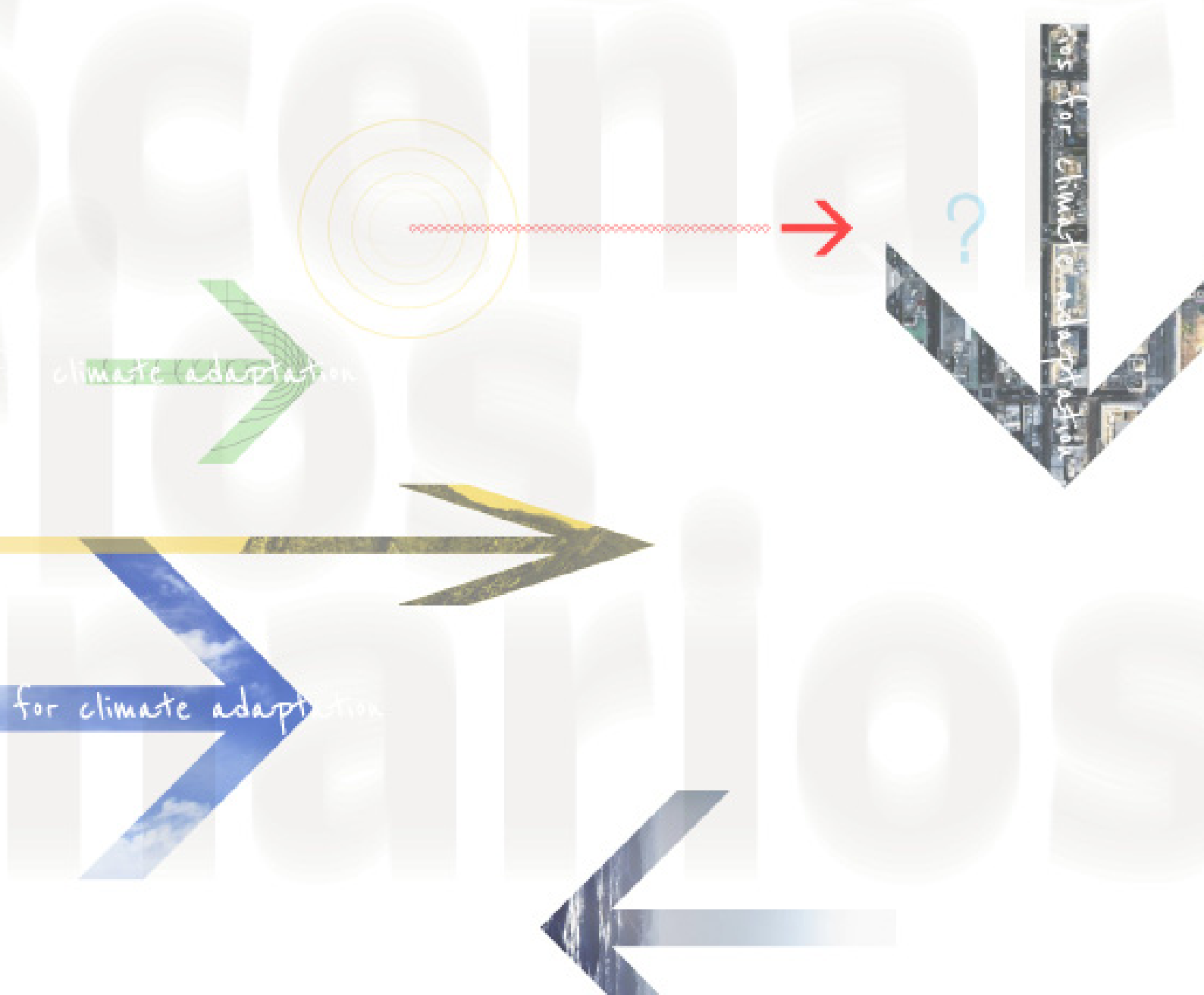


# Scenarios *for* climate adaptation

Final Report:  
Executive Summary



# Scenarios for Climate Adaptation Report: Executive Summary

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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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### **Report aims, background and scope**

1. The aim of this report is 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. Production of the report has been funded by the Victorian Government through the Victorian Centre for Climate Change Adaptation Research. This project has also led to the production of a *Scenarios for Climate Adaptation Guidebook*.
2. Initial work on this project was triggered by numerous conversations with climate change adaptation policy makers and practitioners reflecting on their greatest challenge: how to make well-considered, well-informed decisions about adaptation priorities in the context of a swirling and ever-expanding cloud of evidence about climate trends and risks. Their concerns reflect the larger challenge of making tough choices about the actions needed to reduce and address the risks of runaway climate change under conditions of rapidly increasing complexity, uncertainty and contestation.

As recent events, such as the meltdown of the Fukushima nuclear power plant or the contagious spread of democratic revolutions in the Middle East remind us, we live in an age where predictions and decisions based on the extrapolation of past trends or overly linear mathematical models are likely to be unhelpful, misleading and maladaptive.

Successful responses to the escalating risks of climate change therefore require new methodologies for thinking about the future – methodologies which strengthen the potential for imaginative, out-of-the-box thinking about drivers, tipping points and step changes in relation to both the variety of risks we face and the technological and social innovation needed to reduce and address these risks. Scenario planning – the development and use of diverse, plausible stories about how the future will unfold – provides one potentially useful set of tools for achieving this aim.

3. For the purposes of this report ‘scenario’ refers to:

*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, 2007b).*

The scope of scenarios used in climate adaptation planning encompasses not only science-based climate change exposure and sensitivity scenarios, but broader social, economic and environmental factors affecting the adaptive capacity and resilience of places and population groups.

‘Scenario planning’ encompasses the wide variety of ways in which the development and use of scenarios is being used to inform and improve all aspects and phases of climate adaptation planning and practice.

‘Climate change adaptation’ is defined as follows:

*Adaptation involves changes in social-ecological systems in response to actual and expected impacts of climate change in the context of interacting non-climatic changes. Adaptation strategies and actions can range from short-*

*term coping to longer-term, deeper transformations, aim to meet more than climate change goals alone, and may or may not succeed in moderating harm or exploiting beneficial opportunities (after Moser and Ekstrom, 2010).*

This definition usefully highlights the systemic nature of climate change, non-climatic factors and our responses, and the need for the latter to avoid unintended negative outcomes.

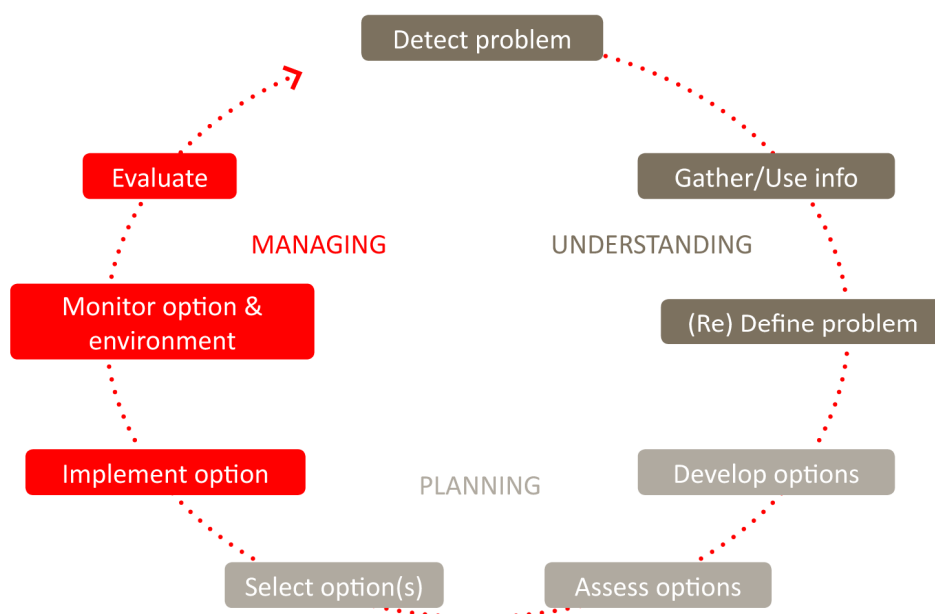
**Principles of climate change adaptation**

4. In general, climate change adaptation is the process of reducing one’s vulnerability to climate change impacts. Vulnerability is a function of exposure to climate change impacts, one’s sensitivity to them and one’s ability to positively respond (adaptive capacity) (IPCC, 2007a).
5. Climate change adaptation is a multi-faceted, ambiguous idea that we all ‘frame’ or interpret in different ways depending on our pre-existing views, norms and experiences (Fünfgeld and McEvoy, 2011). This framing then shapes our approach to adaptation, including which hazards we prioritise and which adaptation options we consider plausible or desirable.
6. Climate change adaptation policy and practice is about making complex value-laden decisions with far reaching, path dependent consequences in the context of highly uncertain knowledge about future climate trends and impacts. Many different types of adaptation have been identified that depend on factors like scale, timing, and the actors involved. In particular, adaptation decision makers need to attend to the following questions and general answers.

Question	General answer
What do we need to adapt to?	An ever-shifting cascade of interacting, potential and actual impacts and feedbacks, including the effects of our responses.
What is good adaptation?	Adaptation that is effective and efficient in reducing vulnerability to climate change impacts and lifts general resilience through improving social equity and environmental sustainability.
Who or what needs to adapt?	Everybody and everything needs to adapt to direct and/or indirect climate change impacts. Different groups have different roles. Our own (in)actions may enable or hinder others’ adaptation.
How will adaptation occur?	There are many types of adaptation processes, including incremental improvement and/or transformation of existing structures and processes, and proactive anticipatory actions or post-impact reactions. Adaptation is a continuous, ever-changing process involving cycles of decision making, planning, action, observation, and above all, social learning and continuous adjustment.

7. A useful framework of adaptation is provided by Moser and Ekstrom (2010) (see Figure 1 below). It points to the importance of developing understanding (e.g. through scenario processes) and planning. For both, diverse forms of knowledge and flexible ways of operating are needed, which may require changes to the conventional ways we operate.

Figure i-A: Phases and sub-processes throughout the adaptation process



Source: Moser and Ekstrom (2010)

8. A group's capacity to adapt at any given time stems from the different types and levels of 'capital' that they and those around them have:
  - financial capital (e.g. investments, assets);
  - human capital (e.g. health, knowledge, capacity to learn);
  - social capital (e.g. relationships, understanding of others),
  - physical capital (e.g. safe buildings, reliable utilities); and
  - natural capital (e.g. quality soil, shade trees, pollinating insects) (Nelson et al., 2007).

These are shaped by one's position in existing structures and the adaptation actions of others. Adaptive capacity may grow or decline over time as adaptation (or maladaptation) occurs.

9. Government needs to not only manage its own adaptation needs, but facilitate enabling and impact-specific forms of adaptation for others. Government's role in shaping the context in which others adapt, promoting public good and addressing cases of market failure means that it especially has a role in proactive or 'planned' adaptation, which can involve decisions with long lead times and far-reaching consequences, as well as putting in place appropriate reactive adaptation measures, such as emergency management. It also has a key role in transformational adaptation: that which fundamentally alters existing institutions or structures to improve our ability to manage climate change. Such adaptation may be necessary for it to help construct, as it needs to, the type of governance and regulatory environment that enable and facilitate good adaptation by others.
10. Adaptation requires that we consider long-term threats and implications. At the same time, uncertainty about the detailed characteristics, timing and interactions of climate change impacts and the effects of our adaptation responses means that conventional 'observe, predict, respond' management approaches are limited in their ability to accurately or usefully inform adaptation strategy (Hulme et al., 2009). Alternative ways of preparing ourselves for the future – such as the scenario planning discussed below – are needed, as is a responsive and flexible ('adaptive') way of managing.

11. Within the evidence-based policy paradigm, the notion of ‘robust decision making’ is increasingly promoted as being key to adaptation planning. In such decision making, strategies are selected either for their ability to work under a range of possible future conditions or for their ability to flexibly switch between modes as needed (Wilby and Dessai, 2010). This profoundly differs from the conventional idea of developing an optimal strategy for conditions that are judged to be most likely. Climate change demands we maintain focus on all possible outcomes, especially when these could be highly consequential. It also demands that we make difficult value-laden decisions about the future that cannot be justified by ‘robust’ or ‘credible’ evidence as we know it, but rely instead on reflection and discussion about the ethics and opportunities involved.
12. Constraints on adaptation are numerous and emerge from multiple sources and at each stage of adaptation. Part of the adaptation project is to identify and address these barriers and limitations. Some are in the form of gaps (e.g. in knowledge, communication, technologies, policy coverage), and others are in the form of obstructive or perverse structures and processes. These require more transformational change and will become more pressing as climate change progresses. They include the need to integrate mitigation of greenhouse gas emissions into our adaptation responses.

### **Scenario planning**

13. Scenario planning involves the development and use of representations of plausible futures and pathways to inform and inspire strategic decision making and planning in a wide range of organisational and policy making contexts. It is increasingly used by a wide variety of private and public sector organisations to identify risks, opportunities and strategic options in the context of complex and uncertain future conditions and events.
14. Scenarios are not silver bullets for forming definitive judgements on how the future will unfold or determining an optimal set of decisions to achieve an optimal outcome. They are learning processes shaped by the quality of interaction, inputs and follow-up.
15. Scenario planning methods are suitable for situations of high uncertainty and low control. In contrast to techniques that attempt to *predict* the future such as forecasting, scenario planning emphasises the need to maintain awareness of uncertainty. It aims to inform and enable good decisions and strategies despite such a challenge.
16. Managing rather than reducing uncertainty is particularly pertinent to climate change, where the rising complexity involved means a large part of the uncertainty about the specific manifestation of climate change impacts is irreducible.
17. A continuum exists between more predictive and more exploratory forms of scenario planning, which address in turn what is *likely to* happen and what *could* happen. Normative scenarios are exploratory, but also ask ‘what *should* happen?’.
18. Scenario processes provide a critical opportunity to interrogate our assumptions. Many scenario practitioners argue that the main value of scenarios is in helping us to ‘move away from the “one future” mentality and expose the inherent and sometimes irrational assumptions that lie behind our vision of the future (Braithwaite, 2010). To achieve this in adaptation, scientific climate change scenarios need to be complemented by searching discussion and analysis of other influences on and ideas about the future.

19. Decisions about the pertinence of scenario planning to climate change adaptation and preferred approaches will be strongly shaped by how climate change adaptation challenges and responsibilities are framed (e.g. the scope of climate change impacts, the remit of adaptation, the roles and responsibilities of different groups). At the same time, participatory, exploratory scenario planning approaches also provide a valuable opportunity to identify and explore these different framings of climate change adaptation.
20. Typical stages in a scenario planning process include:
- problem framing and definition;
  - tracking or exploring key related issues;
  - analysing and prioritising critical and highly uncertain issues;
  - imagining plausible scenarios;
  - identifying a range of possible strategies and testing them against the scenarios leading to strategic decisions;
  - going beyond the scenario planning process to implement these decisions.
21. Benefits common to many scenario planning processes include:
- creating opportunities and a framework within which to imagine, visualise and interrogate alternative stories about how the future will unfold;
  - challenging taken-for-granted mental models about the ways in which problems and solutions are framed;
  - fostering creative learning by individuals, organisations and societies;
  - improving the robustness of strategic planning, decision making and evaluation.
22. Limitations of scenario planning identified in the literature include:
- ambiguity about the purpose and conflation with forecasting;
  - failure to think beyond a mere extrapolation of the status quo;
  - failure to integrate the often challenging outcomes of a scenario planning process into decision making.
23. There has been limited research on how to optimise the use of scenario planning by policy makers. As the European Environment Agency (2009) notes:

*‘The shortage of research on scenario planning and its influence means that there is limited guidance on how to optimise scenarios, in terms of both outputs and uptake by policy-makers’ (p.5).*

24. It is important to consider how a given scenario process can provide policy makers with knowledge that is salient, credible and legitimate (Cash et al., 2003). This means asking:
- Are the scenarios relevant to information and decision making needs? (saliency)
  - Are the scenarios scientifically sound? (credibility)
  - Who developed the scenarios and how? (legitimacy) (Rounsevell and Metzger, 2010)

### **Scenario planning for climate adaptation**

25. Faced with ever-expanding levels of complexity and uncertainty, 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**.

26. Scenario planning has the potential to improve **understanding** of climate adaptation trends, impacts and risks through:
- identifying and communicating the full range of potential climate adaptation trends, uncertainties and risks;
  - providing tools for breaking out of constrained thinking by highlighting the ways in which the future is not pre-determined, illuminating critical unknowns and encouraging participants to ‘think the unthinkable’;
  - contributing to a more holistic analysis of interactions between multiple bio-physical, social, political and technological trends and drivers;
  - communicating climate change risks and adaptation challenges to citizens, stakeholders and decision makers.
27. Scenario planning has the potential to improve climate adaptation **planning** through:
- providing tools which clarify the range of values and mental models which decision makers and stakeholders bring to consideration and prioritisation of climate adaptation options;
  - providing policy makers and planners with key inputs into adaptation planning decisions and priority setting. This includes regional and local scenarios of global climate change under different global emissions pathways as well as a wide variety of social, economic and environmental trends and drivers;
  - enabling the crystallisation and synthesis of a small number of plausible alternative scenarios which can be used to identify and test the robustness of potential policy and practice responses.
28. Scenario planning has the potential to improve climate adaptation **implementation** strategies and capabilities through:
- engaging stakeholders in the exploration of climate change adaptation risks and options and in the development of collaborative plans and strategies;
  - providing a framework for checking, reviewing and evaluating the impacts and effects of climate change adaptation policies;
  - contributing to the embedding of informed strategic conversations within organisations leading to an evolving creation of shared understandings and visions;
  - building ongoing organisational resilience and capacity for robust and reflexive strategic planning.
29. Key questions for scenario planning processes for climate change adaptation include:

Key considerations	Examples of possible responses
Purpose of scenario planning	Explore issues, raise awareness, set agenda for change, educate others, build relationships, identify and select options, test strategies, develop evidence.
Purpose of adaptation efforts	Manage discrete climate risks, build general adaptive capacity and resilience, empower others, build relationships, question or justify existing policies.
Types of knowledge to be included	<ul style="list-style-type: none"> <li>• Formal knowledge: climate science, economics, environmental and social science models and data; predictive or possibilities</li> <li>• Informal knowledge: organisational knowledge, community-based knowledge, imagination.</li> </ul>
Breadth of issues considered	Extent to which the following are incorporated:



	<ul style="list-style-type: none"> <li>• pervasive indirect climate change impacts (economic, social etc.), as well as direct biophysical impacts</li> <li>• possible positive and negative effects of different adaptation responses</li> <li>• present-day vulnerabilities, including the existing ‘adaptation deficit’ and other needs of different groups</li> <li>• barriers and limitations to adaptation (e.g. research and development needs, political will).</li> </ul>
Scale(s) to be considered	<p>Extent to which the following are incorporated:</p> <ul style="list-style-type: none"> <li>• long and/or short time periods, both in terms of climate change and the decisions considered</li> <li>• changes at the global, national, regional and/or local geographic levels</li> <li>• existing and future developments at higher and lower levels of government and society</li> <li>• the influence of other organisations and sectors</li> <li>• the influence of one’s own adaptation actions on the above.</li> </ul>
Who participates in scenario development	<ul style="list-style-type: none"> <li>• Internal to the organisation (which departments, levels of management)</li> <li>• External to the organisation (which partners, stakeholders, community members, or climate change, adaptation and scenario experts).</li> </ul>
Who scenario outputs are shared with and how	<ul style="list-style-type: none"> <li>• Internal to the organisation (which departments, levels of management)</li> <li>• External to the organisation (which partners, stakeholders, community members, general public)</li> <li>• Publication of scenarios as report or website, static or interactive.</li> </ul>
How the results of the process are used to support adaptation decision making	<ul style="list-style-type: none"> <li>• Used in early stages only or used throughout adaptation planning process</li> <li>• Used as prompt and heuristic only, or used as evidence in selection and justification of adaptation options.</li> </ul>

30. There are broadly ‘top-down’ and ‘bottom-up’ approaches to adaptation planning. 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 focused on understanding place-based vulnerability and adaptation needs, for which scenario planning techniques are one set of tools that can be employed.

31. The following typology provides a useful basis for categorising the major ways in which scenario planning is being used to inform and support climate adaptation policy making:
- A. **Off-the-Shelf:** Applying 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

**Scenario planning for climate adaptation: Learning from recent Victorian experience**

32. This project helps fill the knowledge gap about how scenario planning is being applied to climate change adaptation in practice and with what results. 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 people's experiences with and reflections on the value and challenges of using scenario planning to support climate change adaptation.

33. A range of positive examples of the use of scenario planning to strengthen the capability and resilience of organisations and communities exists. These focused on climate change adaptation to a variable degree. The case study examples (summarised in Appendix A) represent an important resource for social learning.
34. Of the 33 identified examples of scenario planning for climate adaptation in Victoria the most common aims were:
  - to explore the implications and risks of climate change for a specific location, community or organisation;
  - to inform policy making decisions and strategies;
  - to foster common understanding of climate change risks;
  - to improve collaboration between stakeholders and decision makers;
  - to explore and visualise desirable futures.
35. The range of scenario planning approaches and methods currently in use in Victoria include:
  - **Off-the-Shelf** climate change scenarios, either being used alone as inputs into climate change adaptation planning, or, more commonly, combined with other trend-based data (e.g. socio-economic projections, water, food, electricity demand/supply projections etc) to produce more context-specific scenarios.
  - **Tailored Exploration** scenarios, constructed through a process of identifying, exploring and prioritising a wide range of drivers of change and their interactions.
  - **Tailored Visioning** scenarios, either emerging out of a Tailored Exploration process in which more desirable futures and drivers of untenable future conditions are identified, or by being constructed through a focused process of goal setting for the future.
36. Scenario planning is frequently and effectively being used as a tool for engaging stakeholders and for building shared understanding of climate change risks, challenges and priorities. This use of scenario planning is particularly common in the early stages of climate change adaptation planning and can play a valuable role in assisting stakeholders and decision makers:
  - explore and develop shared framing of the complex and multifaceted nature of climate change impacts (both direct and indirect);
  - highlight the importance of human agency and choice (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.
37. The use of scenario planning as a tool for deciding on and implementing specific climate adaptation policy options and investment pathways continues to be more problematic. Many policy makers continue to expect firm, confident predictions about the likelihood of future climate trends and impacts. They therefore prefer predictive approaches, often combined with other modelling, cost benefit and forecasting techniques, over more open-ended scenario planning processes of the sort demanded by the unpredictability of climate change impacts. This risks placing too much faith in the predictive capacity of such techniques in the context of climate change, leading to erroneous or maladaptive policy and investment choices. It also neglects the need for discussion about underlying assumptions, and overlooks the opportunity for more innovative, far-reaching and positive change.

38. More generally, the following benefits of and limitations on scenario planning for climate change adaptation were identified:

Benefit	Limiting factors
Greater awareness and understanding of climate change trends, its extensive impacts and its implications for different groups	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	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	Engaging 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	Including 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	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	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	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	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	Addressing the need for repeated and cross-organisational scenario planning

39. Key success factors included:

- 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.

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

40. The following principles for developing and using scenario planning for climate adaptation are informed by learning from recent Victorian policy and practice experience, as well as research literature on scenario planning in other Australian and international jurisdictions.

**1. Clear, shared framing of climate change adaptation challenges and aims**

Developing shared understanding of climate change adaptation is necessary for effective, widespread and coordinated action. As a value-laden concept, climate change adaptation is framed in diverse ways. Effort is needed to identify and reconcile different frames. Scenario processes can help with this, but are also shaped by such framings.

**2. Clear, 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 rather than as a ‘silver bullet’ capable of delivering predictive forecasting. Scenario planning can also provide a strong platform for increasing the robustness of climate adaptation choices leading to decisions that proactively and effectively address a range of possible futures, rather than aiming for an optimal response to one single pathway. While quantitative modelling of climatic trends – and of other social, economic and environmental drivers – can be a useful input in scenario building, the real value and power of scenario planning lies in its emphasis on plausibility rather than probability; multiple rather than singular futures; and out-of-the-box surprises rather than linear trends.

**3. Clear, shared understanding of the primary goals of the specific scenario planning process**

Scenario planning has the potential to make a useful contribution in meeting a range of key climate adaptation challenges, including understanding key trends and impacts; identifying and selecting options and implementing and evaluating strategic policies and plans. 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 from key internal and external stakeholders and champions**

Maximising high-level support from internal and external ‘champions’ at an early stage in the scenario planning process is likely to significantly increase the likelihood that outcomes will usefully inform decision making. High level buy-in is also likely to strengthen the potential for scenario planning to have an ongoing positive influence in developing an organisational culture and community of practice capable of dealing with high levels of complexity and uncertainty.

**5. Time and resources invested in planning, preparing and ensuring the right mix of skills and knowledge**

Successful scenario planning processes require a significant investment of time and resources, with careful consideration given to the choice of specific approaches and methodologies, and, commonly, the employment of skilled scenario planning facilitators.

**6. Broad range of relevant experience, expertise and evidence drawn on**

The encouragement of a broad and inclusive approach to sources of advice about key drivers and possibilities is an essential basis for avoiding ‘group think’ and for identifying and exploring unexpected, out-of-the-box possibilities.

**7. Identification and consideration of the full range of plausible drivers and pathways deliberately encouraged**

The robustness of climate adaptation strategies and policies will be significantly influenced by the robustness of the range of drivers and scenarios identified and considered.

**8. Scenarios sharply defined and capable of effective communication to key audiences**

Lindgren and Bandhold (2009) note the following key characteristics of good scenarios also include:

- consistency – the stories, processes and events must all fit an internal logic;
- differentiation – they must be structurally diverse, not deviations around a common base;
- memorability – scenarios must be easily represented, communicated and stick in people’s minds after they have been heard;
- challenge – they must challenge people’s perception of the future and how the world works.

**9. Careful consideration given to ways in which outcomes of scenario planning process are to be integrated with strategic planning and decision making**

The commonly cited gap between scenario planning and effective inputs into specific decision making processes and outcomes partially reflects the larger challenge of strategic planning and decision making under conditions of uncertainty and complexity. Careful consideration of the actions needed to integrate scenario planning with specific decision making challenges and tasks is, however, a key precondition for bridging this gap.

**10. Scenario planning embedded as an ongoing driver of organisational culture and decision making processes**

The value of scenario planning is likely to be maximised when the process and outputs are integrated and 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 or to embed learning within organisational decision making processes.

There is increasing evidence that the most effective climate adaptation strategies are not discrete, one off initiatives but rather those that involve the creation and maintenance of an ongoing organisational ‘state’ of continual learning and capacity building that fosters flexibility, innovation and resilience.

41. The following steps are suggested as a framework for designing and implementing climate adaptation scenario planning initiatives and projects.

**Phase 1: Preparation**

1. Clarify adaptation goals and issues relevant to your organisational context
2. Decide whether scenario planning is the right tool
3. Define aims and expected outcomes of the scenario planning process
4. Select a suitable approach: Off-the-Shelf, Tailored Exploration or Tailored Visioning
5. Identify stakeholders and design the process.

**Phase 2: Scenario Building and Refining**

6. Refine scope and objective
7. Create space for ‘out-of-the-box’ thinking
8. Identify and gather key drivers
9. Assess and prioritise drivers
10. Explore and select scenario trajectories
11. Generate scenarios.

**Phase 3: Using Scenarios**

12. Conduct gap analysis
13. Identify possible strategic directions
14. Re-run scenarios to test possible strategies

15. Assess implications for strategy and decisions
  16. Articulate strategy or decision outcomes.
42. Beyond these phases it is also suggested that steps be taken to promote the embedding of scenario planning methodologies and approaches into the ongoing practices of organisations and networks grappling with climate change adaptation. There is significant potential benefit to be realised from building a culture and community of practice around reflexive scenario planning among those seeking to improve organisational capacity to respond to rapidly changing and complex contingencies, risks and challenges.

### ***Broader debates and areas for further work***

43. Further research is especially needed in the following areas:
- Applied, longitudinal research on whether and how scenario planning is contributing to improved decisions and outcomes in climate change adaptation, particularly in policy, what barriers exist, and how they can be overcome.
  - How to frame and communicate climate adaptation in ways that resonate with a diverse range of policy makers and stakeholders.
  - The perceived strengths and weaknesses of, and tensions and overlaps between, predictive forecasting and scenario planning.
  - How scenario planning methodologies can be tailored to be of the most value to diverse public, private and non government organisations.
  - Local and regional data sets for analysis of local and regional level social, economic and environmental drivers.
  - How particular organisational and institutional arrangements and cultures assist or inhibit flexible and resilient policy making under conditions of complexity and rapid change.
44. The use of scenario planning to support climate change adaptation touches on a number of broader debates that also demand attention:
- The purpose of climate change adaptation and its relationship with existing goals, structures and processes and with mitigation efforts.
  - Implications of increasing complexity and uncertainty for climate adaptation policy analysis, development and implementation.
  - The distribution of roles, responsibilities and relationships for action on climate change adaptation, implications for adaptive capacity and other tasks, and implications of possible changes over time.
  - The tension between uncertainty around specific climate change impacts and the need for proactive, consequential action by government;
  - How to increase the transparency and thus social and political legitimacy of scenario planning processes without downplaying the value of synthesising different values, ideas and forms of knowledge into comprehensive scenarios.
  - The extent to which 'robust decision making' is feasible or desirable, not only in contrast to more predictive approaches but to decision making based on a less passive, more proactive stance towards the future, involving a normative rejection of some possible futures and commitment to trying to construct a desired future.
  - The extent to which an acceptance of uncertainty and of the value of imagination (as in open-ended scenario planning) can be reconciled with conventional science-based standards and sources of credible and salient evidence for policy.

# References

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- BRAITHWAITE, C. 2010. Scenario Planning and Sensitivity Analysis. Melbourne: KPMG.
- CASH, D. W., CLARK, W. C., ALCOCK, F., DICKSON, N. M., ECKLEY, N., GUSTON, D. H., JAGER, J. & MITCHELL, R. B. 2003. Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 100, 8086-8091.
- EUROPEAN ENVIRONMENT AGENCY 2009. Looking Back on Looking Forward, Technical Report No. 3/2009. Copenhagen.
- FÜNFELD, H. & MCEVOY, D. 2011. Framing Climate Change Adaptation in Policy and Practice. . *Working Paper 1, Framing Adaptation in the Victorian Context Project*. Melbourne: Victorian Centre for Climate Change Adaptation Research, and RMIT University Climate Change Adaptation Program.
- HULME, M., PIELKE JR., R. & DESSAI, S. 2009. Keeping prediction in perspective. *Nature*, 3, 2.
- IPCC. 2007a. *Appendix 1: Glossary, Intergovernmental Panel on Climate Change Fourth Assessment Report: Climate Change 2007, Working Group II: Impacts, Adaptation and Vulnerability*
- IPCC. 2007b. Glossary P-Z, Intergovernmental Panel on Climate Change Fourth Assessment Report: Climate Change 2007, Working Group 1: The Physical Science Basis. Available: [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/annexessglossary-p-z.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/annexessglossary-p-z.html)
- LINDGREN, M. & BANDHOLD, H. 2009. *Scenario Planning: The link between future and strategy*, Basingstoke, Palgrave macmillan.
- MOSER, S. & EKSTROM, J. 2010. A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences* 107, 22026-22031.
- NELSON, D. R., ADGER, W. N. & BROWN, K. 2007. Adaptation to environmental change: Contributions of a resilience framework. *Annual Review of Environment and Resources*, 32, 395-419.
- ROUNSEVELL, M. & METZGER, M. 2010. Developing qualitative scenario storylines for environmental change assessment. *Climate Change*, 1, 606-619.
- WILBY, R. L. & DESSAI, S. 2010. Robust adaptation to climate change. *Weather*, 65, 180-185.

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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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