

# Scenario planning for climate adaptation

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## Climate Adaptation for Decision-makers

*Climate Adaptation for Decision-makers* is published by the Victorian Centre for Climate Change Adaptation Research (VCCCAR). The series identifies policy issues emerging from VCCCAR research to inform decision-makers with responsibility for climate adaptation policies at local and state levels of government. Information on publications in this series and the research on which they are based can be found on the VCCCAR web site at [www.vcccar.org.au](http://www.vcccar.org.au)

*Scenario Planning for Climate Adaptation* aims to strengthen knowledge about the use of scenarios and scenario planning as tools for climate change adaptation decision-making, drawing on the recent experience of Victorian climate adaptation policy-makers and practitioners.

## Policy implications

-  **Scenario planning is a valuable tool for addressing climate change adaptation objectives**  
 Understanding and managing complexity and uncertainty is one of the greatest challenges facing climate adaptation policy-makers and practitioners. Scenario planning – the development and use of plausible and compelling stories about how the future will unfold – can be a powerful tool to help meet this challenge.
-  **There is substantial variation in both types of scenarios and approaches to scenario planning. Context matters**  
 The types of scenarios used to inform climate adaptation decision-making range from those which focus primarily on climate change trends and impacts to those which also consider non-climatic social, economic and environmental issues. Approaches to scenario planning also vary dramatically depending on whether the aim is to understand what is likely to happen, what *could* happen, or what *should* happen in the future.
-  **Maximising the benefit of scenario planning for climate adaptation decision-making requires a clear linkage between scenario outcomes and specific decisions**  
 Scenario processes should be embedded within specific decision-making situations and structured in a way that ensures the relevance of the outcomes is clear to decision-makers.
-  **Scenario planning is being widely used. It is proving particularly beneficial for engaging stakeholders in dialogue about the future and improving understanding of adaptation needs and options**  
 The project identified at least 33 examples of scenario planning for climate adaptation in Victoria in recent years. The majority aimed to improve understanding of adaptation challenges by exploring implications of climate change
-  for a location, community or organisation. Scenario outputs are generally used to stimulate constructive dialogue or inform strategic planning or policy making processes.
-  **Scenario planning supports a shift from 'enhanced prediction' to 'robust decision-making' under uncertainty**  
 Many scenario processes are driven by a desire to determine the 'most likely' future scenario consistent with a 'predict-then-act' model of problem solving. Yet, fundamental to scenario planning is the capacity to overcome 'predictive' mindsets and engage with potential futures beyond the 'status quo'. Scenarios are *not* predictions. The major strength of scenario planning is the exploration of possibilities and making 'robust' decisions that recognise future uncertainties.
-  **Scenario planning can be a powerful platform for exploring and integrating diverse sources of knowledge and stimulating imaginative ideas and responses**  
 Knowledge and opinions from diverse groups of people can be integrated using scenario planning techniques. Scenario processes also help uncover and explore different 'world-views' and build shared understanding. Creative approaches can be particularly effective for capturing the imagination of different people about what the future might look and feel like.
-  **Effective adoption of scenario planning requires building and supporting organisational cultures and communities of practice**  
 There is significant potential benefit to be realised from establishing ongoing support and learning networks around scenario planning among those seeking to improve organisational capacity to respond to rapidly changing and complex contingencies, risks and challenges.



## Background

Understanding and managing complexity and uncertainty is one of the greatest challenges facing climate adaptation policy-makers and practitioners. Traditional linear planning and decision-making methods have developed from an approach that assumes expert knowledge and analysis can be used to define future conditions. However, because climate change will occur over a long time frame, with diverse potential impacts and a high complexity of interacting social, economic, political and environmental drivers, these traditional approaches are unlikely to be effective. Scenario-based approaches are therefore being used as a key tool for decision-making under uncertainty.

The VCCCAR *Scenarios for Climate Adaptation* project examined how scenario planning is being applied to climate change adaptation. Focused on Victorian policy-makers and practitioners, it reports findings from an online survey, case study inventory, key informant interviews and two stakeholder workshops about peoples' experiences with and reflections on the value and challenges of using scenario planning to support climate change adaptation.

## Scenario planning as a tool for policy making under conditions of complexity and uncertainty

A scenario can be defined as: 'a plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships' (IPCC 2007). Put simply, scenarios are stories of the future. They can be presented in many forms, including graphs, maps, narratives, designs and multimedia displays.

Scenario planning involves the development and use of plausible future scenarios to inform strategic planning and decision-making. Originating in military and corporate strategy, scenario planning has been increasingly used by private and public sector organisations over the past thirty years to identify options and decide priorities in the context of uncertain future conditions and events (Varum and Melo 2010).

The emphasis on informing decision-making under conditions of uncertainty distinguishes scenario planning from other tools such as forecasting, which has a narrower focus on predicting likely futures.

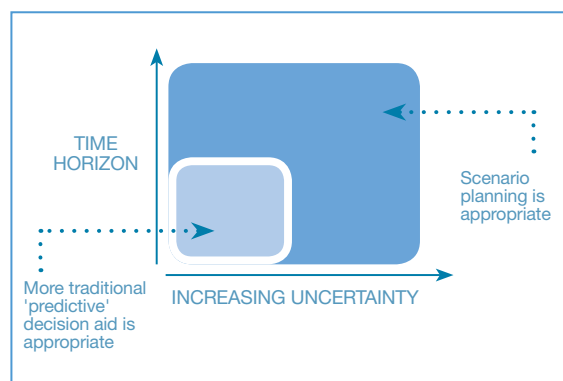


Figure 1. When is scenario planning appropriate?

**'the objective of good scenarios is better decisions not better prediction'** (Dearlove 2002)

There are a range of approaches to scenario planning that generally involve three phases of (i) preparation, (ii) scenario building and refining and (iii) using the scenarios to inform strategic decisions (Figure 2).

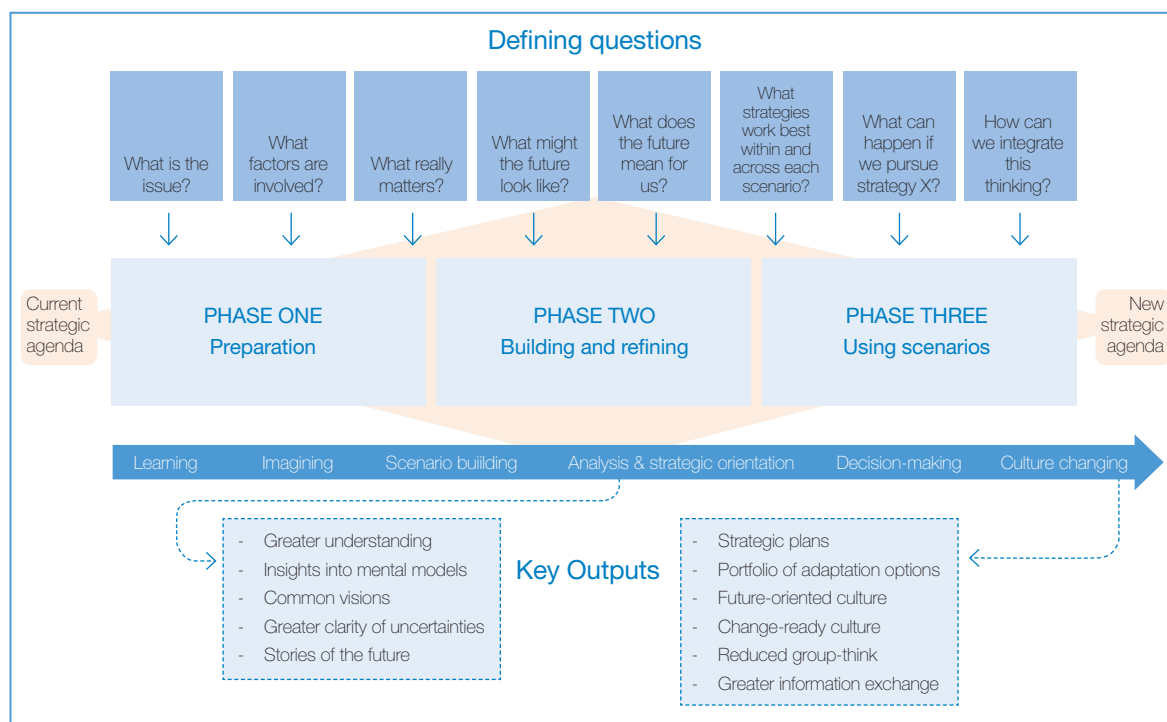
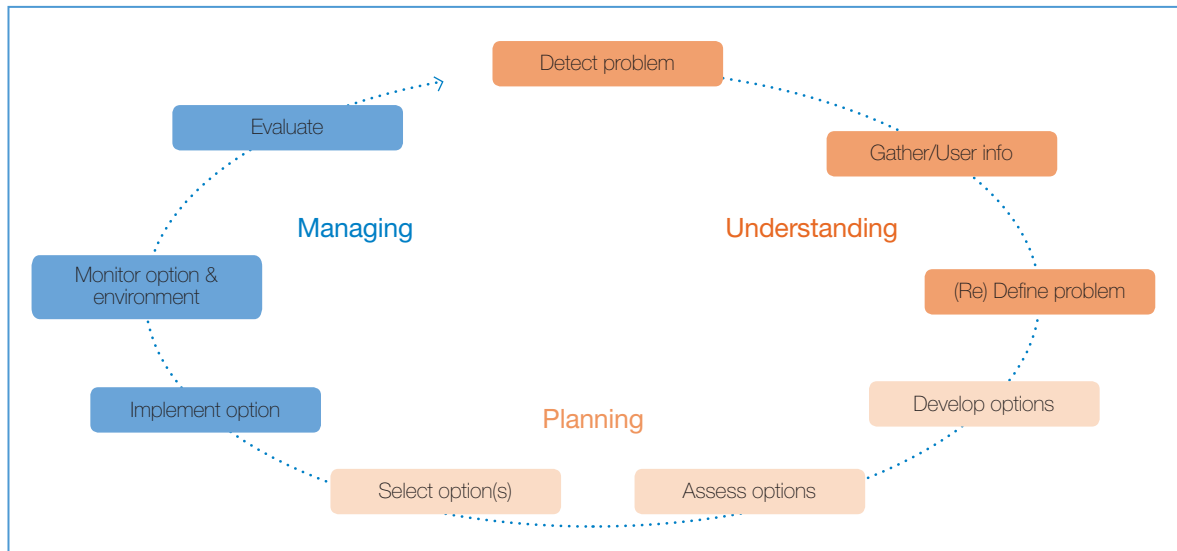


Figure 2. A model of scenario planning to inform strategy development





**Figure 3. A generalised adaptation process**

Source: Moser and Ekstrom (2010)

## Scenario planning for climate adaptation

Planned adaptation to climate change involves an iterative cycle of decision-making, action, observation and learning. Climate adaptation policy-makers and practitioners are increasingly using scenario planning processes and outputs to assist with the key climate adaptation challenges of understanding, planning and implementing (see Figure 3).

In Australia, scenario planning has been used in all these three stages of adaptation (Table 1) and has proven valuable for:

- Clarifying trends and risks;
- Engaging citizens and stakeholders;
- Developing common understanding;
- Provoking and informing debate;
- Expanding the range of options to be considered;
- Evaluating likely policy impacts;
- Informing decisions about strategic priorities;
- Building skills and a culture of ongoing and reflexive strategic planning.



Scenario planning has proven valuable for informing strategic decision-making. **Credit:** Fairfax photos.



**Table 1: Ways in which scenario planning can assist in meeting key climate adaptation challenges**

Key policy and research questions	Types of scenarios and ways in which they can be used to answer questions and meet challenges	Examples
<b>Understanding</b>		
<p>Do we need to adapt to climate change?</p> <p>What climate trends and impacts do we need to adapt to?</p> <p>What climate change risks do we face?</p> <p>How do these climatic risks interact with other non-climatic trends, drivers, stressors and risks?</p> <p>Who or what needs to adapt?</p> <p>Who or what is most vulnerable?</p> <p>How do we raise awareness about climate adaptation risks?</p> <p>How do we engage key stakeholders?</p>	<p>Using down-scaled global and national climate change scenarios to identify possible local and regional climatic changes.</p> <p>Using climate change scenarios as inputs to social and economic impact, risk and vulnerability assessments.</p> <p>Developing 'tailored' local and regional scenarios to explore interactions between climate change and other local and regional drivers.</p> <p>Developing local impact scenarios to identify vulnerable people and places.</p> <p>Using or developing local impact scenarios to strengthen shared understanding of need for adaptation.</p> <p>Developing local impact scenarios as a means of engaging citizens and stakeholders in consideration of risks and current vulnerabilities.</p>	<p><b>CSIRO: Ozclim: Scenario generation tool for Australia</b>  <a href="http://www.csiro.au/ozclim/home.do">www.csiro.au/ozclim/home.do</a></p> <p><b>IPCC SRES: Global emissions scenarios</b>  <a href="http://www.grida.no/publications/">www.grida.no/publications/</a></p> <p><b>Climate Change Adaptation in New Zealand: Future scenarios and some sectoral perspectives</b>  <a href="http://www.nzclimatechangecentre.org/">http://www.nzclimatechangecentre.org/</a></p> <p><b>Broadmeadows 2032</b>  <b>Victorian Eco-Innovation Lab</b>  <a href="http://www.ecoinnovationlab.com/revisioning-broadmeadows">www.ecoinnovationlab.com/revisioning-broadmeadows</a></p> <p><b>DSE Regional Climate Change Profiles</b>  <a href="http://www.climatechange.vic.gov.au/regional-projections">www.climatechange.vic.gov.au/regional-projections</a></p>
<b>Planning</b>		
<p>What kind of future do we want to create?</p> <p>What actions are needed to create this future?</p> <p>What climate adaptation options are available?</p> <p>What criteria should we use to assess various climate adaptation options?</p> <p>How do we engage key stakeholders in identifying, assessing and selecting climate adaptation options?</p>	<p>Using local impact scenarios to stimulate creative thinking about possible adaptation options.</p> <p>Developing and using local impact or climate adaptation response scenarios to assist communities and stakeholders identify possible and desirable futures.</p> <p>Development of climate adaptation scenarios to show what might happen if different adaptation options are enacted.</p> <p>Using climate adaptation scenarios to test the robustness of different policy options or adaptation measures under different plausible futures.</p> <p>Developing impact or climate adaptation scenarios with a range of stakeholders to build shared understanding of adaptation priorities.</p>	<p><b>Scenarios for climate change adaptation in the Hamilton region of Victoria</b>  <i>RMIT Global Cities Research Institute and Hamilton critical reference group</i>  <a href="http://proclmams.rmit.edu.au/cyb31c4gyjn2.pdf">http://proclmams.rmit.edu.au/cyb31c4gyjn2.pdf</a></p> <p><b>Victorian Climate Change Adaptation Program (VCCAP) South West Region scenario project</b>  <i>Department of Primary Industries, Victoria</i>  <a href="http://www.dpi.vic.gov.au">www.dpi.vic.gov.au</a></p> <p><b>Thames Estuary 2100</b>  <i>UK Environment Agency</i>  <a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a></p> <p><b>Towards a Post-Carbon Gippsland</b>  <i>Gippsland Climate Change Network</i>            (See Scenarios for Climate Adaptation Report, Chapter 5 and Appendix A: VIC22)</p>
<b>Implementing</b>		
<p>What is the most effective way of implementing the chosen climate adaptation option?</p> <p>What actions can be taken to improve the capability of organisations and communities to implement climate adaptation policies and programs?</p>	<p>Using scenarios to test and evaluate the ongoing effectiveness and robustness of climate adaptation policies and plans.</p> <p>Using scenarios to improve social learning/reflexive organisations.</p>	<p><i>The Future Climate for Development UK</i>  <i>Department for International Development and Forum for the Future - Project encouraging member agencies to use scenarios in their ongoing strategic planning.</i>  <a href="http://www.dfid.gov.uk/Media-Room/News-Stories/2010/How-will-the-world-look-in-2030/">www.dfid.gov.uk/Media-Room/News-Stories/2010/How-will-the-world-look-in-2030/</a></p> <p><b>Irrigation Futures</b>  <i>Department of Primary Industries, Victoria - Project demonstrating scenario planning methods, sharing lessons learnt and encouraging use of scenario techniques through development of suite of resources.</i>  <a href="http://www.dpi.vic.gov.au">www.dpi.vic.gov.au</a></p>

There are broadly 'top-down' and 'bottom-up' approaches to adaptation planning. Different processes are drawn upon for each. The role of scenarios – the types of scenarios that are relevant, the methods used to develop them, the scale at which they are developed and applied – differs significantly depending on the orientation.

The 'top-down' development of global assessments generates scenarios derived from global trends, while the 'bottom-up' development of local and regional assessments is typically focused on understanding place-based vulnerability and adaptation needs, for which scenario planning techniques are one set of tools that can be employed. Relatively simple scenarios about future climate change may be all that is needed when considering implications for the local context, as more detailed simulations of the climate are often less important than developing a deeper understanding of local vulnerability and opportunities to reduce it.

For adaptation planning that draws out the implications and possible responses in local and regional settings, tailored, context-specific scenario planning processes are increasingly being used. These 'do-it-yourself' approaches provide a forum for combining input and advice from experts and stakeholders with experience and knowledge relevant to specific areas, population groups or issues.

Scenario planning approaches for climate adaptation decision-making include:

- a. **Off-the-Shelf Applications:** Using pre-existing, down-scaled scenarios to specific locations, population groups and policy challenges;
- b. **Tailored Exploration:** Building and using context-specific scenarios to explore possible climate futures, impacts and adaptation policy options;
- c. **Tailored Visioning:** Building and using context-specific scenarios to envisage desirable futures and pathways.

## Learning from recent Victorian experience

This project identified 33 examples of scenario planning being used to help meet climate adaptation related objectives in Victoria in recent years. These include:

- Off-the-Shelf climate change scenarios used as inputs into climate change adaptation planning;
- Off-the-Shelf climate change scenarios combined with other trend-based data (such as socio-economic projections, water, food, electricity demand/supply projections) to produce more context-specific scenarios, which are then being used as an input into climate change adaptation planning;

- Tailored exploratory scenarios being built through a process of understanding and prioritising a wide range of drivers of change;
- Tailored visioning scenarios being built through exploratory processes, which leads to the identification of more desirable futures and points to drivers which are leading to unsustainable or untenable future conditions;
- Tailored visioning scenarios being built through a process of setting a goal for the future (e.g. 'a sustainable, carbon neutral community by 2050').

Scenario planning is frequently used as a tool to engage stakeholders and build shared understanding of climate change risks, challenges and priorities. This use of scenario planning is common in the early stages of climate change adaptation planning to:

- Explore and develop shared framing of the complex and multifaceted nature of climate change impacts (both direct and indirect);
- Highlight the importance of human choices and actions (as opposed to passive acceptance of pre-determined future pathways and drivers);
- Stimulate and inform discussion about assumptions, ethical principles, goals and priorities;
- Identify and consider a broad range of climate adaptation policy and practice options.

The use of scenario planning as a tool for deciding on and implementing specific climate adaptation policy options and investment pathways is more problematic. Many policy-makers prefer predictive approaches, often combined with other modelling and cost-benefit and forecasting techniques, over more open-ended scenario planning processes.

However, there is a risk that placing too much emphasis on prediction could lead to policy and investment choices that do not consider all potential outcomes and increase the potential impacts of climate change or reduce capacity to adapt to different types of events. Using scenario approaches provides an opportunity to discuss underlying assumptions, consider opportunities for more innovative, far-reaching and positive change (Table 2).

Key success factors:

- Clarity of aims and purpose;
- The existence of detailed, context-specific data;
- Effectively engaging relevant stakeholders;
- Maximising the diversity of the expertise and experience of the people involved;
- Having a supportive organisational culture;
- Using skilled scenario planning facilitators.





**Table 2. Key benefits and limitations of scenario planning for climate adaptation**

Benefit	Limiting factors
Greater awareness and understanding of climate change trends, its extensive impacts and its implications for different groups.	Lack of shared understanding of the aims, scope of, need and distribution of responsibilities for climate change adaptation.
Exploration and integration of the many different issues and forms of knowledge that are pertinent to climate change adaptation.	Lack of shared understanding of what scenarios are, the aims and scope of scenario planning, and their relationship to climate change adaptation.
Exposure and exploration of different worldviews, assumptions, and framings of climate change and adaptation.	Difficulties engaging all relevant decision-makers and stakeholders in the scenario planning process.
Consideration of a broader, more holistic range of approaches and options in responding to the climate change issue.	Failure to include a genuinely broad range of inputs, issues and pathways in the scenario planning process.
Greater awareness of the role of human choices and actions in shaping the future.	Difficulties accessing, analysing and integrating relevant data for input into the development of scenarios, including down-scaled climate change scenarios.
Greater awareness of the ethical and political issues that climate change adaptation raises about organisational and societal goals and priorities.	Challenges associated with relating high-level issues and changes to an organisation's or individual's narrower sphere of influence and options for action.
Greater awareness of the potential for and need to avoid maladaptive responses.	Lack of acceptance of the results of a scenario planning process as credible, legitimate and salient by management, colleagues and other stakeholders.
Greater awareness of the relationships between the potential adaptation responses of different levels of government, organisations and sectors.	Difficulties integrating tangible and intangible results of a scenario planning process into subsequent adaptation planning and action.
Understanding of the need for, and steps towards, greater collaboration within and between organisations.	Challenges in addressing the need for repeated and cross-organisational scenario planning.



Scenario planning can promote greater collaboration within and between organisations. **Credit:** VEIL

# Improving the use of scenario planning for climate change adaptation: Ten key principles

## 1 Shared framing of climate change adaptation challenges and aims

Developing shared understanding of climate change adaptation is necessary for effective, widespread and coordinated action.

## 2 Shared understanding of the strengths and limitations of scenario planning

Scenario planning is best seen as a learning tool to support more informed and reflective consideration of climate adaptation risks and options.

## 3 Shared understanding of the goals of a scenario planning process

Like any process that engages multiple stakeholders it is important that those involved in building and using scenarios are clear about the objectives and expected outcomes they are working towards.

## 4 High-level support for the scenario planning process

High-level support from internal and external 'champions' will increase the likelihood that outcomes will usefully inform decision-making and build an organisational culture of innovative approaches to dealing with complexity and uncertainty.

## 5 Time and resources invested in preparing and ensuring the process has the right mix of skills and knowledge

Successful scenario planning requires a significant investment of time and resources and can benefit from the use of skilled and experienced facilitators.

## 6 Include a broad range of relevant experience, expertise and evidence

A broad and inclusive approach is essential for avoiding 'group think' and for identifying and exploring unexpected, 'out-of-the-box' possibilities.

## 7 Identify the full range of plausible drivers and adaptation options

Including a wide range of possibilities will ensure that climate adaptation strategies and policies are more robust to different futures.

## 8 Define scenarios for effective communication to key audiences

Good scenarios are consistent, diverse and memorable and challenge current views or perceptions.

## 9 Consider the ways outcomes are to be used in strategic planning and decision-making

Careful consideration of the actions needed to integrate scenario planning with decision-making will help with the design and implementation and adoption of the process.

## 10 Aim for scenario planning to be embedded in organisational culture and decision-making processes

The value of scenario planning will be maximised when relevant decision-makers are fully involved in all steps of the scenario development process. In practice, many organisations only take the process half way, creating scenario narratives without applying a systemic approach to using narratives to inform and shape decisions.

## Conclusion

### Policy and research priorities

- Continued research on the use of scenario planning will contribute to improved climate adaptation decisions and outcomes. This could be linked to the use of scenario planning for climate change mitigation.
- Allocate resources to identify barriers and improve capacity within government organisations to use scenario planning for climate adaptation.
- Government agencies should work together to develop local and regional data sets that enable rapid provision and analysis of local and regional level social, economic and environmental information for scenario planning.
- Foster further research on the ways in which particular organisational and institutional arrangements and cultures can contribute to flexible and resilient policy making under conditions of complexity and rapid change. This could include considering best practice examples of 'robust decision-making', adaptive management or ongoing, reflexive scenario planning, for example, within different organisational contexts.
- Investigate ways in which scenario planning processes and outcomes can be communicated to facilitate community, industry or individual responses to climate change.



## Scenarios for climate adaptation project

The Scenarios for Climate Adaptation project was conducted to strengthen knowledge about the use of scenarios and scenario planning tools for climate change adaptation decision-making by drawing on the experience of Victorian climate adaptation policy-makers and practitioners. This project has led to the production of a Scenarios for Climate Adaptation Guidebook and a detailed background report including extensive case studies and links to relevant resources.

The *Scenarios for Climate Adaptation* project aims to strengthen knowledge about the most effective ways to develop and use scenario based strategies to improve CCA decision-making, drawing on the recent experience of Victorian climate change adaptation policy-makers and practitioners.

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For further information and resources including the *Scenarios for Climate Adaptation Guidebook for Practitioners* and the *Scenarios for Climate Adaptation Report* visit the *Scenarios for Climate Adaptation project webpage* at [www.vcccar.org.au/content/pages/scenarios-climate-adaptation](http://www.vcccar.org.au/content/pages/scenarios-climate-adaptation).

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The Victorian Centre for Climate Change Adaptation Research (VCCCAR) is a consortium of Victorian universities supported by the Victorian Government to undertake multi-disciplinary research about state-specific climate change impacts and adaptation options. Its brief is to:

1. Increase Government decision-making capacity about state-specific climate change impacts;
2. Encourage the inclusion of adaptation needs in Government strategic planning; and
3. Bring together expertise to work on the provision of multi-disciplinary advice to government, industry and the community.



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