



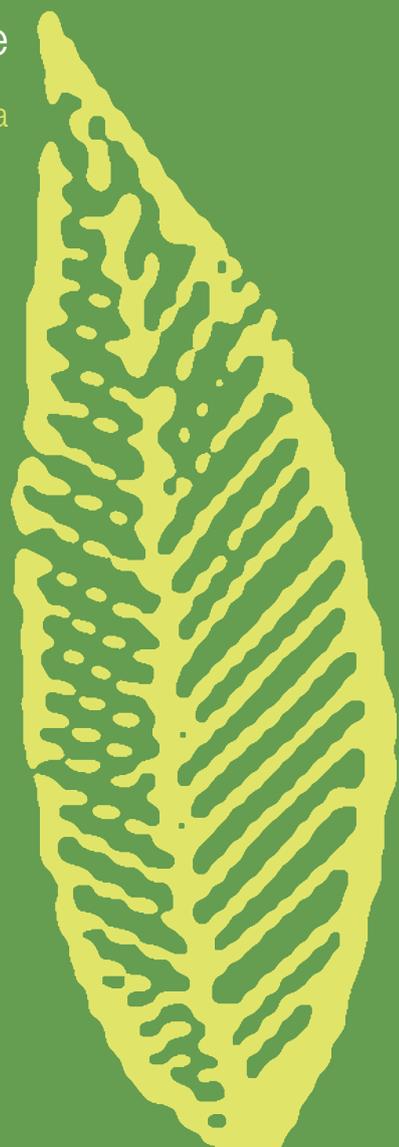
S Commissioner
Environmental Sustainability
Victoria

Science, Policy, People

State of the Environment Reporting 2013, Victoria



Victoria
The Place To Be



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When a shift takes place,
“a scientist’s world is qualitatively
transformed [and] quantitatively
enriched by fundamental novelties
of either fact or theory”

Kuhn, TS (1962)

Foreword

As the Commissioner for Environmental Sustainability in Victoria I am required to prepare a periodical Report on the State of the Environment of Victoria. This report must be prepared in accordance with a framework for environmental reporting that I develop and have approved by the Minister for Environment and Climate Change. The Minister must cause a copy of the framework to be laid before each House of Parliament within 10 sitting days after the framework has been approved. These requirements are set out in section 17 of the *Commissioner for Environmental Sustainability Act 2003* (the CES Act).

In approaching the development of the framework, *Science, Policy, People – State of the Environment Reporting 2013, Victoria* I have been mindful of the need to create an environmental reporting model which is not only rigorous in its scientific inquiry, but one which is also contemporary, readily able to accommodate rapidly changing and transformative environment and climate change contexts.

I gave careful consideration to the reporting model adopted for the *Victoria 2008 State of the Environment* report, Driving force-Pressures-State-Implications-Responses (DPSIR), until recently the most routinely applied methodology in the field. I found that this model lacks the capacity to address the interconnected, trans-disciplinary issues needed for comprehensive assessments of environmental conditions.

Environmental reporting is undergoing a 'scientific revolution'. Traditional models of reporting such as DPSIR are being replaced by methodologies which include considerations of people, culture and policy relevance along with the knowledge provided by natural science. New paradigms are often difficult to institute. They require time, innovation and the perseverance to change established conventions. I intend for my framework *Science, Policy, People* to contribute to the 'scientific revolution' which recognises that the integrity of environmental reporting relies on its transformation into an interconnected, trans-disciplinary endeavour.

Considerations of utmost importance are that the next State of the Environment report reach a new and emerging audience and respond with timeliness to environmental issues, given our legitimate, heightened concern about climate change and its impacts.

My intention is to produce a State of the Environment report which will **inform the Victorian community** about the health of the natural environment and **influence government** to achieve environmental, social, cultural and economic sustainability.

In producing Victoria's next State of the Environment report I will have regard to the accountability principles and objectives imposed upon me by the Victorian Parliament in its passing of the CES Act.



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1. The Rationale

1.1 A reporting shift

The *Victoria 2008 State of the Environment* report explored issues and themes by means of the frequently adopted methodology Driving force-Pressures-State-Implications-Responses (DPSIR). I have decided to depart from a rigid acceptance of the DPSIR methodology as I do not consider it appropriately addresses the interconnected nature of the natural environment and our dependence upon it. My reasons are set out below.

1.1.1 Limitations of DPSIR

My office has researched and analysed historical and recent scholarship about methodological approaches, in particular the DPSIR methodology. This work was undertaken to test the continuing utility, relevance and application of that methodology to state of the environment reporting for Victoria and to generate new thinking and directions as, and where, necessary.

There is a growing recognition that DPSIR (and its variants), despite best endeavours, struggles to take into account the changing dynamics of systems and may enshrine non-neutral stances. It presents linear, single causal chains for systems which, due to their inherent complexity, resist such characterisation (Rekolainen et al in Carr et al 2007: 544-546).

Other critiques have also developed in recent years, particularly in the development discourses (see Carr et al 2007, Carr et al 2010, Ness 2010). The DPSIR methodology is said to downplay 'social diversity and local responses', thereby rendering aggregated impacts on drivers 'difficult if not impossible' to examine (Carr et al, 2007: 544). It is also argued that sustainability science research deals with a 'multitude of perspectives, cross-scale dynamics, [a] host of non-linear interactions and the irreducible uncertainty of systems' (Ness et al, 2010: 479-480). This level of complexity is not well captured by DPSIR methodology.

1.1.2 Responsive reporting

Reporting methodologies need to, and have, responded to changes over time. For instance the recent *United Nations Global Biodiversity Outlook 3* has taken an increasingly flexible but nevertheless scientifically rigorous approach to reporting, incorporating case studies as nodes in networks. The European Environment Agency in its *Annual Report 2009 and Environmental Statement 2010* states that it will encourage a "greater integration of knowledge about the linkages between ecosystems and the major socio-economic arenas" (p.9). It further comments that Europeans agree that the environment has a significant impact on their quality of life and as a consequence the demand for reliable, local information has grown explosively. Citizens across the union want the environment, as well as economic and social needs, taken into account in the policy process. Public acceptance of approaches to key environmental issues is considered a strategic challenge if the European Union is to move to a sustainable future by 2050.

The level of complexity faced by all reporting jurisdictions, or bodies, necessitates, at the very least, the reconfiguration of the DPSIR methodology if not a broader change. Some reports for example have focused on a looser configuration of 'underlying issues' rather than 'drivers' or potentially limiting lists of indicators. The very recent United Nations Environment Programme Latin America country report reflects this change. It commences with a careful discussion of regional complexities before moving to a discussion of driving forces.

1.2 Framing in context

In developing *Science, Policy, People – State of the Environment Reporting 2013* I also found it prudent to reconsider the utility and effective application of the framing context for state of the environment reporting. It is necessary that state of the environment reporting be responsive and engaging, as well as rigorous.

It is in this context that the next Report on the State of the Environment of Victoria will be crafted, and to this end I propose a number of significant innovations. Firstly, I suggest a fundamental reconsideration of the audience for whom the report is written. Secondly, I propose a revision of the model of inquiry, as discussed above, and finally a reporting schedule which will improve the timeliness and relevance of the report.

1.2.1 Audience – a new constituency

My sense of the need for a reconsideration of the target audience for state of the environment reporting in Victoria reflects the urgent need to better convey messages about environmental sustainability and climate change science. The domains and roles of science, policy and people need to be integrated. I take the view that in responding to research communities' clearly articulated call to better communicate science, a contemporary report should address both the foundational audiences and the other, equally important constituency, the community.

State of the environment reporting began in an effort to better inform government and policy makers. Over time reporting has come to rely quite heavily upon the presentation of data, information and the policy instruments developed by the policy makers and legislators to whom offices such as my own report. Reporting for this audience still involves fresh and careful analysis, but reporting to this constituency alone does not expand the sphere of influence of a report. It does not necessarily meet my statutory accountabilities of reporting to the Victorian community, and, depending on the manner of reporting, may struggle to produce better scientific communication and influence action for improved environment conditions.

The audience for environmental reporting increasingly includes a responsive and interested public. The need to urgently address environmental and climate change challenges also means that reporting needs to enshrine a commitment to broader public engagement.

Accepting an expanded target audience my framework, *Science, Policy, People*, reflects the real, visceral interest in the public domain for environmental reporting. There needs to be an emphasis on two way learning, localising information flows, provision of relevant and timely guidance and the need to authoritatively reflect local and cultural knowledge in monitoring Victoria's environmental condition.

What results from this shift in our understanding of the audience is an expansion of our analysis and a change in the manner in which reports are written. In bringing this increasingly complex constituency into the reporting process we need to shift the established paradigm and find improved and innovative ways of collecting and cataloguing the information and knowledge we present.

1.2.2 Timeliness – a new urgency

The need for reporting timeliness has been a focal point in many of my discussions with an increasingly sophisticated public. Timeliness in reporting is a pressing consideration given the climate change challenges we know we face, exacerbating our already considerable environmental challenges. A different understanding of the audience means a different understanding of the immediacy, and consequent viability of the previous reporting process. To address this issue I propose to release a number of Foundation Papers, which will assist me to gather data, information and community perspectives, as I progress the drafting of the State of the Environment report for Victoria.

Legislative Requirements

The CES Act requires that a Report on the State of the Environment of Victoria is prepared at intervals not exceeding 5 years or a shorter period if a shorter period is specified in the framework. To respond with more agility and effectiveness I propose providing the Minister, and thereby the Victorian community, with three Foundational Papers and a State of the Environment report of Victoria.

I will deliver my State of the Environment report in 2013 as the previous report was tabled in the Victorian Parliament on 4 December 2008.

The Victorian Government is required to respond to any recommendations I may make not later than the first sitting day after the period of twelve months since the sitting day on which the Report on the State of the Environment was laid before each House of Parliament.

I believe the release of Foundation Papers makes my reporting function more responsive and flexible. Adopting this course addresses the concerns we all have, often compellingly expressed, that decision making must be predicated upon best science, policy and practice.



2. The Framework

2.1 *Science, Policy, People*

It is apparent that no single unifying or uniform framework will provide or package knowledge across a complex range of cultures, sectors and states. Although a framework is intended to provide structure, such scaffolding is *specifically* not a blueprint. A framework is intended to be a guide – robust, flexible and responsive to both subtle and palpable change. Frameworks breathe – they contract and expand and they respond to new and emerging issues and trends. At its best, and most effective, a framework will persistently address the needs and interests of an increasingly broad and diverse audience and respond to layers of complicated data and information effectively, and in a situated manner. It is in this context that the next Victorian State of the Environment report will be crafted - responsively.

As a result of the research, and consultation across sectors and academic disciplines, my office has undertaken I present the framework *Science, Policy, People – State of the Environment Reporting 2013, Victoria*. The framework is appropriate for the next round of Victorian State of the Environment reporting. It will provide the Victorian community with a rigorous scientific examination of the state of the natural environment and trends over time, but will be enriched through the consideration of social perspectives and local knowledge.

The need for a multifaceted, trans-disciplinary approach is made even more urgent by the challenges of climate change. Victoria is expected to warm at a slightly faster rate than the global average, especially in the north and east of the state. We can expect our climate to be hotter, drier and more extreme now and in the future.

Climate change will have significant impacts upon our natural and human systems. Our challenge as a community is to reduce our emissions and learn to adapt to the impacts of climate change in a way that is sustainable.

2.2 Guiding principles

The *Science, Policy, People* framework seeks to investigate contemporary environmental challenges based on the following guiding principles:

- rigorous scientific investigation, which provides comprehensive data on long term trends, will be combined with social science scholarship and cultural perspectives
- leading edge, best practice science communication methods will be employed
- target an audience across the broad Victorian community
- people will be recognised as participants in the process
- the interconnectedness of the environmental, economic and social will be highlighted
- the diversity of Victorian Indigenous peoples' perspectives will be included
- the knowledge and information bases which underpin environmental sustainability practice and actions already well entrenched across the state and in the Victorian community will be included.

2.3 Reporting schedule

I will produce individual, yet interlinked, Foundation Papers on the themes of *Climate Change, Biodiversity and Land* and *Water and the Environment* to be completed in 2011/12, 2012 and 2013 respectively. These Foundation Papers will inform the development of the State of the Environment report, which will also be completed in 2013.

2.4 An integrated approach

The State of the Environment report will draw upon different forms of knowledge in an integrated way. The report will remain grounded in established and rigorous science but with the understanding that scientific knowledge alone is insufficient to bring about societal and behavioural changes for sustainability. To achieve the optimum blend of knowledge, and consider the widest possible range of information, the data provided by the natural sciences will be incorporated with the analysis of the social sciences to better explain trends in environmental conditions and our management of our resources.

2.4.1 Social sciences

Traditionally, knowledge from social science disciplines (cultural, historical, sociological and anthropological) is largely absent from State of the Environment reporting. As a result, cultural contexts have often been overlooked in problem definition and the framing of solutions. Similarly, the role of the environment in the economic viability of communities has not been a focal point in the assessment and reporting process.

For the next Victorian State of the Environment report, qualitative data will be sourced from a wide range of individuals, reports and research, and localised and regional groups. Broad consultation will ensure that the cultural understandings and environmental experiences of culturally and linguistically diverse, across ages and gender will be included. Tools and techniques will include interviews, case studies, workshops and syntheses of social scientific research.

2.4.2 Natural sciences

To illustrate key trends and concepts in the narrative, a select number of indicators will be used. To track trends in key issues select data sets used in the *Victoria 2008 State of the Environment* report will be examined, reconsidered and, where appropriate, updated.

Data collection and analysis will be the subject of rigorous scholarship and indicators will be reviewed to ensure that the information derived is:

- Valid to (representative of) the issue being examined in all its facets, and
- Reliable - gathered under replicable conditions by reliable methods.

Where the examination of available information does not provide sufficient scientific certainty, this will not result in the exclusion of issues of concern from the reporting process. Rather, where there are believed to be limitations in the validity and reliability of information, these will be made explicit, and alternative ways of describing the issue, for example qualitatively, will be used.

My office will continue to engage with the Commonwealth State of the Environment reporting team and other jurisdictions to ascertain the extent to which data and indicators are relevant and can be consistent between jurisdictions.

2.5 Model of inquiry

The model of inquiry adopted by the framework, and outlined below, allows for the examination of interconnected and significant environmental and socio/cultural issues. Interconnections can be identified between areas of investigations and environmental issues of most concern. This provides an opportunity for the exploration of a broad range of issues, including historic trends, some of which may not be well understood in isolation. This broad remit will also enable new and emerging issues to be considered and included as they arise.

The inquiry model will be applied to each issue addressed in the reporting process.



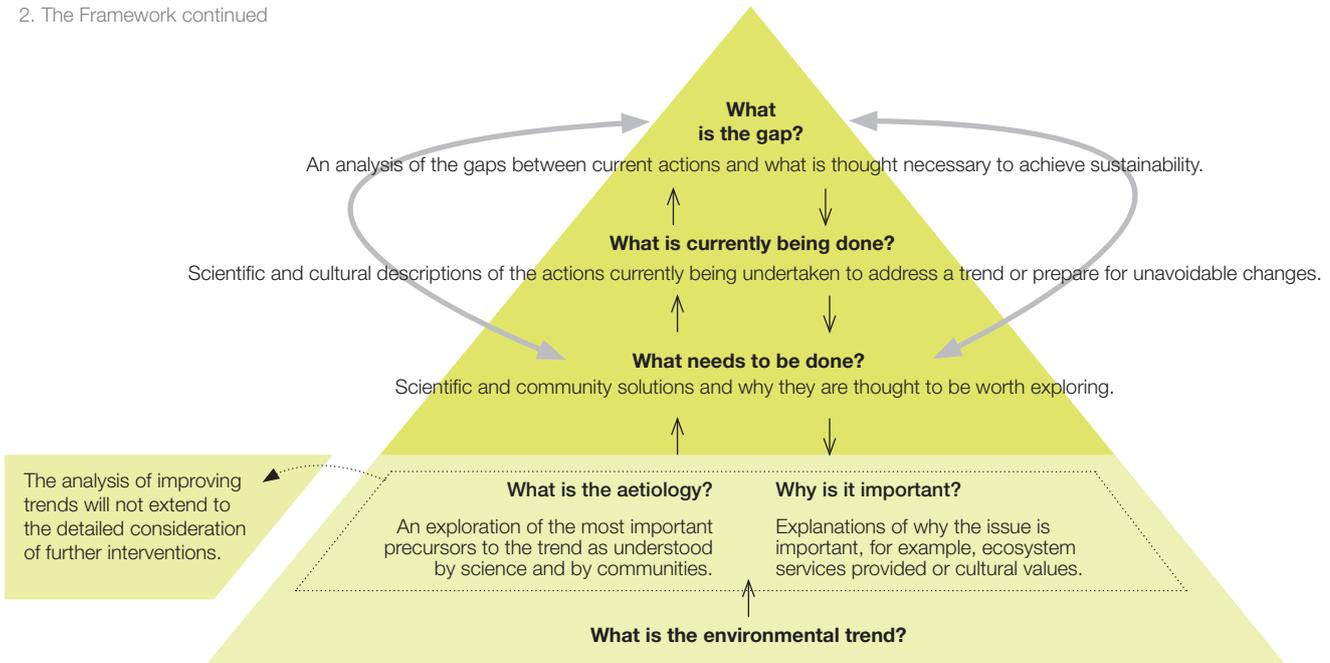


Figure 1: The Model of Inquiry

My framework provides an inquiry approach which recognises that we are facing complex challenges in seeking to ensure ecologically sustainable development.

It aims to generate decision making across sectors, disciplines and within the community which leads to the effective integration of economic, social and environmental concerns for the well being of our community, the health of our natural environment and the benefit of future generations.

In applying the inquiry model to the issues each report in the series will also:

- analyse the effectiveness of community actions and government policy and programs, including regional and local/community examples that showcase success
- present expert commentary from social, economic and environmental perspectives.

2.6 Themes

It is evident to me that the Victorian community places a high level of importance on the health of the environment and wants reporting to be relevant and meaningful. Climate stability, biodiversity and water are clearly and persistently recognised as vital for sustaining humanity and the ecological systems upon which we depend. It is imperative that reports be provided to the Victorian public on these issues.

It is for these reasons that I have selected *Climate Change*, *Biodiversity and Land and Water and the Environment* to be the central themes of State of the Environment reporting for Victoria. I will consider these themes at a 'landscape' and cultural level and will consult widely to frame the particular issues to be addressed. I will be informed by the history Victorians share with the environment and the particular insights Indigenous Victorians bring to our understanding of the environment and its cultural significance. The release of Foundation Papers for these three themes will assist in the development of the State of the Environment report.

2.6.1 Climate Change

Climate change is the environmental issue urgently exercising the minds of natural and social scientists, legislators, policy makers and the broad public. No issue has been more concerning for members of the Victorian community with whom my office has consulted.

There is now very strong evidence that greenhouse gas emissions from energy generation and use, industrial processes and the clearing of vegetation are creating a greenhouse effect that is changing the climate, potentially presenting us with dramatic and unmanageable 'tipping points'. Climate change is adversely impacting rivers, biodiversity, coastal and marine systems.

Our responses must be two-fold. We need to mitigate in an effort to avoid elevating levels of greenhouse gas emissions and we need to adapt to the changes which we can now not avoid. Our responses will need to be multi-sited and cross conventional boundaries and barriers.

My first Foundation Paper will provide a Victorian focus on the issue and examine the Victorian policy context. It will capture the intelligence about climate change impacts, identify hazards, provide an inventory of assets, characterise risks, prioritise actions, and generate interest in and propose directions for adaptation and strategic plans. The report will take into account the Victorian Government's Climate Change White Paper *Taking Action for Victoria's Future* and the implementation of the *Climate Change Act 2010*. Responses to climate change emanate from multiple, cross-sectoral, interdisciplinary participants not just policy and political enclaves. All of these participants and possibilities will be explored.

A key area for consideration in this paper will be the state of Victoria's estuaries, coastal and ocean environments. The coast provides significant cultural, social and economic values for our community. The impacts of climate change are a serious threat to the way we use and enjoy our coast. In considering these areas I will have regard to the *Victorian Coastal Strategy 2008* and review the establishment of marine parks.

The *Climate Change* Foundation Paper will adopt an overview approach and consider climate change science, energy and other sectors' emissions, population and growth and Victoria's adaptive capacity. The more fluid and reactive examination of climate change issues will be driven by the model of inquiry adopted in this framework, in that it persistently resists the reduction of complexity to a linear or formulaic resolution.

2.6.2 Biodiversity and Land

Biodiversity provides us with food, fibre, pharmaceuticals, clean water and air, climate regulation, biological control of pests, pollination, erosion control and soil fertility. It is also vitally culturally important to us.

Our unique biodiversity, both terrestrial and aquatic, makes us who we are, across cultures, from Indigenous to non-Indigenous peoples, across sectors and in towns and the regions.

In Victoria we have recently created new National Parks. In doing so we are assuming responsibility for increasing protected areas, as the United Nations Environment Programme suggests we should. As the second in the series of Foundation Papers to support the development of the State of the Environment report, it will be timely for the *Biodiversity and Land* paper to reflect upon and examine these initiatives, having particular regard to the links between biodiversity and climate change. It will provide the opportunity to again consider how we are tracking in respect to climate change.

The *Biodiversity and Land* Foundation Paper will commence with a broad discussion of these contemporary initiatives and also the many reports and policy instruments which reflect the Victorian Government's and community's concerns about environmental protection and preservation, including the initiatives outlined in *Securing Our Natural Future*, the Victorian Government's White Paper for *Land and Biodiversity at a Time of Climate Change*. Again this paper will be crafted out of wide consultation and the need for reporting on and aiding in policy development, across sectoral, metropolitan and local and regional concerns.

The *Biodiversity and Land* Foundation Paper will address land use change, vegetation loss and modification, fire, threaten species, pest plants and animals and soil health. It will consider both terrestrial and aquatic biodiversity. The paper will build upon the data and information contained in the *Victoria 2008 State of the Environment* report but actively attend to the need for improved science communication. The paper will include additional voices, most notably those of Indigenous people. Their knowledge will find a place.



2.6.3 Water and the Environment

A considerable amount of work is presently being done in respect of water, both practically and on a policy footing. Some of these efforts will need time to impact and settle. Water will be the third in the series of Foundation Papers. Water is vital for society. Victoria's cities, towns, agriculture and industry have developed in a time of relative security of supply. The effects of climate change in an already fragile environmental context, as well as impacts associated with changing demographics will be examined. In some regions, amongst some sectors and settings change will be rapid and difficult to deal with. Future water use will need to be responsive to decreased natural availability, and will need to be secured via integrated strategies, including conservation, recycling, distributed systems and desalination. The effectiveness of these strategies will be canvassed.

At the same time, water is also vital for Victoria's bioregions, particularly rivers and streams. The challenge of maintaining natural flow regimes while also catering for changing demographics under conditions of climate change is a significant one: the risk that some rivers will become modified to a state from which they cannot be restored to their pre-European state is a distinct possibility. The issue of what constitutes an acceptable water-environment-culture is one which we will need to consider, assess, discuss and determine – as a community.

The *Water and the Environment* Foundation Paper will address people and water in Victoria, water harvesting and use, cultural and environmental flows, riparian vegetation and water quality.

2.7 State of the Environment report

The Foundation Papers will each inform the next. Linkages will be made apparent and rendered as both information and data in ways to inform the community and contribute to the strategic considerations of government. The State of the Environment report will be informed by the Foundation Papers, it will synthesise key cross-sectoral issues and present strategic findings. It will be drafted to include the following:

- community aspirations
- cultural and social underpinnings, values in and of the environment
- historic trends and the current state of the environment as understood by science and the community
- the outlook under a 'business as usual' model
- the important gaps
- strategic proposals.

In presenting my strategic findings I will consider community aspirations, environmental trends and the costs and benefits of any proposals I recommend to the Victorian Government for consideration.

3. Consultation

3.1 Developing the content

Engaging with a very broad spectrum of the people of Victoria will be a vital, fundamental and ongoing process in the development of the State of the Environment report.

I will use this engagement process to build upon the data and information contained in the *Victoria 2008 State of the Environment* report. More importantly this process will assist me to decide upon which environmental trends require detailed examination in my preparation of Victoria's next State of the Environment report.

The interrelationships that exist amongst groups will be recognised - for example, the community is a knowledge user but is often overlooked as a knowledge producer. To this end the consultation will include both a formal process (detailed below) and ongoing engagement with the community. See Figure 2 page 14.

3.1.1 Policy makers

As an important holder of data, government departments will be consulted early in the process to ensure that the best data is sourced. Initial contact with government departments and agencies will be via departmental secretaries, and will involve the establishment of an Interdepartmental Project Officer Group (**IPOG; 1**) engaged for the entire period of State of the Environment reporting. The IPOG members will be a first point of contact for my office with other government departments and agencies.

For the development of each Foundation Paper, IPOG members will be asked to nominate experts from their department.

3.1.2 Community representation

These experts will join representatives from community, academia, non-government organisations and business organisations to form an Expert Reference Group (**ERG; 2**) specific to the development of each Foundation Paper. ERG members will assist my office in defining sub-issues to be reported upon and in identifying, obtaining and analysing data.

3.1.3 Peer review

Independent peer reviewers (**3**), sourced principally from academia and research institutions, will be employed to ensure that all data, content and analysis is responsive, robust and verified.

3.2 Consulting on drafts

Finally, government and community members will be consulted (**4**) on a draft of each Foundation Paper before it is finalised. In addition to ongoing contact with the community, the community consultation phase will include, but is not limited to, discussions with Indigenous peoples, regional Victorian communities, member based organisations, local government, non-government organisations and other knowledge brokers.

The IPOG member will again be the principle contact person for each government department or agency during this consultation process.



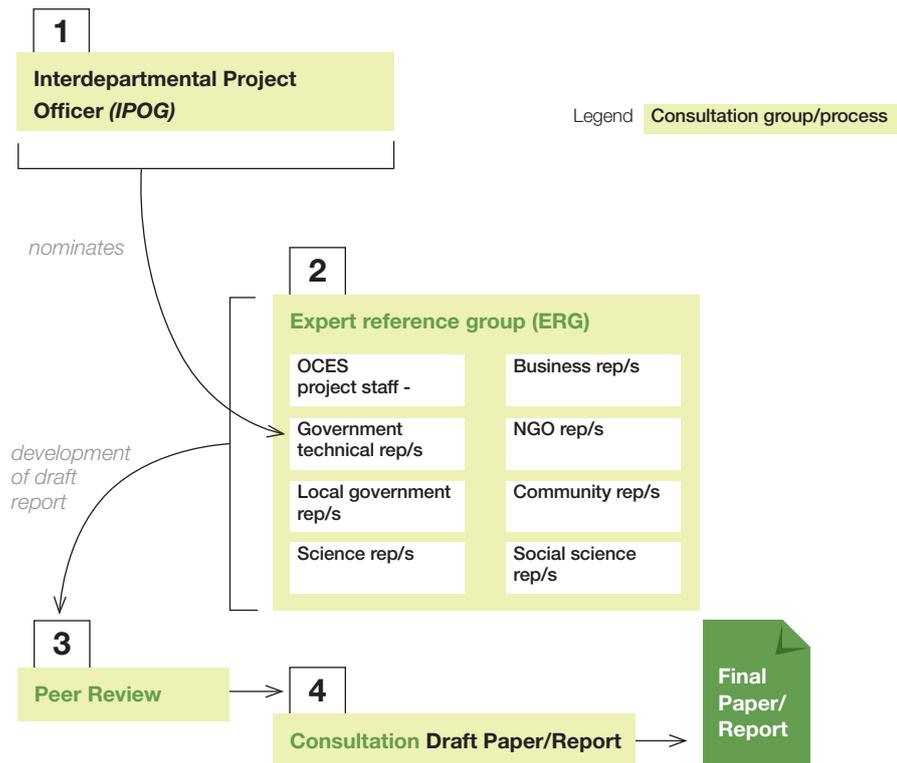


Figure 2: The role of the consultation groups in development of the Foundation Papers and State of the Environment report.

4. Evaluation

4.1 A continuous task

Evaluation of the *Victoria 2008 State of the Environment* report has led to some important changes, modifications and reconsiderations of traditional State of the Environment reporting. As detailed above, these changes are intended to update State of the Environment reporting for Victoria, so that it is more responsive, reflective and compelling.

In order to evaluate the success of the forthcoming State of the Environment report, an ongoing and comprehensive review will be undertaken for this reporting cycle.

This will include, but will not be limited to, an evaluation of:

- the extent to which the State of the Environment report reflects this Framework
- the extent to which the State of the Environment report informs the community and government.

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