

HOBART CITY COUNCIL CORPORATE CLIMATE CHANGE ADAPTATION PLAN 2013 - 2016

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Citing this Climate Change Adaptation Plan

Please cite this Adaptation Plan as follows:

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Executive Summary (Key Risks, Priority Actions)

There is an expansive and growing body of scientific evidence that the global climate is changing and that extreme weather events and sea level rise will increase in the 21st century. Local Government has a key role in working with its communities to manage and prepare for the impacts of climate change. This is facilitated by its local knowledge and experience, its understanding of community needs and vulnerabilities, and its key role in responding to emergencies.

Key climate change risks for the Hobart City Council's municipal area (by 2100) include the following:

- The temperature of **very hot days** to **increase by up to 3°C**.
- Extended heat waves and more **extreme temperatures** are likely to enhance the occurrence and **intensity of bushfire**.
- **Rainfall** trending towards **heavier events** interspersed by **longer dry periods** and for greater extremes.
- **Inundation** along the Derwent Estuary frontage to **increase**.
- The current **100-year storm tide event** (0.9 to 1.4 m above average sea level) may become a **50-year event by 2030**, and a **2 to 6-year event by 2090**.

Key vulnerabilities for the Hobart's City Council's municipal area in relation to the climate change risks include the following:

- **Increased damage to Council assets** such as stormwater **from flooding**.
- **Inundation and degradation** of low-lying road and **stormwater assets in flood & storm surge**.
- **Exacerbated impact** on foreshore when **flood** and **storm surge coincide**.
- **Bushfire impacts** on **natural areas** and **urban fringe**.
- **Injury and loss of life in major bushfire events**.
- **Bushfire impacts** on natural assets leading to **decline in visitor numbers**.

In taking action to address Hobart's vulnerabilities a key overarching consideration is the potential liability exposure for an adopted action, or inaction in particular circumstances. Legal advice to the Regional Climate Change Adaptation Project is that councils will not be liable for existing use or development, nor will liability be incurred for 'no action' in response to climate impacts. However should council take action there could be liability if that action causes harm or damage. Council may also be found liable for operational advice such as in the assessment of planning applications and new developments.

Overall the RCCAP advocates that the Council undertake the following actions to minimize potential exposure to liability:

- **exercising reasonable care when making planning decisions**, which involves taking care to ensure all relevant facts are known and understood, that relevant law is identified and understood, and that reasons for decisions are expressed in clear and accurate terms
- **keeping up to date with general climate change science and information**, particularly in relation to potential risks from natural hazards, relevant to their local government area
- developing **clear and certain criteria for decision making** to increase public confidence that decisions are made on the basis of the best available scientific evidence
- **increasing public consultation**, as this may improve transparency around decision-making processes and limit administrative review, however, this should be weighed against resource implications of the increased consultation
- **facilitating the provision of information to property owners** on potential risks to property enabling opportunity to adjust their expectations about appropriate use and avoid challenges to planning decisions

This Adaptation Plan provides an introduction to local government adaptation planning. It presents specific adaptation actions across climate change risk treatments to provide for an integrated and whole of Council response. Council staff defined a total of 41-adaptation actions relation to Hobart's 32 priority climate change risks. The strongest adaptation treatment theme was 'Regulatory and Institutional' where 16 actions are proposed. Other strong themes were 'Engineering and Technological' with 9 actions, 'Education and Awareness' with 6 actions and 'Advocacy' with 5 actions.

The Plan also recognises the significant body of work currently being undertaken by the Council's 'stakeholders' across the community that contribute to meeting climate change adaptation objectives for Southern Tasmania. The Plan identifies stakeholder linkages to assist in identifying collaborative opportunities, resource sharing and to avoid duplication of efforts wherever possible. For example, Southern Water raised the following points:

- Consideration of periodic and gradual inundation needs to be made when approving developments adjacent to the coast or flood prone areas to ensure an adequate setback for water and sewer infrastructure.
- Reduced water availability is identified as a key climate change risk and requires better collaboration in relation to setting growth boundaries around towns so that population limitations are set within the sustainable yield profile of the drinking water catchment.
- Bushfire management is a key strategic risk as it has huge effects upon drinking water catchments, service provision, abnormal demand management spikes, hydrant performance, and power outages to water and wastewater infrastructure. The Council and Tasmania Fire Service could jointly help manage these risks with Southern Water in a number of ways and would benefit from further discussion.

This Adaptation Plan incorporates an approach to implementation, key components of which include: incorporation of key risks and adaptation actions into established Council documents and processes (e.g. risk register, strategic plan, asset management plan); identification of a mechanism to implement sub-regional and regional adaptation actions through advocacy or collaboration; and a mechanism for plan review and updating.

Climate Change Snapshot for Hobart City Council

Tasmania is fortunate to have had the highest resolution climate modeling conducted in Australia. The recently completed Climate Futures for Tasmania project provides a sound knowledge base for identifying climate related risks at a local level and subsequently in informing appropriate decisions to manage the risks. CFT prepared a detailed report specifically for the Hobart City Council, provided as a accompanying report to the Plan and as a summary, below, of key points from the report.

Current climate and recent trends

Hobart has a **temperate, maritime climate** with relatively mild winters. **Long-term average temperatures have risen** in the decades since the 1950s, at a rate of **up to 0.1 °C per decade**

Despite covering a small geographic area Hobart experiences a **marked rainfall gradient** in average annual rainfall from about 1100 mm on the slopes of Mt Wellington to 615 mm in the city. There has been a **decline in average annual rainfall** since the mid 1970s, and this decline has been **strongest in autumn**

Projected change in conditions by 2100 (A2 emissions scenario)

Table 1: Projected changes for Hobart City by 2090 - 2099 relative to the baseline period (1980-1999)

| Climate Change Variable | Change | Relative change |
|------------------------------------|--|-----------------|
| Temperature (annual average) | +2.6 to 3.3°C | |
| Summer days (>25°C) | +22 days | +120% |
| Warm spells (days) | 2-6 days longer | +50 - 150% |
| Hottest day of the year | +3°C | |
| Frost risk days/year | -9 days | -90% |
| Rainfall (annual average) | Increase in all seasons | |
| Rainfall (wettest day of the year) | | +25% |
| Rainfall extreme (ARI-200) | +30-40 mm | +30-40% |
| Evaporation | | +19% |
| Runoff | Increase in all seasons | |
| Coastal inundation | 100-year event becomes a 2 to 6-year event | |

Extreme events

The changes in climate that are most likely to impact upon the Council's infrastructure, roads, and the local community and environment are a magnification in intensity of extreme events. Specific impacts on Hobart are as follows:

The **temperature** of very hot days to **increase by up to 3°C**. **Warm spells** (days in a row where temperatures are in their top 5%) currently last around 4 days and **will increase by up to 6 days**

Extended **heat waves** and more extreme temperatures are likely to enhance the **occurrence and intensity of bushfires**

Rainfall will trend towards **heavier events** interspersed by **longer dry periods**. High daily runoff events are likely to increase, including those that may lead to erosion or flooding. **Rainfall volume in a 200-year average recurrence interval (ARI) event will increase by up to 30-40%**.

Inundation along Derwent estuary frontage **will increase**. The current 100-year storm tide event is around 0.9 to 1.4 m above average sea level, and accounting for sea level rise (0.82 m), the **current 100-year coastal inundation event may become a 50-year event by 2030, and a 2 to 6-year event by 2090**

Hobart City Council Risk Map

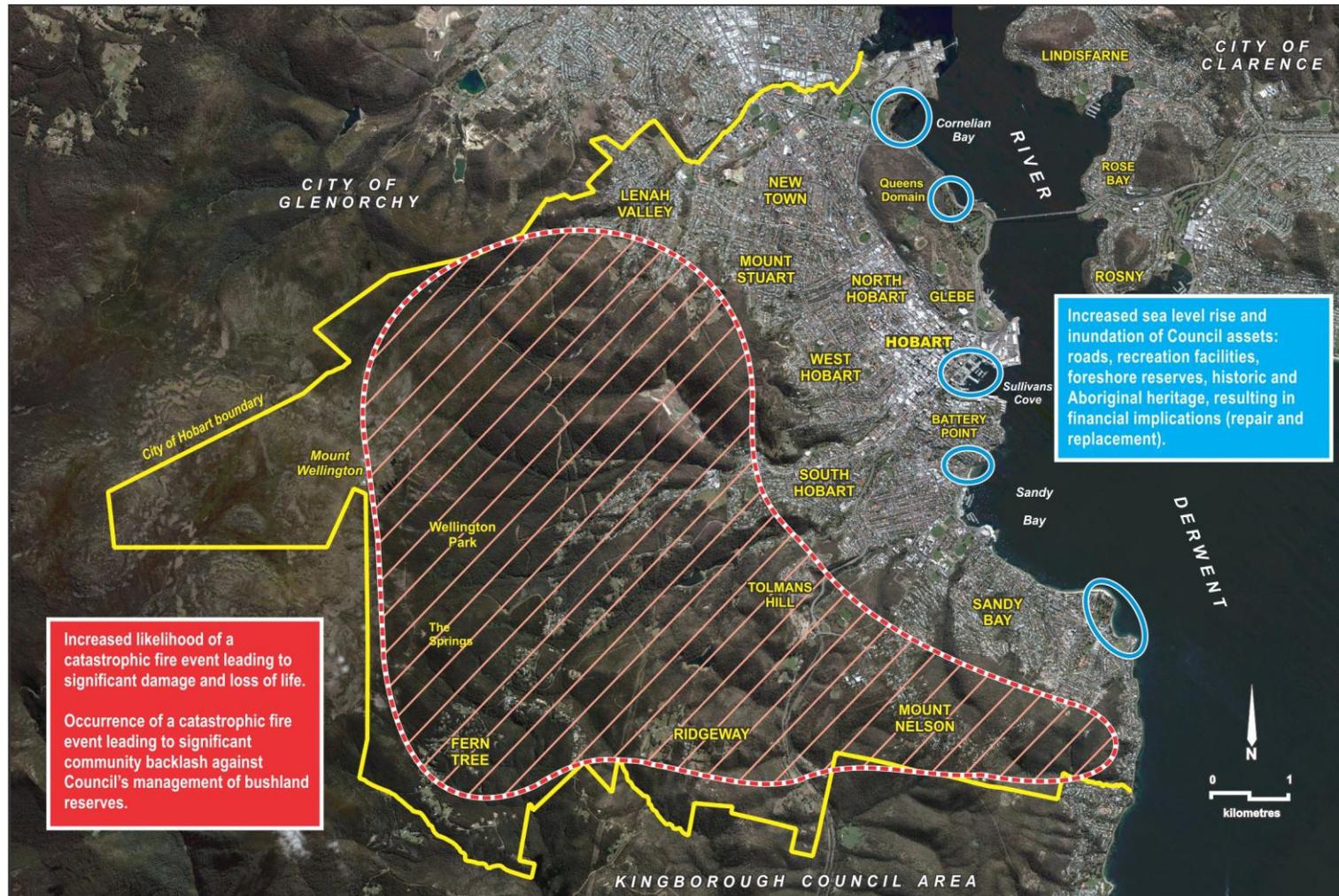


Figure 1 Hobart City Council Risk Map

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Abbreviations

| | |
|-------|---|
| ALGA | Australian Local Government Association |
| BMK | Baker and MacKenzie |
| CFT | Climate futures Tasmania |
| CCAP | Corporate Climate Change Adaptation Plan |
| LGRF | Local Government Reform Fund |
| RCAS | Regional Climate Adaptation Strategy |
| RCCAP | Regional Councils Climate Change Adaptation Project |
| RCCI | Regional Climate Change Initiative |
| SMA | Shaun MacElwaine + Associates |
| STCA | Southern Tasmanian Councils Authority |
| TCCO | Tasmanian climate Change Office |

1. Introduction

1.1 Project Background

The Regional Councils Climate Adaptation Project (RCCAP) aims to improve the capability and resilience of Tasmanian councils to manage the risks of climate change. The 'pilot' phase of the project was conducted in Tasmania's Southern Region. The project's key outputs are:

- Council (corporate) Climate Change Adaptation Plans for each of the 12 southern councils;
- a Regional Climate Change Adaptation Strategy covering themes common to all councils; and
- a Climate Adaptation Toolkit for review of Council's Adaptation Plans and extension to Cradle Coast and Northern Councils.

The Australian Government's Local Government Reform Fund (LGRF), administered by the Department of Regional Australia, Local Government, Arts and Sport, funded the RCCAP. The Hobart City Council also provided a financial contribution of 20% of the overall project funds.

The project was initiated by the Southern Tasmanian Councils Authority's (STCA) Regional Climate Change Initiative, a working group with representatives from each of the 12 Southern councils. It was delivered by the STCA in partnership with the Tasmanian Climate Change Office and the Local Government Association of Tasmania.

1.2 Project Context

The global climate is changing and extreme weather events and sea level rise will increase in the 21st century¹. It is now recognised that there are a range of potential future climate scenarios dependent upon the scale of effort achieved in reducing greenhouse gas emissions. Even if the composition of today's atmosphere was fixed (which would imply a dramatic reduction in current emissions), surface air temperatures would continue to warm by up to 0.9 °C². Under a 'best case scenario' where significant reductions in greenhouse gas emissions are achieved it is still necessary to initiate an adaptation response in order to minimise climate change impacts associated with the warming climate on infrastructure, economy, community and the environment.

In Australia, it is recognised by all tiers of government that it is appropriate and effective to manage climate change at a 'local' scale. The Australian Government recognises that Local Governments will be key actors in adapting to the local impacts of

¹ IPCC, 2011: Summary for Policymakers. In: Intergovernmental Panel on Climate Change Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C. B., Barros, V., Stocker, T.F., Qin, D., Dokken, D., Ebi, K.L., Mastrandrea, M. D., Mach, K. J., Plattner, G.-K., Allen, S., Tignor, M. and P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

² IPCC, 2007: Climate Change, 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning (eds.)].

climate change and their engagement will be a critical part of any national reform agenda³. It has produced publications aimed at assisting local government manage climate change risk⁴ and implement adaptation actions⁵. The Tasmanian Climate Change Office also works in a collaborative manner to support local government in climate change adaptation projects.

Scope is also afforded to Tasmanian councils to address climate change under the *Local Government Act (Tas) 1993*, which describes the role of councils to provide for the health, safety and welfare of the community; as well as represent and promote the interests of the community; and provide for the peace, order and good government of its municipal area.⁶

In managing and preparing for the impacts of climate change, Local Government is well positioned to work with communities due to its:

- core function to directly support and assist local communities;
- local knowledge and experience;
- understanding of community needs and vulnerabilities;
- key role in responding to emergencies;
- role in infrastructure design, construction and maintenance;
- role in review and update of planning schemes (in relation to identified local impacts and threats); and
- ability to effectively disseminate information and provide support to the community.

Pioneering work undertaken by the Clarence City Council with its community identified local government as the most trusted tier of government with regards to information on climate change⁷.

Local experience, in combination with relevant scientific data and technical expertise, provides the key inputs for undertaking a well informed 'risk management' approach to climate change. Moreover, effective adaptation requires a portfolio of actions, ranging from fortifying infrastructure, building capacity (individual and institutional) to advocacy and collaboration. There is also an appreciation that managing current and future risks in relation to climate change can have benefits (such as improving human well-being and protecting biodiversity) regardless of the magnitude of climate change that occurs. It is in this context that the RCCAP is based.

³ Department of Climate Change, 2010: *Adapting to climate change in Australia, an Australian Government Position Paper*

⁴ Australian Greenhouse Office, 2006: *Climate Change Impacts and Risk Management – a Guide for Business and Government*.

⁵ Department of Climate Change, 2009: *Climate Change Adaptation Actions for Local Government*.

⁶ *Local Government Act (Tas) 1993*. Section 20 Function and Powers.

⁷ SGS Economics and Planning, July 2007: *Socioeconomic Assessment and Response for the climate change impacts on Clarence's Foreshore, for the Clarence City Council*

1.3 Legal Implications of Climate Change Action

Councils are at the forefront of responding to climate change impacts and increasingly local communities are looking to their councils to provide solutions to adapt to, manage, transfer or share the risks associated with climate change impacts.⁸ A key consideration of councils in the face of climate change is potential liability that they are exposed to through their various statutory roles, powers and functions. A particular concern is the potential liability that councils are exposed to through their adopted action or inaction in particular circumstances.

Baker and McKenzie (BMK), in a report to the Australian Local Governments Authority on the risk of councils' climate change liability, outline a number of actions that councils may follow to reduce liability.⁹ These include:

- **exercising reasonable care when making planning decisions**, which involves taking care to ensure all relevant facts are known and understood, that relevant law is identified and understood, and that reasons for decisions are expressed in clear and accurate terms
- **keeping up to date with general climate change science and information**, particularly in relation to potential risks from natural hazards, relevant to their local government area
- **developing clear and certain criteria for decision making** to increase public confidence that decisions are made on the basis of the best available scientific evidence
- **increasing public consultation**, as this may improve transparency around decision-making processes and limit administrative review following consideration resourcing required to manage consultation process; and
- facilitating the **provision of information to property owners** on potential risks to property.

BMK also noted that there are a number legislative and policy frameworks that create barriers to effective climate change adaptation by councils. These included: lack of decision-making power, lack of consistency, and lack of clear guidance, materials, expertise and funding.¹⁰ They particularly advocated for a nationally consistent approach to managing climate change impacts on the coastal zone.

RCCAP engaged Shaun McElwaine + Associates (SMA)¹¹ to provide advice on the legal context within which the impacts of climate change reside and how they relate to Tasmanian councils as a whole.¹² SMA's advice is provided as an accompanying report to this plan. The advice, dated 18 December 2011, established that overall councils are not liable for existing use or development, nor are they likely to incur liability for 'no action' in response to climate impacts; however, should they take action they could be liable should that action cause harm or damage. It also considered that councils may be found liable for operational advice such as the assessment of planning applications and new developments.

⁸ Baker and McKenzie; 22 July 2011. 'Local Council Risk of Liability in the Face of Climate Change – Resolving uncertainties', a report for the Australian Local Government Association.

⁹ *Ibid* pp 82 – 83.

¹⁰ *Ibid* pp 75- 81

¹¹ A copy of the legal advice can be obtained by contacting the STCA

¹² This legal advice was considered alongside two similar reports:

- 'Legal issues for Local Government in addressing coastal erosion risks, a research report for Clarence City Council', Dr. McDonald, 18 March 2011
- 'Local Councils Risk of Liability in the Face of Climate Change Resolving Uncertainties', a report for the Australian Local Government Association', Baker and McKenzie, 22 July 2011.

Overall SMA's advice is consistent with the legal comments provided in these two reports.

The advice also noted that while the development and adoption of a [council's CCAP] 'climate risk plan and/or climate change adaptation action(s)' was positive it would also set the standard for the discharge of the duty of care. Thus if a council did not take the climate risk plan and or action(s) into consideration when making operational decisions it may become liable for the consequences of the operational decision.¹³

The advice contained three actions that could be undertaken by the State Government to reduce Tasmanian council's exposure and potential liability.

1. Amendment to the *Local Government Act (Tas) 1996* by the State Government to insert an equivalent section to that of the s733 *Local Government Act (NSW)* that exempts local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are undertaken in good faith and in accordance with manual(s) prepared by the State Government.
2. Review of the State Coastal Policy 1996 by the State Government so as to provide clarity on what is required to satisfy its requirements, i.e.
 - how planning schemes must deal with the impacts of climate change
 - provide specific recommendations and guidelines to manage climate change impacts
 - set prescribed levels for sea level rise in developed coastal regions throughout the State.
3. Formulation of a state-wide code to deal with climate change impacts (with the outcome to achieve a uniform set of provisions across the State) that:
 - is measurable, i.e. contains specific development controls
 - removes decision making from planning authorities
 - does not require risk analysis
 - sets prescribed levels for sea level rise in developed coastal regions throughout the State.

It is considered that the SMA's recommendations whilst reasonable and sound are unlikely to be successful or progressed in timely or efficient manner. Therefore reflecting on SMA's full advice, and to address the barriers to effective climate change adaptation identified by BMK, it is prudent and sagacious for the Council, through the STCA's RCCI or as an individual council to advocate for the Tasmanian Government to:

- play a more active role in the provision of information and guidance in relation to climate change and natural hazards, particularly in coastal areas; and
- consider exempting local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are undertaken in good faith and in accordance with manual(s) prepared by the Tasmanian Government.

The progression of this advice is considered through section 3 of this Plan: Corporate Adaptation Actions and the Regional Adaptation Strategy.

Disclaimer

The purpose of this advice is for the Council generally and the Council should not rely upon it. No liability is accepted for the content of the advice, or for the consequences of any actions taken on the basis of the information provided. If the Council wishes to rely upon the advice it is recommended that they seek their own advice prior to doing so.

¹³ McElwaine, 2011, p. 24.

1.4 Purpose and scope

This adaptation plan is the foundational climate adaptation plan for the Hobart City Council. It introduces adaptation planning methods and aims to improve the capability of the Council to manage the risks associated with climate change.

The risks and adaptation actions identified through this Plan are based on council-specific, climate projection data provided by the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) 'Climate Futures for Tasmania' (CFT) program. Detail of the climate projections for Hobart City Council is given in Section 2. The Plan identifies potential climate change risks within the context of currently available climate change data. Scientific research and modelling of climate change is continually evolving. Therefore, there is a potential that future climate change projection data may require reassessment of the risks, actions and timeframes identified in this Plan.

Specific outputs from the modelled climate scenario for Hobart, such as future rainfall patterns, extreme events, bushfire likelihood and projected sea level rise formed the basis of 'risk management' and 'adaptation action' workshops held with council staff in development of this plan. Workshops were conducted in a manner consistent with the International Organisation for Standardisation (ISO) 31000:2009 Standard for Risk Management as well as the Australian Government publication *Climate Change Impacts and Risk Management: A Guide for Business and Government*. Full details of the project methodology are documented in Appendix A.

Outputs of the workshops conducted with council staff underlie the content of this Plan. The Plan is structured so that prioritised adaptation actions have been allocated to risk treatment themes that apply across the Council. Each Adaptation action has associated roles, responsibilities and timeframes.

The Plan also presents adaptation actions to manage risks that are within the Council's sphere of influence, but are the responsibility, to some degree, of other organisations (such as State Government Agencies, Community Groups and Private Corporations). The primary purpose of the 'stakeholder' section of this Plan is to ensure there is: clear understanding of roles and responsibilities; clarity as to where partner organisations are at in managing climate change risk; and identification of collaborative opportunities for managing risks that are relevant to local communities.

This adaptation Plan incorporates an 'implementation plan' to ensure there is:

- a consistent process for adaptation planning by the southern regions councils;
 - a logical way for incorporation of key local risks and adaptation actions into the Council's documents and processes such as risk registers, strategic plans, annual plans or asset management plans;
 - an appropriate mechanism to implement sub-regional and regional adaptation actions either through advocacy or collaboration; and
 - a mechanism for plan review and updating.
-

2. Projected Climate Change & Council's Corporate Risks

This section presents:

- An overview of the Council's corporate risks
- Summarised scientific climate projections for each of the key climate impacts: Temperature, Rainfall, Sea level rise, Bushfire and Other
- Risk statements for the priority climate change risks identified by Council staff through two corporate climate risk assessment workshops

The climate risk assessment workshop, undertaken with the Council's staff, resulted in the development of 237 initial risk statements these were subsequently evaluated and refined into 156 statements as follows:

- **15 Extreme risks**
- **17 High risks**
- **126 Moderate risks**
- **30 Low risks**

Figure 2 outlines the likelihood and consequence distributions of the initial risk suite, prior to their evaluation.

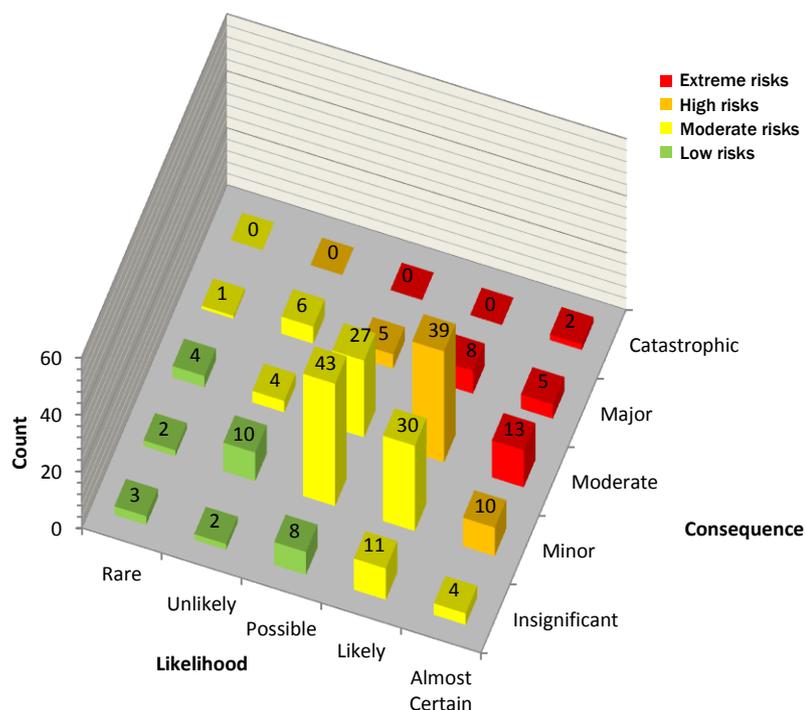


Figure 2: Distribution of climate change risk ratings for Hobart City Council

During the risk evaluation session, particular attention was paid to the moderate and high risks to determine whether any inconsistency had not inadvertently promoted or relegated a priority risk (high and extreme). Following evaluation, the 81 initial priority risks were reduced to 32.

These were considered as priority risks and adaptation actions were developed around these in the next stage of the project (Section 3). The distribution of risks across climate impact is shown in Figure 3.

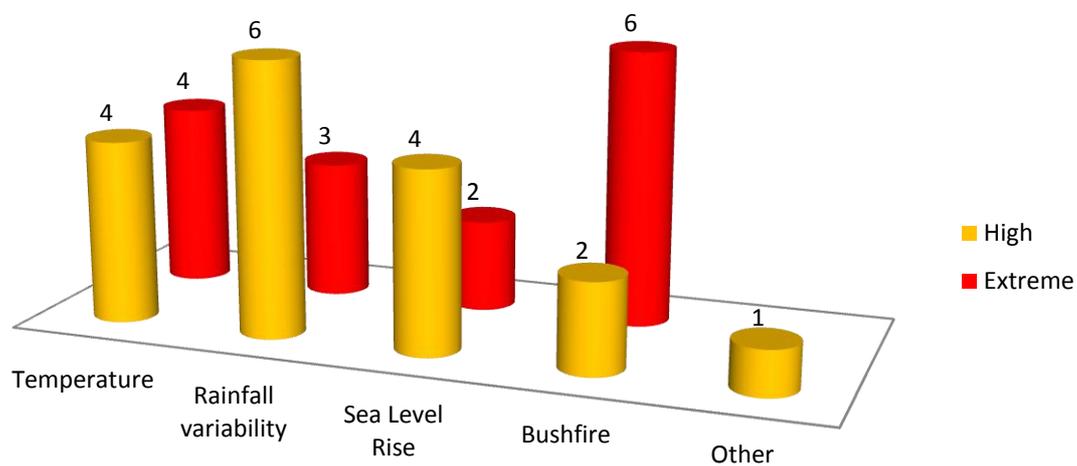


Figure 3: Distribution of Hobart City Council priority risks across climate impact

TEMPERATURE

at a Glance

Climate Change Projections

(A2 emission scenario)

By 2100 across Hobart's municipal area:

- Average annual temperatures are projected to increase by 2.6°C – 3.3°C.
- The number of days over 25°C is expected to increase by 120% or 22 days.
- The temperature of very hot days to increase by up to 3°C.
- Warm spells (days in a row where temperatures are in their top 5%) will increase by up to 6 days.
- Extended heat waves and more extreme temperatures are likely to enhance the occurrence and intensity of bushfires.
- Frosts incidents will reduce by 9 days

(from Local Climate Profile Hobart - Climate Futures Tasmania)

Key Vulnerabilities

Increased heat in Hobart may result in:

- Greater frequency and intensity of bushfires
- Degradation of Council owned assets such as roads and footpaths
- Increased incidences of food related illness in households
- Increase in vector borne disease as their ranges increase
- An increase in heat related mortality particularly in vulnerable demographics such as the elderly, very young and chronically ill
- New invasive weed and pathogen species impacting on local biodiversity

2.1 Temperature

Rising average temperatures and more frequent extreme temperature events have the potential to contribute to a variety of impacts including heat related illness and mortality, particularly in vulnerable demographics such as the very young, elderly and chronically ill, along with an increase in the range of vector related diseases such as Ross River fever. Impacts may also be incurred on the Council's infrastructure and property as well as the natural environment.

2.1.1 Increase in average temperature

A number of priority risks were identified for increases in average temperature associated with climate change as shown in Table 1. Examples of priority risks included reduction in the lifecycle of assets and public safety issues, increased prevalence of vector borne diseases and increased pressure on resource allocation associated with 'climate refugee's' moving to Hobart.

Table 1: Priority risks associated with an increase in average temperature, hot days and drought for the Hobart City Council

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|-------------------------------|---|------------------|------------|---|--|
| • Council owned assets | | | | | |
| AT1 | Increase temperature leading to degradation in asset quality or reduction in design suitability therefore leading to public safety issues | Public Safety | High | <ul style="list-style-type: none"> Infrastructure and Property | <ul style="list-style-type: none"> Department of Infrastructure, Energy and Resources Southern Water |
| • Migration | | | | | |
| AT2 | Increased average temperature leading to increased interstate migration into Hobart resulting in pressure on the Council to provide services | Service Delivery | High | <ul style="list-style-type: none"> All Council services | <ul style="list-style-type: none"> Department of Infrastructure, Energy and Resources Dept Health and Human Services Southern Water |
| • Community Wellbeing | | | | | |
| AT3 | Increased average temperature resulting in increases in the occurrence of vector, mycology and water born disease leading to increased demand on the Council's environmental health resources | Public Safety | Extreme | <ul style="list-style-type: none"> Environmental Health Community Development | <ul style="list-style-type: none"> Department of Health and Human Services |
| • Natural Resources | | | | | |
| AT4 | Increased average temperature leading to reduced viability of alpine and montane ecological communities resulting in ecological degradation. | Environmental | Extreme | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment, Wellington Park Trust Community Groups |

2.1.2 Increase in hot days

An increase in the number of hot days can result in a number of impacts including human health issues, reduced productivity and increased electricity use for cooling. Abrupt changes of temperatures leading to ‘heat waves’ can trigger a number of priority risks such as, causing indirectly fatal illnesses, such as dehydration and heat stress, increased costs associated with cooling and greater stress for coping ranges of ecological communities. In the context of this plan, ‘heat waves’ are relative to the community’s coping range and extended periods of hot days outside of the normal range experienced may have significant impacts across the community.

Table 2: Priority risk associated with an increase in hot days for the Hobart City Council

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|----------------------------|---|------------------|------------|---|--|
| Community Wellbeing | | | | | |
| HD1 | Prolonged hot periods leading to increased incidence of heat stress in vulnerable communities (e.g. elderly) resulting in service delivery impacts to the Council | Public Safety | High | <ul style="list-style-type: none"> Environmental Health Community Development | <ul style="list-style-type: none"> Department of Health and Human Services |
| HD4 | Increase in hot days leading to increased incidence of food and water supply (from private water tanks and systems) borne disease resulting in increased demand on the Council’s resources to investigate/follow up | Public Safety | High | <ul style="list-style-type: none"> Environmental Health Community Health | <ul style="list-style-type: none"> Department of Health and Human Services |
| Energy Use | | | | | |
| HD2 | Increased reliance on power for cooling resulting in increased costs to the Council | Financial | High | <ul style="list-style-type: none"> General Manager and Executive Leadership Team Infrastructure and Property Finance | <ul style="list-style-type: none"> Department of Infrastructure, Energy and Resources |
| Natural Resources | | | | | |
| HD3 | Stress on ecological communities resulting in increased demand on the Council’s management of natural assets and resources | Service Delivery | High | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment |

RAINFALL at a Glance

Climate Change Projections

(A2 emission scenario from Climate Futures Tasmania)

By 2100 across Hobart's municipal area there will be:

- A tendency for heavier rainfall interspersed by longer and more severe droughts
- An increase in average rainfall in all seasons
- Wettest days of the year will increase by 25%
- Extreme rainfall events (200 yr ARI) will increase by 30 – 40 %
- Current coastal inundations 100 year ARI events will become 2 – 6 year ARI events
- Pan evaporation will increase by 19%

(from Local Climate Profile Hobart - Climate Futures Tasmania)

Key Vulnerabilities

Increased rainfall variability across Hobart's municipal area may result in:

- Reduced water availability due to droughts impacting on recreation and local amenity of parks and recreational reserves
- Impacts on biodiversity as rainfall variability is outside of resilience of natural systems
- Increased in flooding and landslip incidents
- Reduced relative capacity of the Council's stormwater infrastructure leading to a need for greater expenditure in order to maintain current service levels
- Low lying areas being subject to increased flooding
- Increased incidence in erosion and sedimentation of waterways

2.2 Rainfall

Potential impacts associated with changes in rainfall and runoff are variable and will depend on the direction and intensity of change. Examples of impacts in Hobart's municipal area will likely include flooding of infrastructure and property, increased erosion of waterways, water security decline and environmental quality decline.

2.2.1 Identified risks - rainfall variability

Climate change is projected to bring about increased rainfall variability for Hobart’s municipal area that includes increased annual and seasonal rainfall combined with more frequent and intense peak rainfall events. Examples of priority rainfall variability risks for Hobart include increased drought periods impacting on maintenance of parks and gardens and social isolation arising from extreme events, particularly for vulnerable community groups. Priority risks associated with increased rainfall variability in Hobart City are provided in Table 3.

Table 3: Priority risks associated with increased rainfall variability for Hobart’s municipal area.

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|--------------------------------|---|------------------|------------|--|--|
| Natural Resource | | | | | |
| RV1 | Increased rainfall variability resulting in long term ecological changes with possible loss or migration of species (flora and fauna) | Environmental | Extreme | • Natural Assets | • Department of Primary Industries Parks, Water and Environment |
| RV2 | Increased rainfall variability leading to alteration to weed infestation patterns- potential expansion to abundance and ranges | Environmental | High | • Natural Assets | • Department of Primary Industries Parks, Water and Environment |
| Recreational Facilities | | | | | |
| RV3 | Extended drought affecting playing fields/sportsgrounds- leading to decreased service provision and increased water use (irrigation) | Service Delivery | High | • Infrastructure and Property • Finance | • Southern Water |

2.2.2 Identified risks - Increased flooding

Increased flooding was viewed as a significant climate impact for Hobart. Table 4 shows the priority flooding risks applicable to the Hobart City including impacts on infrastructure and environment.

Table 4 Priority risk associated with increased flooding for Hobart’s municipal area.

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|----------------------------|--|------------------|------------|-------------------------------------|--------------------|
| Waterways – erosion | | | | | |
| FL1 | Increase in flooding resulting in increased bank erosion leading to environmental degradation of waterways | Environmental | High | • Natural Assets | |
| Flash Flooding | | | | | |
| FL2 | Increase in peak flows resulting in: flash flooding events, reduced recreational water quality and associated decrease in public safety | Public Safety | High | • Infrastructure and Property | |
| FL3 | Increase in peak flows resulting in flash flooding events and associated damage to Council assets (including roads, buildings, tracks etc.). | Service Delivery | Extreme | • Infrastructure and Property | |

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|----------------------------------|--|------------------|------------|--|---|
| Private asset devaluation | | | | | |
| FL4 | Increase flooding leading to declining property values of the Council and private assets in flood prone areas | Financial | High | <ul style="list-style-type: none"> Infrastructure and Property Corporate | |
| FL5 | <i>Increase flooding events resulting in staff shortages, due to isolation by flood events and reduced emergency service capacity.</i> | Service Delivery | High | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> State Emergency Services |
| FL6 | <i>Increased in intense rainfall leading to reduced potable water quality for domestic supply</i> | Service Delivery | Extreme | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment, Department of Health and Human Services, Southern Water |

SEA LEVEL RISE & STORM SURGE

at a Glance

Climate Change Projections

(A2 emission scenario from Climate Future Tasmania)

- Sea level is predicted globally to increase by 0.82 m by 2100
- The current 100-year ARI storm tide event is around 0.9 to 1.4 m above average sea level and is projected to be 1.87 m in 2090
- The current 100-year ARI coastal inundation event may become a 50 year ARI event by 2030 and a 2 to 6 year ARI event by 2090

Key Vulnerabilities

Sea level rise and storm surge impacts on Hobart's municipal area may result in:

- Increased erosion of foreshore areas within the municipal area
- Increased damage and replacement costs of council infrastructure such as roads, stormwater systems and recreational facilities
- Flooding due to reduced capacity of stormwater infrastructure during storm surge events
- Litigation for impacted developments in vulnerable areas
- Loss of salt marsh and wetland areas and distribution

2.3 Sea Level Rise and Storm Surge

Sea levels around the Tasmanian coastline have risen 18 centimetres over the past 100 years. This trend is projected to continue with inundation along Hobart's coastal frontage increasing.

The current 100-year ARI storm tide event is around 0.9 to 1.4 m above average sea level, and accounting for sea level rise (0.82 m) and high-river flows, the current 100-year ARI coastal inundation event may become a 50-year ARI event by 2030, and a 2 to 6-year ARI event by 2090.

Changes in gradual sea level combined with more extreme storm surge events will trigger a range of impacts on Hobart's municipal area such as degradation of stormwater and road infrastructure and impacts on residential property assets.

Sea level rise mapping overlays were produced by 'LiDAR' digital elevation modelling (DEM) as part of the Tasmanian Coastal Inundation Mapping Project (A component of Climate Futures for Tasmania project). The DEM is currently limited to about a

third of the Tasmania coast including most of the populated areas. Sea level rise mapping for Hobart’s municipal area is presented in Figure 4.

The sea levels modelled under the project were at set heights above the National Tidal Centre (NTC) high water mark and were: 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.6 and 2.0 metres. The landward edge of the mapped sea level rise ‘footprints’ indicates the potential location of the ‘back of the beach’ or upper part of the shore in the future. These height values were set by the Tasmanian Planning Commission to enable visualisation of these heights and evaluation of the impact of such sea levels.

Limitations

The ‘permanent sea level rise’ approach makes use of a simple geographic modelling method that includes a limited set of the contributing factors to inundation of the shoreline. This ‘bathtub’ method is essentially a passive model and assumes a calm sea surface. The method does not account for the complexity of the full range of interacting factors and forces that actually occur on the shoreline such as erosion, soil types, wave climate, wind, freshwater flooding or event timing and clustering.

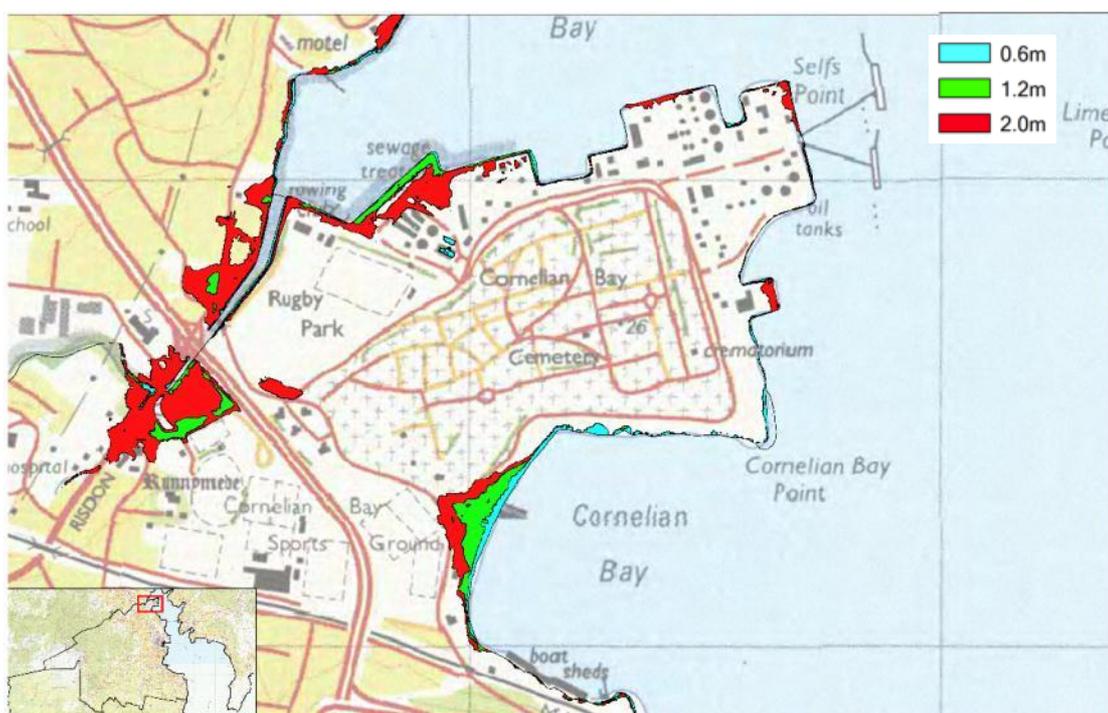




Figure 4: Sea level rise inundation mapping for Hobart's municipal area for the year 2100

Identified Sea level rise and storm surge risks

Sea level rise and storm surge was viewed as the most significant impact associated with climate change for Hobart, accounting for 6 priority risks are shown in Table 5, which shows a wide range of potential impacts such as inundation of estuarine and salt marsh communities, impacts on property and infrastructure and inappropriate landuse planning decisions which do not account for potential impacts of sea level rise and/or storm surge.

Table 5: Priority risk associated with an increase in sea level rise and storm surge risk for Hobart.

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|---|---|------------------|------------|---|--|
| Council owned and private assets | | | | | |
| SL1 | Increase in storm surge leading to increased damage to the Council's assets (roads, buildings, tracks etc.) | Financial | High | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | |
| SL2 | Increase in sea level rise and storm surge leading to impacts on cultural heritage assets- boathouses, jetties and middens; tourism and community infrastructure resulting in reduced revenue | Reputation | High | <ul style="list-style-type: none"> Corporate | |
| Planning and legal | | | | | |
| SL4 | Increase in sea level rise and storm surge leading to property damage and potential liability due to inadequate planning controls | Financial | Extreme | <ul style="list-style-type: none"> Planning | |
| Natural Values | | | | | |
| SL3 | Increase in sea level rise and storm surge leading to erosion impacts across the foreshore reserves and recreation areas | Reputation | High | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Crown Land |
| SL5 | Increase in sea level leading to inundation of freshwater ecological systems resulting in environmental degradation | Environmental | High | <ul style="list-style-type: none"> Natural Assets | |
| SL6 | Increase in storm surge leading to loss of coastal habitat through increased erosion | Environmental | High | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment |

BUSHFIRE

at a Glance

Climate Change Projections

(A2 emission scenario)

- An increase in projected bushfire likelihood and intensity across Southern Tasmania's central and western regions

(BRAM; Antarctic Climate Ecosystems 2011)

Key Vulnerabilities

- Significant community disruption leading to a range of public health and safety issues
- An increase in the maintenance and replacement costs of council and community infrastructure and assets
- Major impacts on Hobart's and Greater Hobart area's natural environment

2.4 Bushfire

It is recognised that a number of key climate change projections including higher temperatures, longer heat waves and drier summer conditions align with conditions suitable for bushfire. On that basis, bushfire modelling has been conducted for the southern region using the Tasmanian Bushfire Risk Assessment (BRAM), developed by the Tasmanian Parks and Wildlife Service specifically for the RCCAP. Climate change projections from the CFT project (A2 scenario) were entered into the BRAM to model bushfire scenarios for the following periods: baseline (1969 – 1990); near future (2010- 2039); mid century (2040 – 2069) and end of century (2070 -2099).

Outputs from the model demonstrate that climate change may result in increased bushfire risk across Tasmanian, particularly within the central plateau and areas to the west of the southern region. With Tasmania's large scale weather pattern predominantly bringing weather to the southern region, the entire region is placed at greater risk. This is likely to be exacerbated with changes to and intensification of land use activities.

2.3.1 Identified risks - bushfire

A total of 8 (25%) priority bushfire risks were identified for Hobart's municipal area. These are given in Table 6.

Table 6: Priority risks associated with bushfire risk for the Hobart City Council

| | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|---|--|-------------------------|------------|--|---|
| Planning and legal | | | | | |
| FR1 | Increase in fire risk leading to further reliance of LUPPA Part 5 agreements/permit conditions relating to bushfire hazard management plans, increasing greatly council's enforcement resources. | Service Delivery | Extreme | <ul style="list-style-type: none"> Natural Assets Planning | |
| FR2 | Potential isolation of vulnerable areas leading possible loss of life and infrastructure, resulting in potential liability issues for Council. | Financial | Extreme | <ul style="list-style-type: none"> Infrastructure and Property | <ul style="list-style-type: none"> Department of Infrastructure, Energy and Resources, |
| Council resources and service delivery | | | | | |
| FR3 | Increased fire risk leading to diversion of on-ground council resources resulting in reduced service delivery in other areas | Service Delivery | High | <ul style="list-style-type: none"> Corporate | <ul style="list-style-type: none"> State Emergency Services |
| Natural values | | | | | |
| FR4 | Increased fire occurrences reducing the loss of environmental values and changed character, amenity and desirability by residents, community and tourists. | Community and lifestyle | High | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Tasmanian Fire Service Community Groups |
| FR7 | Occurrence of a catastrophic fire event leading to significant community backlash against Council's management of bushland reserves | Reputation | Extreme | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Tasmanian Fire Service State Emergency Services |
| FR8 | Increased fire risk leading to increased pressure on reserves- more frequent prescribed burning, larger buffer zones adjacent to developments. | Environmental | Extreme | <ul style="list-style-type: none"> Natural Assets | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment, Tasmanian Fire Service |
| Community wellbeing | | | | | |
| FR5 | Increased likelihood of a catastrophic fire event leading to loss of life | Public Safety | Extreme | <ul style="list-style-type: none"> Corporate | <ul style="list-style-type: none"> Department of Primary Industries, Parks, Water and Environment, Tasmanian Fire Service State Emergency Services Tasmanian Police |
| Council assets and infrastructure | | | | | |
| FR6 | Increased likelihood of a catastrophic fire event leading to significant damage and loss of Council and public and private assets and infrastructure | Service Delivery | Extreme | <ul style="list-style-type: none"> Infrastructure and Property | <ul style="list-style-type: none"> Aurora Energy Southern Water |

2.4 Other

2.4.1 Increase in atmospheric CO₂

The Australian Government's introduction of a carbon tax was the only priority climate change risk associated with increases in atmospheric CO₂. The biggest challenge to Hobart City Council associated with the introduction of a carbon tax includes costs associated with fleet and plant fuel, and the cost of energy supply for the services it provides to the community.

Table 7: Priority risk associated with an increase in atmospheric CO₂ for the Hobart City Council

| Risk Code | Risk Statement | Success criteria | Risk Level | Council services primarily affected | Other stakeholders |
|-----------|--|------------------|------------|---|--------------------|
| CO1 | Introduction of carbon tax resulting in general increase in cost of Council operations | Financial | High | <ul style="list-style-type: none"> Finance | |

3.0 Corporate Adaptation Actions

This section presents Strategic Adaptation Actions and Corporate Adaptation Actions for treatment of priority climate change risks (those rated as ‘extreme’ or ‘high’) identified by Hobart City Council staff.

3.1 Strategic Adaptation Actions

Strategic priorities are broad level climate change adaptation actions that do not specifically address a particular area or risk and fall across numerous Council service areas. Success of such actions is dependent on senior management support. Implementation of strategic actions will provide the Council with a solid framework in climate change adaptation and will build an internal culture that supports the implementation of the more specific adaptation actions identified by the Council, described in subsequent sections.

3.1.1 Legal liability

A key consideration for the Council in the face of climate change is the potential liability that it is exposed to through its various statutory roles, powers and functions. A key ‘legal’ concern is the potential liability that it is exposed to through its adopted action or inaction in particular circumstances. Legal advice by BMK to ALGA established (refer to Section 1.3) that councils may reduce its liability by:

- exercising reasonable care when making planning decisions,
- keeping up to date with general climate change science and information,
- developing clear and certain criteria for decision making;
- increased public consultation within resource constraints, and
- facilitating the provision of information to property owners on potential risks to property

Legal advice sought by RCCAP, specific to the circumstance of Tasmanian councils, established overall councils will not be liable for existing use or development, nor are they likely to incur liability for ‘no action’ in response to climate impacts, however should they take action they could be liable should that action cause harm or damage. It also considered that councils may be found liable for operational advice such as the assessment of planning applications and new developments.

The legal advice contained three options, refer to Table 8, that could be pursued with the State Government and/or in their own capacity to reduce their exposure and potential liability.

Table 8: Potential corporate actions for the Council to pursue in relation to minimisation of its potential legal liability.

Amendment to *Local Government Act* (Tas) 1996, by the State Government, to insert an equivalent section to s733 *Local Government Act* (NSW) that exempts local governments for civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are done in good faith and in accordance with manual/s prepared by the State Government.

Review State Coastal Policy 1996 or develop and appropriate Framework that is specific about: how planning schemes must deal with the impacts of climate change; provides specific recommendations and guidelines for managing climate change impacts; and sets prescribed levels for sea level rise in developed coastal regions.

Formulation of state-wide codes to deal with climate change impacts to achieve a uniform set of provisions across the State that: contain specific development controls; removes decision making from planning authorities; does not require risk analysis; and sets prescribed levels for sea level rise in developed coastal regions throughout the State.

Overall it was considered that these actions are more appropriately pursued through a regional approach (refer to the Regional Climate Change Adaptation Strategy compiled under the Regional Climate Change Adaptation Project) and that in the near future they are unlikely to have timely or satisfactory outcome. To this end it is proposed that in addition to the above recommendations that the Council directly advocate to the State government to

- Play a more active role in the provision of information and guidance in relation to climate change and natural hazards, particularly in coastal areas
- Consider exempting local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are undertaken in good faith and in accordance with manual(s) prepared by the Tasmanian Government

3.1.2 Strategic Corporate Actions

There are key overarching corporate functions that minimise the Council’s risk in the face of extreme events posed by climate change including: incorporation of climate change risks into the Council’s risk register in relation to minimising the risk of litigation in relation to extreme events; incorporation of climate change planning into strategic, annual and financial planning; and developing a process for communication. Success of such actions is dependant the allocation of suitable resources and on senior management support. Implementation of strategic actions will provide Council with a solid framework in climate change adaptation and will build an internal culture that supports the implementation of the more specific adaptation actions described earlier. Potential overarching corporate actions for the Council to pursue are provided in Table 9.

Table 9: Potential overarching corporate actions

| | |
|----------|---|
| 1 | Corporate Climate Adaptation Implementation Team : Establish a Corporate Climate Adaptation Implementation Team to coordinate the Plan’s implementation, review and update |
| 2 | Risk Register Migrate corporate climate risks and treatments, over time as they become more fully established, into the Council’s existing risk management framework |
| 3 | Emergency Management Planning and Recovery Management Ensure that the projected impacts of climate change are properly considered in Council’s emergency management planning. Emergency response and recovery plans should consider the best available climate change projections. Up to date emergency response and recovery procedures can minimise consequences when extreme events occur |
| 4 | Communication Develop and implement a climate change communication and education plan for the Council’s staff and that will form the basis for a broader community communication. Increased staff capacity and awareness will assist in incorporating climate change scenarios and impacts into policy and decision making processes. |
| 5 | Other Council Plans & Strategies Integration of climate risks and adaptation actions the Council’s Strategic & Annual Plan, strategies, policies and plans. The climate impacts and risk process outlined throughout this Adaptation Plan should be considered in the development of future plans, policies and strategies. This will also ensure there are a range of potential internal mechanisms for important actions to be implemented. |
| 6 | Reporting Develop climate adaptation related key performance indicators into the Council’s Annual Report and provide biannual summary report to Executive Leadership Team. |
| 7 | Regional Action Support the STCA in engaging with relevant State Government departments to identify and address gaps in planning instruments, policies, funding and legislation and where required, support the implementation of the Regional Councils Climate Change Adaptation Strategy |

3.2 Corporate Adaptation Actions

A total of 42 actions were identified for management of the Hobart City Council priority risks. Climate change adaptation actions have been documented in this Section of the Plan according to the type of adaptation action. These include:

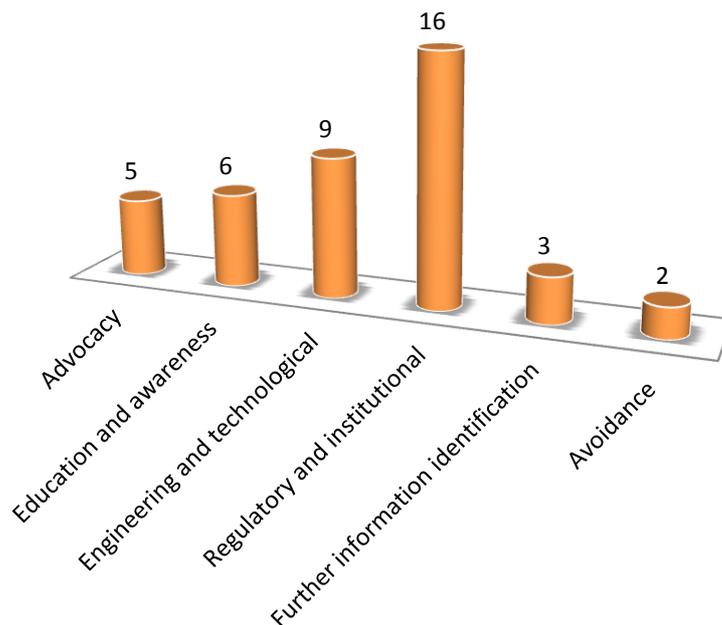


Figure 5 Hobart City Council's corporate adaptation actions grouped by treatment types.

The grouping of actions by treatment types seeks to drive a Council-wide approach to adaptation planning. This will facilitate cost effective pathways for the Council to implement common adaptation actions (e.g. Further Information, Communication Plans) that cross multiple Council Divisions. Notwithstanding this in some cases there are adaptation actions that are discreet (e.g. hard engineering measures) and relate only to a particular Division, where this is the case these actions are clearly identified within this Plan.

The ultimate objective of this adaptation action plan is to provide an initial framework of actions for the Council. To guide implementation, each action is complimented with the following information:

- Timeline for delivery
- Other stakeholders responsible for delivery
- Estimated cost for implementation
- Relevant Council documents and strategies
- Ease of implementation
- Risks treated

3.2.1 Advocacy

Advocacy actions are those that seek to influence and /or collaborate with other spheres of government on policy, resourcing and other issues to manage risks which may affect Hobart City Council and local government adaptation planning. These actions relate to influencing other spheres of government and stakeholders on policy, resourcing and other issues effecting the implementation of climate change adaptation by local government. Examples of actions include advocating to State Government for clearer direction on planning responses for sea level rise and flooding impacts and advocating to Southern Water to ensure that climate change risks are being factored into the design, engineering and operation of water and wastewater treatment plants.

Advocacy options for treatment of priority climate change risks impacting on Hobart City Council are documented below.

Table 10: Advocacy actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|---|---|---------------------------------|------------------------|-----------------------|--|---|--|--|---|
| Infrastructure and property, Planning and community health | | | | | | | | | |
| 1 | Collaboration with neighbouring councils and authorities for coordinated management of areas by climate change impacts affected areas (SES, Fire, Police, Tas Ports and Southern Water etc.) | \$ | Easy | Immediate | <ul style="list-style-type: none"> Environmental Engineering Unit Community Development Parks & Recreation Strategy & Governance Development & Environment Services | <ul style="list-style-type: none"> MOU between HCC and State Emergency Services Climate Change Strategy Social Inclusion Strategy, Positive Aging Strategy Hobart Recreational Management Plan Fire Management Strategy | <ul style="list-style-type: none"> FL2 SL1 SL3 HD1 RV3 FL15 SL9 | <ul style="list-style-type: none"> High High Extreme High High Extreme High | <ul style="list-style-type: none"> Moderate Moderate Low Moderate Moderate Moderate Moderate |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|--|--|---------------------------------|------------------------|-----------------------|--|--|---------------|---------------------|--------------------|
| 2 | Increase rates to accommodate additional costs associated with the carbon tax | \$\$ | Medium | Short Term | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> Climate Change Strategy Asset Management Plan 20 year Financial Plan | CO 2 | High | Moderate |
| Natural Assets and Fire Management, Planning and Community Health | | | | | | | | | |
| 3 | Advocate to State Government for consistent and best practice Planning Scheme Codes, Directives and State Policies regarding climate change impacts and State endorsed data on climate change impacts for risk management purposes | \$ | Easy | Medium Term | <ul style="list-style-type: none"> General Manager and Executive Leadership Team City Planning Unit, Strategy & Governance Bushland and Reserves | <ul style="list-style-type: none"> Planning Scheme Bushland Strategy Fire Management Policy 20 Year Financial Plan 2025 Vision Climate Change Strategy | SL 9 | Extreme | Low |
| | | | | | | | FR 1 | Extreme | Moderate |
| | | | | | | | FR 6 | High | Moderate |
| | | | | | | | AT 6 | Extreme | High |
| | | | | | | | RV 2 | Extreme | High |
| | | | | | | | AT 2 | High | Moderate |
| 4 | Increase resources toward weed management within councils managed areas (including support for Bushcare groups) | \$\$ | Medium | 5–10 years | <ul style="list-style-type: none"> Bushland and Reserves | <ul style="list-style-type: none"> Operational budget review | RV 2 | Extreme | High |
| Environmental Health | | | | | | | | | |
| 5 | Collaborate with State government and local government on risks associated with climate change related disease vectors | \$ | Easy | 5-10 years | <ul style="list-style-type: none"> Environmental Health | <ul style="list-style-type: none"> Municipal Public Health Plan Strategic plan Emergency and Recovery Management Plans | AT 3 | Extreme | Moderate |

3.2.2 Education and awareness:

Education and awareness raising actions are those where Council provides information to other stakeholders to drive climate change adaptation into areas beyond their sphere of influence. These actions typically consist of two aspects:

- *External* - increase public awareness about the potential impacts of climate change and climate change adaptation measures for treatment of priority climate change risks
- *Internal* - educate and inform Council management and personnel about climate change risks and adaptation measures

Examples of actions applicable to Hobart include public education campaigns to communicate high-risk areas associated with sea level rise and storm surge to the community, facilitation of workshops with local industry groups and communicating the findings from this Plan to key council staff. Education and awareness raising adaptation actions for treatment of priority climate change risks are provided below.

Table 11: Education and awareness actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|------------------------------------|---|---------------------------------|------------------------|-----------------------|---|---|---------------|---------------------|--------------------|
| Infrastructure and property | | | | | | | | | |
| 6 | Increase awareness of and educate the community on flood prone areas (e.g. warning signs, brochures, temporary or permanent signalling) and other climate change impacts that they will need to manage | \$ | Easy | Immediate | <ul style="list-style-type: none"> • Development and Environmental Services • Environmental Engineering Unit, • Architectural Projects • Open Space Group | <ul style="list-style-type: none"> • Catchment Management Plans • Flood Inundation Maps for major rivulets • HCC signage process | FL 3 | High | Moderate |
| | | | | | | | SL 1 | High | Moderate |
| | | | | | | | FL 3 | Extreme | Low |
| 7 | Promotion of retrofitting fire resistant features to existing homes | \$ | Easy | Immediate | <ul style="list-style-type: none"> • Development and Environmental Services | <ul style="list-style-type: none"> • Fire Management Policy/Tas Fire Service | FR 5 | Extreme | High |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|-------------------------|---|---------------------------------|------------------------|-----------------------|---|--|--|---|--|
| | | | | | <ul style="list-style-type: none"> Bushland Reserves Unit | | | | |
| 8 | Investigate options for addressing the impacts of natural hazard; such as bushfire, sea level rise and extreme storm events; on communities through voluntary initiatives such as Natural Hazard Management Plans | \$\$ | Medium | Immediate | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> Annual Plan Strategic Plan Bushfire Management Plans | FR 2 | Extreme | High |
| Whole of council | | | | | | | | | |
| 9 | Manage community expectations about climate change impacts | \$ | Easy | Immediate | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> Volunteer Management Framework Community Engagement Framework Emergency Management and Recovery Plan(s) Planning Scheme, Regional Planning Policy & New Plan State Bushfire Code Fire Management Strategy Municipal Public Health Plan Bushland Strategy | SL 3 SL 1 SL 4 HD 1 FR 4 FR 7 FR 8 FR 5 AT 4 RV 2 CO 1 | High High Extreme High High Extreme Extreme Extreme Extreme High | Moderate Moderate Moderate Moderate Moderate High High High High High Moderate |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|-----------------------------|--|---------------------------------|------------------------|-----------------------|--|---|---------------|---------------------|--------------------|
| | | | | | | <ul style="list-style-type: none"> • Climate Change Strategy • 20 year Financial Plan • Strategic Plan • Corporate Plan • Annual Plan • Marketing Strategy, • Planning Schemes, • GIS | FR 2 | Extreme | High |
| | | | | | | | FR 3 | High | Moderate |
| | | | | | | | FL 5 | High | Moderate |
| 10 | Ensure appropriate strategies and community awareness are in place to negate and manage negative community responses to climate change impacts such as sea level rise, flooding, bushfire and extreme storm events | \$ | Easy | Immediate | <ul style="list-style-type: none"> • Development & Environment Services | <ul style="list-style-type: none"> • Communications Manual • Hobart Climate Change Strategy | SL 4 | High | Moderate |
| Planning | | | | | | | | | |
| 11 | Provide briefing and information Sessions to Alderman as Planning Authority about climate change and development implications regarding coastal inundation | \$ | Easy | Immediate | <ul style="list-style-type: none"> • Development & Environmental Services | <ul style="list-style-type: none"> • Planning Scheme | SL 4 | Extreme | High |
| Environmental Health | | | | | | | | | |
| 12 | Develop and implement more robust disease | \$ | Easy | 5-10 years | <ul style="list-style-type: none"> • Environmental | <ul style="list-style-type: none"> • Municipal Public Health Plan | AT 3 | Extreme | High |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|---------------------------------------|--|---------------------------------|------------------------|-----------------------|---|--|---------------|---------------------|--------------------|
| | monitoring programs for climate change related disease vectors. | | | | Health | | | | |
| Corporate Services and Finance | | | | | | | | | |
| 13 | Review suite of strategic planning tools to ensure that they incorporate endorsed Adaptation Plan outcomes. | \$ | Easy | Medium | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> Corporate Planning Documents | AT 2 | High | Moderate |

3.2.3 Engineering and technological:

Engineering and technological actions aim to prevent impacts posed by climate change through hard and soft engineering solutions and changed practices. These actions focus on reducing the exposure and vulnerability of current and planned infrastructure, including natural systems to the potential risks posed by climate change. Examples of engineering and technological adaptation actions identified by Hobart City Council include redesigning roads, re-design and retrofit of stormwater infrastructure and inclusion of riparian setbacks in new development areas. Engineering and technological adaptation actions are shown below.

Table 12: Engineering and technological actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|------------------------------------|--|---------------------------------|------------------------|-----------------------|--|--|---------------|---------------------|--------------------|
| Infrastructure and property | | | | | | | | | |
| 14 | Use of new materials in future projects which suit future climate projections | \$\$ | Medium | Immediate | <ul style="list-style-type: none"> Infrastructure Services Parks & Customer Services | <ul style="list-style-type: none"> Procurement. Asset Management Plans Design Standards Planning/DA Process, Bushland Strategy Parks and recreation AMP | AT 1 | High | Moderate |
| | | | | | | | FL 3 | Extreme | Moderate |
| | | | | | | | FR 6 | Extreme | High |
| | | | | | | | RV 3 | High | Moderate |
| 15 | Engineering solutions to decrease impacts from increased flooding (e.g. bank stabilisation, Water Sensitive Urban Design (WSUD), gabions, rock walls) | \$\$\$ | Medium | Long | <ul style="list-style-type: none"> Infrastructure Services Development Environmental | <ul style="list-style-type: none"> Design Standards, Asset Management Plans DA Planning | FL 1 | High | Moderate |
| | | | | | | | FL 2 | High | Moderate |
| | | | | | | | FL 4 | High | Moderate |
| | | | | | | | SL 1 | High | Moderate |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|------------------|---|---------------------------------|------------------------|-----------------------|---|---|------------------------------|---------------------------------|--|
| | | | | | Services • Parks & Customer Services | approvals, • Communication Strategy • Reserve Management Plans • Parks and recreation • Planning Schemes, • GIS, • Strategic Plan | SL 3 SL 5 RV 1 RV 3 | High High Extreme High | Moderate Moderate High Moderate |
| 16 | Implement engineering solutions to protect ecological communities that are vulnerable to sea level rise and inundation | \$\$\$ | Medium | 3-5 years | • Environmental Engineering • Open Space Group | • Asset Management Plan • Catchment Management Plans • Parks & Recreation | SL6 | High | Low |
| Waterways | | | | | | | | | |
| 17 | Revegetation of banks for stabilisation | \$ | Easy | Medium Term | • Environmental Engineering • Open Space Group | • Catchment Management Plans • Parks & Recreation | FL 1 | High | Moderate |
| 18 | Develop alternative facilities / activities / locations for foreshore type activities | \$\$\$ | Medium | Long Term | • Open Space Group | • Cornelian Bay Master Plan • Sandy Bay Master Plan | SL 3 | High | Moderate |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|---------------------------------|--|---------------------------------|------------------------|-----------------------|---|---|---------------|---------------------|--------------------|
| Asset Management | | | | | | | | | |
| 19 | Prioritise asset remediation through the incorporation of climate change impacts into asset management plans | \$ | Easy | Immediate | <ul style="list-style-type: none"> Infrastructure Services Open Space Group | <ul style="list-style-type: none"> Asset Management Plan | SL 5 | High | Low |
| Energy Efficiency | | | | | | | | | |
| 20 | Investigate and implement alternate sources of energy and energy efficiency technology | \$\$ | Medium | Immediate | <ul style="list-style-type: none"> Energy Management Team | <ul style="list-style-type: none"> HCC Climate Strategy | HD 2 | Extreme | Moderate |
| | | | | | | | CO 1 | High | Moderate |
| Roads – Emergency Access | | | | | | | | | |
| 21 | Identify and develop alternative emergency egress roads from residential areas that are vulnerable to bushfire, flooding and coastal inundation during storm events | \$\$\$ | Medium | 5-10 years | <ul style="list-style-type: none"> Traffic Engineering Open Space Group Environmental Engineering Unit | <ul style="list-style-type: none"> Emergency Management Plan | FR 2 | Extreme | Moderate |

3.2.4 Regulatory and institutional:

Regulatory and institutional adaptation actions focus on prevention of mitigation of potential climate change impacts through revisions to regulations and planning. Examples of adaptation actions applicable to Hobart City Council include amending local planning provisions, updating emergency management response plans and updating insurance policies to accommodate for impacts posed by climate change. Regulatory and institutional adaptation actions for treatment of priority climate change risks are detailed below.

Table 13: Regulatory and institutional actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|--------------------------------------|--|---------------------------------|------------------------|-----------------------|--|--|---------------|---------------------|--------------------|
| Planning and community health | | | | | | | | | |
| 22 | Update of planning controls for impacts associated with climate change | \$ | Easy | Ongoing | <ul style="list-style-type: none"> City Planning Environmental Engineering Open Space Group | <ul style="list-style-type: none"> Policy Making Procedure Development Guidelines Planning Scheme Building code of Australia Australian Standards | FL 2 | High | Moderate |
| | | | | | | | SL 1 | High | Moderate |
| | | | | | | | FL 3 | Extreme | Low |
| | | | | | | | SL 4 | Extreme | Moderate |
| | | | | | | | FR 1 | Extreme | Low |
| | | | | | | | FR 5 | Extreme | High |
| Corporate Services | | | | | | | | | |
| 23 | Confirm and update Council's insurances and indemnities in regards to liability of property damage in flood events | \$ | Easy | Immediate | <ul style="list-style-type: none"> Strategy and Governance | | FL 3 | Extreme | High |
| 24 | Review current procurement strategies to ensure that they include sustainable principles practices e.g. reduced carbon footprint, provide value for money for product life not just initial cost, | \$ | Easy | Short Term | <ul style="list-style-type: none"> Strategy and Governance | <ul style="list-style-type: none"> Hobart Climate Change Strategy | CO 1 | High | Low |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|-------------|---|---------------------------------|------------------------|-----------------------|---|--|---------------|---------------------|--------------------|
| | minimise demand, consumption and environmental impact | | | | | | | | |
| 25 | Continue to implement the Councils Climate Change Strategy (including communication and implementation of community actions) | \$ | Easy | Medium Term | <ul style="list-style-type: none"> Development & Environment Services | <ul style="list-style-type: none"> Hobart Climate Change Strategy Community Consultation Strategy Strategic Plan | CO 1 | High | Moderate |
| 26 | Review emergency management response systems | \$ | Easy | Immediate | <ul style="list-style-type: none"> Municipal Emergency Management Coordinator Emergency Management Recovery Coordinator | <ul style="list-style-type: none"> Emergency Management Plan Hazard specific sub-plans, such as flood emergency action plans | FR 5 | Extreme | High |
| 27 | Ensure that the Council's Business Continuity Plan provides for 'skeleton' services to be maintained while resources are being diverted and then ensure adequate communication | \$ | Easy | Immediate | <ul style="list-style-type: none"> Infrastructure Services | <ul style="list-style-type: none"> Emergency Management Plans | FR 3 | High | Moderate |
| | | | | | | | FL 5 | High | Moderate |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|---|--|---------------------------------|------------------------|-----------------------|--|---|---------------|---------------------|--------------------|
| 28 | Review Human Resource documents and policies to ensure that they consider issues associated climate change variables such as the impact of increased average temperature on employees working outdoors | \$ | Easy | Long Term | <ul style="list-style-type: none"> Corporate Services | <ul style="list-style-type: none"> HR Policies and Procedures | AT 2 | High | Moderate |
| Planning and community health | | | | | | | | | |
| 29 | Ensure that revised population projections and identified vulnerable populations are included in the preparation of the Council's strategic documents | \$ | Medium | Ongoing | <ul style="list-style-type: none"> Community Development Strategy and Governance | <ul style="list-style-type: none"> Social Inclusion Strategy Strategic Plan Emergency Management Plans | AT 2 | Extreme | High |
| 30 | Update regulation enforcement protocols to account for increased frequency and intensity of bushfire due to climate change | \$ | Easy | Immediate | <ul style="list-style-type: none"> Open Space Group | <ul style="list-style-type: none"> Fire Management Strategy Private Bushfire management plans in Part V Agreements | FR 1 | Extreme | Moderate |
| Natural Assets and Fire Management | | | | | | | | | |
| 31 | Increase resources toward enforcement of bushfire hazard management | \$ | Easy | Immediate | <ul style="list-style-type: none"> Open Space Group Permits and Compliance | <ul style="list-style-type: none"> Fire Management Strategy BCA Standards Planning Scheme, Operating Budget | FR 2 | Extreme | Moderate |
| | | | | | | | FR 5 | Extreme | High |
| | | | | | | | FR 7 | Extreme | High |
| | | | | | | | FR 8 | Extreme | High |
| 32 | Update Council natural resource land management techniques in light of climate change projections for bushfire | \$ | Easy | 2-5 years | <ul style="list-style-type: none"> Permits and Compliance Open Space | <ul style="list-style-type: none"> Fire Management Policy Reserve Management Plan | FR 5 | Extreme | High |
| | | | | | | | FR 6 | Extreme | High |
| | | | | | | | FR 7 | Extreme | High |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|-------------|--|---------------------------------|------------------------|-----------------------|----------------------------|---------------------------------------|---------------|---------------------|--------------------|
| | | | | | Group | | FL 6 | Extreme | High |
| 33 | Review and update Fire Management Strategy | \$ | Easy | Immediate | • Bushland & Reserves Unit | • Policy review process | FR 7 | Extreme | High |
| | | | | | | | FR 9 | Extreme | High |
| 34 | Directed vegetation management projects to protect susceptible vegetation communities/areas | \$\$ | Medium | 5 - 10 years | • Bushland & Reserves Unit | • Bushland Strategy | RV 1 | Extreme | High |

3.2.4 Further information identification:

Further information identification adaptation actions typically involve further research and information gathering to improve understanding of relationship between climate change and risk. Examples of actions include:

- Improve knowledge of relationship between past and present variations in climate and performance of economic, social and environmental systems
- Improve modelling of regionally-based climate change impacts > Improve knowledge of the probability of frequency and magnitude of changes to extreme climate events and other climate variables under climate change
- Improve understanding of the relationship between changes to frequency and magnitude of extreme events and critical thresholds for individual risks

Further information identification adaptation actions for treatment of priority climate change risks are provided below.

Table 14: Further information identification actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|--|--|---------------------------------|------------------------|-----------------------|---|---|---------------|---------------------|--------------------|
| Low lying coastal areas – Sullivans cove, Marieville Esplanade, Cornelian Bay and Sandown Point | | | | | | | | | |
| 35 | Investigate long term options to protect and mitigate the impacts of sea level rise and inundation on Council owned, public and private assets. | \$\$ | Difficult | Long Term | • General Manager and Executive Leadership Team | • Strategic Plan • Corporate Plan | SL 2 | Extreme | High |
| 36 | Establish site specific Climate Adaptation Plans for vulnerable coastal areas. | \$ | Easy | Immediate | • Development and Environmental Services | • Asset Management Plan • Strategic Plan | FL 1 | High | Moderate |
| | | | | | | | SL 1 | High | Moderate |
| | | | | | | | SL 2 | High | Moderate |
| Infrastructure and property | | | | | | | | | |
| 37 | Undertake asset condition reports and identify areas of deficiencies in flood protection | \$ | Easy | 1-5 years | • Environmental Engineering | • Asset Management Plan | FL1 | High | High |
| | | | | | | | FL2 | High | High |
| | | | | | | | SL 1 | High | High |

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Responsible Council areas | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|------------------|--|---------------------------------|------------------------|-----------------------|---|---|---------------|---------------------|--------------------|
| 38 | Undertake flood modelling for specific areas and catchments to determine climate change impacts | \$\$ | Easy | Immediate | <ul style="list-style-type: none"> Environmental Engineering | <ul style="list-style-type: none"> Asset Management Plan Flood Inundation Maps for major rivulets | FL 1 | High | High |
| Waterways | | | | | | | | | |
| 39 | Monitoring of erosion on banks to determine future feasibility of action | \$ | Easy | Ongoing | <ul style="list-style-type: none"> Environmental Engineering | <ul style="list-style-type: none"> Asset Management Plan Catchment Management Plan | FL 1 | High | High |

3.2.5 Avoidance:

Avoidance actions are those where an organisation will relocate functions or activities to avoid the impact. Many of these actions are based around acceptance that the impact will occur and avoiding use of a particular area because of it. Avoidance options for treatment of priority climate change risks impacting on Hobart City Council are documented below.

Table 15: Avoidance actions for Hobart City Council

| Action Code | Adaptation Action | Relative cost of implementation | Ease of implementation | Timeline for delivery | Other stakeholders | Relevant Council documents/strategies | Risks treated | Original risk level | Treated risk level |
|---|--|---------------------------------|------------------------|-----------------------|---|---|---------------|---------------------|--------------------|
| Infrastructure and property | | | | | | | | | |
| 40 | Plan for the disposal/replacement/upgrade of buildings in areas vulnerable to flooding | \$ | Easy | Immediate | <ul style="list-style-type: none"> General Manager and Executive Leadership Team | <ul style="list-style-type: none"> -Corporate Plan | FL 4 | High | Low |
| Natural Assets and Fire Management | | | | | | | | | |
| 41 | Investigate alternative habitat sites for ecological communities at risk | \$ | Medium | Ongoing | <ul style="list-style-type: none"> Bushland & Reserves Unit | <ul style="list-style-type: none"> DPIPE Policies and processes, Strategic Plan | SL 7 | High | Moderate |
| Events and festivals | | | | | | | | | |
| 42 | Develop strategies/plans for the temporary or permanent relocation (including alternative sites and mitigation strategies) for Council events such as Salamanca Market, community based events Mawson Place, Sullivans Cove | \$\$ | Difficult | Medium Term | <ul style="list-style-type: none"> Events, City Marketing and Cultural Development | <ul style="list-style-type: none"> Marketing Plan Risk Management Plan Occupational Health and Safety Licensing Agreements Infrastructure Plan Urban Design Project Special Projects Asset Management | SL 2 | High | Low |

4. Stakeholder involvement & collaboration

Climate change projections are likely to impact either directly or indirectly on all aspects of council function. Further to this, impacts are liable to be felt throughout the community and within many other organisations that council has direct involvement with. A collaborative adaptation response between all stakeholders is therefore essential for council to maintain its high service levels in a changing climate.

There is also a significant body of work currently being undertaken within other organisations throughout the community that contribute to meeting climate change adaptation objectives for Southern Tasmania, and that act to assist council in meeting its own objectives. It is therefore important that these linkages are identified; that complimentary processes value-add to one another and duplication of efforts is avoided wherever possible.

With these points in mind, through the 'risk management' and 'adaptation options' workshops, held with each of the twelve Councils in Southern Tasmania, a number of key stakeholders were identified as shown in Figure 6.

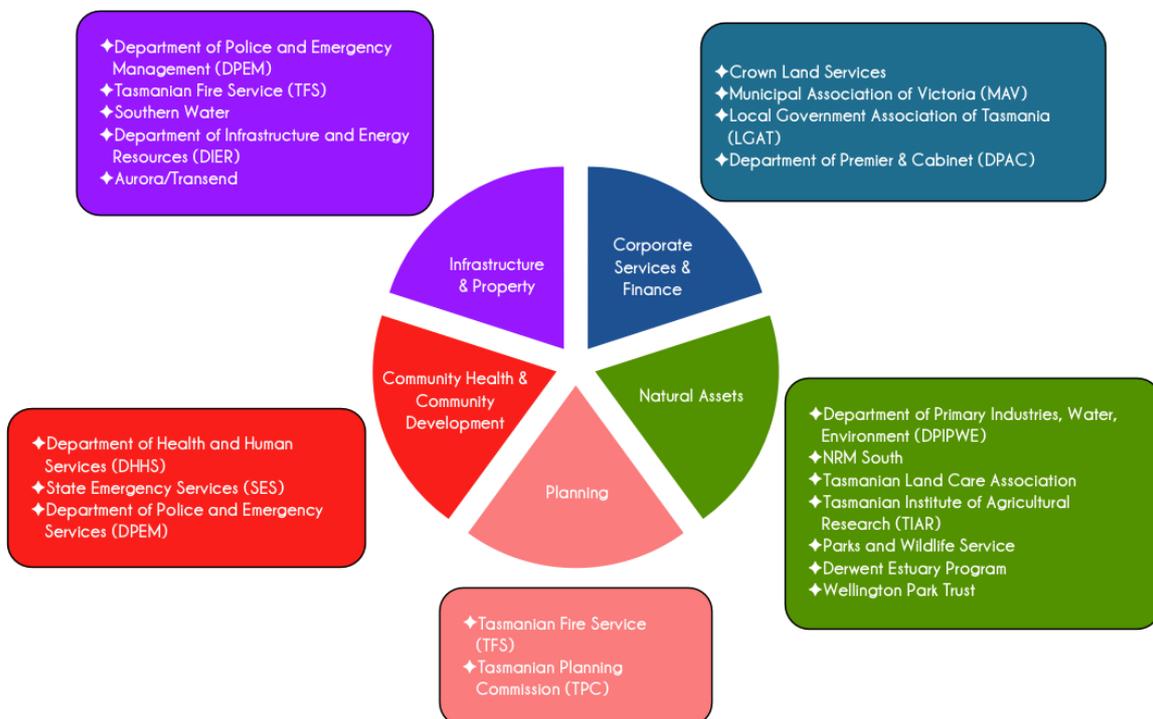


Figure 6: Stakeholder organisations identified during the council corporate risk and adaptation planning workshops

In order for there to be clear understanding of roles and responsibilities in relation to management of the identified climate change risks, together with recognition of opportunities to develop or strengthen existing collaborations, RCCAP engaged with the identified stakeholders. A summary of the Stakeholder Engagement is provided in Appendix B.

5. Implementation Plan

The implementation of this Plan requires a co-ordinated approach, both across the Council's corporate service areas and in partnership with other councils as well as public and private external stakeholders. Key components of the implementation plan include:

- a consistent process for plan endorsement by all councils of the region;
- a logical way for incorporation of key local risks and adaptation actions into council documents and processes such as risk registers, strategic plans, annual plans or asset management plans;
- an appropriate mechanism to implement sub-regional and regional adaptation actions either through advocacy or collaboration; and
- a mechanism for plan review and updating.

Section 3 of this Plan contains 42 adaptation actions for addressing priority climate change risks. When implemented, these actions will provide the Hobart City Council with an initial response to the challenges posed by climate change.

Implementation of the adaptation actions in this plan will provide the Hobart City Council with **an initial response** to the challenges posed by climate change. Effective implementation does not mean 're-inventing the wheel', to the contrary many of the Council's current activities/operational practices can be modified to assist in managing future climate variability. To this end, it will be important that outcomes from the risk assessment process used to support the development of this Plan are integrated with other of the Council's strategic risk management and planning activities. It is recommended that a climate change 'champion' is appointed to oversee implementation of the actions included in this Plan. Senior management will also provide a key role in Plan implementation by remaining engaged with this process and through assuming responsibility for maintaining the risk assessment and implementing adaptation actions (see Strategic Priorities – Section 3.2).

5.1 Financial and resource requirements

Financial and resource availability are critical factors for enabling implementation of adaptation actions. The adaptation options identified in this Plan will come at varying degrees of cost and resource requirement. It is likely that the Council will initially support implementation of those adaptation actions that are cost effective and align with current resource capacity and availability. Implementation of these actions i.e. 'low hanging fruit' will enable the Council to gain some initial momentum in responding to impacts posed by climate change.

It is important to recognise that not all climate change action within the Council will require its own funding, but will become embedded in the operational business of the Council through appropriate governance arrangements, planning and policy. Notwithstanding this some of the more complex adaptation options will require substantial financial support and resources.

For these actions, pursuing grant funding and establishing partnerships for collaborative or common actions can be effective in reducing the overall cost of action for the Council, enabling the full cost of action to be offset.

5.2 Monitoring and Evaluation

Monitoring and evaluating the implementation of actions contained within this Plan will be critical in tracking progress with regard to the appropriateness and effectiveness of actions. Monitoring, evaluation and reporting (MER) is a systematic and objective review of either (or a combination of) the appropriateness, efficiency, effectiveness and impact of a set of actions. An example; of key aspects of the climate monitoring, evaluation, review and improvement cycle; are highlighted in Figure 7.

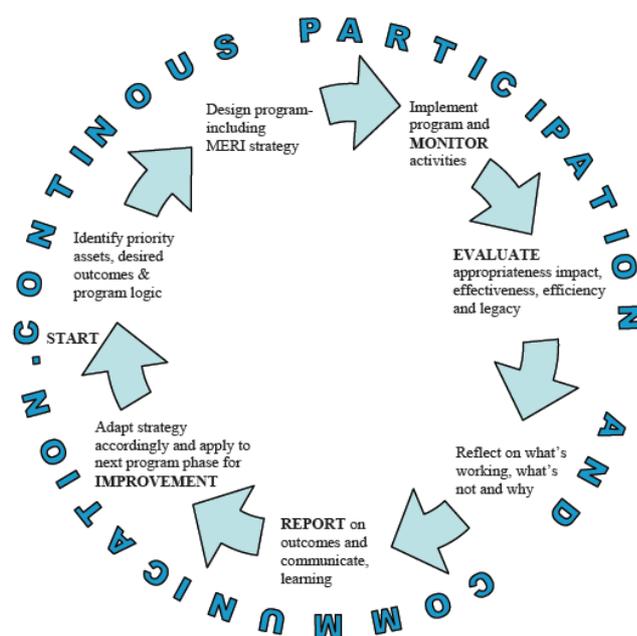


Figure 7: MER Framework to support climate change adaptation plan implementation¹⁴

Tracking progress against actions in this Plan is important to determine:

- Whether actions need to be reviewed; and
- Whether actions are being implemented via operational plans.

Ongoing monitoring of this Plan should include the following:

- Reporting of implementation of adaptation actions;
- Reviewing progress for each council risk treatments;
- Testing whether actions are still relevant;
- Consideration of barriers to implementing this Plan; and
- Consulting with external stakeholders to determine progress with regard to implementation of actions.
- Annual monitoring should be reported in Council's annual report.

¹⁴ Department of Environment, Water, Heritage and the Arts (2008). Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework, May 2008.

As discussed in the previous sections, this Plan focuses on the treatment of priority climate change risks. Although non-priority risks are not addressed in this Plan they should not be ignored. Council should maintain a 'watching brief' on non-priority risks rated as 'moderate' or 'low' as part of the Plan review process. This would include:

- Reviewing the ratings of non-priority risks should new information become available; and
- Upgrading risks to priority risks and developing adaptation actions where appropriate.

5.3 Review

This Plan should be reviewed initially after three years, at which time a schedule of review if is to be established, or earlier if circumstances require. Plan review will be required in context of:

- progress on initial actions;
- updated information on climate science and its relevance at the municipal scale;
- progress in regional and state-wide planning instruments, particularly in relation to codes that guide development in areas likely to be impacted by climate change e.g. the coastal zone;
- developments in State policy in relation to climate change and the coastal zone;
- changes to the legal framework in relation to council's liability in relation to managing climate change risk and implementing actions;

The 'Toolkit' developed as part of the Regional Climate Change Adaptation Project will guide Council staff in revisiting the risk assessment and adaptation action processes used in the development of this Plan.

Appendices

Appendix A – Project Methodology

The development of this Plan has involved two key stages, including a climate change risk assessment and identification of adaptation actions for treatment of priority climate change risks. These two stages of the project were supported by five steps as shown in Figure 8. This framework is consistent with the International Organisation for Standardisation (ISO) 31000:2009 Standard for Risk Management as well as the Australian Government publication *Climate Change Impacts and Risk Management: A Guide for Business and Government* (AGO 2007).



Figure 8: Process for risk assessment used in the Hobart City Climate Change Adaptation Plan.

This risk assessment process was developed to address priority climate change risks¹⁵ which are primarily associated with the Council’s assets and service areas. This Plan also identifies adaptation actions to manage risks that are within the Council’s sphere of influence. Risks have been identified which must be managed in collaboration with other stakeholders (such as State Government Agencies, Community Groups and Private Corporations). Although these risks may not be directly managed by the Council, they remain as important risks to identify as they affect its service areas and assets

A more detailed outline of the project methodology is documented below for the above-mentioned steps.

Climate Change Risk Assessment

Establish the context

Establishing the context sets the scene for outlining the potential impacts of climate change to the Council from a risk perspective. This was undertaken by the following:

- Defining the business or organisation to be assessed and the scope of the assessment. In this case, identifying Council service areas and its sphere of influence
- Clarifying the Council’s objectives

¹⁵ Priority climate change risks are those risks rated as ‘extreme’ or ‘high’. Other risks rated as ‘moderate’ or ‘low’ are not addressed in this Plan.

- Identifying stakeholders and their objectives and concerns
- Establishing success criteria against which risks to Council's objectives can be evaluated
- Determining relevant climate change scenarios for the climate change risk assessment (AGO 2007).

The climate change scenario adopted for Hobart City was the A2 scenario for the year 2100.

Senior management at Hobart City Council were engaged at this stage to encourage greater attendance and participation in the future stages of the project and to ensure the process was effectively owned by Council.

Identify the risks

The process of risk identification was undertaken to describe and list how climate change could impact on each of the key business areas within Hobart City Council. This was undertaken using the information gathered in the previous stage of establishing the context.

Risks were identified in a workshop format with key Council staff from the following areas:

- Natural Areas
- Planning
- Infrastructure and property
- Community health

The workshop participants were presented with information that established the context around climate change risk and Hobart City Council operations. Workshop participants were asked to consider the climate impacts specific to the Council's municipal area (outlined in Section 2) and brainstorm potential risks to their business areas based on their Council experience and local knowledge of the area. Risks were framed as cause and effect risk statements that include a hazard and its associated consequence. During the brainstorming session, all risk statements were considered and participants were encouraged to be open and build on each other's ideas. Generally, the following were considered when identifying risks to Council from climate change:

- **What can happen** - events or incidents that could occur whereby the source of risk or threat has an impact on the achievement of objectives?
 - **Where things can happen** - The physical locations/assets where the event could occur or where the direct or indirect consequences may be experienced
 - **How it can happen** - The manner or method in which the risk event or incident could occur
 - **When it can happen** - the specific times or time periods when the event is likely to occur or the consequences realised
 - **Business areas/stakeholders affected** - Which business units/stakeholders may be involved or impacted. Some risks may impact Council but may also involve external stakeholders and these should be considered
 - **Existing Controls** - What controls currently exist to minimise the likelihood and consequence of each risk
-

In many cases, climate change related risks were similar to current weather related risks to Council. These risks are merely exacerbated with the effects of climate change and are assessed as more extreme as current controls become inadequate resulting in changes to the risk profile.

Analyse the risks

Following brainstorming of risks, participants analysed each of the identified risk statements in their business units using the agreed risk assessment framework. The framework provides Council with a comprehensive approach to identifying and managing risk. The framework is based on the processes and criteria outlined in *Climate change impacts and risk management - A guide for Business and Government* (AGO 2007). This guide has been adopted by a significant number of Councils and organisations across Australia and is consistent with the ISO 31000 standard for risk management.

Each risk statement was analysed using the likelihood and consequence scales outlined in Appendix A. Consequence ranged from insignificant to catastrophic and was rated based on the following success criteria (detailed further in Appendix A):

- Financial
- Public safety
- Reputation
- Community and lifestyle
- Environmental
- Strategy
- Service delivery

These success criteria were used to align consequence to Council objectives. Essentially, all risks can eventually lead to a financial consequence. However, associating success criteria to risk statements guides the development of adaptation actions that manage risks before they become purely financial. A level of risk was determined based on the likelihood and consequence criteria using the risk matrix outlined in Table .

Table 17: Matrix of likelihood and consequence for prioritisation of risks

| | | Consequence | | | | |
|------------|----------------|---------------|---------------|---------------|---------------|---------------|
| | | Insignificant | Minor | Moderate | Major | Catastrophic |
| Likelihood | Almost Certain | Moderate Risk | High Risk | Extreme Risk | Extreme Risk | Extreme Risk |
| | Likely | Moderate Risk | Moderate Risk | High Risk | Extreme Risk | Extreme Risk |
| | Possible | Low Risk | Moderate Risk | Moderate Risk | High Risk | Extreme Risk |
| | Unlikely | Low Risk | Low Risk | Moderate Risk | Moderate Risk | High Risk |
| | Rare | Low Risk | Low Risk | Low Risk | Moderate Risk | Moderate Risk |

A definition of risk categories is provided below (AGO 2007):

- **Extreme** priority risks demand urgent attention at the most senior level and cannot be simply accepted as part of routine operations without executive sanction.

- **High** priority risks are the most severe that can be accepted as part of routine operations without executive sanction but they will be the responsibility of the most senior operational management.
- **Moderate** risks can be expected to form part of routine operations although they will be explicitly assigned to relevant managers for action and maintained under review.
- **Low** risks will be maintained under review but it is expected that existing controls will be sufficient

During risk analysis, it was important to consider the current control measures implemented in Council to manage any current risks associated with climate and extreme weather events. For example, Hobart City Council currently has procedures in place to manage risks associated with the current bushfire regime to its assets. These procedures have been implemented to manage current risks to an acceptable level. Climate change has the potential to exacerbate these risks in the future. Increased temperatures and the incidence and/or the frequency of extreme weather events means that the climate change risks may increase to an unacceptable level where current controls may not be adequate. Adaptation responses for treating these risks will take the form of one or a number of actions in order to reduce the risk profile to a more acceptable level. This is illustrated in Figure 9.

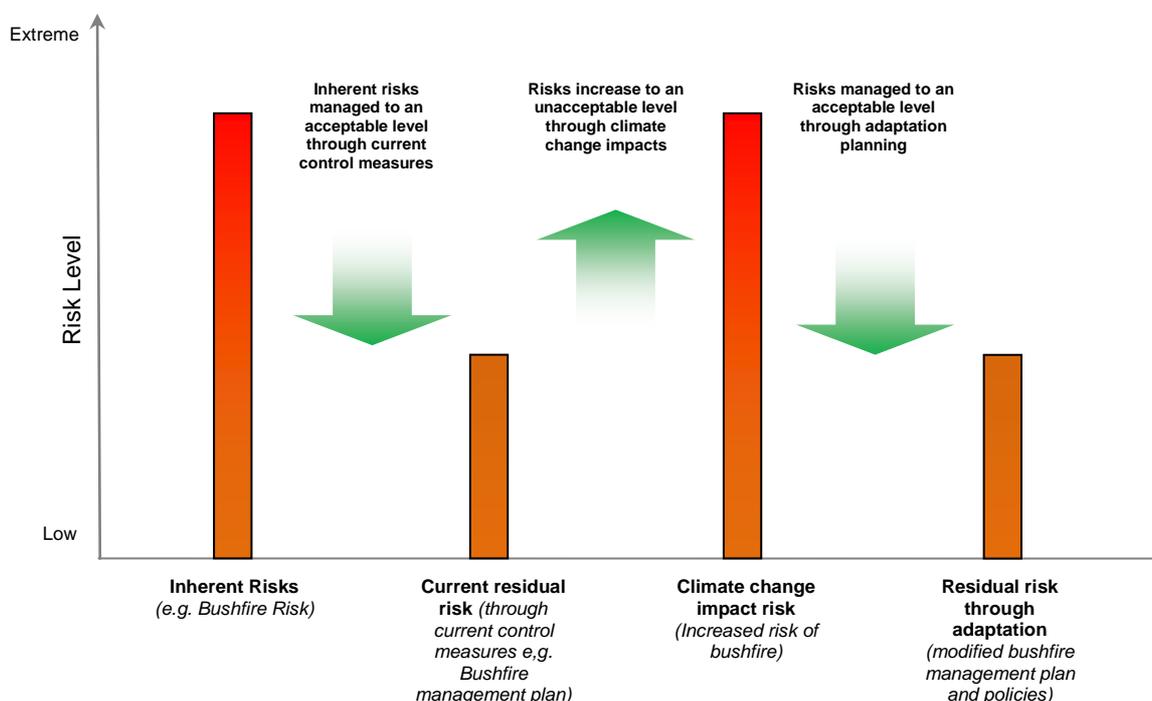


Figure 9: Managing risks through current controls and adaptation planning

Evaluate the risks

Following the identification and analysis of the risks, it is important to evaluate the risks and reassess them in relation to each other. Often, brainstorming and initial assessment of risks can lead to some inconsistency in the way likelihood and consequence scales are applied. Following the risk analysis session, key Council staff were brought together to consider the

final risk ratings. These participants were asked to evaluate the relative risk ratings to ensure that they were consistent, and agreed upon across Council. The risk evaluation step assists to gain general consensus on the final risk ratings.

Climate change adaptation planning

Treat the risks

The treatment of priority risks involves the development of adaptation actions designed to help manage risks to an acceptable level.



Figure 10: Adaptation actions against increasing time, cost and effort

other criteria. Figure shows that educational type actions such as provision of information to the community are generally easier to implement when compared to engineering or redevelopment type actions. Each action was prioritised based on the following screening criteria:

- **Cost** - the potential cost of implementing the action relative to the other actions (high, medium, low)
- **Immediacy** - the timeframe required to implement the action (short term, medium term, long term)
- **Political feasibility** - how feasible the action is politically. This is dependent on Council views (leader, collaborator, influencer)
- **Community acceptance** - the acceptance of the action by Councils rate payers (popular, indifferent, controversial)
- **Concurrent effects** - whether the action has associated benefits or costs associated with its implementation (positive, neutral, negative).

Each adaptation action was scored for each of the above criteria using a multi criteria assessment (MCA) approach. As cost is generally a key criterion in decision-making, this was weighted as 50% of the weighting in prioritising the actions. The remaining 50% of weighting was distributed equally across the other four criteria. The adaptation actions were prioritised by plotting cost against the combined score of the other four criteria in the priority matrix presented in Figure .

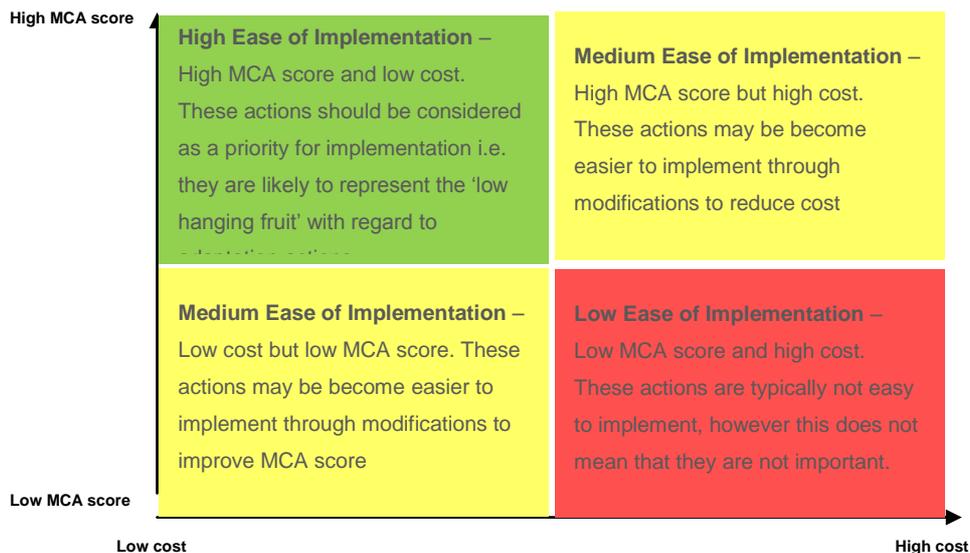


Figure 11: Prioritisation matrix for adaptation actions incorporating cost and four non-monetary criteria.

Consultation and communication

Stakeholder engagement was paramount in the development of this climate change adaptation action plan. Local knowledge of the area and Council activity is just as important as climate change projections to develop a relevant Plan for Hobart City Council. The stakeholder consultation rounds were designed to engage Council staff and incorporate their knowledge and expertise to develop a Plan that has Council input and ownership. Engagement of key Council staff and other relevant stakeholders resulted in increased support and will therefore lead to more success during implementation.

The consultation approach consisted of three distinct rounds outlined in Table .

Table 18: Description of consultation rounds during plan development

| Consultation Round | Stage | Description |
|--------------------|---|--|
| Round 1 | Briefing RCCI and Minister for Climate Change | Two-hour briefing of the STCA Regional Councils Climate Initiative who form the Technical Working group to the Project and the Minister for Climate Change - with possible attendance from the Minister for Local Government and Planning subject to availability. |
| | Engagement of senior council management | One-on-one meetings with the senior management team at each council, to encourage greater attendance in the future consultation rounds and to ensure the process is effectively owned by key stakeholders. |
| Round 2 | Risk assessment | Designed to identify and assess risks associated with future climate change at each council. This was undertaken in a focus group or workshop setting with decision makers from each council business unit. During this Round, risks were identified and assessed for both Council corporate activities and for the associated four land use themes (Rural, Natural, Urban, Peri-Urban). |
| Round 3 | Adaptation option prioritisation | Primarily to fine tune and prioritise adaptation options for inclusion into the adaptation plan. In addition, this engagement defined process and system changes within each council that will be required to see actual change eventuate from adoption of the adaptation plan. It included the same participants as those in Round 2 and was in a workshop or focus group setting. Adaptation options were prioritised for both Council corporate activities and for the community and associated four land use themes. |
| | Engagement with external stakeholders | Targeted consultation with external stakeholders that operate across council boundaries, providing additional input to the adaptation plans. External stakeholders were consulted to engage them in the development of the land use adaptation plans and to determine their role in implementation (i.e. Public Private Partnerships, funding, rebates, education etc.). |

Appendix B – Stakeholder Summary

Aurora Energy

Aurora manages the local electricity distribution network around Tasmania and is the electricity provider for the majority of Tasmania's electricity usage. Many of council's services are dependent on the proper operation of Aurora's assets.

The Tasmanian Electricity Code governs Aurora, requiring it to maintain its infrastructure to minimise risks associated with the failure or reduced performance of assets. Thus, if the operating environment changes in a way that increases the risk of asset failure, as a result of climate change, then Aurora has an obligation to manage that change.

Aurora has not identified climate change as a key business risk, however the Distribution Business Division (responsible for managing Aurora's network) has identified climate change broadly as one of 19 divisional risks.

A key area of concern for Aurora is the lack of consultation during assessment of development applications in vulnerable areas. When new developments are approved by councils, Aurora is required under law to provide power to site. Aurora is not included in the planning assessment process and where proposals may be vulnerable to the projected impacts of climate change, delivery of this requirement may in the future become difficult. Collaboration in the planning approval stage could better manage these situations.

Dept. of Health and Human Services

The Department of Health and Human Services (DHHS) is responsible for delivery of integrated services that maintain and improve the health and wellbeing of individual Tasmanians and the Tasmanian community.

A national process, coordinated by the Department of Health and Aging, is developing a national human health climate change adaptation plan, drives climate action for DHHS. The internal draft climate change plan is to be developed by the Australian Health Protection Committee's Environmental Health Committee; however there is no clear timeframe for its completion. It is not expected that climate impacts will be as significant as that experienced by other States.

In lieu of the national plan the DHHS does not currently have any documents for the management of climate change risks.

Dept. of Infrastructure Energy and Resources

The Departments of Infrastructure, Energy and Resources (DIER) provides infrastructure and related services for the social and economic development of Tasmania. DIER reports to the Minister for Infrastructure, Hon David O'Byrne MP; the Minister for Energy and Resources and the Minister for Racing, Hon Bryan Green MP; and the Minister for Sustainable Transport, Hon

Nick McKim MP. By providing a strategic approach to the provision of both physical infrastructure and regulatory frameworks, DIER aims to (amongst other unrelated factors):

- Enhance infrastructure decision-making across Government;
- Facilitate a safe, sustainable and efficient transport system that enhances economic and social development, in the context of the challenges of climate change, and
- Promote reliable, efficient, safe and sustainable energy systems.

The state road network is approximately 3,700 km's in length and includes approximately 800 bridge structures and 500 culverts. The network is divided in to three regional networks; each network has its own Network Manager (NM) and three Network Supervisors (NS). This structure sees each NS responsible for the management of approximately 400km's of road. Not surprisingly* these staff have an in-depth knowledge of their 'turf' and the direct/indirect effects of extreme weather events. Therefore it is fair to state that DIER staff have inadvertently been documenting and managing the effects of a changing climate for some time now and are thus well positioned to manage the road network in to the future. DIER acknowledges that climate change per se has not featured prominently in past decision-making; however, this is not to say that DIER is unaware of the impacts of a changing climate. Climate change is but one element of the 'risk assessment' (RA) process. DIER acknowledges the significance/weighting of climate change within the RA process is increasing in-line with DIER's continually improving awareness and understanding.

DIER acknowledges that the impacts of a changing climate are highly varied, but notes there are impacts more likely to affect the serviceability of the state road network. From a DIER perspective, the key threatening climate change related impacts are:

- Increased intensity of rainfall events (and the effects of);
- Sea level rise, and
- Storm surge.

DIER has chosen not to independently fund climate change research; instead, opting for a collaborative approach that has to date, proven quite successful. Given that DIER has limited financial resources (at present and into future) with particular reference to climate change type investments; DIER will continue to support and sponsor collaborative research and the development of tools and applications that have the capacity to make DIER a 'more informed' client. In terms of projects, DIER has co-funded/sponsored three climate change related projects in the past 18 months; these include:

- Climate Futures Tasmania – Infrastructure (CFT-I);
- Greenhouse Gas Assessment Workbook for Road Projects – Transport Authorities Greenhouse Group (TAGG), and
- 'Carbon Gauge – Calculating the Greenhouse Footprint of Roads'.

DIER is considering a whole-of-asset risk assessment to identify those sections of the road network more at risk from the effects of climate change over the next 20-40 years for road infrastructure, and 100 years for bridges. Outputs from this

project would then assist development of DIER's work plan for the next 5-10 years. Anecdotally, DIER considers that in the absence of major construction projects, managing the road asset for the effects of climate change should in fact be affordable under historical road transport funding levels.

Dept. Primary Industries, Parks, Water & Environment

Department of Primary Industries, Parks, Water & Environment (DPIPWE) have three key programs in relation to climate change adaptation:

1. Natural Systems Resilient to Climate Change Project;
2. Climate Change and Coastal Vulnerability Program; and
3. Climate Change Impact Monitoring Program for the World Heritage Area (WHA)

Key elements of the Natural Systems Resilient to Climate Change Project are the unpublished report: [DPIPWE (2010) Vulnerability of Tasmania's Natural Environment to Climate Change: An Overview], and a series of relevant spatial resources:

- spatial layer predicting spread/occurrence of WONS (weeds of national significance) in the future;
- spatial layer predicting areas that are not vulnerable to the root-rot fungus (*Phytophthora cinnamomi*);
- spatial layer as a predictor of biosecurity and disease issues related to the natural environment;
- spatial layer identifying fire 'refugia' i.e. areas in the landscape with low vulnerability to wildfire; and
- spatial layer highlighting past glacial 'refugia', i.e. where vegetation communities have contracted to in the past during changing climate.

In combination, the spatial layers may be used to refine or compliment the 'refugia' analysis conducted by NRM South. Once defined, 'refugia' have the potential to be protected through the planning scheme as special areas. Additionally, each individual spatial layer may be used to inform development decisions and would be useful additions to the GIS data libraries of Councils.

Components of the *Climate Change and Coastal Vulnerability Program* include:

- the Climate Change and Coastal Risk Assessment Project which has tools and resources to assist with risk-based management and planning for various assets and values in the coastal zone; and
- The 'Sharples' Report – Indicative Mapping of Tasmanian Coastal Vulnerability to Climate Change and Sea Level Rise.

The *Climate Change Impact Monitoring Program (WHA)* includes:

- Vegetation community monitoring, particularly endemic conifers.
 - Efforts to improve understanding of the effect of sea level changes on coastal geodiversity and biodiversity and identification of opportunities for adaptive management. There is alignment here with the NRM South saltmarsh inundation-mapping project.
-

- A recently released report [Climate Change and Geodiversity in the World Heritage Area] that highlights how climate change may impact upon Tasmania’s geological, geomorphological and soil features (and processes).

Derwent Estuary Program

The Derwent Estuary Program (DEP) is a regional partnership between local governments, the Tasmanian state government, commercial and industrial enterprises, and community-based groups to restore and promote the Derwent Estuary.

The DEP has a strong interest in retaining environmental assets within the Derwent Estuary & improving estuary water quality, which appear to be at risk from climate change. Key areas of interest including the following:

- Sea level rise causing coastal squeeze and loss of tidal wetlands and saltmarshes. The DEP is advocating for planning consideration to be given to current, vulnerable areas and habitat retreat corridors.
- Potential reduced River Derwent flows (if rainfall decreases in the highlands & water extraction increases) causing reduced dissolved oxygen at depth with the estuary (releasing nutrients and heavy metals from estuary sediments). The DEP encourages research and information to assist discussion of this risk.
- Increased occurrence of intense rainfall events in Hobart’s urban areas, causing stormwater management issues such as urban stream scour. The DEP is promoting retention of natural watercourses and local government application of the state stormwater strategy.

The DEP has written a discussion paper that looks at planning mechanisms that may apply the findings of scientific assessment and identification of the areas important for tidal wetland and saltmarsh retreat due to sea-level rise. The DEP wetland & saltmarsh discussion paper has been shared with stakeholders since Jan 2011, including the STCA, TPC, the DEP’s six local government partners (DVC, GCC, HCC, KC, CCC, BC) and staff within DPAC working on climate change adaptation projects (John Harkin) and risk assessment (Luke Roberts), and experts looking at the social implications of climate change (e.g. Clive Attwater). A draft-planning overlay was created for discussion. The science behind the creation of the overlay has been now been undertaken at other location in the state (e.g. Pittwater, Boulanger Bay) and will soon encompass many areas in the south of the state (project being undertaken by NRM South – employing Vishnu Prahalad (who also worked on the Derwent estuary study)).

The DEP is advocating for a new ‘Natural Coastal Processes’ overlay, which would capture wetland and saltmarsh coastal types, and others at risk of recession due to climate change.

Municipal Association Victoria Insurance Liability Mutual Insurance

Municipal Association Victoria (MAV) Insurance Liability Mutual Insurance (LMI) is the primary insurer for all of the councils in Southern Tasmania. Many of the Councils have identified LMI as their most critical risk management framework that should be considered in climate change risk management and adaptation planning.

LMI does not have a statutory obligation to manage climate risks. They do however have a general commitment to assist member councils in effectively managing their risks with a focus on continuous improvement. LMI has developed a broad range of manuals and guidance documents for its members, although not specific and limited to climate change. These documents and support materials may be made available on request.

LMI conducts a biennial audit on all its members, part of which is an Organisational Risk Management section. As part of this section we examine the comprehensiveness of risk assessments for 4 risk areas of council in some detail, one of which is climate change.

LMI also has an internal risk register that includes risks to the scheme from a key claims driver view as well as unusual, new and emerging risks. Climate Change is one of the risks, and is being monitored by the Risk Committee. LMI is unable to provide this risk register to Councils, as it is an internal document only.

LMI does not dictate to members about how they manage their risks. Recommendations and suggestions for improvements may be made, however they have neither the power nor the inclination to 'demand' changes.

Natural Resource Management South

The Southern regional Natural Resource Management Strategy provides the primary framework through which Natural Resource Management (NRM) South prioritises and implements projects involving climate change adaptation.

NRM South is working in several ways to address the impact of climate change on natural systems and agricultural land of the southern region. In terms of natural systems NRM South has:

- Completed a preliminary report on 'refugia' (key places in the landscape that will be most resilient to effects of climate change and hence important reservoirs of genetic diversity) with a view to these areas receiving attention for protection and preservation into the future.
- Progressed saltmarsh inundation mapping and associated identification of opportunities for saltmarsh migration. This work has involved councils to determine a mechanism by which planning schemes may be used to facilitate the migration of this vulnerable vegetation community.

There is a potential role for local government in using planning instruments, such as planning scheme overlays, for protection of the identified 'refugia' and to make allowance for migration of vulnerable vegetation communities such as saltmarsh.

In terms of adaptation in agricultural systems, NRM South is working with the farming community, with involvement of local government, to assist in building resilience in soils and the landscape. Through NRM South's Sustainable Practices on Farms Program there has been a series of seminars and field days on the theme of 'living soils', and promotion and trialling of

‘regenerative’ techniques such as pasture cropping, holistic grazing, compost teas (making and application) & ‘keyline’ systems.

Other collaborations involving local government include:

- Healthy Catchments to Coast Program looking at management approaches that will help protect habitat. More specifically – habitat protection for the 40-spotted pardalote and swift parrot under ‘Mountains to Marine’ (Kingborough & Hobart City).
- Protection of remnants of the endangered Miena cider gum (a victim of changing rainfall patterns) with Glenorchy City Council.
- Development of a Biodiversity, Geodiversity & Landscape Regional Planning Code.

Southern Water

Southern Water is the council owned water and wastewater corporation for the Southern Tasmanian region. Southern Water is responsible for delivering water and wastewater services to the community and managing the associated asset base.

Southern Water is beginning to actively manage climate change in its operations and strategic planning. This is primarily being driven by recognition that climate change may compromise achieving level of service standards and since a commitment has been made to achieving service level provisions, the organisation must therefore adopt an adaptation response.

The following actions are currently being implemented:

- Desktop risk register (completed)
- Climate change strategy (mitigation and adaptation) with a view to develop precinct plans (currently being developed)
- Policy to include climate change as a key part of corporate plan goals and actions.

In terms of collaboration in climate change adaptation and effective service delivery, Southern Water has raised the following points:

- Loss of critical infrastructure around coast lines due to inundation as a result of sea level rise and storm surge is identified as a key climate change risk to Southern Water. Better consideration needs to be made when approving a development adjacent to the coast or creek where adequate setback for water and sewer infrastructure may not be provided to ensure protection from erosion/inundation.
 - Reduced water availability is identified as a key climate change risk to Southern Water and better collaboration needs to be achieved in setting growth boundaries around towns so that population limitations are set within the
-

sustainable yield profile of the drinking water catchment and/or reservations are put in place for additional drinking water catchments.

- Better management of bushfire risk needs to be achieved, allowing for approval of critical asset protection measures (e.g. creating buffers around pump stations) within council planning.
- Bushfire management is a key strategic risk for southern water as it has huge effects upon drinking water catchments, service provision, abnormal demand management spikes, hydrant performance, and power outages to water and wastewater infrastructure. Council and TFS could jointly help manage these risks with Southern Water in a number of ways, and probably requires further discussion.

State Emergency Services

The State Emergency Services (SES) is the statutory authority that coordinates emergency management responses Tasmania-wide. It is a division of the Department of Police and Emergency Management and is comprised of both paid staff and volunteers. It has four core functions that are set out in the Emergency Management Act (Tas) 2006 s.26 as follows:

- the provision of advice and services relating to emergency management in accordance with emergency management plans or as otherwise authorised by the State Controller or Minister in writing provided to the Director SES, other than the provision of a service provided by another statutory service;
- the provision of services relating to rescue and retrieval operations as authorised by the Minister or State Controller;
- the provision of administrative services for the State Committee and each Regional Committee, including support in the preparation and review of emergency management plans as required by the State Committee and Regional Committees; and
- the recruitment, training and support of volunteer members of the State Emergency Service;

Local Government is an important stakeholder in the delivery of emergency management responses and planning. It is identified in key SES documents and plans that set out the key roles and responsibilities of stakeholders. Pursuant to section 34 of the EMA each Council must: prepare an Emergency Management Plan: review the EMP every 2 years; appoint an emergency management coordinator and establish and maintain voluntary units

The SES's response to climate change, through the 'Natural Disaster Resilience Program and other funding programs, has been to fund and engage in research initiatives that identify and seek to quantify key climate risks as they apply across Tasmania, including:

- Climate Futures Tasmania - Bushfire
 - Climate Futures Tasmania - Extreme Events
 - Clarence City Council study into the effect of sea level rise – this was the precursor to the current work that CCC has undertaken
-

- Tasmanian Extreme Wind Hazards Standalone Tool (TEWHST)
- State Framework for natural hazards and Land Use Planning Project.

The SES is the custodian of a significant body of climate change data as a result of its involvement in the Climate Futures Tasmania project and collaboration with Geoscience Australia (Extreme Wind Hazard Project). Opportunities exist for the utilisation of this data to inform local, regional and state emergency management planning.

Tasmania Fire Service

Tasmania Fire Service (TFS) is involved with multiple forums dealing with the impacts of climate change and the potential risks associated with the onset of climate change. Through the bushfire cooperative research council (BCRC) and the Australasian Fire & Emergency Service Council (AFAC), TFS is participating in research and modelling for bushfire. The research being conducted includes, looking at current bushfire risks and assessing current prediction tools to determine modelling for the future. This research will have a bearing on issues such as:

- resource to risk modelling;
- community protection planning;
- bushfire prediction tools;
- bushfire weather modelling;
- prescribed burning modelling; and
- fire management planning.

TFS has also participated in the Climate Futures for Tasmania Project, especially the 'Extreme Events' component. TFS will use this to map a pathway forward for future strategic planning.

Currently, TFS is reviewing the State Fire Protection Plan in which the above issues are called up. Additionally, as part of another review process, TFS is incorporating these developed strategies into its operational corporate plan.

From TFS's perspective the relationship with local government will be important, if not critical for future directions in climate change. Through the State Fire Management Council (SFMC), where LGAT is represented, TFS will engage with local government to ensure they are consulted regarding climate change and bushfire risk into the future. SFMC is currently lobbying State Government for funding to assist with additional programs to develop strategies for vegetation management for the mitigation of bushfires. This also includes legislative changes. Although currently in its infancy, this program will include climate change contingencies as part of the planning process. LGAT are an identified key stakeholder in this program and will be consulted throughout the development of this strategy.

SFMC provides a forum for local government to work with TFS and other land management agencies in relation to climate change and bushfire mitigation. At a 'coal face' level TFS will need to work closely with local government for the

development of fire management planning, prescribed burning programs and development planning, especially in bushfire prone areas.

Tasmanian Landcare Association

The Tasmanian Landcare Association (TCLA) provides financial support to care groups and landowners for a range of Landcare projects through the Tasmanian Landcare Fund and Tasmanian Landcaring Grants that it administers. Often local government NRM facilitators work with groups and landowners to develop applications and implement projects that address climate change risk themes.

Tasmanian Planning Commission

The Tasmanian Planning Commission (TPC) has formed a Coastal Planning Advisory Committee comprising two Commissioners, John Ramsay and Roger Howlett, the head of the Tasmanian Climate Change Office, Wendy Spencer, and the Deputy Secretary of DPIPWE, John Whittington, to:

1. prepare a Coastal Planning Framework for consideration by Cabinet (the TPC has been requested by the Premier to prepare the framework following the Premier's decision to accept the TPC's recommendation to reject the revised draft State Coastal Policy);
2. peer review and conduct community and stakeholder consultation on a draft 'coastal hazards' code prepared by the TPC's Policy Division; and
3. coordinate the state-wide 'coastal hazards' code review with the formal assessment and determination of a state-wide 'flooding' code.

The Advisory Committee has commenced its review of a draft Coastal Planning Framework prepared by the TPC's Policy Division and is due to report to the Commission in the first half of 2012. It is anticipated that the draft 'coastal hazards' code will be released for informal comment in the first half of 2012 and submitted to the Minister for approval as a draft Planning Directive for formal advertising for representations and formal assessment and determination in the second half of 2012.

In terms of other natural hazards and risks, the TPC formed an Assessment Panel in the second half of 2011 to formally assess draft state-wide planning codes prepared by the TPC's Policy Division covering bushfire prone areas, flooding and landslide. These draft codes have been formally advertised and public hearings have been held involving local government representatives.

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