since its first release in 2014. The AdaptNSW newsletters have been the principle means of communicating information on projections to agencies since 2014. The Department advised that it has educated agencies on a one-on-one basis in response to requests, but there is no evidence about how routine this has been, or its outcomes.

The Department's March 2019 communications plan for NARCliM outlines communications around the staged release of NARCliM (v1.5) and (v2.0) but its finalisation status is unclear. The plan is focused on technical users among a limited number of agencies, and it does not adequately consider engagement with other potential agency users and their range of information needs.

[15] Ten agencies external to the Department and three within the Planning, Industry and Environment cluster.
[16] Information provided by the Department indicates that staff from around 16 agencies have subscribed to the Portal.

In August 2020, a communication plan was approved for the NARCliM (v1.5) release to technical users.

In December 2020, a two-year communication strategy and annual plan for the NARCliM projections were approved, which seek to raise the profile of the Department's work related to communicating climate change impacts. The Department advises that a communication plan for NARCliM (v2.0) was also proposed and is currently under review.

In mid-late 2020, the Department also commissioned an overall communication strategy for the AdaptNSW website and related content, such as the newsletters. This strategy covers marketing and content, focused on community, researchers, local government and business users, but there is no detailed plan outlining responsibilities with the Department and implementation timeframes.

The Department's approach to educating State agencies remains unclear, especially in targeting the information needs of agencies with significant assets and services who need to identify and assess climate risks, and developing adaptation responses.

4. Opportunities for enhanced support and monitoring progress

It is too soon to determine the impact of the 2021 Climate Risk Ready NSW (CRR) Guide and Course, produced by the Department of Planning, Industry and Environment (the Department) and NSW Treasury. But there are opportunities for these agencies to progress these developments in partnership: especially with the establishment of senior executive steering and oversight committees related to climate risk.

For the Department, key opportunities to embed climate risk management include leveraging land use planning policies and guidance to drive adaptation, which has potential to better protect the State's assets and services. NSW Treasury has a role in continuing to update its policies, guidance and economic analyses with relevant climate change considerations to support an informed, coordinated approach to addressing physical climate risks to agencies' assets and services, and to the State's finances more broadly.

There is currently no plan on how the Department and NSW Treasury intend to routinely monitor the progress of agencies with implementing the CRR Guide or developing climate risk 'maturity' more broadly. As agencies are responsible for implementing risk management systems that meet NSW Treasury standards, which now clearly includes consideration of climate risk (TPP20-08), establishing effective monitoring, reporting and accountability around this progress should be a priority for the Department and NSW Treasury.

4.1 Scope to further support agencies manage climate risks

The Climate Risk Ready NSW Guide and Course are an opportunity for enhanced communication and engagement with agencies

The Department and NSW Treasury published the CRR Guide for agencies in March 2021, and an accredited CRR Course, with 100 funded places for agency staff. These resources are intended to form the foundation from which capability is built consistently across agencies.

The Department advises that agencies have been prioritised for engagement through the funding to attend the CRR Course. The Department's information indicates that 52 staff from 17 NSW agencies have enrolled, including 22 staff that were involved in the 2020 pilot. Other course participants are from local councils in NSW, and from organisations in other jurisdictions.

There are opportunities for the Department to facilitate the good practices being shared across agencies to assist in take-up of the CRR Guide, and to encourage climate risk assessment and adaptation planning. Along with feedback from agencies, this could inform updates to the Guide and Course. For example, Transport for NSW has developed relevant resources which could be adapted for use by other agencies. This is illustrated in Exhibit 10.

Exhibit 10: Transport for NSW's approach to climate risk assessment

Transport for NSW (TfNSW) updated its Future Transport Strategy 2056 in late March 2021. The Strategy includes a new chapter on sustainability, outlining its approach of incorporating climate change risk assessment in the early stages of all projects and identifying risks throughout the asset project lifecycle. The strategy states that TfNSW will aim to investigate the resilience of existing assets to climate change, improve asset resilience via consistent data collection, and incorporate the most up-to-date information into climate change risk analysis.

TfNSW also recently updated its Climate Risk Assessment Guidelines with a focus on aligning different stages of climate risk assessment to each project stage. The document reflects ISO 14091 Adaptation to climate change, and the CRR Guide. It is intended to help identify climate change risks, assess those risks, identify adaptation strategies, and create monitoring programs. The guidelines also advocate the use of the regional climate models, NARCliM and CSIRO, for detailed analysis of climate projections.

Two Climate Risk Assessment (CRA) Tools have been developed to assist with conducting climate risk assessments. CRA tool one uses climate data from NARCliM (v1.5) as well as additional data on urban heat island effect, lightning, hail, bushfire and sea level rise to develop a set of climate projections for a unique geographical location. CRA tool two uses information from tool one, along with a range of asset information (including a risk library constructed using a wide range of previously conducted risk assessments), to allow estimation of inherent risk levels, adaptation measures and residual risks.

Source: Audit Office of NSW 2021 adapted from information provided by Transport for NSW: Climate Risk Assessment Guidelines, Climate Risk Assessment Tools and Future Transport Strategy 2056.

The Department has taken steps to strengthen the planning system in relation to considering climate risk

The 2016 NSW Climate Change Policy Framework set directions for embedding climate change consideration in government decision-making. The Department's role in land-use planning, guiding development controls, and building regulations, can affect a wide range of decisions by State agencies, and local government. These decisions have wide implications for communities and may also impact the climate resilience of State assets and services.

The Department has taken steps to strengthen how the planning system considers climate risk and guides agencies on how to embed this in their decision-making.

Exhibit 11: Examples of how the planning system is considering climate change

Critical infrastructure development approvals

Climate change needs to be considered in critical infrastructure development. When an application for approval of a declared Critical State Significant Infrastructure project is made, the Secretary of the Department of Planning, Industry and Environment is required to issue environmental assessment requirements. This requires a proponent to assess the risk and vulnerability of the project to climate change and quantify specific climate change risks with reference to the NSW Government’s climate projections.

Regional vulnerability assessments informing some regional planning

The Department undertook regional vulnerability assessments and adaptation projects for each NSW region from 2013 to 2019. This work aimed to develop a shared understanding among stakeholders, including State agencies and councils, of the likely vulnerability to climate change and encourage adaptation planning. These assessments and adaptation projects have contributed to regional plans. For example, the Department issued a draft Illawarra Shoalhaven Regional Plan for consultation in November 2020, that considers some adaptation actions to better manage climate risks. One of the actions is to develop tools to assist councils identify where they can increase resilience in the land-use planning system.

The Department advises that the outputs of its regional vulnerability assessments and adaptation projects have also assisted in the development of councils' Local Strategic Planning Statements (LSPS), which set out the 20-year vision for land-use in a local area.

Source: Audit Office from Department of Planning, Industry and Environment website and documents.

The Department produced the NSW Coastal Management Manual in 2018 to guide councils in the development of coastal management programs (CMPs). Under the *NSW Coastal Management Act 2016,* a local council may, and must, if directed to do so by the Minister, prepare a CMP. The manual requires that the CMP demonstrate how a council has considered the effects of projected climate change and how it may affect the relevant area. To date, three coastal management programs have been finalised.

The Department is taking further steps, although much of this is in draft. Its reform package 'Planning for a More Resilient NSW' includes a draft environmental planning policy related to natural hazards. This draft policy aims to inform the preparation of regional, district and local strategic plans, planning proposals and other strategic planning. It outlines climate risks to communities, assets and services. In 2021, the Department also released a Strategic Guide to Planning for Natural Hazards in NSW – A Toolkit and this refers to relevant resources including the AdaptNSW website and NARCliM outputs.

The Department has stated it is working with NSW Treasury to develop an addendum to the Guide to Cost Benefit Analysis (TPP17-03) for agencies on how to include 'green infrastructure' in their cost benefit analyses for future projects. Green infrastructure includes waterways, bushland, tree canopy and green ground cover, parks, and open spaces, which can reduce the impacts of heatwaves in urban environments.

Weaknesses remain such that the Department could do more to leverage its land use planning role to ensure agencies and communities are more resilient to climate change

There remain weaknesses in the planning system that create a risk that climate change will not be adequately considered by State agencies, or by local councils and the community which can in-turn impact State agencies' assets and services.

For example, few of the Department's relevant State Environmental Planning Policies (SEPPs) mention climate change. There is no mention of climate change in the SEPPs for Coastal Management 2018, Koala Habitat Protection 2020, and Major Infrastructure Corridors 2020. We have been advised that the Department is considering enhancing a range of instruments including SEPPs to improve community resilience, including consideration of climate change.

The Department's 2018 Local Strategic Planning Statement (LSPS) Guidelines for councils do not refer to ‘climate change’ and how it should be considered, although they do refer to regional plans.[17] The Department's 2018 Guide to preparing Local Environmental Plans (LEPs) for Councils does not mention climate change and the 2006 Standard Instrument for preparing LEPs only mentions climate change in relation to planning for floods—this was included in an amendment to the instrument in 2021

Of the 143 council LEPs we examined in March 2020, all make a reference to climate change, but this is only in relation to flood planning, reflecting guidance from the Department's 2005 Floodplain Development Manual. This manual states it is important to consider climate change in flood studies and sea level in relation to flood risk, though it does not provide guidance on what future flood risks are acceptable. Fourteen LEPs refer to climate change at a high level, that is in the Aims of Plan section. One LEP requires the council to have regard to studies addressing 'global warming'. That the Department's guide does not mention climate change means that LEPs, and council's subsequent Development Control Plans, are at risk of not considering climate change.

The Building Sustainability Index (BASIX) is a sustainable planning measure intended to drive reductions in household water and energy usage. BASIX requirements apply to all residential dwelling types and are part of the development application process in NSW.[18] We understand the BASIX targets for energy usage and thermal comfort are currently under review in line with the Commonwealth of Australian Governments agreed Trajectory for Low Energy Buildings and the NSW Net Zero Plan Stage 1: 2020–2030. The Department is not considering the potential impact of climate change in relation to these requirements.

[17] The Department advised that, within councils' individual LSPSs, references to climate change are common and this reflects recent work by specialised the Department staff assisting local councils with their planning.
[18] BASIX requirements include water and energy savings targets and a target range for thermal performance.

A report commissioned by a council in January 2021 estimates that, for homes in the eastern suburbs of Sydney, there will be a 70 per cent increase in energy cooling requirements in 2030 compared with 2020, and a 300 per cent increase by 2070. The report notes that all dwelling types tested failed the current BASIX Thermal Comfort requirements for cooling in 2030 and 2070. This, along with information presented in Exhibit 6 about future predicted temperature across Greater Sydney, indicates that homes in NSW are currently being built for the present, but not for a potential future climate.

NSW Treasury has updated some relevant policies and guidance with climate-related considerations, but key gaps remain

NSW Treasury has the lead role in public sector stewardship for managing the financial exposure of the State's assets, economy and balance sheet to climate risk, and in supporting agencies to identify risks to their assets and services. Relevant activities include issuing policies and guidance on risk and financial management, and coordinating the State's responses to climate risk through the Sustainable Finance Steering Committee, the Climate Risk Steering Group and other executive forums.

NSW Treasury's Internal Audit and Risk Management Policy (TPP20-08), Asset Management Policy for the NSW Public Sector (TPP19-07) and Guide to Cost-Benefit Analysis (TPP17-03) and Risk Management Toolkit for NSW Public Sector Agencies (TPP12-03) refer to the need for agencies to consider the impacts of climate change. For example, and in addition to the updates to the TPP20-08 which now cites climate change as a 'contemporary, emerging risk':

- TPP17-03 states that potential climate change impacts should be assessed in the same way as other risk factors that affect the economic life cycle of assets, as part of an agency's ongoing risk management and decision-making for both existing and new assets
- TPP12-03b states that, when agencies are defining the external context in which they operate, they should consider a range of factors. One of these factors is identified as 'environmental: impacts that your agency's operations have on the built or natural environment, climate change.' NSW Treasury has indicated that it plans to commence a review of the Risk Management Toolkit in 2021, which presents an opportunity to clarify and strengthen guidance on how climate change is considered in the risk management process.

NSW Treasury's updates to policy and guidance for agencies have been focused on guidance related to physical climate risk. Although not documented as part of a climate risk-related policy approach, according to NSW Treasury this focus been informed by considering the financial exposure these risks present to the State, and because assisting agencies to respond to physical climate risks will help NSW Treasury deliver on its state outcomes (see section 1.4).

There remain limitations in how climate change and/or climate risk is incorporated into NSW Treasury policies and guidance, which creates a risk that this will not be sufficiently understood and operationalised by agencies. Throughout its guidance, there is no clear articulation of the distinction between considering risks from individual natural hazards using historical data, and considering climate risk in relation to projected changes in the climate, which are likely to change the intensity and frequency of natural hazards.

Furthermore, there are gaps in specific policies and guidance materials.

- There is risk that climate change will not be effectively considered in the asset management process through the TPP19-07. The policy states that the 'typical information' in an agency's asset management plan should include: an assessment of the resilience and vulnerability of assets to the impacts of climate change, and proposed mitigations/ interventions,' but the 'typical information in an agency's asset management plan' is not a core requirement of the policy. As such, considerations of climate change may not be subject to an annual assurance review by Infrastructure NSW.[19] Also, there is no reference to climate change in relation to strategic asset management plan requirements.
- State Owned Corporations (SOCs), which are major infrastructure holders and service providers, are not covered by the Internal Audit and Risk Management Policy (TPP20-08) or the Asset Management Policy (TPP19-07), such that the climate considerations in these policies do not apply.[20]

  Guidance to SoCs and other government business related to how these organisations are overseen, managed and held accountable for performance, is provided through the Commercial Policy Framework policies, TPP18-02 and TPP17-10. These policies do not mention climate change.
- NSW Treasury's Annual Reporting and Compliance Checklist for agencies does not mention climate change, although there is scope to do this.
- The Organisational Resilience: Practitioner Guide, TPP18-07, which is designed to provide advice on areas agencies can focus on to strengthen their resilience capability, does not refer to climate change.

There is also scope to refer to climate risk, and link to the 2021 CRR Guide, in relevant NSW Treasury policies and guidance to agencies, such as the:

- NSW Government Business Case Guidelines, TPP18-06
- Major Projects Policy for Government Businesses, TPP18-05
- NSW Gateway Policy, TPP17-01.

Finally, steps to finalising draft Guidelines for Resilience in Infrastructure Planning: Natural Hazards, which were developed by NSW Treasury and Infrastructure NSW in 2019, are unclear. The draft guidelines are a potentially critical source of information to agencies when considering how climate change exacerbates natural hazard risks: for example, it is noted that damage to one asset may impact on others and affect their capacity to provide services, making it essential that agencies consider the vulnerability of existing and new infrastructure to these risks.

The NSW Treasury technical papers accompanying the 2021 Intergenerational Report highlight the costs associated with climate risks

The 2021 Intergenerational Report technical papers, including one on physical climate risks, contain relevant information for agencies. The technical paper examines four areas of physical risk, relating to natural disasters, property and land damage from sea level rise, the effects of heatwaves on productivity, and the effects of climate change on agricultural production.

The modelling indicates that the fiscal and economic costs each year associated with natural disasters will more than triple by 2061. Significant costs associated with sea level rises, heatwaves and lost agricultural production are also predicted. These baseline costs, of identified physical climate risks, could be used by agencies to inform strategic planning documents, policy and program proposals, as well as adaptation plans for assets and services.

NSW Treasury also produced technical paper for the Intergenerational Report that models the transitional risks of climate change.

[19] Subject matter experts at Infrastructure NSW are involved in the quality assurance process. NSW Treasury advises that an Asset Management Policy Working Group with Infrastructure NSW was established in 2021, comprising members from each cluster, as a forum for further information and guidance sharing.
[20] Guidance to SOCs and other government business related to how these organisations are overseen, managed and held accountable for performance, is provided through the Commercial Policy Framework policies, TPP18-02 and TPP17-10.

4.2 Monitoring and reporting on progress of agencies' climate risk management and adaptive capacity

Governance and some reporting on the progress of the Department and NSW Treasury's efforts to support agencies manage climate risks have been in place since 2019

Progress in the delivery of support to agencies is overseen by the interagency Climate Risk Steering Group made up of senior agency staff, administered by the Department and chaired by NSW Treasury. The steering group met six times between August 2019 and December 2020 to discuss progress in supporting agencies, including the development of the CRR Guide and Course.

The Department and NSW Treasury have provided periodic updates to the Asset and Liability Committee (ALCO) on climate risk since April 2018 including updates on progress with the CRR Guide and Course in December 2019 and June 2020.

The ALCO noted extreme weather as a State Significant Financial Risk (SSFR) in June 2019. This risk was renamed to climate risk in December 2019. The inclusion of climate risk as a SSFR was to mean that the Department, with NSW Treasury, would then report to ALCO once every 12 months on progress in managing this risk.

The ALCO Charter was updated in April 2021, including a new approach to categorising significant financial risks: as a SSFR, or as an 'Other Significant Financial Risk' (OSRs). Climate risk has now been categorised as an OSR. For SSFRs, ALCO retains primary responsibility for advising on the State's exposures and any mitigating action for SSRFs. For OSRs, this responsibility is covered by another government entity.

NSW Treasury has indicated this new approach attempts to clarify that the operational risk component associated with climate is the responsibility of the Department, while the financial risk component the responsibility of the Department, Resilience NSW, Treasury and iCare. NSW Treasury advises that the ALCO continues to monitor climate risk in the context of it representing a risk to the State's assets. We note, however, that OSRs do not require annual reporting to the ALCO, rather periodic reporting. It is unclear under what conditions this periodic approach to reporting will be activated. There is a risk that climate-related matters receive less specific attention and will not be subject to reporting at the ALCO at least once a year.

Going forward, both the Department and NSW Treasury intend to report annually to the Secretaries Board. This follows the April 2021 endorsement for these agencies to develop a program of actions to better identify and respond to climate risk across government operations, with clear governance and against which progress will be reported. This 'roadmap' would cover an agreed program of priority actions for delivery by relevant government units, against which progress will be tracked.

The Department has some draft evaluation documents relevant to their support to agencies, but the indicators have not been finalised, or reported against. There are drafts output and outcome measures for the Helping Communities become more Resilient to Climate Change (CRCC) program, such as AdaptNSW web analytics, Climate Data Portal user trends, the number of climate projections, hazard maps, and the number of XDI and (State of Assets Resilience) SOAR reports produced.

The Department and NSW Treasury have plans but not a clear, confirmed approach to how they will monitor agencies' progress or report on outcomes

There is limited information on how the Department and NSW Treasury intend to routinely monitor agencies' progress with implementing the CRR Guide, or managing climate risks more broadly. There is no agreed mechanism for agencies to report on their climate risk management 'maturity' levels and progress with risk assessments and adaptation planning. NSW Treasury advises that planned mechanisms include reporting on agencies' progress to existing governance forums.

The Department previously developed performance indicators to monitor agencies' progress, but the status of reporting on these is unclear. Examples of indicators from the Department's Regional Preparedness Operational Plan 2018–2021 are: percentage of agencies reporting climate risks; number of state agencies with a climate change risk assessment; and number of XDI test projects completed.

The Department advises it will monitor the progress of the uptake of the CRR Guide, training and practices and report to the Climate Risk Steering Group during the tenure of this group. It plans to survey agencies' take-up of climate risk assessment planning in 2021 and every three years thereafter. It indicated the survey will be based on previous surveys (in 2015 and 2018) to enable comparison and will include a series of questions that will evolve over time as government practice matures, for example regarding climate-related financial impact analysis by agencies and questions regarding the uptake of the CRR Guide and Course.

The Department indicated procurement for the revision and design of the survey is in progress. NSW Treasury advises it intends to report future survey results and comparison over time to the Sustainable Finance Steering Committee and as part of the above-mentioned annual reporting to Secretaries Board.

We note that the other 'emerging' risk flagged in TPP20-08 is cyber security and that there is a requirement, under the NSW Cyber Security Policy, for agencies to report annually to Cyber Security NSW on their cyber security maturity. This indicates there is scope for NSW Treasury to require agencies to report annually on their climate risk management maturity.

No plans are in place to report progress to stakeholders or the public on how effectively agencies are managing climate risks to their assets and services.

Section two

Appendices

Appendix one – Response from agencies

Response Department of Planning, Industry, and Environment

Ms Margaret Crawford
Auditor General
NSW Audit Office

By email: mail@audit.nsw.gov.au

Our ref: DOC21/671914
Your ref: D2116018/PA66

Dear Ms Crawford

Subject: Performance audit on managing climate risks to assets and services

Thank you for the opportunity to consider and respond to your performance audit of the Department of Planning, Industry and Environment (DPIE) and Treasury – Managing climate risks to assets and services.

I appreciate the significant work and effort by your audit team to develop this report on what is a complex matter where best practice is continuing to evolve. It is pleasing that the audit found the Department has a robust approach to developing the NSW and ACT Regional Climate Modelling (NARCliM) climate projections and acknowledges recent work to support for government agencies to manage climate risks to their assets and services.

NARCliM climate projections are world leading in their application of the latest science and technology. Our Climate Risk Ready program, developed with Treasury, is building capabilities in climate risk management not only in NSW Government agencies and councils but also in other Australian jurisdictions and the private sector. The program materials are also being used by other Australian state governments to develop their own capability building activities in climate risk management.

The scope of this audit has focused on the development of our NARCliM climate projections and support for agencies to use these projections, and how DPIE and Treasury are supporting agencies to manage their climate risks. We welcome the audit recommendations, which offer a useful external perspective on how we, with Treasury, could build on what we are already doing to better support agencies in their climate risk management approaches.

We would like to thank Treasury for its continued collaboration and would like to acknowledge Treasury ownership of the overall risk management and financial reporting frameworks, including related policies and monitoring activities.

We also note climate risk management is a complex and systemic challenge for governments that needs to be addressed across multiple policy and management functions, such as asset management. DPIE is committed to supporting agencies in fulfilling their climate risk management responsibilities, including by advising how their processes could better align with best practice. We encourage agencies to approach us to understand how we could support their approach to climate risk management.

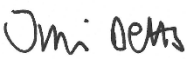
A detailed response to all recommendations is enclosed below.

4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150 | Locked Bag 5022, Parramatta NSW 2124 |
dpie.nsw.gov.au |1

DPIE is leading the NSW Government's commitment to taking action on climate change, including taking decisive and responsible action to reduce emissions. To achieve this, the Government has set a clear objective to achieve net zero emissions by 2050. DPIE actively supports government agencies to reduce emissions from their activities so Government can lead by example to achieve this objective.

Once again, we would like to thank your audit team for their efforts and consultations during the audit and appreciate the flexibility shown by all in conducting the audit virtually due to the COVID-19 pandemic.

Yours sincerely,



Jim Betts
Secretary

Enclosure

Planning, Industry & Environment

Department of Planning, Industry and Environment response to audit recommendations

Recommendation	Responsibility	Response	
By December 2021, the Department and NSW Treasury should, in partnership:			
1. Enhance the coordination of climate risk management for State agencies' assets and services by:	DPIE, Treasury	Supported	We welcome this recommendation, which builds on our existing work with Treasury to coordinate the support of climate risk management for government assets and services. A proposed roadmap to improve agencies' capability to assess and respond to climate risks is under development. As part of this roadmap we will consider the required resourcing. DPIE will continue to work with Treasury to provide access to information on climate change impacts and leading practice guidance to agencies, allowing them to assess potential climate risks, and analyse the potential financial impacts of those risks on their balance sheets over time.
a) developing the proposed roadmap to improve agencies' capability to manage climate risks, including an agreed program of actions that are relevant and proportionate to identified risks, with delivery targets and reporting			
b) implementing a clearly resourced plan to expand the reach of the Climate Risk Ready NSW Guide and Course across agencies, and periodically improve its content			
c) ensuring agencies have access to relevant, robust information on the physical climate risks, and associated costs.			
By December 2022, the Department should:			

Planning, Industry & Environment

Recommendation	Responsibility	Response	
2. Strengthen supports that improve agencies' management of physical climate risks to their assets and services by:	DPIE		
a) ensuring regional climate modelling (NARCliM v2.0) is released, and that climate projection information is updated on the climate data portal and Adapt NSW website	DPIE	Supported	The recommendation is consistent with our current plans on the release of NARCliM v2.0 and update of NARCliM climate projection information on the climate data portal and Adapt NSW website.
b) implementing a targeted education strategy on using climate projections and a feedback mechanism for agencies climate risk assessments and adaptation plans	DPIE	Supported	We welcome this recommendation to build on our existing communications to better educate agencies on NARCliM climate projections and implement more formal mechanisms for agencies' climate risk assessment and adaptation plans.
3. Monitor the progress of agencies in managing physical climate risks to their assets and services, especially the use of NARCliM and take-up of the Climate Risk Ready NSW Guide and Course. This should include three-yearly surveys and reporting on progress.	DPIE	Supported	The recommendation is consistent with our current plans. We have been undertaking three-yearly surveys of agencies on their climate change risk management practices for their assets and services since 2015. We conducted the last survey in 2018 in collaboration with Treasury. Our next survey is planned for late 2021 and will include questions on the uptake of the Climate Risk Ready guide and course.
4. Comprehensively review its land-use planning and development guidance, and the Building Sustainability Index (BASIX) requirements, and identify	DPIE	Supported-in-principle	Climate change is already a key consideration in the development of new and updated land-use planning and development guidance. Recent examples include the development of the Design and Place SEPP, a natural disaster clause included in the Standard instrument LEP

Recommendation	Responsibility	Response	
opportunities to promote climate risk management.			template earlier this year, exhibition of the draft Natural Hazards Guidelines to support consideration of natural hazards at the strategic planning stage (currently being finalised) and an update to the Coastal Design Guideline planned to be exhibited later this year to update matters to be considered for rezoning proposals along the NSW Coast. Additionally, the Department recently completed the flood prone land package, including the revision of the standard instrument LEP clause for flooding. That clause is the first example of explicit referencing of climate change in the standard instrument. The Design and Place SEPP is bringing together multiple initiatives to promote climate risk management in the planning system including consideration of sustainability targets and Net Zero ambitions through BASIX (for the residential building sector) and other building typologies (e.g. commercial). One of the key principles underpinning the SEPP is around planning for 'resilient places that are designed with adaptive capacity to respond to shocks, chronic stresses, and climate change'. This is carried through multiple initiatives in the SEPP and the broader planning system. We support the recommendation to identify opportunities to promote climate risk management in land-use planning and development guidance as much as possible, including in the BASIX requirements, noting a comprehensive review of BASIX including current stringencies is underway and is an extensive exercise which may not be able to be completed within the stipulated timeframe.

Recommendation	Responsibility	Response	
			The development and implementation of new and updated land use planning and development guidance, including the BASIX requirements, would be subject to Government consideration and approval.
By December 2022, NSW Treasury should:			
5. Strengthen its guidance to agencies on climate risk-related matters, including by updating the Risk Management Toolkit (TPP12-03), clarifying requirements for State Owned Corporations, and adding a climate risk management attestation requirement in the Annual Reporting and Compliance Checklist.	Treasury	N/A	We recognise Treasury has ownership of the overall risk management and financial reporting frameworks, including related policies and monitoring activities across government.
6. Coordinate the finalisation of guidance on resilience in infrastructure planning related to natural hazards, maintaining its alignment with NSW Treasury's business case guidelines, in conjunction with relevant agencies.	Treasury	N/A	
7. Review how effectively climate risks have been considered in the assurance of agencies' asset management plans (according to the Asset Management Policy, TPP19-07), and take steps to	Treasury	N/A	

Recommendation	Responsibility	Response	
address gaps in conjunction with relevant agencies.			
8. Monitor how effectively agencies are reflecting the effects of climate-related matters in their financial statements, and determine whether the existing NSW Treasury guidance is sufficiently clear, and if agencies require further support.	Treasury	N/A	
By June 2023, the Department should:			
9. Deliver a climate change adaptation action plan for the State, which includes actions that support agencies to manage the physical climate risks to their assets and services, reflecting commitments in the 2016 NSW Climate Change Policy Framework.	DPIE	Supported	We welcome this recommendation. Work is underway to progress this recommendation and will be subject to Government consideration.
By June 2023, the Department and NSW Treasury should:			

Recommendation	Responsibility	Response	
10. Implement climate risk management across their respective clusters, in line with the Climate Risk Ready NSW Guide. This should include adopting an enterprise-wide climate risk statement; allocating oversight to a central role (such as a climate risk officer); and integrating climate risk assessment into risk management, monitoring and reporting systems.	DPIE, Treasury	Supported	We welcome the recommendation on how we could improve climate risk management and are pleased to observe the recommendations are based on our Climate Risk Ready Guide. Our current risk management practices recognise climate risks. To further implement this recommendation, our focus across the cluster will be on the continuing recognition of climate risks in our documentation and risk management practice. We will consider how best to incorporate the recommended elements of an enterprise-wide climate risk statement and allocation of oversight to a central role as part of our current planned updates to risk management processes.

Response from NSW Treasury

Contact: Alison Weaver
Telephone: [redacted]
Your Reference: P21/2741

Ms Margaret Crawford
Auditor-General of NSW
Level 15
1 Margaret Street
Sydney, NSW 2000

Dear Ms Crawford,

Performance audit – Managing climate risks to assets and services

Thank you for your letter dated 12 August 2021 and the opportunity to respond to the final NSW Auditor-General's Report, *Performance Audit – Managing climate risks to assets and services* (the Report).

I welcome the Report's findings and recommendations relevant to NSW Treasury (Treasury).

I am pleased to note the conclusions and findings recognising that Treasury and Department of Planning, Industry and Environment (DPIE) have been working in partnership to provide coordinated support to the sector. This concerted effort has seen the joint release of a nation-leading capability uplifting guide, Climate Risk Ready NSW Guide, in early 2021.

The findings also reflect Treasury's Whole-of-State (WoS) approach to managing climate risks, in partnership with DPIE. This approach is consistent with Treasury's central responsibility to manage risks to the State's balance sheet and fiscal position, including climate risk, in a coordinated and consistent manner. I expect to continue Treasury's partnership with DPIE and work with other agencies, and ensure that Treasury continues to provide sufficient and targeted support in this area.

I note the findings suggesting that Treasury's overall support to the sector was previously insufficient, and that gaps remain in some relevant policies and guidance to the sector.

Climate risk is a complex subject matter where best practice is continuing to evolve. As the steward of the State's overall risk management framework, Treasury has always provided guidance and support for agencies in managing risks across their portfolios. This includes incorporating climate risk consideration into policy guidance for risk management and economic appraisal, such as the NSW Government Guide to Cost-Benefit Analysis (TPP17-03).

Treasury's guidance for managing climate risk is intended to be largely principles-based, given the evolving nature of climate risk management. Treasury has been proactive in providing sector leading guidance on how to reflect the effects of climate-related matters in financial statements, which is designed to complement and be framed within already

GPO Box 5469, Sydney NSW 2001 ■ Telephone: (02) 9228 4567 ■ www.treasury.nsw.gov.au

mandated standards. There can be risks in publishing overly specific guidance that users apply a 'checklist' approach and potentially overlook the impacts of climate risk that are unique to their organisations. Noting this, I would welcome the opportunity for Treasury to work with the Audit Office to better understand where more specific, targeted guidance could be provided.

Considering rapidly evolving practices and increasing demand for managing climate risks and opportunities over the recent years, Treasury has significantly elevated its effort in guiding agencies' climate risk management, with more detailed and targeted support. In addition to Treasury's partnership with DPIE, other key actions include:

- establishing a dedicated sustainable finance function within Treasury;
- chairing climate risk focused governance committees, e.g. inter-agency Climate Risk Steering Group and Treasury's Sustainable Finance Steering Committee;
- updating or releasing a range of policy guidance incorporating climate risks, including: Internal Audit and Risk Management Policy for the General Government Sector (TPP20-08); and
- incorporating comprehensive climate and energy modelling into the 2021 Intergenerational Report, establishing a baseline for agencies to inform their relevant strategic planning documents, and policy and program proposals.

I welcome the audit recommendations relevant to Treasury. These recommendations are strongly aligned with Treasury's current and planned work program to continue to support agencies' climate risk management, in partnership with DPIE. The recommendations will provide valuable inputs to shaping Treasury's future work program. I look forward to continuing to partner with DPIE in implementing the Report's recommendations and thank them for their ongoing collaboration.

I would like to thank the Audit Office's review team for its considerable efforts in undertaking this review and for working collaboratively with Treasury and DPIE to deliver this constructive and valuable report.

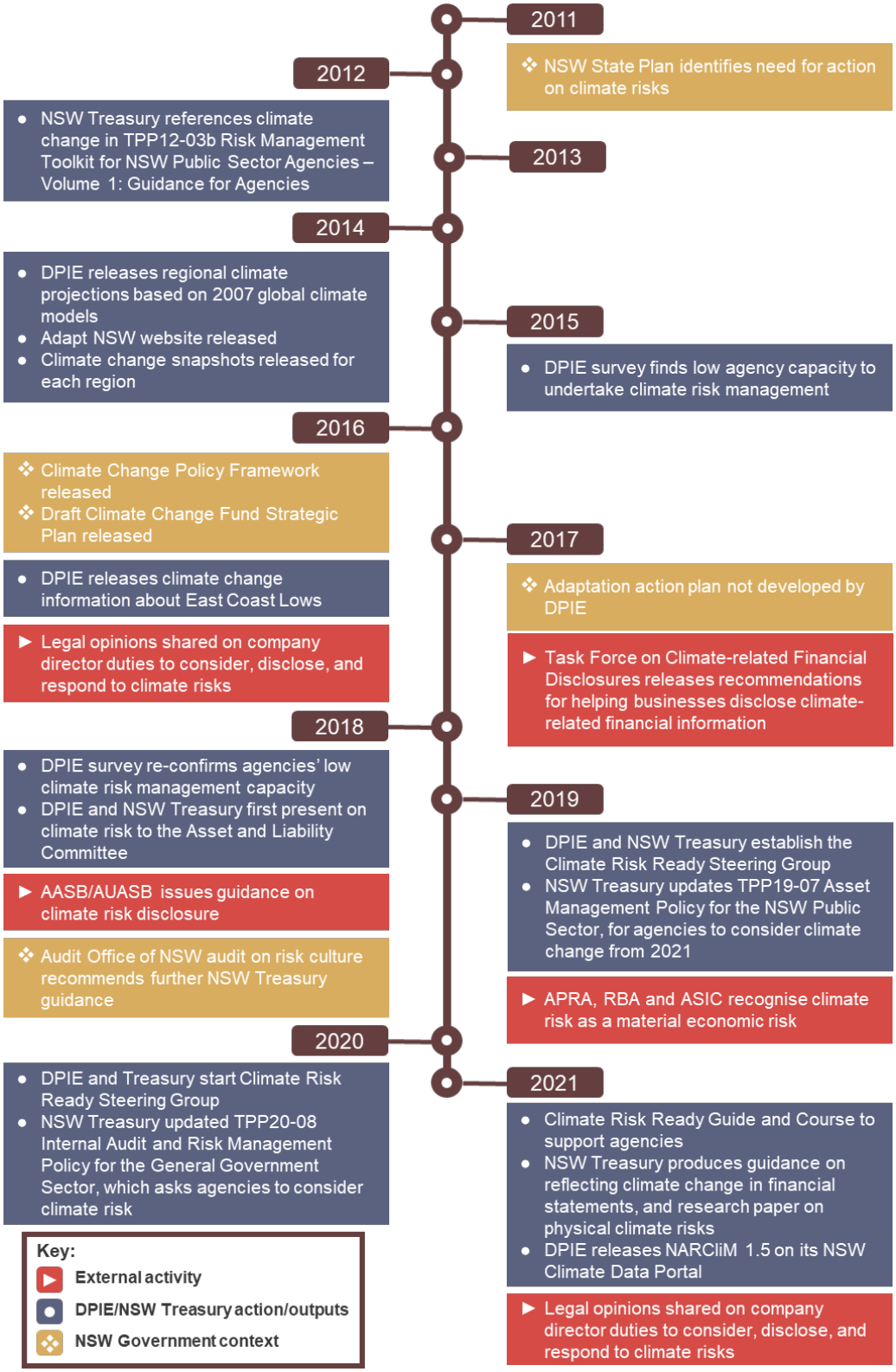
Yours sincerely

Michael Pratt AM
Secretary
30 August 2021

GPO Box 5469, Sydney NSW 2001 ■ Telephone: (02) 9228 4567 ■ www.treasury.nsw.gov.au

Appendix two – Timeline of key activities

This timeline outlines and the progress of key actions by the Department of Planning, Industry and Environment (DPIE) and NSW Treasury in supporting agencies to manage climate risks, in the context of NSW Government and external developments.



Source: Audit Office 2021 from relevant sources.

Appendix three – About the audit

Audit objective

This audit assessed whether the Department of Planning, Industry and Environment and NSW Treasury are effectively supporting agencies to manage climate risks to their assets and services.

Audit criteria

Criterion 1: The Department has effectively developed climate projections and supported agencies to use these projections.

- A robust approach to climate projections is demonstrated.
- Climate projection outputs are in an accessible and practical form at a state, regional and local level.
- A communication and education strategy for climate projections has been developed and implemented.

Criterion 2: The Department and NSW Treasury are supporting agencies to identify climate risks to their assets and services, and develop appropriate responses.

- Agencies are supported to identify climate risks to their assets and services.
- A state-wide strategy has been established to coordinate adaptation planning and build adaptive capacity.
- Agencies are supported to develop appropriate responses to climate risks, including adaptation planning and building adaptive capacity.
- Systems are in place to monitor and report on progress in managing these risks.

Audit scope and focus

The audit was focused activities related to, and supporting, managing the physical risks of climate change to assets and services.

In assessing the criteria, we checked aspects including:

- The Department's activities related to developing climate projections, communicating and educating agencies on their use.
- Support to agencies to identify the physical risks of climate change to their assets and services and develop appropriate responses. Such support may include training, technical advice, and other guidance by the Department and/or NSW Treasury. This included activities funded through the Climate Change Fund and the Climate Risk Ready program.
- Monitoring and reporting undertaken by the Department and/or NSW Treasury on their support to agencies, and on agencies' progress in managing climate change risks.
- Climate change adaptation planning approaches in other jurisdictions, and frameworks for good corporate and public sector governance and risk management around climate change.

Audit exclusions

The audit did not seek to examine:

- climate change mitigation activities, such as emissions reduction
- management of transitional risks to the economy, and the management of liability risks
- outcomes other agencies, local government or businesses in managing climate risks
- the overall management of climate risk on the state's financial assets and balance sheet.

The audit does, however, comment the above where these affect our findings and/or are contextually relevant.

Audit approach and method

Our performance assessment was structured under each criterion with reference to the relevant policy and program commitments, and funding activities.

We interviewed relevant agency staff, experts and stakeholders.

- Key staff in the Department and cluster agencies. Departmental staff from the Energy, Environment and Science Division (e.g. Climate Change and Air Policy Branch, Climate and Atmospheric Science Branch, Climate Risk and Net Zero Emissions) Planning (e.g. Local and Regional Planning, Resilient Places); the Water Group; National Parks and Wildlife Service; Governance and Risk.
- Key staff in NSW Treasury, including the Financial Risk Management and Sustainable Finance; Financial Management Governance and Analytics; Accounting Policy; Policy and Budget Group; Intergenerational Report; Infrastructure; and the Centre for Evidence and Evaluation.
- Staff in a range of relevant agencies that hold significant assets and/or services, including agencies identifies as 'priorities' for engagement by the Climate Risk Steering Group. Consultations involved ten agencies external to the Department, and three within the Planning, Industry and Environment cluster.
- Other relevant climate risk, governance and insurance industry experts, stakeholders and university-based academics.

We reviewed a range of documentation, including:

- procedures and processes in the Department supporting the development of and communication about climate projections, and information from the AdaptNSW website and NSW Climate Data Portal
- evidence about the evaluation, testing and peer review of climate projections, and research collaborations
- climate risk vulnerability assessments and regional adaptation reports
- State, regional and local planning documents and instruments
- strategic, business, program and communication plans on the Department's intended activities, outputs, resources and deliverables for their climate risk management and adaptation planning, and related briefs
- the Department's risk registers and documentation on its enterprise risk management approach
- planning documents on NSW Treasury’s intended activities, outputs, resources and deliverables around their financial guidance and risk management role in relation to climate, and related briefs
- terms of reference, agendas and minutes of the Department and NSW Treasury chaired steering, advisory and technical groups related to climate risk management
- NSW Treasury policy papers and guidelines
- information developed by the Department and/or NSW Treasury to assist agencies to identify climate risks to their assets and services, and develop adaptation actions to reduce exposure to these risks, including the CRR Guide and Course materials, and information about progress of course delivery
- information about intended evaluation and performance indicators for monitoring climate risk management progress and outcomes
- documents provided by a select agencies about their climate risk management processes
- information about corporate sector climate risk management and from other jurisdictions.

Subject matter expertise climate-related governance and risk management was procured to provide the audit team with technical advice.

The audit team conducted the audit in accordance with ASAE 3500 Performance Engagements and ASAE 3000 Assurance Engagements Other than Audits or Reviews of Historical Financial Information. The standards require the audit team to comply with relevant ethical requirements and plan and perform the audit to obtain reasonable assurance about an activity's performance against identified criteria and express a reasonable assurance conclusion against the audit objective.

The audit approach was complemented by quality assurance processes within the Audit Office to ensure compliance with professional standards.

Methodology

Our performance audit methodology is designed to satisfy Australian Audit Standard ASAE 3500 Performance Engagements and other professional standards. The standards require the audit team to comply with relevant ethical requirements and plan and perform the audit to obtain reasonable assurance and draw a conclusion on the audit objective. Our processes have also been designed to comply with requirements specified in the *Government Sector Audit Act 1983* and the *Local Government Act 1993*.

Acknowledgements

We gratefully acknowledge the co-operation and assistance provided by the Department of Planning, Industry and Environment and NSW Treasury.

Audit cost

The estimated cost of this audit including disbursements is $633,000.

Appendix four – Performance auditing

What are performance audits?

Performance audits determine whether state or local government entities carry out their activities effectively, and do so economically and efficiently and in compliance with all relevant laws.

The activities examined by a performance audit may include a government program, all or part of an audited entity, or more than one entity. They can also consider particular issues which affect the whole public sector and/or the whole local government sector. They cannot question the merits of government policy objectives.

The Auditor-General's mandate to undertake performance audits is set out in section 38B of the *Government Sector Audit Act 1983* for State government entities, and in section 421B of the *Local Government Act 1993* for local government entities.

Why do we conduct performance audits?

Performance audits provide independent assurance to the NSW Parliament and the public.

Through their recommendations, performance audits seek to improve the value for money the community receives from government services.

Performance audits are selected at the discretion of the Auditor-General who seeks input from parliamentarians, state and local government entities, other interested stakeholders and Audit Office research.

How are performance audits selected?

When selecting and scoping topics, we aim to choose topics that reflect the interests of parliament in holding the government to account. Performance audits are selected at the discretion of the Auditor-General based on our own research, suggestions from the public, and consultation with parliamentarians, agency heads and key government stakeholders. Our three-year performance audit program is published on the website and is reviewed annually to ensure it continues to address significant issues of interest to parliament, aligns with government priorities, and reflects contemporary thinking on public sector management. Our program is sufficiently flexible to allow us to respond readily to any emerging issues.

What happens during the phases of a performance audit?

Performance audits have three key phases: planning, fieldwork and report writing.

During the planning phase, the audit team develops an understanding of the audit topic and responsible entities and defines the objective and scope of the audit.

The planning phase also identifies the audit criteria. These are standards of performance against which the audited entity, program or activities are assessed. Criteria may be based on relevant legislation, internal policies and procedures, industry standards, best practice, government targets, benchmarks or published guidelines.

At the completion of fieldwork, the audit team meets with management representatives to discuss all significant matters arising out of the audit. Following this, a draft performance audit report is prepared.

The audit team then meets with management representatives to check that facts presented in the draft report are accurate and to seek input in developing practical recommendations on areas of improvement.

A final report is then provided to the head of the audited entity who is invited to formally respond to the report. The report presented to the NSW Parliament includes any response from the head of the audited entity. The relevant minister and the Treasurer are also provided with a copy of the final report. In performance audits that involve multiple entities, there may be responses from more than one audited entity or from a nominated coordinating entity.

Who checks to see if recommendations have been implemented?

After the report is presented to the NSW Parliament, it is usual for the entity's audit committee to monitor progress with the implementation of recommendations.

In addition, it is the practice of Parliament's Public Accounts Committee to conduct reviews or hold inquiries into matters raised in performance audit reports. The reviews and inquiries are usually held 12 months after the report received by the NSW Parliament. These reports are available on the NSW Parliament website.

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards.

The Public Accounts Committee appoints an independent reviewer to report on compliance with auditing practices and standards every four years. The reviewer's report is presented to the NSW Parliament and available on its website.

Periodic peer reviews by other Audit Offices test our activities against relevant standards and better practice.

Each audit is subject to internal review prior to its release.

Who pays for performance audits?

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament.

Further information and copies of reports

For further information, including copies of performance audit reports and a list of audits currently in-progress, please see our website www.audit.nsw.gov.au or contact us on 9275 7100.

Professional people with purpose

OUR VISION

Our insights inform and challenge government to improve outcomes for citizens.

OUR PURPOSE

To help Parliament hold government accountable for its use of public resources.

OUR VALUES

Pride in purpose

Curious and open-minded

Valuing people

Contagious integrity

Courage (even when it's uncomfortable)

auditoffice
OF NEW SOUTH WALES

audit.nsw.gov.au

Level 19, Darling Park Tower 2
201 Sussex Street
Sydney NSW 2000 Australia

PHONE +61 2 9275 7100

mail@audit.nsw.gov.au

Office hours: 8.30am-5.00pm
Monday to Friday.

auditoffice
OF NEW SOUTH WALES

audit.nsw.gov.au