

# Monitoring, Evaluation, Reporting & Improvement Framework for Climate Change Adaptation in Victoria



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# Executive Summary

The Monitoring, Evaluation, Reporting and Improvement (MERI) Framework for Climate Change Adaptation in Victoria (the MERI Framework) outlines a whole-of-government approach to monitor and evaluate the implementation and effectiveness of actions in *Victoria's Climate Change Adaptation Plan 2017-2020* (the Adaptation Plan), and will build an understanding of how adaptation actions have contributed to achieving longer term outcomes and goals articulated in the Adaptation Plan.

The MERI Framework provides for:

- Monitoring, to track implementation of actions by government;
- Evaluation, to determine effectiveness of government's adaptation actions;
- Reporting, to disseminate lessons learned; and
- Improvement of implementation of actions, through feedback to government programs and policy.

The MERI Framework reflects inputs from a wide range of government departments and agencies involved in the delivery of adaptation actions outlined in the Adaptation Plan across Victoria, and is intended to build upon, rather than duplicate, existing MERI frameworks and processes already undertaken across government.

Successful adaptation means that many adverse impacts of climate change can be reduced, managed or avoided.<sup>1</sup> Monitoring, evaluation and reporting will assess the implementation and outcomes of adaptation actions and track progress towards climate resilience. The MERI Framework will also help structure communication on progress and inform and improve future policy and program design.

The approach adopted in the MERI Framework is based on best practice literature on monitoring and evaluating climate change adaptation and has been designed to consider issues of scale and complexity. It also considers potential resource needs associated with different approaches to monitoring and evaluation of adaptation at a state level. The MERI Framework, summarised in Figure 1, has three key components:

1. **6-monthly implementation monitoring** – a simple reporting format to inform internal government stakeholders of progress to date on the implementation of actions in the Adaptation Plan and inform modifications to improve delivery.
2. **18-month review** – a report that combines 6-monthly implementation monitoring, surveys of key stakeholders internal and external to government, and data collected through evaluation of pilot Adaptation Action Plans. The objective of this review is to inform internal government stakeholders of progress delivering the Adaptation Plan, and to facilitate learning and improvement across government.
3. **3-year review** – a synthesis report that analyses evaluation, monitoring, review and research reports applicable to adaptation in Victoria over the life of the Adaptation Plan. This review is intended to inform stakeholders and the broader community about the effectiveness of Adaptation Plan actions in contributing to the goals outlined in the Adaptation Plan; and to inform government stakeholders and the public of progress adapting to climate change in Victoria.

The MERI Framework is supported by a separate and complementary project on long-term 'state of adaptation' indicators that will assist government departments and agencies to establish a baseline for adaptation in Victoria, and to monitor change over time.

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1 Commissioner for Environmental Sustainability, Framework for the Victorian 2018 State of Environment Report: State and Benefit, Victorian Government, 2015

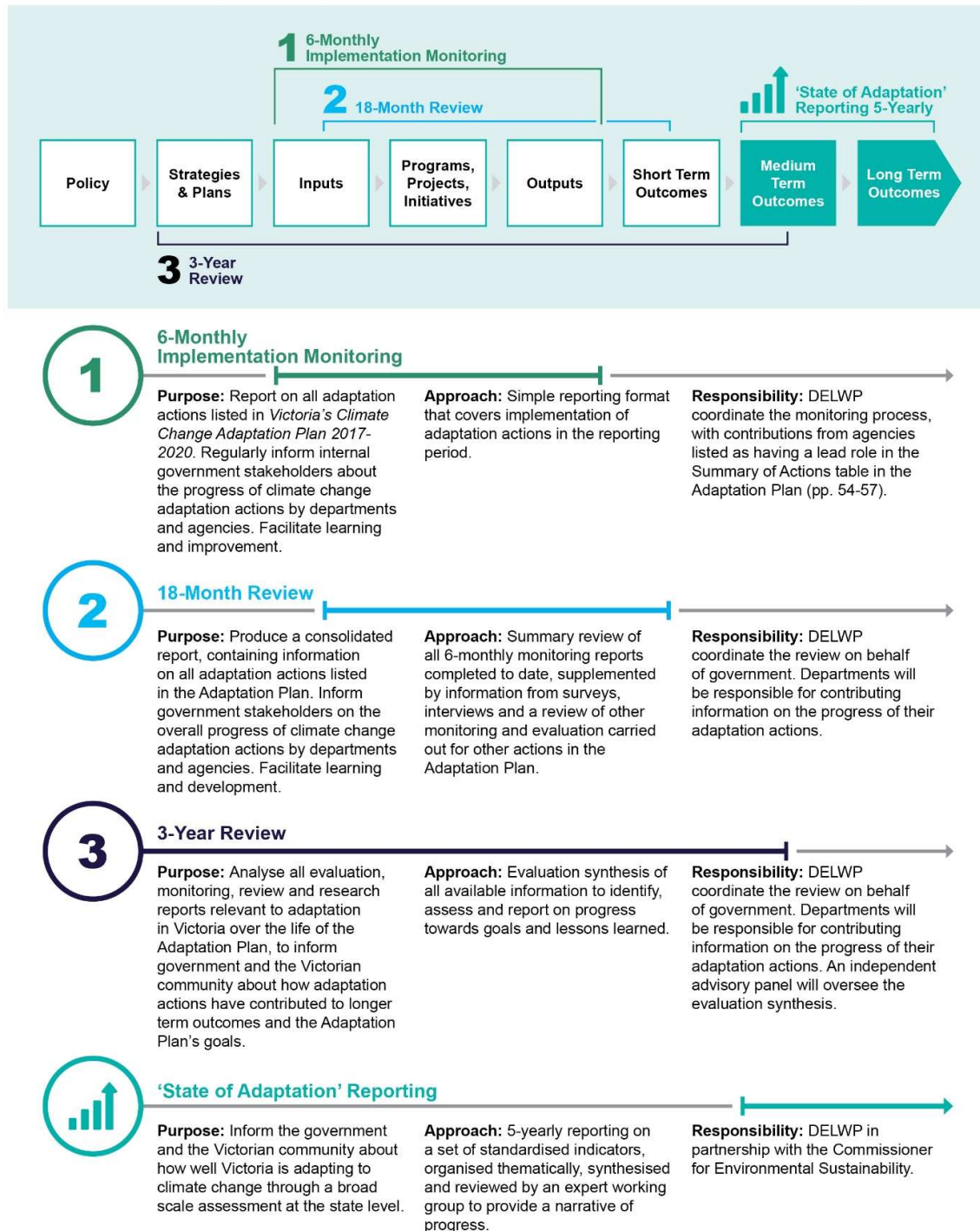


Figure 1: Overview of the Monitoring, Evaluation, Reporting and Improvement Framework

## Acronyms and Key Terms

Term	Definition
AAP	Adaptation Action Plan
CCPB	Climate Change Policy Branch (DELWP)
DELWP	The Victorian Department of Environment, Land, Water and Planning
The MERI Framework	The Monitoring, Evaluation, Reporting and Improvement Framework
IDC	Interdepartmental Committee
MERI	Monitoring, Evaluation, Reporting and Improvement
The Adaptation Plan	<i>Victoria's Climate Change Adaptation Plan 2017-2020</i>



# 1. Introduction

## 1.1 About this document

This Monitoring, Evaluation, Reporting and Improvement (MERI) Framework for Climate Change Adaptation in Victoria (the MERI Framework) was developed following consultation with a range of relevant government departments and agencies over a four-month period during May to August 2017.

This document comprises the following sections:

- Section 1: Background and context for the MERI Framework, including the audience and governance arrangements.
- Section 2: Explanation of the program logic for how actions in *Victoria's Climate Change Adaptation Plan 2017-2020* (the Adaptation Plan) link to the Adaptation Plan's Goals.
- Section 3: The MERI Framework.

## 1.2 Background to this framework

In 2017, the Victorian Government established the new *Climate Change Act 2017*, and released Victoria's *Climate Change Framework* and the Adaptation Plan. These policies set the direction for reducing Victoria's greenhouse gas emissions (climate change mitigation) and preparing for the unavoidable risks and impacts of climate change (climate change adaptation).

Victoria's climate change policies exist in the context of local, state, national and global action (Figure 2). The Adaptation Plan supports state and regional adaptation activity, including the development of pilot sector-based adaptation action plans (AAPs) and a regional adaptation program. The commitments made in the Adaptation Plan support the goals and objectives of international and national policies including the United Nations Sustainable Development Goals.

The actions set out by the Government are underpinned by an expectation that communities, businesses and individuals will take responsibility for understanding the risks they face and take necessary action. Conversely there will be an expectation from the community that the Government will provide the necessary support by implementing the actions they have committed to.

The MERI Framework will guide the assessment of the implementation and outcomes of adaptation actions and track progress towards climate resilience as outlined in the Adaptation Plan. It will also support communication on progress and inform and improve future policy and program design. The information gained through the implementation of the MERI Framework may also support assessments of progress at the national level and potentially feed into reporting against Australia's international commitments.

The MERI Framework can be used as a model approach beyond state government, for example by local governments and non-government organisations.



<b>International</b>	<ul style="list-style-type: none"> <li>• Paris Agreement – Article 7</li> <li>• UN Sustainable Development Goals</li> <li>• Sendai Framework</li> <li>• Global Compact of Mayors</li> </ul>
<b>National</b>	<ul style="list-style-type: none"> <li>• National Climate Resilience and Adaptation Strategy</li> <li>• National Strategy for Disaster Resilience</li> <li>• Australia's Biodiversity Conservation Strategy</li> </ul>
<b>State</b>	<ul style="list-style-type: none"> <li>• Victoria's Climate Change Adaptation Plan 2017-2020</li> <li>• Climate Change Act 2017</li> <li>• Climate Change Strategy (from 2021)</li> </ul>
<b>State Sectoral/Regional</b>	<ul style="list-style-type: none"> <li>• Sector Based Adaptation Action Plans</li> <li>• Plan Melbourne 2017- 2050</li> <li>• EMV – Community Resilience Strategy</li> <li>• Our Catchments Our Communities</li> <li>• Water for Victoria</li> </ul>
<b>Local</b>	<ul style="list-style-type: none"> <li>• Resilient Melbourne Strategy</li> <li>• Municipal Health and Wellbeing Plans</li> </ul>

**Figure 2: Selection of international, national, state and local policy context for Victoria's Climate Change Adaptation Plan 2017-2020**

### 1.3 Framework purpose and approach

The MERI Framework outlines a whole-of-government approach to monitor and evaluate the implementation and effectiveness of actions in the Adaptation Plan, and to build an understanding of how adaptation actions have contributed to achieving longer term outcomes and goals articulated in the Adaptation Plan.

The approach adopted in the MERI Framework is based on best practice literature on monitoring and evaluating climate change adaptation and has been designed to consider issues of scale and complexity. Additionally, it is recognised that climate change is a long-term issue, with many uncertainties about its magnitudes and effects. Many of these effects will not occur over the four-year implementation period of the Adaptation Plan. It also considers potential costs associated with different approaches to monitoring and evaluation of adaptation at a state level. These considerations are discussed further in Section 2. The MERI Framework has three components:

1. **6-monthly implementation Monitoring**, to monitor implementation of actions in the Adaptation Plan.
2. **18-month review**, to monitor implementation of actions, measure short-term outcomes achieved and identify improvement opportunities for implementation of adaptation actions.
3. **3-year review** that analyses evaluation, monitoring, review and research reports applicable to adaptation in Victoria over the life of the Adaptation Plan.

The MERI Framework is described in more detail in Section 3.

The MERI Framework is also supported by a separate and complementary project on long-term 'state of adaptation' indicators that will assist government departments and agencies to establish a baseline for adaptation in Victoria, and to monitor change over time. An overview of the key concepts of monitoring, evaluation, reporting and improvement is provided in Appendix A.

## 1.4 Who is this Framework for?

This MERI Framework has been developed considering multiple audiences. This includes those who will apply the MERI Framework, gather the relevant data required and disseminate or act in response to the information reported. The relevant audiences and their interest in the MERI Framework are summarised in Table 1.

**Table 1 Audiences for the MERI Framework for Adaptation in Victoria and reporting outputs**

Audience for the MERI Framework	
DELWP	Sets out the approach for MERI in relation to the Adaptation Plan.
Departments/agencies with actions in the Adaptation Plan	<p>Sets out the approach for reporting on implementation of actions in the Adaptation Plan.</p> <p>Provides guidance on an evaluation approach that may be used to evaluate the effectiveness of implemented actions at program/project level.</p>
Other organisations undertaking adaptation actions (eg. other subnational jurisdictions)	Provides guidance on approaches to MERI for climate change adaptation.
Audience for the reporting developed as an outcome of the MERI Framework	
Whole of Victorian Government (all departments and agencies)	<p>Reports on the implementation and evaluates the effectiveness of adaptation actions from the Adaptation Plan.</p> <p>Provides understanding of gaps in implementation of actions and identification of risks that may arise as a result.</p> <p>Informs and supports future planning and investment in adaptation actions.</p>
Communities of interest active in climate adaptation	<p>Reports on the implementation and evaluates the effectiveness of adaptation actions from the Adaptation Plan.</p> <p>Progress reporting reaffirms the government's policy commitments and upcoming priority actions.</p>
Broader public	<p>Reports on the implementation and evaluates the effectiveness of adaptation actions from the Adaptation Plan.</p> <p>Progress reporting reaffirms government policy commitments and upcoming priority actions.</p> <p>Transparency of government action in climate change adaptation.</p>

## 1.5 Governance of the MERI Framework

Adaptation actions are being delivered across all systems and by a range of state government departments and agencies. To support this, the governance functions for the MERI Framework will be led by existing cross-government committees. The MERI Framework will be overseen by an interdepartmental committee (IDC) of Deputy Secretaries. DELWP and the relevant interdepartmental working group will also play key roles, providing technical leadership and coordinating with departments.

## 1.6 Resourcing

The implementation of the MERI Framework relies on a range of departments and agencies, which each have different roles to play. DELWP plays a key role in coordinating the implementation of the MERI Framework, guiding and supporting other departments and collating monitoring and evaluation reports. To maximise efficiency, many of the reporting requirements in the MERI Framework will be met through existing or currently planned monitoring, research, data collection, evaluation studies and departmental reporting processes. Departments and agencies with responsibility for delivering actions in the Adaptation Plan will be asked to contribute to and share the 6-monthly monitoring reports and the 18-month and 3-year reviews.

## 1.7 Using the MERI Framework into the future

The MERI Framework, in a general sense, will continue to be used and integrated into government processes beyond the end of the Adaptation Plan in 2020.

While the Adaptation Plan is based on the Government's strategic priorities, and measures and responses for adaptation developed under the *Climate Change Act 2010*, it also lays the groundwork for a new, integrated approach to adaptation under the *Climate Change Act 2017*. Therefore, some elements of the MERI Framework are already aligned with the policy framework outlined for adaptation in the new Act, meaning that the structure and approach of the MERI Framework will remain relevant over the medium- to long-term.

DELWP CCPB, in partnership with relevant government departments and agencies, will be responsible for coordinating and integrating elements of this MERI Framework into the new approach to Victoria's climate change adaptation policy and programs in the future. This will be through mechanisms outlined below:

- The goals of the Adaptation Plan are based on policy objectives in the *Climate Change Act 2010* and are aligned with the policy objectives of the *Climate Change Act 2017*. This means that the vision and broader goals embedded in the MERI Framework – expressed in the form of the long-term outcomes for climate change adaptation – remain broadly relevant beyond the four-year life of the Adaptation Plan.
- Specific adaptation actions will change over time, as many of them come to completion and are replaced by new actions as new information becomes available, and new priorities emerge. The approach to monitoring will remain relevant and broadly applicable for this new suite of actions.
- Evaluation approaches and processes will remain applicable and replicable, as they are aimed at medium-term and long-term outcomes, which are based on goals that are aligned with the *Climate Change Act 2017*. Specific descriptions of medium-term and longer-term outcomes will change incrementally rather than dramatically, because they will remain oriented in overall direction in response to policy objectives. Specific evaluation questions may require some adjustment, although most will remain suitable to guide the evaluation of any particular set of adaptation actions, as they are expressed in broad terms.

The long-term adaptation indicators that will be developed as part of the 5-yearly 'State of Adaptation' reporting will assist government departments and agencies to establish a baseline for adaptation in Victoria, and to monitor change over time.

It is intended that adaptation indicators be integrated into the Commissioner for Environmental Sustainability's 2018 State of the Environment Report. Data gathered through the monitoring of indicators may contribute to future Victorian climate science reports, and five-yearly Climate Change Strategies required under the *Climate Change Act 2017*.

## 2. Program logic

### 2.1 Purpose of the program logic

An early step in the development of the MERI Framework involved articulating the underlying logic that links the adaptation actions listed in the Adaptation Plan, with the Adaptation Plan's goals and outcomes. A program logic model is a representation of the causal relationships between elements of a program and provides an overview of how a program is intended to work.

Effective monitoring, evaluation, reporting and improvement frameworks depend upon a clear understanding of the logic underlying the programs and actions that work to deliver their planned results. Actions and their outputs work through a series of causes and effects to achieve results over time.

The program logic for climate change adaptation in Victoria is presented in Appendix B. It starts with a synthesis of medium-term and long-term outcomes and impact statements derived from the Vision and Goals of the Adaptation Plan. Linkages between the Adaptation Plan's actions and outcomes are then articulated, based on information gathered through stakeholder consultation for the development of the MERI Framework. The articulation of the medium-term and long-term outcomes emphasises that many of the outcomes from the Adaptation Plan are unlikely to be perceptible over its four-year life.

The purpose of the program logic is to illustrate how adaptation actions are expected to deliver a series of outputs, and contribute towards outcomes in the short-, medium- and long-term. These linkages have been articulated so that monitoring and evaluation reports have a clear focus on the appropriate parts of the logic.

The program logic in Appendix B may be used to guide the development of monitoring and evaluation plans for individual adaptation actions or groups of actions. This would involve program personnel first reviewing the sequence of outputs and outcomes across the program logic table for the actions of relevance, expanding or changing the list where necessary. They would then examine each output and outcome and develop detailed questions to be researched during monitoring and evaluation of the action or group of actions.

### 2.2 Development of the program logic

The program logic was developed through a combination of research, one-on-one interviews and a workshop with a group of stakeholders drawn from the departments and agencies responsible for climate change adaptation actions listed in the Adaptation Plan. Information on the planned outcomes of adaptation actions and current monitoring and evaluation activities of the Victorian Government were also gathered. The program logic includes details of adaptation-related:

- activities
- outputs
- short-term outcomes (1-3 years)
- medium-term outcomes (3-5 years)
- long-term outcomes (5-10 years).

Different elements of the MERI Framework relate to different parts of the program logic. The 6-monthly monitoring looks at activities, outputs and short-term outcomes. The 18-month review looks at outputs and short-term outcomes. The 3-year review looks at short and medium-term outcomes. The 'state of adaptation' reporting will consider long-term outcomes.

### **Important notes**

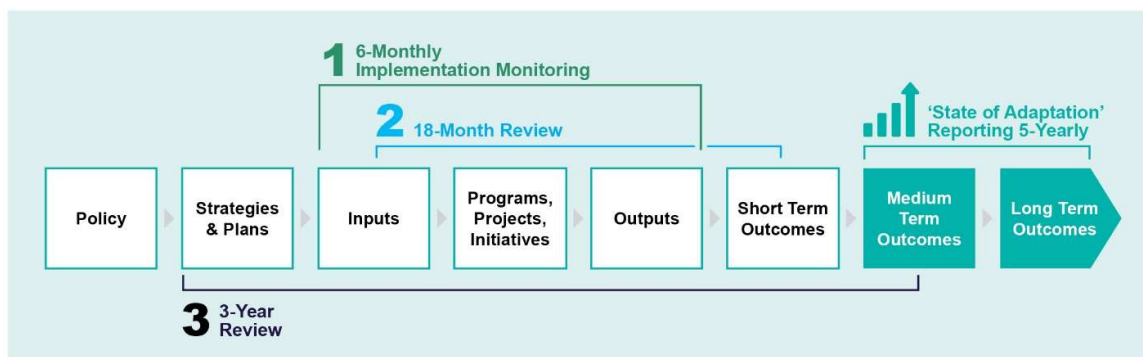
The program logic has been developed as a guide to help shape the MERI Framework. It is not meant to be interpreted as an exact or finalised representation of the logic of all the adaptation actions and their outcomes. When developing more detailed approaches to monitoring and evaluation, program and project managers are encouraged to develop their own detailed program logic models to describe how their programs and projects work to achieve their outcomes.

It is also acknowledged that climate change operates over a much longer time than the five to ten years mentioned above. The latter time frame has been denoted 'long term' in the MERI Framework because the Adaptation Plan has a four-year implementation period and outcomes that develop subsequently are considered 'long term' in that context.

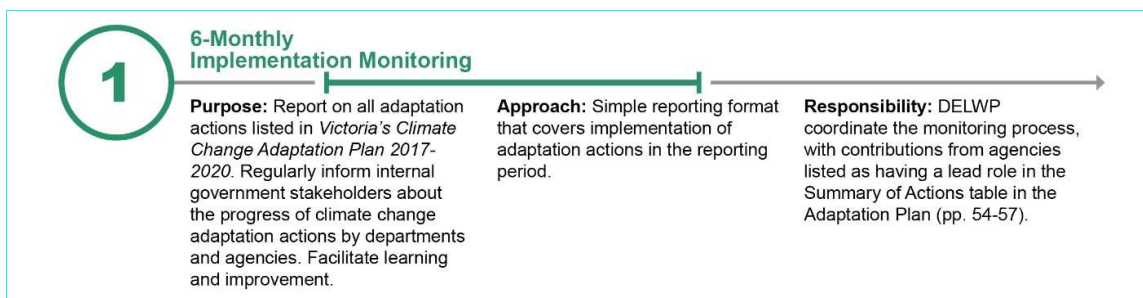
# 3. Monitoring, Evaluation, Reporting and Improvement Framework

## 3.1 Overview

This section outlines the components of the MERI Framework.



## 3.2 6-Monthly Implementation Monitoring



Monitoring will be undertaken every six months to enable any new risks to be identified and timely corrective action taken, as well as enabling lessons learned to be shared regularly.

Monitoring will cover all new initiatives (actions marked with a 'tick' logo in Part Seven of the Adaptation Plan) and existing actions that are continuing to be implemented and are delivering tangible outputs. Actions that have been completed and are not delivering any new outputs specific to the Adaptation Plan are outside the scope of monitoring, however, they will be considered in the 3-Year Review.

To streamline regular monitoring reports on implementation progress, a standardised format will be used that addresses basic questions about:

- progress of implementation activities;
- delivery of planned outputs;
- issues or barriers that may impact implementation or performance of adaptation actions; and
- lessons learned about implementing adaptation actions.

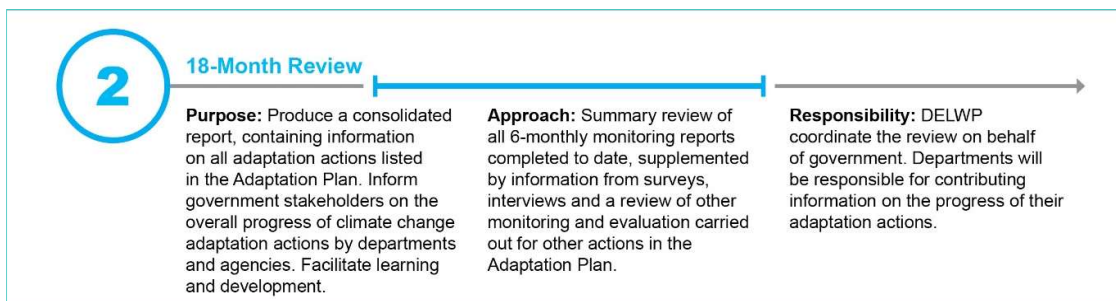
## Monitoring Questions

- To what extent have adaptation actions been implemented as intended?
- What key achievements have been made on delivering climate change adaptation actions by your department or agency in the reporting period?
- Are there any climate change adaptation actions that your department, agency or unit has commenced in addition to those listed in the Adaptation Plan? Consider any new actions that address resilience; improve or maintain the integrity of an asset, system or piece of infrastructure; or otherwise address existing or future risks associated with weather or climate.
- What lessons have been learned about implementing adaptation actions that can be used to improve future actions?
- Are there any case studies or other new information on your climate change adaptation actions that would be valuable to share with other government agencies and/or the community?

## Reporting

The outcome of the monitoring will be a consolidated summary report prepared by DELWP that identifies the overall progress of implementation highlighting achievements and noteworthy barriers that have been observed during the period. The report will recommend actions to enhance adaptation activities for the following six months. The report will be issued for internal use.

### 3.3 18-Month Review



The 18-Month Review will focus on the implementation of adaptation actions in the first eighteen months of the Adaptation Plan and progress towards short-term actions. The primary source of information will be the implementation monitoring reports made by government departments and agencies since the commencement of the monitoring program.

The 18-Month Review will be supplemented by a survey of departments and agencies that seeks any further information on adaptation action outputs and short-term outcomes delivered up until then.

Stakeholders from across government may also be interviewed, to provide qualitative information to support an analysis of the success of implementation so far. Stakeholders will be selected for interview based on their involvement with adaptation action programs or projects that are thought to have potential to reveal useful lessons about climate change adaptation. This may include programs or projects that are considered highly successful or innovative, or that have dealt with significant barriers or implementation difficulties in a way that may prove informative to other program or project managers.

The interviews and surveys may also be extended beyond state government to local government, not-for-profits and the private sector, to add to the full picture of adaptation in Victoria. This will depend on needs and resource capacity.



## Key Review Questions

The overarching questions for the 18-Month Review are:

- To what degree have adaptation actions been implemented as intended?
- What has been learned about the implementation of the climate change adaptation actions and their effects so far that can be used to improve future actions?

The following detailed questions may be used to analyse existing monitoring and evaluation reports:

- What adaptation actions have been implemented so far?
- If actions have not been implemented as planned at this stage, why not?
- To what extent have adaptation actions delivered outputs that were fit for purpose?
- To what extent have adaptation actions been delivered according to the adaptation principles in the Adaptation Plan (informed decision-making, integrated decision-making, risk management, complementarity, equity and community engagement)?
- What evidence is there of progress towards short-term outcomes?
- Are there any additional benefits that have been achieved so far as a result of the Adaptation Plan's implementation?

The following questions may be used in interviews about specific adaptation actions to uncover more information about the success or otherwise of particular actions, barriers encountered during implementation, lessons learned, and potential improvements for future actions:

What lessons have been learned about the adaptation actions that can be used to enhance future actions and build adaptive capacity across relevant departments, agencies and systems?

Have any stakeholders been adversely affected by the adaptation actions of others? If so, what can be learned from these instances?

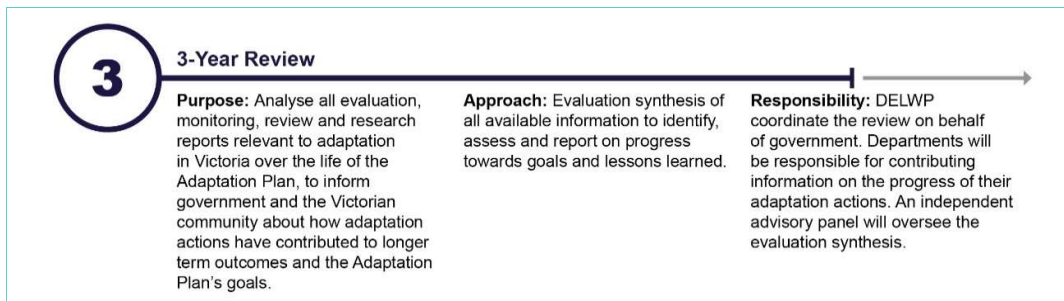
Have there been significant shifts in context (e.g. a major climatic event) that requires a rethinking of adaptation actions and if so, what changes are needed in response?

How can future climate change adaptation actions be improved?

## Reporting

The outcome of the review will be a detailed consolidated report containing information on all adaptation actions listed in the Adaptation Plan. The report will be issued for use by government departments and agencies, and will make recommendations on whether mid-term modifications are required for the Adaptation Plan.

### 3.4 3-Year Review



The 3-Year Review will focus on how effectively adaptation actions have contributed to short-term and medium-term outcomes and progress towards the longer-term outcomes and the Adaptation Plan's goals. All adaptation actions listed in Part Seven of the Adaptation Plan (new, continuing and completed) fall within the scope of the 3-Year Review. New initiatives since the Adaptation Plan was released are also included in the scope.

The 3-Year Review will capture the latest information about climate change adaptation in Victoria to inform future policy and programs. It will begin with an expert review of all available evaluation studies, monitoring reports (e.g. 6-Monthly Monitoring, 18-Month Review and any available 'state of adaptation' data), key indicator data, post-event review reports (e.g. emergency management and major event response reports) and interviews with key government and non-government stakeholders. Consideration will also be given to academic and grey literature and other wider studies published within the timeframe of the review to learn from adaptation efforts underway in other regions. An evaluation synthesis report will be produced that determines the overall lessons to be drawn from the accumulated information.

This approach is considered best available practice as it combines an efficient form of systematic review with wider consideration of developments in climate change adaptation that are relevant to Victoria. The synthesis report will be strategic and add further value, rather than simply duplicating the recommendations in individual evaluation, monitoring and post-event review reports. It will promote learning and collective reflection to improve the overall effectiveness of adaptation in Victoria.

The synthesis report will be reviewed and moderated by an advisory panel. Membership of the advisory panel will include selected representatives drawn from technical specialists working in the field of climate change adaptation in state government, local government, private enterprise and academia, as well as community representatives drawn from organisations active in climate change adaptation.

The evaluation synthesis approach recognises that there are many evaluation frameworks already in use, or proposed, across state government departments and local government. Because many systems and agencies are engaged in delivering adaptation actions, it is preferable that those delivering the actions design and deliver their own program and project evaluations.

Three government agencies will be developing pilot sector-based AAPs during the life of the current Plan. Each pilot AAP will include its own monitoring, evaluation, reporting and improvement framework. It is recommended that sector agencies model their AAP MERI process on the approach outlined in this Framework. The program logic shown in Appendix B of this Framework may be used by agencies to support the development of their own AAP MERI frameworks. Reviews are recommended to occur mid-way through each AAP's implementation and in their final year, similar to this Framework. The key review questions in Sections 3.3 and 3.4 of this Framework may form the basis for developing key review questions for sector AAP MERI approaches.

## Key Review Questions

The overarching key review questions are:

- How effectively has the Adaptation Plan been implemented?
- What progress has been made towards Victoria's climate change adaptation goals?

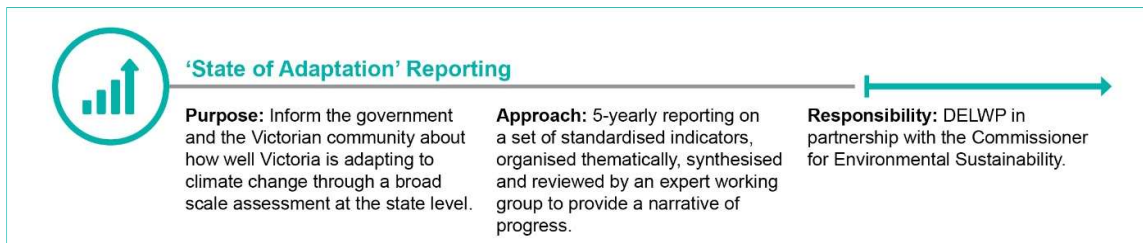
To provide evidence to answer the overarching questions, the data collection for the 3-Year Review will be structured through the following detailed key questions:

- What information is available from evaluation studies, adaptation action monitoring, published research and other relevant sources about the effectiveness of adaptation actions in Victoria and the likelihood of achieving the Adaptation Plan's desired short-term and medium-term outcomes?
- What other evidence exists that may not be formally reported yet on the effectiveness of adaptation actions in making progress towards longer-term outcomes?
- To what extent have evaluations, monitoring and research revealed alignment between adaptation initiatives in Victoria and the principles of successful adaptation in the Adaptation Plan (informed decision-making, integrated decision-making, risk management, complementarity, equity and community engagement)?
- How can the lessons learned in individual program and project evaluations and other research be applied to improve Victoria's adaptation to climate change, including informing the new approach to climate change policy under the new *Climate Change Act 2017*?
- What lessons have been learned about the adaptation actions that can be used to enhance future actions and build adaptive capacity across relevant department, agencies and systems?
- Have there been any adverse impacts arising from the adaptation actions?
- Have there been significant measurable shifts in context (e.g. a major climatic event) that require a rethinking of adaptation actions and if so, what changes are needed in response?

## Reporting

The outcome of the review will be a detailed, publicly available 3-Year Review Report. The report will inform government and the public about how adaptation actions have contributed to the medium-term outcomes and progress towards the Adaptation Plan's long-term outcomes and goals and inform development of the Climate Change Strategy.

### 3.5 Tracking the overall ‘State of Adaptation’



To track the overall success of adaptation in Victoria, a set of standardised indicators are proposed. The purpose of the indicators is to support qualitative commentary on how the state is tracking against climate change adaptation goals. They will assist government departments and agencies to establish a baseline for adaptation in Victoria, and to monitor change over time. Data gathered through the monitoring of indicators may also form the basis of a themed ‘State of Adaptation’ report and may contribute to future Victorian climate science reports, and five-yearly Climate Change Strategies required under the *Climate Change Act 2017*.

Because tracking of the indicators will happen beyond the life of the Adaptation Plan, it is considered separate to the Adaptation Plan’s MERI Framework.

#### Key question

How successfully is the State of Victoria adapting to manage the risks and impacts of climate change?

#### Analysis method

The format for reporting will be aligned with that used by the Commissioner for Environmental Sustainability in the five-yearly State of the Environment reports. Information is to be collected from relevant sources (departments, agencies and other) to reflect knowledge and information on how the state is adapting. This information is then analysed and interpreted to present a coherent and useful narrative.

# Appendix A Development of the MERI Framework

## Development of the MERI Framework

The MERI Framework covers monitoring, evaluation, reporting and improvement. An overview of these four concepts is provided in this section. This section also describes a number of key considerations that influenced the development of the MERI Framework. This includes issues of scale, governance and resourcing.

### MERI concepts

#### Monitoring

Monitoring is concerned with the program delivery, in this case implementation of the actions in the Adaptation Plan. Monitoring will be used for reporting implementation progress of the adaptation actions, and to inform the 18-Month and 3-Year Reviews. Monitoring should be primarily focused on transparency, learning and improvement, rather than having too strong of a focus on accountability, as the latter is covered by existing management reporting processes.

#### Evaluation

Evaluation considers the wider context of the Adaptation Plan's implementation and extends its view to longer term results. It is intended that two main reviews will be conducted: an 18-Month Review and a 3-Year Review. The 18-Month Review will report on progress in implementing actions within the Adaptation Plan and towards short-term outcomes, and make recommendations on whether mid-term modifications are required for the Adaptation Plan.

The 3-Year Review will focus on how effectively adaptation actions have contributed to short-term and medium-term outcomes and progress towards the longer-term outcomes and the Adaptation Plan's goals, and give an overall picture of how effective the Adaptation Plan has been.

#### Reporting

Reporting is the means by which monitoring and evaluation feed back into program and policy design and implementation. The purpose of reporting is to formally communicate monitoring and evaluation information across state government entities and to other stakeholder groups, including the community. As the information and decision-making needs of different groups vary, there may be several different types of reports produced, for both monitoring and evaluation.

Reporting is intended to enable assessment of adaptation performance, determine next steps and facilitate learning. To support these purposes, information should be transparent and tailored to the various stakeholder groups' needs. It is also important to determine the optimum type and frequency of reporting, and the communication and dissemination mechanisms to be adopted.

#### Improvement

The Adaptive Management Cycle approach (Figure3), is a way of enabling improvement by maximising lessons learned and allowing feedback to inform decision making. Monitoring and evaluation reports form a critical component of the improvement feedback loop.



**Figure 3: Key elements of the adaptive management cycle (Source: DELWP, Monitoring, Evaluation and Reporting – Roles and Responsibilities for Reporting Fact Sheet, 2016)**

## Key challenges of adaptation monitoring and evaluation

### Scale

Adaptation occurs across a range of scales, including geospatial, temporal, social, economic and political. Accordingly, monitoring and evaluation approaches can also vary across these scales. The approach to monitoring and evaluation taken may depend on the system, such as health, infrastructure or agriculture; the type of action or intervention; and the scale of the intervention. Synthesising such diverse information to determine an overall picture of both implementation progress (i.e. monitoring) and adaptation progress (i.e. evaluating) overall is challenging as data may not always be available at the same scale. The approach proposed in this MERI Framework synthesises available evaluation results to provide an overall picture of adaptation. Data to support each element of the MERI Framework should reflect the variety scales examined. The complementary State of Adaptation indicators work seeks to aggregate standardised indicators that are applicable to adaptation in Victoria.

### Governance and resourcing

Implementing the MERI Framework will require a governance structure and processes to ensure that monitoring and evaluation results are disseminated to a wide range of audiences. Lessons learned from monitoring and evaluation need to be fed back into improvements in adaptation programs and projects, and used in the planning of future initiatives. Given that adaptation actions are being delivered in all systems and by a range of state government departments and agencies and would ideally be coordinated, governance functions for the MERI Framework will be through existing interdepartmental committees.

In developing the MERI Framework, the ability to resource its implementation was an important consideration. The MERI Framework has been designed in a way that tries to minimise the impact on departmental resources and leverages existing data gathering processes and structures where possible.

# Appendix B Program logic

## Introduction to the Program Logic

The Program Logic is a high-level view of the eighty-seven actions listed in *Part Seven – Summary of actions* within the Adaptation Plan (pp. 54-57). It has been developed to show the relationships between the actions and the outcomes that they will help achieve.

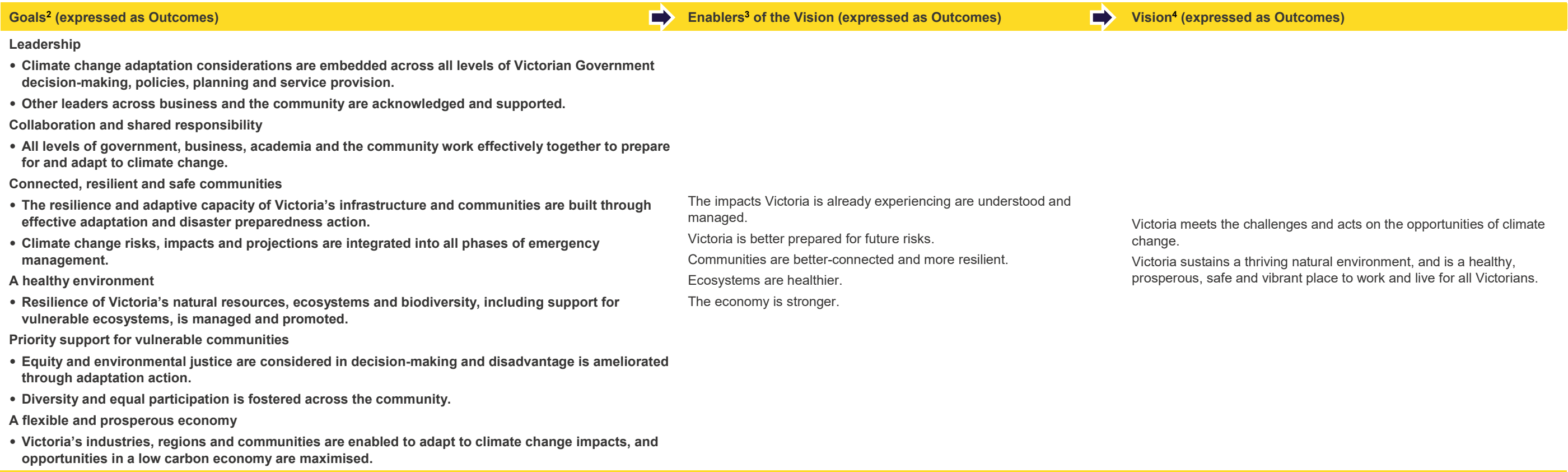
The Program Logic is presented in two parts:

- Part 1 shows the outcomes expected from the Adaptation Plan, as described by its Vision and Goals. The outcomes identified in Part 1 of the Program Logic appear as medium-term and long-term outcomes of the actions in Part 2 of the Program Logic.
- Part 2 of the Program Logic describes how the actions within the Adaptation Plan lead to short-term outcomes that then contribute to the achievement of medium-term and long-term outcomes.



Program Logic Part 1: Outcomes derived from the Adaptation Plan’s Vision and Goals

The following statements of purpose are drawn from *Victoria’s Climate Change Adaptation Plan 2017 – 2020*. They have been used to frame statements of long-term and medium-term outcomes for the Adaptation Plan’s program logic model that follows.



2 Adapted from Victoria’s Climate Change Adaptation Plan 2017-2020 p.23

3 Adapted from Victoria’s Climate Change Adaptation Plan 2017-2020 p.14 par. 2

4 Adapted from Victoria’s Climate Change Adaptation Plan 2017-2020 p.14 par.1

## Program Logic Part 2: Logic Model of Victoria's Climate Change Adaptation Plan 2017-2020

Actions in the Adaptation Plan and associated outputs	Short-term outcomes 1-3 years	Medium-term outcomes 3-5 years	Long-term outcomes 5-10 years
<b>Leading by example: addressing risks to State government operations and assets</b>			
<ul style="list-style-type: none"> <li>Victorian Risk Management Framework</li> <li>Audit of Government operations</li> <li>Whole-of-government working group</li> <li>Advocacy for national action and financial assistance from the Commonwealth Government</li> </ul>	<p>All government agencies have assessed their risks using up-to-date knowledge of climate change.</p> <p>Whole-of-government working group develops strategies and responses to prioritise whole-of-government issues relating to climate change.</p> <p>Funding obtained from the Commonwealth for adaptation programs.</p> <p>Collaboration for action on national issues.</p> <p>Risk-based decision making is included in business plans.</p>	<p>Adaptation plans are reviewed in light of the audit report and risk analyses.</p> <p>Existing and emerging climate-related risks and opportunities are identified and appropriate responses implemented.</p> <p>Climate change adaptation considerations are coordinated and embedded across all levels of Victorian Government decision-making, policies, planning and service provision.</p> <p>Contingencies are built into Risk Management Plans that adequately take into account future climate scenarios and projections.</p>	<p>Climate change and its effects are being assessed and plans are being updated in response to new data and information.</p> <p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Victoria is better prepared for future risks of climate change.</p>
<b>Helping Victorian communities adapt to climate change</b>			
<b>Guidance and authoritative up-to-date information</b>			
<ul style="list-style-type: none"> <li>Future Coasts</li> <li>Flood Studies</li> <li>Better climate projections for Victoria</li> <li>Vulnerability assessment</li> <li>Emergency Risks in Victoria update, including review of assumptions around program logic</li> <li>Victorian Climate Initiative (VicCI)</li> <li>Primary Industries Climate Challenges Centre (PICCC)</li> <li>Virtual Centre for Climate Change Innovation</li> <li>Climate-Ready Victoria factsheets</li> <li>Emergency Management Common Operating Picture (EM-COP)</li> <li>VicEmergency website</li> <li>Agricultural newsletters</li> <li>Authoritative climate change data and information for the community</li> <li>Guidance on how to use updated data</li> </ul>	<p>Target audiences/stakeholders access information and acquire and apply relevant knowledge and skills.</p> <p>Key groups, including vulnerable groups, improve their adaptation capacity.</p> <p>Key groups and individuals, including those that support vulnerable communities, apply new knowledge and skills to adaptation programs, projects and activities.</p> <p>Community events, information briefs and training have evaluation built in to assess whether they add value, change behaviour, inform on where to go for help, encourage subsequent local group formation, and increase traffic of people accessing information sites.</p> <p>Enable mindset change so that at-risk individuals and communities utilise technology as part of wider set of tools when developing personal extreme weather safety plans.</p> <p>Communicate with vulnerable groups in society to improve understanding of risks around extreme weather events.</p> <p>Common platform for collation and sharing of information on climate change.</p>	<p>Individuals, communities and organisations improve their adaptation capacity and better adapt to climate change.</p> <p>Individuals, communities and organisations better prepared for extreme events.</p>	<p>Communities are better-connected and more resilient.</p> <p>Victoria understands and is prepared for future risks.</p>
<b>A partnership with local government</b>			
<ul style="list-style-type: none"> <li>Partnership Agreement</li> <li>Community of practice for adaptation in local government</li> <li>Training and guidance for local government</li> <li>Targeted support for local government adaptation projects</li> <li>Collaborate with and support local government Greenhouse Alliances</li> <li>Forum on managing climate-related insurance risks</li> <li>Effective collaboration between emergency management sector and councils</li> </ul>	<p>Local government adaptation capacity strengthened.</p> <p>Local governments implement adaptation projects.</p> <p>An ongoing collaborative partnership exists between state government and local governments in Victoria on climate change adaptation. It is guided by principles for collaboration and a shared understanding of roles and responsibilities.</p> <p>Each local government is able to sign on to the Partnership Agreement.</p> <p>Council plans' incorporation of climate change and responses in planning are assessed.</p>	<p>Preparation for and adaptation to climate change is undertaken by both state and local government.</p>	<p>Local government services are more resilient to climate change.</p> <p>Communities are better-connected and more resilient.</p> <p>Victoria is better prepared for future risks of climate change.</p>
<b>A regional approach to adaptation planning</b>			
<ul style="list-style-type: none"> <li>Regional adaptation gap analysis</li> <li>Regional adaptation projects and planning supported</li> </ul>	<p>Regional adaptation priorities are identified and actions are planned that may work through or align with Regional Partnerships.</p>	<p>Regional adaptation priorities and tailored initiatives and projects are delivered to support regional communities to prepare for and adapt to current and future climate change</p>	<p>Victoria's industries, regions and communities are better enabled to adapt to climate change impacts.</p>

Actions in the Adaptation Plan and associated outputs	Short-term outcomes 1-3 years	Medium-term outcomes 3-5 years	Long-term outcomes 5-10 years
	Regional adaptation planning is based on best available information about vulnerabilities, gaps and needs and values of the community.	impacts.	
<b>Embedding adaptation in core sectors of our community</b>			
Sector summits (2018, 2019, 2020)	<p>Sector-based pilot Adaptation Action Plans are prepared for the priority sectors of health and human services, primary production, and the water cycle.</p> <p>Sectors collaborate in pilot adaptation planning.</p>	<p>Sector-based pilot Adaptation Action Plans are implemented for the priority sectors of health and human services, primary production, and the water cycle.</p> <p>Government departments and agencies responsible for developing mandatory Adaptation Action Plans have the capacity to fulfil their obligations under the <i>Climate Change Act 2017</i>.</p> <p>Vulnerable sectors are better prepared for adaptation planning under the <i>Climate Change Act 2017</i>.</p>	<p>Climate change and its effects are being assessed and plans are being updated in response to new data and information.</p> <p>The impacts the state is already experiencing are understood and managed.</p> <p>Victoria is better prepared for future risks of climate change.</p>
<b>Addressing the impacts on health and human services</b>			
<ul style="list-style-type: none"> <li>Victorian public health and wellbeing plan</li> <li>Municipal health and wellbeing plans that consider climate change</li> <li>Pilot Adaptation Action Plan for the health and human services sector</li> <li>Assessment of the cost of climate change impacts on social determinants of health and wellbeing</li> <li>Victorian Heat Health Plan</li> <li>State Heat Plan (Emergency Management Victoria)</li> <li>Community Services Climate Resilience Program</li> <li>Climate-adapted public housing demonstration houses</li> </ul>	<p>Pilot Adaptation Action Plan for health and human services system is prepared and implemented.</p> <p>Implementation of priority adaptation actions.</p> <p>Commence mainstreaming of adaptation into departmental strategic planning and other sector-wide plans.</p> <p>Commence mainstreaming of adaptation planning into policy, program, services and infrastructure business planning.</p> <p>Support climate resilience planning in health and human services funded agencies.</p> <p>Complete climate adapted public housing demonstration program. Monitor and evaluate dwellings.</p>	<p>Adaptation Action Plan for health and human services system (2021 – 2026) prepared and being implemented.</p> <p>Progressed implementation of priority (2018 – 2021) adaptation actions.</p> <p>Climate change considerations continue to be embedded in health and human services strategic planning, business planning, policy and program delivery.</p> <p>Improved climate resilience in health and human services infrastructure, programs and services.</p> <p>Improved climate resilience of at-risk individuals and vulnerable groups.</p>	<p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Victoria is better prepared for future risks of climate change.</p> <p>Climate change impacts on health and wellbeing outcomes are well understood and mainstreamed into all facets of health and human services system planning and delivery.</p>
<b>Preparing for and responding to extreme weather events</b>			
<ul style="list-style-type: none"> <li>Floodplain Management Strategy</li> <li>Safer Together</li> <li>Victorian Fire Management Strategy</li> <li>Emergency Management Strategic Action Plan</li> <li>Ministerial Guidelines to consolidate reforms to emergency management planning legislation</li> <li>Emergency Management Climate Change Program</li> <li>Emergency Management Capability Blueprint</li> <li>Critical Infrastructure Resilience arrangements</li> <li>Reducing the risks to the energy network from fires of all types</li> <li>Review the regulation of high-pressure pipelines for the transport of energy and other industrial products</li> <li>Community Resilience Framework for Emergency Management in Victoria</li> </ul>	<p>Climate change risk/resilience, impacts and projections are consistently integrated across emergency management planning and service delivery.</p> <p>Victoria's capability and capacity is strengthened to help communities, business and government respond to the impacts of climate change.</p> <p>Climate change considerations are factored into the design, management and maintenance of critical infrastructure.</p> <p>Communities, businesses and state and local governments are empowered with information about climate change to enable them to make decisions about their safety.</p> <p>Risk management and contingency plans are developed in a coordinated manner, addressing interdependencies across critical infrastructure owners.</p>	<p>Preparation for and adaptation to climate change is understood by all levels of government, business, academia and the community working together effectively.</p> <p>Climate change risks / resilience, impacts and projections are integrated into all phases of emergency management.</p> <p>Climate change considerations are embedded in Critical Infrastructure Resilience arrangements.</p> <p>The resilience and adaptive capacity of Victoria's infrastructure and communities is built through effective adaptation and disaster preparedness action.</p> <p>Emergency services, businesses, government services and communities demonstrate resilience in preparing for, responding to and recovering from extreme weather events.</p> <p>Disruptions of essential services and support services for vulnerable communities are minimised in extreme weather events.</p> <p>Adaptation Principles are integrated into recovery processes so that:</p> <ul style="list-style-type: none"> <li>services are returned quickly; and</li> <li>infrastructure replacements are more resilient than before (but not necessarily replaced quicker).</li> </ul> <p>All initiatives include consideration of consequences for communities.</p>	<p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Victoria is prepared for future risks and impacts of climate change.</p> <p>Communities are better-connected and more resilient.</p> <p>Focus of all initiatives includes consequences on communities.</p> <p>Climate change and its effects are being assessed, including through post-extreme weather event reviews, and plans are being updated in response to new data and information.</p>

Actions in the Adaptation Plan and associated outputs	Short-term outcomes 1-3 years	Medium-term outcomes 3-5 years	Long-term outcomes 5-10 years
		Human casualties and economic losses of extreme weather events are less than previous experience of similar magnitude events.	
<b>Managing impacts on the natural environment</b>			
<b>Protecting biodiversity</b>			
<ul style="list-style-type: none"> <li>Protecting Victoria's Environment – Biodiversity 2037</li> <li>Integrating new climate change projections into spatial decision support tools</li> <li>Valuing and accounting for Victoria's environment</li> </ul>	<p>New climate change projections are integrated into spatial decision support tools.</p> <p>Biodiversity assets are identified and protection responses and adaptation plans are prepared.</p>	The resilience of Victoria's natural resources, ecosystems and biodiversity – including support for vulnerable ecosystems – is managed and promoted.	<p>Ecosystems are healthier.</p> <p>Victoria sustains a thriving natural environment.</p>
<b>Adapting on our coasts</b>			
<ul style="list-style-type: none"> <li>Coastal Climate Change Risk Assessments</li> <li>Incorporate new climate change projections into existing coastal data</li> <li>Victorian Coastal Strategy</li> <li>Marine and Coastal Act</li> <li>Guidance for decision-makers about coastal adaptation</li> <li>Benchmarks for sea level rise</li> <li>Climate-Ready Victorian Infrastructure – Critical Coastal Protection Assets</li> </ul>	<p>Coastal communities' and environments' risks are assessed.</p> <p>Coastal adaptation priorities are identified, and actions are planned.</p> <p>Planning and decision making in coastal areas incorporates climate change.</p>	<p>Coastal infrastructure is designed to be resilient to climate change.</p> <p>Coastal communities' and environments' risks have an implementation response prepared.</p> <p>The community is taking effective actions to adapt to incremental climate change and extreme events.</p>	<p>Victoria is better prepared for future risks of climate change.</p> <p>Communities are better-connected and more resilient.</p> <p>Coastal communities' infrastructure, health services, schools, economies, and ecosystems are better able to respond to the challenges of climate change.</p>
<b>Transition for the alpine sector</b>			
<ul style="list-style-type: none"> <li>Alpine Resorts Futures Project</li> <li>Southern Alpine Resorts Reform Project</li> <li>Adaptation planning for the alpine sector</li> </ul>	<p>Alpine region vulnerability assessment is completed.</p> <p>Possible impacts of climate change on the alpine region's economy and communities are researched and assessed.</p> <p>A plan is drawn up to adapt in response to possible impacts of climate change on the alpine region's economy and communities.</p>	The resilience and adaptive capacity of Victoria's alpine infrastructure and communities is built through effective adaptation and disaster preparedness action.	<p>Communities are better connected.</p> <p>The economy is enabled to transition.</p>
<b>Helping the agricultural sector to adapt</b>			
<ul style="list-style-type: none"> <li>Drought Preparedness and Response Framework</li> <li>Drought Response Package</li> <li>National Centre for Farmer Health</li> <li>Agriculture Infrastructure and Jobs Fund</li> <li>Agriculture sector research</li> <li>Future Industries Fund Food and Fibre Strategy</li> <li>Pilot Adaptation Action Plan for the agriculture sector</li> </ul>	<p>Climate change risks to the agricultural sector, including extreme weather events, are identified and communicated.</p> <p>Individual business plans incorporate climate change adaptation action.</p> <p>Pilot Adaptation Action Plan for agriculture system is prepared and implemented.</p> <p>Implementation of priority adaptation actions.</p>	<p>Adaptation Action Plan for primary production system (2021 – 2026) prepared and being implemented.</p> <p>Progressed implementation of priority (2018 – 2021) adaptation actions.</p> <p>Responses to extreme weather events are implemented that reduce the impact on the agriculture sector so productivity is maintained or increased</p>	<p>Agriculture in Victoria is prepared for future risks.</p> <p>Communities are better connected and more resilient.</p> <p>The economy is stronger.</p>
<b>Protecting our water resources</b>			
<ul style="list-style-type: none"> <li>Water for Victoria plan</li> <li>Pilot Adaptation Action Plan for the water cycle system</li> </ul>	<p>Pilot Adaptation Action Plan for water cycle system is prepared and implemented.</p> <p>Implementation of priority adaptation actions.</p> <p>Strategies and actions for adaptation to protect the integrated water cycle are identified and embedded in planning and operations.</p>	<p>Adaptation Action Plan for water cycle system (2021 – 2026) prepared and being implemented.</p> <p>Progressed implementation of priority (2018 – 2021) adaptation actions.</p> <p>Commencing integration across service provider sectors to facilitate adaptation and liveable vibrant communities. Planning and designing climate resilient infrastructure.</p>	<p>Victoria is better prepared for future risks of climate change.</p> <p>Ecosystems are healthier.</p> <p>Victoria sustains a thriving natural environment.</p>

Actions in the Adaptation Plan and associated outputs	Short-term outcomes 1-3 years	Medium-term outcomes 3-5 years	Long-term outcomes 5-10 years
Improving the resilience of our built environment			
Factoring climate change impacts into land-use planning			
<b>Environmentally sustainable development outcomes (e.g. energy, water, waste) for all assets owned or regulated by state government</b> <b>Bushfire Management Overlay</b> <b>Coastal hazard assessments</b> <b>Review land-use planning policies and provisions</b> <b>Authoritative data, information and guidance for local governments</b> <b>Standards for managing climate change risks in land-use planning</b> <b>Forum on climate change and liability for land-use planning decisions</b> <b>Whole-of-settlement risk mitigation strategies (Plan Melbourne)</b> <b>Review stormwater management in building and planning</b>	<p>Whole of Victorian Government adopts core principles of risk assessment and adaptation planning for mitigation and adaptation planning in Ecologically Sustainable Development standards.</p> <p>Planning and building systems are reviewed to support climate ready / resilient outcomes for new or refurbished buildings.</p> <p>Hazards related to climate change are identified for environments and communities exposed to specific risks.</p> <p>Recommendations are made for land-use policies and provisions to improve the way the land-use planning system manages natural hazards, climate change and environmental risks (including infrastructure, new build and retrofit). Responses to risks are taken into account in planning processes.</p> <p>Data, information and guidance standards with clear advice are provided to local governments to help planning authorities consider the impacts of climate change in planning decisions.</p> <p>Updated coastline and erosion overlays to assist local councils when making planning decisions.</p> <p>Government communicating with community leaders and wider community regarding climate change impacts on land-use.</p> <p>Collaborative, broad-based settlement adaptation plans are created.</p> <p>Local governments have greater clarity about legal liability associated with climate change and land use planning decisions.</p>	<p>Planning provisions and schemes are changed to ensure provisions are current and based on best available climate science to reduce long-term risk.</p> <p>Essential service providers, the emergency management sector and critical infrastructure owners are integrating climate adaptation into their business processes.</p> <p>Private sector / developers consider the impact of climate change in design and development works.</p> <p>All major new builds and refurbishments integrate core principles of risk assessment and adaptation planning in their design and construction.</p> <p>The resilience and adaptive capacity of Victoria's infrastructure and communities is built through effective adaptation and disaster preparedness action.</p>	<p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Fewer communities and infrastructure assets are exposed to risk from climate change effects</p> <p>Victoria is prepared for future risks and impacts of climate change.</p> <p>The economy is stronger.</p>
Addressing heat in the urban environment			
<b>Melbourne CBD 'green roof' demonstration project</b> <b>Support local governments' cooler, greener cities projects</b>	<p>Urban cooling projects are implemented and evaluated.</p> <p>Urban cooling strategies developed for urban centres.</p>	<p>Lessons learned are used to inform other urban cooling projects.</p> <p>Investments in urban cooling are made across Melbourne and regional centres.</p>	<p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Victoria is better prepared for future risks of climate change.</p>
Addressing heat in the urban environment			
<b>Metro Tunnel</b> <b>VicRoads Sustainability and Climate Change Strategy</b> <b>Program of works to upgrade existing infrastructure</b> <b>Western Distributor Project</b> <b>Hot Weather Policy</b> <b>Improve metropolitan street tree coverage</b>	<p>Procurement arrangements for all government funded infrastructure projects integrate climate change adaptation considerations commensurate with the scale of the project.</p> <p>New transport projects, including major upgrades and refurbishments, include climate change risk assessments and adaptation plans.</p> <p>Increased number/coverage of street trees in VicRoads responsibility.</p> <p>New infrastructure projects include multiple purpose assessment under a resilience/climate change scenario.</p>	<p>The transport system's resilience to climate change impacts is increased.</p>	<p>The impacts Victoria is already experiencing are understood and managed.</p> <p>Victoria is better prepared for future risks of climate change.</p>



Actions in the Adaptation Plan and associated outputs	Short-term outcomes 1-3 years	Medium-term outcomes 3-5 years	Long-term outcomes 5-10 years
Monitoring and evaluation			
Monitoring & Evaluation Framework for adaptation in Victoria	Adaptation action implementation monitoring reports. Evaluation and review reports. Establishment of indicators to monitor and track the success of Victoria's adaptation actions.	Programs and policies change in response to monitoring and evaluation findings. Programs become more effective in promoting adaptation.	Climate change and its effects are being assessed and plans are being updated in response to new data and information. The impacts Victoria is already experiencing are understood and managed. Victoria is better prepared for future risks of climate change.