

An Agenda for Achieving Ecological Sustainability in Victoria

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FINDING
solutions
An Engineers Australia, Victoria Division initiative

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Engineers Australia, Victoria Division

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1. EXECUTIVE SUMMARY AND RECOMMENDATIONS

The Finding Solutions program of Engineers Australia Victoria Division has concluded that ecologically sustainable solutions already exist for many of the environmental problems facing Victoria but that these are not being put into practice. Engineers Australia believes that it is time to put known solutions into effect, while continuing to develop our knowledge and understanding.

It is time for the government and trained professionals to take the lead and address sustainability in a forward-thinking, holistic way...

Accordingly, in this Action Agenda we identify crucial barriers to implementing sustainable practices in Victoria and propose actions to overcome these barriers. Our objective is to contribute to progress in sustainability, as defined in Victorian State Government Policy and in the *Environment Protection Act 1970*.

A significant barrier we have identified is inertia in the two sectors which should be providing informed and proactive leadership: government and professionals, including engineers. The sustainability debate is currently being led by sectional lobby groups. These groups are well-intentioned but usually under-resourced and sometimes tunnel-visioned, promoting solutions to one environmental problem which might well lead to problems in other areas. It is time for the government and trained professionals to take the lead and address sustainability in a forward-thinking, holistic way, by making objective assessments of the issues and implementing solutions in a manner that balances competing interests.

This Agenda was developed through three Forums – one in Nagambie and two in Melbourne – supported by a series of roundtables and discussions with relevant Victorian stakeholders.

The Action Agenda is summarised in the recommendations below, and schematised in Figure 1.

Recommendations

1. State and Local Governments should set bold targets for sustainability and develop holistic, well-resourced implementation plans to achieve them.
2. The State Government should publish a Victoria 2030 plan that includes these bold targets and implementation plans for achieving them.
3. State and Local Governments should amend their procurement processes, beginning with large infrastructure projects, to require their service and product suppliers to meet sustainability standards, and the Victorian Government should lead the way by volunteering a significant major project as a pilot study for new sustainability standards.
4. Engineers Australia Victoria Division will adopt a set of sustainability principles for procurement that Engineers Australia members working in public and private enterprises can use when developing procurement policies and systems for their enterprise.
5. Engineers Australia Victoria Division will consult with other professional associations and industry groups to develop a set of common standards for use by professionals in defining, measuring and implementing sustainability.
6. Resource pricing should reflect the real cost of natural resources, including externalities, with water and energy urgent priorities for action. The recommendations of the Australian Academy of Technological Sciences and Engineering (ATSE) & Engineers Australia report on water should be implemented in full and the State or Federal Government should commission ATSE and Engineers Australia to prepare a similar report on the future of energy.

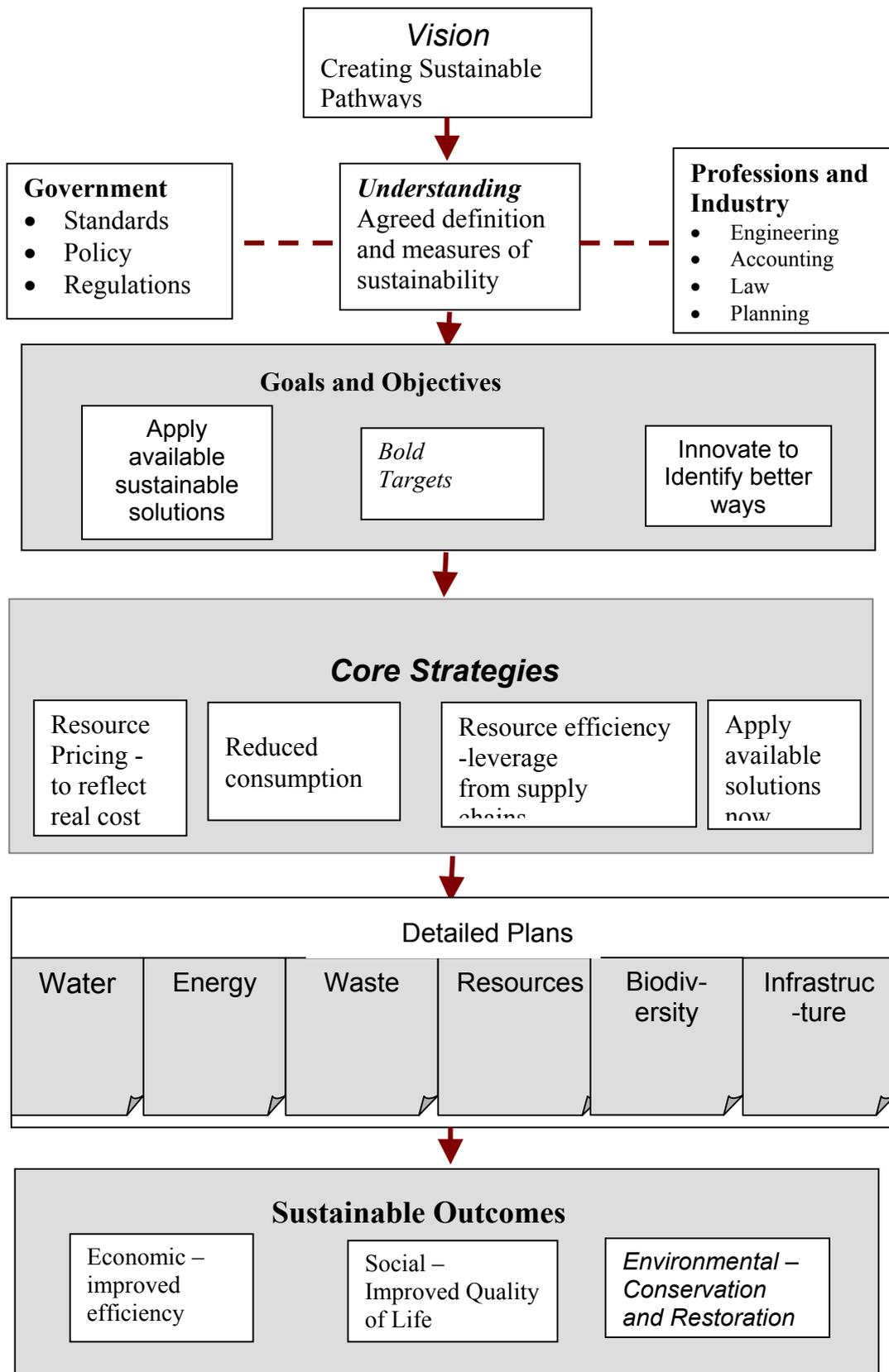


Figure 1: Sustainable Victoria

2. BACKGROUND: The Finding Solutions Program: Ecological Sustainability – Victoria’s Future at Stake

...engineers are ideally placed to take an objective, holistic view of all the issues and develop practical solutions that achieve positive outcomes...

The Finding Solutions Program is an initiative of the Victoria Division of Engineers Australia. The objective of the Program was to develop practical solutions that overcome barriers to Victoria’s sustainable development, with engineers working in consultation with community leaders, stakeholders, planning authorities and external experts.

Engineers Australia believes that engineers are ideally placed to take an objective, holistic view of all the issues and develop practical solutions that achieve positive outcomes while balancing competing agendas. Guiding principles for the Finding Solutions program are that our efforts don’t duplicate work already being done and that the outcome is an Action Agenda that the Division commits to promoting.

It was widely agreed in the forums that a useful starting point in defining sustainable development is the ‘Brundtland’ definition:

‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’¹

Various speakers elaborated on this definition. We suggest that, for the purposes of this Agenda, it is useful to base discussion on the elements of sustainable development from the policy principles enunciated in the *Environment Protection Act 1970 (Vic)*, and associated policies.²

A succinct summary of the policy objectives was provided by Dr Lyndsay Neilson, Secretary of the Department of Sustainability and Environment, in his address at Finding Solutions Forum 2, on June 24, 2003.

‘Victoria needs to adopt two basic concepts:

The Ecological Concept - natural ecosystems need to be managed to protect their viability over the very long term.

The Efficiency Concept - we need to consume fewer resources in all areas of human activity.’

The Finding Solutions Program began with a roundtable of representatives from a variety of government, professional, commercial and not-for-profit groups interested in sustainability. The roundtables identified issues for discussion at the Forums. As a result, the Division organised two Forums (the Issues Forums): one in Nagambie on 23 May, 2003 and the other in Melbourne on 24 June, 2003. Each forum was attended by over 120 people. Speakers at the Forums scoped out the issues identified in the roundtables and obtained feedback from the audience.

¹ *Our Common Future: Report of the World Commission on Environment and Development*, 1987. (The Brundtland Report)

² For example see ‘Waters of Victoria’ policy. *Victoria Government Gazette S 107 4 June 2003*.

An issues paper was prepared following these two forums, supported by two further roundtable discussions. This paper was circulated to participants and stakeholders for comment to help shape the program for the third Forum (the Solutions Forum), held on September 12, 2003. At this forum speakers were challenged to propose solutions to some of the issues discussed at the first forums.

This Action Agenda captures some of these solutions, prioritised at further roundtables with key stakeholders of Engineers Australia.

Engineers Australia, Victoria Division is grateful to the sponsors of the Finding Solutions (Ecological Sustainability) Program: the Department of Sustainability and Environment, and consulting engineering firms GHD and URS.

Broad Themes

A number of key themes and observations emerged at the forums:

- It is widely recognised that current resource consumption is unsustainable, but action is constantly deferred because both public and private bodies perceive action is too hard and therefore won't take even the first steps, many of which are neither difficult nor costly. Leadership from government and skilled professionals is needed.
- Innovation is also fundamental to achieving sustainability. Significant advances have been made in developing sustainable technologies and practices, but they are not being implemented.
- However, while we need to continue to develop our knowledge and understanding of sustainability, many environmental problems can be addressed using solutions which are already available and viable.
- A critical step to sustainability is to establish a common framework between the professions for managing projects and business processes so that governments and corporations can receive consistent, interdisciplinary advice and information on which to base planning and decision-making.
- There can be a conflict between collective good and individual freedom in finding sustainable pathways; people need a persuasive (and financially feasible) case for change.
- Sustainability is not about stopping all development – it is about finding pathways with better social and environmental outcomes and tailoring economic systems to achieve these. Figure 2 below illustrates this concept of shifting to a new understanding of the relationship between the environment, economics and society.

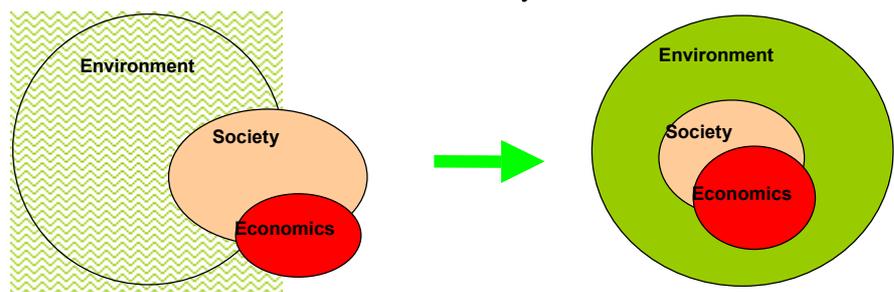


Figure 2: Creating a Shift to New Economics

3. THE AGENDA: ISSUES AND SOLUTIONS

3.1 EFFECTIVE PLANNING TO ACHIEVE BOLD TARGETS – GOVERNMENTS SHOULD LEAD THE WAY

The environmental problems we face, such as climate change, scarcity of natural resources, salinity, waste management and biodiversity, demand radical action. However, targets need implementation plans, and these are largely lacking at the highest levels.

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Such plans need to be based on systems thinking. Engineers are at the forefront of this field, with well-developed expertise in the behaviour of constrained systems. Generalising these to encompass economic and social conditions and constraints is a crucial challenge. It is essential that governments take the lead in meeting the challenge, and they must do this with a holistic, long-term approach that rises above short-term political agendas.

Barriers

- Despite strong political rhetoric from both government and industry, there is a failure to 'walk the talk' of sustainability. Even sustainability 'experts' often fail to move from rhetoric to reality.
- Governments and organisations seldom co-ordinate their planning into a 'big picture'. Different government departments and even different parts of the departments act as silos, setting plans and objectives in isolation from, and often in conflict with, each other.
- To be successful, systems thinking needs effective knowledge management. Our workplaces and social institutions have undergone unprecedented change in the past two decades and knowledge capture and maintenance are difficult during times of constant change.

It is essential that governments take the lead... and they must do this with a holistic, long-term approach that rises above short-term political agendas.

Solutions and Actions

Various government departments and agencies at federal, state and local levels have begun to set bold targets; however only some of them have developed detailed plans for achieving these targets. Broad strategic plans need to become detailed, with short term actions and milestones leading to longer-term significant objectives.

For example, the City of Melbourne has stated targets and has developed detailed, long term plans to reduce greenhouse emissions and water use by the City as a whole.³ The Building Commission has recently introduced targets for increasing energy and water efficiency in new houses, to be achieved by regulation.⁴

The project planning, risk management methodologies and Environmental Impact Statement (EIS) methodologies routinely used by engineers provide the essential disciplines for creating these long term plans. Simple techniques such as identifying and systematically consulting public and private stakeholders to gain their input can reduce conflict and assist in identifying potential for cost sharing and innovation. Such techniques are a necessary part of integrated planning and decision making that helps overcome the problem of organisational silos.

³ These were outlined at the Finding Solutions Forum on September 12, 2003 by Mr Geoff Lawler, Director Strategy & Development, City of Melbourne.

⁴ See www.buildingcommission.com.au/www/default.asp?casid=2843

A sustainability plan for Victoria is long overdue.

In order to take to take the lead, the government must have a plan. A sustainability plan for Victoria is long overdue. Such a plan would:

- (a) address initially a limited number of key sustainability objectives rather than try to solve all problems at once priorities might be water use energy use, land use
- (b) be based on standards and measures relating to sustainability that are in existence or in development. (See *Appendix 1*);
- (c) propose solutions currently broadly accepted by the scientific community, while providing resources for further research;
- (d) be integrated with existing plans such as *Melbourne 2030* and the *Great Ocean Road Strategy*.⁵

Once such plans are in the implementation phase, simply reporting progress against public indicators could lead to dramatic awareness of progress in key areas of sustainability, just as the State's water reservoir levels are now a regular news item and are known to most in the community.

Recommendation 1

State and Local Governments should set bold targets for sustainability and develop holistic, well-resourced implementation plans to achieve them.

Recommendation 2

The State Government should publish a Victoria 2030 plan that includes these bold targets and implementation plans for achieving them.⁶

⁵ See www.dse.vic.gov.au/melbourne2030online and www.dse.vic.gov.au/planning

⁶ Engineers Australia Victoria Division has previously proposed a Victoria 2030 Plan for Infrastructure: See www.vic.ieaust.org.au/about/IEAust%20Infrastructure%202.pdf
www.vic.ieaust.org.au/events/agenda01.pdf

3.2 GETTING SERIOUS ABOUT APPLYING SUSTAINABILITY PRINCIPLES

The majority of the stress on our environment comes from a failure to re-engineer established practices, processes and infrastructure. Smarter, more efficient and cost effective resource uses are available, but are not being deployed because people are unaware of the solutions and lack a 'resource efficiency' philosophy. Inefficient use of resources thus represents an economic loss and an environmental problem.

Barriers

Consumers don't see the link between their buying habits and resource wastage and environmental degradation.

- We are bombarded daily with information from government, business and media on the importance of consumer confidence, standard of living and growth of the economy. This constantly reinforces the values of consumerism, rather than of sustainability.
- Our existing buildings and infrastructure represent an enormous sunk cost. Replacing or decommissioning those that do not function sustainability would amount to writing this past investment off, with major impacts on businesses and individuals and consequent social costs.
- Consumers on the whole don't see the link between their buying habits and resource wastage and environmental degradation. Changing consumer behaviour is perceived as very difficult so few retailers, governments or manufacturers attempt it.
- Some improved domestic and industrial technologies may be economic, but the payback period may be longer than many consumers and businesses are prepared to accept or else they do not remain in a given residence/premises long enough to capture the benefits.
- Making people aware of new and improved approaches to natural resource, land and water management approaches, and training them in new ways is very difficult – estimates of uptake of new, sustainable farming practices are as low as 20%.

Solutions and Actions

There are many technologies and practices that would help shift Victoria to a sustainable management regime and help repair past damage. These are not being deployed with sufficient speed or vigour because of the barriers identified above. The same barriers are stifling local innovation in finding appropriate solutions at the corporate, regional, or consumer level.

The government, is ideally placed to exert a powerful impact on industry by ensuring its own procurement and project delivery practices are based on sustainability principles.

Many large companies are working towards more sustainable practices, and individual consumers participate in community initiatives such as domestic waste recycling. However, the reality is that efforts are piecemeal and relatively inconsequential, and they will remain so until governments take a strong lead. While regulation will be an inevitable implementation strategy in some areas, much would be achieved if the government lead by example.

Implementation of sustainability in industry involves the whole supply chain, from procurement to waste treatment. The government, as client for major projects, products and services, is ideally placed to exert a powerful impact on industry by ensuring its own procurement and project delivery practices are based on sustainability principles.

The setting of bold targets (Recommendation 1) will help focus attention on deploying best available, economically feasible technologies and practices in government. Recommendation 3 is that governments multiply their influence into broader industry and the community by setting performance standards for suppliers at every stage of the supply chain.

Recommendation 3

State and Local Governments should amend their procurement processes, beginning with large infrastructure projects, to require their service and product suppliers to meet sustainability standards, and the Victorian Government should lead the way by volunteering a significant major project as a pilot study for new sustainability standards.⁷

Recommendation 4

Engineers Australia Victoria Division will adopt a set of sustainability principles for procurement that Engineers Australia members working in public and private enterprises can use when developing procurement policies and systems for their enterprise.

⁷ See Appendix 1. The AusCid Sustainability Framework for the Future of Australia's Infrastructure combined with standards currently in development at Standards Australia would provide excellent models for application to a major infrastructure project

3.3 A SUSTAINABILITY FRAMEWORK FOR PROFESSIONAL USE

A number of approaches to defining and measuring sustainability have been, or are under development. However, there is no generally accepted, simple yardstick to facilitate planning, control and evaluation. In most organisations, only things that are measured are taken notice of, so the absence of a simple yardstick adds to the general inertia that keeps unsustainable practices in use.

Barriers

- Sustainability is a difficult concept to measure – the social and environmental outcomes that the ‘triple bottom line’ (3BL) aims to measure include intangible elements such as the current economic value of biodiversity or social cohesion for which there are no accepted valuation methods.
- Different professions have a different language – professions such as law, engineering and accounting do not communicate well with each other. They have independent processes for creating new professional standards and knowledge. Consequently, they are developing separate approaches to sustainability and creating unnecessary divergence in an already complex area.
- Issues of sustainability do not only arise at the point of service delivery or product manufacture. They permeate the entire procurement process and supply chain, as inputs have their own 3BL impacts. This adds another degree of complexity to measuring sustainability.
- The complexity of sustainability also requires a shift to systems thinking. The linear scientific and economic models of thinking that dominated the last two centuries are powerful and valuable but they have their limitations in addressing sustainability.

The complexity of sustainability ... requires a shift to systems thinking.

Solutions and Actions

There are a number of measures and guidelines for sustainability in existence or being developed. The Environment Protection Authority, for example, is currently trialling an ‘eco-footprint’ assessment model for sustainability⁸. The Municipal Association of Victoria has developed a set of sustainable procurement principles⁹. The Australian Council for Infrastructure Development has published a *Framework for Sustainability Handbook* which is a useful guide for developers wanting to create infrastructure based on sustainability principles. (See *Appendix 1*)

All these models have strengths and weaknesses, but there is certainly sufficient agreement on the key factors that need to be considered to begin to move toward a generally accepted standard for use by professionals. The standard would evolve over time as knowledge of complex environmental and social systems improves, but there is enough available knowledge to create a standard against which the sustainability of public and private infrastructure and enterprise can be judged.

⁸ See www.epa.vic.gov.au/Eco-footprint/default.asp

⁹ See www.mav.asn.au/ecobuy

These standards should be applicable to specific projects and/or companies to allow them to rate the sustainability of their operations. Government at all levels should support and contribute to the development of this system, with a view to adopting it in government business, as the Government is currently doing in the related field of risk management. The system should also be consistent with Australian and International Standards (see Appendix 1) and Engineers Australia will also work with relevant bodies to this end.

Recommendation 5

Engineers Australia Victoria Division will consult with other professional associations and industry groups to develop a set of common standards for defining, measuring and implementing sustainability.

3.4 RESOURCE PRICING – TIME TO REFLECT REAL COSTS

Much of the sustainability debate hinges on the issue of ‘internalising’ the costs of resources and pollution that are still largely unaccounted for in the economic and monetary system. Including these costs or ‘externalities’ will facilitate market solutions to some of the more vexed public resource allocation issues.

The most prominent of these issues – and the one in most urgent need of solutions in Australia – is water. The most urgent around the world is energy. Once provided free to users, with infrastructure costs borne by the public sector, the use of water in agriculture, industry and residential households has become wasteful and inefficient. Our failure to implement better ways to allocate this scarce resource is now a widely recognised national crisis.

Barriers

- Public resources, especially water and energy, are still available to users at too low a cost, thus encouraging waste and inefficiency.
- Environmental costs are not accounted for, especially in relation to energy sources such as brown coal.
- The high cost makes alternative systems such as rainwater collection uneconomic.
- There are sound social and equity reasons for not linking an individual’s access to public resources with the ability to pay.
- The major users of water and energy are primary and secondary producers, and increasing charges for these could have a significant effect on the cost of the end product.

Unsustainable consumption should be paid for, rather than rewarded through low pricing.

Actions and Solutions

As with other issues, there are a number of available actions that could be taken using available knowledge and technologies that could lead to dramatic improvements in resource pricing. Unsustainable consumption should be paid for, rather than rewarded through low pricing.

The full pricing of resources need not exclude social and equity concessions. These, however, should be explicitly targeted within a market framework – all people have a basic entitlement for personal use, but this does not preclude excess or industrial uses being charged at full cost.

Water and the Australian Economy was jointly published by the Australian Academy of Technological Sciences and Engineering and Engineers Australia¹⁰. The study includes a review of available water resources by region, current demand and percentage of the resource committed. In ten of the twenty principal regions, available resources are committed to the extent of more than 20% and only 5 are under 20% committed. United Nations reports have suggested 20% commitment as an indicator of the threshold for significant stress on aquatic ecosystems.

¹⁰ See www.atse.org.au/publications/reports/water1.html

Compiled in 1998-99, many of the recommendations in *Water and the Australian Economy* have not yet been implemented but remain relevant and valid, especially the introduction of an efficient water trading market and new pricing procedures for externalities associated with resource use.

Further work should be undertaken by state and federal Governments on environmental flows to sustain aquatic ecosystems and on pricing mechanisms, but the existing ATSE recommendations could and should be implemented now.

Recommendation 6

Resource pricing should reflect the real cost of the resources, including externalities, with water and energy urgent priorities for action. The recommendations of the Australian Academy of Technological Sciences and Engineering (ATSE) & Engineers Australia report on water should be implemented in full and the State or Federal Government should commission ATSE and Engineers Australia to prepare a similar report on the future of energy.

Appendix: Sustainability Frameworks and Standards

Frameworks

Reputable Frameworks for measuring and/or implementing sustainability include:
Department of Sustainability and Environment, Ecological Sustainable Design and Construction. Principles and Guidelines

www.dse.giv.gov.au

Environment Australia : Public Environmental Reporting

www.deh.gov.au/erin/ert/index.html

Environment Protection Authority Victoria, Eco-Footprint

www.epa.vic.gov.au/Eco-footprint/default.asp

Global Reporting Initiative (GRI)

www.globalreporting.org

Municipal Association of Victoria Green Buying Guide

www.mav.asn.au/ecobuy

Project Sigma

www.projectsigma.com

An excellent summary of such resources is contained in Annexure 1 of the AusCid *Sustainability Framework for the Future of Australia's Infrastructure*:

www.auscid.org.au/auscid/index.html

Standards

There are a number of international standards for environmental management.

See: International Standards Organisation (ISO 14000 series)

www.iso.org

Standards Australia has a number of environmental management standards and is currently establishing an Energy and Sustainability Coordination Group to coordinate the development of standards and guidance material across the full range of Australian standards.

New Standards in development include

- Carbon Accounting
- Energy Efficiency in Buildings
- Building for Enhanced Environmental Performance
- Energy Auditing

Standards Australia is the Australian Contracting Party for the implementing agreements of the International Energy Agency on Solar Heating & Cooling and Energy Conservation in Buildings and Community Systems.

Standards Australia coordinates Australian input into ISO/TC 59/SC 17 Sustainability in Building Construction. Areas covered include – general principles and terminology; sustainability indicators; environmental declaration of products; environmental performance of buildings.

See Standards Australia

www.standards.org.au

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Engineers Australia publications on sustainability may be found at:
www.ieaust.org.au/policy/publications_by_year3.html

Acknowledgements

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Facilitators

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Speakers

Forum One, May 23, 2003

Mr Ian Porter, Director, Sustainability and Greenhouse Unit, Department of Sustainability
 Dr Paul Sinclair, Director, Healthy Rivers Campaign, Environment Victoria
 Professor Diana Patterson, Acting Chairperson, Victorian Catchment Management Council
 Ms Heather Shaw, Project Manager, Developing Social Capabilities, Department of Primary Industries
 Mr Paul Weller, President, Victorian Farmers Federation
 Mr David Norman, MIEAust, Chairman, Engineers Australia Environmental Engineering Society

Forum Two, 24 June 2003

Professor Lyndsay Neilson, Secretary, Department of Sustainability and Environment
 Mr Brian Bayley, Chief Executive, Melbourne Water
 Commissioner Tony Arnel, Building Commissioner of Victoria
 Mr Daniel Grollo, Chairman, Property Council of Victoria
 Ms Meredith Sussex, Executive Director, Office of Commonwealth Games Co-ordination
 Ms Attracta Lagan, National Director, Ethics and Sustainability, KPMG
 Ms Tricia Caswell, Global Sustainability @ RMIT University, R&I Institute
 Dr Erin Jancauskas, Partner, Now for Future

Forum Three, 12 September 2003

Mr Francis Grey, Director, Research, Sustainable Asset Management
 Mr Geoff Lawler, Director, Strategy and Development, City of Melbourne
 Mr Chris Barnett, Project Architect, Sustainable Built Environment
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Acknowledgements

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Mr Jonathan Crockett - GHD Group
Mr Robert Enker – Building Commission
Ms Jan Fitzgerald -Steps Towards Sustainability
Mr Darren Gladman - Environment Victoria
Mr Francis Grey - Sustainable Asset Management
Dr Peter Jackson - CRC for Clean Power from Lignite
Mr Terence Jeyaretnam - URS Australia Pty Ltd
Mr Erik Ligtermoet - Melbourne Water
Mr Robert Lorenzon - Australian Industry Group
Mr Andrew Milward-Bason - Grimshaw Jackson Architects
Mr Dennis Monahan - Environment Protection Authority
Mr David Norman - South East Water
Ms Sally Parker - South East Water
Mr Edward Pinceratto - BHP Billiton Petroleum Pty Ltd
Mr Colin Rudd - URS Australia
Mr Brian Young - Envirosafe International Pty Ltd