Attachment 15

Climate change risk assessment and adaptation planning

30 September 2024

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1.1 Overview

1.1 Alignment with WaterNSW strategic priorities

One of the strategic priorities under the Corporate Strategic Plan is 'Building a Sustainable Future' with the objective being that "*We will make transparent decisions that reduce out environmental footprint, improve the resilience and quality of water sources, strengthen our social licence to operate, and create healthy ecosystems for our communities to enjoy for generations to come*".

WaterNSW has adopted a comprehensive Environment Sustainability and Governance (ESG) Program, which ensures our assets and operations are resilient to climate change, as a key pillar.

The key objective of our climate change work is to understand and build resilience to the growing impacts of climate change across WaterNSW's operations and take appropriate actions to minimise impacts on operations, customers, and communities.

WaterNSW is already operating in and planning for climate change and the increasing risks to the water security of NSW. These risks have intensified by growing populations and the changing water needs of households, businesses, communities, and the environment.

Currently, around 80 percent of NSW's water supply is taken from surface water which is particularly susceptible to the impacts of climate change. Droughts impact on our ability to secure quality supply for critical needs and impact on the operation of our infrastructure, while extreme rainfall can threaten or damage infrastructure, exceeding capacity and impact on water quality.

1.2 Recent climatic events impacting WaterNSW

WaterNSW has only in recent times navigated some of the biggest climatic events of the past century, ranging from droughts, bushfires, extreme rainfall, and flooding. The cumulative impact of these events has presented challenges in our operations and in managing our assets, and the frequency and severity of these events are likely to continue into future determination periods. These events have impacted on our infrastructure and our ability to maintain reliable and cost-effective services to our customers. This could include being supplied with water of reduced quality or having the reliability of supply disrupted. Impacts of historic climatic events are outlined below.

Drought

Higher temperatures and extended droughts in the Wingecarribee reservoir area during the Millennium Drought (1997-2009), caused major blue-green (Cyanobacteria) algal blooms[1] and put alternate supplies and transfer options at stress[2].

The 2017-19 drought, one of the most severe on record, resulted in record low inflows and storage levels that affected both water quality and ability to maintain bulk water supply in rural NSW.

Drought was also one of the key contributors to the three fish-kills that occurred in rapid succession over December 2018 and January 2019, with low- and no-flows and hot temperatures favouring growth of large blue-green algae blooms which depleted the level of oxygen in the water[3].

The drought also decreased inflows in the Greater Sydney region which in turn reduced the gravity discharge capacity from storages. This led to the requirement to pump water, which placed more stress and reliance on pumping stations to maintain delivery schedule in order to meet demand[4].

Increased rainfall and flooding

In regional NSW, between 2021-2022 widespread flooding negatively impacted on WaterNSW's operations. Floods prevented access to sites resulting in the deferral of scheduled maintenance and capital works programs to 2022-2023, including asset maintenance and renewal, land management and metering upgrades, land management and metering upgrades.

From 7 to 10 February 2020, the Warragamba Catchment experienced a widespread storm event with approximately 399 mm and 517.4 mm of rain recorded over a four-day period at the Warragamba (Warragamba Dam wall) and Katoomba (Farrells Road) weather stations, respectively. As a result, Warragamba Dam increased to 70 per cent storage capacity from around 40 percent, in less than a week.

During 2021 and 2022 Warragamba Dam was affected by multiple rain events. Inflows caused the dam to spill continuously over an eight-month period. One rainfall event in July 2022 saw 1,100GL of water entering the storage in a single week – more than 50 percent of the entire storage volume.

Multiple rainfall events since 2019 have impacted WaterNSW's assets and water operations, and as a result there have been significant recovery works with associated costs and insurance claims due to flood damage.

Costs arising from multiple rainfall and flood events since 2021 include:

- As of 30 May 2023, 87+ claims with a total value of $40M have been lodged with our insurer, iCare, associated with the flood recovery program[5].
- As of September 2023, $13.7m has been committed and $6.3m spent on Flood Recovery works.
- From the FY22 flood events, 49 projects to address flood-related damages in the Greater Sydney area have a total cost of $37m. Works include an expanded Flood Recovery Program for the remediation of the flood damages.
- The FY23 flood events that mostly affected regional NSW had 41 claims lodged with the insurer with cost estimates to be determined upon the completion of detailed damage assessment.
- For Greater Sydney, the book value of the flood damaged assets that have been disposed is $8.6m.
- Repair costs have increased since December 2022 with the revised total flood recovery and resilience budget, for FY22 and FY23 together, at $59m. Of this expenditure, flood resilience and upgrade work for Greater Sydney is currently estimated to cost $10m.
- The full impact of severe weather events on asset condition is yet to be finalised as site inspections are still in progress, with $11.4m of assets written-off as at September 2023.

[1] Can produce toxins which are dangerous to humans and animals
[2] Sydney Catchment Authority, Climate Change Impact Assessment, 2010
[3] https://www.science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/fish-kills-report
[4] Sydney Water & WaterNSW, Greater Sydney Drought Response Plan 2.0, 2022
[5] WaterNSW Board meeting Insurance works and claims update, Water NSW Board meeting – Flood Recovery Program

Compounding impacts

The Warragamba catchment was particularly impacted by drought between 2017 and 2020 and the resulting bushfires in the summer of 2019/20. This was followed by periods of high rainfall, which created erosion in the catchment and sedimentation in lakes supplying water for treatment.

Over the 2019-2020 bushfire season, major bushfires in the Warragamba Special Area and Shoalhaven Catchments resulted in 33,355 ha of WaterNSW land being burnt. Following the bushfire season, a high intensity rainfall event occurred at the beginning of February 2020 with increased rates of sediment, ash and debris delivered to Lake Burragorang (the lake behind Warragamba Dam which holds 80% of Sydney's drinking water) which reduced water quality for an extended period[6].

1.3 Considerations of climate adaptation

WaterNSW will play our part in creating a more resilient water system. One which enables thriving communities and healthy ecosystems, whilst reducing our environment footprint. As part of the 'Building a Sustainable Future' strategic priority, WaterNSW will:

- Adopt a comprehensive Environmental, Social and Governance strategy that addresses all aspects of the WaterNSW business and aligns to the 17 United Nations Sustainable Development Goals.
- Support the creation and management of healthy ecosystems.
- Collaborate with our stakeholders to improve water quantity and quality outcomes for communities and our customers.
- Reduce waste and increasing reuse.
- Ensure business, asset management and investment plans all consider climate change and resilience.

WaterNSW has already implemented a range of controls and measures to manage some of the risks that the above initiatives are looking to address. To fully achieve the required outcomes, WaterNSW is looking to implement other climate adaptation actions. More details on existing controls and measures and future climate adaptation actions are discussed in the following sections. The following figure provides a summary of the approach that WaterNSW follows to ensure that considerations of climate adaptation are in alignment with the process required by the regulator. These could also be used to inform the assessment related to costs needed to minimise climate change risks depending on customer and stakeholder priorities.

[6] https://rbms.tempurl.host/wp-content/uploads/2021/08/33-rebecca-mabbott.pdf

Figure 1 – WaterNSW Climate Adaptation review cycle

2. WaterNSW is always planning for climate change

2.1 Existing controls

WaterNSW already has in place controls to manage physical risks associated with weather events. Some of these controls are outlined below.

Water planning, delivery, yield, supply and demand

- System flexibility - Network augmentation, source from different depths in reservoir.
- Transmission loss - Account for potential evapo-transpiration and seepage losses during planned releases.
- Contingency measures - Desalination plant.
- Planning support – Developed Drought Contingency plans for Rural valley and continue to work to implement the Greater Sydney Drought response plan with Sydney Water. Drought and water depletion modelling.
- Water diversions - During emergency drought (such as Shoalhaven Transfers).
- Management of environmental flows - scheduled water release for ecosystem and downstream environmental health.

Water quality

- Periodic audits – Undertake water quality audits.
- Water quality alert system - Algal alerts during heatwaves.
- Forecasting - Algal risk forecast.
- Post-event monitoring - Catchment health recovery, post fire recovery coordination/partnership.
- Collaboration - With stakeholders for Greater Sydney and rural water quality.

- Enhanced monitoring - During extreme weather.
- Debris control measures - Installation of booms to reduce debris contamination.

Land management and catchment protection

- Catchment and land management planning - Engaging with leaseholders of WaterNSW owned lands on appropriate land management practices.
- Land surveillance - Maintaining fire towers, using satellite imagery and other aerial photography.
- Easement management - Coordination with land/property owner.
- Maintain infrastructure surroundings – Maintain access tracks, grass cover and vegetation clearance.
- Shared management with NSW RFS - Bushfire Management Plans.
- Community engagement - Communicate planning (e.g., water sharing plans), enforcement of environmental protection legislation.
- Access route control - Temporary closure of recreational areas during emergency.
- Erosion control measures - Consultation and installation of erosion control structures.
- Emergency response coordination - Data sharing with BoM, SES and NSW RFS.

Asset strategy and maintenance

- Schedule maintenance - Periodic preventative maintenance and inspections that align with climate drivers (such as drought maintenance tasks or inspections, for when rural dams are near empty).
- Maintain infrastructure surroundings - Access tracks, vegetation clearance etc., with schedules that are response to whether events (ie increased vegetation management after prolonged wet weather or back burning ahead of anticipated hot and dry seasons)
- Short & long-term asset planning - Asset review, replacement, and/or renewal plans that have regard for longer-term changes to customer demand and climate drivers (see Attachment 24 – Long Term Capital and Operating Plan for Greater Sydney, as an example).

2.2 Current adaptation measures

WaterNSW is already implementing a range of significant adaptation measures that support the management of climate-related risks.

An Integrated catchment and water quantity lake model is being developed for the Greater Sydney System. This will include assessment of changes to source water and catchment heath under different climate scenarios including changes in land use and vegetation cover, bushfires, droughts and large rainfall events. Outcomes will be used to prioritise risks and inform the development of mitigation strategies.

Part of our Science Program's $2m annual budget funds research on climate change impacts, including improve understanding of impacts form bushfires and extreme events on catchment health and water quality with outcomes used to enhance our modelling tools accuracy, optimise monitoring and the assessments of emerging risks. The program is also focusing on improving our understanding of our greenhouse gas emissions.

Bushfires

WaterNSW is collaborating with NSW fire authorities to ensure that water quality is protected in the aftermath of bushfire events.

Contaminated runoff associated with post-bushfire rainfall events can increase sediment and ash

transport into rivers or lakes and impact water quality.

Using existing knowledge sharing channels with NSW fire authorities, WaterNSW could explain the risks of bushfires for water quality. This has elevated the protection of water catchment areas in addition to protecting life and property.

To further reduce risks to water quality, the WaterNSW Bushfire Management Framework describes specific adaptation strategies including early detection, rapid response and suppression capabilities in collaboration with relevant fire authorities.

Drought

WaterNSW is developing valley-scale Drought Management Plans (DMPs) to support improved water supply resilience during drought events. Each valley has unique water usage characteristics and drought risks profiles. As a result, it is necessary for WaterNSW to adapt practices and take a tailored approach to drought management.

WaterNSW is developing DMPs for each valley to ensure that drought contingencies are tailored to the circumstances of each valley. Contingencies include a range of actions that cover different stages of drought to consider: prevention, preparedness, response and recovery.

The DMPs are being prepared in addition to WaterNSW's collaboration with external stakeholders to inform regional water sharing plans.

Extreme rainfall and flooding

Quantifying climate change impacts on water resources is very important in water resources planning and management of hydrological extremes i.e. floods and droughts. WaterNSW has completed extensive modelling and analysis of a range of scenarios assessed impacts of climate change to System Yield in Greater Sydney, and is investing in research to further improve water security modelling incorporating emerging climate risk.

WaterNSW is also currently working in collaboration with the University of New South Wales - Water Research Centre and the University of Melbourne (UoM) to implement a state-of-the-art automated probabilistic hydro-climate modelling framework of extreme storms in NSW, including considerations for climate change, required to support Hydrologic Risk Assessments of rural NSW dams as a part of the broader Portfolio Risk Assessment Program (2023-25). The project includes modelling approaches and conceptualisation for stationary as well as climate change conditions, using best practice methods leveraging research advances in hydroclimate and hydrologic modelling in a probabilistic framework.

3. How this has been communicated with customers?

WaterNSW has outlined the challenges faced by the business in relation to climate change to our customers. This included providing an overview of how we are adapting to climate change, and reviewing some short-term measures and longer-term actions in response to minimising our own impact on climate.

Customers and community stakeholders are sympathetic to our objectives of reducing our own greenhouse gas emissions and the opportunity to utilise land assets to generate carbon and biodiversity credits over the long-term. However, there is broad agreement that these should not be solely funded by customers and that WaterNSW should do the minimum to comply with changing legislation regulation, and/or seek other sources of funding.

Some shorter-term actions such as increase land management activities to control pest and weeds were viewed a little more sympathetically from a customer funding perspective.

In recognition of this position, we are working on options to progress initiatives while exploring non-customer based funding options or partnerships to deliver some of them.

A large component of our capital program is also related to reduced environmental impact and addressing future climate change risk. The Warragamba climate resilience and E-flows projects

(described in Attachments 7 and 24) are the largest of these.

The fish passage and cold-water pollution programs are aimed at meeting regulatory requirements that support reduced environmental impacts. Our customers are supportive of the objectives behind these but again believe that the benefits are community wide and that there should be a much larger government cost share (on behalf of the broader community).

4. What WaterNSW is doing to address climate change

4.1 Considering climate change

Under IPART's 3Cs framework, the consideration and monitoring of climate change impacts and risks should be considered in long-term investment plans. Some of the key actions suggested in the framework that WaterNSW could take to meet this requirement include the development of adaptation and resilience strategies and undertaking climate change risk and impact assessments on assets, asset management and operations and to identify climate risk prevention measures.

WaterNSW is meeting this requirement through the ongoing development of a climate change risk assessment and adaptation framework (the 'framework') that will enable us to understand the changing frequency and severity of climate hazards and prioritise climate risk management and adaptation efforts across all assets and activities to mitigate climate change impacts.

A Climate Change Risk Assessment and Adaptation Plan is being developed, which includes:

- The key climate hazards (such as bushfires, severe weather, heatwaves, extreme rain and drought).
- A climate change risk register which includes risks across different asset types (dams, pumping stations, reservoirs, distribution pipe network etc.) as well as for WaterNSW services.
- The output from the scenario analysis run across WaterNSW's asset locations showing current and future exposure to climate change across different hazards, scenarios and time horizons.
- A high-level roadmap, including proposed key actions, timing and resources required to address key exposures and vulnerabilities.

4.2 Alignment with regulatory and other requirements

The framework is consistent with the requirements of the NSW Government Climate Risk Ready NSW Guide[7], which provides guidance for the NSW Government sector to assess and manage climate change risks. Climate Risk Ready process is aligned to:

- Internal Audit and Risk Management Policy for the General Government Sector (TPP20-08).
- Asset management principles articulated in the NSW Treasury's Asset Management Policy for the NSW Public Sector (TPP19-07).

The framework is also aligned to global standards, and the general process and considerations contained in:

- ISO 31000:2108 – Risk management guidelines.
- ISO 14091 – Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment.
- Recommendations of the Taskforce on Climate-related Financial Disclosures (2017).

[7] https://www.climatechange.environment.nsw.gov.au/sites/default/files/2021-06/NSW%20Climate%20risk%20ready%20guide.pdf

- WaterNSW's Corporate Risk Management Plan.

4.3 Climate-related financial risks

There is an increasing expectation that organisations in the private and public sectors are proactively managing climate change risks. This increasing attention has been in part catalysed by the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD seeks to help manage the exposure of the financial system to climate-related risks through more informed investment decision-making and by supporting targets set out in the Paris Agreement to limit global warming this century to well below 2°C.

In December 2023, the Commonwealth Department of Finance confirmed that all Commonwealth entities and Commonwealth companies will be required to make climate disclosures in their annual reports. In December 2022, The NSW Government's Net Zero Plan Implementation Update 2022 committed all NSW agencies to identify their own climate change risks by the end of 2023.

Going forward, WaterNSW will be subject to climate-related disclosure reporting. The Federal Government's June 2023 Consultation paper proposes a transitional period for corporations, beginning from 1st July 2025, with full application for all groups of reporting entities from 2027-2028. Climate disclosures will support Australia's transition to net zero emissions by 2050, adapt to the changing climate and promote a sustainable financial system.

5. Climate change risk assessment and adaptation planning

To enable us to plan for operating in a changing climate, a climate change risk assessment was undertaken to identify the key hazards and risks impacting WaterNSW assets and operations across NSW. 1,589 sites across NSW were assessed, that were a combination of dams, weirs, regulators, catchment areas, pipelines, water monitoring stations and other priority assets such as the Upper Canal and pumping stations. Key climate hazards and potential impacts are outlined below.

Table 1 – Key climate hazards and potential impacts

Physical hazard	Potential impacts
Bushfires	Emergency shutdown of critical infrastructure, damage to assets
Extreme rain	Increased runoff, carrying more organic matter and/or sediment to the dams and reservoirs, emergency shutdown of critical infrastructure, damaged quality monitoring system
Drought	Increased pollutant concentrations, increased demand for water treatment, reduction of natural water
Severe weather	Damage to infrastructure and asset integrity, reduced asset performance, limited access to assets
Compound weather events	Increased volatility in peak water demand, challenges to the delivery system

5.1 Priority physical climate risks

Initially, a long list of physical and transition climate change risks and opportunities (99 in total) was developed from desktop research and stakeholder interviews.

These were consolidated into a shortlist for prioritisation by senior WaterNSW stakeholders where three

final physical risk statements were chosen for further analysis:

- **Disruptions to water delivery:** Drought, extreme rainfall and/or compounding weather extremes may impact the ability of WaterNSW to deliver water when and where required.
- **Disruptions to water quality:** Drought, bushfires, extreme rainfall and/or compounding weather extremes may impact the ability of WaterNSW to maintain source water quality according to customer requirements.
- **Asset impairment or damage**: More frequent flooding due to increasing frequency and severity of extreme rain and associated extreme weather (e.g. East Coast Lows, severe storms) may damage or impair WaterNSW assets.

5.2 Top climate hazards, risks and impacts for WaterNSW by region

Climate scenario analysis was conducted for the three risk statements examining future changes in multiple physical hazards for two scenarios (moderate and high emission) and two-time horizons (2050 and 2070). The key findings of this analysis are outlined below.

Multiple hazards are projected to increase with climate change that may impact **Greater Sydney and southern NSW** in different ways. Extreme rainfall is likely become more intense leading to increased runoff transporting sediment and debris and localised flooding in affected catchments.

This may further degrade water quality which may impact the ability of WaterNSW to satisfy the water quality requirements of its supply agreements. Projected increases in dry spells coupled with existing high exposure to water stress may increase supply augmentation requirements as dry conditions affect supply flexibility. Following dry spells, increased risk of bushfires can damage and/or impede access to critical assets. Both have implications for water quality and delivery. This region of NSW is also considered one predisposed to compound weather events which may present challenges across multiple WaterNSW operations.

In **Western NSW**, the greatest risks are those associated with projected increases in hot and dry conditions contributing to drought and extreme bushfire weather conditions. Coupled with long-term rainfall decline, surface water availability in this region is likely to decrease and have implications for catchment health, environmental flows and the availability of water for customers.

The greatest risks in the **central and northern coastal NSW** region arise from projected increases in the frequency and intensity of extreme rainfall events that may also coincide with other severe weather events (e.g. East Coast Lows, ex-tropical cyclones). While this can increase water storage levels, increased runoff, sediment and debris transportation may deteriorate water quality. When sustained, extreme rainfall can also contribute to localised flooding which may lead to spilling of full dams that were not designed to have the ability to mitigate or control releases or spill events (ie through gates).

6 Adaptation activities to date

Managing weather and climate risks is a day-to-day activity for WaterNSW. To date WaterNSW have implemented a range of control measures to manage the associated risks to their operations. Those activities have included both assessment of potential climate change impacts and responses to actual or potential impacts and have included:

- Inclusion of climate impact scenarios into the models used for operational and capital planning activities.
- Development of long-term capital and operating plan (LTCOP) expenditure forecasts (in conjunction with Sydney Water) incorporating potential climate risk elements.
- Development and refinement of drought management and bushfire plans.
- Development of an ESG strategy and program plan including addressing both climate change

related risk assessments and potential for WaterNSW to reduce its impact on climate change through emissions reduction and carbon sequestration.

- Determining risk to some key assets and future actions to address these (e.g. the Climate Resilience project at Warragamba Dam).

7 Adaptation actions during the current determination period (2020-2025)

The development of a high-level climate adaptation roadmap that includes a range of adaptation actions which WaterNSW could implement to help mitigate exposure to identified climate risks is being progressed. It has been developed in response to internal stakeholder perspectives on the climate scenario analysis findings and will be socialised for endorsement and approval through the Executive, Sustainability and Service Delivery Board Committee and ultimately the Board in FY25.

The adaptation actions listed in the roadmap are intended to complement and enhance WaterNSW's existing adaptation controls, with the intent being to have the actions identified in the roadmap highly interdependent - with the short- and medium-term actions setting the foundations for longer-term actions.

Adaptation actions will be grouped under four core themes:

- **Asset & operations:** These actions are related to protecting and optimising WaterNSW's operations as the climate changes, including maintenance, retrofitting upgrades, and/or new infrastructure development. These actions are focused on the water delivery network and quality monitoring equipment.
- **Business strategy and planning**: These actions are centred around governance and strategic climate-related efforts (e.g., collaborative adaptation) to secure WaterNSW's operations and assets.
- **Data systems and intelligence**: These actions are focused on building data capacity and capability to ensure adequate systems are maintained and analysed to monitor changes in water availability. This will further inform adaptation requirements and other changes required by WaterNSW to manage the impacts of climate change on the business.
- **Risk management**: These actions are focused on embedding the management of climate-related risks into BAU risk management efforts of WaterNSW that encompass landscape management, emergency response management, incident management, or post-disaster recovery and resilience programs.

Adaptation actions are being grouped in to short (0-2 years), medium (2-5 years) and long (>5 years) term timeframes.

Key short- and medium-term actions that are likely to be taken in this determination period include:

- **Establishing procedures to consider climate resilience** in procurement policy, asset strategy & planning for any new or renewal of assets and delivery scheduling.
- **Integrating climate risk and climate scenario analysis findings** into Corporate Risk Management Framework and other operational governance policies and procedures.
- **Integrate finance and asset management processes** to understand, for example, asset impairment and maintenance expenditure associated with climate risks (e.g. incorporating expected increases to maintenance costs in the LTCOP) to inform long-term asset planning and procurement decisions through effective cost-benefit analysis.
- **Develop communication strategy with key external stakeholders** to influence long-term planning that protects water security and ensures that WaterNSW perspectives are considered in long-term decision making that will impact operations.

- **Conduct a transition scenario analysis** to provide further evidence to support more capital-intensive activities, understand dependencies, understand changes in water demand as customer demographics evolve, investigate possibility of expanding revenue streams by using land for renewables or vegetation planting for offsets, etc.

8. Climate change risk management and governance

The WaterNSW Board is responsible for approval of Corporate Strategic Plan, of which the ESG strategy (including climate resilience) is a key pillar. Governance of the actions, including climate change response, is overseen by the Board Sustainability and Service Delivery committee.

A nominated Climate Risk Officer will be responsible for leading monitoring and evaluation, and reporting on climate change risks and adaptation measures, as required by WaterNSW Operating Licence.

Priority climate risks will be incorporated into the Corporate Risk Register to support ongoing management of identified climate risks in alignment with other coordinated activities to manage enterprise risks, and to ensure we continue to operate within our established risk appetite.

Adaptation actions will be reviewed annually as required to meet the requirements of 'Systematic' climate change risk maturity as per the NSW Climate Risk Ready Guide.

9. Operating and capital expenditure for delivering climate adaptation programs

The actions noted for delivery in this attachment in the current determination period focus on planning for operating in a changing climate and integrating climate change considerations to enhance existing adaptation controls. These actions will have minimal impact on capex and/or opex in this determination period.

Climate change adaptation considerations are incorporated in a number of specific initiatives in this submission , including within the LTCOP, and projects such as the Warragamba Climate Resilience Project.

10. Our long-term approach to climate adaptation

A number of long-term actions will be identified as part of the adaptation planning process. Off the back of the planning and integration-focussed short and medium-term actions, key long-term actions will include evaluating the merit of different engineering or operating actions, such as consideration of what future water supply would look like across the state. This work will inherently be done in close partnership with NSW DCCEEW, who are the lead agency in NSW for setting long term strategies that incorporate the latest climate science and modelling (including the NSW, Greater Sydney and various Regional Water Strategies).

The adaptation roadmap is only an initial step in WaterNSW's journey towards climate resilience. Resilience-building is an ongoing process and will require constant iteration including:

- Post event evaluation of implemented measures.
- Periodic review of policy/procedures/systems.
- Considering leading practices domestically and internationally, as well as relevant new scientific and/or technological advancements.

11. WaterNSW governance and prioritisation frameworks for climate change adaptation investment

WaterNSW's investment prioritisation framework is guided by our Corporate Risk Management Plan which allocates a risk rating of 'extreme' if WaterNSW has an inadequate response to climate change. Under a plausible worst-case scenario, the failure to apply strategic direction to address climate change and mitigate adverse impacts is likely to result in failure to;

- provide water quality and quantity that meets resource demand,
- maintain assets that are fit for purpose and
- protect the safety of our people.

The reputational impact of an inadequate response to climate change could result in government intervention or direction into WaterNSW operations. Operationally, it could have a severe impact on water quality and supply, and in the absence of additional controls and investment, the likelihood of government intervention or direction is increasingly likely over time.

Longer-term we acknowledge that the magnitude of adverse impacts resulting from climate change is uncertain, while we expect our customer base to remain relatively stable in the foreseeable future. When considering long-term investments, we adopt a balanced approach of assessing the cost impact on customers today against future long-term impacts under various climate scenarios.

12. Reducing our contribution to climate change

WaterNSW is also investigating options to reduce our contribution to climate change through the reduction of carbon emissions we generate, where it's economic to do so.

We are currently in the process of developing a Net Zero Plan which may include emission reduction targets, pathways, and timeframes to achieve net zero. Interventions being investigated to reduce our emissions profile such as transitioning to renewable energy are being considered through the lens of being effective and providing value for money.

Our customers, particularly those in the regions, acknowledge that we need to support the NSW Government achieving its legislative targets regarding emissions reduction, However, we should do so in a manner and timeframe that minimises the cost impact for them. There is little appetite to accelerate meeting net zero beyond the 2050 deadline.

Through its Renewable Energy and Storage Program WaterNSW is also looking to identify opportunities to use its land and assets to support renewable energy generation and storage projects to help support the energy markets transition to renewable generation technologies.

Additionally, we are investigating opportunities to sequester carbon through vegetation planting which will offset our operational emissions and also potentially provide a revenue source through the generation of carbon and biodiversity credits that can be traded.