Hope for the future

The Western Australian State Sustainability Strategy

A VISION FOR QUALITY OF LIFE IN WESTERN AUSTRALIA

GOVERNMENT OF WESTERN AUSTRALIA

September 2003

A better place to live

Foreword

I have pleasure in presenting Australia's first comprehensive sustainability strategy at the State level. This initiative follows an election commitment and the need identified by the Western Australian Government, along with most governments around the world, to use sustainability as an integrated, whole of government approach to many deep-seated issues.

The State Sustainability Strategy shows how we can meet the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. It proposes new principles, approaches and actions to help us to achieve a more sustainable future, to help us make a better place to live.

Clearly, sustainability is a concept that resonates. Many people, government agencies and businesses now see this approach as the only way forward. It provides us with the basis of hope for the future and a vision for quality of life in Western Australia.

The transition to a sustainable future is a long-term agenda that requires rethinking the way we live, use resources, govern and do business. The Strategy challenges us to consider new ideas and to be innovative about the opportunities that are presented. The actions contained within the Strategy illustrate how our journey to sustainability will begin. The actions will be implemented over the next five to ten years, though many begin immediately and some will take much longer. Many other actions will emerge as we proceed.

Partnerships are central to the process of sustainability. Government, business and the community will need to find new ways of working together to achieve our common aim. The Strategy reports on the results of a historic partnership developed with local government and provides for several new partnership arrangements.

The time is right for this important Strategy. The global debate has shown that integrating the environment, society and the economy remains an enormous challenge. Individuals, businesses and governments everywhere are searching for new approaches to economic development that contribute to environment and society now without degrading them over the longer term. Western Australia shares this aspiration and I am confident that we can achieve it and benefit from the opportunities that sustainability brings.

I am delighted with the genuine enthusiasm and support expressed by so many people for this initiative thus far. Many people helped in preparing this Strategy. The Strategy will need to evolve and grow with successive governments because we are addressing the future of Western Australia, and most importantly, the future for our children.

Hon. Dr Geoff Gallop MLA
Premier of Western Australia
September 2003

Executive Summary

Sustainability is meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. This aspiration enables processes to be developed that provide mutually reinforcing outcomes that can benefit the economy, the community and the environment.

Sustainability is a global process but Western Australia is the first Australian State to undertake a comprehensive assessment of what it means for forty-two areas of government. The State Sustainability Strategy is based on a Sustainability Framework of eleven sustainability principles, six visions for Western Australia and six goals for government.

Actions across government that support the framework are presented and will be implemented over a ten-year period and beyond. A selection of actions is set out below under the Western Australian Government's six goals for sustainability that begin to illustrate how the principles of sustainability can start to be applied across the whole of government.

**Ensure that the way we govern is driving the transition to a sustainable future**

- Develop a **Sustainability Act** that embeds the principles of sustainability in government actions and processes and supports reporting on the outcomes across government through a periodic **State of Sustainability Report**.

- Demonstrate leadership by requiring government agencies to respond to a **Sustainabilty Code of Practice for Government Agencies** and develop a **Sustainability Action Plan** to address a range of issues including energy use, greenhouse emissions, waste minimisation, community engagement and **sustainability procurement**.

- Initiate and trial **Sustainability Assessment**—an integrated and holistic approach to decision-making to create 'net benefit' outcomes.

- Create a **Sustainability Roundtable** with community and industry expertise in order to facilitate:
  - the further development and implementation of the **State-Local Government Sustainability Partnership Agreement**
  - community and industry **Partnership Projects**
  - **Regional Sustainability Strategies**
  - global aid project involvement
  - **State of Sustainability Reporting** and
  - revising the State Sustainability Strategy (every 2 years).

- Embed sustainability into the planning system through:
  - a **Sustainability Directorate** in the Department for Planning and Infrastructure
  - a **Sustainability Scorecard** approach to development control, and
  - a **Sustainability and Development Assessment Committee** as a Standing Committee of the Western Australian Planning Commission.

- Promote Aboriginal employment targets in major developments, joint management with Aboriginal people of National Parks, an Indigenous Protected Areas program and Indigenous Regional Agreements to support Indigenous sustainability.

Play our part in solving the global challenges of sustainability

- Facilitate the new **Global Centre for Sustainability** (combining expertise from universities, TAFE, the CSIRO, government and industry) to undertake major international partnership projects on the interrelated issues of population, development aid and environmental technology.

- Implement a Western Australian **Greenhouse Strategy** and continue to develop innovative contributions to the global greenhouse issue.

- Develop a **Biodiversity Conservation Strategy and Act**, create thirty new National Parks under the policy to protect old-growth forests and five new marine reserves, assess the need for new reserves, and support the linking of major terrestrial reserves with areas of privately owned bush and regeneration, to help meet Australia's international obligations for biodiversity protection.

- Respond to the findings of the Transport Energy Strategy Committee on short, medium and long-term transport goals for the transition from **oil vulnerability**, to gas, to the hydrogen economy.

Value and protect our environment and ensure the sustainable management and use of natural resources

- Develop a new vision for the **Ningaloo Coast** including fast tracking World Heritage nomination for Cape Range – Ningaloo Coast and gazette the extensions to the Ningaloo Marine Park and Cape Range National Park.

- Strengthen the *Nuclear Waste Facility (Prohibition) Act 1999* so that it prohibits the transportation or storage of any **nuclear waste** in Western Australia.

- Use **Statements of Planning Policy** and other mechanisms to coordinate the actions of local governments, regional councils and State natural resource management agencies on priority natural resource issues, for example regional drainage, biodiversity corridors, local community services and coastal planning.

- Build **community values** into regulatory approaches to natural resources management.
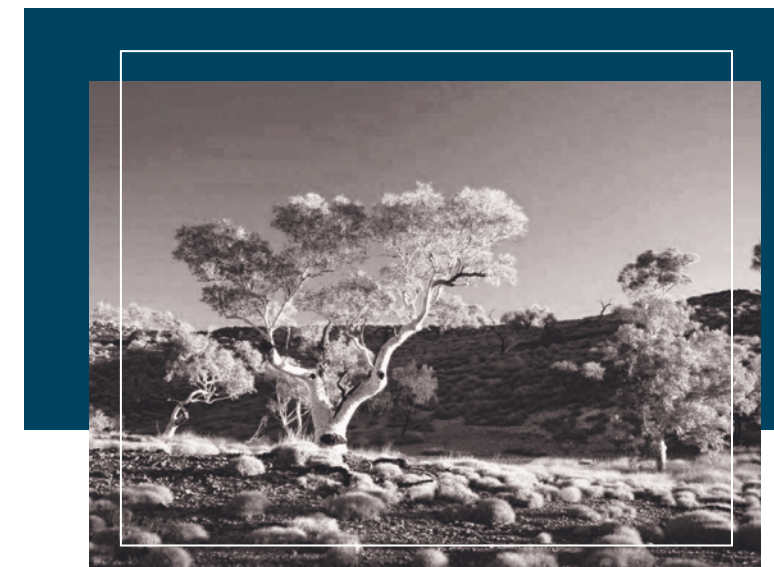
Snappy gums, Karijini National Park.

Source: Cliff Winfield/ Department of Conservation and Land Management

Plan and provide settlements that reduce the ecological footprint and enhance our quality of life

- Implement the **State Water Strategy** and continue to develop long-term solutions for water conservation and water supply including more community scale re-use applications.

- Emphasise the **revitalisation of suburbs** and, as part of Greater Perth, establish growth management to control urban sprawl.

- Overcome car dependence through development that builds on the doubling of the rail system, revamp the **Perth Bike Plan** and introduce a **SmartRider** ticketing system for public transport with extra incentives, security and speed of operation.

- Develop a **Strategic Framework for Waste Management**, including detailed plans for each waste stream (including hazardous waste), towards **zero waste by 2020**.

- Demonstrate the **Sustainability Scorecard** approach to development control to encourage thermal efficiency, solar orientation, accessible design, affordable housing and other sustainable building practices in new and renovated homes.

Support communities to fully participate in achieving a sustainable future

- Involve the community in developing 'place management' approaches through an **integrated community services framework** to help prioritise and co-locate services.

- Create an **Education for Sustainability Competition** based on student projects and school plans demonstrating sustainability.

- Hold an annual sustainability ethics seminar **'Many Cultures – One Earth'** and an annual **Sustainable Living Festival**.

- Promote Aboriginal naming of regions, towns, suburbs and landscape features, to assist in the development of 'sense of place' in Western Australia.

- Use *Consulting Citizens: A Resource Guide* and *Consulting Citizens: Planning for Success* to promote effective public consultation and active citizenship.

- Strengthen communities in their 'sense of place' through a neighbourhood renewal initiative, an Early Intervention Strategy, projects in sport, recreation, culture and the arts, and Regional Sustainability Strategies.

Assist business to benefit from and contribute to sustainability

- Establish training schemes to provide capacity in new areas of professional activity for sustainability through initiatives such as a TAFE centre of specialisation in **applied sustainability**.

- Implement strategies that support the use of **local employment in mining ventures**.

- Review taxation, subsidies and financial incentives to promote sustainability and support **Sustainability Investment Tours**.

- Create **industry sustainability covenants** that recognise and help to market sustainability innovation and leadership, particularly in regions as part of Regional Sustainability Strategies.

- Develop through **industry partnerships** new approaches to sustainable building, eco-efficiency (the factor 4 agenda), sustainability assessment, mining and petroleum production sustainability, corporate social responsibility and the new sustainability research and development agenda.

- Continue to document and celebrate the best examples of **industry innovation** in sustainability.

Source: Midwest Development Commission

Acknowledgements

Contents

CD-ROM and Poster
A CD-ROM with an electronic copy of the Strategy and background material is in the pocket on the inside back cover, as well as a poster on the Sustainability Framework and Sustainability Actions.

Introduction

Background

Sustainability is meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity.

This aspiration enables processes to be developed that provide mutually reinforcing and beneficial outcomes for the economy, the community and the environment.

Sustainability is a relatively new concept but one that has been widely accepted as a powerful way for the world, nations, states, businesses and communities to envision their future and to move forward. The concept challenges us to do things differently, and to look for opportunities to improve our environment, society and economy at the same time, rather than accepting trade-offs between them without question.

The Western Australian Government has embraced sustainability. Premier Gallop said in addressing the Western Australian Leaders Conference, '...sustainability–in thought and deed–is the key to ensuring we can improve ourselves and our world. It is an ideal and it does create a challenge but it is the external challenge of making our world better for all and not just a few.'[1] Box 1 provides an overview of the Government's commitment to sustainability from the 2001 Environment Policy.

BOX 1   AN OVERVIEW OF THE WESTERN AUSTRALIAN GOVERNMENT'S ELECTION COMMITMENTS TO SUSTAINABILITY

Establish an ESD[2] Unit to:

- develop a strategy for sustainability
- monitor and coordinate the environmental, social and economic assessments of government agencies
- undertake ESD assessment of Cabinet submissions, proposed legislation, and agreements
- work with agencies to prepare a code of conduct for policy-making and management arrangements
- introduce annual environmental performance reporting requirements for all government agencies in areas such as energy consumption, waste disposal, vehicle fuel efficiency and recycling, and
- prepare and monitor quality of life indicators.

Encourage all government agencies to buy recycled products where these are available at competitive prices.

Set an example by requiring government departments and agencies to set targets for waste reduction and recycling. These will be audited according to the principles of ESD and included in all Annual Reports.

Source: Environment Policy

Achieving sustainability is a long-term agenda that requires rethinking the way we live, use resources, govern and do business. In recognition of these fundamental shifts and the need for a strategic approach, the government established the Sustainability Policy Unit in the Department of the Premier and Cabinet in July 2001. In November 2001 the Premier announced that a State Sustainability Strategy would be developed to pursue new forms of development that do not compromise the health of our environment or society. A consultation document was issued in December 2001 and 200 written submissions were received. The draft State Sustainability Strategy was released for comment in September 2002 and 171 submissions were received.

[1] Gallop, G (Premier of Western Australia) 2002, *Advancing Western Australia's Leaders Conference*, speech, 25 February, Department of the Premier and Cabinet, viewed 31 July 2002, <http://www.premier.wa.gov.au/Speeches/A01/advancing_leaders_conference_250202.pdf>

[2] In Australia, the term Ecologically Sustainable Development (ESD) emerged from the development of the 1992 *National Strategy for Ecologically Sustainable Development*. Since that time a preference has emerged among business and community leaders worldwide and in Australia for the term 'sustainability' as this term is perceived to be more inclusive. The Western Australian Government has since adopted the term 'sustainability'.

> PURPOSE OF THE STATE SUSTAINABILITY STRATEGY

In the State Sustainability Strategy, the Western Australian Government has addressed sustainability comprehensively for the first time. While there have been elements of sustainability within government policy in the past, the Strategy is the first attempt in this State to meet the needs of current and future generations through integrating environmental protection, social advancement and economic prosperity.

The purpose of the State Sustainability Strategy is to illustrate how the State government will respond to the sustainability agenda by adopting the sustainability framework and highlighting actions across government that give meaning to the framework. By focusing the Strategy on agency activity, the State government is demonstrating its important leadership role in supporting the transition to a sustainable future.

> HOW COMMUNITY AND INDUSTRY SHOULD APPROACH THE STRATEGY

The core of the State Sustainability Strategy is the sustainability framework that is outlined at the front of the document. This framework describes what sustainability means. These seventeen pages about the concept and framework are relevant to all Western Australians. The rest of the document describes what government agencies will do to give substance to the framework. The majority of the document is therefore government-oriented, though various sections and actions are relevant to individuals, community and industry.

There is already significant individual, community, local government and industry innovation occurring that is consistent with the sustainability framework. The main task for the community and industry with regard to the State Sustainability Strategy is to examine the seventeen-page section that defines sustainability and its principles and see what this means for them. All stakeholders are encouraged to further engage with the sustainability framework, to undertake their own activities in support of sustainability, and to be involved with the implementation and ongoing development of the Strategy.

The government supports the development of consultative partnership approaches with local government, industry and non-government organisations, particularly for those actions where the participation of these stakeholders is essential for the actions to be effective. The Strategy therefore establishes mechanisms to support the active participation of stakeholders in developing and progressing partnership initiatives for sustainability.

Over time, many other actions and partnerships will emerge that create further opportunities to address sustainability. Therefore, the State Sustainability Strategy must be viewed as a work in progress and as part of the journey to sustainability, not the destination.

> PROCESS TO DEVELOP THE STRATEGY

The State Sustainability Strategy was developed in consultation with a range of stakeholders. Developing the Strategy involved some innovative activities that are outlined below. All of the information contributed to the thinking behind the Strategy, and most written materials, are available on the sustainability web site <http://www.sustainability. dpc.wa.gov.au> and on the CD-ROM at the back of this document.

Sustainability seminars and workshops

As part of a seminar series entitled Opportunities for Sustainability in Western Australia, visiting experts presented fifteen seminars on a range of sustainability issues at the Alexander Library Theatrette, leading up to the writing of the draft strategy. The goal was to try and determine the key global approaches to sustainability and what could be applied in Western Australia. Following the release of the draft State Sustainability Strategy, six workshops / seminars were held in Perth to present the Strategy and receive feedback on the major sections. A regional seminar series was also undertaken and twenty-two seminars were held in regional areas. The Sustainability Policy Unit has been invited to speak on the draft Strategy at over 150 events including conferences and seminars since its release.

Case studies and background papers

The sustainability agenda is new and complex and the preparation of the Strategy provided an opportunity to utilise the research capacity of universities. A university partnership was established which led to students researching and preparing case studies and background papers. The Institute for Sustainability and Technology Policy at Murdoch University provided the most input. The Institute's staff and students have been researching sustainability for over a decade.

Sustainability is best understood by seeing its application by industry, the community and government agencies. Universities were invited to engage undergraduate students in preparing Sustainability Case Studies as part of their course work. The students and several others prepared forty-four case studies. A separate CD-ROM of the Sustainability Case Studies is also available from the Institute for Sustainability and Technology Policy, Murdoch University <http://wwwistp.murdoch.edu.au>.

The Sustainability Policy Unit identified a number of priority issues that required research to understand how they were being addressed within Australia and overseas, and what this could mean for Western Australia. Postgraduate research students and academics prepared background papers (see CD-ROM) by reviewing the relevant literature and meeting with key experts in Western Australia. In most cases this work will contribute to Honours, Masters and PhD theses.

In addition, community leaders, ethicists and religious leaders were invited to prepare papers on the ethics of sustainability.

Written submissions and peer review

Written submissions on the discussion paper were invited from the end of December 2001 to the end of April 2002. Written submissions on the draft Strategy were invited from September 2002 to February 2003. One hundred and seventy-one submissions were made on the draft State Sustainability Strategy. A group of sustainability experts were also sent the draft State Sustainability Strategy for their 'peer review' comments.

Government agencies have provided detailed submissions on how the State Sustainability Strategy can be implemented and have integrated their programs and activities into the Strategy. All submissions in response to the discussion paper and the draft State Sustainability Strategy, including the peer review comments, are available on the CD-ROM and on the sustainability web site. A response from the Sustainability Policy Unit to the submissions on the draft Strategy is also available in tabular form based on a summary of each point made in each submission. Table 1 below summarises the comments from submissions made on each section of the draft Strategy.

Table 1 Numerical breakdown of responses to draft strategy sections

Section from draft strategy	No. of responses
Foreword	78
1. Introduction	**Total=27**
- Background	16
- Process to develop the draft Strategy	3
- Process to finalise and implement the SSS	8
2. Conceptual basis	**Total=58**
- Evolution of sustainability	2
- What sustainability means	17
- Character of the Strategy	3
- A sustainability framework	28
- Indicators for sustainability	8
3. Sustainability and governance	**Total=434**
- Introduction	7
- Sustainability assessment	93
- Institutional change	35
- Embracing sustainability in government agencies	39
- Partnerships for action	49
- Planning for sustainability	64
- Sustainability in the regions	47
- Indigenous communities and sustainability	50
- Research and development for sustainability	26
- Sustainability information online	16
- Recognising sustainability excellence	8
4. Contributing to global sustainability	**Total=189**
- Introduction	5
- Population, development aid and environmental technology	32
- Maintaining our biodiversity	58
- Responding to greenhouse and climate change	68
- Oil vulnerability, the gas transition and the hydrogen economy	26
5. Sustainable use of natural resources	**Total=235**
- Introduction	22
- Sustainable agriculture	57
- Sustainable fisheries and aquaculture	25
- Sustainable forestry and plantations	10
- Sustainable mining and petroleum production	31
- Sustainable tourism	21
- Protecting aquatic systems	32
- Sustainable coastal and marine environments	21
- Sustainable rangelands management	16
6. Sustainability and settlements	**Total=502**
- Introduction	12
- Managing urban and regional growth	82
- Revitalising declining centres and suburbs	34
- Integrating land use and balanced transport	72
- Managing freight and regional transport	20
- Preserving air quality	19
- Reducing and managing waste	84
- Our water future	47
- Sustainable energy	67
- Preserving cultural heritage and landscapes and creating 'sense of place'	31
- Building sustainably	34
7. Sustainability and community	**Total=127**
- Introduction	11
- Community services and development	20
- Housing and sustainability	22
- Sustaining healthy communities	18
- Education and community awareness for sustainability	28
- Culture and the arts	20
- Multiculturalism	8
8. Sustainability and business	**Total=104**
- Introduction	12
- Training and facilitation for sustainability	31
- Financial reform and economic instruments	26
- Eco-efficiency and industrial ecology	21
- Industry sustainability covenants	14
9. Implementation	**Total=82**

Sustainability WA exhibit

The WA Museum and the Sustainability Policy Unit jointly mounted an exhibit called Sustainability WA as part of the MuseumLink program. The exhibit described the stories of 18 Western Australians who have contributed to sustainability and traveled to 26 regional centres and throughout the metropolitan area. It is estimated that some 90,000 people had an opportunity to see the exhibit. A free-of-charge postcard was provided so anyone could contribute their ideas and 193 postcards were received. The exhibit is on the WA Museum's web sit <http://203.30.234.169/wam/exhibitions/online/sustainability/index.html> and on the CD-ROM.

Source: WA Museum

WA Collaboration

The WA Collaboration, a partnership of peak civil society groups including the Aboriginal and Torres Strait Islander Commission, Council of Churches of WA, Ethnic Communities Council of WA, Environmental Alliance, Unions WA, WA Council of Social Services and the WA Sustainable Industry Group was funded by Lotterywest to work with non-government organisations on the sustainability agenda and feed into the development of the State Sustainability Strategy. The WA Collaboration has developed a Community Sustainability Agenda (www.wacollaboration.org.au) after conducting regional workshops and a 'Sustainability Summit'.

Partnership processes

A number of partnership processes have been established to work through proposals and assist with developing the Strategy. The most significant was the State-Local Government Sustainability Roundtable, which explored opportunities for the State and local governments to work together to progress sustainability. This process was facilitated through seven workshops. A partnership approach with local government is integral to the implementation of the State Sustainability Strategy.

A university partnerships process was established to help provide background material for the project (see photo below).

A further partnership was established with universities, CSIRO and TAFE called the Global Centre for Sustainability. This Global Centre for Sustainability has contributed to the development of a methodology for how Regional Sustainability Strategies can be developed.

Working Groups were also established on a partnership basis and in particular the Working Group on Sustainabilty Assessment provided assistance with how to proceed on this. A report summarising the output from the working group is available on the sustainability web site.

Research students who did background papers for the State Sustainability Strategy prepare to go to a Youth Affairs Conference where they ran a workshop on sustainability in May 2002.

Source: Murdoch University

> ABOUT THIS DOCUMENT

The State Sustainability Strategy is designed to provide background to the concept of sustainability as well as establish illustrative actions for sustainability in Western Australia.

The various major parts of the document are shown in the 'roadmap' diagram below.

The conceptual basis and sustainability framework

The next part of the document describes the concept of sustainability and how the Strategy gives this meaning in a Western Australian context through the sustainability framework. The sustainability framework consists of eleven principles, six visions for Western Australia and six government goals for sustainability action.

This part is in a different colour to demonstrate that the sustainability framework is the basis and core of the whole Strategy. These seventeen pages effectively outline what sustainability means. The remainder of the document describes what government agencies will do to give substance to the framework in their areas of responsibility.

All stakeholders are encouraged to engage with the sustainability framework to understand what it could mean for them. There is already significant individual, community, local government and industry innovation that is consistent with the framework and examples are summarised in boxes throughout the Strategy and through Sustainability Case Studies on the sustainability web site.

Priority areas

The majority of the Strategy document outlines the forty-two priority areas for government action in six sections:

1. Sustainability and governance

2. Contributing to global sustainability

3. Sustainable natural resource management

4. Sustainability and settlements

5. Sustainability and community, and

6. Sustainability and business.

For each priority area opportunities to progress sustainability are identified and illustrative government actions, to be implemented over the next five to ten years, are described. Where relevant, references to further information, including background papers and case studies, are provided at the end of each priority area.

Implementation and action plan

The final section summarises the main mechanisms proposed in the Strategy and outlines the process of implementation. A list of all the actions and the responsible agencies is also provided: this is the Action Plan for the State Sustainability Strategy. The Action Plan is a statement of intent from government agencies indicating how they will contribute to addressing sustainability. However, many other actions will emerge over time as government, industry and the community find new ways to extend this agenda.

CD-ROM

The Sustainability Policy Unit utilised public submissions and research undertaken by university students, academics and government agencies to prepare the Strategy. All of this information is available on the CD-ROM enclosed at the back of this document and from the sustainability web site.

Poster

A poster outlining the Sustainability Framework and a summary of the key Sustainability Actions, is inserted in the inside back cover of this document.

ROADMAP TO STATE SUSTAINABILITY STRATEGY DOCUMENT

| Conceptual Basis and Sustainability Framework | Sets out the meaning of sustainability for Western Australia (pages 19–35) |

Sustainability and governance

Contributing to global sustainability

Sustainable natural resource management

Sustainability and settlements

Sustainability and community

Sustainability and business

Government agency responses to the Sustainability Framework (pages 36–280)

| Implementation and Action Plan | Summarises actions and responsible agencies (pages 281–303) |

The conceptual basis: developing a framework for sustainability

> EVOLUTION OF SUSTAINABILITY

In 1987 the Prime Minister of Norway, Gro Harlem Brundtland, launched the book Our Common Future that effectively began the era of sustainability. Prime Minister Brundtland chaired the United Nations World Commission on Environment and Development (the Brundtland Commission) which had worked for two years to try and resolve a major problem in global politics: the apparent conflict between the environment and development.

Sustainability as a proposed solution was necessarily an attack on conventional thinking and practice, though not in all interpretations a radical attack. It recognised that it would eventually be suicidal to allow a further undermining of ecological life support systems, locally and globally. But at the same time it demanded development - not just to eliminate destitution and ensure material security but also to allow individuals and communities more choices and more power to exert greater control over the factors affecting their lives. Together these demanded development with sustainability - development pursued in ways that would protect resources and ecological integrity over the long term while greatly improving human well-being, especially among the poor.

RB Gibson[3]

Ecologists around the world had been warning from the 1960s that the earth had reached certain limits:

- human-induced climate change seemed certain as the atmosphere had increased its CO_2 concentration by 28% and certain new chemicals (CFCs) were threatening the ozone layer

- deforestation and land degradation from over-grazing and over-cropping were spreading rapidly

- fresh water supplies and groundwater were being depleted and polluted

- human beings across the globe had toxic chemicals in their tissues

- the continued loss of species and threats to important ecosystems was everywhere apparent.

Scientific evidence on the problems was mounting and scientists began to speak out. Ecologists warned that population growth must stop, the consumption of resources must be reduced and further economic growth must be prevented as it was driving problems like those listed above. At the same time those in developing countries and parts of the developed world, faced with continued poverty and deprivation, did not share the ecologists' viewpoint. For them development was essential: they needed food, clean water and shelter. The one billion people living in poverty had a strong case for economic development.

The Brundtland Commission concluded that there ought to be development but it must now be different: it must be *sustainable* development. Development needed to be more directed to meeting the needs of the poor in a way that no longer caused environmental problems but helped to solve them. In other words development must meet the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. This would not happen quickly as the world's economy was built around short-term gains that did not take into account these long-term issues (see Box 2).

BOX 2   THE GLOBAL NEED FOR SUSTAINABLE DEVELOPMENT: TIME TO RE-EXAMINE THE FUTURE

Emeritus Professor Ian Lowe prepared a paper for the Environmental Protection Authority, entitled Towards Sustainability. A section in the position paper highlights global environmental issues including:

- Nearly 50 per cent of the earth's land surface has been transformed for human activity.

- More than half of the earth's accessible fresh water is now used directly or indirectly.

- More nitrogen is now fixed synthetically than naturally.

- More than half of all mangroves and coastal wetlands have been lost.

- Two-thirds of fisheries have been depleted or at their exploitable limits.

- Arctic sea ice area is now 70 per cent of the 1870 figure and shrinking rapidly.

- Terrestrial glaciers and permanent snow cover are in retreat around the world.

- In the second half of the twentieth century the human population doubled, grain production trebled, energy use quadrupled and economic activity quintupled. So on average, we became much richer and better fed, as well as doubling our energy use.

- The human population is expected to continue growing to about 1.5 times the present level (about 9 billion before stabilizing) while the average consumption of resources is also increasing. So the total demand for resources is likely to double in the next fifty years.

- Forest cover is still being lost at a rate of 10 million hectares per year.

Environmental Protection Authority (2003). Towards Sustainability, Preliminary Position Statement No. 6, Environmental Protection Authority, Perth.

The United Nations began a long-term project to make the global economy more sustainable. The United Nations Conference on Environment and Development was held in 1992 in Rio de Janeiro, Brazil, to coincide with the 20th anniversary of the first international Conference on the Human Environment in Stockholm. A detailed program of action for the 21st century, *Agenda 21*, was agreed at the Rio Conference. Negotiations on an international agreement on climate change commenced at this conference (which led to the Kyoto Convention) and agreements on forestry and biodiversity were initiated.

Australia responded to the global call for sustainability by developing the *National Strategy for Ecologically Sustainable Development* (ESD) between 1989 and 1991 (see Box 3 for a summary of the goals, objectives and guiding principles). Twelve working groups examined every aspect of the Australian economy in terms of the new ESD principles. Little immediate action was taken on these reports, though the ideas developed began to spread as State and local government started to take the concept seriously. The 1996 and 2001 Australian State of the Environment Reports also contain many ideas on how sustainability can be addressed in Australia.

[3] R B Gibson, Specification of sustainability-based environmental assessment decision criteria and implications for determining 'significance' in environmental assessment, 2001, p. 9, viewed 5 August 2002, <http://www.sustreport.org/downloads/sustainabilityEA.doc>

BOX 3   GOAL, OBJECTIVES AND GUIDING PRINCIPLES OF THE NATIONAL STRATEGY FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The Goal is:
Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The Core Objectives are:
- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations
- to protect biological diversity and maintain essential ecological processes and life-support systems.

The Guiding Principles are:
- decision-making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations
- where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the global dimension of environmental impacts of actions and policies should be recognised and considered
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised
- cost-effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms
- decisions and actions should provide for broad community involvement on issues which affect them.

These guiding principles and core objectives need to be considered as a package. No objective or principle should predominate over the others. A balanced approach is required that takes into account all these objectives and principles to pursue the goal of ESD.

In addition, all Australian Governments agreed in 1992 to the Intergovernmental Agreement on the Environment to provide for a cooperative national approach to the environment, definition of roles and responsibilities, reduction in disputes, greater certainty of business and decision-making and better environmental protection. Box 4 describes the principles of environmental policy that were recorded in the agreement. The principles contained in this Strategy build on these and incorporate more social and economic considerations.

Western Australian coastal issues have become a touchstone for what sustainability means in planning (see Sustainable coastal and marine environments*).*

Source: Department of Conservation and Land Management

BOX 4   PRINCIPLES TO INFORM POLICY-MAKING AND PROGRAM IMPLEMENTATION WITHIN THE INTERGOVERNMENTAL AGREEMENT ON THE ENVIRONMENT

Precautionary principle
Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

(i)   careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii)   an assessment of the risk-weighted consequences of various options.

Intergenerational equity
The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

Conservation of biological diversity and ecological integrity
Conservation of biological diversity and ecological integrity should be a fundamental consideration.

Improved valuation, pricing and incentive mechanisms
Environmental factors should be included in the valuation of assets and services.

Polluter pays i.e. those who generate pollution and waste should bear the cost of containment, avoidance, or abatement.

The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.

Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.

The global sustainability process continues to evolve and expand. The World Summit on Sustainable Development convened from 26 August to 4 September 2002 in Johannesburg. At this time the nations of the world reported on progress towards sustainability. At the same time hundreds of non-government organisations and business groups shared information and assessed progress. For example, the World Business Council on Sustainable Development and the Global Mining Initiative reported on how companies are responding to sustainability. Thousands of local governments reported on how they have implemented Local Agenda 21 and the Cities for Climate Protection Program. Regional governments or states committed to sustainability formed the Network of Regional Government for Sustainable Development and twenty-one member governments, including Western Australia, signed the Gauteng Declaration. This confirmed these governments' intention to apply sustainability to their whole sphere of influence.

Western Australian Governments have considered sustainability over the past decade but the Labor Government was elected with a strong set of commitments to produce a sustainability strategy across the whole of government. Box 5 demonstrates why Western Australia must pursue a sustainable future.

BOX 5   THE WESTERN AUSTRALIAN SITUATION

Examples of Western Australia's significant environmental and social issues include:

- 4.4 million hectares are affected by salinity or at risk of further salinisation and this could double over the next 50 years
- rainfall runoff in the South West of Western Australia has reduced by 50% over the past 25 years, partly due to greenhouse induced climate change
- salinity and over-grazing threaten about one quarter of endangered plant species
- South-west Western Australia ranks twelfth out of the world's twenty-five most significant biodiversity 'hotspots'
- Western Australians, consume a lot of resources especially water, land and transport energy
- health and social indicators reveal high levels of deprivation in Indigenous communities
- the population and economies of many rural communities and parts of Perth are in decline with consequent social and environmental problems

Source: Predominantly drawn from State of the Environment Report, 1998, Government of Western Australia, Perth.

> **WHAT SUSTAINABILITY MEANS**

In this Strategy, sustainability is defined as *meeting the needs of current and future generations through an integration of environmental protection, social advancement, and economic prosperity.*[4]

This definition reflects an aspiration and a process to achieve real outcomes. The definition of sustainability is very challenging. It demands that we act together, providing an integrated and mutually reinforcing approach to issues that in the past have been treated more in isolation. It implies that proposals need to begin by considering all three factors together and that trade-offs are minimised. While recognising that any steps forward require some trade-offs the Strategy seeks to enable firms, the community and government to find 'net benefit' in all three areas. This aspiration is the basis of innovation for sustainability as set out throughout this document. Figure 1 below shows how the three areas remain separate (and need to for many aspects of life and government) but there are important areas of overlap that need to be found and explored.

Figure 1   Integrating environmental, social and economic dimensions of sustainability

Sustainability is sometimes described as the 'triple bottom line', to reflect the importance of environmental, social and economic factors in decision-making. However, the definition proposed here goes beyond the triple bottom line through emphasising the importance of integration between these factors and achieving them synergistically. The Strategy demonstrates where this is occurring already and identifies opportunities to support the transition to a more sustainable future through strategic action in forty-two priority areas. It emphasises how synergies can be found providing mutually reinforcing solutions.

Some submissions suggested that 'sustainability' should be replaced by 'sustainable development'. Globally the word sustainability has been preferred as it emphasises the stance that is required to enable 'sustainable development'. Both terms are used in the strategy.[5]

There is considerable discussion about the meaning of sustainability, particularly in academic and professional circles. Pezzoli[6] has found ten types of definition on sustainability in four key areas of concern. For many, the difficulty in pinning down a precise meaning is reason enough for them to consider that the concept has no relevance.

Such dismissal misses the point. The concept has not come from academia or the professions, it has come from global politics as a way of asking the world to resolve a fundamental tension that has developed between environmental, social and economic improvement. The resolution of this tension is the challenge for sustainability. The UN has made 2005–2015 the Decade of Education for Sustainability, recognising the need for a long-term commitment to this concern of global politics.

[4] 'Environmental protection is taken to be minimising impacts and providing rehabilitation and renewal of damaged environments.

[5] Further discussion on this can be found in a Background Paper 'Response to Industry Submissions on Sustainability Concepts' on the sustainability web site.

[6] K Pezzoli, *Sustainable development: a transdisciplinary overview of the literature,* 1996, Paper at joint international congress of Collegiate Schools of Planning and the Association of the European Schools of Planning, Toronto, July.

The concept of sustainability is simple but implementation is difficult. New Zealand academic John Peet[7] described the problem of ascribing meaning to sustainability as similar to trying to analyse the meaning of love or hope or democracy. These words, he says, are dialectical; they become meaningful mostly when applied. Sustainability is fundamentally a 'fuzzy' concept when analysed by itself. It begins to make sense when it is applied to specific issues, such as land management, energy, settlements, projects or specific communities.

This Strategy seeks to give sustainability meaning for Western Australia: its regions, its issues, its projects and its communities. It accepts that there are tensions between economic, environmental and social goals and seeks to resolve them through finding mutual benefit. See Box 6 for an example of sustainability applied to land development.

BOX 6   SUSTAINABLE LAND DEVELOPMENT

The benefits of integrated and mutually reinforcing synergies from sustainability approaches are demonstrated through a recent study by the Department of Housing and Works on Sustainable Land Development.

LandStart (the development arm of HomesWest) was proposing to build at a site in Forrestdale. The management at LandStart decided to examine what would be different (and how much more it would cost) if the development was built using sustainability principles. The Planning Group were employed to work with a cross-agency consultative group and examined ways to integrate energy and water conservation, better site ecology, more walkability and transit-orientation, and more community-based design.

The result has been a development that will demonstrate 60% water saving and 50% energy saving, utilises Liveable Neighbourhood design principles and provides a more attractive development from community and services perspectives—and it saved $1575 per block. Net benefit can be demonstrated on all aspects of sustainability.

Similar innovations are now being attempted across a range of developments in Perth including: the South Beach EcoVillage, the Somerville EcoVillage at Chidlow, LandCorp's Harvest Lakes, the Port Coogee Project, Hillarys-Cook Avenue Project and many more. Through such demonstrations Perth is becoming a global leader in what sustainability means for land development

> **CHARACTER OF THE STRATEGY**

When the United Nations World Commission on Environment and Development defined sustainability in 1987 the world was facing a major environmental dilemma. The debate was largely about resolving how development could be environmentally responsible. Although the debate also considered how development could be socially responsible, the environment was the overwhelming focus for government and industry in the 1990s.

Many submissions acknowledged the need for more integrated approaches, suggesting that the greatest need is to find out how to integrate social needs and processes into sustainability. Major resource companies have been global leaders in seeking what sustainability means and they emphasise the importance of the social and the need for government to provide a framework for how they contribute to this.

Significant attention and progress has been made in resolving the dilemma between environmental protection and development. Techniques have been developed like environmental assessment, eco-efficiency, green procurement, zoning land for environmental purposes, renewable energy facilitation and regulation of pollution. Much less progress has been made on resolving the social aspects of development (see Box 7).

[7] J Peet, Sustainable Auckland Conference, 2001. Auckland Regional Council, Auckland, September.

BOX 7   POVERTY AND SUSTAINABILITY

Sustainability in global forums grew out of the need to overcome global poverty while maintaining or improving the global environment. The Brundtland Commission argued that poverty drives many of the problems of natural resource management such as over-cutting, over-grazing and over-fishing, with subsequent impacts on biodiversity. Consumption of fossil fuels is seen to be a problem of the wealthy world not of the poor; some increase in use of resources by people in poverty can occur while the rich reduce their consumption. Issues of environmental justice are also discussed where mostly the poor are left to live or work in unhealthy or toxic environments.

The State Sustainability Strategy highlights this issue in Principle 2 Equity and Human Rights (see Foundation Principles): 'that significant gaps in sufficiency, safety and opportunity endanger the earth.'

This principle applies to Western Australia as well as to developing nations. A range of commentators has identified the growing gap between rich and poor at both the national and state levels. The Australian Collaboration, for example, states:

'Incomes are less equally distributed, with a growth in both the high and very low ends of the income spectrum, and a hollowing out of the middle… The growing gap between rich and poor is a social trend of deep concern.'

Similarly, the WA International Year for the Eradication of Poverty (1996) Taskforce states:

'Levels of relative poverty in Australia continue to grow, with the gap between the richest and poorest increasing by over 50 percent in the last 20 years.

Poverty impacts on the capacity of people to 'achieve a basic standard of living that is acceptable to the general community and to be able to participate in the life of the community.' Poverty is also interconnected with the environmental dimension of the sustainability agenda, as Bob Brown states: '...if you don't fix the social equation and get a fair society, you won't be able to fix the environment.'

The application of this principle to poverty in Western Australia requires a range of measures, including that private development is consistent with this goal as well as Government programs and community support. How this can be done remains a significant challenge and one that requires long-term commitment and innovation.

The Western Australian Council of Social Services completed a study on the social aspects of sustainability and identified five principles: equity; diversity; interconnectedness; quality of life; democracy and governance. The links between poverty and sustainability involve these principles and others including issues of identity and 'sense of place'. These are pursued throughout the Strategy.

The State Sustainability Strategy attempts to demonstrate that it is possible to create a stronger economy and a healthier environment by more fully integrating the social dimension. It suggests that, by thinking differently and more inclusively, the 'deep clues' as to how to resolve fundamental environmental, social and economic conflicts can be discovered. The solutions are not to be found only in environmental science and engineering, but in the social sciences, humanities and business.

A number of submissions suggested the draft State Sustainability Strategy did not sufficiently emphasise the economic dimension of sustainability. There is no doubt that any approach to the future which does not address the needs of the economy will not contribute to sustainability, for example the State should avoid future debt (see Box 8) and business needs to minimise sovereign risk. If financial sustainability is not addressed then no other elements of sustainability can be considered. However sustainability is emerging in business as the best way to ensure that long-term debt and sovereign risk are minimised (see <http://www.acca.org.au>). The sustainability agenda was created to find ways of incorporating environmental and social considerations into the economic

BOX 8   AAA RATING AND SUSTAINABILITY

A core principle of sustainability is that the long-term future must be considered. Future generations need to be assured of clean air, a good water supply, access to wild areas such as forests and coasts, uncontaminated food and an ecosystem as biodiverse or better than at present in Western Australia.

Future generations also need to be assured of a strong, inclusive community that they belong to and identify as their 'place'.

However, future generations will not thank those of the early 21st century if their legacy is one of substantial financial debt. State debt needs to be managed so that current and future generations can have access to services paid for at an interest rate that is at world best practice levels. The AAA rating for the State is established as a goal for budgeting, not just for good accounting now, but for the long-term benefit of the State economy. With an AAA rating all businesses in Western Australia benefit, including all those attempting to contribute to the sustainability goals of this Strategy.

development process, recognising that they are not subservient but mutually supportive. The State Sustainability Strategy explores how these perspectives can be integrated and made to occur synergistically.

The social and economic agendas also frequently overlap, for example creating jobs in regional areas or for particular groups like Indigenous people achieves a simultaneous economic and social gain. However the achievement of social goals can never be assumed merely because economic development is possible. The WA Collaboration submission outlines how the community dimensions of sustainability can begin to be addressed.

These kinds of integration—where environmental, social and economic factors begin to mutually reinforce each other—are often found in situations where business, communities and governments form creative partnerships. Such partnerships are described by the World Business Council for Sustainable Development as 'playing jazz' (see Box 9).

BOX 9   SCENARIOS FOR THE FUTURE

The World Business Council for Sustainable Development (WBCSD) has analysed three scenarios for the future:

1.FROG – 'First Raise Our Growth'. This scenario is essentially business as usual where industry focusses on profit alone. The WBCSD suggests this cannot work and that the social and environmental problems (market failure) generated will lead to the collapse of many firms.

2.GEOPOLITY – This scenario suggests governments raise taxes and extensively intervene on a scale similar to the New Deal or postwar reconstruction. The WBCSD suggests there is little appetite for such action in the present global climate and that there would be many examples of 'government failure' due to the problems of top down solutions.

3.JAZZ – This scenario is based on partnerships, synergies and flexibility. It suggests that although a basic theme tune of sustainability can be agreed on, there will be many experiments and individual performances that can lead us through the problems we face. The WBCSD says this is our only real choice and that by 'playing jazz together' any part of the world can demonstrate what sustainability means.

Source: World Business Council for Sustainable Development 1997, Exploring sustainable development, WBCSD Global Scenarios 2000-2050 summary brochure, London.

The Case Studies in Sustainability developed as background to this Strategy bear testament to this process. The character of the State Sustainability Strategy is one of establishing processes where people can enter dialogue about issues to enable creativity and partnerships to flourish.

> OPPORTUNITIES FOR SUSTAINABILITY

The approach adopted within the State Sustainability Strategy recognises that while there are many economic opportunities, not all of these are socially and environmentally responsible.

Australia has developed in the context of centuries of debate and criticism about the way in which development has occurred. These include economic opportunities based on slavery, child labour, excessive working hours and dangerous work practices. Australia and the world are now incorporating the ideas of sustainability into decision-making. This means that certain economic opportunities are no longer pursued. The end of logging in Western Australia's old-growth forests is one example of where this has occurred in recent times. The growing community concern to protect coastal areas, such as Ningaloo, from unsustainable development is another. Sustainability is not about halting progress but it does demand that we take a deep breath and think again about particular issues.

The pursuit of sustainability provides many new economic opportunities. Firms that engage in the 'jazz' scenario are likely to gain considerably as demonstrated by the Dow Jones Sustainability Index, which shows that firms committed to sustainability consistently outperform all others.

The fastest growing sector of the global economy is the development of environmental technology, estimated conservatively to be worth $1 trillion annually.[8] United Kingdom Prime Minister Tony Blair calls this the 'sustainability revolution'.

[8]Leaders Group, Investing in sustainability, Department of Industry, Science and Resources and Environment Australia, canberra, 2001.

The State Sustainability Strategy assists Western Australia to become part of this global revolution and every issue considered in this Strategy has a section that considers opportunities in Western Australia for global sustainability.

Ethics and sustainability

There is a growing awareness that sustainability is an ethical issue—something that underlies all business, all professional thinking and how we live our daily lives. A set of background papers considering ethics and sustainability was collected from a diverse range of ethicists, philosophers, creeds and religions (see the CD-ROM).

Several common threads unite them and each provides a sense of hope that sustainability is worth pursuing. They show that human beings can be better stewards of the natural world and society, perhaps more so than they have over the past few centuries. The sustainability principles used in this document resonate with the approaches suggested in the background papers.

Partnership between government, industry and community

Sustainability cannot be achieved without partnerships (as set out in the 'jazz' scenario of Box 9). In this Strategy the major focus is on what government (State and to some extent local government) can do. However it also relies on and tries to help industry and community meet their sustainability responsibilities (see Box 10).

BOX 10   ROLES AND RESPONSIBILITIES FOR SUSTAINABILITY

Sector	Roles and Responsibilities
Government	1. Demonstrate leadership through decision-making and good governance 2. Develop policy frameworks 3. Develop plans with the community and business 4. Provide for (independent) performance evaluation and public reporting 5. Provide incentives for sustainable practice 6. Forge partnerships; take and respond to initiatives 7. Promote examples of sustainability in practice 8. Undertake institutional reform, including appropriate revisions to legislation and regulatory practices following full community debate 9. Support capacity building within and outside government 10. Implement procurement policies in support of sustainability 11. Embrace and pursue triple bottom line public reporting (noting that this in itself is not necessarily a measure of sustainability)
Business	12. Pursue the objectives of sustainable industry practice 13. Peak industry groups to pursue a leadership role in their business sector 14. Consider socially responsible investment 15. Implement green offsets for sustainable development 16. Commit to sustainability as a proper part of doing business 17. Set out how to relate industries to their place and their communities of interest
Community	18. Recognise and act on the need for behavioural change by all members of society as the key to long-term success. Sustainability ultimately is about the aggregated influence and outcomes from millions of everyday decisions by everyday people in everyday lives 19. Pursue opportunities to play a role in community leadership to achieve sustainability 20. Contribute to and respond to good practice guidance 21. Consider 'ethical investments' 22. Look for opportunities in volunteer, sustainability-based community activities 23. Provide ethical perspectives on sustainability 24. Participate in building up community in a place and in relation to a place

How can the Western Australian Government approach sustainability? The first step has been to create a framework for thinking and decision-making.

The concept of sustainability is simple but it is difficult to implement because of our tendency to work in isolation. Most professions, corporations, institutions and government practices around the world have been built around the separation of the environmental, social and economic dimensions, with economic factors being the dominant consideration. Sustainability is challenging everyone to find a new way of approaching the future. Western Australia is joining this process. It can only do this if there is a re-evaluation of the principles, visions and goals that guide how we operate.

The Strategy proposes a set of sustainability principles that guide how government, industry and communities think about and approach the management of resources. These principles are aimed at facilitating change that has net social, environmental and economic benefit for current and future generations. Sustainability principles will underpin the State Strategic Planning Framework for the public sector and other government policies such as the Regional Policy Statement.

The sustainability framework consists of:

- seven foundation principles and four process principles that reflect the core values of sustainability
- six visions for Western Australia's sustainability
- six goals for government and forty-two priority areas for action.

The framework is described graphically through the pullout poster at the back of this document and the linkages between the three areas of the framework are illustrated in Figure 2.

Figure 2 The Sustainability Framework

SUSTAINABILITY PRINCIPLES → SUSTAINABILITY VISIONS → SUSTAINABILITY GOALS AND PRIORITY AREAS

Sustainability principles

Sustainability principles have often been developed through global agreements and have begun to be placed in legislation over the past decade in Australia and overseas, but the social and economic aspects of sustainability have rarely been included. The State Sustainability Strategy deliberately attempts to change this.

The first seven principles in the Strategy are foundation principles that establish the basis of sustainability through long-term economic health (see Box 11), equity, ecological integrity, efficiency (see Box 12), community, net benefit and common good. The last four principles are process principles that stress the need for integration, transparency and engagement, precaution and hope through gradual change towards a broad vision.

FOUNDATION PRINCIPLES

Long-term economic health

Sustainability recognises the needs of current and future generations for long-term economic health, innovation, diversity and productivity of the earth.

Equity and human rights

Sustainability recognises that an environment needs to be created where all people can express their full potential and lead productive lives and that significant gaps in sufficiency, safety and opportunity endanger the earth.

Biodiversity and ecological integrity

Sustainability recognises that all life has intrinsic value and is interconnected, and that biodiversity and ecological integrity are part of the irreplaceable life support systems upon which the earth depends.

Settlement efficiency and quality of life

Sustainability recognises that settlements need to reduce their ecological footprint (i.e. less material and energy demands and reduction in waste), while they simultaneously improve their quality of life (health, housing, employment, community...)

Community, regions, 'sense of place' and heritage

Sustainability recognises the significance and diversity of community and regions for the management of the earth, and the critical importance of 'sense of place' and heritage (buildings, townscapes, landscapes and culture) in any plans for the future.

Net benefit from development

Sustainability means that all development, and particularly development involving extraction of non-renewable resources, should strive to provide net environmental, social and economic benefit for future generations.

Common good from planning

Sustainability recognises that planning for the common good requires equitable distribution of public resources (like air, water and open space) so that ecosystem functions are maintained and a shared resource is available to all.

PROCESS PRINCIPLES

Integration of the triple bottom line

Sustainability requires that economic, social and environmental factors be integrated by simultaneous application of these principles, seeking mutually supportive benefits with minimal trade-offs.

Accountability, transparency and engagement

Sustainability recognises that people should have access to information on sustainability issues, that institutions should have triple bottom line accountability, that regular sustainability audits of programs and policies should be conducted, and that public engagement lies at the heart of all sustainability principles.

Precaution

Sustainability requires caution, avoiding poorly understood risks of serious or irreversible damage to environmental, economic or social capital, designing for surprise and managing for adaptation.

Hope, vision, symbolic and iterative change

Sustainability recognises that applying these principles as part of a broad strategic vision for the earth can generate hope in the future, and thus it will involve symbolic change that is part of many successive steps over generations.

BOX 11   BALLIOL AND ARALUEN: LONG-TERM THINKING

Horticulturalist, ABC TV weather presenter and Araluen Foundation President John Colwill tells a story about sustainability thinking in action and the importance of long-term thinking.

Balliol College at Oxford University discovered that beetles were eating the oak superstructure of its dining hall. The great beams of oak were 500 years old and the engineers suggested that they should be replaced but oak trees of sufficient size were no longer available. It appeared that the engineers would have to come up with an alternative. Fortunately the master of Balliol mentioned the problem to the head gardener who responded, 'We was wondering when you was going to ask sir. 500 year ago we planted a forest just for this purpose. It's ready now.' So, thanks to considerable foresight, Balliol College was able to replace its beautiful oak structure. The Araluen Botanic Park Foundation recently refurbished the park's massive memorial pergola with old growth jarrah and realised that such timber is unlikely to be available in the future. Taking a leaf from the Oxford gardeners they have set aside some land and planted it with jarrah. The trees are protected by a covenant that dedicates them for use in the Park's maintenance programs over the next 50 to 100 years.

Source: John Colwill

BOX 12   RESOURCE USE AND SUSTAINABILITY

One of the key characteristics of sustainability is the decoupling of resource use and wealth, that is, it is now possible to increase wealth while decreasing resource use. For most of the past two hundred years it has been assumed that as wealth increases then so will the consumption of resources such as energy, minerals, water and land.

Although the benefits of decoupling this relationship can be easily seen at the individual level of a firm or a household, where using fewer resources costs less, the situation is less obvious at a societal level. Sustainability has helped to show that this link can and should be uncoupled after a certain minimum level of material prosperity is achieved. The process has been clearly demonstrated with electricity consumption in the past few decades where in many developed countries per capita wealth has grown but electricity cost per capita has declined. This has corresponded with the change to the knowledge economy.

In Australia, a similar situation applies with water use. In the past 10 to 15 years most Australian cities have reduced per capita water consumption, except Perth where this occurred in the previous decade. The consumption of water demonstrates that demand management has reduced the use of water at the same time as our economic health has improved.

In cities, land consumption per capita used to parallel wealth per capita, that is, wealthier people chose bigger blocks and lived further and further out of the city. This has reversed in the past decade with increased demand for smaller blocks closer to the city. This has resulted in reduced transport energy, not only due to the shorter distances travelled, but from improved public transport and easier walking and cycling[9]. The equity aspects of these trends are considered under *Sustainability and settlements*.

Extraction of minerals continues to increase as the world grows in population and wealth. However, there is the potential for this to slow as patterns of consumption begin to reflect the cleverer use of resources, more recycling, a reduced priority on consumption, and slowing growth in population (as discussed in *Population, development aid and environmental technology*).

In general terms, the same could also apply to agriculture. The viability of Western Australian agriculture has been under consideration for some time as terms of trade for agriculture have been declining for decades.

The trend towards decoupling resource use and consumption raises two important policy considerations:

• the need to diversify the economy and embrace the knowledge economy more fully and directly and

• the need to constantly demonstrate the sustainability of our primary production.

Both are pursued in the State Sustainability Strategy.

Around the world increasingly knowledgeable purchasers tuned into sustainability will look for products that are 'clean and green' and add social criteria to their consumption choices. As has occurred with forest products, people will increasingly choose not to buy products that they perceive are produced unsustainably. Western Australian companies have an opportunity to win markets in the future not just through competitive pricing but also through demonstrating sustainable quality production.

[9]P Newman and J Kenworthy, Sustainability and Cities, 1999, Island Press, Washington.

Sustainability visions for Western Australia

These eleven principles can be applied to any sustainability issue whether it is to do with a firm, an institution or a State like Western Australia. The State Sustainability Strategy also defines a set of visions for governance, global contributions, natural resources, settlements, community and business so that the sustainability principles begin to become more practical.

VISIONS

Governance

Western Australia's system of governance is world famous for responding to sustainability issues, implementing effective and financially responsible programs, supporting transparent and inclusive processes and reflecting the State's globally significant responsibilities towards the land and its people.

Global contributions

Western Australia contributes to the solution of global sustainability issues particularly population pressures and poverty, climate change, threats to biodiversity, and oil vulnerability and in so doing creates significant local opportunities for new jobs in the rapidly growing sustainability economy.

Natural resources

Western Australia's vast landscape and seascape, intricate web of biodiversity and other natural resources are conserved, managed and used sustainably for the common good, and the community is involved in management and planning processes that are transparent and visionary.

Settlements

Western Australia's settlements are among the most attractive places to live in the world, constantly becoming more innovative and efficient in their use of resources and management and use of wastes while simultaneously being more liveable and equitable.

Community

Western Australian communities in cities and in regions have a strong sense of place and supportive networks receptive to the diversity of local needs, and through this can respond uniquely to the sustainability agenda.

Business

Western Australian businesses, large and small, are globally innovative and receptive, leading to the resolution of sustainability issues at home and abroad and achieving competitive advantage and prosperity.

Once the visions are in place it is necessary to see what they can mean in terms of goals and priorities for the government. What should be the goals to deliver these visions and what are the priority areas for government action?

Sustainability goals and priority issues for government

The State Sustainability Strategy has six goals which together guide government action towards achieving the visions for a sustainable Western Australia. The priority areas for sustainability in Western Australia are listed under each goal. Each of the goals corresponds to a section of the Strategy.

GOALS

Goal 1 Ensure that the way we govern is driving the transition to a sustainable future
Sustainability assessment
Institutional change
Embracing sustainability in government agencies
Partnerships for action
Planning for sustainability
Sustainability in the regions
Indigenous communities and sustainability
Research and development for sustainability
Measuring and reporting on sustainability

Goal 2 Play our part in solving the global challenges of sustainability

Population, development aid and environmental technology
Maintaining our biodiversity
Responding to greenhouse and climate change
Oil vulnerability, the gas transition and the hydrogen economy

Goal 3 Value and protect our environment and ensure the sustainable management and use of natural resources

Sustainable agriculture
Sustainable fisheries and aquaculture
Sustainable forestry and plantations
Sustainable mining and petroleum production
Sustainable tourism
Protecting drinking water and aquatic systems
Sustainable coastal and marine environments
Sustainable rangelands management

Goal 4 Plan and provide settlements that reduce the ecological footprint and enhance quality of life at the same time

Managing urban and regional growth
Revitalising declining centres and suburbs
Sustainable urban design
Integrating land use and balanced transport
Managing freight and regional transport
Preserving air quality
Reducing waste and managing it as a resource
Our water future
Sustainable energy
Conserving cultural heritage and landscapes and creating 'sense of place'
Building sustainably

Goal 5 Support communities to fully participate in achieving a sustainable future

Community services and development
Housing and sustainability
Sustaining healthy communities
Education and community awareness for sustainability
Sustainability through culture and the arts
Sustainability through multiculturalism

Goal 6 Assist business to benefit from and contribute to sustainability

Training and facilitation for sustainability
Financial reform and economic policy for sustainability
Eco-efficiency and industrial ecology
Corporate social responsibility and industry sustainability covenants

Actions and tools

On the basis of the Sustainability Framework the State Sustainability Strategy examines 42 areas of government activity and develops a set of recommendations for action within each area. These actions are illustrative of how the sustainability agenda can begin now and also how Western Australia can start the processes related to more long-term issues over the next 10 years and beyond. There will be many additional items that will emerge as agencies, industry and the community begin to adopt sustainability and practice the innovation it engenders. The sustainability agenda is growing rapidly in its conceptual understanding, its institutional expressions and its tools (see Box 13).

BOX 13   TOOLS FOR SUSTAINABILITY

Increasing effort is being directed to developing a set of practices or techniques for sustainability. A number of the techniques relevant to Western Australia and currently in use by national, State and local governments and progressive industries and businesses are listed below. Many of these techniques are designed to aid in decision-making.

The State Sustainability Strategy advocates the demonstration of these innovative techniques through pilot projects prior to their broader application to programs, policies and legislation.

Ecological economics
Seeking economic valuation of environmental and social assets and services, the 'polluter pays' principle, the need for full life cycle costing of goods and services (including asset replacement and waste disposal) and incentive mechanisms for achieving sustainability goals.

Ecological footprint
A technique for calculating the global area of impact generated by a particular settlement based on its resource consumption.

Eco-efficiency, industrial ecology and waste minimisation
Reducing resource requirements in industrial processes, exchanging wastes for resource needs in industrial estates, minimising waste through recycling and re-use, and seeking zero waste discharge.

The Natural Step
The Natural Step provides a common framework comprising easily understood, scientifically based principles that can serve as a compass to guide society towards a just and sustainable future. The framework uses two key tools: four 'system conditions' and backcasting to assist corporations, governments, small business and local communities to chart their course towards a sustainable future.

Facilitating sustainable technology options
Facilitating renewable energy, energy efficient modes of transport, resource efficient appliances and buildings, and other sustainable technology by providing the infrastructure and increasing the ability of people to choose these options.

Multi-criteria analysis
Assessment of options by listing criteria, measuring these where possible or rating them where not, weighting the criteria through community involvement, and providing integrated options from the analysis.

Voluntary partnerships
Providing partnership agreements between all levels of government and between business, the community and government to provide voluntary commitments to mutually beneficial solutions.

Breaking down barriers
Seeking holistic solutions through breaking down the barriers between different disciplines, different professions and different government agencies

Regulation, enforcement and opportunity
Providing enforceable regulation to ensure common good outcomes in such a way that they form the basis for new economic opportunities.

Strategic and statutory plans
Providing long-term visions from transparent and fully engaging community processes to provide achievable, organic steps towards sustainability goals, with the detailed frameworks that express common good outcomes defined in statutory plans.

Sustainability checklists
Key criteria are determined on projects and examined for all options. A variant of this is the Sustainability Scorecard for development control (see *Building sustainably*)

Community development processes
Enabling community-based solutions through development approaches that recognise and value diversity and the inherent ability of local people to be creative and innovative and which assist through the removal of barriers and provision of access to information and resources.

Artistic innovation
Facilitating artistic creativity focused on the changes required in unsustainable elements of our culture, community and a greater sense of place.[10]

Scenario planning
Creating alternative future visions with linkages to the present through 'backcasting' to the first steps for change. This is an experts' process but communities can be involved in helping choose preferred end points.

Community visioning
A technique developed in Portland, Oregon, and now well established to create a preferred vision for a community or region through a values-oriented process of imagining scenarios for the future.

Value frame analysis
Analysing the different value frames used by various parties in dispute over a sustainability issue to find common ground for a solution.

Education
Providing sustainability education (formal and informal), training and accreditation of all professional activity that recognises and increases awareness of sustainability principles and how they can be applied in daily life.

Research, innovation and demonstration
Facilitating solutions to long-term issues with significant environmental, social and economic outcomes through scientific research and commercial development on sustainability issues, as well as the use of social demonstration projects to enable innovations in sustainability to be tested.

> CHANGE AND SUSTAINABILITY

The sustainability agenda has emerged from people's deep desire to preserve and protect the best in their environment (the human, built and natural environment) and at the same time a recognition of the need for change.

Change is needed to create jobs, improve public transport, support eco-housing, provide better community facilities, increase recycling, revive dying country towns and suburbs, increase supplies of renewable energy, and improve health and education…

Change is needed in the environment as well. In Western Australia the density of population is the lowest in the world, yet there are many sustainability issues. In the wilderness area of the Prince Regent River in the Kimberley, feral donkeys are threatening rare flora. Management is needed. The landscape of this vast ancient State with all its special areas, was modified by humans over thousands of years. It continues to need to be understood and managed with humility and care.

Sustainability and change are closely intertwined. Even to protect a heritage building can require finding a contemporary use that can maintain it. The dichotomy is false between keeping things as they are and changing, between stasis and growth.

Sustainability helps us to define the changes we want from development: leadership from government; the vast and largely untapped potential of business to contribute; the desire of communities to provide better places and have a strong sense of who they are and what they want to protect.

The State Sustainability Strategy is built on the premise that it is possible to have change that enables environmental protection, social advancement and economic prosperity.

Herein lies the hope for the future.

[10]C Landry, 2000, *The Creative City: A Tool Kit for Urban Innovations*, Earthscan.

1

Sustainability and governance

Vision for Western Australia

Western Australia's system of governance is world famous for responding to sustainability issues, implementing effective and financially responsible programs, supporting transparent and inclusive processes and reflecting the State's globally significant responsibilities towards the land and its people.

Goal

Ensure that the way we govern is driving the transition to a sustainable future.

Government needs to show leadership on sustainability. This is a global theme that was echoed time and again in public submissions.

Government should be giving leadership. It should be constantly raising the profile of sustainability, annunciating a vision for the future. All government departments should be taking the lead to improve their economic, social and environmental performance in a demonstrable manner i.e. Government should be actually "walking the talk" in sustainable practices, soon rather than later.

Australian Corporate Citizenship Alliance, Western Australia

Government has a leadership role to play and to ensure that mechanisms are in place for all relevant government departments to have a consistent vision, commitment and approach towards the attainment of sustainability, along with clear channels of communication. InWestern Australia, restructuring and the combining of natural resource management agencies such as the Department of Environmental Protection (DEP) and theWater and Rivers Commission (WRC) is a positive move towards integrating institutions and establishing a consistency in governance toward sustainability.

Eastern Metropolitan Regional Council

Governments can achieve a significant amount, by the example of how they operate their own organization, the policies they pursue and by the leadership they show to others...because of the importance we attach to strong and clear leadership from government, we recommend the Government uses its own Sustainability Strategy document to send the clearest possible signal about the future direction of WA.

BP Australia Ltd

Sustainability applies to all government activity and is being considered and reflected in a range of other policy initiatives. The links to these will be made throughout the Strategy.

This section proposes governance arrangements to support sustainability within the Western Australian Government and its agencies, with local government and other stakeholders, at the regional scale and in support of Indigenous sustainability. The section begins with the emerging area of sustainability assessment. It then describes how government agencies must operationalise sustainability in their planning, decision-making and day-to-day activities. It proposes institutional reform for sustainability, and discusses the importance of research and development for sustainability and of measuring and reporting on sustainability.

Local government has a critical role in planning and decision-making for sustainability and many sustainability issues are best addressed at this level. A State-Local Government Sustainability Roundtable was established at the release of the draft State Sustainability Strategy and has been working to develop a State-Local Government Sustainability Partnership Agreement. A draft of the Agreement is available on the web site. It is anticipated that when it is finalised, the Partnership Agreement will provide for State and local governments to work cooperatively within the Sustainability Framework and lay the foundation for ongoing dialogue on progressing sustainability in key areas, for example through the planning system. The planning system is discussed in some detail in *Planning for sustainability* as a statutory mechanism for implementing responses to many sustainability issues at the local and regional levels.

In recognition of the diversity within Western Australia and the government's commitment to the regions, this section proposes the development of Regional Sustainability Strategies, and describes possible future roles for Regional Development Commissions. Regional Councils (groups of local governments) are highlighted as important agencies for implementing the State Sustainability Strategy.

The Western Australian Government has recognised the rights of Indigenous people through its Statement of Commitment to a New and Just Relationship, jointly signed by the government and the Aboriginal and Torres Strait Islander Commission in 2001. Building on this, the Strategy describes how the government will undertake to support the pursuit of sustainability for Indigenous communities.

> SUSTAINABILITY ASSESSMENT

Sustainability assessment is a new process that provides integrated advice to achieve net benefit outcomes. The government will build on environmental impact assessment to develop sustainability assessment of complex or strategic projects and will also apply it to projects, plans, policies and programs within government.

> *Sustainability-based environmental assessment is certainly different from the more common, narrower exercises that typically consider only some aspects of environment and focus chiefly on negative effects. It is more ambitious, more demanding and much more positive. But it is also, in important ways, not a huge step from present practice and present capabilities.*
>
> RB Gibson

The Western Australian Government was elected with a commitment to improve decision-making processes across government through greater integration. In particular there is a commitment to establish a mechanism for sustainability assessment that would build upon the State's strong record in environmental impact assessment. The Final Report of the Review of the Project Development Approvals System (Keating Review) has highlighted the need for a coherent sustainability assessment framework for State significant projects in Western Australia. The review noted that most submissions in response to its interim report supported establishing such a framework, but not for smaller projects.

The establishment of a sustainability assessment process will be a major step forward in simplifying and creating a more effective decision-making process. It is not an easy process to change due to the silos of government and disciplines of professions. It will require careful trials to establish the processes and a long-term commitment to build capacity across government and society. Cabinet will select those projects to be subject to sustainability assessment.

Some innovative companies in the private sector are already using sustainability assessment as an internal mechanism for decision-making because of its value in integration and holistic perspective (see Box 14 on Hamersley Iron).

Sustainability assessment is already beginning in government but until it is a fully developed, integrated process it is likely to be limited to consideration of separate environmental, social and economic factors. This is best labelled 'triple bottom line' assessment. Sustainability assessment integrates these factors at the start and throughout the assessment process, using an approach that promotes positive outcomes (see Table 2) with clear goals guiding the process.

Sustainability assessment involves a number of processes that are already developing across government in health assessment and gender assessment as well as the many elements already occurring as part of environmental assessment.

While government will move to establish processes for sustainability assessment, it is proposed that transitionary arrangements be put in place to enable important government decisions to begin to be assessed in this way.

The character of sustainability assessment

Sustainability assessment is not meant to provide another set of barriers or 'hoops to jump through' for proponents seeking approval for projects. Sustainability assessment will make transparent the kind of social and economic issues that government must take into account when considering a project, as it currently does with environmental assessment.

Government (and proponents) often consider social and economic issues (along with formal environmental assessment conclusions) but these considerations are not necessarily transparent and are rarely integrated from the beginning of the process. This generally means that government sometimes has to make difficult decisions, involving significant trade-offs between social, economic or environmental factors.

Sustainability assessment is designed to work through the social and economic issues in a transparent way (similar to that for environmental considerations) and then to find integrated solutions where trade-offs are minimised or non-existent wherever possible. It is about 'win-win-win' or net benefit.

There will always be some local impacts from any change which can alter the environment, the community and the economy. Assessment processes are there to ensure that these are managed and acceptable. Sustainability Assessment enables, through for example offsets, to go beyond local changes and demonstrate how net benefit can be achieved in environmental, social and economic terms, as a total package.

Sustainability assessment is emerging as a way to improve decision-making on major, complex or strategic projects with opportunities for public engagement and consultation. It not only offers the potential to resolve apparently deep conflicts and minimise potentially harmful impacts, it has the potential to provide clear, positive benefits. It is a new paradigm in assessment and therefore requires a new framework to be developed. It is also being developed for the assessment, within government, of projects, plans, policies and programs.

BOX 14   HAMERSLEY IRON'S SUSTAINABILITY ASSESSMENT PROCESS

Hamersley Iron has adopted an internal decision-making process based on sustainability assessment. The key idea is to try and find net benefit in the social, environmental and economic areas in an integrated way.

An example is an assessment that was conducted on the management of the company's pastoral leases in the Pilbara. The question was whether to operate these leases to maximise yields of cattle, relinquish them to achieve social and environmental benefit only, or consolidate them with a balance of these goals. The process involved detailed interviews with over 30 stakeholders from government, Hamersley Iron, community and industry groups. The results were put into a 'spider web' decision-making diagram where the results on each issue were either positive or negative along an axis (based on the strength of responses given in the interviews). The distance along the line in a positive or negative direction could then be added to give an overall social result, an overall economic result and an overall environmental result.

The first attempt did not show any of the three management options as having net benefit on all three factors. Potential mitigations were developed and the options were presented to stakeholders again. This time a clear result for the consolidated option came through with net benefit in all three areas.

The company has since applied the technique to a much more complex mining decision and also found that the first options were not acceptable in this sustainability framework. After modification an option was found that solved this problem. Technical assessment of this option is now underway. This option could then be taken to the Board and eventually to government for their approval processes. Hamersley Iron acknowledges that significant resources are required to use the process and intends to use the methodology for significant development proposals rather than fully integrating the methodology into all aspects of the business.

Source: Bruce Larson, Hamersley Iron

Long-term arrangements

There is a need for commitment to the long-term evolution and development of the assessment process, to build capacity, to reform institutional and legislative arrangements and to establish new procedures, criteria and guidelines. This will need to be an incremental and organic process where government, industry and community continuously learn from experience and progressively adapt the sustainability assessment process accordingly. At each stage Cabinet will determine whether and how sustainability assessment will be used in the assessment process.

The sustainability assessment framework

Sustainability assessment builds on the sustainability framework already outlined and has the additional elements of criteria, assessment techniques, procedures and guidelines. A discussion of the emerging procedures and techniques associated with sustainability assessment is provided by the Working Group on Sustainability Assessment (see web site and CD-ROM).

Table 2 below sets out a series of criteria that could be used in the process of a sustainability assessment. These are derived from and supplement the sustainability principles within the sustainability framework. The two columns show the major differences in approaches to assessment: one is to minimise the negative impacts of a project, plan, policy or program; the other is to promote the positive outcomes. The first approach is what is usually called 'impact assessment' and the second describes how the 'sustainability assessment' approach should work.

Table 2 Criteria for sustainability assessment	
Managing the negative	**Promoting the positive**
Provides short-term gain but long-term economic gain is uncertain.	Provides both short and long-term economic gain.
Minimises impacts on access, equity and human rights in the provision of material security and effective choices.	Increases access, equity and human rights in the provision of material security and effective choices.
Avoids damage to biodiversity, ecological integrity and life support systems.	Improves biodiversity and ecological integrity and builds life support systems.
Minimises the increase in ecological footprint while improving quality of life.	Reduces ecological footprint while improving quality of life.
Minimises impacts on community and regions, 'sense of place' and heritage protection.	Builds up community and regions, 'sense of place' and heritage protection.
Minimises conservation loss and social impact while providing economic benefit.	Provides conservation benefit and net social-economic benefit.
Minimises the reduction of 'common good' resources.	Increases 'common good' resources
Minimises the risks which are not understood.	Ensures there are acceptable levels of risk with adaptation processes for the worst scenarios.
Brings change without hope for the future as it is not part of a broader strategic vision.	Brings change and a sense of hope for the future as it is linked to a broader strategic vision.

There are many techniques to aid decision-making that integrate social, economic and environmental factors and can incorporate the principles of sustainability. There is no single preferred approach and each jurisdiction must build on the unique legislative and institutional process of assessment as well as the collective experience and capacity in the community, industry and government agencies.

A number of industries have already begun doing sustainability assessment as part of their internal decision-making (see Box 14 on Hamersley Iron, and the Case Study on Argyle). The techniques of integration need to be discussed between those industries grappling with the issue, consultants, academics, community groups and government agencies. The Working Group has outlined some of these.

Western Australia has a strong base in environmental impact assessment with some experience in strategic environmental assessment. The government has capacity in economic assessment though it is not clearly linked to environmental assessment. However, social assessment is not well established in government with the last concerted effort being phased out in 1993. There have been some recent examples of multi-criteria analysis that have shown how planning can involve a transparent process of sustainability assessment. These strengths and weaknesses have informed the recommendations on institutional change here and in following sections.

Project sustainability assessment

Arrangements for sustainability assessment of complex or strategic projects

There has until recently been no attempt to publicly assess the economic and social impacts of major development proposals. The government has started to fill this gap, in the case of Chevron Texaco's proposal to access Barrow Island to develop the Gorgon gas field. This occurred through a social-economic-strategic assessment with public comment along with the Environmental Protection Authority's environmental assessment. The process has been managed by the Standing Interagency Committee of Chief Executive Officers.

It is proposed to review this process and then to apply sustainability assessment to those projects that are particularly complex or strategic as determined by Cabinet. In terms of project assessment there is a need to provide capacity in government for the implementation of sustainability assessment within the areas of social and economic sustainability. In particular the skills of economic assessment and social assessment are needed to assist with the sustainability assessment process.

Residential development control decisions

The Minister for Planning and Infrastructure has announced that all local and State planning decisions subject to development control, will take a sustainability scorecard approach. This is sustainability assessment at the local planning level. See *Settlements* for more detail on this proposed process.

Internal Sustainability Assessment

Government has made an election commitment to ensure that agencies incorporate sustainability principles into their activities and many agencies have been building sustainability into policies and programs. The Department of the Premier and Cabinet will continue to provide advice to government agencies on how to use sustainability as the basis for developing and reviewing programs, policies and agreements. The Sustainability Code of Practice for Government Agencies (see *Embracing sustainability in government agencies*) will include guidelines for government agencies on policy development and sustainability assessment of policies, programs and agreements.

Sustainability assessment for projects, plans, policies and programs within government

Sustainability assessment involves gathering information about the impact of the project, plan, policy or program (PPPP) against relevant sustainability principles and government goals. Once that information has been collected, an assessment can be made as to whether the PPPP has an overall net benefit relative to other alternatives.

It is recognised that some PPPP may have an adverse impact on some sustainability principles and that some trade-offs are inevitable. In short, a PPPP will be acceptable as long as it does not compromise the government's ability to achieve sustainability outcomes and it has greater net benefit than alternatives when all relevant economic, social and environmental factors are taken into account.

Every department needs to develop its own expertise and capacity to handle sustainability assessment of day-to-day projects. Agencies will need to develop a social, environmental and economic checklist and a range of techniques that can help to integrate these.

Table 3	Proposed criteria for prioritisation of key projects in the planning and infrastructure portfolio	
Goal	**Strategic Direction**	**Objective/Outcomes**
Economic	Economic	Wealth creation International competitiveness Shared benefits to the community Secures jobs - long term High benefit cost ratio
Environment	Environment	Maintains ecological processes Improves use of natural resources (energy) Enhances natural and built environment Supports biodiversity
People and Communities	Accessibility	Enhances transport choices Provides basic level of access Accessible for people with disabilities
	Social inclusion	Enhances vibrant communities
		Supports Indigenous communities
	Safety and health	Transport safety impacts Physical activity impacts Health impacts (third parties)
Governance	Integration	Land use/ transport synergy Integrates transport modes Whole of government policies
	Financial	Internal rate of return
		First year rate of return
	Community involvement	Meets community needs Involves public Uses transparent process

For example, Main Roads WA use an assessment technique for all projects that initially considered environmental and economic factors and is being expanded to include social aspects. Another sustainability assessment is required at the level above this to consider all projects and prioritise them. The Minister for Planning and Infrastructure is developing a portfolio-wide response to integrated funding of planning and infrastructure (see Table 3).

The Department for Planning and Infrastructure and other government agencies are currently using techniques like citizens' juries and multi-criteria analysis with community-based weighting of sustainability criteria to decide on preferred planning options. The Sustainability Code of Practice for Government Agencies (see *Embracing sustainability in government agencies*) will outline how agencies can use multi-criteria analysis and similar tools as a basis for incorporating sustainability into decision-making.

Cabinet submissions

The Policy Division, Department of the Premier and Cabinet, currently provides advice to the Premier on sustainability and other policy implications of Cabinet submissions. The Policy Division will use the sustainability assessment framework as the basis for providing advice on Cabinet submissions. The Sustainability Code of Practice will include guidelines for applying the sustainability framework to Cabinet submissions. Government will also modify the Cabinet Handbook to incorporate the requirement to address sustainability issues.

Corporate plans

Government agencies have highlighted the need for guidance on how sustainability considerations can be integrated into their decision-making processes, including criteria and guidelines to ensure their practices are consistent with sustainability objectives. The Sustainability Code of Practice for Government Agencies will include guidelines for applying the sustainability framework to corporate plans.

In short...

Vision

Sustainability assessment forms the basis of all significant government decisions and is embedded into all levels of government activity.

Objective

Enable net benefit outcomes to be achieved from an assessment process that is consistent with sustainability principles.

Actions underway

- Triple bottom line assessments are being trialled for complex and strategic projects.

- The Western Australian Government has responded to the Review of the Project Development Approvals System (Keating Review).

- A gender assessment tool is being developed for integration into sustainability assessment and all other policy decision-making by government agencies.

Actions

1.1 Undertake sustainability assessment on those complex or strategic projects selected by Cabinet.

1.2 Improve the capacity of government to undertake integrated sustainability assessment with skills being developed in economic and social assessment and in the integration of individual factors making up the sustainability assessment.

1.3 Develop the process of sustainability assessment by building on the present assessment system and with the involvement of stakeholders.

1.4 Facilitate sustainability assessment of Cabinet Submissions and government projects, plans, policies or programs through a variety of techniques such as checklists, multi-criteria analysis and sustainability scorecards in the development control system.

Global opportunities

The process for sustainability assessment is likely to produce better all round outcomes for government, industry and the community. Considerable discussion is occurring globally on the need for sustainability assessment though no government appears to have a comprehensive process in place. If Western Australia can develop this process and establish capacity to ensure it is done well, then this service could contribute to a significant global market.

Further information

Buselich, K 2002, *An Outline of Current Thinking on Sustainability Assessment*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Gibson, R 2001, *Specification of Sustainability-Based Environmental Assessment Decision Criteria and Implications for Determining 'Significance' in Environmental Assessment*, Canadian Environmental Assessment Agency Research and Development Programme, viewed August 2002, http://www.sustreport.org/downloads/Sustainability,EA.doc

Independent Review Committee 2002, *Review of the Project Development Approvals System: final report*, Government of Western Australia, Perth, viewed August 2002. http://www.premier.wa.gov.au/Feature_stories/ProjectApprovalsFinalReport.pdf

Pope, J 2003, *Sustainability Assessment Working Group Outcomes*, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

> INSTITUTIONAL CHANGE

Sustainability involves most government agencies and ministers; each has responsibilities primarily in social, environmental or economic dimensions – the need is to provide integrated policy advice.

The sustainability agenda can provide a very useful framework for the State Government in achieving a more coherent whole-of-government agenda. It provides a wide range of principles by which government decision-making can be considered, and a powerful vision that can appeal to the broad community. It also provides an integrative framework that addresses all the key goals for our society and its governance, while also providing important guidance for setting priorities.

Environmental Alliance

In our view, a key role of the Sustainability Policy Unit should be to provide guidance to Government agencies on how sustainability considerations can be integrated into their decision-making. This would complement the Unit's work on awareness raising and promoting best-practice. Such guidance would assist those agencies in their work with industry.

Chamber of Minerals and Energy

This section describes the proposed institutional arrangements for sustainability.

Each government portfolio has different responsibilities for implementing aspects of the triple bottom line of sustainability–environmental, social and economic. The challenge for government will be to support the integrated thinking across agencies that sustainability demands. Rather than operating within 'silos' to progress only the environmental, social or economic dimensions, government agencies need to work in a way that progresses all three elements concurrently.

In recognition of the need for coordinated planning and decision-making the government established Cabinet Standing Committees for Economic, Environmental, Regional and Social Policy in 2001, which has enabled coordinated consideration and development of government policy in these broad areas.

The Machinery of Government Taskforce reforms have also resulted in fewer departments and the consolidation of responsibilities and functions to minimise overlap and duplication. This has benefited sustainability thinking by integrating responsibilities that were previously separate, for example the formerly separate transport agencies are now part of the Department for Planning and Infrastructure. This provides the mechanism for better integrating transport planning with planning for sustainable urban form. Similarly, water resources management and environmental protection are now the responsibility of the Department of Environment.

No single minister or agency is currently able to provide the integrating mechanisms across government that are required for sustainability. However, the Sustainability Policy Unit within the Department of the Premier and Cabinet can undertake many functions to improve integration including:

- coordinating sustainability assessment
- assisting with capacity building
- advising agencies on how to operationalise sustainability in their own activities through the Sustainability Code of Practice for Government Agencies and a Sustainability Resource Guide (see *Embracing sustainability in government agencies*)
- coordinating across-government activity in sustainability reporting

- providing sustainability policy advice including overseeing the implementation of the State Sustainability Strategy as well as the incorporation of sustainability principles into legislation, the approvals process and the planning process, and
- providing community advice and programs on sustainability.

Other agencies also need to ensure sustainability capacity within their policy functions. This will have the advantage of enabling a network of skilled staff across government to achieve a 'whole of government' perspective on sustainability. The Sustainability Policy Unit will support regular communication and information exchange across this network to build the capacity for sustainability across the public sector.

A Sustainability Act is proposed as the mechanism for ensuring sustainability is embedded across government, consistent with the broad approach adopted in this Strategy. Manitoba has such an Act. In Western Australia, there has been a trend for new legislation to refer to sustainability, however there is a need for a consistent and comprehensive approach that can help define this. The Sustainability Principles from the Strategy provide this base to build the Act on. A Sustainability Act will provide these sustainability principles with a legislative base and enable them to be incorporated into relevant legislation as it is reviewed or drafted. The government will introduce procedures to ensure that sustainability is addressed whenever proposals for legislation are developed. The Act could also support the development of guidelines or codes for the incorporation of sustainability principles into the operations of relevant government agencies and in particular to support the process of State of Sustainability Reporting (see below).

The Sustainability Strategy has many elements that relate to community and regional sustainability. In order to provide advice to government on the implementation of these programs a Sustainability Roundtable will be established. It will consist of representatives from the relevant agencies, community (including local government and university research) and industry and will report to the Chairs of the Cabinet Standing Committees on Environmental, Economic, Social and Regional Policy. The Sustainability Policy Unit will support the Sustainability Roundtable.

The core functions of the Sustainability Roundtable will be to facilitate:

- the implementation of the State-Local Government Sustainability Partnership Agreement
- development of the methodology for Regional Sustainability Strategies
- community partnership projects
- contributing to global sustainability, including through overseas aid
- industry partnership projects
- State of Sustainability Reporting and
- a biennial review of the State Sustainability Strategy.

The Roundtable will establish committees to progress these initiatives as appropriate.

In short...

Vision

Institutions for sustainability are established and functioning as an essential and integral part of government operations.

Objectives

- To enable robust institutional arrangements within and across the State government to ensure sustainability is embedded into government activities.

- To enable adaptability and progressive learning on how institutional arrangements can most effectively enable sustainability to be realised.

Actions underway

- The Sustainability Policy Unit is established within the Policy Division of the Department of the Premier and Cabinet.

- The Department for Planning and Infrastructure has established a Sustainability Directorate.

- The Department of Housing and Works has a policy group with sustainability expertise.

- The Department of Fisheries has an ecologically sustainable development reference group.

- The Department of Conservation and Land Management and other departments have had commitments to sustainability within their corporate plans for some years.

- The Machinery of Government Taskforce has restructured government agencies to achieve more integrated, whole of government outcomes.

Actions

1.5 Establish a Sustainability Act to:
- establish the principles of sustainability that can then be incorporated by reference into relevant legislation as it is reviewed or developed, and
- support the development of guidelines or codes for the implementation of sustainability principles into the operations of relevant government agencies, including reporting.

1.6 Require the Sustainability Policy Unit to:
- support sustainability assessment
- assist agencies to implement the State Sustainability Strategy within their own areas of responsibility
- monitor implementation of the State Sustainability Strategy and coordinate sustainability reporting across government, including the production of the State of Sustainability Report
- provide general policy advice on sustainability
- support regular communication, information exchange and capacity building in sustainability across the public sector
- support community awareness and education programs on sustainability.

In short cont'd...

1.7 Establish a Sustainability Roundtable that reports to the Chairs of the Cabinet Standing Committees on Environmental, Economic, Social and Regional Policy to facilitate key community and regional actions within the State Sustainability Strategy including:
- implementation and further development of the State-Local Government Sustainability Partnership Agreement
- development of the methodology for Regional Sustainability Strategies
- contributing to global sustainability, including through overseas aid
- community partnership projects
- industry partnership projects
- State of Sustainability Reporting and
- a biennial review of the State Sustainability Strategy.

The Sustainability Roundtable will be broadly representative of key skills in sustainability in the community and industry and will also have government agency representation. Subcommittees to address particular areas of responsibility will be established as necessary.

1.8 Establish a network of skilled staff across government to support sustainability capacity building and contribute to integration.

Global opportunities

The establishment of sustainability in a proper institutional framework and the experience generated will become a major, globally innovative process. The potential to use this in capacity building within developing countries could be greater than the processes that have been developed over the past 20 years in environmental protection.

Further information

The Machinery of Government Taskforce 2001, *Government Structures for Better Results,* The Report of the Taskforce Established to Review the Machinery of Western Australia's Government, Ministry of the Premier and Cabinet, Perth.

> EMBRACING SUSTAINABILITY IN GOVERNMENT AGENCIES

Government needs to lead by example on workplace sustainability and a range of agency sustainability innovations will be implemented.

Government agencies should at least minimise their own ecological footprint, by adopting eco-efficient office operations, critically reviewing transport and travel and inclusion of environment and sustainability criteria in government purchasing and contracting. The government cannot urge sustainability on the rest of the community without putting its own house in order. Leadership must be provided in the first instance by the Premier, Geoff Gallop, and by the relevant Ministers in the departments and agencies under their control.

Environmental Alliance

Perth Zoo has a vision for becoming the World's first "Sustainable Zoo", consolidating Perth Zoo as a world leader and providing the Western Australian public with a leading cultural institution, that educates, entertains and undertakes vital conservation work and breeding programs. Perth Zoo plans to achieve a vision for a sustainable approach to its own management and development using environmental management systems, water recycling, waste re-use, conservation and community education and maintaining a focus on sustainable eco-systems within Zoo enclosures.

Perth Zoo

The Department has also sought to move towards sustainability in its operations. It has for many years established renewable energy systems in isolated locations wherever practicable, and has more recently committed to purchasing a portion of its electricity from renewable sources. Paper, plastic and metal recycling programs are active in most Departmental locations. These activities will be coordinated and enhanced through a "Cleaner Production Plan" which is currently in development.

Department of Conservation and Land Management

Part of the government's leadership role is to ensure that its agencies embrace and pursue sustainability principles, supporting a transition to a more sustainable future through its considerable influence in setting policies, making decisions, purchasing and procurement and managing its own activities to positively support sustainability. This sends clear signals to the community and businesses that the government is 'walking its own talk' and 'putting its house in order'.

Many jurisdictions around the world have responded to the sustainability imperative through initiatives that support the 'greening of government'. Government agencies in Western Australia have made some progress in workplace sustainability. Some agencies have already begun a comprehensive response to this issue through the adoption of an Eco-Office Program or through becoming signatories to the Western Australian Sustainable Industry Group's Cleaner Production Statement. Box 15 describes the Perth Zoo's efforts to become the world's first sustainable zoo.

The implementation of sustainability across the public sector requires a holistic and well-planned approach to ensure that this is undertaken comprehensively. At a whole-of-government level, this requires government planning to be consistent with sustainability principles. The government's State Strategic Planning Framework for the public sector will therefore incorporate sustainability as a fundamental principle, particularly through high-level goals against the triple bottom line and governance. This will ensure that all government activity is directed towards achieving a sustainable future for Western Australia. In addition, the annual reporting framework of government will be reviewed to better reflect the triple bottom line.

In its Environment Policy, the government committed to developing a Code of Conduct for policy-making and management practices that would enable sustainability principles and practices to be incorporated into all aspects of government decision-making.

A Draft Sustainability Code of Practice for Government Agencies is being developed and will be finalised in consultation with Government agencies and other stakeholders. The Code of Practice will ensure that activity at the agency level is directed towards supporting sustainability, including through:

- applying sustainability principles in the discharge of agency functions
- ensuring agencies' day-to-day activities are sustainable
- supporting sustainability assessment of legislation, policies, agreements, Cabinet submissions and projects, and
- monitoring and reporting on agency achievements and commitments to sustainability.

BOX 15   PERTH ZOO: THE WORLD'S FIRST SUSTAINABLE ZOO

It is Perth Zoo's vision to become the world's first sustainable zoo. It is setting an example for other recreation and tourism venues by developing management strategies that integrate environmental, economic and social sustainability and demonstrate possibilities for the future. Being the most popular tourist and family destination in the state, with approximately 550,000 visitors annually, the Perth Zoo aims to use its success and popularity to increase support for world conservation, sound environmental practices, community education and sustainable business practices.

The Zoo is developing a sustainability management plan in conjunction with Curtin University's Centre for Cleaner Production. The sustainability plan for the zoo recognises the importance of research, continual improvement and the establishment of long-term business and sponsorship relationships. These relationships involve organizations that similarly demonstrate an ongoing commitment to the environment and conservation ethos.

Perth Zoo is limited by space and funding. Therefore its sustainability strategy must embrace these challenges as opportunities to increase the economic and ecological efficiency of its operations. Strategies have so far involved: an Environmental Management System; energy and water conservation; alternative energy sources and solar design; onsite chipping and composting; the use of recycled paper in offices and shredded paper for animal bedding; the introduction of public recycling stations; the encouragement of electronic communication when possible; and an Environmental Management Committee chaired by the CEO. The Perth Zoo has found that implementing these strategies not only provides social and environmental benefits they are also economically efficient.

In leading by example the morale of the zoo staff is increased and its role in education is enriched. The Zoo has a role to inform the public about global biodiversity protection and research on endangered species and their habitats. The impact of this on local families, school groups and tourists is increased when it is clear that the zoo is 'walking the talk' on global sustainability issues in general. The Zoo's Homestead exhibit provides an environmental showcase for the public. Information is provided on recycling, waste reduction and reuse, permaculture, alternative energy sources and solar passive design principles. The Zoo believes this is an effective way of communicating actions that individual householders can take to minimise their impact on the environment.

The implementation of a sustainability management plan focusing on community education and conservation has given the Perth Zoo great potential as a community and industry leader in sound environmental management and business sustainability.

Source: Amber Hadley and Elyse Casserly

Agencies will develop a Sustainability Action Plan to respond to the Sustainability Code of Practice and comprehensively address how sustainability will be pursued. This will ensure the operationalisation of sustainability within agencies beyond the State Sustainability Strategy. It will also allow flexibility and an evolutionary approach by enabling agencies to determine what sustainability means for them in the context of their statutory responsibilities, operating environments and customers. At the same time, it will also ensure consistency in important government-wide policies for procurement and energy efficiency, for example. Box 16 summarises the main elements of a Sustainability Action Plan. Agencies will also report on the implementation of the Sustainability Action Plan in their Annual Reports and the Sustainability Policy Unit will produce a State of Sustainability Report integrating this across government.

The Sustainability Policy Unit will prepare a Sustainability Resource Guide for agencies to assist the development of Sustainability Action Plans. The unit will also review draft plans.

BOX 16   GOVERNMENT AGENCIES' SUSTAINABILITY ACTION PLANS

Sustainability Action Plans will be developed in consultation with key stakeholders to:

• address issues outlined within the State Sustainability Strategy of relevance to the agency

• identify any agreed actions for which they are primarily responsible arising from the State Sustainability Strategy

• describe how the agency will shift to more sustainable day-to-day management of their operations, including the adoption of existing government-wide programs and policies for procurement as well as targets for energy use, water use, waste reduction and recycling, vehicle use, travel reduction and other relevant targets

• set out a community engagement plan

• set out proposals for action and improvement over a three year period (2003 - 2006)

• be incorporated into strategic and business plans as these plans are reviewed and/or prepared

• define the measures that agencies will use to report on progress towards sustainability.

Applying sustainability principles

Agencies will review and amend their existing strategic and operational plans to:

• incorporate sustainability principles

• reflect any commitments they are responsible for under the State Sustainability Strategy

• adopt additional measures that are available to implement sustainability principles in agency operations.

Additional measures to implement sustainability principles will vary between agencies. For example:

• an agency responsible for making decisions concerning the use of natural resources should specify how sustainability principles will be applied in making those decisions

• an agency that plans for transport infrastructure should specify that the full costs, including infrastructure, environmental and safety costs, should be taken into account in developing those plans (see Table 3, the Department for Planning and Infrastructure's proposed criteria for prioritisation of key projects) and

• an agency that assists particular industries should set out strategies for using that assistance to promote sustainability in that industry.

Ensuring agencies' day-to-day activities are sustainable

In its Environment Policy the government committed to introducing annual environmental performance reporting requirements for all government agencies in areas such as energy consumption, waste disposal, vehicle fuel efficiency and recycling; as well as requiring departments and agencies to set targets for waste reduction and recycling. These were to be audited according to the principles of sustainability and included in Annual Reports.

Through the Sustainability Action Plan agencies will be required to respond to government-wide targets and initiatives including for the following areas:

• procurement

• waste reduction and recycling

• energy use

• water use

• travel, vehicle use, fuels efficiency

• occupational health and safety, and

• public engagemnet and social responsibility.

Existing government initiatives, requirements and targets in these areas are summarised in Box 17.

Assistance for agencies is available in some areas, for example through the Sustainable Energy Development Office's Energy Smart Government Program that provides funding for agencies to invest in energy-saving activities, and assistance on water conservation is provided through the Water Corporation. A new common-use contract has also been established to provide a panel of consultants who can conduct waste audits for agencies.

BOX 17   GOVERNMENT WIDE PROGRAMS AND COMMITMENTS FOR SUSTAINABILITY

Waste reduction and recycling
The government requires its agencies to meet the Waste 2020 target of towards zero waste by 2020.

Energy use
As part of the Energy Smart Government Program, the government requires agencies to achieve 5%, 6%, 7%, 8% and 12% energy savings per year for the years 2002-3 to 2006-7. Building on the present Financing Energy Efficiency Program, the new Energy Smart Government Program supported by the Sustainable Energy Development Office will enable agency offices to be audited and refitted for energy conservation. The government will undertake to purchase renewable energy for an increasing proportion of electricity requirements in the most cost-effective manner.

Building design
Government building and landscaping will incorporate the principles of solar orientation, energy efficiency, waste recycling, water use efficiency, accessible design and other sustainability innovations.

Water use
Government properties will demonstrate best practice in water use efficiency through water wise gardens, bores, rainwater tanks, grey water recycling and water efficient appliances (see *Our water future*).

Vehicle packages, fuels, reduced travel and vehicle use
The number of cars in the government vehicle fleet will continue to be reviewed to ensure these remain at the optimum level and are reduced where possible, and options will be available for senior public servants to include provisions for taking public transport in lieu of vehicles.

Agencies will reduce vehicle use by promoting travel alternatives, improving workplace end of trip facilities and managing car parking. The TravelSmart Workplace program assists agencies to survey staff travel, audit workplace facilities and policies and develop a green transport plan. The plan identifies measures to minimise unnecessary car travel and make it easier for staff and visitors to walk, cycle or use public transport, carpool or teleaccess. (See *Integrating landuse and balanced transport*).

The government will adopt a revised government vehicle fleet environmental policy to increase the use of four-cylinder vehicles and significantly reduce fuel consumption (and CO_2 emissions) per kilometre and continue the use of LPG vehicles where appropriate. Tenders will be called for transport emissions offsets in 2004/5.

Gas, hydrogen and biodiesel will be actively used in buses to demonstrate the applicability of these fuels for heavy vehicles.

Government centres will develop Internet conferencing facilities to ensure that meeting travel is minimised.

Occupational health and safety
Health and safety in the workplace improves environmental, economic and social outcomes in government agencies.

Public engagement
The government will ensure transparent, participatory and engaging public processes are embedded in agency activity as set out in *Consulting Citizens: A Resource Guide* and *Consulting Citizens: Planning for Success*.

Social responsibility
The government will require agencies to examine strategies for community-building and social responsibility involving their own employees. This will include cross-cultural awareness training, gender assessments, a community focus through employee-adopted community programs and place-based integration of services across government.

Government purchasing

Each year the Western Australian Government spends around $5 billion on goods and services, construction and building-related services. This is a significant contribution to Western Australia's economy. Clearly, government purchasing can be a powerful driver to support more sustainable behaviours as well as encouraging this in businesses that supply goods and services to government.

Government agencies are significant resource consumers in their own right. They are required to include sustainability considerations in their purchasing. To support this outcome, the Premier established an Interdepartmental Committee on Sustainability Procurement in 2001 to develop a comprehensive approach to government buying.

The Committee recognises that sustainability purchasing needs to address more than the lowest price offered, that a single policy alone will not deliver the desired outcomes and that government buying is diverse and can be very complex. It also acknowledges that approximately 80% of government expenditure is for purchasing services rather than goods.

While existing government and State Supply Commission policies provide a firm foundation for sustainability purchasing, an integrated approach to the triple bottom line is not currently demonstrated.

The development of a Sustainability Purchasing Policy framework recognises that government buying can have a positive impact on meeting the needs of current and future generations through environmental protection, social advancement and economic prosperity.

The Sustainability Purchasing Policy consists of:

- a policy statement that makes Directors General accountable for ensuring their agencies' buying supports sustainability
- guidelines and checklists to support sustainability purchasing for specific product and service categories, which will be further developed over time, and
- an implementation plan supporting training and awareness for both government agencies and suppliers.

The Government's Sustainability Purchasing Policy framework is a comprehensive approach to achieving progressive change across all purchasing in all government agencies over time. However, this approach will necessarily be phased in and involve learning-by-doing within government and with suppliers to government. The process will begin with selected areas of government purchasing including consumable supplies such as paper, as well as construction of new government infrastructure.

The State Supply Commission will work with the Procurement Leaders Council to ensure that consideration is given to sustainability purchasing across the public sector. The State Supply Commission will administer the Sustainability Purchasing Policy.

Supporting sustainability assessment of legislation, policies, agreements, Cabinet submissions and projects

Relevant government agencies will support sustainability assessment as described in the section on *Sustainability assessment*.

Public engagement

Public consultation and engagement is an important principle of sustainability and agencies are expected to undertake this as part of their core business. Each agency could utilise *Consulting Citizens: A Resource Guide* and *Consulting Citizens: Planning for Success* developed by the Citizens and Civics Unit, Department of the Premier and Cabinet, to facilitate public engagement.

The process of engagement will also be assisted by the WA Collaboration, a grouping of civic society in Western Australia, involving conservation groups, unions, social services, churches, youth and other interests. Lotterywest provided funding to the WA Collaboration to contribute to the State Sustainability Strategy and its involvement will be sought where appropriate.

Monitoring and reporting on agency achievements and commitments to sustainability

An increasing number of businesses and government agencies around the world are preparing triple bottom line reports and working to determine how best to report their social, economic and environmental activities. Within Western Australia, Rio Tinto, the Water Corporation, WMC, BP Australia and Alcoa have all recently prepared a triple bottom line or sustainability report.

The State Strategic Planning Framework for the Public Sector will inform the structure of future budgets and include environmental, social and economic goals for government. The annual reporting framework for government agencies will be reviewed to incorporate sustainability reporting, including through key performance indicators.

The government will also report publicly on the implementation of the State Sustainability Strategy though the State of Sustainability Report.

In short...

Vision

Western Australian government agencies are recognised nationally and internationally for their sustainability innovations.

Objective

Ensure government agencies are leading by example in pursuing sustainability through adopting sustainability in their planning, decision-making, everyday activities and reporting.

Actions underway

- Some agencies have adopted a dedicated Eco-Office Program, developed an Environmental Management Plan or are signatories to the Western Australian Sustainable Industries Group Cleaner Production Statement in order to minimise the environmental impact of their activities.
- The Armadale Redevelopment Authority has released its *Implementation Strategy for Sustainability.*
- The Sustainable Energy Development Office promotes the Energy Smart Government Program to encourage the adoption of energy efficient activities within government agencies.
- The State Supply Commission's Supporting other Government Directions Policy encourages agencies intending to purchase a good to consider energy efficient, recycled and recyclable goods.
- The Perth Zoo has adopted a comprehensive environmental management program and aims to be the first sustainable zoo of the 21st century.
- The Premier established an Interdepartmental Committee on Sustainability Procurement to develop a comprehensive policy on this issue.
- The Department of Fisheries is developing a process to assess all Western Australian fisheries in terms of ecologically sustainable development and to report to Environment Australia and the Western Australian community.

In short cont'd...

- To reduce car trips to and from their workplaces some agencies are implementing green transport plans through the TravelSmart Workplace Program. The plans promote healthy, environmentally friendly travel choices by staff and clients.

Actions

1.9 Develop a State Strategic Planning Framework for the Public Sector that reflects sustainability and the triple bottom line.

1.10 Incorporate sustainability principles and practices based on the Sustainability Act into relevant legislation as it is reviewed or drafted.

1.11 Finalise a Sustainability Code of Practice for Government Agencies to guide planning, managing, reporting on and operationalising sustainability after trialling a Draft Code with selected agencies and in consultation with community and industry stakeholders.

1.12 Review the annual reporting framework for government agencies and incorporate sustainability reporting, including through key performance indicators.

1.13 In response to the Sustainability Code of Practice for Government Agencies, require agencies to create Sustainability Action Plans that reflect their commitments and response to sustainability. A Sustainability Resource Guide will be developed to assist agencies in this process.

1.14 Implement a whole of government Sustainability Purchasing Policy framework through:

- developing sustainability purchasing guidelines

- reviewing the State Supply Commission Risk Management Policy to ensure that sustainability procurement is directly addressed in all government agency Procurement Plans.

- ensuring that new whole of government contracts are consistent with the Sustainability Purchasing Policy, and

- ensuring that government agencies and suppliers are provided with information about sustainability purchasing principles and practices, for example through the development of case studies in best practice, information sessions for purchasing officers and suppliers to government and, where appropriate, trade events and exhibits to promote more sustainable products and services to government.

1.15 Apply the Sustainable Purchasing Policy to the following priority areas:

- consumable office supplies (paper, envelopes and stationery)

- personal computers including printer cartridges

- photocopiers

- vehicles and fuels (including seeking offsets for greenhouse emissions)

- design and construction of government buildings.

1.16 Progressively implement the Sustainability Purchasing Policy to ensure continuous improvement in the application of the Policy including an independent review.

1.17 Work with local government to identify opportunities for State and local government purchasing to jointly support sustainability.

Global opportunities

Achieving sustainability in government is one of the key challenges in the global sustainability agenda. For example, there are large World Bank projects on these issues. Agencies and consultants developing this expertise will be able to participate in this market.

Further information

Aitken, L 2002, *Towards a Sustainable Procurement Strategy*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Mastny, L 2003, *Purchasing Power: Harnessing Institutional Procurement for People and the Planet*, Worldwatch Paper 166, Worldwatch Institute, Washington DC.

Waller, S 2002, *'Walking the Talk'*: *workplace sustainability policy, program and actions within the State government of Western Australia*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

The Department of Land Information has embarked on an ambitious program to achieve energy saving at its office in Midland through the EnergySmart Government Program. Here A/Chief Executive Grahame Searle and Project Coordinator, John Radalj consider the ultrasonic occupancy detector which will be installed in the building to control office lighting.

Source: Department of Land Information

> ## PARTNERSHIPS FOR ACTION

Implementation of sustainability will require partnerships with a range of key stakeholders. Local government in particular will be a key partner for implementing sustainability.

Individual governments, just like individual companies and individual people, cannot deliver sustainability on their own–global approaches are required as well as local approaches, and partnership is essential.

BP Australia Ltd

Local governments around the world and in Australia have taken sustainability seriously for a long time. Chapter 28 of Agenda 21 considered the role of local authorities in supporting sustainability. This initiative has become known as Local Agenda 21 and has provided the framework and driver for much action by local government around the world.

The Western Australian Local Government Association indicates that some 6,416 local authorities in 113 countries have either made a formal commitment to Local Agenda 21 or are actively undertaking the process. At the end of 2000, over seventy councils in Australia were either starting or had developed a Local Agenda 21 program. To date, fifteen Western Australian local governments have formally committed to a Local Agenda 21 process including the Cities of Fremantle, Armadale, Mandurah, Nedlands, Subiaco, Stirling, Joondalup and Cockburn, the Shire of Serpentine-Jarrahdale and the Town of Cottesloe. Many local governments have also been actively involved in initiatives like Cities for Climate Protection and the Perth Biodiversity Project.

The Western Australian Local Government Association provided a detailed submission setting out how local government needs to be involved in every aspect of the State Sustainability Strategy. The association proposed:

'... that a Sustainability Partnership [be] formalised (under the umbrella of the more general State-Local Partnership) at the time the Strategy is finalised; and in the meantime a Roundtable is established as an embryonic Advisory Council to progress the Strategy formulation.'

Given the complexity of the issues involved and the Western Australian Government's intention to work closely with local government on a range of issues, it was desirable that opportunities to jointly pursue sustainability were considered comprehensively by State and local governments working together. Therefore, during the process of public consultation on the draft State Sustainability Strategy, the government established a Roundtable with the Western Australian Local Government Association (representing local government). This effort was directed towards creating a State-Local Government Common Sustainability Framework consisting of common principles, goals, approaches and programs, building on the sustainability framework outlined in this strategy. This approach is unique in Australia.

The framework will address institutional accountability, alignment of State and local government policy directions and processes on sustainability, regional groupings of local government for responsibilities in different areas (see below), and common State-local government methodologies and resources.

Local governments have expressed the view that some large regional projects do not adequately address local social and economic considerations. The Department of Industry and Resources is currently involved in developing a protocol between the Department and relevant local authorities for future State Agreements and resource projects of significance to the State. The Protocol is being jointly developed by the department (on behalf of the Minister for State Development), the Western Australian Local Government Association (WALGA) and the Department of Local Government and Regional Development (on behalf of the Minister for Local Government and Regional

Development). The Protocol recognises the complexity of developing major resources projects and the effects such projects may have on local communities, the wider region and the State as a whole. The purpose of the Protocol is to establish a broad set of principles and procedures that will facilitate communication and discussion between the Department of Industry and Resources relevant local authorities in regard to projects of significance to the State, future State Agreements and variations to existing State Agreements.

A key question will be how to develop planning legislation to enable sustainability principles and processes to be incorporated into statutory processes at the local level. This will include exploring how Regional Councils could be used to address sustainability issues, and the use of various statutory powers by agencies and local governments directly for sustainability outcomes for natural resource management, settlement and community issues.

Regional Councils can be established with the powers of a local government under the Local Government Act. These were originally set up to manage waste as it was obvious that each local authority (especially in the city) could not have their own landfill site nor could they establish a recycling centre in each locality. Regional partnerships were required.

The same issue now confronts local government on many of the sustainability issues outlined in this report: natural resource management issues (especially landcare, drainage and coastal issues), settlement issues (especially transport, growth management, air quality, waste, renewable energy location and heritage) and community issues (especially location of community services, social housing, health and education).

There is a real need for local government to establish regional partnerships with the State government on these issues while at the same time maintaining local identities and close links so vital to the implementation of any policy. The main link will be at the professional officer level where capacities are greatly expanded through regionalising. Political representation on Regional Councils can ensure that local democratic processes are extended into these areas of government to provide the necessary local and regional flavour. This will be achieved in incremental steps to ensure regional capacity building and ownership is in place. Many issues will also be managed by agencies or by local government directly, for example the City of Swan and the City of Gosnells have sustainability projects that are partnerships with the State Government *(see Sustainability and settlements)*.

There are already three good models of Regional Councils (which made substantial submissions to the State Sustainability Strategy): the Eastern Metropolitan Region of Councils (representing six Councils to the east of Perth); the North East Wheatbelt Regional Council (NEWROC, which represents seven councils in the Wheatbelt); and the Pilbara Regional Council which is a statutory body for local governments in the Pilbara. Regional Councils have been able to develop the staff and capacity to make significant contributions on policies for sustainability.

The process for implementation of the State Sustainability Strategy through the Sustainability Roundtable requires significant input from local government.

The Roundtable will be broadly representative of key skills in sustainability in the community and industry and will have government agency representation as well. Subcommittees to cover particular areas of responsibility will be established as needed. In particular the Roundtable will be able to facilitate Partnership Projects between local and State government, e.g. the Maddington Kenwick Sustainable Communities Initiative with the City of Gosnells and the Community Planning Strategy with the City of Swan.

The Strategy also proposes additional partnerships involving civil society, research organisations and industry to undertake further work in key areas important to the different sectors, for example:

- regional sustainability
- research and development for sustainability
- sustainability scorecard
- sustainable mining and petroleum production
- corporate social responsibility
- eco-efficiency and industrial ecology, and
- industry sustainability covenants.

Each of these partnerships will be an inclusive process to try and achieve creative and innovative solutions through dialogue and involve representation from the community. These partnerships will be described in more detail in other parts of the Strategy.

In short...

Vision

State and local governments are acting in unison to realise a sustainable future for the Western Australian community. Other partnerships with universities, civil society and industry are able to creatively resolve sustainability issues.

Objectives

- Establish partnerships involving civil society, industry, local government and research organisations to progress, finalise and implement the State Sustainability Strategy.
- Achieve integrated State-local government approaches to sustainability and align State and local government policy and processes with sustainability principles.

Actions underway

- Fifteen Western Australian local governments have formally committed to a Local Agenda 21 process including the Cities of Fremantle, Armadale, Mandurah, Nedlands, Subiaco, Stirling, Joondalup and Cockburn, the Shire of Serpentine-Jarrahdale and the Town of Cottesloe.
- Some 67% of Western Australia's population live in a local government area involved with the Cities for Climate Protection program.
- Some partnerships with government for sustainability already exist, for example the WA Sustainable Industry Group.

Actions

1.18 Through the Sustainability Roundtable implement the State-Local Government Sustainability Partnership Agreement and create further State-Local Government partnerships to promote sustainability at community and regional levels.

1.19 Through the Sustainability Roundtable examine the appropriate scale for sustainability actions including the role of Regional Councils of local government in supporting sustainability, the implementation by individual local governments and the role of the State government in enabling local governments to fulfill these roles.

In short cont'd...

1.20 Through the Sustainability Roundtable, work with the WA Collaboration and industry stakeholders to implement the State Sustainability Strategy through partnership processes.

1.21 Develop a protocol that establishes broad principles and procedures to facilitate communication and discussion between the Department of Industry and Resources and relevant local governments in regard to projects of significance to the State, future State Agreements and variations to existing State Agreements.

Global opportunities

Agencies, local governments, industry and civil society can participate in the growing international market for sharing the insights and innovations from places like Western Australia that develop unique partnerships for sustainability.

Further information

Alderson, G and Turner, S 2002, *Moving Towards Sustainability in the City of Gosnells: A Case Study of Local Government Addressing the Sustainability Agenda,* http://www.sustainability.dpc.wa.gov.au/CaseStudies/gosnells/gosnells.htm

Leigh, C 2002, *Local Government and Sustainability: How the Western Australian Local Government Association is assisting local councils to adapt to the new agenda of sustainability,* http://www.sustainability.dpc.wa.gov.au/CaseStudies/WALGA/walga.htm

Menage, X 2002, *Working Towards Sustainability: Local Government Greenhouse Action through the Cities for Climate Protection Campaign*, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Greenhouse%20Action/greenhouseaction.htm

Zele, P 2002, *Local Agenda 21 Applied Locally in Western Australia: the City of Cockburn Case Study February*, 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/la21/localagenda21.htm

The Premier of Western Australia, Hon Dr Geoff Gallop MLA, with members of the State Local Government Sustainability Roundtable at the signing of a partnership agreement to develop a State Local Government Sustainability Partnership Agreement.

L-R Ms Cheryl Gwillam, Director General, Department of Local Government and Regional Development; Mr Cliff Frewing, President of Local Government Managers Australia (WA); Premier Gallop; Mr John Hyde MLA Member for Perth (Chair); Clive Robartson, President of the Western Australian Local Government Association; Professor Peter Newman, Director, Sustainability Policy Unit, Department of the Premier and Cabinet and Ms Ricky Burges, Chief Executive Officer, Western Australian Local Government Association.

Source: Department of Agriculture

> PLANNING FOR SUSTAINABILITY

Sustainability represents a new emphasis in traditional planning practice. The statutory planning tools to prepare, implement and review policies and plans offer a powerful mechanism to apply the principles of sustainability.

Western Australia is fortunate in that it has an established planning system administered by agencies and institutions with considerable experience in dealing with a range of development issues and community views. It provides significant opportunity through strategies, policies, regulation and special projects to influence the direction and type of growth and development throughout the State and demonstrate commitment to sustainability principles.

Royal Australian Planning Institute

The EMRC provides a successful model of a partnership by its member Councils to enable a strategic long-term focus that is both environmentally and culturally sensitive to the Region. The Regional Environmental Strategy 2000 (RES) is a major strategic initiative undertaken by the EMRC to protect and manage the Region's natural environment and resources. The RES also identifies issues and defines future actions aimed at achieving sustainability and to value and preserve the environmental, social and economic aspects that make the Region unique.

Eastern Metropolitan Regional Council

The core process in sustainability consists of:

- finding a strategic vision of the future which is the desired outcome for a majority of the community, based on common good principles

- setting out practical steps that integrate economic, social and environmental outcomes relevant to that vision and which can be taken through every element of development, and

- incorporating these in statutory processes and procedures where appropriate to make a significant contribution to the implementation of the desired Strategy.

This is also the process that has traditionally been called 'town and country planning'. The town planning profession arose out of health and transport problems at the turn of the 19th century and has provided an orderly statutory process for achieving social, environmental and economic goals for over a hundred years, in all parts of the world including Western Australia.

Figure 3 shows the major elements of Western Australia's strategic and statutory planning system. Each part of this hierarchy of planning measures has a contribution to make to sustainability. The review of the State Planning Strategy will include the incorporation of Sustainability Principles, consistent with the State Sustainability Strategy and planning legislation review (see below). Each part of the planning hierarchy needs to incorporate and apply the principles of sustainability through developing and applying criteria for planning and assessment appropriate for each level in the hierarchy. For example, the application of BASIX (a NSW web-based planning tool focussed on residential development and buildings) in Western Australia presents a good starting point to determine how sustainability can be embedded into this State's planning and development approval systems.

Local government is a major stakeholder in all levels of planning. Local Town Planning Schemes are an important mechanism for addressing sustainability issues in the statutory process, as well as Metropolitan Region Schemes and Regional Plans. However the vision for tackling sustainability issues has mostly come from other processes. Local governments have been preparing Local Agenda 21 Plans and have participated in the international program Cities for Climate Protection. Natural resource management groups have had close links to local government, and much community development occurs through local government. Yet little of this is incorporated into the statutory planning process despite it having significant implications for land use (and transport) planning.

Figure 3 Hierarchy of planning strategies, policies, plans and schemes
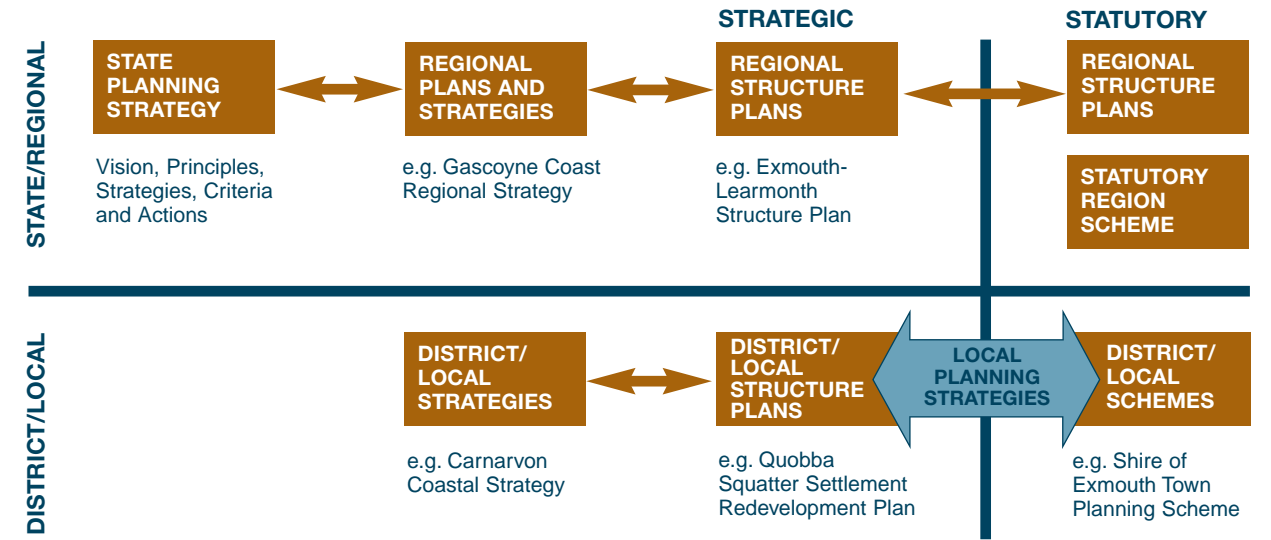
Source: Department for Planning and Infrastructure

Another planning instrument created under the *Town Planning and Development Act 1928*, the Statement of Planning Policy, has great potential to be used more widely to promote sustainability. In particular, it has the potential to be used as a whole of government document, developed in accordance with sustainability principles, to integrate land use and management requirements for specified areas of the State. Current Statements of Planning Policy being developed or already developed by the Western Australian Planning Commission cover environment and natural resources, sustainable settlements, economy and employment, transport and infrastructure, and regional planning. The classification system for existing and proposed Statements of Planning Policy is provided at Figure 4.

The State Sustainability Strategy proposes a number of ways that planning processes can be used to support sustainability, particularly through Statements of Planning Policy by local governments and by Regional Councils of local governments that focus on the sustainability issues confronting them. The use of developmental control planning powers in local government in order to assist sustainability will be pursued through the Sustainability Scorecard approach (see *Sustainability and settlements*).

Planning legislation is currently being reviewed to consolidate a number of provisions and to more closely integrate sustainability into the planning system. Proposals include:

- including the promotion of sustainable land use and development as a fundamental and underlying purpose of the planning legislation

- increasing the focus of the Western Australian Planning Commission on sustainability issues by:
  - expanding the functions of the Western Australian Planning Commission to include advising the Minister on the coordination and promotion of sustainable land use and transport and land development in the State, and
  - expanding the membership of the Western Australian Planning Commission to include the chief executives of the Department of Industry and Resources and Department of Housing and Works to provided added expertise on economic and social considerations to be taken into account in planning decision-making,

- providing that Town Planning Schemes can deal with any matter for achieving any of the purposes of the Act, including promoting sustainable land use and development.

The Western Australian Planning Commission and Department for Planning and Infrastructure, therefore, are well placed to take a central role in delivering sustainable outcomes. In order to coordinate and facilitate this process a Sustainability Directorate has been formed in the Department for Planning and Infrastructure and a Standing Committee of the Western Australian Planning Commission will be established to deal with Sustainability and Development Assessment.

Figure 4 Classification System for Statements of Planning Policy

Statements of Planning Policy Sector Policies	Statements of Planning Policy Supplementary Policies	Operational Policies

STATE PLANNING STRATEGY AND STATEMENT OF PLANNING POLICY No. 1 STATE PLANNING FRAMEWORK

ENVIRONMENT AND NATURAL RESOURCES (SPP2)

SPP2.1 Peel-Harvey Catchment
SPP2.2 Gnangara Mound Crown Land*
SPP2.3 Jandakot Groundwater Protection
SPP2.4 Basic Raw Materials
SPP2.5 Agriculture and Rural Land Use Planning
SPP2.6 State Coastal Planning
SPP2.7 Public Drinking Water Sources
and others............

SUSTAINABLE SETTLEMENTS AND COMMUNITY (SPP3)*

SPP3.1 Residential Planning Codes*
SPP3.2 Planning for Aboriginal Communities
SPP3.3 Integration of Land Use and Transport♦
and others............

TRANSPORT AND INFRASTRUCTURE (SPP5)*

SPP4.1 State Industrial Buffer*
SPP4.2 Metropolitan Centres
SPP4.3 Poultry Farms
and others............

ECONOMY AND EMPLOYMENT (SPP4)*

SPP5.1 Land Use Planning in the Vicinity of Perth International Airport*
SPP5.2 Telecommunications Infrastructure*
and others............

REGIONAL PLANNING AND DEVELOPMENT (SPP6)*

SPP6.1 Leeuwin-Naturaliste Ridge
SPP6.2 Future Perth*
and others............

OPERATIONAL POLICIES TO BE REVIEWED AS PART OF THE REVIEW OF LIVEABLE NEIGHBOURHOODS

* Statements of Planning Policy currently under preparation/review

♦ Proposed Statements of Planning Policy

NON-STATUTORY POLICIES
Regional Strategies
Structure Plans

Statements of Planning Policy (SPP) under s5AA of *Town Planning and Development Act 1928*

Source: Department for Planning and Infrastructure

In short...

Vision

Planning provides the processes and procedures to create regional and local sustainability visions and triple bottom line actions to achieve these visions.

Objectives

- Better incorporate sustainability principles into statutory planning, especially integrated land use and transport planning.

- Identify opportunities through planning processes and procedures to implement the State Sustainability Strategy.

- More effectively involve local government in sustainability planning.

In short cont'd...

- Develop Statements of Planning Policy on the sustainable planning, provision and maintenance of transport and infrastructure, the integration of land use and transport and the maintenance of the freight network.

Actions underway

- Longer term planning processes, such as the State Planning Strategy, have incorporated triple bottom line approaches.

- Specific projects such as the Freight Network Review and the Perth City Rail Access Committee on the Southern Rail have used sustainability techniques.

- Some Regional Councils of local government have demonstrated regional sustainability planning.

Actions

1.22 Create a Standing Committee of the Western Australian Planning Commission to deal with sustainability and development assessment and to advise on methodology for, and coordinate the implementation of, sustainability through the planning system in association with the Sustainability Roundtable.

1.23 Develop and trial a Sustainability Scorecard through the Western Australian Planning Commission's Sustainability and Development Assessment Committee for application through the Model Scheme Text in local Town Planning Schemes.

1.24 Through the Natural Resource Management Council, the Sustainability Roundtable and the Sustainability and Development Assessment Committee of the Western Australian Planning Commission, support the increased involvement of local government in planning for natural resource management, including issues of agricultural sustainability, particularly regional drainage, biodiversity conservation, regional revegetation programs, water quality and soil acidity.

1.25 Establish a Sustainability Directorate within the Department for Planning and Infrastructure to assist in the implementation of new initiatives in the State Sustainability Strategy relating to planning.

1.26 Develop Statements of Planning Policy on the sustainable planning, provision and maintenance of transport and infrastructure, the integration of land use and transport and the maintenance of the freight network.

Global opportunities

Planning professionals from Western Australia are already in demand for global development projects in the Asia Pacific Region. Town planning is established worldwide but rarely has it been applied in its full capacity to solving sustainability issues. If Western Australia can demonstrate this then planning professionals and sustainability professionals involved will have many global opportunities to pass on their expertise and experience.

Further information

Western Australian Planning Commission,
http://www.planning.wa.gov.au/

> SUSTAINABILITY IN THE REGIONS

Sustainability means most when it is applied at a regional scale.

Regions need to be proactive in their creation of a sustainable future. This is a significant challenge for regions in decline. Demographic, service and employment issues that many regions are experiencing are intimately related to economic and ecological change. The ability of regional communities to care for their natural environments is dependent on economic and social wellbeing.

R Armstrong

In order to achieve a transition to sustainability and permit strategic planning for sustainability, it will be important to have a clear understanding of the state of the social, economic and cultural environments in regional Western Australia. The WAM, with its knowledge resource - environmental, historical and cultural - and its museums in key regions (Albany, Geraldton and Kalgoorlie), is well placed to play a key role in this process.…It is intended that MuseumLink will facilitate the engagement of regional communities with important societal issues such as sustainability, and thus empower them to better participate in the dialogue about their future.

WA Museum

Belonging requires a sense of place, a home place where persons can be secure, where meaning and well-being can be enjoyed without pressure or coercion,., a sense of place is as much a function of the nature of the places themselves as it is of human activity.

G Lilburne 1989, *A Sense of Place: A Christian Theology of Land*, Abingdon, Nashville, pages 25 and 28

The sheer size of Western Australia means that there is enormous variation in environments, economies and communities. At the regional scale, however, the natural environment becomes more defined and the regional variation in land, water and vegetation less distinct. Regions are a useful scale to plan for environmental and natural resource management as seen in the emergence of regional natural resource management groups and groupings of local authorities such as the North Eastern Wheatbelt Regional Organisation of Councils, the Eastern Metropolitan Regional Council and the Pilbara Region of Councils.

Regions are linked to State, national and especially global economic factors but are also influenced by the predominant industry within that region (such as mining, agriculture or tourism). The formation of Regional Development Commissions recognised the need to capitalise on the different economic strengths and opportunities within the regions. Also local communities exist within and relate to a region—it is part of their identity. Many government services are delivered and administered regionally because it is a manageable scale.

For all these reasons, the State Sustainability Strategy encourages the pursuit of sustainability at the regional scale through the development of Regional Sustainability Strategies. These strategies will provide an opportunity to apply the broad framework of the State Sustainability Strategy working with groups of local government as outlined above. Many other government processes can also feed into the strategies, for example the Regional Natural Resource Management Strategies being prepared by Regional Natural Resource Management Groups.

The consultation undertaken by the State-Local Government Sustainability Roundtable suggested that it may be possible for regional sustainability strategies to be developed based on regions that are made up of four to six local governments. This is the scale at which natural resource management boundaries, such as sub-catchments or bioregions, become significant. In this way, it would be possible to create integrated approaches to economic and environmental issues on a regional basis with significant local government involvement.

However, Regional Sustainability Strategies can also integrate the social dimension: community aspirations that can be tapped through place narrative and community visioning processes. The strategies can then produce a regional 'sense of place' document to facilitate a shared understanding of the past, and a shared vision of sustainability for each region's future.

Regional strategies can provide the key to how future development should proceed, an issue explored by the Review of the Project Development Approvals System. The Regional Sustainability Strategies can define the issues that require further action and the resources that are available. They can describe the human dimension to a region through telling the 'story' of an area as suggested by City Vision:

The cultural and social dimensions of the state, the people, the place and how they have interrelated with each other and their natural environment are the source of many rich stories. Some of the most skilled and powerful story-tellers the state has to offer are its artists, writers, composers, filmmakers, scientists and historians. The real challenge is to determine how the skills of these story-tellers and the rich repository of stories which exist, can contribute more overtly to the shaping... longer term planning and development.

City Vision, 'Can Perth Be More Creative?', 2002.

This story telling approach can apply in regions of the city and in rural areas. The strategies will be prepared through community-based processes and involve universities, industry, local government and regional bodies.

The 'story' of each region will include Indigenous stories and history, natural history and local history (see Box 58 on Kodja place and photos over). Partnerships to achieve these perspectives are already being established, for example Professor Bolton's team at Murdoch University is developing an Indigenous history of Western Australia, the Department of Conservation and Land Management has regional conservation studies, the Western Australian Museum is creating an approach to regional 'belonging' and local history and the Department for Planning and Infrastructure and Regional Development Commissions have various strategies and regional plans. Box 18 describes two other projects that add valuable insight to the development of regional sustainability strategies.

BOX 18 DEMONSTRATION PROJECTS ON REGIONAL SUSTAINABILITY STRATEGIES

Regional Sustainability will be given a boost in Western Australia by three projects: CSIRO's Healthy Country Program, the World Wild Fund for Nature, Southwest Australia Ecoregion Initiative (SAEI) and the Global Centre for Sustainability's Pilbara Regional Sustainability Strategy.

Healthy Country will address many of the regional sustainability research and development issues that are critical for the future for the State. This important initiative will be closely tied to the implementation of the State Sustainability Strategy and is further outlined in *Research and development for sustainability*.

The SAEI is an international project by the World Wide Fund for Nature that has as its focus the management of the region's globally significant biodiversity. The project will be community-based to provide 'bottom-up' solutions to the many issues facing the region with an emphasis on policy and a biodiversity vision. (See also *Sustainable urban design*).

These demonstration projects support the implementation of the State Sustainability Strategy and help provide substance to a Regional Sustainability Strategy for the South West.

The Global Centre for Sustainability (see *Research and development for sustainability*) has been funded to do a demonstration Regional Sustainability Strategy in the Pilbara. An interdepartmental committee has been established by the State Government to help define the methodology for Regional Sustainability Strategies. The first phase of this methodology will be trialled in the Pilbara region.

The Committee considered a paper proposing a methodology for Regional Sustainability Strategies which is available on the CD-ROM and sustainability web site.

Regional Sustainability Strategies will:

- provide an integrated application of the State Sustainability Strategy as it applies to the region

- build on the regional plans and natural resource management strategies currently in preparation

- incorporate the social element through sense of place 'stories' incorporating Aboriginal stories, the natural history and the local history

- link to broad, non-government organisation processes in the regions to pursue regional visions, for example the Southwest Australia Ecoregion Initiative and CSIRO Healthy Country, as well as a community visioning process where appropriate

- provide a broad set of goals for the future from this process.

The Sustainability Roundtable will oversee the development of Regional Sustainability Strategies after reviewing the first demonstration project in the Pilbara region. There are also important policy issues and regional planning to be considered with the Western Australian Planning Commission, local governments and Regional Development Commissions, for example on how best to determine boundaries for managing some sustainability issues through Regional Councils of local governments. The State-Local Government Roundtable provided support for the establishment of Regional Councils for some sustainability issues including natural resource management, water supply and drainage, waste management, transport planning, economic and social planning.

The government has committed to amending *The Regional Development Commissions Act 1993* to ensure that the activities of the Regional Development Commissions are consistent with sustainability principles. The Regional Development Commissions will also be involved in the development of Regional Sustainability Strategies and Regional Councils of local governments.

In short...

Vision

Each region has its 'story' that is constantly updated by the people who live there. This 'sense of place' resource enables all development project proponents to assess how they can contribute to the area; it can also be a resource for tourism and education in the region.

Objectives

- Enable regional Western Australia to develop more sustainably.

- Apply the State Sustainability Strategy regionally.

- Develop a process that can enhance the long and short-term 'sense of place' in the regions of Western Australia.

Actions underway

- The Department of Local Government and Regional Development is developing a Regional Policy Statement for Western Australian that will provide a clear vision for regional Western Australia and a long-term comprehensive, sustainable approach to regional development.

- The Department of Conservation and Land Management's biological survey and other programs provide environmental information on the regions.

- Regional natural resource management councils are preparing regional natural resource management plans.

In short cont'd...

- Regional development plans have economic, social and environmental components and Regional Development Commissions have elements of all three components in their activities.

- Regional cultural studies are beginning as part of cultural mapping for Indigenous perspectives.

- The Department of the Premier and Cabinet supported the development of a methodology for Regional Sustainability Strategies through an interdepartmental committee.

Actions

1.27 Through the Sustainability Roundtable and the Western Australian Planning Commission develop a methodology for Regional Sustainability Strategies after reviewing the methodology adopted for the demonstration project in the Pilbara region. These strategies will provide an opportunity to apply the broad framework of the State Sustainability Strategy in cooperation with local governments, Regional Councils, Regional Development Commissions and the Western Australian Planning Commission. These strategies will build on and link regional plans, natural resource management plans, economic development plans, regional 'sense of place' stories and future aspirations for regions.

1.28 Amend the *Regional Development Commissions Act 1993* to ensure that the activities of the Regional Development Commissions are consistent with sustainability principles.

Global opportunities

The regional 'sense of place' documents can give the social basis for development as well as the economic and environmental factors. This will be a significant achievement and generate international interest.

Further information

Armstrong, R 2002, *Developing a Strategy for Regional Sustainability in the State of Western Australia*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Stanton-Hicks, E 2002, *Sustainability and the Iron Ore Industry in the Pilbara: a regional perspective*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/pilbara/pilbara.htm

Waller, S 2003, *Storytelling and community visioning: Tools for sustainability*, background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Inside the Kodja Place Visitor and Interpretive Centre, Kojonup, which was designed to be 'One story, many voices' for the local community.

The Storyplace interpretive exhibition Designers: Arbor Vitae Landscape Architecture and Philip Gresley Architect

Artwork: Craig McVee (floor painting) and Stuart Green (fire line sculpture)

Photograph: Gary and Tracey Dixon of Melody Makers, 2003
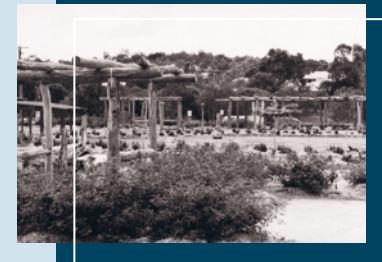
The rose maze, consisting of Australian roses, provides the opportunity to tell the stories of women from the three local cultures, Wadjela (consisting of English and Italian people) and Noongar, people that have contributed to the development of Kojonup today.

Source: Gary Burke

The Kodja Place building is shaped liked the kodja axe, which was made by Noongar people from plentiful local stone and was widely traded in the area. The building was constructed using local and traditional building materials wherever possible and the interior colours represent the local natural environment.

Source: Gary Burke

> INDIGENOUS COMMUNITIES AND SUSTAINABILITY

There is much to learn from the Aboriginal peoples of Western Australia about sustainability. They lived in this country for more than 500 generations with a traditional lifestyle based on sustainability principles.

Today, Aboriginal cultures are a unique and valued part of the State of Western Australia. Aboriginal people have continuing rights and responsibilities as the first peoples of Western Australia, including traditional ownership and connection to land and waters.

Even so, Aboriginal people suffer much greater disadvantage than the non-Indigenous population. Circumstances differ significantly between regions and localities, and these differences create different challenges in working towards sustainability. Regional and local approaches are required to address the issues that impact on Aboriginal communities, families and individuals. To achieve improvement, government and Aboriginal people need to work in partnership and share responsibilities. It is only through this process that sustainability can be achieved.

The sustainability of Indigenous communities is fundamentally dependent on two factors. The first is that Indigenous communities undertake to identify appropriate governance structures. These bodies will be ultimately responsible for development of the community and all of the process through which this will occur. If these bodies have credibility within the Indigenous community, and are able to deal with the environment within which those communities operate, there will be resilience and cohesion necessary to implement changes for a preferred future. The other factor is that the whole of Government undertakes to develop appropriate processes to work with Indigenous communities. If this is undertaken in a way that respects the history, values and uniqueness of Indigenous communities then the service required by the Indigenous communities will deliver outcomes in line with those experienced by mainstream WA.

Department of Indigenous Affairs

For Indigenous Western Australians, sustainability is integral to all areas of community life including land management; biodiversity conservation; protection of culture, language and heritage; economic development; health; housing; education; employment; and physical infrastructure. The issues are so closely interrelated that they need to be addressed within an integrated planning process.

Wealth creation in the Western Australian community and in the Indigenous community is fundamentally important to addressing issues facing Aboriginal people. Securing Aboriginal spiritual and cultural heritage and respecting traditional ecological value systems must be guaranteed elements within the overall development of the State. This protection and respect must be assured within the State development approval process.

Challenges for government in achieving sustainability within Indigenous communities include:

- understanding the diversity of the Aboriginal community in Western Australia

- building capacity to govern, resolve internal community issues and shift negative patterns of decision-making towards appropriate internal governance and accountability

- providing for long-term planning strategies, partnerships and programs to support empowerment of the individual, family and communities

- reviewing and removing inadequate service delivery models for Indigenous development

- promoting initiatives already active within Aboriginal communities to achieve commonly agreed outcomes (e.g. to manage and maintain 'country' in a traditional manner, to protect and maintain cultural heritage and knowledge, and provide opportunities for useful local employment)

- creating better understanding about how to achieve equity through normalisation of service delivery and

- reviewing the absence of statutory obligations to meet mainstream planning, building and public health standards in Aboriginal communities.

In addition, there are promising opportunities for promoting sustainability in Indigenous communities arising from a number of recent initiatives, which include:

- managing 'country' according to traditional cultural groupings and on the basis of traditional law and custom

- the involvement of Native Title Representative Bodies in facilitating community negotiation, governance and the establishment of more representative structures

- the collaborative work of environmentalists, ecologists, anthropologists, archaeologists and Aboriginal traditional owners resulting from community interaction and management on their traditional lands

- cultural/eco-tourism projects emerging across the State, and

- the move by mining companies to negotiate land use agreements which provide a range of benefits including financial contributions, provision for cultural heritage and environmental management, employment and training, support for small business development and community infrastructure.

Additionally the Statement of Commitment to a New and Just Relationship between the Government of Western Australia and Aboriginal Western Australians asserts that the Government will work with Aboriginal communities with the assistance of the Aboriginal and Torres Strait Islander Commission to:

- agree on a set of principles and a process for the negotiation of a Statewide framework that can facilitate negotiated agreements at the local and regional level

- negotiate a new approach in Aboriginal affairs policy and administration in Western Australia based on regional agreements and

- enhance negotiated outcomes that protect and respect the inherent rights of Aboriginal people and will significantly improve the health, education, living standards and economic standing of Aboriginal people.

Steve Kinnane's background paper *Beyond the Boundaries: exploring Indigenous sustainability issues within a regional focus* proposes that processes for strategic policy development be anchored in community-based programs with a participatory approach. With regard to land management, it is important that a non-adversarial, consultative approach is adopted which seeks to bridge the gap between traditional Aboriginal customs and responsibilities for caring for the country and the need to address the contemporary threatening processes introduced through European settlement.

In the short term the Sustainability Strategy will deliver immediate benefits through the establishment of an Indigenous Protected Areas program based on principles of joint management of lands and waters within the conservation estate of Western Australia, which will involve provision for land management, natural resource management, protection of cultural heritage and ongoing employment and training programs.

These programs will:

- be established through negotiated partnership agreements between the State and Indigenous groups, and expanded to other regions throughout Western Australia in the medium term, and

- provide the basis for the development of regional agreements that are part of the Statement of Commitment in the longer term.

By investing in existing structures and initiatives, the government will be providing employment for Aboriginal rangers and supporting the development of a network of Aboriginal land and water management specialists with the capacity to drive the development of broader strategies.

As discussed in *Sustainability in the Region*, it is intended to include Aboriginal stories in the 'sense of place' document to be created for each region (in the country and city). Indigenous regional sustainability can begin around the Aboriginal stories and history that are being recorded as part of the Regional Sustainability Strategies, other Aboriginal arts and cultural tourism projects, and the Aboriginal history project being conducted under the supervision of Professor Geoffrey Bolton, Murdoch University. Indigenous place narrative will feed directly into the development of Regional Sustainability Strategies as outlined in the previous section.

The Government is committed to improving Aboriginal involvement and joint management of the State's conservation reserves, and has released a consultation paper that aims to provoke discussion on options for joint management of conservation lands based on a number of objectives including the following:

- the establishment of a comprehensive, adequate and representative conservation reserve system that meets international standards
- the management of protected areas so that objectives for conservation, Aboriginal heritage, and recreation are met
- the adequate representation of Traditional Owners on the management body and in the management planning of conservation lands
- the participation of the wider community in the management planning of conservation reserves;
- the implementation of joint management throughout the State
- the recognition of the *Conservation and Land Management Act 1984* of the aspirations of Aboriginal people to participate in conservation land management, and the Aboriginal heritage of the State
- the protection of native title through the creation of new conservation lands
- the responsibility of Traditional Owners for cultural heritage matters on conservation reserves, and
- the establishment of an Indigenous protected Areas program.

There are other important strategies for Indigenous sustainability. The fundamentals of health, housing, safety, community stability and employment are still sadly lacking for many Indigenous people. Commitments to dealing with and resolving the underlying issues need to be built into all government programs with the goal of improving and raising life expectancy rates to the level enjoyed by non-indigenous Western Australians. This process will require mutually agreed partnerships.

These partnerships will only be effective and sustainable where they are:

- Based on integrated planning and shared responsibility, and the process of guaranteeing the accountability of outcomes is formalised through an agreement
- Based on realistic and measurable outcomes supported by agreed benchmarks and targets
- Clear in terms of the roles, responsibilities and liabilities of the parties, and
- Inclusive of an agreed accountability process to monitor negotiations and outcomes from agreements.

Underlying many of the social problems experienced by Indigenous people is the inability to participate in meaningful employment due to a lack of education and training. Recent trends in the mining industry have demonstrated how such obstacles can be overcome if appropriate training is provided. The social charter of sustainability assessment would encourage companies to show how they will contribute to training and employment of Indigenous people.

The Pilbara iron ore companies, Rio Tinto and BHP now have a goal of 12% Aboriginal employment in their companies and are well on the way to achieving this. Rio has a goal of 80% local employment including 40% Indigenous employment by 2007 in its Kimberley operations at its Argyle diamond mine. Indigenous employment was 13.5% in 2002 after having been 4.6% in 1999 and will be 25% by the end of 2003. This means Rio are moving away from fly in/ fly out to a policy of 'localisation' based on training of Indigenous people. United KG, which performs construction and maintenance work for some of Western Australia's biggest resource companies, has signed a deal with ATSIC to give preferential jobs and apprenticeships to Aboriginal people in Western Australia's north. Other companies involved in regional development will be urged to set comparative targets. A similar process of education and encouragement has produced new attitudes and approaches to respecting and protecting Aboriginal heritage.

Regional agreements will increasingly be used to bring together all aspects of Indigenous Sustainability.

In short...

Vision

Western Australia will be a national leader in innovative and sustainable solutions to Aboriginal community development where reconciliation, negotiated regional agreements and Native Title lead to Aboriginal organisations with sustainable employment, while retaining their communities' cultural focus, and where Indigenous health indicators are the same as the rest of the population.

Objectives

- Regional agreements and, where applicable, Native Title will be used to recognise, protect and progressively help create Indigenous community sustainability.

- Natural resources are managed in a sustainable manner consistent with regional Aboriginal cultural understandings of sustainable resource management and development.

- Indigenous knowledge is incorporated in land management activities on all public and Indigenous lands to build skills in Indigenous communities and educate mainstream environmental and land management agencies and field workers.

- Programs are implemented to support the process of regional place narrative in Regional Sustainability Strategies (see Box 58 on Kodja Place in *Sustainability and settlements*)

- Future developments acknowledge and respect Indigenous cultural diversity.

Actions underway

- Implementation of the Statement of Commitment to a New and Just Relationship between the Government of Western Australia and Aboriginal Western Australians. This is developing the framework to create regional negotiated agreements to improve governance, capacity building and economic independence.

- Various programs to support the preservation of Indigenous culture.

- The Aboriginal and Torres Strait Islander Commission is supporting the development of comprehensive regional agreements and joint regional planning.

- The Department of Fisheries is working with the Aboriginal community to develop fishing strategies to ensure recognition of Aboriginal fishing interests and aspirations within the existing sustainable fisheries management framework.

- The Department of Conservation and Land Management is implementing joint management strategies for conservation lands and the government is committed to the development and implementation of policy and legislative mechanisms for Indigenous ownership and joint management of conservation lands.

- The government has committed to employ more Aboriginal people in the public sector particularly in senior levels and in decision-making roles.

- The Law Reform Commission is undertaking a Customary Law Project.

- The development of an Aboriginal Justice Plan, for the Indigenous Affairs Advisory Council, which will involve Indigenous people through regional and local partnerships to improve the delivery of justice services to Aboriginal people.

- The government supports the development of the Heritage Protection Agreement as a mechanism to balance Indigenous cultural heritage concerns with the need to expeditiously grant mineral exploration titles.

In short cont'd...

Actions

1.29 Implement an Indigenous Protected Areas Program to enhance long-term employment for Indigenous people in their regions, based on joint management, cultural heritage and training. These will be expanded in the longer term into partnership agreements and regional agreements under the Statement of Commitment to a New and Just Relationship.

1.30 Develop Indigenous 'place narratives' that will feed into Regional Sustainability Strategies and regional agreements as set out in the Statement of Commitment to a New and Just Relationship jointly agreed by the Western Australian Government and the Aboriginal and Torres Strait Islander Commission.

1.31 Use Indigenous names of places to help all Western Australians develop an enhanced sense of place and to assist Indigenous tourism.

1.32 Assist Indigenous communities to establish keeping places and interpretive centres to preserve and showcase Indigenous culture and support the intellectual property rights of Indigenous communities and artists.

1.33 Expand Indigenous cross-cultural awareness training within the Western Australian public sector, for all staff working with Aboriginal people, to build trust and improve service delivery.

1.34 Work with Indigenous and industry stakeholders to meet jointly agreed targets for Indigenous employment in major new resource development projects.

1.35 Continue to work in a collaborative manner with Indigenous Western Australians to enhance housing and health outcomes through improved service delivery.

Global opportunities

Western Australia is well placed to show global leadership on Indigenous sustainability through a practical program of initiatives, strategies and agreements. This can be a real contribution to global sustainability and become the basis for future employment in the global industry.

Further information

Government of Western Australia 2003, *Indigenous Ownership and Joint Management of Conservation Lands in Western Australia,* Consultation Paper July 2003, Department of Conservation and Land Management.
http://www.calm.wa.gov.au/projects/pdf_files/abpolicy/2003_indig_ownership.pdf

Kinnane, S 2002, *Beyond the Boundaries: exploring Indigenous sustainability issues within a regional focus*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Miles, N 2002, *Placer Dome, Mt Keith: gold and Indigenous development*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/grannysmith/grannysmith.htm

Ruane, S 2002, *Indigenous Tourism: sustainability issues and opportunities*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/indigenoustourism/indigenoustourism.htm

Stanton-Hicks, E & Newman, P 2002, *Argyle: 'creating a future'*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Argyle/Argyle.htm

> RESEARCH AND DEVELOPMENT FOR SUSTAINABILITY

Sustainability requires innovation in the economy. Government leadership is required to ensure research and development assists the sustainability agenda.

> *Most modern economic theories recognise the importance of innovation, technology and new ideas in generating sustained economic growth. Innovation, technology and new ideas are also crucial to achieving our social and environmental goals and these goals would be best achieved through a vibrant research and development community.*
>
> Chamber of Commerce and Industry

> *Many of the State's sustainability challenges ... require the development of new methodologies or technologies. The State's universities are an under-utilised resource in this regard. A closer alignment between the research activities (particularly in the natural and social sciences/engineering) and the needs of community to develop more sustainable practices would be a major contribution to the State's sustainability.*
>
> Western Australian Local Government Association

Many submissions called for more research and development for sustainability in Western Australia. The concept of sustainability facilitates innovation as it requires new synergies to be identified as well as 'systems thinking' to produce simultaneous outcomes for the economy, community and environment.

Government must work in partnership with other stakeholders to conduct research and development. In 1998-99 the Western Australian Government conducted research and development worth $92 million. During the same year industry undertook research and development worth $434 million, universities $225 million and Commonwealth government agencies $64 million. The State Government's Innovate WA program is designed to build on and extend this research commitment.

The Science Council was established in July 2001 and the Office of Science and Innovation was established on 1 July 2002 to provide support for the science community in Western Australia. The Centres of Excellence in Science and Innovation program is administered through the Office and provides funding support for commercially oriented research. Generally, centres are established as a partnership between universities, CSIRO, the private sector and/or public sector agencies.

The Office of Science and Innovation currently provides almost $7 million, or 30% of current program commitments, to ten centres that have a recognised focus on sustainability issues:

- Cooperative Research Centre for Sustainable Energy
- The Centre for Management of Arid Environments
- Centre for Organic Waste Management
- Cooperative Research Centre for Biological Control of Pest Animals
- Centre for Marine Science and Technology
- Centre for Water Research
- Centre of Excellence in Natural Resource Management
- International Environmental Technology Centre
- Centre for Sustainable Mine Lakes
- Cooperative Research Centre in Dry Land Salinity

The Centre of Excellence in Cleaner Production at Curtin University is funded through the Western Australian Government's Waste Management and Recycling Fund.

In February 2003 the Chief Scientist for Western Australia was appointed and together with the Science Council has agreed on a number of areas for future research. These include energy, environmental research in the areas of salinity and water, and the marine environment. All areas have the potential to expand sustainability objectives.

The government is also assisting in the establishment of a new centre called the Global Centre for Sustainability. This centre is a partnership between the five universities, CSIRO, the State Government and private industry. The aim of the centre is to develop partnerships around major international funding opportunities from the World Bank, AusAID and the Asian Development Bank. These large projects require innovation in sustainability that is often very evident in Western Australia, but this State is rarely considered for such projects. The Global Centre for Sustainability will facilitate the necessary support to seek out and form the government-university-industry partnerships so often needed to compete globally. It will begin by working on the methodology for Regional Sustainability Strategies which overseas development agencies are looking to use in future aid.

The Western Australian Government has undertaken a considerable amount of research and development in sustainability (see Boxes 19 and 20). There is a need to prioritise government research and development in sustainability and to encourage partnerships with other research and development groups in government, universities, CSIRO and industry. It is proposed that a Science Council–CSIRO forum on sustainability science be held with all relevant research and development groups to help develop priorities and partnerships, especially in the light of CSIRO's Healthy Country initiative (see Box 21).

BOX 19   BIODIVERSITY RESEARCH IN WESTERN AUSTRALIA

The Department of Conservation and Land Management (including the Herbarium) has a $10 million annual budget for 180 environmental research projects, primarily based on describing and documenting the State's biological diversity and how it can be conserved.

In Australia, some 6000 species are under threat and 40% of these are in Western Australia. Three mammal species have recovered and been removed from the threatened list as a result of research and management actions by the Department of Conservation and Land Management. The Botanic Gardens and Parks Authority has a budget of $0.8 million for similar biodiversity work. The Authority discovered the effect of smoke on the germination of native plant seed that has enabled the horticulture and landcare industries to access 20 per cent of the Australian biota previously considered unavailable for propagation. The Western Australian Museum also research bio- and geodiversity and recently won the Golden Gecko Award for its research and development with Woodside on the Dampier Archipelago. The Zoo conducts research on global biodiversity issues such as orang-utans as well as some native species. The biodiversity of the marine environment is only just beginning to be researched in comparison with other parts of the environment.

Sustainability science is emerging as a new discipline that integrates perspectives on large scale and regional scale sustainability issues, allowing scenarios to be drawn up and modelled (see Box 22).

BOX 20   NATURAL RESOURCE MANAGEMENT RESEARCH

The Water and Rivers Commission allocates between $1 and $3 million per year to jointly funded water management research projects. These projects include the development of a computer model to understand the extent and dynamics of all the groundwater aquifers in the Perth basin and how they are linked. This will enable government to decide how to optimise the use of the aquifers and minimise environmental impact. This million-dollar project is attracting world attention.

The Water Corporation spends $4 million on research and development a year and its MIEX plant, opened by the Premier in 2002, is a world first water purification plant based on joint research with CSIRO, that magnetically removes organic pollutants from water.

The Department of Environment allocated $5 million to research that allowed the establishment of clear environmental criteria for managing water in Cockburn Sound; enabled Pilbara air quality studies to reduce dust impacts; and supported air toxin research on personal exposure and health monitoring and the public health aspects of air quality.

The Department of Agriculture's research and development budget is the biggest in the State' total of $48 million per year. This reflects agriculture's value to the Western Australian economy of $4.6 billion per year. Research is conducted on new agri-industries, ecologically sustainable agricultural practices and protecting the resource base. The Department of Agriculture allocates around $11 million per year to salinity monitoring and management studies including rapid catchment appraisal work based on satellite imagery and data from 7000 bores linked to a database. The Department of Agriculture is also doing research on nutrient management in the Peel-Harvey, Wilson Inlet and Albany Harbours, including groundbreaking work with local community involvement in Denmark. An innovative project to remove phosphorus from the Swan-Canning system through 'Phoslock' technology has been developed jointly with UWA and CSIRO.

The Department of Conservation and Land Management has a number of biodiversity recovery catchments that are threatened by salinity, to ensure all is done to prevent loss of species. Lake Toolibin is being pumped to enable plant life to survive that would have died from saline invasion.

The Forest Products Commission spends $3.5 million per year on research into how salt-affected land can be remediated through reafforestation. With the Department of Conservation and Land Management they are investigating how oil mallees could help revitalise rural land and local communities through new industries and power generation.

The Department of Fisheries allocates $10 million to research and development to ensure the sustainability of the State's fisheries.

In a State as large as Western Australia it is important to have good data on the land and its resource base. Western Australia has internationally recognised research and development that is constantly tapping the new technology of satellite imagery and ground-truthing with detailed surveys. The Geological Survey maps geological resources. The Department of Land Information and the Leeuwin Centre map all land surface characteristics using different parts of the light spectrum to enable land management to be pursued. The proposed Cooperative Research Centre in Earth Observations will make more productive use of these data and make it more accessible to decision makers.

BOX 21   CSIRO 'HEALTHY COUNTRY' PROJECT

'Healthy Country' is one of CSIRO's seven 'Big Hairy Audacious Goals' that is redefining how CSIRO will do a significant proportion of its research.

One of four focus regions for this project will be the South West of Western Australia. The research undertaken on biodiversity, land degradation and water can provide answers to many of the deep questions that face us by focusing on key areas of knowledge and innovation. Research priorities will be determined through processes involving scientists, industry, the community and government.

The CSIRO will be seeking to undertake the significant research that can really make a difference, unlocking solutions to broad scale systems of land and water ecosystems as well as their human and social context. The State Sustainability Strategy recommendations and implementation will be closely tied into this project.

The Woylie is the world's first mammal species removed from the international threatened species list as a result of research and management actions by the Department of Conservation and Land Management.

Source: Babs and Bert Wells/ Department of Conservation and Land Management

BOX 22   SUSTAINABILITY SCIENCE AND THE ORD-BONAPARTE PROJECT

Many professions have developed around disciplines of knowledge that are largely isolated and self-propagating. The concept of sustainability challenges us to find new synergies and integration between the disciplines. Sustainability science is emerging as a way to tackle major issues that require the integration of science, social sciences and humanities with beneficial outcomes for the environment, the community and the economy.

The Ord-Bonaparte Project was established to facilitate sustainable development in the East Kimberley through a research partnership between the Federal and State Governments, scientists and the community. The Project is providing new understandings of the land; freshwater and marine ecosystems; issues related to fire and biodiversity; grazing and Aboriginal use of the land and the marine ecosystems; nutrient management in the irrigation system, extent of groundwater resources; and the overall scenario of how the Kimberley can be a model of sustainability within a region. See photo below.

In short...

Vision

Western Australia is recognised around the world as a global centre for research and development on sustainability that is not only innovative globally but is practical and relevant to solving Western Australia's problems.

Objectives

- Initiate research and development targeting sustainable outcomes for Western Australia's land, water, air and other natural resources.

- Make Western Australian industry and resource use more efficient.

- Facilitate Western Australia's involvement in the global sustainability economy.

- Create long-term jobs for Western Australians.

Actions underway

- Many State government agencies undertake research on sustainability issues.

- The Western Australian Government provides funding to support Centres of Excellence through the Office of Science and Innovation and other research organisations.

- The Institute for Regional Development has been established at the University of Western Australia.

- Edith Cowan University in Bunbury has established a Professorial Chair in regional development.

- The Department of Conservation and Land Management is publishing biodiversity assessments for all regions of the State, consistent with the National Land and Water Resources Audit's 2002 Terrestrial Biodiversity Assessment.

In short cont'd...

Actions

1.36 Use the Western Australian Major Research Facilities Program to successively establish globally significant research centres on the sustainability science associated with energy, salinity, water supply, and marine issues.

1.37 Build on the Global Centre for Sustainability as a partnership for sustainability research and development in Western Australia with a focus on attracting global research funds.

1.38 Continue to support bids for Commonwealth funding for cooperative research centres and other research funding programs related to sustainability.

1.39 Endorse the CSIRO's commitment to implement the Healthy Country initiative in the South West of Western Australia.

1.40 Establish an agricultural research institute to coordinate work currently undertaken by the Department of Agriculture, Curtin University of Technology, Murdoch University and the University of Western Australia, to increase economies of scale and better address agricultural sustainability issues.

Global opportunities

The global market for environmental technology has been estimated to be worth $1 trillion dollars and funding on global aid is similarly enormous. The strategies outlined above are designed to enable Western Australia to access these markets as well as solving many of the sustainability challenges of our own State.

Further Information

Centres of Excellence in Science and Innovation Program
http://www.dpc.wa.gov.au

Environmental Technology Centre, Murdoch University
http://wwwies.murdoch.edu.au/etc/

Premier's Science Council
http://www.sciencecouncil.dpc.wa.gov.au/

The Centre of Excellence in Cleaner Production, Curtin University
http://cleanerproduction.curtin.edu.au/

CSIRO technicians John Byrne and Gerald Watson drilling one of 80 new bores to monitor groundwater in the Ord River Irrigation Area. The network of monitoring bores has allowed CSIRO/Ord Bonaparte Project scientists to develop detailed models of groundwater in the irrigation area, and support the implementation of strategies to manage rising groundwater.

Source: Ord Bonaparte Project

> MEASURING AND REPORTING ON SUSTAINABILITY

To assess how we are progressing on the sustainability agenda it is essential to have a framework in place that allows regular reporting on progress against key sustainability indicators, and the provision of data that is publicly available and easily accessible. Information is critical to sustainability but it needs to be integrated and accessible.

Government must support community access to the latest research, data and technology to enable improved land management.

Environmental Alliance

A mechanism is needed to tell how we are tracking on the sustainability agenda in the management of the economy, community and the environment. This is to provide decision makers with a more complete picture of their region so they can make informed choices, increase community understanding about sustainability issues and measure progress against sustainability policies and targets.

Traditionally, economic measures, such as Gross State Product, have been widely used as surrogate indicators of progress and prosperity. While economic measures are important, they do not take into account environmental or social considerations. As strong economic performance does not necessarily equate to a healthy environment or an equitable standard of living, a set of headline sustainability indicators is required that measures (as a minimum) progress across the triple bottom line – economic, social and environmental quality.

Key indicators and targets for sustainability

Over the past five years there has been extensive work at the international, national, State and local levels to develop indicators and targets for sustainability. For example, the United Nations has been developing global indicators for sustainable development and in 2002 the Australian Government issued its first report on the National Headline Indicators for Sustainability. The Western Australian Government has developed a set of regional economic, environmental and social indicators. In most cases existing indicators do not adequately integrate social, economic and environmental aspects of sustainability.

To make effective decisions and policy true to the principles of sustainability, however, indicators are required that both reveal and validate the interrelationships between the environment, society and the economy. In this light, new integrative indicators have begun to emerge. These indicators, often termed 'true measures of progress' or 'quality of life', attempt to measure cause-effect relationships between the three components. Ecological footprint analysis is one such indicator (ecological footprint analysis provides an estimation of the area of land required to support a region's level of consumption).

The headline sustainability indicators outlined in Table 4 are designed to provide an overall guide for how Western Australia should be trying to move. They reflect the definition of sustainability and also relate to the sustainability principles. The real test for sustainability indicators is that they must integrate economic development, community action and government activity. Additional work will be required to develop a suitable set of integrative headline sustainability indicators for Western Australia.

Figure 5, over, demonstrates how current environmental, social and economic information systems can feed into a triple bottom line reporting program and eventually integrative sustainability indicators.

Table 4 Examples of possible headline sustainability indicators		
Desired sustainability outcomes	**Indicator measures**	**Measured by**
Wealth increasing inclusively	All economic activity including how wealth is distributed (as in Principles 1 and 2).	Gross State Product per capita or, when it is available, the Index of Economic Welfare (GSP amended to exclude negative externalities like road accident costs, crime costs). The ABS are developing a new indicator they are calling 'inclusive wealth' to help demonstrate distributional equity.
Ecological footprint decreasing	Energy use, waste, land & water use (as in Principles 3 and 4).	Ecological footprint index per capita as measured in the Australian State of Environment report.
Social capital increasing	Strength of community networks and interaction (as in Principles 5, 6 and 7).	Social capital index as used by the Department of Health or by a more fully developed index as suggested by the Western Australian Council for Social Services.
Sustainability governance improving	Extent to which sustainability is embedded in government (as in Principles 8, 9, 10, and 11).	Numbers of sustainability action plans, sustainability assessments conducted and sustainability annual reporting by agencies (combined index).
Sustainability awareness increasing	Extent to which community is aware of local and global sustainability issues (as in Principles 5 and 7).	New index based on a survey of selected key sustainability issues to test for awareness and interest in issues.

Figure 5 Towards headline sustainability indicators for Western Australia
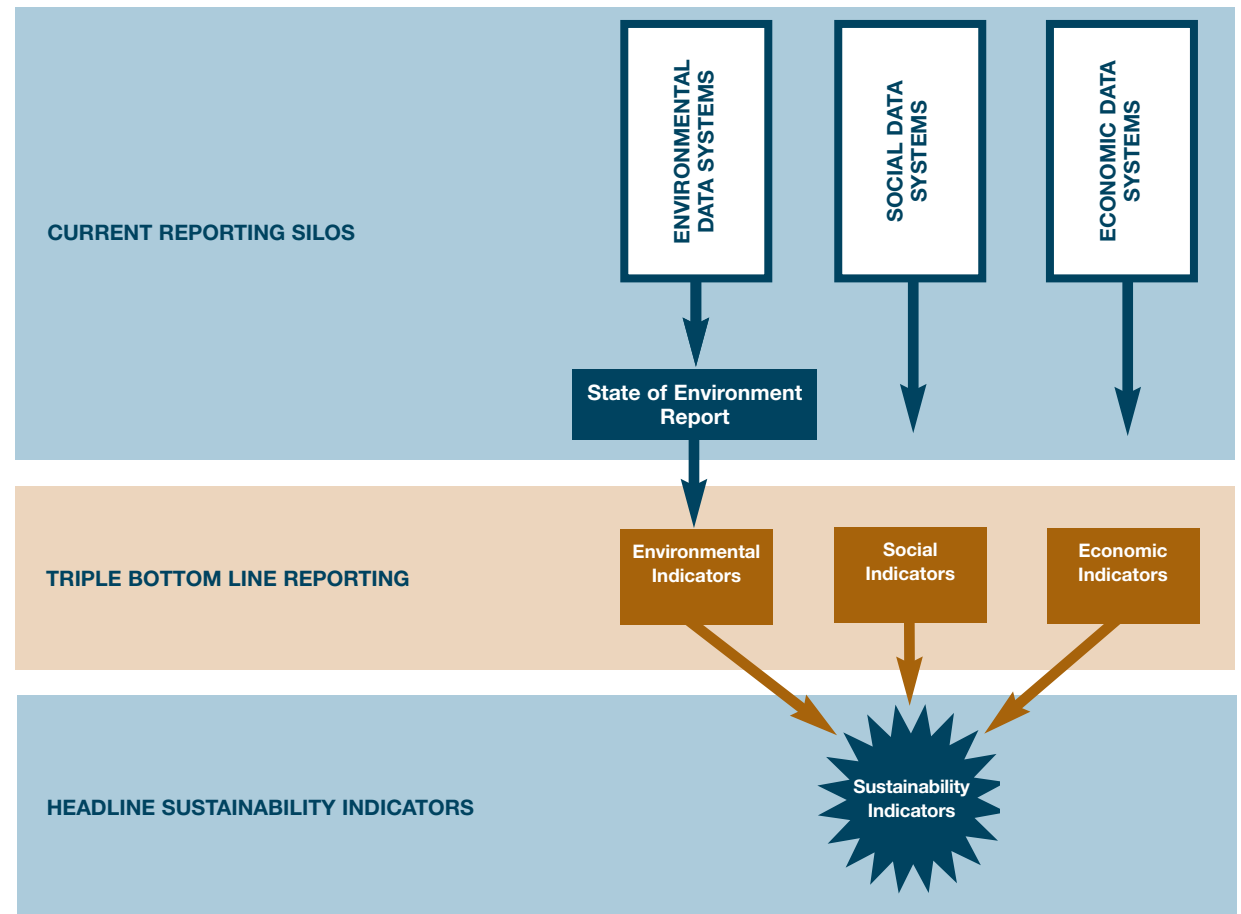
With a few exceptions, many integrative sustainability indicators have yet to be tested with any scientific rigour and, as such, lack the robustness to be applicable at the State or regional level. Until such time that integrative sustainability indicators are more fully developed, a triple bottom line reporting approach will provide a useful indication of Western Australia's progress towards sustainability. Accordingly, the Western Australian Government is looking to develop headline sustainability indicators to demonstrate Western Australia's progress across the triple bottom line and to assist with informing the community.

For headline and integrative sustainability indicators to be meaningful in terms of desired sustainability outcomes, they must be measured in the context of an agreed sustainability framework. Similar to an environmental management system approach, indicators should be able to detect change in sustainability resulting from sustainability policies and targets, thereby increasing transparency of process and enhancing our knowledge base for developing sustainable practices.

Sustainability and State of the Environment reporting

In terms of the environmental bottom line, Western Australia's State of the Environment (SOE) reporting program is the key mechanism for summarising the condition of the State's natural resources.

The SOE report discusses each of the State's key environmental issues in the context of the pressure-state-response model to assess the condition of the environment, the pressures being exerted upon it, and what is being done (or should be done) to mitigate those pressures. The SOE reporting program underpins the State Sustainability Strategy in the following ways:

- reporting on matters relating to the condition of Western Australia's natural environment
- facilitating the decision-making process to identify sustainable outcomes
- enhancing knowledge and understanding of environmental issues, and
- encouraging sound environmental practices and procedures to be adopted by the Western Australian government and local government.

Economic and social bottom lines also need to be reported on. The approach adopted through the State of the Environment reporting process needs to be expanded to enable reporting on all aspects of sustainability. This will be pursued through the State of Sustainability Report that will report progress on the implementation of the State Sustainability Strategy together with headline sustainability indicators.

Sustainability and the Western Australian Land Information System

Sustainability cannot be delivered without accurate, up-to-date and reliable land and geographic information. Geographic information helps us to understand and form effective strategies to address critical sustainability issues such as salinity, forest management, Native Title, land use conflict and infrastructure planning. Easy access to this information is crucial to the success of the State Sustainability Strategy.

The Western Australian Land Information System (WALIS) is a key avenue through which data relating to the provision of land and geographic information can advance the goals of the State Sustainability Strategy. Government will support coordinated approaches to the continued development of suitable land and geographical information.

The Western Australian Atlas is an interactive mapping service managed by WALIS and provides free access to reliable information to assist government, community and industry, to support improved environmental planning and decision-making. The Western Australian Atlas enables users to overlay different geographic datasets, including coastal, infrastructure, topographic and environmental themes, to meet their differing needs.

Information systems for sustainability

To report on Western Australia's progress towards sustainability, as well as enhance the capacity of community groups and agencies working on sustainability issues, environmental, social and economic data/information sources should be incorporated within an information system that is readily available to decision makers and the public.

To this end, current systems provide an incomplete picture of sustainability for Western Australia. This is largely the result of inconsistencies in the scale at which data for each of the three components of sustainability (social, environmental and economic) are collected and reported. For example, regular reports on economic data including the cost of living, inflation, unemployment etc., are consistent at the State scale. Yet, many occasional social measures are reported differently in each region.

Temporal differences in data can also pose difficulties for sustainability reporting. Up-to-date environmental data and information on natural resource management, for example, is often less available than current economic and social data. This means that assessing and reporting on progress towards sustainability at any particular time is difficult.

The Australian National Land and Water Resources Audit (NLWRA), a progressive information system available on the internet, has attempted to overcome some of these barriers. This system brings together relevant social, economic and environmental data for particular regions around Australia. Although measures are not integrated, the system is able to provide an estimate of progress across the triple bottom line. Programs such as the NLWRA will provide useful models for Western Australia to develop a State information system for monitoring, data analysis and reporting on sustainability.

Western Australia's Sustainability Online

The Western Australian Government will work to establish a Sustainability Online web site. Like the NLWRA online information site, Sustainability Online will be an atlas of Western Australian resources collating and eventually integrating economic, environmental and social information. This system will be designed to make information easily accessible to government, community and industry, and to service many users at a range of scales (local, regional and State).

This site will be a support tool for government to provide the public with an understanding of the state of the environment and sustainability issues in general. Access to a range of environmental data will result in easier and better decision-making on State development projects.

Initially this site will be the major source of up-to-date environmental information, to a large degree drawing on the outcomes of the SOE reporting program. However, in time it will include integrated social and economic data sources that support improved natural resource management as new indicators for progress towards sustainability emerge. It will also provide a portal to already functioning web sites on sustainability such as the Department of the Premier and Cabinet's sustainability web site and the Sustainable Energy Development Office web site among others.

Over time the site will include locally and regionally monitored community data of importance to the sustainability of that local or regional area.

The Western Australian Land Information System (WALIS) offers a coordinated focal point for accessing geographic information in Western Australia. The decision to design a new, more interactive website that provides access to the WA Atlas, was critical to ensuring that WALIS has a tool to engage, simulate and inform.

Source: Western Australian Land Information System

The system will, for the first time, incorporate a range of natural resource management spatial datasets including those created through:

- Land Monitor
- National Land and Water Resource Audit
- North West Shelf programs
- Salinity Action Plan
- State of Environment Report
- metropolitan air quality
- Greenhouse
- sustainability projects
- regional and catchment planning
- biodiversity data from several agencies
- water quality data.

The site will contain advice and policies generated by the Environmental Protection Authority, spatial data with mapping capabilities, metadata search and input tools, scientific reports, and other environmental statements and reports. Integration of the data at the regional scale will be attempted in the next few years as part of the development of regional sustainability strategies.

In short...

Vision

Headline sustainability indicators are regularly reported and widely available and inform the response of government, the community and business to the sustainability agenda. An internet one-stop-shop provides easy access for anyone wanting sustainability information from government.

Objectives

- Develop headline indicators for Western Australia that gauge progress across the social, environmental and economic dimensions of sustainability, in close consultation with all stakeholders.
- Regularly report on Western Australia's progress along the triple bottom line across government, the community and private sectors, using existing reporting mechanisms such as State of the Environment reporting.
- Improve access to sustainability information to increase the capacity of all stakeholders to make informed decisions about environmental and sustainability issues.

Actions underway

- A State monitoring and evaluation framework is being developed by the Environmental Protection Authority in consultation with the lead Natural Resource Management agencies that will prove information on the condition of the State's natural resources.
- The Land Monitor Project provides fundamental datasets for environmental monitoring and assessment.
- The Departments for Planning and Infrastructure, and Environment, Water and Catchment Protection have established an inventory within the online Western Australian Land Information System 'Interrogator' to provide a central database for storing government and non-government information (metadata) on Western Australia's natural resource datasets.

In short cont'd...

- The Department of Fisheries publishes an annual State of the Fisheries report that reports in detail on the activities and impacts of the commercial and recreational fisheries and aquaculture sectors in Western Australia.
- Web sites with considerable public information are available in most government agencies, e.g. Sustainable Energy Development Office, Water Corporation.
- A wide range of social and economic data are available from the Australian Bureau of Statistics that will underpin triple bottom line reporting for the State.

Actions

1.41 Through the Sustainability Roundtable develop headline sustainability indicators for Western Australia and regularly review and report this information.

1.42 Establish an ongoing State of Sustainability reporting framework to measure and report on the goals and objectives of the State Sustainability Strategy together with headline sustainability indicators and environmental, economic and social 'bottom lines'.

1.43 Work to establish Sustainability Online as a source of sustainability information in Western Australia.

Global opportunities

The problem of integrating data and making it accessible to the public is a universal issue. If Western Australia can adequately address this issue it will be of global significance. The involvement of the staff of the Department of Land Administration in global development projects has shown how our land data systems can be of value in major aid projects.

Further information

Australian Bureau of Statistics
http://www.abs.gov.au

Department of Environment
http://www.environ.wa.gov.au/

Environment Australia National Headline Indications for Sustainability
http://www.ea.gov.au/esd/national/indicators/index.html

Sustainable Energy Development Office
http://www1.sedo.energy.wa.gov.au/

United Nations Global Indications for Sustainable Development
http://www.un.org/esa/sustdev/isd.htm

Western Australian Atlas
http://www.walis.wa.gov.au/content/wa_atlas_popup.html

2 Contributing to global sustainability

Vision for Western Australia

Western Australia contributes to the solution of global sustainability issues particularly population pressures and poverty, climate change, threats to biodiversity, and oil vulnerability and in so doing creates significant local opportunities for new jobs in the rapidly growing sustainability economy.

Goal

Play our part in solving the global challenges of sustainability.

Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a daily reality for all the world's people.

Kofi Annan, Secretary General, United Nations (March, 2001)[9]

Ecologists understand that all economic activity, indeed all life, depends upon the Earth's ecosystems. Economics knows how to translate goals into policy. Economists and ecologists working together can design and build an eco-economy, one that can sustain progress.

Lester Brown[10]

Sustainability gained wide acceptance globally in the 1980s. It was a political response to the tension that existed between the ecological perspective, which highlighted the impacts that development was having on the Earth, and the social justice perspective which argued that the 1 billion people whose basic needs were not met needed development to provide housing, health care and jobs.

In 1987 the Brundtland Commission attempted to resolve this tension by saying that it was possible to redefine development so that it enabled the poor to benefit and did not increase the burden on the world's ecological systems. Sustainable development required that social and ecological considerations be incorporated fully into economic development not 'bolted on afterwards', and required economic decisions to occur within an ecological and social context.

In this section, the State Sustainability Strategy considers the global sustainability agenda and suggests how Western Australia can contribute to global sustainability. Economic opportunities are also emerging for nations and states that take the sustainability agenda seriously and these are highlighted.

Because global sustainability issues occur in a global context it is necessary for most international negotiation to be conducted by national governments, e.g. on issues such as immigration, foreign aid and climate change. Nevertheless for all such negotiations and contributions to sustainability issues, there are significant ways that States like Western Australia can contribute. This is primarily because land and water, biodiversity, rural and urban infrastructure, and most community issues, are in the main State responsibilities.

The role of States in global sustainability will be enhanced through the Network of Regional Governments for Sustainable Development, of which Western Australia was a founding member.

The Strategy identifies four key areas that provide opportunities for Western Australia to contribute to global sustainability:

- Population, development aid and environmental technology
- Maintaining our biodiversity
- Responding to greenhouse and climate change
- Oil vulnerability, the gas transition and the hydrogen economy.

[9]K Annan (Secretary General United Nations) 2001, *Secretary General calls for break in political stalemate over environmental issues*, media release, United Nations, 14 March.

[10]L Brown, Eco-Economy, Norton, 2001, p. 4.

> POPULATION, DEVELOPMENT AID AND ENVIRONMENTAL TECHNOLOGY

The government will participate in the global sustainability agenda to reduce global population growth, contribute to development aid, reduce consumption and improve technology.

The World Bank has reported that there are now 25 million environmental refugees. The world population today is divided between the high consumer, high living standard nations with near stable populations and the desperately poor in the third world countries whose populations are growing rapidly. The world's richest nations with 20% of the world's population account for 86% of the world's consumption while the poorest 20% of the world's people account for only 1.3%.

Sustainable Population Australia (WA)

The global population needs to stabilise, as a continuously growing population undermines sustainability. The world's population increased to 6.2 billion in 2001, more than double the population in 1950,[11] though recent estimates suggest that if birth rates continue to decline then the population may stabilise at 8 to 9 billion.[12] About half the anticipated reduction in population growth is due to fertility decline (most developing countries moving rapidly to replacement levels of 2.1 children per household) and half due to AIDS.

Population issues and the capacity of Western Australia to absorb growth are considered under *Sustainability and settlements*, particularly the sections on *Our Water Future* and *Managing urban and regional growth*. This section largely concentrates on the global aspects of population and what Western Australia can do about it.

Extensive evidence suggests that high birth rates in developing countries begin to drop quickly when:

- women are educated
- people have enough food so that their children don't have to work
- there is political security
- children attend school
- basic health care is provided, and
- some form of social security is available.

Social and economic development is therefore critical to stabilising global population growth and it is important to consider what Western Australia can do to play its part in addressing this fundamental sustainability issue.

Some Western Australian firms and individuals are already involved (see Box 23) as are non-government organisations, such as Oxfam Community Aid Abroad, and government agencies (see Box 24). The Western Australian government also has a number of sister-state relationships overseas which frequently involve exchanges related to sustainability.

[11]D Nierenberg, 'Population Growing Steadily', Vital Signs 2002-2003, Earthscan Publications Ltd, London, 2002.

[12]United Nations Population Division, World Population Prospects: The 2000 Revision, Volume III: Analytical Report, United Nation, NY, 2002.

BOX 23   HARRY NESBITT: THE RICE GOD OF CAMBODIA

Harry Nesbitt, a Western Australian scientist, went to Cambodia on an Australian aid project to help reconstruct agriculture after the 'killing fields' virtually destroyed rice-growing capability. Over thirteen years Harry developed a team who identified the best rice to use for local conditions and trained people in new production techniques. Cambodia is now an exporter of rice and Harry's contribution has been recognised by many international and Cambodian awards as well as with an Order of Australia in 2003.

Western Australia can play its part in supporting development by encouraging research on sustainability technologies with a global sustainability focus and ensuring government agencies are sharing their expertise with developing countries. Many agencies are already involved in aid projects providing expertise through funding provided by the Asian Development Bank, selected UN agencies, the World Bank and bilateral donors such as AusAID. New

BOX 24   GOVERNMENT AGENCY INVOLVEMENT IN OVERSEAS PROJECTS

Western Australian government agencies have been involved in overseas aid projects for many years. AgWest International is the international project unit of the Department of Agriculture. This unit is undertaking work in:

- East Timor - developing maps on agriculture and training locals to create maps through GIS
- India - training people in apple production techniques
- Vietnam - potato production training
- China - training in livestock, post harvest and crop production techniques
- Middle East - training in horticulture and livestock in Egypt and Jordan.

The Department of Land Information, is working in Bangladesh, Sri Lanka and East Timor on developing land titling and administration systems that are critical to enable financing for any development.

Environment agencies are involved in pollution control projects in Indonesia, Vietnam and Thailand, after long term involvement in several Middle East countries. The Water and Rivers Commission conducted a detailed water plan for the Sultanate of Oman.

The Department of Education and Training, through TAFE International WA, has recently won a $50m oil and gas training project in Qatar. Training projects have been undertaken in China, East Malaysia, Hong Kong, Mauritius and the United Arab Emirates. Training international students who come to study in Western Australia is an important contribution to international development, contributing some $600m annually to Western Australia.

The Department of Industry and Resources has projects in Leeds (UK) on its GEMS technology and with the Asian Development Bank on electronic procurement strategies. The Department has also delivered a number of overseas projects related to mining, oil and gas exploration and development, the administration of mining tenements, environmental assessment and legislation. Projects have been undertaken in Eritrea, Pakistan, Ethiopia, Mongolia, China, Vietnam, Hong Kong, Myanmar, Sri Lanka and India. The biggest project involved a series of training exercises through the Channar Fund in China.

opportunities can also be pursued through the trade agenda. The government can encourage reduced resource consumption through a variety of initiatives and undertake research to better understand the relationship between population and consumption issues in Western Australia.

Given its location on the Indian Ocean, Western Australia has a special advantage over other States in developing social and cultural and trading relationships with the countries of the Indian Ocean Rim and other overseas destinations. Cultural understandings are central to sustainability and development of business, trade, social and security relationships in the region. The arts and cultural sector is particularly well placed to assist Western Australian trade and industry to exploit these relationships through research and exhibition partnerships, cultural exchanges and sharing of cultural maintenance and conservation skills. Similarly, the Western Australian Museum can contribute to global sustainability by forming networks and partnerships with museums worldwide. This fosters dialogue, research, ideas and actions to clarify and expand the role of museums in securing a sustainable future for their communities.

Population, consumption and technology

It is obvious that many sustainability issues are related and overlap. Addressing sustainability will require recognising these relationships and seeking ways to resolve them. Population influences many different issues and this was reinforced by many submissions. In particular, submissions pointed to the links between population, consumption and technology (see Box 25).

The Strategy will address consumption and technology by suggesting audit processes such as ecological footprinting, highlighting the many ways of reducing unnecessary and wasteful resource use, and the technologies that offer hope in many areas.

BOX 25   POPULATION X CONSUMPTION X TECHNOLOGY

Professor Paul Ehrlich defined global environmental impact as a combination of three factors based on the simple formula:

I	=	P	R/P	*	I/R
Input		Population	Consumption of resources per person		Technological impact per unit of resource used

Ehrlich and many others emphasise population as the issue; others tend to suggest the real problem is consumption or lifestyle, and others emphasise technology. This Strategy will try to account for all three factors and to find the opportunities that this difficult formula presents.

BOX 26   WESTERN AUSTRALIAN INNOVATIONS IN ENVIRONMENTAL TECHNOLOGY

Source: Orbital Engine Corporation

Orbital Engine Corporation

Orbital Engine Corporation has developed a 2 stroke motorbike engine that has much reduced emissions. The economic opportunities and the air quality improvements for smoggy Asian cities are significant. The 4 stroke car engine has been demonstrated to provide significant air quality benefits as well.

Source: Peter Newman

Ecomax and Biomax

Ecomax and Biomax are two of several Western Australian companies that have developed small-scale sewage treatment systems and are also involved in several aid projects. One such project provided sewage treatment to a squatter village in Indonesia and demonstrated that a small community can manage waste and improve health with the aid of these simple new technologies.

Some general points will be made first about the global context though most of the detail on consumption and technology will be found in particular issues in the Strategy.

One side of the sustainability debate asserts that there is a case for the poor of the world to have greater access to the fruits of the earth. The other side of the debate asserts that overall the world should learn to reduce its ecological footprint—to learn to live with less energy, less water, less materials and less land. Both should be possible.

There is a new market for firms that can demonstrate resource efficiency while improving quality of life, and a need for infrastructure and government processes to facilitate this. Such opportunities will become important parts of the new global economy. For example, if people in Western Australia can show how they can adapt to living with a more constrained use of water, then this will have global ramifications. Many other examples of how reduced consumption can be achieved, while improving quality of life, are outlined in the Strategy, including through procurement, full life cycle assessments, greater use of recycled materials in buildings, stronger local communities and so on.

There are many global processes attempting to guide technological development so that it is more sustainable. Increasingly it is found that small-scale renewable energy systems or clever waste management or more energy and water efficient buildings, are not just for villages in the developing world, but for everyone.

Environmental technology is the fastest growing area of technology today. The global market is conservatively estimated at $1 trillion by a recent Federal Government report that said, 'We are entering the era of sustainability, with the environment industry moving into the mainstream of business life.'[13]

This report urges Australians to invest in sustainability, as there are endless opportunities for innovation and employment in this global market. Already in Western Australia there many firms and individuals developing globally significant environmental technology (see Box 26).

As part of the approach to global sustainability that recognises the role of environmental technology in solving the sustainability problems of the future, the government will support a number of initiatives including promoting Western Australian environmental technologies and facilitating research and development (see *Research and development for sustainability*).

In short...

Vision

Global population is stable and consumption is reduced to achieve a smaller 'ecological footprint' through sustainable technology and management. Basic needs are met for all people and global ecosystem processes are restored and in balance with human needs. Western Australia contributes significantly to this transition.

Objectives

- Ensure that Western Australia takes part in the global economy through environmental technology.

- Enable Western Australia government agencies, industries and non-government organisations to be linked into global aid programs that can assist in grass roots development and population control.

- Facilitate education at all levels about global sustainability issues, including population.

- Create new opportunities for research and development on global sustainability issues to ensure that Western Australia is well placed to contribute to major global aid projects.

[13]Leaders Group, *Investing in Sustainability*, Department of Industry, Science and Resources & Environment Australia, Canberra, 2001.

In short cont'd...

Actions underway

- Research and development in environmental technology is facilitated through funding research bodies such as Curtin University's Centre for Cleaner Production and Murdoch University's Intenational Environmental Technology Centre—now a UN funded Partnership Centre for the Asia Pacific region.

- Department of Fisheries provides advice to Indonesia and the Pacific Islands on fisheries management practices and associated issues.

- Perth Zoo fosters a strong in-situ conservation ethic by participating in internationally renowned conservation breeding programs, for example Sumatran tigers and Sumatran orang-utans.

- The government provides some industry facilitation in support of global environmental technology markets.

- Some local industries and universities are involved in global sustainability markets.

Actions

2.1 Facilitate the development of the Global Centre for Sustainability to bring Western Australian expertise into global development aid projects and facilitate global contributions to sustainability.

2.2 Encourage the Commonwealth Government to increase its commitment to aid projects for global sustainability.

2.3 Assist government agencies where appropriate to be positioned to secure or participate in global aid projects in developing countries.

2.4 Promote market development of Western Australian environmental technologies in global trade and aid through the International Development Business Unit in the Department of Industry and Resources.

2.5 Facilitate research and development in environmental technology through the support of new and continuing State Centres of Excellence in Science and Innovation and Commonwealth Cooperative Research Centres.

Global opportunities

There are considerable and growing economic opportunities for Western Australians to be involved in the global sustainability issues of population, development aid and environmental technology. Government agencies can become significant participants in this global economy, particularly in aid projects, which often require substantial government involvement for credibility and capacity building. Partnerships with business and researchers will be made through the Global Centre for Sustainability to attract large aid projects to Western Australia. The key step is for Western Australians to recognise that their innovations in sustainability have global significance.

Further information

Australian Government Overseas Aid Program
http://www.ausaid.gov.au/

Maher, K. *The Environmental Technology Centre: a case study for sustainability*,
http://www.sustainability.dpc.wa.gov.au/CaseStudies/ETC/environmenttechnologycentre.htm

United Nations Environment Program, International Environmental Technology Centre
http://www.unep.or.jp/

> MAINTAINING OUR BIODIVERSITY

Western Australia's biodiversity is globally significant—it is one of the world's 'hotspots'. Conserving biodiversity is a global responsibility.

There has been significant loss of biodiversity through impacts from various developments and over-exploitation of natural resources. Biodiversity loss continues as a result of salinity, over-grazing, invasive species and diseases, habitat loss for developments, wetland degradation, altered fire regimes and climate change.

Western Australia cannot have a truly sustainable future unless we all work to eliminate biodiversity loss in all of our areas of enterprise.

Biodiversity is the key to maintenance of the world as we know it… It holds the world steady.

E.O. Wilson, 1992

Biodiversity is a combination of the words biological diversity. In its broadest sense, the term 'biodiversity' refers to the variety of life, encompassing all living things. Most treatments of biodiversity, however, consider only the living components that occur naturally in the landscape and thus exclude ourselves and the plants and animals we have imported, whether that import was intentional or not. In this strategy we will follow this convention and consider biodiversity to only cover the naturally occurring living elements of the landscapes and seascapes of the State.

The National Strategy for the Conservation of Australia's Biological Diversity (the strategy) was signed by the Prime Minister and all State Premiers and Territory Chief Ministers in 1996. The strategy defines biological diversity as:

'the variety of all life forms – the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part.'

The strategy identifies that biological diversity needs to be considered at three levels:

- genetic diversity – the variety of genetic information contained in all of the individual plants, animals and microorganisms that inhabit the earth

- species diversity – the variety of species on earth and

- ecosystem diversity – the variety of habitats, biotic communities and ecological processes.

Biodiversity provides the natural biological processes upon which we depend for our survival. The air that we breathe and the food we eat have been produced at least in part as a result of biodiversity.

Biodiversity is valued by our society for a variety of reasons, many relating to the services that it provides to maintain our well-being, or the ethical notion that we have a stewardship responsibility to protect all of the naturally occurring plants and animals. A biologically diverse environment also provides resilience to change and maximises the chances of recovery of ecosystems following natural disasters or human impacts.

Australia has been isolated from the rest of the world for millions of years. This isolation has led to the development of thousands of unique species of flowering plants, hundreds of unique vertebrate animals and countless unique invertebrates and microorganisms. At the State scale, Western Australia contains a rich variety of landscapes and seascapes that support a high degree of endemic terrestrial, aquatic, subterranean and marine biodiversity that in many respects matches or exceeds the levels of biodiversity in other States, with, for example, over 50% of Australia's flowering plants found within this State. This is partly attributed to the large size of the State, but also to its isolation from the rest of Australia (mostly separated by desert and highly arid lands) and its isolation from the rest of the world.

Western Australia's biodiversity is very important on a global scale. Some of the key features of the State's biodiversity are listed below.

- The South West Region of Western Australia has recently been identified as one of only twenty-five Global 'Biodiversity Hotspots'[14] due to the high number of species it supports, the high degree of endemism of these species, and the degree of threats to these biodiversity values. No other part of Australia has achieved this recognition. The Fitzgerald River National Park for example has as many species of plants as the whole of the Murray Darling Basin (around 100 times the area of the Park).

- The west coast of Western Australia (between the North West Cape and Perth) is also recognised as one of the eighteen world tropical marine biodiversity hotspots, ranked second in terms of endemism.[15]

- The State's marine ecosystems are diverse in species, although their values are poorly documented. The coral reefs off the west coast of the State are of particular global significance.

BOX 27 SCALE AND BIODIVERSITY OF WESTERN AUSTRALIA

- 2.5 million km[2] of land area
- 27,000km of coastline
- 26 of Australia's 80 biogeographic regions (from sub-alpine to tropical rainforest and desert), with 8 ranked high or very high priority, 11 as moderate priority and 7 as low priority for further conservation reservation
- 149 of Australia's 210+ mammals including 25 that are endemic
- 439 reptile species, including 187 that are endemic
- 1600+ fish
- Unknown enormous diversity of invertebrate animals
- 12,000+ species of vascular plants (8,000+ described)
- Unknown total number of non-vascular plant species (1500 described)

Past substantial declines in Western Australia's biodiversity were largely a result of widespread land clearing, salinity, over-grazing, weeds, introduced animals, draining and filling of wetlands, and pathogens such as *Phytophthora cinnamomi*. As well, there are newly emerging issues that have the potential to impact on biodiversity. For example, there are the now widely accepted risks of climate change and the risks that genetically engineered organisms and other genetically manipulated material could escape into the wild and affect the reproduction of naturally occurring plants and animals.

Effective biodiversity conservation is inextricably related to issues such as landuse planning and development, greenhouse gas abatement, and the management of natural resources.

The State's global biodiversity conservation values, and our responsibilities to conserve these, are well recognised, and there are increasing global processes to monitor our performance in the management of these values. Whilst we have a moral obligation to ensure that Western Australia's special biodiversity status is recognised and maintained, the State has entered agreements with the

[14] Myers et al. 'Biodiversity hotspots for conservation priorities.' Nature Vol 403.24 February 2000. pp. 853-858.

[15] Roberts et al, 'Marine Biodiversity Hotspots and Conservation Priorities for Tropical Reefs', American Association for the Advancement of Science, vol. 295, 2002, pp.1280-4.

Commonwealth to implement the Commonwealth's obligations under international treaties related to biodiversity such as:

- Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, Iran, the Ramsar Convention)
- Asia-Pacific Migratory Waterbird Conservation Strategy: 2001-2005
- Montreal Protocol on Substances that Deplete the Ozone Layer
- Convention on Biological Diversity (Biodiversity Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and
- Convention for the Protection of the World Cultural and Natural Heritage (World Heritage Convention).

The responses to date to Western Australia's biodiversity conservation obligations include:

- The ongoing establishment, protection and maintenance of the State's terrestrial conservation reserve system. As at 30 June 2003 terrestrial reserves covered 16,757,613 hectares or 6.6% of Western Australia's land area, with a further 4,748,241 hectares of pastoral leases purchased to be incorporated as reserves and a further 698,790 hectares of forest land identified for inclusion under the government's 'Protecting our old-growth forests policy'. The total project area once these lands are incorporated is 22,204,644 hectares or 8.8% of the State's land area, still short of the 15% benchmark target. The government has also identified a further 1,466,421 hectares of pastoral lease it is seeking to have excluded at the time of pastoral lease renewal in 2015 for incorporation into the reserve system.

- The ongoing establishment, protection and maintenance of the State's marine reserve system, with a total of 1,145,940 hectares of marine park and marine nature reserves in place as at 30 June 2002. The government is also establishing new marine reserves at Jurien Bay, and in the Montebello/Barrow Islands, Dampier Archipelago, Geographe Bay to Cape Leeuwin area, and the Walpole-Nornalup area.

- Ongoing major programs for threatened species and threatened ecological community recovery, including actions by recovery teams involving community, government and scientific institutional members. The implementation of the Western Shield program for the control of foxes has led to the recovery of three native mammal species to the extent that they have been removed from the State's list of threatened fauna. **The woylie is one of these species and has also become the world's first mammal species removed from the international threatened species list, maintained by the World Conservation Union, as a result of management recovery action.**

- The continuous improvement in the conservation management of the Shark Bay World Heritage area. Two of the six pastoral leases in the area have been purchased for conversion to conservation reserve.

- The expansion of World Heritage Areas within the State with the proposed nomination of Ningaloo Marine Park and Cape Range National Park in addition to the successful listing of the Purnululu National Park in 2003, joining the long-established Shark Bay World Heritage area.

- The inclusion of twelve State wetlands in the global list of Wetlands of International Importance under the Ramsar Convention, as areas managed and monitored to ensure the ongoing conservation of their special biodiversity conservation values.

- The ending of old-growth forest logging and the forthcoming establishment of thirty new national parks, which will assist the State in establishing a comprehensive, adequate and representative conservation reserve system.

- The State has contributed native seeds of a number of poorly known species to the Millennium Seed Bank Project for flora conservation at the Royal Botanic Gardens, Kew, south of London, as a cooperative effort between the Department of Conservation and Land Management, the Botanic Gardens and Parks Authority and the Royal Botanic Gardens.

- Ongoing research and conservation programs on Western Australia's biodiversity by the Perth Zoo, the Botanic Gardens and Parks Authority, the Department of Conservation and Land Management and the Western Australian Museum, which are contributing to an increased knowledge and understanding of the State's biodiversity, and are providing the basis for the conservation and recovery of biodiversity.

- The release of the Government's Consultation Paper 'A Biodiversity Conservation Act for Western Australia' in December 2002 signalled the government's intention to repeal and replace the outdated *Wildlife Conservation Act 1950* with a new Biodiversity Conservation Act for the 21st century. The proposed new Act will provide a whole new suite of initiatives and controls to greatly increase our capacity to conserve biodiversity including new community partnership provisions, while also providing a sustainable future for our human communities. The government has also announced an intention to establish a Biodiversity Conservation Strategy to assist in guiding the implementation of the proposed Biodiversity Conservation Act and biodiversity conservation across all activities.

BOX 28   BIOREGIONAL SURVEYS FOR WESTERN AUSTRALIA

The Government's environment policy includes a commitment to *'complete the program of comprehensive bioregional surveys designed to establish an inventory of the State's terrestrial and aquatic biodiversity and to identify areas of significance for nature conservation'*.

The Department of Conservation and Land Management (often with the assistance of the Western Australian Museum and scientists from other organisations) has a long-standing commitment to undertaking regional biogeographic surveys of the State.

Since the 1970s, the Department and its predecessors have conducted and published major regional surveys of the Eastern Goldfields, Nullarbor, Kimberley rainforests, and the southern Carnarvon Basin. A survey of the Wheatbelt (as part of the State Salinity Strategy) is nearing completion. Other completed major surveys include those of the Great Sandy Desert, parts of the southern forests and numerous existing and proposed conservation reserves.

The Pilbara biological survey is the current priority and commenced in July 2002.

Biodiversity research and conservation programs in Western Australia are varied, and carried out by a number of different agencies, industries and interest groups (see *Research and development for sustainability*).

Recent research has demonstrated the valuable role that the Woylie (Bettongia penicillata) plays in the regeneration of sandalwood trees and illustrates how biodiversity conservation is intimately related to the development of sandalwood as a native biological resource.

Source: Babs and Bert Wells/ Department of Conservation and Land Management

BOX 29   CACHING OF SANDALWOOD SEEDS BY THE WOYLIE IN DRYANDRA WOODLAND, DEMONSTRATING A RANGE OF SUSTAINABILITY BENEFITS THROUGH BIODIVERSITY CONSERVATION

Sandalwood (*Santalum spicatum*) is a hemiparasitic tree that is native to Western Australia. The scented heartwood of sandalwood is valuable for the production and marketing of sandalwood oil, an export industry that is worth more than $10 million annually. Since European settlement, a decline in the natural distribution of sandalwood has been observed. This has largely been a result of widespread land clearance in the agricultural region and inappropriate land use and land management practices, in combination with the naturally poor seed dispersal of the species.

In the past, it was speculated that the woylie (*Bettongia penicillata*) played an important role in dispersing and caching (hoarding) sandalwood seeds, and that the decreasing number of woylies due to habitat destruction was partially responsible for the low recruitment of sandalwood populations. This speculation was tested in 2002 by Murdoch University Honours student Marie Murphy. In conjunction with the Forest Products Commission, Ms Murphy carried out a study to examine the relationship between woylies and sandalwood to determine if woylies do actually play a role in the distribution and recruitment of sandalwood through the caching of sandalwood seeds.

The study was carried out in Dryandra woodland, where woylies occur, and in Wickepin, where there are no known woylies. The study found that in areas where woylies were present, they collected and buried sandalwood seeds in caches away from the parent tree, therefore assisting in the broader distribution and regeneration of sandalwood trees. In areas where woylies were not present, juvenile sandalwood trees were fewer, and were generally found to occur under the crown of the parent tree. The findings of Ms Murphy's study suggest that past speculations about the relationship between sandalwood and woylies are correct; and the findings will be valuable for designing a silvicultural system that mimics natural processes and for the establishment of sandalwood recruits.

This illustrates how biodiversity conservation and the potential for sustainable use of a native biological resource (sandalwood) can be intimately linked. See photo below.

Source: Murphy, MT 2002, 'Caching of sandalwood seeds (*Santalum spicatum*) by the woylie (*Bettongia penicillata*) in Dryandra Woodland: Implications for the development of a sustainable sandalwood industry in Western Australia.' Unpublished thesis, Murdoch University, Western Australia.

In addition to attempting to ensure that Western Australia's biodiversity is adequately conserved, it is also important to acknowledge the growing demand in the use of natural biological resources. It is essential that the use of biological resources in industries such as wildflower picking, seed collection, and emu and crocodile farming is ecologically sustainable. These industries not only provide economic benefits to the State, but their sustainable use provides an incentive to conserve and protect these resources and the habitats they depend on in perpetuity. Bioprospecting in Western Australia is a relatively new concept that has particular potential to be economically viable, whilst, at the same time, provide benefits to biodiversity conservation. The role of traditional knowledge in bioprospecting is also a matter that is receiving increased attention.

The global market for nature-based tourism and recreation is large and growing rapidly. It is critical that future developments based on this industry are consistent with sustainability principles so that the biodiversity on which the tourism depends is adequately conserved for the future growth of this industry.

Community awareness, support and involvement in biodiversity conservation in Western Australia is integral in meeting our biodiversity conservation objectives and strategies. Many conservation and research programs undertaken in Western Australia are accessible to members of the public, as volunteers (Box 30) or as participants of the Department of Conservation and Land Management's Landscope Expeditions.

BOX 30   VOLUNTEERS AT THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Volunteers in nature and biodiversity conservation express the Western Australian spirit that is so fundamental to sustainability.

Throughout Western Australia, the Department of Conservation and Land Management has 5,000 volunteers who help manage the State's National Parks and reserves, assist with maintenance of plant collections at the Western Australian Herbarium and care for injured wildlife.

Volunteers range from young students who volunteer on weekends and during their holidays, to retirees people who may spend several days a week on the job. Volunteers are given significant responsibility and have training commensurate with this.

As Keiran McNamara, A/Executive Director of the Department of Conservation and Land Management, says, 'Our volunteer program is a key part of working with the Western Australian community'.

There are obvious social dimensions to biodiversity conservation activities. The importance of activities like nature-based tourism and community-based nature conservation is not just economic, but it is part of what defines our identity as Western Australians and as local communities. Western Australians are proud of the State's wildflowers, interesting fauna, and vast landscapes, and this is an important part in defining our 'sense of place' in our community. Box 31 outlines how the Malleefowl Preservation Group has helped generate a sense of community in the Gnowangerup area.

BOX 31   IT'S 'GNOW' OR NEVER ...

The Malleefowl Preservation Group formed ten years ago with the goal of saving the Gnow bird, Nyoongah for malleefowl. By the 1980s, the bird on the Gnowangerup Shire emblem appeared to be endangered. The local community began to rally around the cause of saving habitat and protecting the malleefowl from foxes and cats.

A sophisticated network tracks the birds to their nesting mounds and informs local action to protect them. Fences are constructed and people even camp nearby for critical phases of the nesting. Intensive baiting of feral animals is also undertaken.

Suzanne Dennings, the President of the Malleefowl Preservation Group, says that the local community has been strengthened by their actions to save the malleefowl: 'Not only do we share a common interest but it has helped us all to get to know and love our local environment so much more. As a result the broader issues of managing the land more sustainably are able to be addressed.'

The vision of the group is to construct wildlife corridors through private farms linking known malleefowl sites to reserves. These corridors are being planned to stretch 1500 km north-south and are attracting enormous support from farmers and community groups keen to link their actions to a major visionary conservation exercise. They are part of the Gondwana links project (see *Sustainable agriculture*).

A heritage centre called Yongegnow is being planned in nearby Ongerup, which will be a major tourist attraction focussing on the malleefowl and its habitat. The story of Ongerup and similar towns is a reflection of the status of this 'icon' bird and hence its revival and rehabilitation is an important part of the revival of the region. The Yongegnow centres will act as a scientific base where eggs will be incubated and taken to new areas along designated malleefowl corridors.

The Malleefowl Association plays a critical role in defining the character of the communities of the southeastern wheatbelt and helps to create a clearer sense of their future. See photo below.

Indigenous involvement in biodiversity conservation and land management is an integral part of Aboriginal history and culture (read about Mike Hill who is featured in the Sustainability WA exhibit on the CD-ROM), and plays an important role in improving our understanding of biodiversity conservation and land management in Western Australia. The Western Australian Government is now moving to recognise how this can be directed into creative public and private enterprises. Indigenous involvement in managing National Parks and creating nature-based tourism ventures has significant growth potential and can be a very important contribution to sustainability in Western Australia, as will be Indigenous involvement in bioprospecting.

The Malleefowl Preservation Group has demonstrated the importance of community partnerships in preserving endangered species, including its namesake, the Malleefowl (Leipoa ocellata). The success of this group is a demonstration of social entrepreneurship in sustainability.

Source: Babs and Bert Wells/ Department of Conservation and Land Management

In short...

Vision

Western Australia is contributing to global biodiversity targets to ensure that it has a comprehensive, adequate, representative and integrated terrestrial, freshwater, estuarine and marine conservation reserve system. Functioning land and seascapes that adequately provide for their full range of biodiversity will be conserved and protected, by ensuring that off-reserve conservation areas complement the conservation reserve system and that the intervening matrix of different land use is managed so as to minimise threatening processes. The loss of native species of flora, fauna and other organisms and habitats is being addressed, and programs are being developed to recover threatened species and ecological communities. There is widespread knowledge and understanding of, and appreciation within all parts of the community for, the need to ensure the conservation of the State's biodiversity. Some natural biological resources are used in an ecologically sustainable manner as a source for new products, and this production contributes to Western Australia's economy. Western Australia plays a significant part in meeting high demands for nature-based tourism opportunities.

Objectives

- To continue to improve our knowledge and understanding of Western Australia's biodiversity and the processes that threaten biodiversity.
- To establish a comprehensive, adequate and representative marine and terrestrial conservation reserve system in Western Australia.
- To ensure the effective management of conservation reserves and other recognised special biodiversity conservation areas.
- To ensure the protection and recovery of species and ecological communities that are threatened or in special need of protection.
- To conserve landscape/seascape scale ecological systems (integrating reserve and off-reserve conservation).
- To ensure that all use of biological resources is ecologically sustainable, and enable industries to grow that can protect and enhance or provide incentives to conserve Western Australia's biodiversity.
- To encourage awareness and appreciation of the biodiversity values of Western Australia, and promote the involvement of the public in the conservation of these values.
- To implement programs for monitoring and evaluating effectiveness and efficiency in achieving biodiversity conservation outcomes in Western Australia.

Actions underway

- The government is committed to an ongoing program of regional biogeographic surveys throughout Western Australia by the Department of Conservation and Land Management, in conjunction with the Western Australian Museum and scientists from other organisations.
- The biological survey for the Wheatbelt Bioregion is nearing completion, and the Pilbara Bioregion biological survey has commenced.
- Government continues to expand the terrestrial conservation reserve system in order to achieve a comprehensive, adequate and representative conservation reserve system, including the creation of thirty new National Parks in the south-west forests, the acquisition of pastoral leases under the Gascoyne-Murchison Strategy and the process of renewal of pastoral leases in 2015.

In short cont'd...

- A system of marine parks has been proposed to protect marine environments. The government has committed to creating new marine reserves at Jurien Bay, and in the Montebello/Barrow Islands, Dampier Archipelago, Geographe Bay to Cape Leeuwin area, and the Walpole-Nornalup area over the next two years.

- Between 2003 and 2015 and subject to ongoing negotiations, around 1.4 million hectares will be excluded from pastoral leases in the rangelands and incorporated in conservation reserves to increase the area of the conservation estate in the State's pastoral rangelands. Other areas will be set aside for conservation management within pastoral leases under conservation agreements.

- Management plans will continue to be developed and implemented by the Department of Conservation and Land Management for the State's conservation reserve network.

- The government will nominate additional World Heritage Areas in Western Australia, with the initial focus being Ningaloo Marine Park and Cape Range and will also nominate additional wetlands as Wetlands of International Importance under the Ramsar Convention.

- State strategies/programs are being implemented to protect biodiversity from threatening processes, such as salinity, feral/introduced animals, weeds, dieback and fire. These include recovery teams implementing recovery plans for fourteen threatened animal species, and a further seventeen recovery groups implementing recovery plans for threatened flora and threatened ecological communities at an area, community or species scale.

- Programs for threatened species research, protection and restoration are being lead by the Department of Conservation and Land Management, the Botanic Gardens and Parks Authority, the Perth Zoo and the Western Australian Museum.

- The State has dedicated project approval processes, including the assessment of proposals under the *Environmental Protection Act 1986* to ensure that land use proposals are only approved if biodiversity conservation values have been considered and addressed.

- A consultation paper for a new Biodiversity Conservation Act was released for public comment in December 2002. Over 150 public submissions were received, and public comments will be taken into account in the preparation of a draft Biodiversity Conservation Bill.

- Work is being undertaken with pastoralists (see Box 45) to gradually transform management practices of pastoral leases towards meeting sustainability objectives, including setting aside areas for the protection of biodiversity values.

- The existing conservation reserve system is progressively being complemented by the implementation of off-reserve conservation programs such as conservation agreements with land/leaseholders, nature conservation covenants through the Department of Conservation and Land Management and the National Trust, and other initiatives such as the Land for Wildlife program.

- The continued implementation of the State's innovative Salinity Strategy and Salinity Action Plan programs, including the ongoing implementation and expansion of the program of natural diversity recovery catchments, integrating production and biodiversity conservation planning and action at the catchment scale.

- Communication and education programs for the public are available on biodiversity conservation.

- Programs are available for the community and volunteers to be involved in biodiversity conservation and management (see Box 30).

In short cont'd...

Actions

2.6 Replace the *Wildlife Conservation Act 1950* with a new Biodiversity Conservation Act for Western Australia, which is focussed on providing protection for all biodiversity. Develop a State Biodiversity Conservation Strategy to complement and guide the application of the Biodiversity Conservation Act.

2.7 Continue to carry out the ongoing systematic regional biogeographic survey throughout Western Australia.

2.8 Seamlessly link environmental databases in a whole of government environmental database that incorporates the results of the ongoing biological surveys and monitoring program, and the research and development programs dealing with management of the biodiversity values in-situ, and ensure that communities wishing to be involved in management, research and monitoring of biodiversity have access to this database.

2.9 Establish a plan for a Biodiversity Research Consortium that includes marine and estuarine capability and brings together the research and databasing capacity of the Department of Conservation and Land Management, the Western Australian Herbarium, the Western Australian Museum, and the Botanic Gardens and Parks Authority.

2.10 Complete the Biological Survey for the Pilbara Bioregion by 2010.

2.11 Continue to identify and acquire land for addition to the terrestrial conservation reserve system so that it is comprehensive, adequate and representative.

2.12 Implement within the State, Australia's international commitments on environmental protection and biodiversity, and establish a long-term monitoring and reporting program to demonstrate that the State is fulfilling its global biodiversity conservation obligations.

2.13 Continue to work towards meeting national biodiversity conservation objectives and targets to which the State is a signatory.

2.14 Identify key threatening processes that result in the loss of Western Australia's biodiversity, and develop mechanisms (such as threat abatement plans, recovery plans or management plans) that will control or manage the impacts of the threatening process.

2.15 Account for biodiversity conservation in all land-use planning, where clearing of native vegetation is involved, and management decisions in Western Australia.

2.16 Ensure that mechanisms are in place for the identification, protection and recovery of Western Australia's threatened and specially protected biota.

2.17 Ensure that all landholders, managers and project proponents take into account the requirements for biodiversity conservation as a standard and vital component of their planning and management activities.

2.18 Continue to expand off-reserve conservation programs, such as conservation agreements, nature conservation covenants and Land for Wildlife.

2.19 Expand the existing natural diversity recovery catchment system from six to twenty-five recovery catchments over the next ten years in partnership with the community and the Commonwealth Government under programs such as the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust.

In short...

2.20 Review and improve the current licensing system to ensure that access to biological resources is properly regulated, and develop wildlife management plans to ensure that the use of particular biological resources is ecologically sustainable. Ensure that the right of Indigenous people to use native biota for customary purposes is continued on a sustainable basis.

2.21 Facilitate opportunities for nature-based recreation and tourism in Western Australia that are compatible with, and promote, the State's biodiversity conservation status.

2.22 Plan a major science-education facility that can assist in the education of the community on Western Australia's biodiversity.

2.23 Increase opportunities for the community to learn about and gain hands-on experience with biodiversity conservation issues.

2.24 Establish and implement a program for monitoring and evaluation to measure trends in resource conditions and management actions for biodiversity conservation in Western Australia.

Global opportunities

The biodiversity conservation efforts in Western Australia are already contributing to global conservation outcomes. These efforts can be expanded substantially through increased resourcing, both throughout Australia and through international aid programs to assist countries throughout the Asia-Pacific region in biodiversity conservation research, monitoring and evaluation.

Further information

Verstegen, P 2002, Sustainability and Biodiversity Conservation: Opportunities and Challenges for Western Australia, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Carew-Reid, L 2002, The Lake Toolibin Recovery Project for a Sustainable Future, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/LakeToolibin/LakeToolibin.htm

Hart, R 2002, Preserving the Western Australian Malleefowl, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/OilMallee/malleefowl/Malleefowl.htm

Holland, K 2002, Ribbons of Blue: Communities Caring for Water Catchments, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/ribbonsofblue/ribbonsofblue.htm

McAuley, H 2002, Cottesloe Reef: Community Managed Natural Resources, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/CottesloeReef/CottesloeReef.htm

Ruane. S & Merito, T 2002, Private Sector Conservation: Assisting Biodiversity, sustainability case study, Department of the Premier and Cabinet, Perth,viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/privatesectorconservation/privatesectorconservation.htm

Conservation Commission of Western Australia, <http://www.conservation.wa.gov.au>

Stanton-Hicks, E 2002, Oil Mallees: Native Flora with Myriad Benefits, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/OilMallee/OilMallee.htm

Department of Conservation and Land Management, <http://www.calm.wa.gov.au>

The Wilderness Society Wild Country Program and GondwanaLink, http://www.wilderness.org.au/projects/WildCountry/gondwana.html

> RESPONDING TO GREENHOUSE AND CLIMATE CHANGE

A comprehensive Greenhouse Strategy is being developed to address the issues of greenhouse emissions, adaptation, sequestration and new industries.

It would be naïve to ask governments to put their economic interests aside. I hope, however, that a better appreciation of the costs of inaction and the economic benefits of innovation in technologies and lifestyles will generate a more balanced economic vision.

Michael Zammit Cutajar, Retiring Executive Secretary of the UNFCCC, January 30, 2002

The evidence is overwhelming: human activity has interrupted the global carbon cycle and is beginning to have a profound impact on the Earth's climate.

Over the past 25 years, the South West of Western Australia has experienced a significant reduction in rainfall and major falls in run off to water storage dams. Scientists have suggested that this is at least partly due to global climate change. We must now adapt to climate change and work to achieve a global reduction in greenhouse gas emissions.

In 1992, the World agreed to stabilise the concentration of greenhouse gases in the atmosphere through the United Nations Framework Convention on Climate Change (UNFCCC). Achieving this goal will require a 60-70% reduction in global greenhouse gas emissions.

The Kyoto Protocol, which was agreed in 1997, is the first step toward implementing the UNFCCC. The Kyoto Protocol establishes limits on greenhouse gas emissions that challenge Western Australia's energy intensive society and economy and the type of economic development prospects offered by our huge deposits of natural gas. We must anticipate and position ourselves for future greenhouse gas emission limits before they are applied globally in coming decades. The economy is moving inevitably towards reduced carbon intensity.

The changes that are required to address climate change can offer an opportunity for innovation and economic development. If we are able to use reductions in greenhouse emissions as a driver for economic modernisation, efficiency and innovation then we can create a strong economic future for Western Australia while making a fair contribution to reducing global greenhouse gas concentrations.

Greenhouse has become a pre-eminent global sustainability issue. If the climate is changing due to human activity then how can we be looking after the future from an economic, social or environmental perspective? Our sustainability principles could be undermined by climate change unless we take proper account of this issue as a priority.

The world is rapidly moving towards a consensus of action on greenhouse matters and a new economy is emerging where 'early movers' in greenhouse can begin to find opportunities for new technology and new services. Even those countries not signing the Kyoto Protocol are committed to shifting their economy towards less carbon intensive production.

The increasing requirement to sequester carbon may provide Western Australia with significant opportunities. Western Australia has all the requirements:

- substantial land that was cleared in 1990 and can be revegetated before 2010-12
- satellite photography and scientific analyses that enable verifiable calculations to be made of the potential carbon dioxide that would be sequestered
- carbon rights legislation that enables a clear, legal process to be established.

However a Commonwealth Government system consistent with global standards will be required to truly encourage this process.

The Western Australian Government is committed to meet the challenges of climate change. A Greenhouse Strategy is being prepared by the State Government to outline how Western Australia can respond to greenhouse and climate change (see Box 32).

BOX 32   WESTERN AUSTRALIAN GREENHOUSE STRATEGY – KEY DIRECTIONS

The Western Australian Greenhouse Strategy builds on the following directions agreed by State Cabinet:

- Managing greenhouse emissions to ensure the State contributes to global efforts to reduce the greenhouse effect.
- Promoting organic carbon sequestration, especially where associated natural resource and regional development benefits can be gained, and providing a focus for considering geosequestration options
- Ensuring adaptation options are understood by all sectors of the State community and that essential state values, such as biodiversity are protected
- Facilitating business opportunities that might emerge from climate change;
- Demonstrating government leadership
- Providing information to the community and helping local government to provide local leadership
- Guiding climate and greenhouse research, and
- Representing Western Australia's interests when national and international agreements and policies are being established.

Key proposals will address matters such as:

- How industry, agriculture and other major emitters in Western Australia can reduce their greenhouse emissions at least cost
- How organic sequestration can be promoted in Western Australia
- How information about Western Australia's greenhouse emissions can be continually improved to support ongoing policy development and more focused emission control programs
- How climate research can be coordinated to ensure Western Australians are able to prepare for unavoidable climate changes, and
- How Western Australia's particular circumstances can be successfully represented in national and international agreements and policies.

Throughout the State Sustainability Strategy a range of other proposed initiatives related to industry, energy, buildings, transport, water, planning and agriculture will lead to reduced greenhouse emissions.

The rapid establishment of plantations on cleared agricultural land in Western Australia means that land-use change is now a net sink for greenhouse emissions in Western Australia.

Source: Forest Products Commission

In short...

Vision

Climate change stabilises through concerted global action including reduced emissions, new technology, new ways of living, substantial revegetation and stabilised population growth. Western Australia contributes significantly to this process.

Objectives

- To contribute to global solutions for greenhouse-related issues.

Actions underway

- A Draft Western Australian Greenhouse Strategy is being prepared for public release and comment.
- Government has established a Sustainable Energy Development Office.
- Carbon rights legislation has been proclaimed.
- Government has required government agencies to reduce greenhouse emissions by reducing their energy consumption by 12% between 2001-02 and 2006-07 through the Energy Smart Government Program.
- The government-owned electricity generation portfolio has begun to achieve significant reductions in carbon intensity due to more efficient power stations and greater use of gas.
- Through the Strategic Environmental Assessment of the Power Procurement Process, the government has ensured that greenhouse is a significant factor in future power plant decisions.

Actions

2.25 Finalise and implement the Western Australian Greenhouse Strategy after consultation.

Global opportunities

Many global opportunities arise from the greenhouse effect. There is a rapidly growing market for Western Australian gas (as evidenced by the recent contract with China for Liquid Natural Gas) as the world moves towards less carbon intensive energy futures. Western Australia's rural areas offer opportunities for revegetation and reforestation, which could be supported through State, national or global carbon trading markets. Western Australian innovations in greenhouse-related technologies offer scope for economic development here. For example, small-scale biomass power as is being developed through the Oil Mallee project at Narrogin, wind power systems at Albany and greenhouse-related services such as construction of new rail systems or climate adaptation strategies could support new fields of economic endeavour.

Further information

Australian Greenhouse Office
http://www.greenhouse.gov.au/

Commonwealth Scientific and Industrial Research Organization
http://www.csiro.au/

Indian Ocean Climate Initiative
http://www.ioci.commerce.wa.gov.au/

Menage, X 2002, *Working Towards Sustainability: Local Government Greenhouse Action through the Cities for Climate Protection Campaign*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Greenhouse%20Action/greenhouseaction.htm

Western Australian Greenhouse web site
http://www.greenhouse.wa.gov.au

> OIL VULNERABILITY, THE GAS TRANSITION AND THE HYDROGEN ECONOMY

One of the most difficult issues facing the world is the transition away from fossil fuels that have been the basis of industrial economies for several hundred years. In particular oil has been the basis of most economic growth in the past fifty to eighty years as the world has become very mobile.

Transport's current dependence on cheap oil supplies is not a sustainable activity. Estimates of the life of cheap oil supplies range from 3 to 50 years however the sooner we start the transition to a sustainable system the easier it will be.

Royal Automobile Club of Western Australia

Since 1995 Australia has been consuming oil and condensate at three times the rate of discovery. Australia should urgently shift to natural gas based fuels to replace oil based petroleum products, and develop other alternatives like hydrogen and ceramic fuel cells, especially for transport.

Brian Fleay

Figure 6 Oil Vulnerability (existing and projected production)
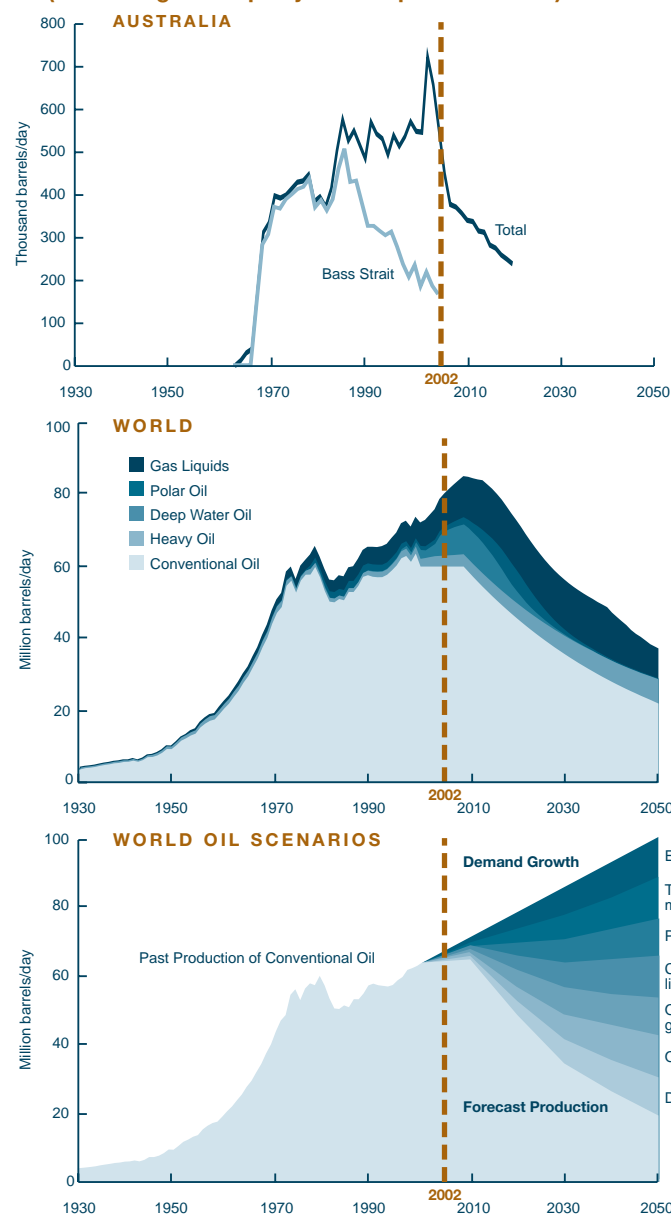
Source: See B.Robinson, *Global Oil Vulnerability: the Australian Situation.*

Since the first oil crisis in 1972 there has been increasing awareness that oil vulnerability is an issue of concern. The concentration of oil reserves in politically unstable areas means that there is a distinct possibility of political control of oil prices and oil availability. Apart from this the world is using oil at a much faster rate than it is being found–four barrels are used for every one found (some estimates suggest this could be as high as nine). Added to this are the problems of greenhouse emissions from oil use and the car dependence in cities.

Global awareness of oil vulnerability has grown since September 11 and it was the basis of several key industry submissions to the Strategy. There is just one week's supply of petrol in storage in Western Australia for emergency purposes and in the medium term the oil and gas industry is also suggesting a major global oil crisis could occur (see Box 33).

Figure 6 outlines the problem and this is explored in some detail by Bruce Robinson's background paper (and an update based on new global data). Adam Hawke's background paper looks at medium-term technological options (see Box 33) and Lisa Garrity's background paper examines how Western Australia can prepare for the long-term future hydrogen economy. A Federal Government initiative on the hydrogen economy is underway and the Western Australian Government now has a web site based on its work in this area. <www.dpi.wa.gov.au/fuelcells>

BOX 33   THE TRANSITION TO SUSTAINABLE TRANSPORT FUELS AND TECHNOLOGY[16]

As oil supply becomes less certain and its use less environmentally acceptable, governments worldwide are implementing strategies that introduce tough emissions standards, encourage responsibility for pollution and greenhouse gases, and foster sustainable transport industry upstream and downstream.

Australia's oil vulnerability in particular is highlighted by the fact that it faces a $7.6 billion deficit on trade in liquid hydrocarbons by 2010 from a surplus of $1.2 billion in 2000. Given Western Australia's major natural gas resources and strong public support for protecting the environment, the State is well placed to play a major role in meeting this challenge. There is a global transition to the use of gas for greenhouse reasons as well as economic and air quality reasons.

The global pool of transport technology is rapidly growing and there are no obvious benefits to any one technology; it is therefore not possible to second-guess which technology combination will eventually provide the solution. Government must therefore facilitate the transition to lower emissions fuels and vehicle technology without picking winners. It needs to be part of trials and remove barriers to the rapid integration of new technology. Demonstration projects with LPG and CNG, biodiesel and hydrogen fuel cells, are all underway and need to be carefully monitored.

There is also awareness that there are/will be multiple benefits if we use less energy in transport. Transport energy demand can be minimised through urban design, quality public transport, and bicycle and walking options.

Western Australia is well placed to create economic opportunities from the global oil situation though we also have some constraints of concern. The opportunities come from:

- the globally significant gas resources in our North West

- the political and economic security for developing these resources into value-added products like liquid fuels as a short-term or transitionary solution

- the opportunity to create biodiesel from waste animal fat and from canola so that we increase our portfolio of transport energy sources and thereby increase the resilience of our economy

- oil refineries being able to process gas condensates and produce high quality fuel suitable for the future in engine technology

- the electric train system which enables local fuels to be used for transport including a growing amount of renewable electricity

- the Hydrogen Fuel Cell Bus trial in which Perth is the only non-European participant (the global trial is supported by the European Union) and

- long-term potential for hydrogen to be produced from the substantial renewable energy resources of wind in the south, solar in the Pilbara and tides in the Kimberley, with potential pipeline and cryogenic facilities linking these areas (see paper by P Newman, Sustainability and the Hydrogen Economy in Western Australia).

The constraints are:

- Western Australia is a highly transport fuel intensive State due to its large distances and the nature of our economic activity

- the nature of Perth's development which has been highly car dependent, and

- the oil intensive nature of Western Australian agriculture.

The State can show global leadership in considering how best to address oil vulnerability and has established a Sustainable Transport Energy Program in the Department of Planning and Infrastructure. A taskforce to pursue the issues of oil vulnerability, gas transition and the hydrogen economy has also been established - the Transport Energy Strategy Committee - involving industry, community, university and government expertise. The Committee is assessing the global oil situation, examining Western Australia's liquid fuel situation in short and long-term supply, assessing how best to use Western Australia's gas in transport, how this can lead to a hydrogen economy and the implications for sustainable transport policy. Their interim report was released in July.

[16]A Hawkes, *Evolution towards a Sustainable Transport Energy Source*, Background Paper for the State Sustainability Strategy, CD-ROM, 2002.

There is potential for the Kimberley to be a demonstration site for the hydrogen economy due to the possibilities associated with the Ord Hydro scheme, remote power through fuel cells in mining and Indigenous communities, tidal power options, use in road trains etc. Other areas in the world with hydrogen economy innovations tend to be in remote areas, for example Iceland and Antarctica (see paper by Dr Bruce Hobbs).

In short...

Vision

Oil-based transport moves quickly to a combination of gas-based systems and there is an increase in the provision of public transport, cycling and walking infrastructure as a means to forestall oil vulnerability. Then hydrogen becomes the basis of the provision of power for our economy, using fuel cells and hydrogen gas produced from renewable energy.

Objectives

- Assess global oil vulnerability and position the State's options as cheap oil becomes less available.

- Consider how to optimise the State's gas reserves in order to ensure that the global gas transition is addressed sustainably and to the state's long-term advantage.

- Facilitate Western Australia's involvement in the emerging hydrogen economy.

- Provide 'whole of government' perspectives on transport energy sustainability issues that can enable innovation and leadership to occur.

Actions underway

- An emergency fuel storage plan has been prepared.

- The Ministerial Council on Energy (Federal and State Ministers) has a Strategic Energy Supply and Security Working Group.

- A revised government vehicle fleet environmental policy, aimed at a significant and cost-effective reduction in vehicle fleet fuel consumption, and providing an option for emission offsets will be completed in 2003-04.

- Negotiations have been finalised regarding the commencement of a hydrogen fuel cell bus in Perth, which will be the only non-European city participating in the this trial.

- Local firms, such as Orbital Engine Corporation, are making global contributions to fuel efficiency (see Box 26 in *Population, development aid and environmental technology*).

- A Sustainable Transport Energy Program has been established in the Department of Planning and Infrastructure. This initiative is leading the way in reducing the use of transport fuel by purchasing cars with smaller engines and purchasing twenty Toyota Prius hybrid cars.

- A Transport Energy Strategy Committee has been established to provide advice to the Minister for Planning and Infrastructure on how best to ensure future supplies of transport energy for Western Australia. The Committee's Interim Report was released in July.

- A major trial of biofuel in Transperth buses has been established in the Public Transport Authority.

In short cont'd...

Actions

2.26 Ensure all future buses purchased for the Transperth bus fleet are powered by compressed natural gas.

2.27 Finalise and implement the report of the Transport Energy Strategy Committee after public consultation.

2.28 Evaluate the effectiveness of the Department for Planning and Infrastructure's Sustainable Transport Energy Program and provide recommendations on broadening its implementation across government and into the first steps towards a hydrogen economy.

2.29 Adopt a revised government vehicle fleet environmental policy to increase the use of 4 cylinder vehicles and significantly reduce fuel consumption (and CO_2-emissions) per km, provide greenhouse emission offset option and continue the use of LPG powered vehicles where appropriate.

2.30 Examine the feasibility of the Kimberley as a demonstration area for the hydrogen economy.

2.31 Commence the hydrogen fuel cell bus trial in July 2004 with three test buses.

Global opportunities

The oil problem is Western Australia's golden opportunity to establish global leadership in how to move towards the better use of gas in transport and to help lead the world towards a hydrogen economy. Economic opportunities in this area of sustainability abound.

Further information

Combes, D 2002, *Gas as a Transition Fuel: Western Australia's Natural Alternative*, sustainability case study, Department of the Premier and Cabinet, Perth,viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/ CaseStudies/gasastranstion/gasastransition.htm

Garrity, L 2002, *Hydrogen Fuel Cell Buses: The Future for Sustainable Transportation in Western Australia and Around the World*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Hydrogen%20Fuel%20Buses/Hydrogen%20Fuel%20Cell%20Buses.htm

Garrity, L 2002, *The Hydrogen Economy*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Hawkes, A 2002, *Evolution towards a Sustainable Transport Energy Source*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Hobbs, B 2003, *Towards a Strategic Action Agenda for Science and Innovation in Western Australia*, www.sciencecouncil.dpc.wa.gov.au/presentations

Newman, P 2003, *Sustainability and the Hydrogen Economy in Western Australia*, paper from Federal Government Hydrogen conference, Broome. State Sustainability Strategy CD-Rom, Department of Premier and Cabinet, Perth.

Transport Energy Committee 2003 *Interim Report*, Department of Planning and Infrastructure, Perth.

Passey, R 2002, *Biodiesel: A Fuel for the Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/biodiesel/biodiesel.htm

Robinson, B 2002, *Global Oil Vulnerability: the Australian Situation*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

3 Sustainable natural resource management

Vision for Western Australia

Western Australia's vast landscape and seascape, intricate web of

biodiversity and other natural resources are conserved, managed and used

sustainably for the common good, and the community is involved in

management and planning processes that are transparent and visionary.

Goal

Value and protect our environment and

ensure the sustainable management and

use of natural resources.

Priority areas for action

> SUSTAINABLE NATURAL RESOURCE MANAGEMENT

Since European settlement in 1829, much of Western Australia's economic wealth and sense of identity has come from the use of natural resources. Agriculture, forestry, fishing and the production of minerals and petroleum all provide employment, development opportunities and wealth. Tourism is also a significant contributor to the economy and employment and relies heavily on Western Australia's natural assets.

Western Australia is the biggest sub-national state in the world with a population of under two million people. By way of comparison, it is equivalent in size to the whole of Western Europe with a population in excess of 200 million people. The sheer size of Western Australia also creates certain unique challenges to the way we use natural resources sustainably. For this reason, separate sections consider aquatic systems, the coastal and marine environments and the rangelands.

Western Australia's 27,000 km coastline is largely undeveloped and relatively pristine. Some areas of the coast are developing rapidly and in need of careful management while others are under considerable threat of cumulative impact or have become degraded or irreversibly damaged and require more urgent or remedial action. Western Australia's marine and inland waters are vitally important natural assets that are used for many and sometimes competing uses. While the marine environment remains relatively intact, the same cannot be said for our inland waters, which are often degraded by surrounding land use and management.

The rangelands are similarly vast, occupying about 90% of the total area of the State. Of this area, about 40% is under pastoral lease. Much change has occurred in the rangelands in recent years, with traditional pastoralism existing alongside traditional use by Aboriginal people, and land managed for conservation purposes, tourism, mining and horticulture.

This section of the Strategy focuses on the sustainable management and use of natural resources.

Our past experience

Over the last 200 years, some of our natural resources have been used to generate wealth without understanding their place in the landscape and the consequences of upsetting balanced ecosystems. Often the mistakes of the past were exacerbated because 'development' occurred at a rate that was faster than the rate at which degradation became apparent. Examples of this are the clearing of native vegetation for broad-acre agriculture leading to waterlogging and salinity, and the overstocking of pastoral country leading to degradation of native vegetation and erosion.

The clearing of native vegetation has had a large impact on the state of our natural resources. Twenty-five shires have between 0% and 10% native vegetation cover, twenty-two shires have between 10% and 20% native vegetation cover and 685 of Beard's 305 vegetation complexes found in the south west of the State have less than 30% of their original area remaining.[17]

Native vegetation management must be considered in the context of Western Australia's unique natural heritage. The south west is one of the world's twenty-five biodiversity hotspots, and much of the region has plant species numbers in the order of 80–100 species per 10 m by 10 m square quadrat. In some areas, such as Mt Lesueur, the number is as high as 120 species per quadrat.

The present

Much activity is occurring to identify the challenges and enhance the sustainability of our environment and our industries. The State Government, the regional natural resource management groups, non-government organisations, local governments and others are developing strategies and plans of their own, but more generally in partnership, to address natural resource management issues.

[17]D.P. Shepherd, G.R. Beeston and A.J.M. Hopkins 2001, Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

What do we mean by natural resource management?

The Natural Resource Management Council has recently commissioned work to better define what the term 'natural resource management' means and to consider how this should be interpreted in a Western Australian context.

The term 'natural resources' is used to encompass renewable resources such as forests, water, wildlife, soils, etc., and non-renewable resources such as coal, oil, and ores, all of which are natural resources. 'Management activity' is defined as an activity undertaken by humans for the purpose of harvesting, transporting, protecting, changing, replenishing, or otherwise using resources.[18]

Sustainability in natural resource management is seen as addressing the triple bottom line of economic development, ecological integrity, and social and cultural wellbeing.

Thus, the concept of sustainable natural resource management is defined as using, conserving and enhancing natural resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased.

Core objectives

- To enhance individual and community well being and welfare by following a path of natural resources management that improves productivity and safeguards the welfare of future generations
- To provide for equitable allocation of natural resources and the involvement of affected stakeholders in natural resource decisions
- To protect biological diversity and maintain ecological processes and life support systems.

Guiding principles

- Provide a long-term vision for natural resource management based on sustainability, and intergenerational, social, economic and political equity.
- Recognise the intrinsic value of biodiversity and natural ecosystems, and protect and restore them.
- Build on the characteristics of ecosystems in the development and use of natural resources.
- Enable users of natural resources to minimise their ecological footprint.
- Recognise the distinctive characteristics of natural resources including their human and cultural values, history and ecological systems.
- Empower stakeholders in natural resource management, clarify roles of the community and other players, foster participation and establish cooperative networks to work towards a common sustainable future.
- Enhance individual and community wellbeing and welfare while having regard for intergenerational equity.
- Protect the productive capacity of the land.
- Promote sustainable production and consumption through appropriate use of environmentally sound technologies and effective demand management.
- Achieve long-term economic security.
- Monitor and evaluate outcomes and where deviations from sustainability are identified adapt the management approach to accommodate those deviations.

[18]J Dunster and K Dunster, Dictionary of Natural Resource Management, UBC Press, Vancouver 1996

BOX 34   THE NATURAL RESOURCE MANAGEMENT GOVERNANCE FRAMEWORK IN WESTERN AUSTRALIA

Western Australia has developed institutional arrangements in natural resource management over the last decade or so that have been created through community interest and government support. The arrangements are not legislated, so the structure has flexibility and the ability to respond to changing circumstances.

The State Government has a Cabinet Standing Committee overseeing policy and other developments in natural resource management, sustainability, the environment and associated areas (Cabinet Standing Committee on Environmental Policy). The Committee comprises the Minister for the Environment (chair), the Minister for Agriculture, Forestry and Fisheries, the Minister for Planning and Infrastructure, the Minister for Local Government and Regional Development and the Minister for Peel and the South West. A Natural Resource Management Council advises the Minister for the Environment on natural resource management policy issues and provides leadership in the community on natural resource management generally. The Council comprises thirteen members, eight community members chosen through an expression of interest process based on their expertise in natural resource management matters and five Directors General of State agencies involved in natural resource management.

Six regional community-based Natural Resource Management Groups have developed over the years to cover the State geographically, to focus and integrate the community input into managing natural resources. These groups are:

- The Avon Catchment Council
- The Swan Catchment Council
- The South West Catchments Council
- The South Coast Regional Initiative Planning Team
- The Northern Agricultural Catchments Council, and
- The Rangelands Natural Resource Management Coordinating Group.

The State Government and these Regional Natural Resource Management Groups, along with the Natural Resource Management Council, have signed a Natural Resource Management Memorandum of Understanding to work together to better manage natural resources within the regions and the State as a whole.

Many other groups are involved in natural resource management such as Local Government, statutory authorities (e.g. the Environmental Protection Authority and Conservation Commission) non-government organisations (such as the Conservation Council of Western Australia, Greening Australia (WA), World Wide Fund for Nature), community groups, production groups (such as the Oil Mallee association, WA No-tillage Farmers Association, Saltland Pastures Association, Liebe Group, Environmentally Responsible Agriculture Organisation) and industry. Further details on natural resource management are available on www.nrm.org.au.

The social challenge

Until recently the focus of effort in natural resource management has largely been on integrating biophysical sciences and economics. Western Australia has been at the forefront of this effort in fisheries, agriculture, mining and forestry as well as in the management of water resources such as estuaries, rivers, wetlands and groundwater. The more recent challenge for natural resource management and for sustainability generally is how to better incorporate community values–an important aspect of the social dimension of sustainability.

The importance of incorporating community values into natural resource management is perhaps best exemplified by the long-running debate on the management of native hardwood forests in Western Australia. Previous government attempts to determine appropriate management regimes failed to incorporate the groundswell of deeper community responses to the forest as a recreational resource and as an ecosystem that needed to be retained for its biodiversity and intrinsic values. In other words, the social dimension of sustainability, which included ethical considerations about the inherent environmental character of an area, had not been adequately reflected in forest management plans. The government's old-growth forests policy and proposed new Forest Management Plan represent a major step in incorporating community values, as well as scientific information and economic modelling, into forest planning and management.

Similarly the Department of Fisheries has recently released the Policy for the Implementation of Ecologically Sustainable Development for Fisheries and Aquaculture in Western Australia. The policy acknowledges the need to expand on the social and economic components of sustainability, particularly as this applies to allocation issues.

Agriculture and pastoralism have contributed to (and been impacted by) land degradation issues as well as declining commodity prices for many years. While the landcare movement and various funding sources have supported a range of actions, land degradation continues. Recent documentation by the National Land and Water Resources Audit has made very apparent the importance of the social dimension in agriculture's future. In many parts of Australia, the demography of agriculture is changing so that social considerations such as the general aging of the farming population and rural population decline are increasingly important in the debate about sustainable agriculture.

Threats to water bodies and water quality such as salinity and eutrophication are closely related to land management. Research on the Hardy Inlet, Cockburn Sound and the Peel-Harvey Estuary has provided an understanding of options to improve the management of inland and marine waters. Recent work has explicitly recognised the importance of community values in developing water management options. For example, the development of the Draft Environmental Protection Policy and Environmental Management Plan for Cockburn Sound reflects the community's values associated with the use of the sound for recreation and the protection of natural and cultural heritage, as well as productive uses.

In addition, the Department of Environment is allocating water based on biophysical research, economic analysis and community values reflecting the extent to which water should be allocated to the environment.

A strategy is proposed below to proactively support the incorporation of community values with biophysical research and economic analyses to enable sustainable natural resource management through improved use of statutory and non-statutory planning mechanisms.

Providing a statutory basis for natural resource management

There is already significant statutory power to support the sustainable management of natural resources in Western Australia and to incorporate community values in adopting these statutory processes. For example, the *Fish Resource Management Act 1994* provides for the ecologically sustainable management of fisheries through various mechanisms, including the creation of Fisheries Management Plans, while the *Conservation and Land Management Act 1984* provides for the establishment of management plans for conservation reserves and State forests.

The current work of the six natural resource management regional groups in developing regional natural resource management strategies offers a mechanism for identifying economic, social and environmental values. The close involvement of local government and interaction with the Department for Planning and Infrastructure will enable use of a variety of statutory mechanisms to support the sustainable use of natural resources at a regional scale, particularly land, water and biodiversity. This is supported by the accreditation process for regional natural resource management strategies and the recently developed Statement of Planning Policy No. 2 Environment and Natural Resources Policy.

The regional natural resource management strategies will be reviewed by the Natural Resource Management Council and the State/Commonwealth Steering Committee before being accredited by the State and Commonwealth Ministers in order to receive funding through the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. The accreditation process, in part, requires setting clear environmental targets for resource condition and management actions and an evaluation process.

The regional natural resource management groups have agreed to involve local government more in natural resource management. Local government has significant statutory planning powers that could be used to support the implementation of the regional natural resource management strategies. Further, it may also be desirable to give effect to the regional natural resource management strategies through various statutory mechanisms, such as Environmental Protection Policies and regional Statements of Planning Policy as set out in *Sustainability and governance*.

The existing State-Local Government Working Group on Natural Resource Management could explore this model as part of the deliberations of the Sustainability Roundtable. This process should examine whether and how local government, including regional councils of local government, could support the institutionalisation of natural resource management, building on the work of natural resource management regional organisations in developing regional natural resource management strategies.
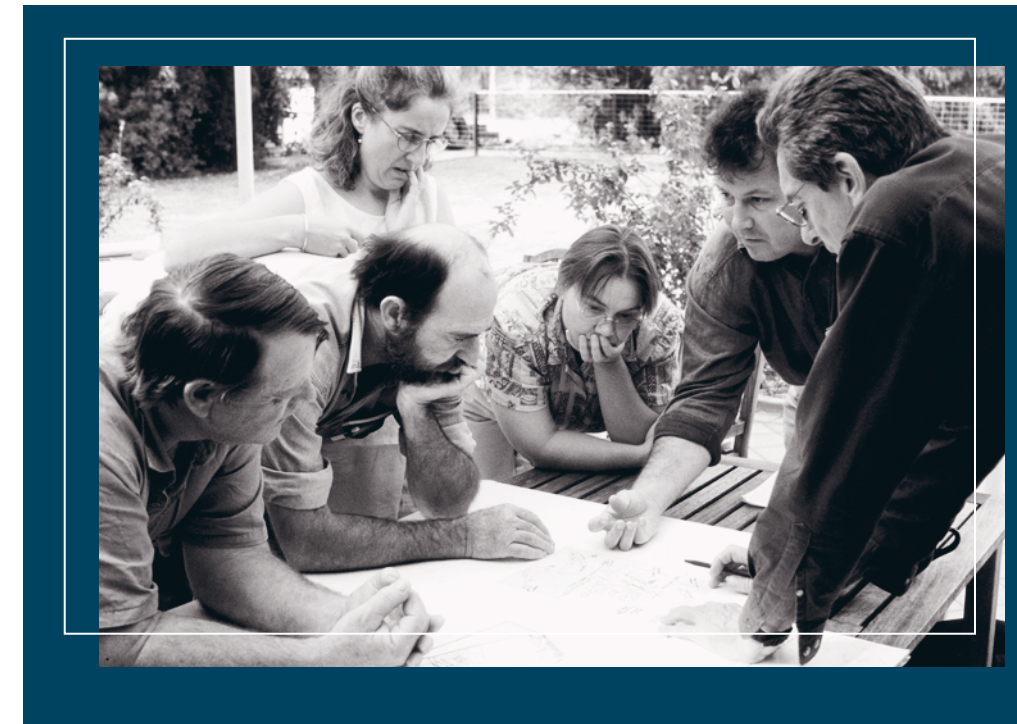
Pastoralists in the southern rangelands planning their properties using the EMU approach (see Sustainable rangelands management).

Source: Angas Hopkins

> SUSTAINABLE AGRICULTURE

Greening Australia (WA) believes that current agricultural land-use practices are far from sustainable. Consequently, we believe that it is necessary to formulate a new vision for our rural landscapes prior to examining the methods required to achieve this vision.

Greening Australia (WA)

Developing sustainable systems for farmers is pointless if they have no understanding of the processes involved and the adoption benefits. Hence the benefit in developing systems in partnership with farmers.

WA No-Tillage Farmers Association Inc.

The State Sustainability Strategy is largely about change. WAFarmers recognises that the agricultural regions have serious environmental, social and economic issues that need to be subjected to the change process to ensure sustainability into the future.

The Western Australian Farmers Federation (Inc)

Agriculture continues to be an important economic driver for Western Australia. The value of the State's agricultural exports for 2000-01 was estimated at $3,802 million, which represents 15% of the state's total export and 16% of national agricultural exports.

However, the 1998 Western Australian State of the Environment Report[19] identified that the economic contribution of agriculture has come at the cost of widespread land degradation associated with current farming and grazing systems. More recently, the 2001 Australian State of the Environment Report[20] concluded that, while strenuous attempts are being made to improve environmental, economic and social sustainability in many regions of established agricultural land use, serious doubts exist as to whether agricultural industries can finance the adoption of remedial and truly conservation-oriented farming systems. The Department of Agriculture[21] also notes that changing community goals and values since agriculture was established as an industry in Western Australia mean that many agricultural practices do not meet today's societal expectations of sustainability.

There are many definitions and different understandings of sustainable agriculture. The Standing Committee on Agriculture and Resource Management[22] (now the Natural Resource Management Standing Committee) identified a number of guiding principles for sustainable agriculture:

- farm productivity is sustained or enhanced over the long term
- adverse impacts on the natural resource base of agricultural and associated ecosystems are ameliorated, minimised or avoided
- residues resulting from the use of chemicals in agriculture are minimised
- the net social benefit derived from agriculture is maximised
- farming systems are sufficiently flexible to manage risks associated with the vagaries of climate and markets.

[19]Government of Western Australia 1998, Environment Western Australia 1998: State of the Environment Report, Government of Western Australia.

[20]Hamblin, A 2001, Land, Australia State of the Environment Report 2001 (Theme Report), CSIRO Publishing on behalf of the Department of the Environment and Heritage, Canberra.

[21]Department of Agriculture 2002, Submission to the State Sustainability Strategy.

[22]Standing Committee on Agriculture and Resource Management 1993, Sustainable Agriculture: Tracking the indicators for Australia and New Zealand. Report No. 51.

The Department of Agriculture[23] proposes a definition of sustainable agriculture that attempts to recognise the contribution of agriculture to the sustainability of rural communities:

Ensuring profitable agricultural systems that conserve our environment whilst contributing to the economic and social well being of rural Western Australia.

The significant environmental impacts of agriculture such as salinity and rangeland degradation coupled with declining terms of trade and, in most rural areas, diminishing populations all indicate that there are very real and significant challenges to achieving sustainable agriculture in Western Australia.

Primary producers, community organisations and government agencies are recognising the significant challenges that the move to sustainable agriculture presents and much is being done to determine how best to meet the considerable challenges that exist. For example, the widespread adoption of minimum tillage has had significant benefits in reducing erosion and runoff.

The State Sustainability Strategy will not attempt to address challenges to sustainable agriculture individually—many government and community programs are already attempting this. It will, however, propose strategies to address the most significant challenges that agriculture will face in the near future, and recommend actions which can be taken to seek out the opportunities that these challenges present and explore the role of government in addressing these.

The Department of Agriculture's submission provides a useful overview of the existing challenges to sustainable agriculture in Western Australia by considering the trends impacting on vibrant rural communities, profitable agricultural systems and conservation of the environment over the last twenty-five years as well as future challenges and emerging trends. These are summarised in Table 5 below.

However, while there is considerable awareness of the need to act on these issues, and the landcare movement has supported action in many areas, it is becoming increasingly obvious that the incremental change approach adopted has not resulted in significant change at the scale necessary to achieve sustainable agriculture. There is an expectation that sustainable agriculture in the future would look very different from the agriculture of today.

As well as the challenging trends outlined in Table 5, a number of priority issues will affect the future sustainability of agriculture in Western Australia. These are summarised below.

Table 5 Trends influencing sustainable agriculture in Western Australia

Vibrant rural communities	Profitable agricultural systems	Conservation of the environment
• Depopulation of rural areas	• Weakening relationship between farm and food prices	• Salinity
• Decreasing rural employment with increased mechanisation, comparatively low wages for the rural workforce and low diversity of job opportunities	• Decreasing terms of trade	• Loss of soil structure
	• Deregulation of markets	• Water-repellence of some soils
	• Relative importance of agriculture in the nation's economy is declining	• Waterlogging
• Reduction of services in rural towns	• Introduction and spread of quality assurance schemes	• Wind erosion
• Increasing isolation for those remaining in rural communities		• Traffic hard-pans
		• Deterioration in remnant vegetation
• Rationalisation of country towns into large regional centres		• Destruction of habitat
		• Nutrient runoff causing pollution problems
		• Soil acidity
		• Loss of biodiversity values

[23]Department of Agriculture 2002, Submission to the State Sustainability Strategy.

Salinity

Salinity is considered to be the greatest environmental threat to Western Australia and impacts significantly on broadacre agriculture, biodiversity, water supplies, rural towns and infrastructure such as roads.

It is unlikely that the process of salinity can be reversed within current farming systems. In May 2001, the Minister for the Environment and Heritage appointed a Salinity Taskforce to review the existing salinity program and to recommend future directions. The government responded to the Taskforce recommendations in July 2002 and indicated it would continue to protect high value public assets, invest in new technologies and industry development and provide incentives for on-ground work on private land. The government has also appointed a Natural Resource Management Council, indicated its support for natural resource management regional organisations and regional strategies and will provide increased attention to drainage, biodiversity and adjustment issues.

Soil acidity

The removal of product from paddocks and leaching of nitrogenous fertilisers is increasing the acidity of many soils in agricultural regions. Acidity damages plant root structure, reduces plant water use and changes soil nutrient availability, resulting in reduced productivity. Acidity is manageable; however, in the long term it could have a major impact on the productive potential of soils unless it is recognised as a factor limiting production and appropriate management is widely adopted.

Water quality, availability and drainage

Water quality in the South West of Western Australia is declining due to processes such as salinity, sedimentation and eutrophication, and agriculture is a significant contributor to these processes.

In addition about 40% of Western Australia's water use is for agriculture and the future development of agriculture depends on continued access to water resources. Irrigation could increasingly compete with uses such as public water supply and industrial activity.

The use of drainage in rural areas is a significant issue and was highlighted in many submissions. The government's response to the Salinity Taskforce report acknowledges the important role that drainage may play in treating salinity in certain circumstances and many farmers have installed surface and sub-surface drainage. However, regional drainage schemes have not been developed and the difficult issue of likely downstream impact is largely unresolved. The government has established a high-level review of the regulatory framework for large-scale drainage, including planning, approval, maintenance and environmental impact and has funding to assist this process.

Biodiversity

Biodiversity and the conservation of natural areas as well as the preservation of important ecosystem services is very important for the maintenance of agricultural systems. Recent amendments to the *Environmental Protection Act 1986* significantly strengthen the protection of biodiversity in rural areas through regulating land clearing. Figure 7 shows that the applications to clear land and the area that was not objected to under the *Soil and Land Conservation Act* have declined significantly.

Much more effort will be needed to preserve biodiversity in some areas, particularly with the potential risk to existing reserves in the wheatbelt from salinity. New ideas are emerging, such as the development of bushland corridors linking reserves (the Wildcountry Gondwana Link project or the Malleefowl Link concept) and the proposal to trial the EMU Plus process being successfully implemented in the rangelands.

Figure 7 Clearing applications under the Soil and Land Conservation Act (1986 – 2002)
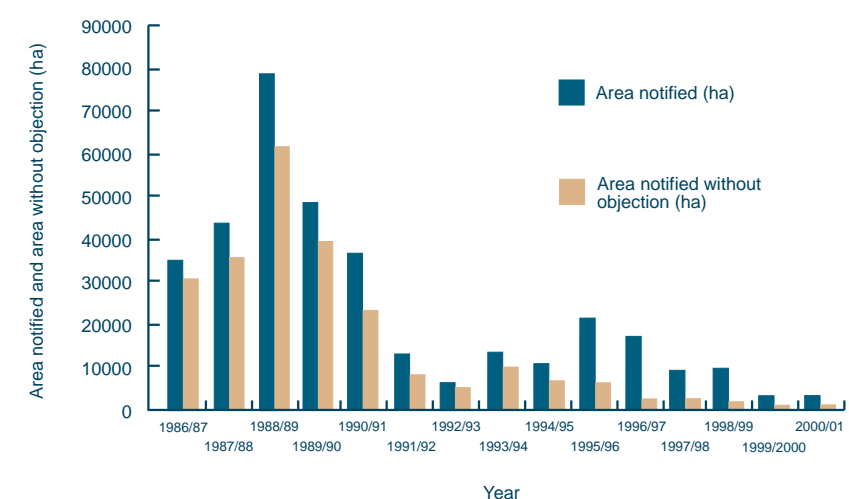
Source: Department of Agriculture

Greenhouse gas emissions

The agriculture sector is the second biggest contributor to greenhouse gas emissions through the emission of methane and nitrous oxide by livestock. The National Greenhouse Gas Inventory estimates that agriculture contributes approximately 18% of total national greenhouse emissions, although in Western Australia agriculture is estimated to contribute approximately 30%. Being a major contributor to emissions, agriculture will be expected to reduce emissions, a challenge for an already efficient system. In 2002, Western Australia's greenhouse gas emissions from agriculture were 115% of 1990 levels. Agriculture production in 2000 was about 145% of that in 1990. Agricultural efficiency, per tonne of greenhouse emissions, has therefore increased by 30%. Put another way, the intensity of emissions, per unit of agricultural production, has decreased. This trend is likely to continue as farming practices improve. Plantations have now become a net sink for carbon as clearing of agricultural land has declined (see detail in Greenhouse Strategy).

Climate change

Climate change as a consequence of greenhouse gas emissions is expected to have a significant impact on the agricultural sector. Generally Western Australia is expected to become warmer and drier, particularly in the south of the State. This could mean a reduction in crop yields in some areas as a result of a shorter growing season and less winter rainfall, though agriculture has shown considerable capacity to adapt to these conditions over the last decade. For example, a recent study of the effect of climate change on the economics of eastern Wheatbelt farms suggests that although profitability declines under a warmer and drier climate, this can be compensated by technological improvements. In other, higher rainfall areas, reduced waterlogging risk will increase the prospects of viable cropping. For many areas, the risk of damaging frosts could decline in the longer term. There is likely to be considerable spatial variability in the response of agricultural systems to climate change.

Projected increases in temperatures have implications for variety selection and breeding for cropping, pasture and horticulture enterprises. Crops dependent on a 'chill factor' to produce fruit such as vines and stonefruit in particular may be adversely affected. Tree crops are more sensitive to temperature trends because of the longer lead times associated with their establishment and development compared with annual crops. In many cases there are variety and/or management options available to adapt to a warmer climate, but they commonly incur increased production costs or changes to product quality.

A mitigating factor for crops such as wheat is that yields increase under higher CO_2 concentrations. However, existing varieties show yield reductions as warming increases beyond about 1 degree of mean temperature. Impacts on plant diseases and insect activity are uncertain due to the complex interaction between climate and pathology.

Climate change is likely to affect pasture growth in the southern rangelands. Projected increases in temperature and rain over the southern rangelands may result in increased pasture growth but could also bring changes in species competition and fire regime. Some pasture species could become extinct or restricted in range – leading to a decrease in biodiversity.

Climate change could also affect milk and meat production due to increased heat stress on livestock. There are management responses to adapt to this, but at increased cost of production.

There is likely to be a major issue with water supply, both on- and off-farm sources being affected by changes in the frequency and duration of runoff events. Decreased runoff into farm dams would require improvements to dam catchments and dam design, while there is also likely to be increased competition from the metropolitan area for regional water resources.

Climate change will affect natural resource management as well as production risk. Interactions between rainfall, temperature and evaporation could easily result in an increased risk of wind erosion, but could provide a benefit by potentially slowing the spread of salinity.

A final factor to consider is that agriculture in Western Australia may be affected just as strongly by changes in agricultural production overseas. The future economic climate will be as important as the atmospheric climate.

The challenge exists for agriculture to adapt to climate change and respond to increasing pressures to reduce greenhouse gas emissions; however, it is not yet clear that farmers will be able to make sizable emission reductions through changes in management practices.

Weeds, pests and diseases

Current agricultural systems are heavily reliant on the use of chemicals to control weeds, pests and disease. A number of pests and diseases are already expressing tolerance to chemical control methods, threatening the productivity of agricultural systems. Resistance is expected to be a continuing problem. Exotic weeds, pests and diseases could establish themselves in Western Australia, threatening many existing agricultural systems as well as the natural environment.

Biotechnology

Biotechnology will be a main influence on broadacre farming in the future. Farmers have readily adopted genetically modified crops in a number of other major grain exporting regions.

A number of submissions raised concerns about the risk associated with genetically modified organisms in agriculture. The Western Australian Government is adopting a cautious approach to this matter. Small-scale field trials are being undertaken to provide further information about these crops in Western Australian conditions, and consultation has been undertaken on the application of genetic modification free zones within Western Australia. The Department of Agriculture actively monitors market trends for GM grains.

While the Federally-based Office of the Gene Technology Regulator is responsible for ensuring human safety and environmental protection, each State is responsible for putting measures in place to safeguard its own produce and industries from a marketing perspective.

Maintaining vibrant agricultural communities

Agricultural trends and other pressures have resulted in the depopulation of rural areas. To maintain vibrant rural communities a number of challenges facing rural communities will need to be addressed. In particular a tension exists between the desire to revitalise rural communities and economic pressures encouraging farm businesses to grow and consolidate by buying out or leasing adjacent lands.

As Barr and Cary[24] note:

> In many areas 'sustainable agriculture' will be as much about industry restructuring as about agricultural systems and agronomy. This raises larger questions about the acceptable rate of community change and the desirable form of rural communities.

It appears the economic and social components of sustainability are in direct opposition to each other under traditional farming systems. Consequently the challenge exists to develop rural industries that maintain or revitalise rural communities (see case study on the Oil Mallee Project) through new, diversified, low-impact crops and farming systems with employment and environmental benefits.

Opportunities for sustainability

When all of the existing and possible future challenges to agriculture are considered, it is easy to be overwhelmed by the scale of the changes necessary to address these. As the Australian Natural Resource Atlas[25] suggests:

> The task of improving catchment health, particularly reducing the predicted future impacts of salinity, is a massive undertaking. A sustainable long-term solution implies significant and major changes in catchment landscapes. If we look at this task in short time frames, it is easy to become overwhelmed. History tells us that societies do not achieve such massive changes in landscape in short time frames without social disruption.

Further, the Australian Natural Resource Atlas concludes that land use change is always occurring, and in most cases this change is being driven by economic and social factors unrelated to natural resource management policy.

Attempts to pursue sustainable agriculture in Western Australia must promote all three dimensions simultaneously by developing and supporting forms of agriculture that are profitable, environmentally beneficial and contribute positively to people living in rural areas by maintaining social capital. While fundamental changes will be necessary, this will only occur in the longer term.

A number of submissions called for a new vision for our agricultural and rural landscapes as the basis for putting in place policies and processes to assist the transition to a more sustainable agriculture (see Box 35 Wildcountry: Gondwana Links). The new Natural Resource Management Council could assist with this, by advising government on the appropriate mechanisms to support sustainable agriculture.
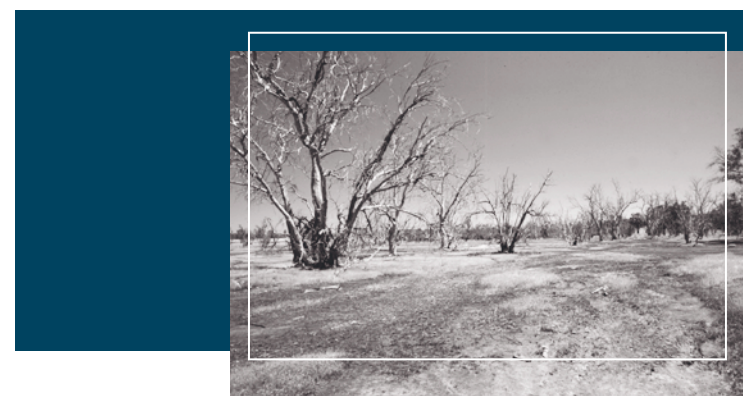
Salinity is the most significant environmental issue in Western Australia threatening the productivity of agricultural lands, biodiversity values, aquatic systems and water supplies, as well as rural infrastructure including roads and buildings. This photo shows the impact of salinity in the Wellington catchment.

Source: Jiri Lochman/ Department of Conservation and Land Management

[24]N Barr & J Cary, Influencing Improved Natural Resource Management on Farms: A guide to understanding factors influencing the adoption of sustainable resource practices, Bureau of Rural Sciences-Discussion Paper, Department of Agriculture, Fisheries and Forestry-Australia, Canberra, 2000, p. 4.

[25]Commonwealth of Australia 2001 http://audit.ea.gov.au/ANRA/People /docs/adjust_fact_sheet/future.html

BOX 35   WILDCOUNTRY: GONDWANA LINKS

Can we halt ongoing biodiversity loss and build sustainable rural communities?

That's the challenge a partnership of non-government groups has set itself in the Gondwana Link partnership. Made up of Greening Australia, the Wilderness Society, Fitzgerald Biosphere Group, Friends of Fitzgerald River National Park, Australian Bush Heritage Fund and the Malleefowl Preservation Group, the partnership is restoring links from the inland woodlands around Kalgoorlie to the karri forest of the wetter south western corner.

The partnership's main focus at present is on re-vegetating farmland between the Stirling Range and Fitzgerald River National Parks as well as securing conservation protection and management for the vast mosaic of woodland, mallee and heathlands that stretch east of the cleared wheatbelt.

The partnership uses a range of innovative approaches. Philanthropic donors have assisted with the purchase and revegetation of farms, researchers are developing biodiverse farming systems, farmers have been encouraged to put covenants on the bushland, conservation investors have purchased bushland areas and conservation science approaches have been developed to focus on the fundamental ecological processes that operate across southern Australia.

The project takes part of its inspiration from similar continent-scale processes underway in the United States, including the ambitious 'Yellowstone to Yukon' conservation network currently under development. The partnership is also working with the United State's largest conservation group, The Nature Conservancy, to build Western Australia's ability to attract private funding to large-scale environmental works.

Opportunities that exist to support a transition to more sustainable agriculture include:

- Developing more sustainable agricultural industries that have well-developed and applied best management practices (see Box 36), including low-input agriculture to meet future market needs.

- Further developing accreditation methodologies for agricultural systems that enable access to markets through verified compliance with production processes that ensure food safety/quality and/or sound environmental management.

- Significant research and development of new industries and innovations that are profitable and environmentally responsible, such as bio-fuels.

- Exploring new opportunities for agriculture that could be provided through the concept of valuing ecosystem services through market-based instruments.

- Supporting the development of carbon sequestration opportunities, including commercial plantations, alley farming and landcare plantings to offset greenhouse gas emissions that could provide salinity benefits as well as large renewable energy resources for power generation. These plantings could be strategically developed to support programs like Wildcountry in creating important bush links across the landscape.

BOX 36   ENVIRONMENTAL MANAGEMENT SYSTEMS AND ACCREDITATION FOR SUSTAINABLE AGRICULTURE

The Commonwealth and State governments have been working together to investigate the opportunities and possibilities associated with environmental management systems in agriculture. Similarly, the World Wide Fund for Nature and others have been investigating the place of accreditation for sustainable agricultural systems.

This work is in recognition of the international trends in the adoption of environmental management systems to other forms of primary production and the possible application to simultaneously assist with making agriculture more sustainable and benefiting agricultural producers.

The term 'environmentally responsible agriculture' reflects the inter-generational equity and precautionary principles of sustainability. This is demonstrated through the adoption of management practices judged as sustainable through a transparent and scientifically rigorous process. The Department of Agriculture is developing the framework to describe processes and outputs for the achievement and demonstration of environmentally responsible agriculture. The framework will define the roles, responsibilities and communication strategies that underlie the processes and outputs and will be developed in consultation with relevant stakeholders from industry, community and government. The major processes and outputs described in the framework are outlined below:

- engagement of relevant producer and community groups

- environmental condition assessment using spatially defined zones

- natural resource management outcome targets

- industry performance standards linked to natural resource management outcome targets

- best management practices underpinned by these standards which allow for profitable agriculture and address environmental outcomes

- sign-off and reporting to a third party on compliance with best management practices,

- evaluating and reporting progress towards natural resource management outcome targets.
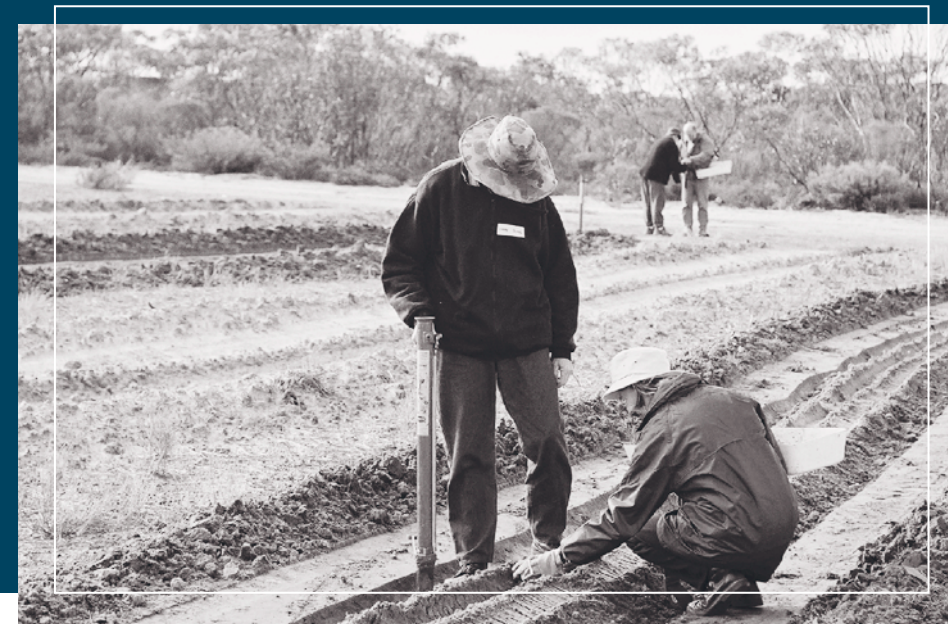
Volunteers involved with the Gondwana Links project help revegetate 70ha of cleared land with native species. Revegetation will re-link a large area of bush with a nearby nature reserve (see Box 35).

Source: Amanda Keesing

In short...

Vision

Agriculture achieves a new balance in Western Australia with production becoming more efficient and diverse while restoring ecological integrity in the landscape. Natural bush and regenerated land are linked in corridors across the State. New bio-industries based on local species are creating employment in rural towns.

Objectives

- Develop and identify agricultural systems designed to maintain or improve the condition of the State's natural resources.

- Facilitate the widespread adoption of best management practices that minimise environmental impact while improving profitability.

- Facilitate appropriate landuse change.

Actions underway

- The Department of Agriculture and other State and Commonwealth government agencies such as CSIRO and Land and Water Australia support or directly undertake considerable research, development and extension of sustainable agriculture techniques, such as best management practices for farmer groups and individuals, including the development of best management practices for irrigators in the south west irrigation area.

- The Department of Agriculture and the Great Southern Development Commission are undertaking the Central South Coast Strategic Analysis to identify the constraints impeding adoption and implementation of change to more sustainable agricultural practices.

- The Western Australian Government has responded to the Salinity Taskforce's report and outlined its strategic priorities for salinity management in Western Australia.

- The government will continue to lobby the Federal Government for a greater share of national salinity funding to ensure appropriate recognition of the significant extent of Western Australia's dryland salinity.

- The Western Australian Government is amending the Environmental Protection Act to provide for improved management of land clearing.

- The Cooperative Research Centre for Plant Based Solutions to Dryland Salinity has been established.

- Research into the productive use of pastures on saline land has increased. The aim is to improve the sheep grazing value of saltbush-based pastures by optimising the combination of shrub and under-storey plants and their utilisation.

- The University of Western Australia in collaboration with the State Government has established a Centre of Excellence in Natural Resources Management at its Albany campus.

- Organisations like the Western Australian No-Tillage Farmers Association are researching more sustainable agricultural practices.

- In May 2001, the government announced an interim 5 year moratorium on the commercial production of GM food crops to allow issues associated with market impacts, identity preservation and the feasibility, risks and benefits of establishing GM and GM-free zones to be fully debated in the community. The GM Crops Free Areas Bill 2003 will enable the government to designate areas where commercial cultivation of specified GM food crops is prohibited. The Gene

In short cont'd...

Technology Bill 2001 has been examined by the Standing Committee on Public Affairs and Environment that reported to the Legislative Council in July 2003. Passage of both bills is expected in 2003.

Actions

3.1 Through the Natural Resource Management Council, the Sustainability Roundtable and the Sustainability and Development Assessment Committee of the Western Australian Planning Commission, support the increased involvement of local government in planning for natural resource management, including issues of agricultural sustainability, particularly regional drainage, biodiversity conservation, regional revegetation programs, water quality and soil acidity.

3.2 In collaboration with regional natural resource management groups conduct resource risk assessments and develop regional targets for natural resource condition, for incorporation into regional natural resource management plans.

3.3 Carry out strategic land use analyses in relation to resource condition targets and support diversification and landscape scale change towards sustainable land use.

3.4 Continue to develop the Western Australian Government's policy on genetically modified food crops including through the enactment of the Gene Technology Bill 2001 and the Genetically Modified Crops Free Area Bill 2003.

3.5 Research and extend the productive use and rehabilitation of saline lands including management of the Western Australian component of the Sustainable Grazing on Saline Lands program involving participative research by up to sixty farmer groups in agricultural areas.

3.6 Develop with industry participation, standards and best practices for agricultural systems at regional and enterprise scale to provide the basis for accreditation of sustainable agriculture practices and to support regulatory processes.

3.7 Investigate economic incentives and innovative instruments such as biodiversity offsets, integrated ecosystem services trading, tax incentives and environmental stewardship rebates as well as land purchase, as drivers of land use change towards more sustainable use.

3.8 Support the sustainability of farming enterprises and improved self-management of price, climate and other risks associated with agriculture through:

- research into improved risk prediction mechanisms, e.g. seasonal weather forecasting

- promoting a better understanding and use of risk management strategies such as enterprise diversification, Farm Management Deposits, price risk management and off-farm investment, and

- reforms to support schemes such as Exceptional Circumstances to ensure they meet broader sustainability needs.

3.9 Investigate the application of the EMU Plus process developed in the rangelands as a means of empowering farmers and catchment groups, building capacity, facilitating change and leveraging private investment towards sustainable agriculture.

3.10 Work with grower groups to implement Water Wise on the Farm, a training program for irrigators to improve irrigation skills and conduct research and extension programs to improve the productivity, efficiency and sustainable use of water.

In short cont'd...

3.11 Manage bio-security threats to sustainability through:

- pre-border and border controls to minimise the introduction of non-established animals and plant pests and diseases

- maintaining a capacity and capability to manage incursions of non-established animal and plant pests and diseases, and

- reviewing, with the Agriculture Protection Board, industry, community and local government participation, the funding and decision-making arrangements for management of widespread declared plant and animal pests.

3.12 Work towards a greenhouse neutral agriculture including by collaborating nationally on research to quantify the emissions of non-CO_2 greenhouse gases from agriculture and quantifying the impacts of changed management on these emissions.

3.13 Promote industry development opportunities such as bio-energy production and 'carbon farming'.

Global opportunities

Resolution of many of the issues affecting agriculture in Western Australia, such as salinity, soil acidity, the impact of climate change and the need to reduce greenhouse emissions, is integral to achieving sustainable natural resource management. These issues are being experienced in other regions of the world. Through joint research as well as involvement in aid projects Western Australians will continue to contribute positively to resolving agricultural sustainability challenges in our State with the knowledge of global experience. The more that Western Australia participates in this process the more globally relevant experience the State will gain. This will benefit farmers, consultants, industry groups and government agencies.

Further information

Carew-Reid, L 2002, *The Lake Toolibin Recovery Project for a Sustainable Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/casestudies/laketoolibin/laketoolibin.htm

CSIRO, Sustainable Agriculture Program
http://www.clw.csiro.au/research/agriculture/

Hart, R 2002, *Preserving the Western Australian Malleefowl*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/OilMallee/malleefowl/Malleefowl.htm

Holland, K 2002, *Ribbons of Blue: Communities Caring for Water Catchments*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/ribbonsofblue/ribbonsofblue.htm

Merito, T & Ruane, S 2002, *Private Sector Conservation: Assisting Biodiversity*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/privatesectorconservation/privatesectorconservation.htm

National Association of Sustainable Agriculture Australia
http://www.nasaa.com.au/

Stanton-Hicks, E 2002, *Oil Mallees: Native Flora with Myriad Benefits*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/OilMallee/OilMallee.htm

The Allen Consulting Group 2001, *Repairing the Country: Leveraging Private Investment*, Business Leaders Roundtable, viewed August 2002, http://www.acfonline.org.au/docs/publications/rpt0005.pdf

Western Australian Department of Agriculture
http://www.agric.wa.gov.au/programs/srd/statesus/index.htm

> SUSTAINABLE FISHERIES AND AQUACULTURE

Fisheries management and sustainability is one of the good news stories in Western Australia. This is due to a powerful regulatory system and technology and resources for monitoring and reporting, as well as strong cooperation and partnerships with industry and the community. The Western Australian Government has adopted a policy on the ecologically sustainable management of fisheries that is a world first.

The achievement of ecosystem-based management is hampered by the absence of an overarching, bio-regional, marine planning system and the lack of integration between the implementation of the marine reserve system ... fisheries management and the Commonwealth's Oceans Policy.

Environmental Alliance

The WA Rock Lobster industry is the world's first fishery to receive Marine Stewardship Council certification.

Worldwide Fund for Nature

The rock lobster industry is global best practice in many ways, its management techniques should be translated to other fisheries, including aquaculture.

Australian Corporate Citizenship Alliance

In 2001-02, commercial fisheries, including aquaculture, accounted for $615 million of Western Australia's income per annum, of which over $600 million comes from exports. These exports represent about 25% of the national total, making Western Australia the leading State in terms of fisheries. Additionally, an estimated 600,000 Western Australians contribute a further $570 million in annual economic activity from recreational fishing and aquatic eco-tourism. In some regional towns in the Gascoyne and Kimberley regions, fisheries activity provides the main form of employment.

A key feature of our coastal waters is the diversity of fish. This supports well-developed commercial and recreational fisheries. Within Western Australia there are thirty-four managed commercial fisheries, five licensed recreational fisheries and a number of emerging aquaculture industries. These fisheries are mainly coastal and have developed under conditions of low productivity compared to western shores of the other continents in the southern hemisphere.

Many of the target species are demersal and rely on specific habitats, for example coral reefs, mangroves or algal reefs that are limited in number and extent. This scenario leads to the possibility of over-exploitation that could compromise the sustainability of these fish stocks and other interdependent non-target species and their habitats. Fish Habitat Protection Areas are being established as an integral part of fisheries management plans and strategies.

Fisheries management

The *State of the Fisheries Report 2001-2002* reports comprehensively on the status of Western Australian fish stocks, associated fishing activities and aquaculture development as well as the associated impacts of these industries. The report indicates that the majority of the fish stocks are in a healthy condition and are being exploited at sustainable levels. The report notes that the southern pilchard stocks, which were severely depleted as a result of a virus in 1999, are now showing good signs of recovery. The remaining commercial fishery of concern is the southern and west coast demersal gillnet and demersal longline fishery for shark which is responding to management, but is also being impacted by other offshore fisheries not under Western Australia's jurisdiction.

Over-exploitation of our natural biological resources can compromise sustainability. The sustainability of fish stocks and conservation of their habitats are desired government outcomes reflected in the *Fish Resources Management Act 1994*. The objects of this Act are consistent with sustainability objectives and guiding principles. In addition, Commonwealth Government legislation now requires that all export fisheries undergo an assessment against guidelines for sustainability.

BOX 37   ACCREDITATION FOR SUSTAINABLE FISHERIES AND THE WESTERN ROCK LOBSTER FISHERY

The Marine Stewardship Council is an independent global organisation established to harness consumer purchasing power to generate change and promote environmentally responsible stewardship of the marine environment. The Council has been operating independently since 1999, though it was first established in 1997 with international food company Unilever and the Worldwide Fund for Nature.

The Western Rock Lobster Fishery is widely recognised as one of the best managed fisheries in the world and is Australia's most valuable single species fishery, at a value of $300 to $400 million annually. In March 2000, it became one of the first fisheries in the world to receive certification from the Marine Stewardship Council.

The foundation of this success was a management package introduced by the Department of Fisheries in 1993-94 to rebuild severely depleted breeding stock. In 1997-98 and 1999-2000, these management measures resulted in bumper catches and economic prosperity for commercial fishers and the State.

The Council's accreditation process is now also paving the way for the fishery to meet its requirements in demonstrating ecological sustainability to Environment Australia—a necessary requisite for all future export fisheries under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 2000*.

Approximately twelve to twenty-five fisheries worldwide are in various stages of assessment for accreditation by the Marine Stewardship Council. The Council has established an Asia-Pacific presence in Sydney that will allow it to better respond to the increasing demand for its accreditation services with considerable benefit to Australian fishing industries.

The government has recently committed $15 million to the development of a new fisheries research institute and associated community education initiatives to promote the sustainable use and management of marine resources.

The Department of Fisheries has also released a Policy for the Implementation of Ecologically Sustainable Development for Fisheries and Aquaculture in Western Australia.[26] This policy outlines how sustainability can be implemented within the fisheries sector. It focuses on environmental components of sustainability that are necessary to complete the assessments for export that Commonwealth Government legislation now requires. Future revisions of the policy will expand upon the social and economic components of sustainability and consider resource allocation issues.

The policy requires the preparation of sustainability assessments for each fishery, with the report being made available for public comment. Effort is currently directed towards commercial fisheries, particularly those with a substantial export component. Work has also commenced on a reporting framework for aquaculture.

The Department of Fisheries has identified the following key issues as requiring consideration in the future:

- an increased public requirement for accountability in respect to the maintenance of biodiversity and the ecologically sustainable use of the marine environment

- additional pressure placed on inshore fish stocks as a result of continuing population growth, coastal development, improved access and fishing technology, together with a growing recreational sector

- the development of high-quality recreational fisheries and low-impact eco-tourism experiences in some regions to meet increasing community interest and tourism potential

- direct involvement of the Commonwealth Government in the day-to-day management and planning of Western Australia's marine environment through the implementation of the Commonwealth's Oceans Policy initiative, and

- Indigenous fishing issues and the development of the law in respect to Native Title.

There is also increasing pressure on the marine environment from a variety of users, including those in the aquaculture, fishing and tourism sectors, together with a growing community desire for unfettered access to the marine environment and for conservation of important areas, habitats and species. For certain types of aquaculture, there is a shortage of high-quality marine sites. Suitable sites tend to be in high-use areas and close to major townsites. This often results in a high level of conflict between aquaculturalists and other users and the general community.

A number of State government agencies are involved with planning for the marine environment[26]:

- The Department of Fisheries prepares plans for fish habitat protection areas, aquaculture plans, fisheries management plans, regional recreational fishing management plans and fisheries environmental management plans.

- The Department of Environment prepares water management programs for estuaries and inlets.

- The Department of Industry and Resources plans for resource development in State waters.

- The Department of Conservation and Land Management plans for marine nature reserves, marine parks, marine management areas and for management of marine wildlife.

There is currently no legislative framework for planning in the marine environment and existing land use planning processes for coastal lands often do not integrate the use of the adjoining marine environment. Government has gazetted a State Coastal Statement of Planning Policy that requires the marine impacts of coastal land use decisions to be taken into account. A marine planning strategy is proposed to provide an integrated planning framework for the marine environment. This strategy would complement State and regional land planning strategies. This need has been recognised in the government's response to the Report of the Ministerial Taskforce on Coastal Planning and Management 'Coasts WA: Better Integration'. The report outlines an integrated coastal planning and management framework. The framework proposes the development of a State Coastal Strategy and State Marine Planning Strategy that will provide mechanisms for a more integrated planning framework for the marine environment.

Marine and freshwater biodiversity conservation

The Marine Parks and Reserves Authority and the Department of Conservation and Land Management have responsibility for establishing and overseeing the management of marine parks and marine nature reserves under the Conservation and Land Management Act, and for the protection of biodiversity in them. The Department also has responsibility for the conservation of marine mammals, reptiles and birds in Western Australian waters. The government is committed to the expansion of the marine conservation reserve system, including six new marine reserves by 2005.

[26]Department of Fisheries 2002. Policy for the Implementation of Ecologically Sustainable Development for Fisheries and Aquaculture within Western Australia. Fisheries Management Paper No. 157, Perth.

Lead responsibility for management of populations of all other marine organisms is with the Department of Fisheries under the *Fish Resources Management Act*. For the purposes of that Act, all those marine organisms are fish (this includes algae and marine invertebrates). Under the Fish Resources Management Act, the Minister for Fisheries may declare fish habitat protection areas for conservation of fish and marine ecosystems, for fish research and for appreciation of fish in their natural surroundings.

While the *State of the Fisheries Report* indicates that the majority of commercial, recreational and aquaculture fisheries are being managed sustainably, there is concern about the status of the freshwater fish populations, particularly in the south west corner of the State. There are fourteen species of freshwater fish in the south west of Western Australia and eight of these are endemic. Most are affected to some extent by habitat loss and five are considered potentially vulnerable because of this. In the south west, habitat degradation of freshwater systems has occurred because of salinity, the clearing of native vegetation, point source pollution, eutrophication, silting and the loss of riparian vegetation. Considerable effort needs to be directed to planning for the protection and management of freshwater fish. The Department of Fisheries has a responsibility for freshwater fish.

In short...

Vision

Marine fisheries and aquaculture are sustainably managed in a way that ensures all species, including the non-commercial species, can survive and that people can enjoy the benefits of recreational activities in marine environments. Inland aquatic systems are managed so that no further decline in fish species occurs.

Objectives

- To protect biodiversity and maintain essential ecological processes of the marine environment.

- To provide effective legal, institutional and economic frameworks for ecologically sustainable development of fisheries based on sound science.

Actions underway

- The Department of Fisheries is compiling ecologically sustainable development assessment reports for commercial fisheries for export approval under the Commonwealth's Environment Protection and Biodiversity Conservation Act. Assessment of other sectors will follow.

- The State Government is involved in implementing the National Oceans Policy, particularly in northern Australia and commencing in the south west in 2004.

- The government has committed $15 million to the establishment of a new fisheries research institute and associated community education initiatives to promote the sustainability of marine resources.

- Fish habitat protection areas have been established at the Abrolhos Islands, Lancelin Lagoon, Cottesloe Reef and Miaboolya Beach.

- Six marine parks (Ningaloo, Marmion, Shark Bay, Shoalwater Islands, Rowley Shoals and Swan Water Estuary) and one marine nature reserve (Hamelin Pool) have been established. The Marine Parks and Reserves Authority and the Department of Conservation and Land Management are continuing to implement identified State Government priorities for further reservations, including new marine parks or reserves at Jurien, Montebello/Barrow Islands, Dampier Archipelago, Leeuwin-Naturaliste and Walpole-Nornalup Inlets, as well as extensions to existing parks particularly Ningaloo.

In short cont'd...

- Fisheries environmental management reviews are being prepared on a region-by-region basis for all fisheries and fishing activity in Western Australia's marine waters out to the 200 nautical mile Exclusive Economic Zone boundary.

- Regional recreational fisheries management strategies have been developed for the Gascoyne and West Coast regions. Planning is underway for the Pilbara-Kimberley and South Coast regions. Aquaculture development plans are being developed on a regional and/or sectoral basis.

- The Western Rock Lobster Fishery has been certified by the Marine Stewardship Council, an independent body that accredits fisheries on their environmental sustainability.

- Work is being undertaken to preserve freshwater fish stocks, including research, retaining breeding stocks, working with other relevant departments, and working with a freshwater fish reference group to identify issues associated with the conservation of native fish and establish priorities for management.

- The Great Southern Development Commission is undertaking work to assess the capacity of the local fishing industry to add value to the local fish resources, find markets and make a better return.

- The Aboriginal Fishing Strategy Working Group released a discussion paper on a proposed Aboriginal fishing strategy.

Actions

3.14 Expand the scope of the existing and proposed environmental assessments of fisheries and aquaculture sectors to include social and economic components in order to meet government policy and legislative objectives.

3.15 Develop a State marine planning strategy through the Coastal Planning and Coordination Council.

3.16 Develop a long-term aquatic ecosystem strategy to rehabilitate freshwater ecosystems and establish a freshwater native fish sub program within the Department of Fisheries to conserve and protect the native freshwater fish populations of the State.

3.17 Continue to establish fish habitat protection areas to complement the marine park and reserve system.

3.18 Continue to expand the State's marine conservation reserve system, by meeting the government's commitment to establish five new marine parks and reserves over the next 18 months.

3.19 Continue and expand targeted education and training programs to promote sustainable fisheries and aquaculture throughout Western Australia.

3.20 Support the development of an integrated fisheries management strategy and supporting processes taking into account the needs of all stakeholders on a bioregional basis (e.g. commercial, recreational, conservation, Indigenous, tourism, pearling and aquaculture).

In short cont'd...

Global opportunities

Global fisheries are not managed sustainably, particularly in the developing world. There are many international projects that could utilise Western Australia's expertise in sustainable fisheries, aquaculture management and marine planning processes leading towards sustainable management of marine environments.

Further information

Department of Fisheries 2000-2001, *Policy for the Implementation of Ecologically Sustainable Development of Fisheries and Aquaculture within Western Australia*, Fisheries Management Paper No.157, Department of Fisheries, Perth, viewed August 2002, http://www.fish.wa.gov.au/esd/index.html

Department of Fisheries 2001-2002, *State of the Fisheries Report 2001-2002*, Department of Fisheries, Perth http://www.fish.wa.gov.au/sof/index.html

McAuley, H 2002, *Cottesloe Reef: Community Managed Natural Resources*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/CottesloeReef/CottesloeReef.htm
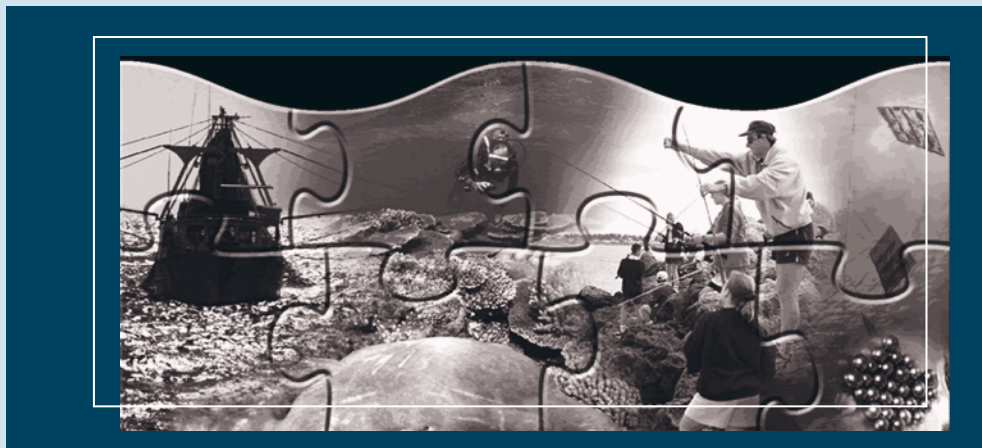
Department of Fisheries believes that sustainability is like a jigsaw: people, fish, marine ecosystems, technology and science, all fitting together for a long term future.

Source: Department of Fisheries

> SUSTAINABLE FORESTRY AND PLANTATIONS

The Western Australian Government has ended logging in old-growth forests on public land and is proceeding to incorporate these areas into secure conservation reserves, including thirty new national parks. As part of this process the government has put in place programs to restructure the timber industries to maintain social capital and regional development opportunities. This $151 million package is an essential part of how sustainability applies to forests.

Increasing global attention is being directed to our attempts to save forests, create habitat for rare and endangered species, manage feral animals and weeds. Can this become a new economic opportunity for the State? How can this help communities in rural areas?

Environmental Alliance

Western Australia's State forests and timber reserves are vested with the Conservation Commission of Western Australia and managed according to an approved management plan. A Draft Forest Management Plan for the State's south west forests was released for public comment in August 2002 as part of the development of the new plan to implement the government's forest policy. The government is committed to maintaining the ecological integrity of forests and woodlands, and will achieve this through the application of ecological sustainable forest management principles.

The Draft Forest Management Plan proposed refinements in the way in which levels of sustained yields of timber from native forests are calculated, to provide more accurately for risks and impacting processes that can affect future yields. It also proposed to formalise adaptive management: a systematic approach to defining management actions, implementing them, monitoring their impacts and then adapting the management practice based on the results of the study. Further research and monitoring to improve the knowledge base underpinning ongoing management decisions will be required. The proposals are consistent with the precautionary principle. These actions were carried forward in the Proposed Forest Management Plan that has been endorsed by Cabinet to be forwarded to the Environmental Protection Authority for assessment.

Potentially the greatest single threat to biodiversity values in the south west, *Phytophthora cinnamomi*, sometimes referred to as jarrah dieback, is estimated to affect around 4000 species of native plants and to cause major, permanent and irreversible changes to vegetation structure and habitat values for native animal species. Other species of *Phytophthora*, species of *Armillaria* and a range of insect pests also cause significant damage.

Phytophthora species continue to pose a significant risk to the sustainability of forests in Western Australia. Disease management needs a strong commitment, such as rigorous controls on movement of vehicles and other vectors into likely uninfested areas, including those in State forest and timber reserves, national parks and nature reserves in the south west. A commitment to evaluate rehabilitation requirements of areas degraded by *Phytophthora* is also required.

The forest plantation industry has an important role to play in the future sustainability of the State. Plantations have the potential to produce timber to compensate for the declining production from native forest. They can be a sink for greenhouse emissions earning carbon credits on a world market. In addition, plantations can help deal with salinity and other land degradation issues and, if placed correctly with appropriate species, can help restore biodiversity values, especially through linking existing conservation reserves and other remnant vegetation. Plantations can also be the basis of new bio-industries including bio-energy (see *Sustainable energy*).

The Forest Products Commission has developed an Action Plan for Tree Farming for the south west that includes sawlog eucalypts, maritime and radiata pines, oil mallees and blue gums. The Commission is also developing a suite of salt-tolerant eucalypts to provide commercial revegetation options for land affected by salinity, and is working with the Department of Conservation and Land Management to develop new woody tree crops. The Forest Products Commission's INFINITREE™ initiative seeks to maximise the economic, environmental and social benefits of tree farming in medium rainfall areas of the agricultural zone.

The sandalwood industry has considerable potential to contribute to diversification in the rangelands. The opportunities that the sandalwood industry provides for diversification should be reviewed. Such a review would oversee the development of an integrated business and resource management plan that ensures the resource is managed on an ecologically sustainable basis, that maximises environmental, social, regional development benefits as well as providing adequate financial returns to the State. The review should also examine and report on mechanisms to support further development of sandalwood plantations in the agricultural region. The Forest Products Commission has commenced trials with pastoral leaseholders to reduce and where possible eliminate feral goats from sandalwood production areas.

As for other sustainability issues, there will be an ongoing need to continue to involve the community in the planning and decision-making in relation to forest management.

In short...

Vision

Western Australia's native hardwood forests are managed on an ecologically sustainable basis that provides for a wide range of uses, all of which reflect the unique values of these forests. Regeneration of native forests is also a major focus, with strong community involvement. Production of sawlogs, pulpwood and other timber products from sustainably managed plantations is integrated with native forest use. Rural communities have adjusted to support the changed focus in use and management of native forests and the ongoing development of plantations throughout the south west, including their role in restoring degraded landscapes creating new bio-industries and providing other environmental services such as carbon sequestration. Woodlands and sandalwood resources are also used and managed sustainably, with sandalwood production providing the basis for a new industry in the rangelands.

Objective

- Ensure that Western Australia's forests, woodlands and sandalwood resources are managed according to sustainability principles.

- Encourage the expansion of tree farming to achieve environmental, social and economic benefits.

Actions underway

- The Conservation Commission has prepared a proposed forest management plan incorporating ecologically sustainable forest management principles, which is being assessed by the Environmental Protection Authority.

- The government has ended logging in the remaining old-growth forests on State-owned land and is working towards the creation of thirty additional national parks and two new conservation parks to expand the reserve system in the forested south west.

In short cont'd...

- The Forest Products Commission has developed an Action Plan for Tree farming covering the south west. In medium rainfall areas, this is being implemented through the Commission's INFINITREE™ initiative to maximise economic, environmental and social benefits.

- An agreement to develop a LVL plant from the Gnangara pine plantation creating over 100 jobs and improved groundwater management possibilities.

- New bio-industries (and bio-energy) based on tree plantations are being created around Oil Mallees, pine plantations and bluegum plantations as well as from trees like sandalwood.

Actions

3.21 Continue to support restructuring of the native forest timber industry, giving particular support to value-adding opportunities in the timber processing and wood working areas, especially production and marketing of fine timber products made from specialty native hardwoods.

3.22 Promote the efficient use of all logs, development of high value-added timber utilisation, and forest structure based on maintaining the full range of forest values including sawlog production.

3.23 Actively support the Action Plan for Tree Farming in Western Australia and the Forest Products Commission's INFINITREE™ initiative for the further development of a plantation industry on previously cleared agricultural land within the guidelines being developed by the Western Australian Planning Commission to retain viable rural communities. Particular attention should be given to production of sawlogs as a substitute for the declining yield from native forests and for carbon credits,

3.24 Work to create new bioindustries including bio-energy from plantations across the state.

3.25 Finalise the boundaries of the thirty new forest national parks committed to by the government after consultation with the public.

3.26 Review the sandalwood industry in Western Australia, the present and projected resource availability, the manner and pattern of exploitation of the resource, and the role that it might play in regional development and ecologically sustainable management of the rangelands. Develop sandalwood management having regard to principles of ecologically sustainable forest management.

3.27 Seek to minimise the loss of natural values from State forests and timber reserves and all other reserve categories within the south west as a consequence of the extraction of low-value bulk commodities such as sand and gravel.

3.28 Create a comprehensive dieback strategy to:

- establish and maintain a database on the distribution of *Phytophthora* species throughout the south west for use in planning timber harvesting operations and other activities

- develop and implement rehabilitation plans for selected disease-affected areas

- promote the use of best practice hygiene procedures in the Western Australian nursery industry to help eliminate *Phytophthora* species from all seedlings and propagating material

- work with relevant Commonwealth agencies to help prevent the introduction of new plant diseases into Australia that could impact on forest ecosystems and forest-based industries

In short cont'd...

- develop an education program for the general public, and private and public organisations whose activities involve use of land in dieback susceptible vegetation types, and

- examine the establishment of a centre of excellence for *Phytophthora* research into ecological impacts on key elements of the biota, methods of managing and counteracting impacts of diseases, and monitoring spread.

3.29 Support accreditation of native forest and plantation management to sustainability standards as an important part of maintaining sustainable forest management in Western Australia.

Global opportunities

The decision to stop the logging of old-growth forests in the south west of Western Australia and a move towards sustainable forest management has attracted interest from around the world. When fully implemented, monitored and evaluated, this area of sustainability will be of considerable global value as the world's forests continue to decline at an alarming rate.

Further information

Conservation Commission of Western Australia
http://www.conservation.wa.gov.au

Department of Conservation and Land Management
http://www.naturebase.net

Forest Products Commission
http://www.fpc.wa.gov.au

Oil mallee plantations and alley plantings are providing an alternative and perennial crop on cleared agricultural land with multiple benefits.

Source: Department of Conservation and Land Management

> SUSTAINABLE MINING AND PETROLEUM PRODUCTION

The mining and petroleum industries are important contributors to Western Australia's economy and are part of the State's rural landscape. In the past twenty years they have been at the cutting edge of developments in environmental science and management. It is accepted that assessment of resource projects on local environmental criteria is now well advanced but that the integration of social, economic and strategic issues needs more attention.

> *From a mining industry perspective, many of the practices of years gone by are no longer valid. There has been a gradual recognition that a healthy economic bottom line will only come if environmental and social goals are pursued in tandem. The growth of factors such as ethical investment, community expectations and human rights movements are driving significant change in the resources sector.*
>
> Rio Tinto

In Western Australia, the mineral and petroleum resources sector accounts for 25% of Gross State Product, 49% of investment, 71% of exports and 17% of direct and indirect employment. The Western Australian resources sector is 50% of Australia's total mineral resources production and accounts for 47% of the investment in mining nationally.

The resources industry contributes to sustainability by providing the raw materials to underpin the global economy and by demonstrating how to do this with environmental and social responsibility. Western Australia's minerals sector produces a huge variety of mineral products. Some, like iron, nickel and alumina, are refined into metals that can be recycled for generations. Others, like mineral sands and silicon, are high-value inputs into high-technology industries that are increasing the efficiency of the global economy, helping manufacturers to achieve more and more with less and less raw materials and energy. The petroleum industry also provides feedstocks for high-value industrial processes. More importantly, it supplies the fuels to satisfy most of the vital energy needs of our society and will continue to do so through the transition to the fuels of the future, in particular to gas and the hydrogen economy.

A number of key sustainability innovations have been developed in the Western Australian resources sector, including land and water rehabilitation, eco-efficiency in mineral processing and, more recently, a range of social innovations, for example the training and employment of Aboriginal people. Four sustainability case studies and a background paper describe some of these innovations.

The international minerals sector has been one of the most pro-active industries in embracing sustainable development. A series of bodies beginning with the Global Mining Initiative (GMI) through to the International Council on Mining and Metals (ICMM) have tackled the implications for the industry, and where industry can best lead the pursuit of sustainable outcomes. Key work in this area has seen the Mining, Minerals and Sustainable Development (MMSD) report, Breaking New Ground, which examined key issues for the sector in depth, to which the Australian sector contributed a large amount of work, culminating in a dedicated Australian regional report under the MMSD framework. Other key initiatives have been the GMI Toronto Conference in 2002 and the Toronto Declaration, contribution to the World Summit for Sustainable Development in Johannesburg, and the ICMM Sustainable Development Framework and Principles which outline the ways members of the ICMM seek to take action in ten key areas (see Box 38). Agreed principles of sustainability in resources operations are important for the public to recognise where net benefit considerations are occurring. It is also important for the public to see where regulations are being applied and the monitoring and reporting processes that are in place. Sustainability reporting should be in accordance with internationally developed formats to aid comparison and understanding of the data.

BOX 38   ICMM SUSTAINABILITY FRAMEWORK: SUSTAINABILITY PRINCIPLES

1.   Implement and maintain ethical business practices and sound systems of corporate governance.

2.   Integrate sustainable development considerations within the corporate decision-making process.

3.   Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.

4.   Implement risk management strategies based on valid data and sound science.

5.   Seek continual improvement of our health and safety performance.

6.   Seek continual improvement of our environmental performance.

7.   Contribute to conservation of biodiversity and integrated approaches to land use planning.

8.   Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.

9.   Contribute to the social, economic and institutional development of the communities in which we operate.

10. Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.

It is also important that industry be allowed sufficient flexibility to find innovative ways to achieve sustainability goals. The State has facilitated this in the petroleum industry through the safety case framework, where each oil or gas facility must come up with a unique site-specific risk mitigation plan according to the framework. This has assisted in mitigating the environmental, health and economic risks of petroleum production in a cooperative way with government.

To move ahead, action items include ensuring that government decision-making processes are open to public input and scrutiny, and address better the potential social and environmental impacts of all aspects of the sector's activities. The State Sustainability Strategy can provide an avenue for this to occur through a partnership similar to that developed with local government.

Economic sustainability

Some submissions to the State Sustainability Strategy suggested that Western Australia should move away from being an economy based so heavily on the resources sector. Diversification of the economic base is a goal of the State, and the resources industry can underpin a diversified economy by providing opportunities for downstream processing and inputs for elaborately transformed manufactures, as well as being an important client for the services sector.

The expertise required to develop the State's vast resource base is significant and, in Western Australia, the processes of exploration, development, processing and rehabilitation are world class. This expertise is now being exported to numerous countries with an estimated benefit to the national economy of $1 billion, with Western Australia gaining 60% of this benefit (see Box 39).

The case studies on mining (see below) document how a number of companies have created long-term futures by creative use of technology and innovative thinking. They demonstrate that mining is a lot more than digging up the ground and are finding clever solutions to their problems. It is clear from these examples why the companies have chosen to use sustainability for the framework they used for their innovation. And it is clear that Western Australia is at the global forefront in the application of sustainability to mining. Box 40 below sets out how the HIsmelt process has created a long-term future for Pilbara iron ore.

BOX 39   EXPORTING SUSTAINABILITY SERVICES IN THE MINING SECTOR

Ivanhoe Mines Mongolia Inc. is undertaking a mine development scoping study for a significant copper-gold porphyry deposit located in southern Mongolia. The scoping study is using Perth-based mining consultants to complete planning and pre-feasibility studies for the project. Ivanhoe Mines recognise that the success of the project relies upon the integration of economic, social and environmental concepts into the early mine planning phase of development, i.e. to demonstrate sustainability.

The challenges for planning mineral resource development to meet sustainability objectives include consideration of economic, social and environmental demands made during the life of the project and beyond. For the Oyu Tolgoi Project, the planning phase establishes rigorous and internationally accepted objectives for water management, air quality, conservation of natural systems, waste management and community amenity. Through the implementation of an effective environmental management system, Ivanhoe Mines is able to plan to achieve these environmental objectives, through a continual process of planning, implementation, monitoring, and review.

As a demonstration of this commitment to achieving best practice environmental management, Ivanhoe Mines successfully achieved independent accreditation of the Oyu Tolgoi Project Environmental Management System to the internationally recognised ISO 14001 series (Environmental Management Systems).

The Oyu Tolgoi scoping study identifies feasible mine development options and establishes the basis for ongoing project planning. Oyu Tolgoi is a remote and sparsely populated arid region of Mongolia with almost no existing infrastructure. The study also includes options for the provision of power, water and services in a manner that is sensitive to the future needs of the Mongolian people. The project offers opportunities for developing social infrastructure including employment and training that will assist in the alleviation of current widespread poverty in rural communities.

Sustainability Pty Ltd, a Perth-based consultancy, provide technical and practical support and guidance to Ivanhoe Mines Mongolia Inc. in the identification and implementation of best practices, to ensure the continued achievement of the sustainability project objectives. Sustainability's ongoing involvement in the project planning phase is a further example of Western Australian exports in knowledge and expertise, particularly in the field of sustainable development.

BOX 40   HISMELT TECHNOLOGY: A GLOBAL INNOVATION FROM WESTERN AUSTRALIA

HIsmelt technology is a globally innovative technology breakthrough from Rio Tinto developed in Kwinana. This technology has been researched and developed by Rio Tinto with support from government over the past twenty years. The project was approved in late 2002 by the Minister for Environment and Heritage for full-scale application at a company-owned plant in the Kwinana industrial area along the coast south of Fremantle.

In terms of sustainability the technology is a breakthrough on several fronts. First, it enables vast areas of previously uneconomic high phosphorus iron ore to become economic, giving the Pilbara region a much longer lifetime as a producer of quality iron ore. Second, it is a fundamental change to how iron is produced, with significant potential to reduce energy consumption and greenhouse gases.

The process combines a hot air blast system, ore pre-heater and vertical smelt reduction vessel to smelt a continuous ore/coal/flux feed into high purity iron ore without the use of coking ovens or sinter plants. The key innovation is the use of a direct smelting rather than a shaft furnace process, which greatly increases the range of suitable and economically viable ferrous feed stocks, due to its ability to separate impurities efficiently on a continuous basis. Phosphorous, which is captured in the pig iron in a traditional blast furnace and is an impurity for steelmaking, is no longer a hindrance. After a downstream sulphur removal stage, the end-result is a high-grade pig iron, which is highly sought after by steel manufacturers.

The design of the plant will also allow for the capture of thermal energy produced in the smelting process that can then be used for energy production. This new efficiency is called a 'Factor-X' gain (a term used in industrial ecology to denote ecologically beneficial efficiencies in a production process that are gained through producing multiple products where formerly there was only one). In this case, the dual outcomes of iron production and energy means a much-reduced greenhouse gas output as compared to the production of these two commodities independently. This is a precursor to the next wave of production technology and regulatory requirements, which will eventually result in the retirement of older, less greenhouse efficient, stand-alone energy plants.

The sustainability benefits of the HIsmelt process are many. Locally, the Perth area gains a new industry and a value-added technology. Regionally, both the Perth metropolitan area and the Pilbara benefit through the extended life of an industry that is of vital importance to both in terms of employment and economic stability. The State of Western Australia also benefits in a similar manner. At a national level, technologies such as HIsmelt will be crucial to Australia's commitment to reduce greenhouse gases, as well as ensuring a role for this country in an emerging global market through the steady progression of agreements, such as the Kyoto Protocol.

On a global scale, licensing this technology will mean that steel production can be combined with energy production in many areas (such as China, which is both heavily coal dependent and a major steel manufacturer), merging the greenhouse emissions of the two industries into one. Finally, the energy and iron/steel industries benefit through a more secure future, steel and energy production efficiencies, reduced need for carbon offset trading, fewer emissions and a greater potential ore body to mine. Furthermore, this technology, through the expanded range of viable feedstocks will facilitate the eventual merger of the iron mining and iron recycling industries. This is a microcosm of a similar transition, which is expected to occur across the mining industry over the next fifty to one hundred years. Through HIsmelt, Australia has the opportunity to be a leader in this development.

The question of global consumption is sometimes linked to the production of resources. The State Sustainability Strategy recognises the need for greater diversity in the Western Australian economy and this is occurring quite rapidly in terms of employment. Indeed, resource development projects are often able to make a global contribution to sustainability through demonstrating best practice. Solving the problem of over-consumption of resources would not be assisted at all by stopping resources development. This can only be addressed by consumers and by eliminating processes that support over-consumption, not those who extract the resources. Global processes to reduce over-consumption and waste through eco-efficiency (see *Sustainability and business*) and lifestyle changes are underway but in the short to medium term there is growing demand for non-renewable resources.

Western Australia's largest resource sector developments are mainly associated with gas extraction off the north west coast. Some submissions suggested that these developments should not be supported. As outlined in *Contributing to global sustainability: Oil vulnerability, the gas transition and the hydrogen economy*, these developments are an important part of the global transition from oil and can assist in creating the hydrogen economy. Recent gas contracts with China will continue the process of replacing Chinese coal which has already been associated with significant economic, greenhouse and health benefits.

Environmental sustainability

Over the past twenty years, the minerals and petroleum production sector has developed some sophisticated land management and rehabilitation techniques so that mined land can be returned to some form of production or conservation after mining. There have also been mining activities showing net environmental benefit, for example where companies purchase pastoral leases to mine a small proportion and manage the majority of those leases for nature conservation. Western Australia's industry is recognised as being world-class in environmental management, and the annual Golden Gecko award for environmental excellence is coveted by industries across the State.

Social sustainability

The next challenge in this industry sector is to develop the social aspect of sustainability. This will go beyond philanthropy and shift to strategic investment by companies into projects and programs that can make a difference, informed by engagement with the communities of which they are a part. The most obvious way they can help local and regional communities is by providing local employment. Not only will local communities benefit but travel costs are reduced and workforce health and safety can be improved. However, this policy of localisation can only work if significant commitment is made to training of local people – many of which are Aboriginal. Significant advances in this direction are now emerging (see Box 41 and other examples below). The

BOX 41   WOODSIDE INVESTING IN LOCAL TRAINING AND EMPLOYMENT.

Woodside, through the Warrgamgurdi Yirdiyabura program, provides funding for training and employment opportunities for Aboriginal people within the Shire of Roebourne, in partnership with its major contractors in Karratha, other industry members, the Aboriginal community and government agencies. Under this program, local Aboriginal people have been assisted to develop their potential so that they can compete effectively for employment within the general labour market. Fifty per cent of trainees have successfully gained employment in the Pilbara.

The benefits of this program are recognised within the community. These include not only the increased opportunity for employment, but the development of individual skills and self-esteem, and providing successful, local role models for the community.

government is also committed to working with Indigenous and industry stakeholders to meet jointly agreed targets for Indigenous employment in major new resource development projects (see *Indigenous communities and sustainability*).

The Aboriginal training programs within Woodside, Rio Tinto and BHP in the Pilbara are examples of this focus (see case study *Sustainability and Iron Ore in the Pilbara: a Regional Perspective*). After five years, many local Aboriginal people are employed in the mining industry and young Aboriginal people are supported to undertake tertiary and other further education. Argyle Diamonds in the Kimberley has supported an Aboriginal training program so that by 2002 there was 14% Aboriginal employment at their mine. By 2007 the goal is to have some 40% of their staff Aboriginal and 80% Kimberley locals. This innovation in training is becoming an industry standard, providing a clear example of how major resource companies can achieve a level of Indigenous employment that is equivalent to the region's Indigenous population. The Aboriginal training programs are an innovation in social sustainability that has occurred with limited government involvement.

Various submissions have suggested that there is a real need for government involvement in the social side of sustainability. For example, through sustainability assessment, the government could ensure that mining companies liaise with local Aboriginal communities, local pastoralists and shires. Most companies do this already, but this will become even more advanced in the future and more apparent through the sustainability assessment process.

In short...

Vision

A Western Australian resources sector that underpins a sustainable global economy, by consistently enhancing its technological edge and the development of the State through continuous improvement in safety, health and environmental management, superior product, excellence in risk management, transparent governance, and in-depth engagement of communities across Western Australia.

Objective

- Ensure that minerals and petroleum production in Western Australia remains at world best practice and the industries help to establish the standard for sustainability.

Actions underway

- Environmental impact assessment has helped establish environmental bottom lines for the minerals and petroleum production sector.

- The State's royalty regime helps ensure that the community receives an economic return from the development of mineral and petroleum resources (revenue in 2000-01 was $1.14 billion).

Actions

3.30 Work towards sustainability assessment of complex or strategic mining and petroleum projects using sustainability criteria (consistent with the Keating Review).

3.31 With key stakeholders, develop a set of agreed sustainability operating principles for the mining and petroleum sectors through a working group or groups managed through the Department of Industry and Resources and the Sustainability Roundtable.

In short cont'd...

3.32 Foster local community involvement (particularly Aboriginal communities, pastoralists and local shires) as part of the sustainability assessment process.

3.33 Establish transparent processes to enable community awareness of the day-to-day regulatory system for exploration, mining and minerals processing including through the web site of the Department of Industry and Resources.

3.34 Work with industry on the development of voluntary accreditation for mining and petroleum industry sustainability.

3.35 Implement strategies that support the use of local employment in mining ventures, particularly using regional centres as employment hubs, and encourage mining companies to maximise their purchasing of goods and services within regions.

Global opportunities

Western Australia is a world leader in mining and petroleum production, especially in advancing sustainability and mining. There are already numerous examples where global opportunities in mining and sustainability have been taken by Western Australian consultants and companies. The opportunities in this area will continue to grow.

Further information

International Council on Mining and Metals 2002. *ICMM Toronto Declaration*. http://www.icmm.com/html/pubs_pubs.php.

International Council on Mining and Metals 2003. *ICMM Sustainable Development Framework: ICMM Principles.* http://www.icmm.com/html/pubs_pubs.php.

Miles, N 2002, *More Sustainable Approaches in Mining: Encouraging Progress at the Granny Smith Gold Mine*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/grannysmith/grannysmith.htm

MMSD Project 2002, B*reaking New Ground: Mining, Minerals and Sustainable Development*, Earth Scan Publications Ltd, United Kingdom, viewed August 2002 http://www.iied.org/mmsd/finalreport/index.

Stanton-Hicks, E & Newman, P 2002, *Argyle: Creating a Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Argyle/Argyle.htm

Stanton-Hicks, E 2002, *Sustainability and Iron Ore in the Pilbara: A Regional Perspective*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Pilbara/Pilbara.htm

Argyle Diamonds has instituted strong commitment to Indigenous employment, including in its rehabilitation of alluvial mining areas that includes the use of 'bushtucker' species. These images show the induction of a local employee into the workforce and Sam Samaraweera (Sustainability Specialist) reviews the progress of rehabilitation growth.

Source: Argyle Diamonds

> SUSTAINABLE TOURISM

The tourism industry plays an important role in supporting sustainability. Not all tourism needs to be nature-based to be sustainable. From the largest five-star hotel to the smallest nature- based tour operator, all participants in the industry can have an impact on the environment or the social fabric of a local community. Western Australia has a unique opportunity to champion sustainable tourism development.

Tourism isn't a benign thing that's going to protect the environment. It has to be controlled…we need to support programmes that try to protect nature, to restore nature, to allow people to make a living from nature without destroying it.

David Suzuki, 2000

In the year 2000, 700 million people travelled around the globe. Of this, 4.8 million (0.7%) visited Australia, and 590,000 visited Western Australia.

Niche markets

In a global context, Western Australia is a niche destination. The advantages Western Australia offers to the visitor include our untouched nature, our wide-open spaces, unique lifestyle and the fact that we are a safe destination. Western Australia is well positioned to capitalise on these advantages to attract a tourism audience.

In order to ensure the long-term sustainability of Western Australia's tourism industry, it will be imperative to protect these inherent advantages. A sustainability approach to all tourism development within Western Australia is therefore vitally important. This will include a focus on preserving the natural environment, operating tourism businesses with a focus on minimal impact and protecting cultures and communities within which the tourism industry operates.

Tourism demand across the world is growing. Within this overall market, there are a number of niche markets that are developing, for which Western Australia holds key strengths.

Nature based tourism

Nature-based tourism is growing at a rapid rate. Around the world, people are beginning to want more subtle, low-impact and more natural kinds of experiences. Consequently, nature-based tourism accounts for nearly 30% of all domestic travellers in Australia. In 2000, 47% of all tourists visited a National Park. See Box 42 about Rottnest Island's work to become a sustainable tourism destination.

Western Australia is recognised internationally for its biodiversity, wilderness areas and other special places. Places such as the Kimberley, Ningaloo Reef, the Shark Bay World Heritage Area and the forests of the south west have put Western Australia on the map as a tourism destination. It is these natural features that differentiate Western Australia and it is these that must be protected to ensure the long-term sustainability of the nature-based tourism industry.

Nature-based tourism already contributes to regional economies, and the trend is for this to increase. For example, it is estimated that more than 100,000 tourists visit Exmouth each year, of whom around 50% are international visitors and around 15% are from interstate. Most of these visitors cite the Ningaloo Marine Park as the reason for their visit. It is estimated that they spend in excess of $85 million per annum in the local economy and a further $42 million in Western Australia getting to Exmouth, visiting other places in the region, and equipping themselves for their holiday.

The projected substantial growth in nature-based tourism will need to be managed in order to protect biodiversity and natural assets. As the Western Australian Tourism Commission states:

> There is an opportunity to design and construct innovative, low impact tourism facilities, in a range of locations throughout the State, positioning Western Australia as a world leader in low-impact tourism development.

A nature-based industry will also require cooperation between the tourism industry, government and protected area managers. Tourism in natural areas needs to be managed to ensure that visitor impacts are kept at sustainable levels. The Memorandum of Understanding between the Department of Conservation and Land Management and the Western Australian Tourism Commission will contribute to ensuring this occurs.

The Western Australian Government has committed to the creation of additional parks and reserves to protect Western Australia's biodiversity. Thirty new national parks are being created following the decision to end old-growth forest logging. The management of parks and reserves will need to ensure that natural values are maintained and visitor impacts minimised. Management planning is vital and will need to acknowledge carrying capacities and provide facilities and services adequate for the market and to ensure impact is minimised.

Educating visitors about sustainability will be a key to reinforcing sustainability values amongst visitors to Western Australia. It is imperative that nature-based tourism is delivered in a way which educates local and overseas visitors. Visitors increasingly seek learning experiences and there is much scope to develop nature-based experiences whereby visitors learn about and contribute to conservation initiatives. The 'Be Touched by Nature' Environmental Tourism Package initiative of the Western Australian Tourism Commission is one such initiative. Additional opportunities exist to promote Western Australia as a place where people can become involved directly in research and management programs in parks and reserves as part of a genuine learning experience, as demonstrated in the Landscope Expeditions concept.

Significant activity is already occurring in tourism accreditation. The Western Australian Tourism Commission supports three programs: the National Tourism Accreditation Program from the Tourism Council Western Australia; the Nature and Ecotourism Accreditation Program from the Ecotourism Association of Australia; and Green Globe 21.

The government can assist tourism professionalism and quality through increased involvement in national and international accreditation systems; these need to be expanded and promoted in Western Australia so people enjoying and using these natural places gain maximum value from the experience with minimal impact. There is an opportunity to promote these experiences regionally to support sustainable regional development.

The development of walk trails and other interactive activities throughout Western Australia can contribute to the sustainability of the tourism industry. The Bibbulmun Track and the Cape to Cape Trail attract large numbers of walkers. There is a growing demand for small-scale economic development associated with these trails, such as bed and breakfast facilities (just as railways and roads have facilitated growth in the past). It is vital that product development has a sustainability focus and hence the development of a niche product development role within the Sustainable Product Development Unit of the Western Australian Tourism Commission will be valuable in this process.

Cultural tourism

Visitors are also increasingly demanding cultural experiences. Visitors seek learning experiences where they can interact with the host culture, learn about a place's history or participate in local festivals. The Western Australian Tourism Commission is focusing on developing linkages between cultural industries and the tourism industry to ensure that tourists can gain an authentic cultural experience while they are in Western Australia. The development of a cultural tourism strategy will facilitate this.

BOX 42   ROTTNEST ISLAND: A MODEL FOR SUSTAINABILITY

Rottnest Island is a holiday destination valued by West Australians, with around 500,000 visitors each year.

The elements of sustainability are a dominant factor in the management of Rottnest Island. A Strategic Goal of the Authority is 'Rottnest Island's environment and heritage are conserved and enhanced as a model of sustainability'. The vision Rottnest: Forever Magic, reflects the community's wish that the unique Rottnest Island experience be preserved for future generations of Western Australians. The Rottnest Island Management Plan has formalised the Authority's commitment to sustainability and demonstrated the relevance of this concept to Rottnest Island.

The Authority is proceeding with a range of sustainability initiatives including visionary projects that demonstrate sustainability in action. These include:

- Active recycling and composting that has resulted in a 30% diversion of waste to landfill since 1998-99. The recyclable waste stream has increased by 126% since 1998-99.
- The use of desalination plants significantly reduces reliance on rainfall dependent water sources for potable water supply. It is anticipated that solar desalination will be established by the end of 2005.
- The reduction in fossil fuels through the installation of a wind turbine (by April 2004), the trailling of biodiesel in Island vehicles and the use of solar energy for some infrastructure requirements.
- The management of visitor impacts and behaviour through formal and informal interpretation programs. These include guided and self-guided tours, walk trails, dive trails, brochures, signage, school holiday activities and education activities for school groups.
- Recognising and respecting the significant Aboriginal heritage through interpretation, site protection and discussion with Aboriginal people.
- Conservation and interpretation of the Island's cultural heritage for current and future visitor use and enjoyment.
- Implementing disability access with; measures for visitors such as provision of specifically designed accommodation, beach-going wheelchair facilities, transport for mobility impaired recreational fishers and beach access facilities.
- Provision of affordable accommodation for Western Australians through a range of options from camping to heritage accommodation.
- Restoring the Island's original woodland environment by planting 50,000 woodland seedlings annually.
- Rehabilitating the Island's swamps providing suitable surface water for fauna to encourage the re-establishment of frog populations.
- Being signatories to the Greenhouse Challenge Program, Green Globe Accreditation and Cleaner Production Statement.

Given the large number of Island visitors this commitment to sustainability principles is being communicated widely on a local, national and international front.

In addition, the Heritage Council of Western Australia is developing a Heritage Tourism Strategy. It will be vital that these two strategies are linked and can work together to ensure preservation of our 'sense of place' and our unique culture.

Cultural infrastructure which is iconic can actively contribute to tourism as well as to a greater sense of place. Development of this infrastructure should be seen as a tourism and cultural investment.

During the 2000 Sydney Olympics 80% of visitors indicated they wished to have an authentic Indigenous cultural experience in Australia. The development of Indigenous tourism is a key focus for government. The formation of the Western Australian Indigenous Tour Operators Committee (WAITOC), which represents Indigenous tourism operators, is taking a strong leadership role. A key initiative of WAITOC is the development of an accreditation program that guarantees the authenticity of Indigenous tourism product.

Tourism plays an important role in the development and sustainability of Western Australian regional communities. In using tourism for economic development it is important for communities to identify and preserve a 'sense of place' that is defined by its people, its places, its buildings and natural environments and its culture. Importantly, communities need to be aware of the social and economic benefits sustainable tourism offers.

In short...

Vision

To make Western Australia the world's natural choice.

Objective

All tourism developments and organisations are encouraged to focus on sustainability.

Actions underway

- Various accreditation programs exist for the tourism industry.
- The government has implemented a nature based tourism strategy.
- A Memorandum of Understanding operates between the Western Australian Tourism Commission and the Department of Conservation and Land Management.

Actions

3.36 Promote the sustainable development of niche markets for which Western Australia has a unique advantage, in nature-based, cultural and heritage tourism.

3.37 Help to reinforce Western Australia's sense of place and the sustainable development of cultural, heritage and nature-based tourism within Western Australia.

3.38 Support the Western Australian Indigenous Tour Operators Committee.

3.39 Support development of materials on the Aboriginal names of places in Western Australia.

3.40 Focus on developing sustainable niche product sectors such as trails, dive tourism etc.

3.41 Link tour operator licensing and marketing with accreditation to foster private sector commitment to sustainability principles.

3.42 Support the expansion of existing sustainable tourism accreditation in Western Australia.

3.43 Support the application of appropriate accreditation to a local government area as a way of demonstrating area-wide tourism sustainability.

3.44 Develop accreditation for authentic Indigenous tourism operations.

3.45 Create partnerships between the arts and tourism industries to maximise cultural tourism opportunities and foster 'sense of place', and universities and tourism industries wishing to build on the global market for wilderness and Indigenous-based learning experiences.

Global opportunities

Nature-based, Indigenous, cultural and heritage tourism are growth areas of the worldwide tourism industry. Western Australia's special status as a marine and terrestrial biodiversity 'hot spot' is a significant global marketing opportunity along with our unique cultural attributes.

Further information

Contact the Sustainable Industry Sector Development Unit within the Western Australian Tourism Commission on 9220 1700.

> PROTECTING DRINKING WATER AND AQUATIC SYSTEMS

There are many threats to our drinking water and our aquatic systems—wetlands, rivers and estuaries—and it is an enormous challenge to protect and enhance these precious assets.

A common thread running through much evidence reviewed by the Committee is that to maintain the quality of Perth's water the first priority should be to protect the water through good land use planning to protect the catchment providing the water, whether surface or groundwater. Using treatment to deal with contamination is a second-best option. The Committee found support for adopting catchment protection as the major weapon in preventing contamination of water supplies.

Standing Committee on Ecologically Sustainable Development

From our perspective as a community group dedicated to the conservation of wetlands we would like to see some emphasis placed on the need to conserve biodiversity and water resources in the State Sustainability Strategy.

Wetlands Conservation Society

The Swan – a warning to us all

Aquatic systems are the visible expression of catchment health as was graphically demonstrated in June 2003 when thousands of fish died in the Swan River. What we do on the land ends up in the river. Thus the whole catchment needs to be considered and this therefore involves everyone as we all live in catchments. A clean and biologically alive Swan River is important for the economy of Perth and also for all residents who see it as a 'sacred site'. It also vitally important to protect those catchments that provide our drinking water. Riverplan was launched by the Government in July 2003 as a comprehensive management plan and implementation strategy to address these issues at a catchment level.

This section considers the protection of drinking water and the sustainable use and management of rivers, estuaries and wetlands. The sustainable management of the water supply system is addressed in *Our water future*. The high biodiversity value of aquatic systems is addressed in *Maintaining our biodiversity*. Long-term water sustainability issues are addressed in *Sustainability and governance: Research and development for sustainability*. There are also linkages in the management of aquatic systems with *Sustainable natural resource management* (agriculture, fisheries/aquaculture, forestry, tourism, coastal environments and rangelands management) and with the State Salinity Strategy.

Aquatic values

Western Australia's rivers, estuaries and wetlands are an integral part of our heritage. They have important social and economic values including traditional and cultural use by Aboriginal people, commercial fishing, recreation and leisure, drinking, and industrial uses. These values are set out in Table 6.

Table 6 Range of values of aquatic systems

Environmental	Social	Economic
• Natural land drainage	• Recreation and tourism (water quality, views)	• Drinking water
• Flood conveyance and storage	• Aesthetics/ landscape	• Water use – industrial, agriculture/pastoralism, aquaculture/ fisheries
• Drought refuge	• Heritage and spiritual	• Disposal
• Ecological corridors	• Drinking water	• Water quality
• Water quality maintenance (filtering, sedimentation)	• Public infrastructure	• Stock protection (from storms and sun)
• Habitats (migratory birds, fish)	• Conservation	• Use of flora and fauna (bioharvesting, biotechnology)
• Biodiversity/ food web/ indigenous flora and fauna/rare & threatened species and communities	• Education & awareness	
• Riparian/fringing vegetation		
• Scientific research		
• Uniqueness		

Drinking water protection

Fresh water is one of the most important natural resources of Western Australia. The community expects that its drinking water will be safe to drink and that sufficient amounts will be available to meet current and future consumer requirements (see *Our water future*). Public drinking water supplies are obtained from groundwater and surface water resources. Groundwater and rivers feeding town water supply are obviously critical to our economic and social survival. In Western Australia, there are approximately 140 sources that need to be protected (see Box 43 for a summary of mechanisms to protect water catchments).

The major groundwater aquifers in the Perth Metropolitan Region are the Gnangara and Jandakot Mounds. In the Perth metropolitan area approximately 50% of the public water supply comes from surface water and the remainder from these groundwater sources. Other groundwater aquifers also supply water to towns north of Perth and the major regional centres of Geraldton, Bunbury and Albany. The majority of surface water supplies come from dams in the Darling Scarp and the south west of the State.

Both surface water and groundwater catchments are under pressure from competing uses including industry, intensive agriculture, recreation and urban development. Care is needed to ensure that incompatible land use and development does not contaminate groundwater and surface waters, making them unsuitable for human consumption.

The importance of protecting public water supplies is recognised in the:

- Select Committee Report on Metropolitan Development and Groundwater Supplies (1994)
- State Planning Strategy (1997)
- Standing Committee Report on the Quality of Perth's Water Supply (2000)
- State Water Quality Management Strategy for Western Australia (2001)
- Statement of Planning Policy No. 2.7: Public Drinking Water Source (2003)
- Statement of Planning Policy No. 2: Environment and Natural Resources Policy (2003) and
- State Water Strategy (2003).

The Select Committee Report on Metropolitan Development and Groundwater Supplies outlined a long-term vision for sustainable development and recognised the conflicts that exist between the need for progress and land development and the need to ensure that our water supply is secure. The report found that cleaning up a contaminated source costs many more times that of establishing drinking water catchment protection.

The report also found that if we are to avoid the mistakes made by others, there is a need to coordinate a whole of government approach to planning that considers community aspirations for a safe water supply; community involvement in decisions relating to drinking water source protection; future drinking water supplies; and the need for social and economic development.

Aquatic systems

Aquatic systems also perform important ecological functions. Rivers, estuaries and wetlands form important links between landforms and are home to a wide range of plants, animals, and micro-organisms. Permanent pools within a river system are an important refuge for fauna during prolonged dry seasons, and estuarine basins provide unique conditions for fresh and marine species. Wetlands provide drought refuges and are critical for the survival of migratory birds. Flora and fauna species diversity is generally very high within wetlands, particularly within seasonally inundated or waterlogged wetlands. Rare or endangered species and threatened ecological communities are often associated with aquatic systems. Often a riparian or fringing corridor is the only connection between remnant natural bush habitats.

Sometimes there can be conflicting values between different users of aquatic systems and hence sustainability approaches are needed to resolve these.

BOX 43   MECHANISMS FOR ENSURING DRINKING WATER CATCHMENTS ARE PROTECTED

- A key strategic statement in the *State Planning Strategy* is to 'ensure that water resources are conserved and their quality protected'. This is recognised in various criteria for plans and key actions in the Strategy to protect existing and future public drinking water supplies.

- The *Statement of Planning Policy No. 2.7: Public Drinking Water Source Policy* requires consideration and inclusion of drinking water protection objectives in strategic plans, regional and local statutory schemes, conservation and management strategies, and other relevant plans or guidelines, as well as through the day-to-day process of decision-making on subdivision and development applications. It also recognises the importance of land use and water management strategies that have been prepared, or are proposed, for public water supply areas to assist in the protection of water resources as well as ecological features.

- Existing and future drinking water sources are protected by declaration of water reserves, catchment areas and underground pollution control areas under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* and the *Country Areas Water Supply Act 1947*. The legislation enables government to control potentially polluting activities, regulate land use, inspect premises and take steps to prevent or clean up pollution within these areas.

- The Department of Environment has an ongoing program to prepare drinking water source protection assessments and plans for all public drinking water sources in the State. State and local government agencies need to consider these documents and how best to incorporate the proposed drinking water protection management strategies into appropriate planning schemes and strategies.

- The Western Australian Planning Commission (WAPC) has prepared land use and water management strategies for the Jandakot Mound and Gnangara Mound. *Statement of Planning Policy No. 6: Jandakot Groundwater Protection Policy* (1998) was subsequently prepared to implement recommendations of the Jandakot Strategy. *Statement of Planning Policy No. 3: Gnangara Mound Crown Land* (1995) is concerned with the protection of groundwater resources relating to Crown land over the Gnangara Mound. This is currently being reviewed to incorporate outcomes of the *Gnangara Land Use and Water Management Strategy* (2001).

- Within the Perth Metropolitan Region, the Water Catchments reservation and, more recently, the Rural Water Protection zone have been introduced into the Metropolitan Region Scheme (MRS) to identify surface and groundwater catchments and to ensure that local government town planning schemes give effect to strategies for the protection of public water supply sources.

- The Department of Environment has published a Water Quality Protection Note on *Land Use Compatibility in Public Drinking Water Source Areas* that shows the compatibility of different land uses within drinking water catchments. The protection note lists compatible, incompatible, and conditional land uses against a three-tiered priority classification system used to categorise land within a drinking water catchment. This information has been prepared to support the *Public Drinking Water Source Policy (No. 2.7)* described above.

- Ongoing promotion and development of best management practices that minimise adverse water quality impacts from land uses and activities. These include State Government policies (the Draft Policy for Recreation in Public Drinking Water Source Areas), Environmental Guidelines (Environmental Guidelines for Mining and Mineral Processing, Code of Practice for Vegetable and Potato Growers etc.) and Water Quality Protection Notes and brochures. These are available via the Department of Environment web site at www.wrc.wa.gov.au (prior to December 2003) or www.environment.wa.gov.au (after December 2003).

Wetlands

The Wetlands Conservation Policy for Western Australia (1997) provides broad objectives for all aquatic systems. Although river systems, estuaries and nearshore marine areas are within the scope of the Statement of Policy, their specific conservation and management needs are addressed through other programs and processes such as Floodplain Management Taskforce, Waterways WA Program and Environmental Water Provisions Policy. The Policy also provides a strategy for the management of wetlands, which includes sixty-two action items. Implementation is overseen by the Wetlands Coordinating Committee that has membership of relevant government agencies and other stakeholders.

Wetlands on the Swan Coastal Plain have been mapped and assigned management categories (Conservation, Resource Enhancement and Multiple Use). The State Government has recognised Conservation category wetlands as 'valuable' requiring protection and management. Significant loss and degradation of wetlands has occurred since European settlement. On the Swan Coastal Plain, 80% of wetlands have been lost or degraded and this continues as most wetlands, including Conservation category wetlands, are not legally protected. Over many other areas of the State, there is insufficient knowledge of the location and condition of wetlands to properly gauge the loss that is likely to be occurring in those regions.

Waterways

There are 208 major waterways in Western Australia, with a combined length of more than 25,000 km. Those surface water sources used for drinking water supply have been protected and are generally in good condition. Many other waterways and associated catchments are degraded as a result of human activities. Water quality in non-protected catchments is generally declining across the State, with some waterways carrying high loads of nutrients, sediment, and organic matter, and in some cases toxic chemicals. A large number of rivers are also becoming increasingly saline.

Freshwater and estuarine fish habitats are being lost as a result of declining water quality and flows. This has resulted in the decline in native fish populations and threatens the recreational marron fishery that is an important part of Western Australian culture. Extensive algal blooms are signalling that aquatic systems are no longer able to accommodate the changes we have made in catchments. The sedimentation and erosion of many systems is resulting from increased flows from increasingly cleared catchments. Many of the causes of aquatic system decline are derived from a combination of cumulative impacts that over time exceed the system's capacity to accommodate.

Estuaries are the receiving water bodies for catchments via river networks and their fates are intertwined. Estuaries are highly impacted both from the population pressure in close proximity and by the highly degraded, generally agricultural catchments which drain into these estuaries. Estuaries are a mixing zone of fresh and marine water and can influence the condition of near-shore environments. The clean-up of the Peel Estuary after the Dawesville Cut has demonstrated that engineering can help but if continued nutrient build-up occurs in the catchment then once again algae blooms will happen in the estuary.

In agricultural areas habitat destruction, land salinisation and water abstraction have reduced water quality over large areas. In some cases these effects are exacerbated by wastewater and mine discharges. The current pattern of use for many of our rivers and estuaries is clearly unsustainable in that the water quality and habitat value are both declining. In urban areas development and habitat destruction are at least as important as contaminant discharge in affecting environmental health.

No Statewide river and estuarine management framework currently exists although a strategy is in the development stages. In the past a number of estuarine management approaches have been explored, most notably with authorities managing across key estuaries at risk. This approach provided a framework for community involvement in decision-making and was one of the first of its kind in Australia, forming a foundation for the way much community decision-making happens today. Newer models of community decision-making have been developed for the Vasse-Wonnerup (GeoCatch) and Cockburn Sound (Cockburn Sound Management Council) that are proving effective. The Swan River Trust is the only actual estuarine management entity in Western Australia with planning and decision powers.

Climate change has led to a reduction in rainfall in the south west of the State since the 1970s and is a significant threat to many aquatic systems. Many systems and natural seeps have stopped flowing, resulting in significant impacts on the ecology of these systems. In this same period total water use in Western Australia has doubled and is expected to double again by 2020. In response to decreasing inflows to dams and increasing water demands, the State has accelerated its Water Source Development Program with plans for developing new water sources within a relatively short timeframe (see *Our water future*).

In the context of accelerating water resource development it is important to balance environmental water needs with community water supply needs. Environmental water provisions (EWPs) are water allocations provided to protect water-dependent ecosystems and values such as aquatic biodiversity, water quality, riparian zone vegetation and key ecological processes such as nutrient processing. They are established through the water allocation process, under the *Rights in Water and Irrigation Act 1914*, in accordance with the Environmental Water Provisions Policy for Western Australia, 2000.

Rangeland aquatic systems are diverse, ranging from spectacular gorges, spring-fed pools and complex floodplain channels, to seasonal lakes, dry sand filled rivers and small rocky headwater creeks. These unique and varied characteristics, together with seasonal changes and cycles of drought and flood, defy many traditional notions of aquatic systems and influence decisions about their management.

Drainage

The constructed drainage systems in Western Australia are designed to improve land utility and prevent flooding either by conveying away stormwater runoff or by lowering the groundwater table. Consequently the traditional emphasis of stormwater management has been one of efficiently collecting and conveying runoff and groundwater from residential, commercial, industrial and rural areas into nearby lower areas such as natural water bodies, wetlands, streams, rivers, estuaries and the marine environment. Little or no consideration has traditionally been given to the 'downstream' consequences of a conveyance-dominated approach, leading to problems in water quality and reduced recharge of groundwater systems.

Contemporary stormwater management is aimed at reducing the impacts of development on the natural water cycle by considering all water as a resource. Stormwater management now emphasises water quality, health of aquatic ecosystems and public amenity, in addition to managing water quantity. New approaches in stormwater management aim to prevent pollution at source, maximise infiltration in appropriate areas to reduce stormwater runoff and recharge groundwater, and minimise change to the natural water balance. By necessity, urban stormwater management needs to be broadly based, requiring multi-disciplinary inputs. A notable shift has also occurred in the reduced emphasis on 'end of pipe' water quality treatment solutions, and an increased emphasis on the application of 'preventative' measures (see *Sustainable urban design*).

The State Government has created the Drainage Reform Group with CSIRO to achieve better management of drainage and related water management. The government is investigating solutions to reform drainage governance and look at how Western Australia can better integrate the management of surface and groundwater. Total water cycle management is a fundamental principle for drainage management as it ensures that all aspects of the hydrological cycle are considered when planning in a catchment. Areas such as integrating statutory management with water sensitive urban design and regional natural resource management Groups, including major catchment groups are also seen as fundamental to improving our aquatic systems. Research and trialling innovative approaches are the key to sustainable drainage management.

Community focus

The ever-increasing pressure on aquatic systems requires a commitment to change through a catchment focus, community participation and involvement in decision-making. The focus of management effort has generally been in the most populated south west of the state. Aquatic systems in the rangelands (Goldfields, Central Deserts, Pilbara, Kimberley) are less well understood and the best approaches for the long-term management are more uncertain (see Ord-Bonaparte Project Box 22).

The current focus of natural resource management planning is through the development of community-based regional strategies. Government agencies are working in partnership with the community to develop these regional natural resource management strategies. These strategies will describe key actions and management options (including legislative tools) that will contribute to the sustainable management of all natural resources including aquatic systems. As aquatic systems cannot be managed in the long term without understanding the catchment influences on the systems, this regional approach conects aquatic systems and catchments. The regional strategies will also propose environmental values, objectives and criteria (targets) for aquatic systems. The National Action Plan for Salinity and Water Quality and the second phase of the Natural Heritage Trust provide opportunities to implement large-scale improvements in aquatic systems.

In short...

Vision

Drinking water sources are fully protected for future generations. All other aquatic systems are sustainably managed in a way that ensures that the widest range of values is maintained now and for the future. The ecological, geomorphological and hydrological processes of all aquatic systems are understood. The community and government work in partnership to develop environmental values to ensure the protection, management and restoration of all aquatic systems.

Objectives

- Ensure that land uses do not contaminate drinking water catchments.
- Improve understanding of aquatic systems and link this to the management of all aquatic systems.
- Protect all drinking water catchments and all aquatic systems of high environmental/conservation, scenic and heritage significance.
- Manage aquatic systems to agreed conditions for a range of environmental values through a catchment management context.
- Incorporate social and cultural values when managing aquatic systems.
- Increase community awareness and involvement in the management and protection of drinking water catchments and all aquatic systems.
- Ensure that abstraction of water does not exceed the water requirements of aquatic ecosystems.
- Provide for the protection of water-dependent ecosystems, while allowing for the management and development of water resources to meet the needs of current and future users.
- Ensure stormwater is recognised as a valuable component of the total water cycle and management objectives incorporate the sustainability of the receiving environment.

Actions underway

State planning

- The Draft Environment and Natural Resources SPP has been finalised and a Water Resources SPP is proposed. This will help to incorporate the assessment of impacts of development in decision-making and planning processes. This will provide local government with a stronger role in water resource management.
- The Environmental Protection Authority's Bulletin 1078 provides a framework for the development of environmental values, environmental quality objectives and environmental quality criteria (indicators and targets) that can be given a legislative base for significant aquatic systems.

State policies and strategies

- The State Water Quality Management Strategy implements the National Water Quality Management Strategy for the protection of drinking water and aquatic systems.
- Development of the Waterways WA Framework, incorporating the State Algal Management Strategy, will establish key priorities, principles for waterways management, and a framework for waterways management across Western Australia. The framework includes Waterways WA: Policy for the management of Waterways in Western Australia and the development of a framework strategy in

In short cont'd...

2003. A Statewide waterways management needs assessment methodology has been developed as a means of designating priority groupings of waterways across the State, based on an assessment of their condition, pressures, values and level of management response. A total of 208 waterways have been assessed via this process and a report released.

- The draft State Water Conservation Strategy was released in 2002 and was incorporated into the State Water Strategy in 2003, together with the results of the State Water Symposium held in late 2002

Institutional reforms

- Investigation of the solutions to reform drainage governance and look at how we can better integrate the management of surface and groundwater.
- Department of Environment's Interim Stormwater Position Statement – Principles and Objectives (2003). To complement this the WA Planning Commission's Planning Bulletin on stormwater management is being drafted.
- Drainage Reform Group coordinated by CSIRO is preparing a position paper on institutional issues associated with drainage management in Western Australia.
- Regulatory Design for Water Quality Management in Perth WA (2003) has been prepared as an Australian Research Council project being undertaken by the Australian National University for the Department of Environment

Regional NRM planning and coordination

- Geocatch—a major river restoration and catchment management initiative—has been implemented for Geographe Bay. A whole of catchment restoration program has commenced for the Watershed-Torbay catchment and the Wilson Inlet Action Plan has been completed. The community-based Ord Land and Water Management Strategy is moving towards regional scale initiatives.
- The Swan-Canning Cleanup program aims to understand the mechanisms that trigger algal blooms and control their growth, reduce the frequency of their occurrence, help maintain water quality now and in the future, help change land uses, planning and development to reduce nutrient inputs, and inform and involve the public in the process. It includes the development of Riverbank ($500,000 Restoration and Revegetation Program for Perth's river shorelines) and Landscape Precinct Policy.
- The Western Australian Government is presently working with local governments in the Peel-Harvey catchment to develop and implement a water quality improvement plan for that catchment. Almost $3 million will be spent over the next three years in an attempt to better manage the nutrient inputs and water flows to the estuary.

Legislation

- Significant steps are currently being taken to protect conservation category wetlands on the Swan Coastal Plain through the development of the Environmental Protection (Swan Coastal Plain Wetlands) Policy that is a revision of the existing Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 (Lakes EPP).
- Other EPPs that are in place that deal with aquatic systems include South West Agricultural Zone Wetlands 1998, Western Swamp Tortoise Habitat 2002, Swan and Canning Rivers 1998 (including Riverplan), Peel Inlet - Harvey Estuary 1992 and Gnangara Mound Crown Land 1992. A State Coastal Zone EPP (which could include estuaries) is being considered by the EPA.

- Protection of drinking water catchments through legislation and planning process requirements (see Box 43).

- The government's proposed environmental legislation makes it an offence to clear without approval and this will help to protect vegetation around aquatic systems. The proposed contaminated sites amendments to the *Environmental Protection Act 1986* will assist in reducing contamination of aquatic systems.

Community education and capacity building

- A River Restoration Manual that defines Western Australian solutions to restoration issues has been completed, and community and local government training has been undertaken through River Restoration workshops since 1998. In addition, technical support and advice is provided to community groups who are undertaking river restoration activities.

- A wetland restoration and management manual that provides information to landowners and community groups about wetland processes, functions, management and restoration is being prepared.

- Extensive support and capacity building for river and wetland management has occurred through State-Federal funding agreements such as the Natural Heritage Trust.

- Revision of the 1998 Manual for Management of Urban Stormwater Quality to more fully incorporate a total water cycle management approach and water sensitive design principles.

- Support the development and application of the Australian Runoff Quality Management Manual, prepared by the Institution of Engineers, Australia, as a companion document to the WA manual.

Actions

3.46 Develop benchmark environmental quality criteria for aquatic systems to assist in the long-term assessment of progress towards meeting objectives, for example to assist community water quality monitoring programs of aquatic systems such as Ribbons of Blue.

3.47 Develop processes that ensure social, environmental and economic values of aquatic systems are incorporated into regional sustainability strategies and regional natural resource management plans, and embed these within appropriate management tools, for example planning schemes.

3.48 Work to ensure all present and future drinking water sources are fully protected.

3.49 Expand the assessment of the ecological water requirements of the State's rivers, wetlands and estuaries, especially of existing regulated systems or systems planned for water resource development, and continue to allocate water to the environment through the State's allocation process, incorporating this approach in regional, sub-regional and local water resource management planning.

3.50 Implement and assess strategic and statutory planning processes and documents to achieve better protection of aquatic systems, including:

- the development of model scheme texts to assist local government in incorporating aquatic systems management into planning schemes

- developing a water resources statement of planning policy to describe key management actions to protect aquatic systems for incorporation into the planning system

- continuing the work of the State Wetlands Coordinating Committee to ensure that the objectives and actions of the State Wetlands Conservation Policy are implemented, and continuing the update of the classification and evaluation method for Swan Coastal Plain wetlands and inventories of wetlands throughout Western Australia, and

- continuing the process of nominating significant wetlands for inclusion on the Ramsar Convention list of Wetlands of International Importance.

3.51 Ensure that activities in catchments are actively managed and sustainable, and that environmental values are not compromised, degraded or destroyed, through:

- management

- community partnerships and education

- development and implementation of best management practice guidelines,

- legislation

- transferable rights, incentives that encourage and aid landowners to protect and manage aquatic systems on their properties, and pollution offset schemes

- integrated property management plans for accredited water cycle management

- investigation of the impact of active catchment management strategies that enhance water quality and quantity outcomes, and

- a whole of government review of irrigation activities throughout the State that may also lead to better management of off-site discharges.

Lake McNess—one of the important wetlands in the South West of Western Australia.

Source: Dr Jenny Davis, Murdoch University

In short cont'd...

Global opportunities

Protecting aquatic systems is a priority the world over. All global indicators show that water availability and quality is in decline. Western Australia's ability to protect and manage aquatic systems could provide a significant contribution to global effort.

Further information

Carew-Reid, L 2002, *The Lake Toolibin Recovery Project for a Sustainable Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/LakeToolibin/LakeToolibin.htm

Government of Western Australia 1997, *Wetlands Conservation Policy for Western Australia*, Department of Conservation and Land Management, Perth.

Holland, K 2002, *Ribbons of Blue: Communities Caring for Water Catchments*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/ribbonsofblue/ribbonsofblue.htm

State Salinity Council (2000). *Natural Resource Management in Western Australia: The Salinity Strategy*. Government of Western Australia, Perth.

Waterways WA
www.wrc.wa.gov.au/protect/waterways
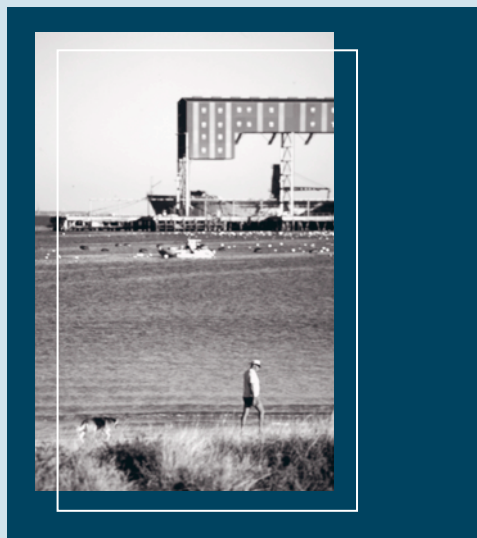
Cockburn Sound south of Perth has many social, economic and environmental values to those who use and enjoy it. These values have been incorporated into the Cockburn Sound Environmental Protection Policy that provides for the management of the sound.

Source: Department of Environment

> SUSTAINABLE COASTAL AND MARINE ENVIRONMENTS

The coast and the marine environment are highly significant to Western Australians; many of our settlements cling to the coast and much of our recreation, leisure and tourism rely on the ocean, beaches and surrounds.

I am at the beach looking west with the continent behind me as the sun tracks down to the sea. I have my bearings...

Tim Winton[27]

Western Australia's coast and marine waters are important community assets and their sustainable use and management are closely interrelated. The vast majority of the State's population lives within 20 km of the coast. Urban and industrial development in Western Australia generally has a coastal focus and shipping ports are associated with most of these coastal developments. Commercial fishing of wild stocks is an important industry and aquaculture is expanding rapidly (see *Sustainable fisheries and aquaculture*). Petroleum exploration and production activity is high and focused on the offshore waters of the North West Shelf and the Timor Sea. Domestic recreation has a strong marine focus and fishing is a popular recreational pastime. Nature-based tourism on the coast servicing both the domestic and international market is growing.

Western Australia is fortunate to have much of its coastline largely undeveloped and in a relatively pristine state. Some areas are developing rapidly and in need of careful management to ensure their values are not adversely affected while others are under considerable threat of cumulative impact or have become degraded or irreversibly damaged, for example through development occurring on primary dune systems, and require more urgent or remedial action.

In July 2003 the Premier announced that the Coral Coast Marina development would not proceed, that new options for management along the Ningaloo coastal area would be canvassed and that Cape Range and the Ningaloo coast would be fast tracked for World Heritage nomination.

Western Australia's special features

Western Australia's coastline is some 27,000 km long and spans a range of climatic zones, grading from temperate on the south and lower west coast, through tropical semi-arid on the north west coast to monsoonal in the north. Tides range from less than 1 m in the south to over 10 m in the north.

Coastal waters on the south and west coast are generally nutrient poor and very clear whereas inshore waters along the north west and northern coast contain higher suspended sediment loads and are more turbid. The Leeuwin Current flows southward along the continental shelf break in winter, maintaining relatively high seawater temperatures and providing a mechanism to transport tropical species into temperate waters. The current also prevents significant 'up-welling' of nutrient-rich waters from the deep ocean that sustain the highly productive anchovy/sardine fisheries off the west coast of South America and South Africa. This physical setting has produced a wide variety of ecosystem types with many unique features. For example:

- extensive arid-zone mangrove communities (Pilbara coast)
- a 270 km long fringing coral reef less than 6 km offshore (Ningaloo Reef)
- an inverse-estuarine ecosystem maintained by 20,000 km^2 of seagrass meadows (Shark Bay)
- an extensive high latitude coral reef complex (Abrolhos Islands)

[27]T Winton 1993. Land's Edge, p.6

- nutrient-poor coastal lagoons/embayments protected by limestone reefs and characterised by highly diverse and endemic seagrass flora (central west and south coasts), and

- nutrient-poor high-energy coast with granite reefs and cliffs and highly diverse and endemic floral and faunal assemblages (lower west and south coasts).

As a result of these unique conditions the marine biodiversity of Western Australia is exceptionally rich (see *Maintaining our biodiversity*) with the area from North West Cape to Perth being recognised as one of the world's eighteen marine biodiversity 'hotspots', and in endemism it is ranked second. Recognition of the unique costal environment has occurred through the Shark Bay World Heritage listing and is behind the Premier's fast tracking of Cape Range – Ningaloo for World Heritage listing. As well, the Premier has called for the creation of five new marine parks and other reserves to ensure the special features of the Western Australian coastal and marine environment are preserved and managed for perpetuity.

Threats to the marine environment

Contamination of the marine environment can come from a range of human-derived sources as well as natural sources. The human-derived sources enter the marine environment through point source discharges from pipelines and drains and from diffuse sources like groundwater and air. The Department of Environment has established a generic inventory of contaminant sources to coastal waters. This inventory has been completed for the metropolitan coastal waters to the south of Perth, including Cockburn Sound, and is currently being completed for the North West Shelf region between Exmouth and Port Hedland.

Existing and possible future marine pest incursions are one of the most significant threats to the Western Australian marine environment. At present there are approximately 250 species of introduced marine animals in Australia and it is considered that approximately one in six will reach pest proportions. Approximately ninety have established in Western Australia including the Asian mussel and European fan worm that are recognised globally as pest species. One incursion of black striped mussels at Broome has been eradicated. Incursions of serious pests including the north Pacific seastar, Japanese seaweed and *Caulerpa taxiflora* are established in the Eastern States and are considered a serious threat to the Western Australia marine environment. Marine pests can be introduced in a number of ways including ballast water, aquaculture, aquarium trade and vessel hull fouling on yachts, ships, barges, dredges and petroleum drilling rigs.

Management of the marine environment

The many unique features of Western Australia's marine environment pose a challenge to sustainability because traditional management methods developed for overseas or east coast ecosystems are often not appropriate for our conditions. To achieve sustainability, management must be underpinned by a sound understanding of our ecosystems and the effects of human-induced pressures on the structure of these systems and on the key ecological processes that sustain them. This in turn relies on a fundamental understanding of the key ecological processes that sustain the system naturally and the identification and understanding of key threat-response pathways for each combination of activity and ecosystem type.

The State Water Quality Management Strategy is being developed to protect and enhance the quality of our water resources while maintaining economic and social development. This Strategy is underpinned by the National Water Quality Management Strategy and relies on defining environmental values and specific environmental quality objectives through consultation with the community. Environmental quality criteria are established as benchmarks from which environmental quality can be judged. This environmental quality management framework has been implemented for Cockburn Sound via the draft Cockburn Sound Environmental Protection Policy and associated interim Environmental Management Plan for Cockburn Sound and its catchment.

A fundamental requirement of environmental management for sustainability is knowledge of how the natural environment functions and varies naturally, and how it responds to human-induced pressure. The Western Australian Government has established a strategic marine research fund to support a collaborative partnership between State government agencies and Commonwealth and local research institutions to underpin the sustainable management of Western Australia's marine environment. It is envisaged that an important output of this study will be the establishment of key baseline reference sites to understand natural variability and separate natural from human-induced change.

However, even with the best understanding of an ecosystem and its variability, and of the consequences of a particular human activity, there is always a risk that something that was unlikely or unforeseen will occur and damage part of the environment and the biodiversity it supports. To offer the best chance of preserving all components of our marine biodiversity it will be important to ensure the establishment of a comprehensive, adequate and representative system of secure marine protected areas. In the interim, areas of high conservation significance must be identified and protected from threatening activities.

Management of the coast

Many submissions to the State Sustainability Strategy related to the marine environment and particularly the near-shore coastal environment. It is clear that the State Sustainability Strategy should highlight the value of the coast and recommend a way forward to simultaneously accommodate sensible and diverse uses of the coast along with protection of the marine environment. The strategy should seek to protect the natural values of our coast and near-shore waters without compromising social and economic opportunities for future generations.

The government is committed to bringing a greater transparency to planning and decision-making processes for coastal areas, providing a more integrated approach and delivering more sustainable outcomes. This will be achieved by more effective community input into decisions to be made about coastal planning and management. The government will create a Coastal Planning and Coordination Council as a prescribed committee of the Western Australian Planning Commission. The new Council will lead a robust, integrated, coastal planning and management system that includes all levels of government, the community and industry.

One of the tasks of the Council will be to develop a marine planning strategy which focuses on the identification of areas and issues where direct management intervention, detailed planning studies or on-ground works are required. Current and existing on-ground works will be reviewed in light of the strategy.

The strategy will:

- define strategic issues facing the marine environment in Western Australia

- define the principles and goals of quality strategic planning in the marine environment

- document what is currently happening in the marine environment in terms of strategic planning and coastal planning and highlight any gaps, overlaps or limitations

- define the opportunities and constraints for developing a marine planning strategic framework for Western Australia

- develop a strategic framework within which future conflict between uses can be resolved and an integrated approach to planning can be undertaken (it is not intended to replace existing conflict resolution mechanisms designed for specific purposes), and

- identify the areas and priorities for marine strategic planning and management in Western Australia.

In the final stage of the project, following completion and adoption of the strategy, the State's agreed highest priority actions will be implemented.

The State Sustainability Strategy is suggesting a model for implementing the Strategy through regional strategic planning processes guided by the State Coastal Planning Policy (Statement of Planning Policy 2.6) and other policies. Establishment of a Coastal Planning and Coordination Council, together with the development of the proposed marine and coastal strategies, should provide an effective management framework. There may be a need to address particular coastal areas where development issues are so complex that a separate sustainability assessment or regional sustainability plan is required as has been done on the Ningaloo coast.

In short...

Vision

Western Australia has healthy, sustainable marine ecosystems. Its coast and marine environments remain accessible to the public and are protected through statutory policies, strategic plans and other mechanisms that reflect community values.

Objectives

- Enable coastal areas to be managed in a way that reflects their special value for Western Australians.
- Establish effective marine planning throughout the State's marine waters to enable appropriate marine biodiversity management.
- Establish sustainability principles in coastal planning and management.
- Protect and maintain the ecological integrity of our marine ecosystems, and the habitats and communities dependent upon them.

Actions underway

- Release of the 'Future Directions' paper seeking public comment on tourism and land use plans for the Ningaloo coast in a sustainability framework.
- *Coasts WA: Better Integration* sets out the Government's response to the report of the Coastal Ministerial Taskforce and establishes a new integrated framework for coastal planning and management, including the creation of a Coastal Planning and Coordination Council as a prescribed statutory committee of the WAPC.
- A State Coastal Planning Policy (Statement of Planning Policy 2.6) has been developed to provide specific high-order guidance for planning decisions affecting the coast. This is supported by the ongoing activities of the Coastal Planning Program, which partners with local government to keep coastal plans up to date.
- Coastwest has been a catalyst for the creation of partnerships between community and coastal managers and continues to provide funds to address pressing coastal and marine management needs across the State.
- An environmental quality management framework that utilises community-derived environmental values and quality objectives is being developed for the marine waters of the State starting with Cockburn Sound.
- The Cockburn Sound Management Council has been established to facilitate the multiple-use and sustainable management of the marine waters of Cockburn Sound to ensure the objectives of the Cockburn Sound Environmental Protection Policy are met.
- A marine habitat protection policy is being developed to help protect ecological integrity and the dependent biodiversity of our coastal waters.

In short cont'd...

- Contaminant input inventories are being developed for the North West Shelf region to identify pressures and threats to the environmental values, and inform management.
- Multi-disciplinary environmental studies are being conducted to facilitate multiple-use management and protection of the marine ecosystems on the North West Shelf.
- A strategic marine research fund has been established to support an ongoing collaborative partnership between State government agencies, Commonwealth and local research institutions to underpin the sustainable management of Western Australia's marine environment.
- The Marine Parks and Reserves Authority, together with the Department of Conservation and Land Management, is establishing a comprehensive, adequate and representative system of marine reserves, to facilitate conservation and multiple-use management.
- The Department of Environment is conducting a community consultation process to assist the Environmental Protection Authority in establishing an agreed set of environmental values and quality objectives for the coastal waters between Exmouth and Port Hedland to guide environmental impact assessment and management.
- A State Coastal Zone Environmental Protection Policy is being developed.
- The Department of Fisheries has undertaken community awareness programs to increase public awareness regarding introduced marine pests and to assist in early detection of some of the species which are considered a major threat. Officers have also been trained in emergency response and a contingency fund has been established to enable a rapid response to incursions.
- The Department of Conservation and Land Management is developing a Biodiversity Conservation Act and a Biodiversity Conservation Strategy that will address marine biodiversity conservation issues.
- The State government is working collaboratively with the National Oceans Office to develop regional marine plans that encompass State and Commonwealth waters off the Western Australian coast.

Actions

3.52 Ensure that the management regime for the Ningaloo coast, following public consultation, provides for the proper protection and appropriate and sustainable development of this unique area.

3.53 Complete the Carnarvon-Ningaloo Coastal Regional Strategy to define the location and character of preferred development and use of the coast in the context of the proposed World Heritage nomination. Ensure adequate planning and development controls are established to implement the outcomes of the Strategy.

3.54 Create five new marine reserves by 2005 to ensure Western Australia's unique coastal and marine environment is preserved in perpetuity.

3.55 Progress the survey of marine biodiversity, especially in the State's marine biodiversity hotspots.

3.56 Develop a State Coastal Strategy and a State Marine Planning Strategy with appropriate consultation.

3.57 Progressively identify the environmental values and designate environmental quality objectives for all of the State's marine ecosystems on a priority basis.

In short cont'd...

3.58 On a priority basis, progressively implement scientific programs to derive environmental quality criteria for all of the State's marine ecosystems.

3.59 Reinforce and promote the principles of best management practice in coastal and marine management and continuous improvement for existing activities, and ensure they are demonstrated for new proposals.

3.60 Recognise and consider the potential for cumulative impacts and synergistic effects of multiple activities on coastal and marine systems in environmental impact assessments of new proposals and in the management of ongoing activities.

3.61 Evaluate the findings of the North West Shelf Joint Environmental Management Study in terms of a decision-making strategy based on the principles of sustainability.

3.62 Prepare an introduced marine pest response strategy for Western Australia to exclude pests that already occur in other parts of Australia or may be introduced from overseas.

3.63 Work with the Commonwealth Government for regional marine planning beyond three nautical miles to ensure effective and integrated marine planning and adequate, comprehensive and representative marine planning.

Global opportunities

The way Western Australia manages its coastal and marine environment provides real opportunities to tap a different kind of global market, a growing tourist niche for those wanting a natural or wilderness experience.

Further information

Government of Western Australia 2003, *Coasts WA: Better Integration The Western Australian Government's Response to the Coastal Taskforce Report*, http://www.dpi.wa.gov.au/planning/coast/coast.htm

McAuley, H 2002, *Cottesloe Reef: Community Managed Natural Resources*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/CottesloeReef/CottesloeReef.htm

Ningaloo Coast
http://www.ningaloocoast.wa.gov.au

The Cottesloe Reef Fish Habitat Protection Area was created in September 2001 and provides many recreation opportunities.

Source: Glen Cowans, CMPG.

> SUSTAINABLE RANGELANDS MANAGEMENT

There is concern about ongoing degradation of the rangelands and the commensurate loss in productivity and profitability, as well as the loss of social capital from the regions.

Across Australia's extensive semi-arid and arid pastoral lands, stocking rates as perceived by early squatters (usually viewed during better seasons), have been as rosily optimistic as humpback whale quotas perceived by eager whalers. Over recent decades as environmental degradation of pastoral lands proceeded faster than cuts in stocking rates, the carrying capacity of grazing lands has declined despite token management measures - paralleling the decline of humpback stocks and the cuts in annual quotas. And within our strictly limited areas of arable land, degradation (in the forms of salination, erosion, compaction, acidification, loss of organic debris & species diversity, etc.) are now cutting into the high hopes of sustainable yields.

Graham Chittleborough

The rangelands of Western Australia account for some 90% of the State's land mass. Many different land uses occur in the rangelands including pastoralism, mining, tourism, horticulture as well as traditional use by Aboriginal people. Almost half of these rangelands are vested as pastoral leases, and a considerable proportion of the remainder is unallocated Crown land and Crown land reserved for particular uses.

The *Land Administration Act 1997* provides the legal framework for the administration of much of the land in the rangelands. This Act establishes the Pastoral Lands Board with responsibility for managing pastoral leases on behalf of the Western Australian Government. The Act specifically requires that the Board ensure that leases are managed on an ecologically sustainable basis. All pastoral leases are due to expire in 2015; all but six will be renewed, and ninety-one lessees have been notified that some land may be excised from the present leases for public purposes. Negotiations on these excisions are due to be finalised by October 2004.

It is clear that management decisions and practices on the pastoral rangelands have not often been based on the principles of sustainability. While recognising real efforts of some within the industry, much of the rangeland under pastoral management is severely degraded, with a greatly reduced productive capacity. Both natural and social capital have been seriously eroded. Moving to a position of sustainability in the long term will require rebuilding this capital, and wise management of the intact portions. The task of rebuilding presents some enormous challenges; however, they are challenges that must be met for the sake of future generations, in accordance with the principles of sustainability.

The Western Australian Government is committed to achieving sustainable resource management in the areas of agricultural and pastoral production, and to building markets based on clean and green accreditation. The government has continued support for the rural reconstruction strategy in the Gascoyne-Murchison region, which has been a useful pilot project for the State's rangelands as a whole.

The government has established five working groups to review the key issues facing the pastoral region, with the Government's response to the groups' recommendations expected early in 2004 to provide future direction to the industry. The Pastoralism for Sustainability Working Group is providing recommendations to the government on means to achieve sustainable land management on pastoral rangelands. The Working Group will also identify ways to achieve nature conservation outcomes on pastoral lands. This will help define required reserves as well as off-reserve conservation measures.

The other aspects of the pastoral industry under review are: alternative models of land tenure; Aboriginal access; access to pastoral leases; and pastoral industry economic monitoring requirements. The outcomes of the deliberations of these groups will assist to move towards sustainable pastoral land management.

The sandalwood industry has considerable potential to contribute to local economies and to diversification in the rangelands. Elsewhere in this draft Strategy (see *Sustainable forestry and plantations*), it is recommended that the sandalwood industry be reviewed, to enable the development of an integrated business and resource management plan that ensures sandalwood is managed on an ecologically sustainable basis that maximises environmental, social, regional development benefits as well as providing adequate financial returns to the State.

Biodiversity conservation is not well catered for in the rangelands. The Conservation Through Reserves Committee Review in the early 1970s did not deal with those regions under pastoral management. This deficiency was acknowledged in the Gascoyne-Murchison Strategy (see Box 45), a comprehensive regional initiative to address the long-term decline of that region. A specific allocation was made within this initiative for land acquisition for the conservation estate, as part of a lease adjustment program. To date, around fifteen whole pastoral leases and parts of fifteen other leases have been acquired for conservation. The Gascoyne-Murchison Strategy has also piloted an innovative program to embed sustainability into pastoralism through the Environmental Management Unit Project (EMU Plus). The components of this project are described in Box 45.

BOX 45   GASCOYNE-MURCHISON STRATEGY

The Gascoyne-Murchison Strategy (GMS) is a regional initiative addressing critical economic development, structural adjustment and natural resource management needs of the pastoral industry in the Gascoyne- Murchison region of Western Australia.

Pastoralists in the Gascoyne-Murchison region are progressing toward sustainable production. The GMS has assisted pastoralists to formulate and coordinate a number of sustainability initiatives. The GMS comprises four core programs, one of which is the Regional Environmental Management Program. The aim of this program is to improve natural resource management from the paddock scale through to the regional scale encompassing advancement of sustainable pastoral production. The EMU Plus project was developed under the Regional Environmental Management Program; this is now being implemented successfully across the southern rangelands.

Key components of the EMU Plus project are:

- making provision for biodiversity conservation in the matrix (off-reserve conservation)
- empowering managers of leases to better manage each lease through an understanding of landscape processes
- providing tools for monitoring and an adaptive management framework
- providing access to markets through accreditation of products and services
- providing options for diversified local and regional economies, and
- ensuring that all activities are consistent with sustainability principles and practices through developing Environmental Management Systems for all scales of management.

There are significant opportunities for the pursuit of sustainability to contribute to a viable future for the rangelands. There is potential to extend the work of the Gascoyne-Murchison Strategy EMU Plus project to other parts of the rangelands to ensure sustainable management into the longer term. Such a process could provide the mechanism by which the government would recognise accreditation prior to consideration of lease renewal, so that the state in its capacity as land owner and landlord can be confident that future management will be consistent with sustainability principles. There could also be a review of the existing system under which permits are issued, in support of enterprise diversification across the rangelands.

Beyond the rangelands that are managed for pastoral purposes, remote areas face significant management problems. These management issues include the presence of feral herbivores including goats, camels and donkeys, the presence of foxes and feral cats, invasion by weeds including buffel grass, unmanaged access by 4WD vehicles, and uncontrolled wildfires.

The State's rangelands are now recognised as a Natural Resource Management (NRM) Region for the purposes of the Natural Heritage Trust. Preparation of an NRM strategy and investment plan has commenced; it is expected that there will be a high level of community consultation and engagement, and that the relevant local governments will be involved to an increasing degree. The focus of the strategy will be the move towards sustainability, and developing the mechanisms to achieve this.

In short...

Vision

Twenty years from now, human activity in the rangelands will have become richer. Pastoral enterprises will be efficiently and effectively managed to provide a level of return that enables people to stay on the land, while also protecting biodiversity and natural processes across the landscape. The new generation of pastoral lease managers will adopt risk management approaches to business and grazing management, focused on the condition of the land and its vegetation. Monitoring and evaluation of natural resource conditions will be a condition of leases and open up marketing opportunities for 'sustainable' products. Pastoralists have adopted new technology and best practice management systems and many have diversified their enterprises. Government regulations and incentives have supported these changes, but the primary driver of change has been the pastoralists' own business decisions. Pastoralists take responsibility and action for the control of animal pests, weeds and fire, and work actively to rehabilitate degraded areas. Sustainability is accepted as a fundamental goal and all landholders, including the Crown, use regional indicators and targets for environmental management.

The range of livestock grazed has expanded, and other forms of land use are common—horticulture, aquaculture, native foods, tourism, and rural retreats. In addition, there are many different kinds of businesses operating across the rangelands; they are all contributing in a significant way to a generally robust community in these outback regions. Mining continues to make a substantial contribution to regional economies and begins to engage effectively with local communities.

Objectives

- Ensure the Western Australian pastoral rangelands are managed sustainably in accordance with the requirements of the *Land Administration Act 1997*.

- Ensure that the conservation reserves within the rangelands are managed to protect their biodiversity values, and in a manner that reflects the department's good neighbour policies.

- Provide support for off-reserve conservation of biodiversity to complement the conservation reserve system.

- Provide opportunities for diversified and sustainable production from the rangelands.

- Ensure that all areas of unallocated Crown land in the rangelands are managed in a way that adequately reflects their biodiversity conservation values and potential future uses.

In short cont'd...

Actions underway

- The Gascoyne-Murchison Strategy has piloted a range of initiatives in support of sustainability in the rangelands, particularly through its Regional Environmental Management Program (the EMU Plus project).

- The Minister for Planning and Infrastructure has established five working groups to review and make recommendations on the key issues facing the pastoral region. The working groups examined:

  - alternative models of land tenure

  - Aboriginal access

  - access to pastoral leases

  - pastoralism for sustainability, and

  - pastoral industry economic monitoring requirements.

  The recommendations of these working groups will be released at the Gascoyne Muster II in October 2003. The government's response, providing the future direction of the pastoral industry, will be released in early 2004.

- The Western Australian Rangelands Monitoring System provides regular up-dates on the condition and trends of native vegetation on pastoral leases; this system is due to be expanded to incorporate explicitly some key biodiversity values.

- The rangeland condition assessment program provides status reports to the Pastoral Lands Board on the condition of pastoral leases; the assessment is being expanded to include biodiversity elements and sustainability benchmarking information.

- Comprehensive biological surveys of the Nullarbor, eastern Goldfields the southern Carnarvon Basin and the Great Sandy Desert have been completed, and parts of the Little Sandy Desert and the Kimberleys have been surveyed.

- The program of mapping land systems across the pastoral rangelands of the State is almost complete and provides a sound basis for on-ground management including locating water points and fences.

Actions

3.64 Implement policy initiatives arising from the government's response to the five pastoral industry working groups: alternative models of land tenure; Aboriginal access; access to pastoral leases; pastoralism for sustainability; and pastoral industry economic monitoring requirements.

3.65 In making the government response to the five pastoral working groups, take account of the vision for the rangelands and identification of priority issues for sustainability in the rangelands provided by the Rangelands Working Group of the Natural Resources Management Council.

3.66 Complete the negotiations for the 2015 pastoral lease exclusion process to define the future structure of the pastoral estate and future use of the excluded land.

3.67 Review the arrangements for managing unallocated Crown land within the rangelands to ensure that these arrangements are appropriate to protect the biodiversity conservation values and potential future uses of these lands.

In short cont'd...

3.68 Support the roll-out of the EMU Plus project across the southern rangelands and into the Pilbara and Kimberley, recognising the potential of this project to improve environmental management through building capacity in the rangelands, and to underpin future accreditation.

3.69 Further develop the environmental management systems currently being trialled within the Gascoyne-Murchison Strategy Regional Environmental Management Program to provide a framework for accreditation of sustainable pastoralism in the rangelands, and consider the application of the accreditation process for the new pastoral lease arrangements after 2015.

3.70 Support the development of regional and sub-regional natural resource management strategies for the rangelands region as the basis for future investment under the Natural Heritage Trust, and the involvement of local governments and local communities, including Indigenous communities, in that process.

3.71 Encourage universities to do more research and teaching on sustainable rangeland management in recognition of the significance of the region to Western Australia.

Global opportunities

Rangelands throughout the world are under severe pressure and desertification is a major concern of the United Nations Environment Program. Successful development of a model sustainable rangelands program will have important potential applications in other parts of the world, especially north and southern Africa and the Middle East.

Typical rangelands vegetation on Nerren Nerren Station, in the Murchison.

Source: Angas Hopkins

4 Sustainability and settlements

Vision for Western Australia

Western Australia's settlements are among the most attractive places to live in the world, constantly becoming more innovative and efficient in their management of resources and wastes, while at the same time protecting liveability, cultural heritage and a 'sense of place'.

Goal

Plan and provide settlements that reduce the ecological footprint and enhance quality of life at the same time.

Priority areas for action

We live in an urbanising world. Aside from the growth or urbanisation itself, urbanisation is the dominant demographic trend of our time. The 150 million people living in cities in 1900 swelled to 2.9 billion people by 2000, a 19-fold increase. Meanwhile, the urban share of world population increased from 10 percent to 46 percent. If recent trends continue, by 2007 more than half of us will live in cities. For the first time, we will be an urban species.

Lester Brown[28]

Western Australia is highly urbanised with about 90% of the population living in towns and cities. The quality of urban environments both rural towns and cities, is therefore highly significant to the well-being of Western Australians. Our settlements should be both healthy and positive places to live. They should provide ready access to services, employment and recreational opportunities for people of all ages and abilities. In addition, because of the proximity of people, there should be a strong sense of community, engendered in part by the urban form.

To be sustainable, settlements require the integration of environmental, social and economic dimensions. The world is littered with examples of unsustainable settlements. The drifting sands of depleted agricultural soils now cover towns in Northern Africa that once serviced the wheat belt of the Roman Empire, and the ancient Roman city of Ephesus was abandoned when its port silted up after the surrounding Turkish hills were cleared of vegetation.

Western Australia also has abandoned settlements: ghost towns left behind as goldfields were depleted or forests were cut out. More recently, Wittenoom was closed down because of environmental health concerns arising from the mining of asbestos. Some country towns are struggling to survive, for example one Shire has lost 48% of its population in the past 25 years, and Indigenous people in remote settlements have significant health problems. Parts of Perth are also facing significant decline. These places are seeking sustainable development, they are not able to change without it.

The State Sustainability Strategy promotes development for these places in a way that creates a more enduring future within global constraints. While there are important environmental considerations, the fundamental problems are largely related to social and economic factors. However, for other parts of Perth and for many coastal settlements the challenge for a sustainable future is in managing growth. These settlements and areas need new priorities, new policies and new technologies that can redirect growth more sustainably.

The State Sustainability Strategy provides opportunities to improve public access and transport, restore amenity and create urban forms that support the development and maintenance of a sense of community as well as achieving environmental gains The model for integrating these different elements of sustainability in settlements is presented in Figure 8.

Figure 8 Extended metabolism model of human settlements

| RESOURCES INPUTS | DYNAMICS OF SETTLEMENTS | LIVABILITY | WASTE OUTPUTS |

LIVABILITY

Health   Lesuire activities
Employment   Accessibility
Income   Urban design quality
Education   Community
Housing

RESOURCES INPUTS

Land
Water
Food
Energy
Building material
Other resources

DYNAMICS OF SETTLEMENTS

Transportation priorities
Economic priorities
Cultural priorities

WASTE OUTPUTS

Solid waste   Air pollutants
Liquid waste   Greenhouse gas
Toxics   Waste heat
Sewage   Noise

[28]L Brown, Eco-Economy, Norton, New York, 2001, p. 187

Figure 8 shows the Extended Metabolism Model[29] developed for the 1996 and 2001 Australian State of the Environment Reports.[30,31] This model suggests that for a settlement to be sustainable, resource consumption (such as land, energy, water and materials) and waste (solid, liquid and gaseous) must be reduced, while simultaneously improving liveability (in areas such as income, housing, health, education and community). This model gives substance to the *Settlement efficiency and quality of life* sustainability principle; other principles such as *Biodiversity and ecological integrity* also apply to settlements (see *The conceptual basis*).

A range of current government initiatives and projects are addressing many aspects of settlement sustainability including:

- water supply (The Premier's Water Taskforce)
- waste (Waste Management Board)
- planning (Greater Perth)
- freight (Freight Network Review) and
- electricity (Electricity Reform Taskforce).

The Strategy discusses these matters from a sustainability perspective. Additional processes are required to consider sustainable community regeneration and sustainable building and construction.

In the section on *Planning for sustainability* a range of mechanisms within the Western Australian planning framework are examined in terms of sustainability. Here two levels of the planning framework are outlined to show how settlement sustainability issues can be addressed.

Strategic planning and settlement sustainability

Many strategic settlement sustainability issues can be resolved through the Western Australian Planning Commission in partnership with regional councils and local governments as discussed in *Sustainability and governance*. Regional Councils arose primarily from the need for local governments to form partnerships to solve their waste problems and are now moving to take on extra involvement in other sustainability responsibilities.

The Eastern Metropolitan Regional Council (EMRC), consisting of six local government authorities, is a very good example of how effective regional councils of local government can be in resolving sustainability issues. The EMRC has some forty staff working on a range of issues to do with sustainability including natural resource management and greenhouse. A recent study by EMRC has highlighted for the first time the lack of regional approaches to managing stormwater runoff and drainage in the city and in rural areas. This has significant environmental implications for nutrient management and salinity near to the city. It has become even more critical now Perth's water crisis has focused attention on the need to use all water, including runoff, effectively (see *Sustainable urban design*). This issue illustrates the importance of a regional local government approach. If water tables are low, stormwater recharge to groundwater is needed. If water tables are too high, more rainwater tanks could remove excess groundwater recharge.

The necessity of such a 'fine-grained approach' to managing sustainability issues in urban environments is obvious for most of the issues considered in this section. Some issues can be examined directly by local authorities, others require a more regional perspective. This could then be reflected in statutory Statements of Planning Policy and local town planning schemes where appropriate.

Before statutory processes can be implemented it is necessary to resolve the broad strategic issues involved. The Greater Perth plan is a very significant part of the strategic planning for the future of the metropolitan region and will reflect sustainability principles. Although Greater Perth will be finalised after the State Sustainability Strategy, it is already committed to reflecting sustainability principles and strong public participation in its development through processes like Dialogue with the City. There is a need to build on this experience and develop models of plan preparation to integrate sustainability throughout the planning process.

Statutory development control and settlement sustainability

In all aspects of settlement sustainability there are key steps where development control at local government level can influence whether sustainability innovation occurs or not. The approach being developed by the Minister for Planning and Infrastructure is to create and demonstrate a Sustainability Scorecard where local government planners and developers can transparently address sustainability issues. Box 45 outlines BASIX, an example of a Sustainability Scorecard approach. Each section of *Sustainability and settlements* is relevant to this scorecard approach to sustainability.

BOX 45   THE SUSTAINABILITY SCORECARD AND BASIX

The Minister for Planning and Infrastructure announced in March 2003 that there would be a 'sustainability scorecard' to manage the development control process according to principles of sustainability. The motivation for doing this is partly due to the need to give substance to sustainability but also to provide some uniform guidance and certainty for the development industry and the community. A number of local governments (at least five in Perth) have developed their own Sustainability Scorecards and there has been an increased number of conditions that are not transparent or predictable in their application.

The need for a development control system to be uniform, transparent and based on sustainability has been recognised by all Australian States. In particular the NSW Government has developed a Sustainability Scorecard called BASIX over the last two years. The BASIX Sustainability Index:

- is web based and this replaces the significant documentation currently necessary for developers and the public to access in relation to development control

- provides options for developers through setting reasonable outcomes

- can be applied to any part of Australia by changing parameters or indices for the particular location such as energy and water data, transport and transit, and climate and soil, and

- enables consideration of key sustainability criteria including energy, greenhouse, water, waste, site ecology, transport, infrastructure, materials and social issues like affordable housing and accessibility.

The NSW Government has developed BASIX along with local government and the housing and development industry. It is now being trialled in a number of local government areas throughout NSW. BASIX has been the subject of several seminars as part of the consultation process on the State Sustainability Strategy. It has met with considerable interest. A number of Western Australian developments are now likely to trial the application of BASIX as a means of developing a Sustainability Scorecard in Western Australia. The Minister for Planning and Infrastructure is supporting this proposal.

The *Settlements* section will look at growth management, revitalising declining areas, urban design, integrating transport and land use (especially to overcome car dependence), managing freight and regional transport, air quality, waste, water, energy, heritage and buildings—all through the lens of sustainability.

[29]P Newman and J Kenworthy, Sustainability and Cities, Island Press, Washington DC, 1999.

[30]P Newman et al, Human Settlements, Australia State of the Environment Report 1996, CSIRO Publishing on behalf of the Department of the Environment and Heritage, Canberra, 1996.

[31]P Newman et al, Human Settlements, Theme Report, Australia: State of the Environment 2001, CSIRO Publishing, Melbourne, 2001.

> MANAGING URBAN AND REGIONAL GROWTH

There is a need to promote growth in some areas where there is clearly real social and economic disadvantage and to redefine growth in places where development is a threat to sustainability. Western Australian inland country towns are the settlements most in need of strategies to promote growth. Redefining growth needs to occur in Perth and coastal settlements.

The relative isolation and small populations of rural towns compared with closer settled areas along the coastal sand plain from Gingin to west of Albany makes them ideal opportunities to develop model sustainable communities.

Eco Town Inc.

With a high percentage of the population concentrated in Perth and the strong link between urban form and sustainable development, the priority sustainability issue for WA is focused on future development of the city and other major centres such as Geraldton, Bunbury and Albany. The issues of economic vitality, social equity and ecological integrity are core elements of a sustainable approach to development within the city.

Royal Australian Planning Institute

Country towns in decline have a range of environmental, social and economic needs. Regional development programs exist to address all of these needs, however there are few that are able to integrate all three. Eco Towns[32] does it through a partnership involving several Wheatbelt towns. The project is creating local employment through environmental improvement, particularly the use of stored rainfall to reduce the impact of rising saline groundwater on towns. Other 'green job' projects are also being implemented. For example, Green Skills, a Denmark-based organisation that trains people in land care, energy efficiency and other green jobs, also shares the goal of sustainability employment opportunities.

Managing growth on a large scale urban area is a relatively new approach in Australia. Both Melbourne and Adelaide have recently established growth boundaries through State government planning processes. The Western Australian Government has significant ability to manage growth through its land release programs, the Metropolitan Development Program and Country Land Development Program. Perth's sprawling form has reached the stage where clearer guidelines for land release need to be developed. Shaping city growth must be a key consideration for Greater Perth. Another powerful growth management technique is redirecting growth to 'brownfields' rather than 'greenfields', that is to areas where redevelopment can be beneficial to overcome decline, or the use of existing infrastructure can be optimised. This has many sustainability benefits and is considered under *Revitalising declining centres and suburbs.*

[32]See submission from Eco Towns Inc. to draft State Sustainability Strategy.

BOX 46   THE ECONOMICS OF URBAN GROWTH

There are obvious environmental and social problems when a city like Perth grows outwardly so fast that it leapfrogs established infrastructure. Such areas can impact on bush and agricultural land and create highly car dependent areas with few employment opportunities and services. The economics of such growth are not often understood however.

Recent research by the Department for Planning and Infrastructure dramatically shows the costs of urban sprawl. The State Government provides significant financial support to new infrastructure including through transport, health and education services, yet is unable to recoup these costs as some other commercial service providers can (for example, the Water Corporation). The Department estimates the following costs to the State Government of different forms of development:

• Re-development in existing areas – no or minimal cost

• Development on the development 'front' - $30,000 per block

• Development off the development 'front' - $66,000 per block.

In the North West Corridor alone, there are currently twelve proposed developments beyond the 'front' of existing infrastructure. Yanchep and Two Rocks are communities that should be considered on the 'front'.

Western Australia has pioneered the redefinition of urban growth within new subdivisions through its internationally acclaimed Liveable Neighbourhoods code (see case study on *Liveable Neighbourhoods: Guiding New Developments for a More Sustainable Urban Future*). This voluntary code has significant sustainability benefits through encouraging reduced car use, a greater sense of community, greater access to services and more efficient use of land. Further development of this now seems warranted.

Managing growth is therefore, about where we grow, and also how we grow in the existing and future urban areas of Western Australia. The principles of sustainable urban design (see *Sustainable urban designs*) need to be used to ensure that urban development integrates economic, environmental and social sustainability objectives. In general, more sustainable urban places are typified by walkable, mixed use communities; a range of housing types to fit our diverse population; a spatial context for local services employment; and compact and site-responsive development to reduce land-take and support biodiversity.

In short...

Vision

Growth management is implemented to enable towns and areas of the city with significant decline problems to be developed in sustainable ways.

Objective

Create a sustainable balance of employment, transport, housing choice and community development by managing urban and regional growth, including population change, through better urban structure.

Actions underway

• The State Planning Strategy is being progressed through Greater Perth to develop visions for the long-term future of the South West Urban Systems.

• The Liveable Neighbourhoods code is being reviewed and finalised with a view to promoting a more sustainable policy to guide structure planning and subdivision and is being applied at major projects on the urban fringe of Perth and in key regional centres.

• Models for the provision of district-level transit-supported development are being developed in the North West Corridor.

• Infrastructure provision and land supply is being coordinated through the Metropolitan Development Program and the Country Land Development Program.

• A strategic development framework is provided for local areas through coordinating and developing local planning strategies with local government.

Actions

4.1 Consider and decide on the establishment of an urban growth boundary as part of the Greater Perth process and fully assess new developments in terms of their economic, social and environmental impacts.

4.2 Promote ongoing public discussion and debate on the future of Perth's urban form through exercises like Dialogue with the City to raise public awareness of the issue and contribute to the solutions we can adopt.

4.3 Facilitate projects to provide sustainability gains for country towns including regional sustainability strategies that build on the 'sense of place' stories of each community.

4.4 Through urban design encourage employment initiatives such as the creation of 'knowledge economy' jobs and small business incubator projects as a catalyst for 'growing' job opportunities in outer metropolitan and regional centres.

In short cont'd...

4.5   Develop strategies to proactively manage the location of urban development, including:

• consultative agreements with local government on land release, and

• using the Metropolitan Development Program and the Country Land Development Program to match land supply to the cost-efficient provision of infrastructure, and building this into the operation of the Sustainability Scorecard through locational parameters impacting on employment, transport, infrastructure provision, social facilities and the environment.

4.6   Use demonstration projects that actively address the community's concerns and the perceived negative impacts of increased residential densities.

Global opportunities

Many Western Australian urban services firms already have a presence in the Asia-Pacific region. If it can offer a model for how to manage urban and regional growth, Western Australia can build on the existing urban services exports.

Further information

Armstrong, R & Head, G 2002, *Liveable Neighbourhoods: Guiding New Developments for a More Sustainable Urban Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/LivableHoods/Liveable Neighbourhoods.htm

Department for Planning and Infrastructure *Greater Perth*, http://www.planning.wa.gov.au/publications/futureperth/fp_content.html

Institute for Sustainability and Technology Policy, Murdoch University, http://wwwistp.murdoch.edu.au/
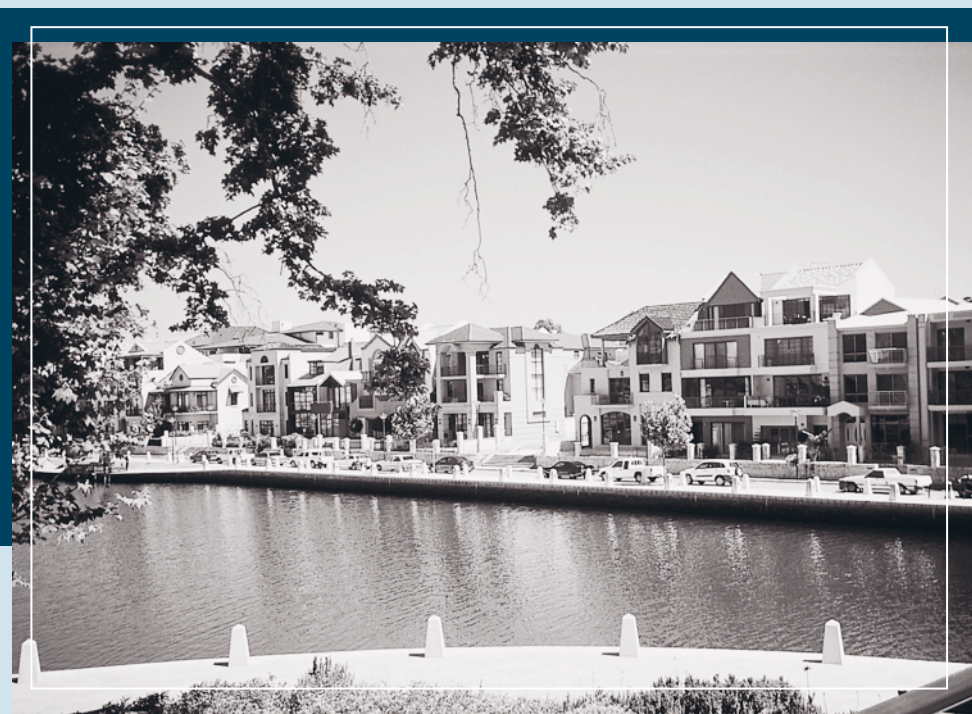
East Perth is a revitalised old industrial site that has, like many inner area developments, helped to reduce the sprawl of Perth and enables better use of urban infrastructure.

Source: Peter Newman

> REVITALISING DECLINING CENTRES AND SUBURBS

Some centres and suburbs in Perth and in regional Western Australia are in physical, social and economic decline after the first phase of development has passed. Some inner city areas and regional centres are already being regenerated through a combination of government intervention and private investment, however there are other areas where further intervention and assistance is needed to promote and facilitate revitalisation with the potential to improve the quality of life for local communities, and to achieve sustainable regeneration outcomes.

The social and cultural aspects of sustainability are of particular importance to Swan. Despite its proximity to the centre of Perth, the region is socially disadvantaged and lacks cultural focus (no major tertiary institution is one example). Sustainability needs to be considered in terms of the inter-and intra-regional inequities that exist in a City where growth is driven by demand for living near the coast and where investment in social infrastructure favours the wealthier areas, despite concerns about the sustainability of continued linear growth.

City of Swan

The 'renewal' of urban areas has been occurring almost since the moment that urban areas came into being, and in that historic sense can be seen as part of an evolutionary process as cities change over time. However, in addition to managing the 'natural', evolutionary change aspects of urban renewal, attention has increasingly turned to the advantages of proactively undertaking and managing renewal processes, in the interests of more sustainable urban development outcomes.

In some of its earliest manifestations, urban renewal was described and practised primarily as a process of physical regeneration: replacing outmoded buildings and infrastructure with 'modern' development. Increasingly, however, it is defined as also encompassing social and economic regeneration, and is being practised with a view to meeting those broader objectives, under the heading of 'revitalisation'.

While the management of growth on the urban fringe is a key focus for delivering sustainable development, there is also a pressing need to consider the future of existing urban areas that in some cases are declining through a combination of outmoded or inadequate infrastructure, relative economic and social deprivation, and diminishing access to opportunities and services. In these areas, there is little chance to renew housing, transport and other infrastructure in more sustainable ways unless there is a rationale for intervention and change. In this situation, an area can continue to deteriorate, eventually causing significant social problems.

Studies and research worldwide have shown that there is often a correlation between social and economic deprivation and unsustainable patterns of urban development, and that the most successful revitalisation programmes have typically been those founded upon partnerships between levels of government, with the support of the private sector, and where communities themselves have taken a central role in setting goals, determining priorities and initiating action.

In Perth, redevelopment activity initiated by the State government in partnership with local government has seen the regeneration of inner city areas such as East Perth and Subiaco, and the beginnings of improvements at regional centres including Midland and Armadale (see Box 47). Private sector redevelopment has also contributed to the regeneration of other inner city precincts, and the New Living program has made a significant impact in areas with a comparatively high level of public rental housing. However, there are areas in Perth's middle and outer suburbs where decline is evident and there is significant relative social disadvantage, expressed through poor urban structure and the reduced quality of the public domain, limited access to employment opportunities, public transport and community services, and a lack of housing diversity and low residential amenity.

BOX 47   WESTERN AUSTRALIAN REDEVELOPMENT AUTHORITIES

Redevelopment has clear sustainability gains for a city. As shown in Box 46 there are significant economic savings to government infrastructure and service providers and considerably reduced car dependence and transport emissions, compared to development on the fringe of urban areas. However, redevelopment is complex and can require the focus of a statutory authority, especially if it is an older area with significant industrial or contaminated land.

There are currently five redevelopment projects operating in Western Australia, at East Perth, Subiaco, Midland, Armadale and Hope Valley-Wattleup. The projects collectively represent significant achievements that offer valuable lessons for the progression of further sustainable development initiatives in a revitalisation context.

The East Perth and Subiaco projects, initiated in the early 1990s as part of the 'Building Better Cities' program, have successfully focused on the regeneration of inner city areas close to the Perth CBD (see also case study on Perth and Subiaco). With the 'second generation' projects at Midland and Armadale, the focus is on the revitalisation of strategic regional centres and their communities.

While the projects differ somewhat in their approach and intent, all have a fundamental objective of making more sustainable use of existing urban infrastructure and land, and are actively promoting development that demonstrates best practice in urban renewal.

The Armadale Redevelopment Authority has adopted an Implementation Strategy for Sustainable Development with an associated action program, and the other authorities are also formalising their approaches to sustainability through the development of focused policies and guidelines.

BOX 48   THE MADDINGTON-KENWICK SUSTAINABLE COMMUNITIES INITIATIVE

The City of Gosnells is working in partnership with the State government on the Maddington-Kenwick Sustainable Communities Initiative.

A scoping analysis has identified a number of opportunities for action, including improving accessibility to public transport facilities, conserving and upgrading the natural environment, and the more effective coordinated delivery of community services and social programs. The partnership involves a number of government departments, including the Department of the Premier and Cabinet, Department for Community Development, Department of Health, and Department of Housing and Works, and the project's Technical Committee is being co-chaired by the City and the Department for Planning and Infrastructure.

A partnership forum has been held to collate information used in further defining the scope of the agreement, and a number of initiatives have been identified with the potential to deliver early benefits to the local community. The project has a five-year timeframe.

The State-Local government partnership approach being followed for Maddington-Kenwick uses a holistic framework that seeks to address physical and social issues through actions at both levels of government, and has the potential to provide valuable feedback that will contribute to the development of further revitalisation initiatives in Western Australia.

It is important that these various programs and initiatives operate in a coordinated manner to achieve the most resource-effective outcomes. The establishment within the Department for Planning and Infrastructure of a dedicated resource capacity in a new Revitalisation Directorate will assist in developing and maintaining an overview of these initiatives.

There is no single model for revitalisation. In Western Australia, redevelopment authorities have had considerable success but require special powers and resources that will not always be available or appropriate. Other interventions on government-owned land have provided some valuable demonstration projects and lessons for new centre-focused revitalisation projects, but have limited geographic coverage. Many of these approaches, however, are not well suited to 'broad acre' revitalisation across whole suburbs, where the diversity of the issues requires a holistic approach that crosses the boundaries of professional disciplines and departmental responsibilities, and requires action at both State and local government levels.

A focus on Neighbourhood Renewal (see *Community services and development*) would seek to build connection, caring, civic pride and the notion of common good (i.e. rebuilding/strengthening civil society) through the engagement of the local community in social and cultural planning and service delivery and other community projects.

A repertoire of approaches to revitalisation is needed to support more sustainable urban forms. To realise this we must learn from experiences elsewhere, so that we can adopt best practice approaches with proven success. They must be adapted, however, to meet the specific needs in Western Australia, and the circumstances that exist across our State. It is clear that revitalisation models which are founded on partnerships between State and local government, and local communities, and which are 'place-based' and tuned to the particular needs of the areas concerned, are much more likely to succeed than imposed, 'off-the-peg' approaches.

A number of current projects and proposed initiatives are seeking to address these issues. The establishment of the Maddington-Kenwick Sustainable Communities Initiative (see Box 48) is an important step in the development and testing of appropriate models for revitalisation at a suburb level. Greater Perth will examine the revitalisation issue at a strategic level, and will also examine indicators for identifying areas of priority. As a companion to this process, the Western Australian Planning Commission is working to develop a program of revitalisation initiatives that will further extend the available mechanisms and capacity for addressing revitalisation issues at State level.

In short...

Vision

The development and application, in consultation with the community, of a range of techniques and initiatives that will contribute to the sustainability and regeneration of existing centres and suburbs.

Objective

To revitalise existing centres and suburbs by :

- strengthening their local economies
- increasing their social capital, and
- making more sustainable use of their existing infrastructure and services.

Actions underway

- Ongoing work to implement outcomes of the Enquiry By Design processes used to investigate and promote revitalisation options and opportunities for centres and suburbs in Perth, including Claremont, Mirrabooka and Bassendean.
- The Maddington-Kenwick Sustainable Communities Initiative (see Box 48).
- The ongoing actions and programs of the Redevelopment Authorities operating at East Perth, Subiaco, Midland and Armadale.
- Local government-led initiatives such as the Gosnells Town Centre Revitalisation project and the City of Swan's Place Planning program in liaison with the Department for Planning and Infrastructure.
- The creation of a register of revitalisation projects by the Department for Planning and Infrastructure that will facilitate information sharing on revitalisation issues and techniques currently being applied in Western Australia.
- The preparation of a Discussion Paper on Liveability and Revitalisation as an important element of the supporting framework for the Greater Perth project.

In short cont'd...

- The establishment within the Department for Planning and Infrastructure of a Revitalisation Directorate, with the objective of developing, promoting and managing revitalisation programs and initiatives, and providing advice and assistance to other agencies, to local government and to the community on revitalisation issues in Western Australia.

- Continuing research into revitalisation techniques being applied in other States and internationally.

Actions

4.7 Create a Revitalisation Directorate within the Department for Planning and Infrastructure with the objective of developing, promoting, and managing revitalisation programs and initiatives, and providing advice and assistance to other agencies, to local government and to the community on revitalisation issues in Western Australia.

4.8 Develop a program that will provide guidance and resources to assist in revitalising declining centres and suburbs, with the objective of creating viable investment opportunities through more effective planning and design, local infrastructure improvements and the promotion of partnerships between government, community and business.

4.9 Support the Maddington-Kenwick Sustainable Communities Initiative as a demonstration project and consider extending this approach to similar areas.

4.10 Link revitalisation projects to the development of the neighbourhood renewal initiative (see *Sustainability and community*).

Global opportunities

The fostering of skills and the development of techniques that can be demonstrated to achieve the sustainable revitalisation of urban areas would attract considerable global interest and demand.

Further information

Armstrong, RJ 2002, *Sustainable Community Regeneration*, background paper for the State Sustainability Strategy, CD-ROM

Armstrong, R & Head, G 2002 , *Liveable Neighbourhoods: Guiding New Developments for a More Sustainable Urban Future*, sustainability case study, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Livable Hoods/LiveableNeighbourhoods.htm

Armstrong, R 2002, *Reurbanisation in Perth: East Perth and Subiaco Contributing to a Growing Trend Towards a More Sustainable Perth*, sustainability case study, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Subiaco/Subiaco.htm

Rebbettes, D 2002, *Fremantle: Thriving Economically through an Urban Heritage Focus*, sustainability case study, Department of the Premier and Cabinet, Perth, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Fremantle%20Heritage/fremantle heritage.htm

> SUSTAINABLE URBAN DESIGN

A city is most certainly an ecosystem.

Grimm et al, 2000[33]

Cities and towns are like organisms or ecosystems – they grow and decline, live and die, and adapt to their surroundings. An emerging area of sustainability studies is how cities can be understood as ecosystems. These ideas build on centuries of thinking about cities by people in architecture and planning but have merged with newer ideas from urban economics and urban ecology[34]. Together these ideas enable us to see how cities are organic: they are a unique combination of people and place, and change according to similar principles and processes that determine how ecosystems change. This provides strategies for how sustainability can be designed into cities.

The section sets out how the sustainable planning and design of cities can respond to human patterns and economic processes, to ecological processes and environmental conservation. It builds on a set of principles set out in Box 49. Other elements contributing to sustainability in the design of cities and towns (e.g. human patterns and economic systems) are addressed in other sections, such as *Managing urban and regional growth, Revitalising declining centres and suburbs* and *Integrated land use and balanced transport*.

BOX 49   PRINCIPLES OF SUSTAINABLE URBAN DESIGN

The main principles of sustainable urban design are reflected in the Liveable Neighbourhoods trial policy, but would also apply to managing change in all urban areas. These are:

- Incorporate collaboration in project planning and delivery.
- Promote urban structures that support and integrate economic, social and environmental sustainability.
- Foster community and local identity and character.
- Integrate, connect and maximise access for all users.
- Design for legibility, and local character and identity.
- Provide diversity, choice and variety.
- Build in robustness and flexibility.
- Respond appropriately to environmental features to create sense of place.
- Design for surveillance and safety.

These principles are developed further below in terms of sustainability.

The redevelopment of Subiaco has seen the rapid development of high-density housing and commercial buildings close to public transport and facilities and is an example of successful regeneration of inner-city areas close to the Perth CBD. SubiCentro's urban design has won many awards and has attracted worldwide interest.

Source: Peter Newman

[33]NB Grimm, JM Grove, STA Pickett and CL Redman, 'Integrated approaches to long-term studies of urban ecological systems', BioScience, vol.50, No,7, 2000, pp.571-584.

[34]People like Christopher Alexander have described cities in terms of underlying patterns that have a natural order necessary for human qualities in a city to be fulfilled. Jane Jacobs saw the economy of cities as something that emerges out of its organic processes. And Bill Mollison (the inventor of permaculture) describes the biology of cities and sets out how we should copy and work with such processes.
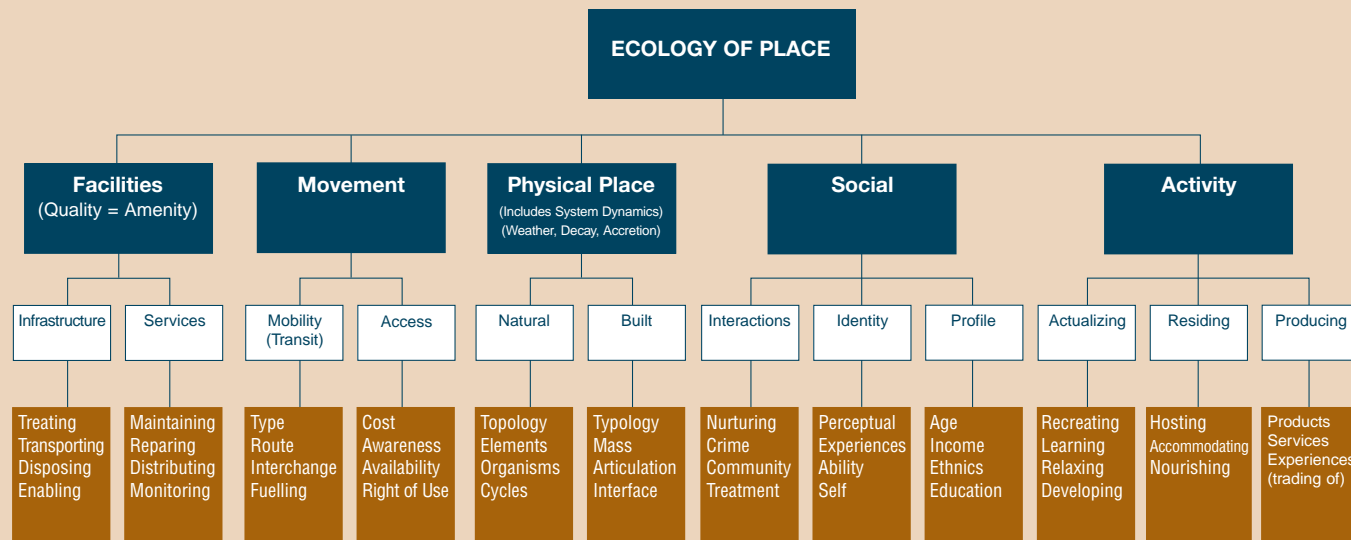
Human patterns

The core principles of urban design that enable cities to work for and not against human instincts for community, security, accidental interaction, walkability, beauty, vitality and delight are set out in Box 49 above and in Box 50, The Art of Place Making, below.

BOX 50   THE ART OF PLACE MAKING[35]

People are on one level diverse and unique. On another level we have physiological and psychological needs that are universal. People like to wait where they can watch what is going on, they like to feel the sun on a winter's day or find shade out of the midday sun. They get uncomfortable when a stranger stands too close in a small space but gather close to friends to laugh and talk and exchange ideas. These fundamentals are so powerful that they have shaped great cities for millennia. Cities that have relegated people second to industry, transport or private greed have all failed to develop a rich diverse and sustainable urban ecology. In time they have either reinvented themselves as people cities or become redundant. Cities that have created places that support people's daily needs and reinforce and celebrate life's events have overcome periods of great turmoil and flourished over centuries.

Over the past two decades Perth has rediscovered and reinvested in many of its most important major places. One example is Central Perth. At first glance, Central Perth may appear the same as 10 years ago but in many ways it is a new city. People have moved back in, more space has been given to pedestrians, new trees shade benches and cafes spill out wherever there is enough space on the footpath. There is a new energy in places like Central Perth and many smaller traditional centres across Western Australia. There is also, however, a half-century's worth of suburbs designed for the motor car where local centres provide little for the local community and shops are vacant or in decline. For these suburb's Perth's centres become even more important places.

Place making reasserts the importance of outcomes. It sees processes, policies and strategies as servants to good outcomes. It says that if we get the place right for people we get it right for what cities are supposed to do. Communities will be stronger and healthier, business will be vibrant and successful and the environment will be brought back into balance with the city. Place making brings together the experts that develop and administer strategies, the people who control finances, those that have technical know-how and those that understand local issues. These specialists work together in an interactive process where each idea is tested and evaluated in an iterative process. A designer often supports this process of inquiry. The designer helps to illustrate the patterns of development that will result from the approach the team is proposing. These illustrations help reveal where improvements need to be made and highlight opportunities that may not have been realised by discussion alone. Together, these concepts and people-based processes are the basis of place making.

ECOLOGY OF PLACE				
Facilities (Quality = Amenity)	**Movement**	**Physical Place** (Includes System Dynamics) (Weather, Decay, Accretion)	**Social**	**Activity**
Infrastructure / Services	Mobility (Transit) / Access	Natural / Built	Interactions / Identity / Profile	Actualizing / Residing / Producing
Treating Transporting Disposing Enabling / Maintaining Reparing Distributing Monitoring	Type Route Interchange Fuelling / Cost Awareness Availability Right of Use	Topology Elements Organisms Cycles / Typology Mass Articulation Interface	Nurturing Crime Community Treatment / Perceptual Experiences Ability Self / Age Income Ethnics Education	Recreating Learning Relaxing Developing / Hosting Accommodating Nourishing / Products Services Experiences (trading of)

The policy framework which attempts to give substance to these principles of urban design in Western Australia is the Liveable Neighbourhoods code. This development control system was introduced as a voluntary design code in 1997 and has been applied (at least in part) to many developments since. The Liveable Neighbourhoods code is being reviewed to determine whether it should be made the preferred code in Western Australian subdivision. Further development of urban design manuals and guidelines will help make Western Australia a better place to live in.

Economic systems

Each city and each part of a city generates its own underlying economic processes that hold it together—totally interconnected with the more social considerations outlined above. Midland is a service town for the Swan Valley and Hills region. Parts of Perth like Cockburn-Kwinana-Rockingham have an established industrial base on which the region is economically dependent. The linkage between the residents and the economic base is always changing and can be understood as a story or 'place narrative' (as outlined in *Sustainability in the regions*). Many areas of cities are rapidly moving to be more part of the knowledge economy, based around urban services and processing of information.

The links between the economy of Perth (and its region) have been studied as part of Greater Perth. The implications for policy and planning generally mean a much more flexible approach to zoning is needed to encourage mixed use of compatible service-oriented/knowledge economy jobs and housing.

Ecological processes

Cities are part of an eco-region with its own ecological processes such as coastal processes, the water cycle, climate and soils. Cities depend on their ecological context for water supply, air quality, processing of wastes, space for recreation etc. Cities can fit within the natural carrying capacity of their region or they can exceed them and become dysfunctional with poor land use that degrades coasts, poisons aquifers, depletes water systems, creates bad air, causes wastes to build up or leaves inadequate space for passive or active recreation. In addition to the ecological imperatives to respond to the natural environment in the development of urban areas, responding to natural resource, landscape and conservation assets contributes to a city's 'sense of place', identity and cultural character.

Many of these issues are dealt with in other sections of *Sustainability and settlements* (e.g. water, air, waste, energy) and also *Sustainable natural resource management* (e.g. aquatic systems like the Swan River or Cockburn Sound).

Statements of Planning Policy provide strategic guidance on ecological processes. The Statements of Planning Policy on Environment and Natural Resources and on Coastal Planning set out these principles in a policy framework for adoption in Town Planning Schemes and Regional Schemes. They outline policies like coastal planning to minimise impacts on coastal processes like dune formation, and to protect development from coastal processes. They outline the need for water sensitive urban design, a policy that was developed in Perth and which has spread across Australia. The water sensitive urban design sets out how to enable stormwater to be recharged to local aquifers, how wetlands can be facilitated to remain as natural ecosystems within the city and how water supply needs can be minimised by building in water efficiency and local water use from tanks or groundwater.

Further Statements of Planning Policy will specify how human settlements can take account of local and regional ecological processes, so that the city or town can work with nature and not against it.

These ecological processes need to be understood by planners if they are to be worked with positively and not negatively. The links between ecosystem knowledge and planning knowledge need to be reinforced.

[35]By Brett Wood-gush, Perth urban designer

Environmental conservation

Areas of natural bush are an important part of what it means to live in Perth. Unlike cities such as Melbourne, Perth has not significantly altered its landscape through large-scale European planting. There are of course many foreign plants in gardens and parks in Perth, but significant areas of urban bushland have been conserved and this tradition has been in place since Kings Park was created at the turn of the century. The Perth Metropolitan Region has approximately 50% of its area covered with native vegetation of which 40% is in reserves (Parks and Recreation and State forest) and most Wheatbelt shires have less than 5%.

Bush in the city is also important for urban habitats and can also play an important role in regional conservation. Cities are often seen as negative influences on the conservation of biodiversity. However, cities can also be partners in regional conservation as set out below.

Cities can set aside land for conservation purposes and because of the intensive population nearby can provide the resources to play an important part in a regional conservation program. Perth for example has some of the most significant areas of remnant vegetation in the south west of Western Australia. Rural areas have often been over-cleared and where reserves remain they are subject to intense invasion from feral animals and weeds. Urban reserves can be intensively rehabilitated (weeded and fenced) with strict management regimes that can ensure different habitat opportunities than in regional areas. Intensive horticulture of native plants in research areas, in schools, in backyards and urban reserves can become more and more sophisticated in assisting the biodiversity restoration of a region.

There is an increasing awareness of the importance of urban bushland and urban horticultural practices in biodiversity conservation. The 'zoos' and 'arks' that can be established in cities can become more and more the havens for rare species, for breeding and for regeneration before such species can be transplanted to areas for re-establishment. This kind of partnership between city and bush is evident in the work conducted by the Botanic Gardens and Parks Authority, the Herbarium, the Zoo and the Department of Conservation and Land Management in their research work.

The Southwest Australia Ecoregion Initiative (SAEI) is a project to create a partnership for biodiversity conservation in the south west of Western Australia (see Box 18). It is possible to imagine cities like Perth developing more and more as biodiversity partners in the regional regeneration of the SAEI. The development of the State Biodiversity Strategy and in particular the South West Eco-region project can act as catalysts for creating a regional partnership approach on biodiversity linking the city and its region.

Urban bushland is being set aside in a program called Bush Forever. Following guidelines set by the World Conservation Union, Bush Forever aims to protect at least 10% of the original vegetation in each of the twenty-six vegetation complexes within the Swan Coastal Plain portion of the Perth Metropolitan Region. This project needs to be extended next to cover the Peel and Bunbury regions.

There are 287 Bush Forever sites that make up 51,200 ha of land in the Perth Metropolitan Region. Approximately 64% of these sites have been purchased or set aside for government-owned land as part of the existing conservation estate. The remainder of the designated Bush Forever sites will be protected through various mechanisms including reservation and purchase, private conservation and negotiated outcomes to balance conservation with other land uses and developments, by 2010 under the $100m Bush Forever program.

As part of the next phase of Bush Forever (from retention to management) a Statement of Planning Policy is being created to guide all local governments in the ongoing protection and management of local and regional bushland. Local Bushland Protection Strategies are to be the mechanism for creating a statutory and local community-oriented strategy. These strategies can become an important part of regional biodiversity protection, especially if they are linked to the partnership on biodiversity in the south west (above).

In short...

Vision

Sustainable urban planning and design is more attuned to the human, economic and regional ecological processes that the city's residents live within, creating opportunities for a more sustainable urban future.

Objectives

- Plan and manage urban environments to facilitate human and economic dimensions of sustainability and to contribute to their regional biodiversity and maintenance of ecological processes.

Actions underway

- Implementation of Bush Forever.
- Establishment of a Statement of Planning Policy for Environment and Natural Resources.
- The Liveable Neighbourhoods code is being reviewed and finalised with a view to promoting a more sustainable policy to guide structure planning and subdivision and is being applied at major projects on the urban fringe of Perth and in key regional centres.

Actions

4.11 Based on the review of the Liveable Neighbourhoods design code, ensure that there is an increased commitment to sustainable urban design which creates community-oriented city spaces and networks, economically facilitated mixes of housing types and business spaces, and ecologically sensitive design.

4.12 Develop a state urban design charter to promote development based on the principles of sustainable urban design, to guide the private and public sectors, and develop a manual of guidelines for urban design in Western Australia.

4.13 Continue the development of Statements of Planning Policy linking ecological processes to strategic and statutory planning. Develop local planning strategies that can apply these general principles to specific areas and regions.

4.14 Extend and expand educational programs to enable more ecological understanding to be integrated into planning and design knowledge and practices.

4.15 Complete implementation of Bush Forever through amendments to the Metropolitan Region Scheme and an associated Statement of Planning Policy to guide the management of urban conservation and preparation of local bush protection strategies that can build on community involvement and help create 'sense of place'.

4.16 Extend Bush Forever to the Peel and Bunbury regions.

4.17 Use the development of the State Biodiversity Strategy and the Southwest Australia Ecoregion Initiative to develop a partnership approach between city and regional biodiversity management. The partnership should involve Botanic Gardens and Parks Authority, the Herbarium, the Zoo, Department of Conservation and Land Management, regional natural resource management groups, community organisations, schools, volunteers and local government through local bush protection strategies. The partnership will help create biodiversity refuges, rehabilitation areas and intensive horticultural production of rare plant species.

In short cont'd...

Global opportunities

Urban design is a rapidly growing global profession. With sustainability as its focus, it is possible for Western Australian urban design professionals to participate in large overseas projects that build on an already strong reputation for excellence in planning.

Further information

Armstrong, R & Head, G, *Liveable Neighbourhoods: Guiding New Developments for a More Sustainable Urban Future*, sustainability case study, http://www.sustainability.dpc.wa.gov.au/CaseStudies/LivableHoods/LiveableNeighbourhoods.htm

Armstrong, R, *Reurbanisation in Perth: East Perth and Subiaco Contributing to a Growing Trend Towards a More Sustainable Perth*, sustainability case study, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Subiaco/Subiaco.htm

English Partnerships and The Housing Corporation, 2000, *Urban Design Compendium*, http://www.englishpartnerships.co.uk

*A recent study undertaken by the Botanic Gardens and Parks Authority and the Department of Conservation and Land Management has shown that Perth is one of the most floristically diverse cities on Earth. Over 1000 plant species have been identified. Through research and urban bushland management involving the community, biodiversity is being protected at a level that is globally significant.
See www.bgpa.wa.gov.au*

> INTEGRATING LAND USE AND BALANCED TRANSPORT

Sustainability in settlements is strongly influenced by the priority given to transport modes and by how land use is integrated with these modes. Perth's development has been heavily influenced by our dependence on the car and truck and this needs to be more balanced with better integrated land use and transport.

Eighty four percent of people in the metropolitan area want transport policy and planning to favour environmentally friendly modes, and half of the population believe planners have an exaggerated impression of the community's demand for car-oriented planning.

Subiaco Bicycle Users Group

Car dependence arises when cities are built with 'scattered' suburbs, forcing people to rely heavily on cars to reach services, jobs, schools and shops. Around the world, planning is being undertaken to avoid this phenomenon; to build and rebuild cities where land use is integrated with public transport, walking and cycling so that there is a much more balanced transport system and more focused land use. As Professor Ian Lowe says, 'better urban planning would provide accessibility without requiring mobility'.[36]

Overcoming car dependence is fundamental to sustainability in cities. In environmental terms this will reduce the land required, transport energy, water use and pollution and greenhouse gases. In social terms, integrated land use and balanced transport can contribute to a reduction in crime, healthier people through increased walking and cycling, more community opportunities and enhanced 'sense of place'. This can also provide increased opportunities for people who don't own a car over half of the total population. Integrated land use and balanced transport can also achieve economic gains by providing more efficient transport, less infrastructure (shorter pipes and cables) and better community facilities. In addition, because of the reduced demand for infrastructure, more capital is available to the productive economy, greater employment opportunities arise, for example through the location of knowledge-oriented jobs. Finally, it has been estimated that individual households could save up to an additional $750,000 in superannuation over a lifetime by having one less car. In some poorer outer suburbs over 40% of household income is being spent on cars and travel.

The recently developed National Charter of Integrated Land Use and Transport Planning is a high level agreement between land use and transport planning Ministers (see *Planning for sustainability*). It provides the principles, aims and outcomes to facilitate effective and sustainable urban and regional development across Australia through better transport and land use integration. The document recognises the need for better coordination between all three levels of government in the achievement of a number of aims, which include:

- increased accessibility by widening choices in transport modes and reducing vehicle travel demand and impacts

- creation of places and living areas where transport and land use management support the achievement of quality of life outcomes

- increased opportunities for access in both the present and longer term, and

- a safer and healthier community.

The Charter can provide the context for the development of State and local level policies, plans and strategies aimed at improving the sustainability of urban and regional areas through better land use and transport integration.

In Western Australia, there have been some important innovations in overcoming car dependence that have attracted worldwide attention, particularly the Liveable Neighbourhoods code, the new electric train system and the TravelSmart Household program.

[36]Professor Ian Lowe, quoted in Sustainable Population Australia's submission to the draft State Sustainability Strategy.

Figure 9   Rail patronage in Perth and Adelaide 1991-1997
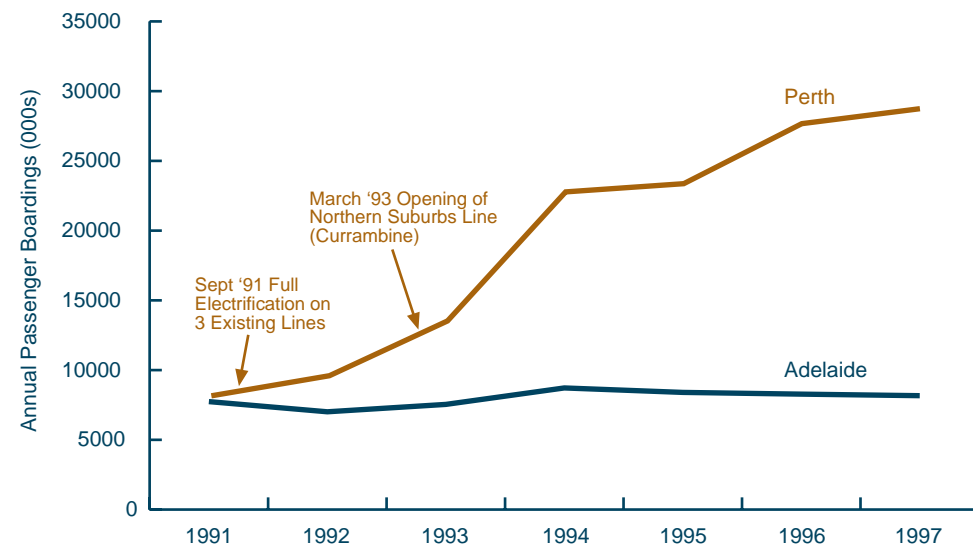
Source: Jeff Kenworthy, Murdoch University

Liveable Neighbourhoods

Liveable Neighbourhoods is the code for planning of new suburbs that enables development to be more walkable and transit oriented. The code has won several national and international awards and is increasingly becoming the norm especially in joint venture-State Government projects like LandCorp's Atwell South and LandStart's Butler, Brighton, Clarkson and Leda developments.

The Liveable Neighbourhoods code needs to be reviewed as a step towards making it mandatory. The Sustainability Scorecard can incorporate extra points for integrated transport and land use as provided through the Liveable Neighbourhoods code.

Electric train system

The Perth electric rail system has been an outstanding success story with patronage growing from 9.5 million passenger boardings per year in 1992 to 30 million seven years later. This is likely to double again with the southern rail extension to Mandurah. No other city has achieved such growth (see Figure 9).

The train's success has been due to its speed, comfort and integration into a broader system. This major upgrading of transport infrastructure has provided an opportunity to revitalise sub-centres (and the city centre), to integrate other forms of transport into station precincts and to shape new development in less car dependent ways.

The new rail system provides a 'spine' of fast transport services but not all of Perth has access to this and increasingly journeys are across the city between corridors. There are successful cross-city bus services but some of these are reaching capacity. Integrated bus service expansion and extended rail services need to be planned into the longer-term. The potential for light rail and other innovative new services to provide links between corridors and sub-centres needs to be explored. A long-term public transport plan is needed to guide the city into the future. This can be done as part of the updating of the Metropolitan Transport Strategy and Greater Perth.

Bus system

The provision of bus priority measures throughout Perth at points where buses are delayed by any substantial traffic congestion will improve the reliability and therefore the attractiveness of Transperth bus services as a transport option. While the Transperth train system provides a very effective and desirable heavy passenger transport spine, it is not available to a large number of Perth residents. Currently buses carry approximately 60% of public transport passengers compared to rail's 40%. While this proportion will change when the

expanded rail system opens, for many Perth residents buses will continue to be their key mode of public transport. Unlike trains, buses must compete with cars for road space and bus priority measures are essential at key congestion points. Greater opportunities for bus priority need to be considered in future capital programs. Such priority measures may well establish the reserves required for light rail systems when patronage builds and warrants light rail.

Ticketing

Promotion of public transport can occur through the use of new smart card ticketing and technology providing for faster boarding on buses, trains and ferries and greater security for passengers if the card is lost.

Fuel

The government now requires that all Transperth buses procured after June 2002 are powered by environmentally friendly natural gas, a fuel sourced from within the State. Notwithstanding this, other alternative fuels are being assessed. Perth is the only southern hemisphere city participating in a world trial of the latest fuel cell bus technology, with three fuel cell buses to be delivered into the Transperth fleet in mid-2004. This visionary project has involved key industry stakeholders in Western Australia and also Murdoch University, which will be undertaking associated fuel cell studies during the bus trial. Transperth is also working with interested parties to undertake bio-fuel trials. The Minister for Planning and Infrastructure has established a Sustainable Transport Energy Program that will incorporate these trials and research projects and will also include an initiative to reduce the use of fossil fuels (see *Oil vulnerability, the gas transition and the hydrogen economy*).

TravelSmart Program

The TravelSmart household program was pioneered in Perth and has successfully demonstrated a shift toward more balanced transport usage. The program provides information and motivation to residents in such a way that they reduce car use and choose existing alternatives. Car driver trip reductions of between seven and fourteen per cent have been achieved. These results wipe out around ten years of local traffic growth, contribute significant pollution and greenhouse gas reductions and deliver a cost-effective package of health and other social benefits.

A series of TravelSmart demonstration projects are underway across the metropolitan area with early results indicating that the Household program can be successfully transferred to many urban and socio-economic environments. Following its success in Perth, the program has been taken up by most other States and five overseas countries.

The TravelSmart household program is supported by a suite of TravelSmart programs that are delivered in different settings including local government, schools, workplaces, and major destinations. These programs focus on providing information and encouragement for people to change travel behaviour and influencing policy and decision-making in these settings in favour of balanced transport.

The TravelSmart Local Government program provides support for TravelSmart officers in local governments to:

- deliver local action plans and community education and information strategies that contribute towards balanced transport, and
- encourage consideration of alternative modes in local government policy and decision-making.

The TravelSmart schools program helps local school communities to reduce traffic congestion around their schools. This program is curriculum based and incorporates strategies that engage students and schools with a focus on student-centred learning and development of leadership skills. The program is delivered in partnership with Millenium Kids, a local non–profit youth based environmental group that empowers youth to contribute to the environment. The Walking School Bus supports the TravelSmart to Schools program by enabling groups of parents to take action in making walking to school safer and more convenient.

A walking school bus in Perth that delights in the local walk to school, creating community and 'sense of place' as well as health outcomes.

Source: Department for Planning and Infrastructure

The Department of Environment and the Department for Planning and Infrastructure jointly deliver the TravelSmart Workplace program. The program offers support for both government and non-government employers to manage work-related travel. The focus is on reducing car use by improving and promoting travel alternatives, particularly to staff by assisting workplaces to develop, implement and evaluate Green Transport Plans.

Both the TravelSmart Workplace and Local Government programs provide support for TravelSmart officers and facility management in major destinations (i.e. universities, hospitals) to promote reduced car use and increased use of the travel alternatives to access these facilities.

Walking/cycling

Forms of transport including cycling and walking are critical to sustainable urban development. The Physical Activity Taskforce (see *Sustaining healthy communities* and case study on the Taskforce) has demonstrated the multiple benefits of increased physical activity in our daily lives. Social benefits from an increase in walking and cycling are also being discovered. The Pedestrian Advisory Committee of Western Australia conducted a seminar in May 2002 called *Battery Reared or Free-Range Children*. This seminar considered a British study which found that children who are driven to school do not develop the same 'sense of place' and confidence in taking risks as those who walk, and therefore are less able to mature in this area of their personal development.

Local government land use and development decisions determine density, mixed use and physical layout of neighbourhoods that in turn profoundly influence the level of auto dependency in the community. The newer dense areas of Subiaco and East Perth, like the older areas of Fremantle, are far more attractive for walking and cycling than low-density suburbs. Local government can also influence how the community travel in their municipality through bike plans, pedestrian access and transport nodes around commercial centres.

Facilitation of pedestrian activity and cycling requires more design and infrastructure (especially at the local level), support in the form of engineering codes and educational campaigns. This should include a revamped Perth Bicycle Plan and a focused strategy of working with local Bicycle User Groups.

Funding priorities

A better balance of transport modes and integration of these with land use planning can be achieved through the funding of infrastructure and services. Within the Planning and Infrastructure portfolio, portfolio priorities for the assessment of capital funding proposals have been developed by incorporating sustainability considerations. The jointly developed Portfolio Directions statement (based on the draft State Sustainability Strategy) sets out broadly how the portfolio agencies will create better places for all West Australians to live, with progressive alignment by agencies of their plans and resource requirements to meet sustainability objectives.

In short...

Vision

Transport and land use decisions are so interconnected and synergistic that a more balanced, less car dependent city rapidly emerges and solves multiple urban sustainability problems.

Objectives

- Maximise the opportunity to increase residential, employment, retail, community and entertainment activity around key transport nodes and in major centres.

- Achieve a more sustainable balance between car use and other transport options through the promotion and provision of efficient and effective public transport and non-motorised personal transport alternatives.

Actions underway

- Agencies have been restructured to integrate planning and transport functions into the Department for Planning and Infrastructure.

- The new Public Transport Authority has been created within the Planning and Infrastructure portfolio with a core focus on delivery of safe, reliable and high quality public transport services around the State. Improving the quality of public transport services is a key to changing travel demand, increasing patronage and thereby balancing the transport task.

- The New Metro Rail Project will almost double the existing suburban rail system and includes the 74 km $1.4b southern rail line and rail extensions to Clarkson and to Thornlie.

- Associated with the large-scale rail expansion, work is underway to improve land use around rail stations and public transport transit corridors, thereby maximising the environmental and economic benefits of the rail investment.

- Bus and trains services are integrated whenever possible, including integrated timetables. Through the Building Better Stations program, options have been examined to improve and implement transport land use integration for existing train stations. Opportunities are also being examined for maximising population and employment at future stations on the South West Metropolitan Railway.

- The Western Australian Pedestrian Advisory Committee has been established and holding public seminars on pedestrian issues.

- In consultation with the local communities, a number of sub-regional Integrated Transport Plans are being prepared which prioritise improvements for public transport, cycling, and walking facilities over 5, 10 and 20 year timeframes.

In short cont'd...

- The TravelSmart Household program is being implemented incrementally to reduce car use and increase walking, cycling, and public transport patronage, thereby making better use of existing transport facilities and services.

- A suite of TravelSmart initiatives are being trialled and implemented in different settings including local government, schools, workplaces, and major destinations. These programs focus on providing information and encouragement for people to change travel behaviour and influencing decision-making in these settings in favour of balanced transport.

- The Western Australian Bicycle Committee has been continued and Bikewest has been re-established in the Department for Planning and Infrastructure to undertake a coordinating role in bicycle infrastructure development and advocacy activities.

- Concession fares have been frozen and time validity increased for public transport ticketing.

- Environmentally friendly gas-powered buses are being introduced into the Transperth bus fleet from June 2002.

- A Sustainable Transport Energy Program has been developed including the preparation of a strategy for Western Australia by a specially appointed Ministerial Committee, and the fuel-cell bus trial.

- Community acceptance and trial implementation of Liveable Neighbourhoods planning and design policies which facilitate and provide for walking and cycling as a necessary element of a community.

- Development of a Statement of Planning Policy on the sustainable planning, provision and maintenance of transport and infrastructure and the integration of land use and transport.

- Department for Planning and Infrastructure participates in the development of the National Charter of Integrated Land Use and Transport Planning.

- A recent partnership between the Disability Services Commission and the Main Roads Department has been established to develop a video ('Easy Street') which looks at planning for an accessible pedestrian environment.

Actions

4.18 Provide by the end of 2004 a world-best SmartRider ticketing system for integrated public transport incorporating promotional and incentive activities for passengers, greater security at stations and faster boarding.

4.19 Reduce the need to travel by car through:

- the application of locational and design criteria in the Sustainability Scorecard

- application of the Liveable Neighbourhoods Community Code and related policy options

- continuing to improve public transport infrastructure (eg the Building Better Stations program) and encourage behaviour change (e.g. the TravelSmart Household program) in favour of public transport and other transport options, and

- initiatives to promote regional and district centres and encourage jobs growth in non-CBD locations (thereby developing an opportunity to increase travel demand in non-peak directions and allow greater use of existing resources and capacity on the Transperth train and bus system).

In short cont'd...

4.20 Encourage pedestrians and bicycle use through:

- developing friendly environments in town centres

- improving pedestrian and bicycle access on local streets

- continuing the implementation of the TravelSmart Household program and complementary TravelSmart initiatives

- providing guidelines which assist local government authorities to audit and improve the accessibility of their pedestrian and cyclist infrastructure, and

- updating the Perth Bicycle Network Plan.

4.21 Promote further integration of buses and other travel modes such as cycling to the existing train system, and actively prioritise improvements to new station precincts where better integration is possible, thereby ensuring that residents have the opportunity to complete their entire journey using public transport.

4.22 Research and document vehicle trip behaviour and personal travel mode choices to establish planning implications for land development, traffic management, bus priority measures and cycling infrastructure projects.

4.23 Provide safe and economical bike parking at train and bus stations and car parking at designated Park and Ride Stations.

4.24 Develop programs that increase mixed-use development in strategic and other regional centres with good public transport provision, and where possible identify public transport requirements and funding support as part of development applications.

4.25 Encourage local government to provide for flexibility in residential zoning, which allows small businesses and 'corner shop' retail facilities to locate in existing suburban communities.

4.26 Encourage flexibility in local government parking policy in areas where there is good public transport; research parking demand at suburban centres and build on the success of the *Perth Parking Management Act 1999*.

4.27 Review and update the Metropolitan Transport Strategy and develop a long-term public transport strategy which reflects the New Metro Rail Project, the integrated bus, pedestrian and cycle networks with potential future upgrading, and the continuation of the TravelSmart program.

4.28 Support Commonwealth Government investigations into the extension of Australian Design Rules to cover noise and other environmental issues for all vehicles.

4.29 Work to remove inequitable taxation treatments and salary packaging arrangements that do not allow public transport and bicycles as travel options.

4.30 Within the Department for Planning and Infrastructure establish and implement a whole of portfolio prioritisation model to enable funding priorities for integrated land use and transport planning and balanced multi-modal transport based on sustainability objectives.

4.31 Consider the cross-government benefits of cycling and pedestrian programs for health and environmental benefits in an effort to better coordinate program and funding arrangements.

4.32 Expand research and training on the integration of transport and land use for more balanced transport outcomes and recommend this for inclusion in the proposed Masters in Transport Studies being established between the universities.

In short cont'd...

4.33 Continue integrated transport planning across regional council groupings in association with the development of corridors and sub-regional areas.

4.34 Develop a Statement of Planning Policy on the sustainable planning, provision and maintenance of transport and infrastructure and the integration of land use and transport.

Global opportunities

Cities around the world are attempting to better integrate land use and transport planning. Western Australia's experience could be globally significant. The TravelSmart Household program has been adopted by the Commonwealth Government and is currently being replicated in Queensland, Victoria, South Australia, United Kingdom, United States, Sweden, Germany and France. Now recognised as the pioneer of an effective transport innovation, many countries are looking to Western Australia for leadership in this approach.

Further information

Armstrong, R & Head, G 2002, *Liveable Neighbourhoods: Guiding New Developments for a More Sustainable Urban Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/LivableHoods/Liveable Neighbourhoods.htm

Armstrong, R 2002, *TravelSmart: Helping to Create a More Sustainable WA by Empowering People to use Alternatives to the Car for their Transport Needs*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/travelsmart/travelsmart.htm

Chambers, L 2002, *Sustainable Transport* sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Curciarello, S 2002, *Multi-Criteria Integrated Transport Assessment*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/multicriteria/multicriteriatransport.htm

George, S 2002, *WA Physical Activity Taskforce: Helping Create a More Sustainable WA*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/PhysicalActivity/PhysicalActivity.htm

Prince, J 2002, *Reclaiming our Streets: Pedestrian Initiatives in Perth*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/pedestrianinitiatives/pedestrianinitiatives.htm
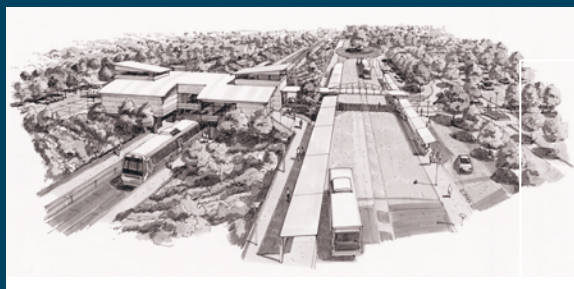
The Perth to Mandurah Railiway is the largest and most comprehensive integrated transport project ever undertaken in Western Australia. It will create a 48-minute link over the 71km journey (20 minutes faster than an average car trip).

Source: New Metro Rail

> MANAGING FREIGHT AND REGIONAL TRANSPORT

The Western Australian Government made a commitment to review the freight network and began this soon after taking office through a series of innovative public forums, built around the concept of sustainability. This process has been highly successful and has demonstrated that a transparent process, engaging all stakeholders with the goal of sustainability, can come up with mutually supportive solutions that are better for the economy, the community and the environment.

It is ironic that the very cars and trucks that have made massive urbanisation possible are now contributing to the deterioration of cities.

Lester Brown[37]

The Freight Network Review began with a role-playing exercise involving the trucking industry and community groups in the Hills area that helped find solutions to a noise problem and did not require the construction of a proposed bypass.

A Freight Congress was held involving 150 people from all major stakeholder groups as well as randomly selected members of the public. The Congress set the agenda for 9 months of intensive work by six working groups. The first group created a paper on *Sustainability in Relation to Freight*. This set the principles for the other groups and a master plan and also recommended the use of a public multi-criteria analysis process to consider some major road planning proposals.

The Fremantle Eastern Bypass and the extension of Roe Highway through Bibra Lake have generated serious divisions in the community. The multi criteria analysis process was applied to these situations through a series of workshops involving Dr David Annandale from Murdoch University. This process identified twenty-three alternative options and developed thirty-seven environmental, social and economic criteria. A community committee worked with experts to translate these criteria into measurable factors and weighted the criteria to reflect community and industry values. These weighted scores were then applied to the alternative routes.

The final workshop found that the four groups in the process—industry, community, environmental and government—all agreed on the best options. None of the options involved a road through the Bibra Lake wetlands that had previously been proposed as part of the controversial Roe Freeway Stage 8. This sophisticated and transparent process has pioneered a technique in Western Australia for applying sustainability to the resolution of a complex planning problem with practical outcomes. The multi-criteria technique can now be applied to any complex planning decision with confidence. Those involved in the process have developed capacity that is arguably world's best practice.

The particular road planning options need to be part of a broader strategic planning solution and this was developed by the Freight Network Review Working Groups, and approved by a reconvened Freight Congress in June. The solution involved a strategy to increase the use of rail from the Port of Fremantle (the focus of many of the freight problems) from 3% to 30% as well as reducing the number of empty truck movements so that the growth of truck traffic could be curtailed to keep it at present levels. Other identified needs were for planning to begin immediately on the development of an Outer Harbour container terminal and determining rail and road connections and a freight interchange node.

The Congress also considered that the Freight Network Review should be more broadly applied to the development of road-rail nodal interchange points (to ensure that freight routes are clearly planned and not compromised) and that demand management should be put on the agenda. The review could be usefully extended to the rest of the State.

[37]L Brown, *Eco-Economy*, Norton, New York, 2001, p. 208

The process of developing Regional Transport Plans could be the mechanism for extending the Freight Network Review. It can also provide the opportunity to incorporate local and regional perspectives on passenger transport futures, particularly in light of the oil vulnerability issues (see *Oil vulnerability, the gas transition and the hydrogen economy*).

In short...

Vision

Freight becomes more efficient, more rail-based and more connected through inter-modal centres so that the expected large growth in truck movements does not occur. Simultaneously, improved regional passenger transport also becomes available.

Objectives

• To achieve an integrated and safe freight transport system that is economically and environmentally sustainable and minimises community conflict.

• To enable transport to meet the needs of regional communities.

Actions underway

• The Freight Network Review was undertaken in close consultation with community and industry.

• Accreditation for the road transport industry is occurring.

• Strategic planning to support freight rail in limited markets is being undertaken.

• The government is participating in national processes to achieve uniformity of regulations and standards.

• The new Australian Design Rules for vehicle emissions are being introduced.

• The Prospector train is being upgraded.

• The development of a Statement of Planning Policy on the provision of an efficient freight network that is socially and environmentally responsive.

Actions

4.35 Implement the Freight Network Review including the switch to rail freight in the Fremantle Port from 3% to 30% of all containers, the more efficient use of trucks through modal interchange nodes and an acceleration of strategic planning for the Outer Harbour.

4.36 Extend the Freight Network Review principles and concepts to the whole State, through discrete projects in the regions.

4.37 Develop a mechanism to manage conflicts between freight and residential activity, using zoning options to create incentives for property owners and site management options where necessary.

4.38 Encourage the expansion of freight rail infrastructure to effect modal change.

4.39 Ensure that all complex and contentious road and rail planning is done using sustainability techniques such as the multi-criteria analysis process developed for the review of Roe Highway, the citizen jury approach used for Reid Highway and land use/transport modelling (see *Sustainability and governance: Sustainability assessment*).

In short cont'd...

4.40 Develop a long-term strategy for country passenger rail.

4.41 Create Regional Transport Plans with Regional Councils for freight and passenger services in country and city regions.

Global opportunities

The need to develop sustainable freight movement in cites and regional areas is a global issue.

Further information

Department for Planning and Infrastructure
http://www.dpi.wa.gov.au/hotspots

The Freight Strategy is shifting containers at Fremantle Port from road to rail. The change from 3% to 30% of containers by rail will mean thousands fewer trucks on the road.

Source: Department for Planning and Infrastructure

> PRESERVING AIR QUALITY

Clean air is essential to a healthy population and a healthy environment.

The vision for Western Australian air quality is to have the air in every community healthy to breathe, to reduce damage to the environment from air pollution and address global air quality problems. The Western Australian government, industry and the community must be charged with protecting air quality and progress improvements in air quality, despite opposing trends in population, economic, and transportation growth.

Air quality and community exposure to air pollutants across the State are being influenced by personal lifestyle and behaviour decisions (such as vehicle use and home heating choices), industrial emissions and activities such as fire management.

Haze (particle pollution) is most evident during colder months, when atmospheric inversion layers trap emissions for extended periods of time. The primary source of urban haze events is domestic wood fires. Fuel reduction burns, motor vehicles, off-road vehicles and industry are also significant sources of particles; however, due to the type, location and temporal period of the emissions from these sources, they are less significant to the formation of haze. Wood fires, particularly open fires are progressively being phased out of most modern cities along with coal burning.

Photochemical smog is primarily composed of lower atmospheric ozone, which is the result of the chemical reaction between nitrogen oxides and reactive organic compounds, in the presence of heat and light. Their principal sources are motor vehicles, combustion processes (for nitrogen oxides), and refining, petrochemical and solvent-based industries (for reactive organic compounds). Motor vehicles produce both reactive organic compounds and nitrogen oxides which combine to form photochemical smog during inversion events (most in winter and spring).

'Air toxics' are gaseous, aerosol or particulate pollutants that are present in the air in low concentrations with characteristics such as toxicity or persistence so as to be a hazard to human, plant or animal life. Air toxics are emitted into ambient air from a wide range of sources. Exposure to these substances is dependent on individual lifestyle and places of work and residence.

Several scientific air quality studies have been undertaken to investigate and understand air quality pollution levels, air pollution development processes and community exposure to air pollutants. Examples of these studies include the Perth Haze Study, the Perth Photochemical Smog Study, Air Emissions Inventories for the Perth, Pilbara and Bunbury airsheds and the BTEX Personal Exposure Monitoring in Four Australian Cities.

An important common finding of current research is that the most significant source of air pollution in most urban areas of Western Australia is not industry but the community. Domestic woodheaters in winter and vehicle use are the largest causes of air pollution. The community needs to recognise that individual behaviour is the fundamental cause of air pollution.

Although there are economic implications in addressing pollutants, they are minor compared to the resulting health, social and environmental costs of air pollution to the Western Australian community. It has been estimated that up to 2,400 deaths per year in Australia can be linked to particle pollution alone, with an associated health cost of $17.2 billion (Environment Australia, 2003). As early as the 1970s air quality monitoring has revealed significant health threats on 10 to 20 days a year in the Perth metropolitan area. A recent study of air quality in Perth has confirmed that air pollution is still affecting the health of Western Australians. Researchers found that increases in smog concentrations were associated with increases in the number of deaths in Perth (Department of Environment, 2003). They also found links between air pollution and hospital visits for asthma, pneumonia and other respiratory diseases.

The State Government in association with local governments, industry, education institutions and community associations has been and continues to implement air quality management initiatives to maintain and improve regional and local air quality across the State. This is achieved through management tools such as Environmental Protection Policies (EPP), regulation and management plans.

At present there are two EPPs which deal with air quality. The Kwinana and Goldfields EPPs both address industrial air emissions in specific airsheds. A State Air EPP is currently under development to fulfil a commitment to implement the Ambient Air Quality National Environment Protection Measure in Western Australia.

Regulations such as the Environmental Protection (Diesel and Petrol) Regulations 1999 and Environmental Protection (Domestic Solid Fuel Burning Appliances and Firewood Supply) Regulations 1998 have been developed to maintain and improve emissions from specific sources. The introduction of 'Clean Fuel' Regulations saw Western Australia become the national leader in clean transport fuels. These regulations have seen a reduction in sulfur from diesel fuel, a reduction in benzene and hydrocarbons from petrol and the removal of the toxic additive MTBE and lead from petrol. The health benefits of this regulation have been identified in a recent study which found that Perth participants' average exposure to benzene, toluene, ethyl benzene and xylenes was significantly lower than those participants from Melbourne, Sydney and Adelaide (Environment Australia 2003). Since the introduction of unleaded fuel, ambient lead concentrations have significantly decreased in Western Australia. The most recent Western Australian fuel quality regulations further contribute to this trend.

The Domestic Solid Fuel Burning Appliances and Firewood Supply Regulations ban the sale of green firewood and woodheaters that do not comply with the Australian Standard (AS4013).

The Perth Air Quality Management Plan (AQMP) has bipartisan support and sets out priority actions for the Perth airshed. The Implementation Strategy (2002) outlines how and when the programs are to be undertaken. The primary focus of the AQMP is:

- land use transport and planning to reduce car dependence and enable more balanced transport options

- vehicle emissions programs, incorporating the National Environment Protection Measures

- community education and behaviour change programs related particularly to the issues of individual responsibility, domestic woodheaters and car use, and

- industry emissions, particularly those in the Kwinana region.

The programs within the Perth AQMP need to be continued and accelerated where feasible. Similar strategies need to be considered and developed for growing regional centres. The innovations suggested in land use and transport policy are outlined in *Integrating land use and balanced transport*. The vehicle emissions programs are part of a Commonwealth Government process and the Western Australian Government needs to ensure that no attempt is made to weaken this and avoid compliance with world best practice.

The next stage to preserving air quality will be to investigate in detail some of the air toxics emitted from woodheater use, industry and transport fuels. Domestic woodheater use needs to be carefully monitored and if the educational process is not working sufficiently, then mandating standards may be required. Monitoring should ensure industry emissions continue to improve across the State.

Many actions that address air quality are included in other sections of the State Sustainability Strategy including *Integrating land use and balanced transport, Managing freight and regional transport, Sustainable energy* and *Building sustainably*.

In short...

Vision

To have the air in Western Australia healthy to breathe, to reduce damage to the environment from air pollution and address global air quality problems.

Objectives

- Maintain and improve air quality for this and future generations.

- Reduce the impacts of air pollution on human health and the environment, including biodiversity.

- Ensure future development recognises and manages air quality issues and reduces emissions to the maximum practical extent.

- Educate the community to recognise that reducing air pollution is the responsibility of everyone, not only industry. Individuals can make a difference.

Actions underway

- Government is currently implementing the Perth Air Quality Management Plan with the support of its major stakeholders, involving priority actions in the areas of land use transport and planning, vehicle emissions, community education and behaviour change and industry emissions.

- The Environmental Protection Authority is developing a State Air Environmental Protection Policy to provide a strong legislative foundation to protect air quality around Western Australia.

- Monitoring programs for the National Environment Protection Measures for ambient air quality (for the priority air pollutants of NOx, SO_2, lead, CO, PM_{10} particulates, ozone) are well established.

- Development of National Environment Protection Measures for air toxics is in progress and the government is implementing the National Environment Protection Measures for the testing of diesel emissions.

- The Kwinana Gap Emissions Study is a desktop study of the current licensing arrangements for air pollutants emitted from major and significant industrial premises in the Kwinana Industrial Airshed, and a comprehensive review of the appropriateness of current ambient monitoring programs in place.

- Inter-agency cooperation (whole of government protocols) to ensure there is a reduced frequency in the smoke events from fuel reduction burns.

Actions

4.42 Continue implementation of the Perth Air Quality Management Plan, focusing on coordinated action to work towards Perth having the cleanest air of any city of its size in the world.

4.43 Develop a Statement of Planning Policy for Integrated Land Use Planning and Transport that demonstrates, among other things, how local planning can minimise air pollution.

4.44 Work with local government to help them in general community liaison on air pollution issues, especially smoke haze from woodheaters, and through the application of the Sustainability Scorecard to air emissions from housing, and location of development.

4.45 Continue to provide community information and education aimed at changing individual behaviour, especially the use of domestic woodheaters, and to encourage a shift to non-car modes of transport.

In short cont'd...

4.46 Continue to monitor the air quality criteria set by National Environmental Protection Measures.

4.47 Continue to develop air quality guidelines and standards through national forums and further develop methods for assessing the impacts of air quality on human health and the environment.

4.48 Ensure that air quality factors are fully considered in sustainability assessments.

Global opportunities

Western Australia has developed world-class expertise and experience in managing air quality issues and there are opportunities for this expertise to be exported and offered to developing countries with similar air quality problems.

Further information

Air Quality in Western Australia
http://aqmpweb.environ.wa.gov.au/air_quality

Department of Environmental Protection, 2001, *Air Quality in Perth* 1992-1999, viewed August 2002, http://www.environ.wa.gov.au/downloads/Technical_Series/109.pdf

Department of Environmental Protection, 2002, *Implementing the Perth Air Quality Management Plan*, Government of Western Australia.

Department of Environmental Protection, 2003, *Research on Health and Air Pollution in Perth Morbidity and Mortality: A Case-Crossover Analysis 1992-1997*, Technical Series 114, Government of Western Australia

Environment Australia, 2003, *Technical Report No. 6: BTEX Personal Exposure Monitoring In Four Australian Cities*, Environment Australia, Canberra.
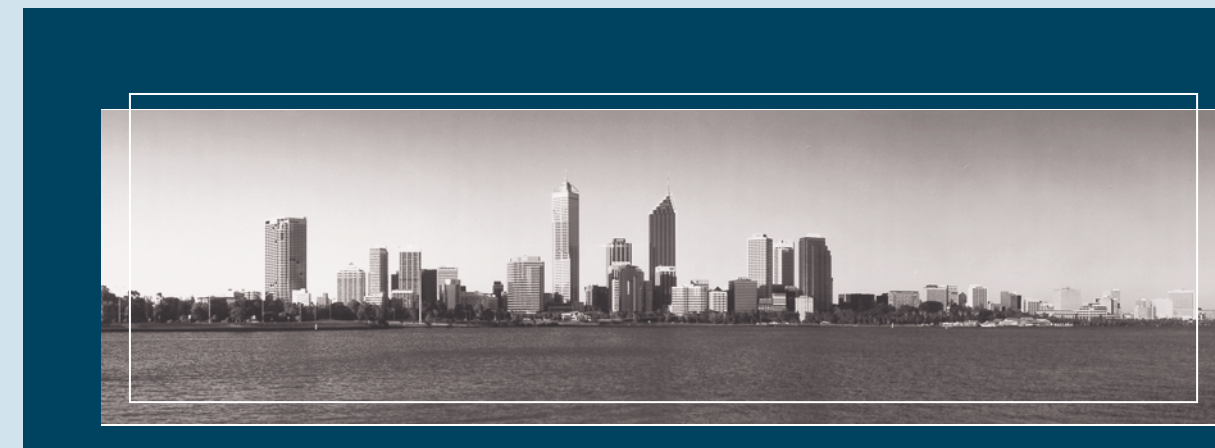
Perth prides itself on its clean and green image. But the city is faced with challenges to its air quality, including car dependence and urban sprawl, which contribute to photochemical smog and subsequent impacts on human health.

Source: Department of Industry and Resources

> REDUCING WASTE AND MANAGING IT AS A RESOURCE

Reducing and managing wastes in settlements is fundamental to ensuring a healthy environment and good quality of life. Recent management experience has revealed continuing improvement and innovation in solid waste management but problems with hazardous waste.

… it is imperative that the State Sustainability Strategy for Western Australia take a deliberate and detailed look at the issues evolving in waste management particularly the importance of ensuring the maximisation of the recovery and recycling of resources from waste.

Amcor Recycling

Waste, in all its forms, can be used to monitor our journey toward a sustainable lifestyle. The government through the Draft Strategic Framework for Waste Management has set an action agenda for how we can move toward a waste-free society, embracing the vision *'toward zero waste by 2020'* developed by the WAste 2020 Strategy.

To achieve this requires a shift toward a closed loop economy, where we optimise consumption and where wastes from one part of society become the raw materials for another. Accurate data on the waste streams will be required in order to monitor progress and identify opportunities for improvements. Programs will also be needed to support waste avoidance initiatives and develop markets for recycled materials.

Government will take an active role in stimulating the development of markets for recycled materials through its own purchasing requirements as outlined in *Embracing sustainability in government agencies*.

In order to implement strategic directions for waste, the Western Australian Government has developed a model to achieve zero waste. This has been designed to aid decision-making and illustrate the thinking required to implement the waste management hierarchy (Figure 10). The application of the model is built on a cycle of continual improvement and will require the commitment and participation of all stakeholders to:

- prevent the generation of waste
- maximise recovery and recycling of resources from waste, and
- analyse the residual waste stream and make improvements to move toward zero waste by 2020.

The WAste 2020 Strategy identified the need to establish an effective structure to coordinate the implementation of the toward zero waste vision. The government established the Waste Management Board to undertake this role.

The future direction of waste management as described by the 'zero waste' model will utilise the waste management hierarchy as a decision support tool and product life cycle management to help guide product design. Both social and intergenerational equity issues need to be addressed by ensuring all waste is managed in time and space as close to the point of generation as possible.

Specific issues such as converting waste to energy, should only be considered after all other alternate strategies, consistent with the waste management hierarchy, have been considered.

The community is more aware of the negative impact wastes have on our quality of life, especially since the Bellevue chemical fire in February 2001. As a result, technologies for treating and storing wastes and the location of waste facilities have been of great concern to many in the community, leading to demands for preventative strategies to minimise wastes and particularly those that can enable the elimination of hazardous wastes. The government has made a number of commitments over time that has led to a policy of containing the nuclear industry with its hazardous wastes. The history of this and the latest step to legislate to prevent an intermediate nuclear waste facility being sited in Western Australia, is set out in Box 51.

BOX 51   A NUCLEAR-FREE WESTERN AUSTRALIA

The nuclear fuel cycle continues to produce the most dangerous weapons, energy and wastes known. Nuclear power currently generates 17% of the world's electricity, but the industry is rapidly in decline because it is so capital intensive, and environmentally and socially unacceptable.

The Western Australian Government is committed to remaining nuclear free. The State is taking a global leadership role in putting an end to the dangers of the nuclear industry. The government has put in place policy and is introducing legislation to prevent uranium mining and is committed to prevent the use of Western Australia as a dumping ground for nuclear waste generated elsewhere.

There is a push on in Australia for more uranium mines, a new nuclear reactor and national and international radioactive waste dumps. The State Government believes it is unacceptable that Western Australia provides support for this industry and becomes a repository for its waste. Nuclear energy cannot compete with cheaper and newer forms of energy such as combined cycle gas turbines and it is the most expensive and dangerous way of addressing global warming. The problems of nuclear waste remain unsolved and subject to intense community concern. The Western Australian Government is working toward solutions and is fighting any attempts to impose a nuclear waste dump that would tarnish its clean and green reputation.

The government is also committed to establishing guidelines in conjunction with the community and industry for the selection, siting and management of secondary waste reprocessing facilities. Hazardous wastes need to be slowly phased out along with all other wastes, and in Western Australia this goal is set to be achieved by 2020. The phasing out of hazardous waste will require technological breakthroughs as well as institutional change (such as extended producer responsibility – see below). Plans will be developed for this phasing out and for an interim solution to hazardous waste siting.

A Resource Recovery and Waste Avoidance Bill will be drafted containing modern provisions for achieving world best practice in the sustainable minimisation and management of waste and resource consumption. This Bill will ensure a coordinated approach across the State to maximise the recovery of waste resources, and will begin to establish requirements for extended producer responsibility of materials and wastes.

There is a need for consumers and producers to become more responsible for the life cycle of products and services. One key mechanism developing overseas for closing the loop is through requirements to extend a producer's responsibility beyond the point of sale of a product. This means that a producer is responsible for their products throughout their life cycle, which has led to advancements in design. A policy position paper will be developed on the application of extended producer responsibility in Western Australia.

At a national level a voluntary National Packaging Covenant has been established to reduce the amount of packaging being consumed in Australia. The Western Australian Government has prepared an Action Plan to implement the Covenant and will introduce the necessary regulations under the *Environmental Protection Act 1986*.

Figure 10   Waste management hierarchy

Reduce
Reuse
Recycle
Secondary Reprocessing
Recover Energy
Disposal

Desirability
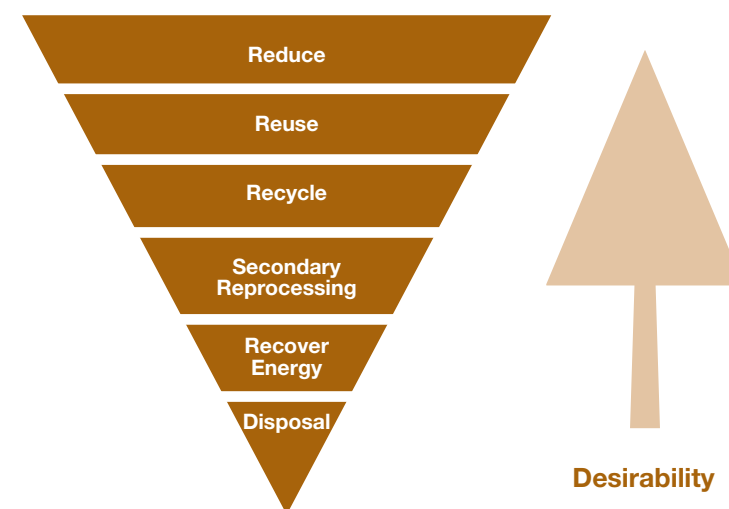
In short...

Vision

Toward zero waste by 2020.

Objectives

- Manufacturing and other industrial processes are operated in a sustainable manner that minimises the quantity of wastes produced.

- Products and services are designed and/or packaged to minimise waste and facilitate re-use and resource recovery.

- Information and data on waste generation are continuously collected, analysed and reported.

- All wastes are segregated and sorted close to source in a manner that optimises resource recovery for higher end-uses.

- Hazardous components in goods and services are replaced to increase resource recovery options.

- Comprehensive suites of treatment facilities are established which maximise resource recovery.

- Residual waste streams are continuously assessed and actions taken to enhance recovery.

- A community that understands the impact of purchasing choices and actively participates in waste reduction and recycling activities.

Actions underway

- Implementing the WAste 2020 Strategy.

- Establishing the Waste Management Board.

- Developing a whole of government procurement policy for waste paper recycling.

- Conducting research on solid waste management through the waste levy.

- Conducting the Parliamentary Inquiry into the Bellevue Chemical Fire and acting upon its recommendations, including initiating a comprehensive review into hazardous waste management in Western Australia.

- Establishment of the National Packaging Covenant program and regulations.

- Survey and review into hazardous waste generation.

- In 1999 the Western Australia Parliament passed the *Nuclear Waste Facility (Prohibition) Bill 1999* that banned the storage of overseas nuclear waste, to stop Pangea Resources from establishing a high level nuclear waste dump in Western Australia.

- Since 22 June 2002, the Government has placed a limitation on all new leases for mining uranium.

In short cont'd...

Actions

4.49 Finalise the Strategic Framework for Waste Management to guide the management of waste in Western Australia towards zero waste by 2020 and liaise with stakeholders and the community on the implementation of the Framework.

4.50 Recognise the success of those individuals, innovators, industries and councils who are successfully implementing a Zero Waste Framework.

4.51 Introduce and enact the Resource Recovery and Waste Avoidance Bill.

4.52 Enact the Contaminated Sites Bill.

4.53 Prepare detailed business plans to support and prioritise the strategic activities to support the goal of moving towards zero waste by 2020.

4.54 Encourage all government agencies to reduce consumption and waste by undertaking a comprehensive audit of resource consumption and waste and setting targets for reductions as part of their Sustainability Action Plans.

4.55 Encourage the use of recycled products by all government agencies through the Government's Sustainability Procurement Policy.

4.56 Encourage recycling of paper, glass, plastics, metals and organic waste using the Sustainability Code of Practice for government agencies.

4.57 Work with local governments to expand the scope of their waste management plans to be consistent with the Strategic Framework for Waste Management, and support markets for recovered materials through the use of the Sustainability Scorecard in development applications involving construction and demolition waste.

4.58 Examine how the landfill levy can better reflect environmental and social costs of waste disposal.

4.59 Set mandatory hazardous waste targets for industry and target cleaner production programs towards industries producing hazardous waste so that a plan can be created for zero hazardous waste by 2020.

4.60 Develop policies and legislation to encourage or require producers of hazardous and problematic wastes to share the responsibility for managing and reducing these wastes until they are phased out by 2020.

4.61 Actively engage the community to determine appropriate siting and establishment of industrial/hazardous waste precincts for the metropolitan region until such waste is phased out by 2020.

4.62 Ensure appropriate regulations exist to effect the safe transportation, storage and disposal of hazardous and controlled wastes in the period leading to the phase out of such wastes.

4.63 Develop a comprehensive and clear waste classification and recording system for all wastes across Western Australia.

4.64 Develop and report effective indicators to measure progress toward zero waste for each sector of society, including industry, community and government.

4.65 Strengthen the *Nuclear Waste Facility (Prohibition) Act 1999* so that it prohibits the transportation or storage of any nuclear waste in Western Australia.

4.66 Prevent the establishment of an intermediate level radioactive waste repository in Western Australia.

In short cont'd...

Global opportunities

Western Australia has developed a number of innovative waste management technologies and with strong regulatory controls on waste this innovation will continue. The Waste Management and Recycling Fund will be used to target initiatives that reduce waste and support resource recovery. Global opportunities are considerable.

Further information

Department of Environmental Protection 2001, *Waste 2020 TaskForce Report and Recommendations,* draft, viewed August 2002,
http://www.environ.wa.gov.au/downloads/WAste_2020/Controlled_Waste.pdf

Murdoch University, Environmental Technology Centre
http://wwwies.murdoch.edu.au/etc/

Resource recovery turns materials traditionally seen as waste into valuable products for reuse. With strong community support in separating household waste, the Southern Metropolitan Regional Council's regional resource recovery centre (RRRC) provides an integrated processing facility which recovers 85% of domestic material from landfill. It is considered a model of best practice in sustainable waste management. The centre marries a user-friendly domestic collection system with three state of the art processing facilities: a green waste processing plant; a composting plant; and a materials recovery facility.

Source: Southern Metropolitan Regional Council

> OUR WATER FUTURE

The sustainability of our water supply is an issue of concern to many Western Australians. There is a need to provide a vision for the future, new sources of supply and new ways to save water.

Effectively managing water supplies is a key task for our state. It requires thorough investigation into the options, and commitment to tough choices and actions where necessary. We must ensure we have enough water to meet our needs.

Meeting the challenge of creating and securing a sustainable water future for Western Australia is a high priority for Government and is a unique opportunity for us to work together in achieving this goal.

Hon Dr Geoff Gallop, Premier of Western Australia[38]

Water supply is a major issue in the South West of Western Australia with a 50% decline in the runoff to metropolitan dams being experienced in the past 25 years.

The Premier's Water Taskforce produced the Draft State Water Strategy in December 2002 after widespread public consultation. The final Strategy was released by the Premier in February 2003. The State Water Strategy (see Box 52) set out how to simultaneously increase water supply options and reduce per capita water consumption. The objectives of the State Water Strategy are to ensure a sustainable water future for all Western Australians by:

- improving water use efficiency in all sectors
- achieving significant advances in water re-use
- fostering innovation and research
- planning and developing new sources of water in a timely manner, and
- protecting the value of our water resources.

BOX 52   SUMMARY OF MAJOR INITIATIVES CURRENTLY BEING UNDERTAKEN THROUGH THE STATE WATER STRATEGY

- Project Director appointed to coordinate the implementation of the eighty-four tasks in the State Water Strategy.
- A Water Re-use Steering Committee has been created to oversee the development of an implementation plan to achieve the 20% re-use target by 2012.
- Project plan signed off for the Local Government Water Campaign to be implemented by the International Council for Local Environmental Initiatives (ICLEI).
- A model is being developed which will assist in the development of an integrated resource planning process (which will ensure that when planning new sources water conservation and water use efficiency are also considered as part of the planning process).
- Reviewing the current land subdivision process to evaluate how water efficiency can be built in as part of this process.
- Price of water for domestic consumption has been increased for those users who use more than 550 kilolitres to $1.20 per kilolitre.
- Review of the irrigation industries about to commence in Western Australia .
- A process for the introduction of a water conservation plan to be submitted when a licence is renewed or applied for is nearing completion.
- Legislation amended to ensure no watering between 9 am and 6 pm.
- Water Wise Rebate Scheme established for rebates on rainwater tanks, showerheads, washing machines and garden bores.
- Joint projects being established with CSIRO under their flagship project 'Healthy Country'.
- Pilot project being scoped for a Water Wise on the Farm project.

[38]Hon Geoff Gallop, Government of Western Australia, Our Water Future: Its up to all of us, 2002

BOX 53   SHENTON SUSTAINABILITY PARK: INTEGRATED SOLID AND LIQUID WASTE RECYCLING

The Shenton Sustainability Park proposal is an innovative project aimed at promoting and facilitating resource recovery and eco-efficiency in municipal waste and wastewater management as well as contributing to broader sustainability in urban settlements.

This proposal aims to 'close the loop on wastes' by producing useful products from the existing waste streams in the Shenton Precinct, including treated wastewater and sludges/biosolids from the Water Corporation's Subiaco Wastewater Treatment Plant, and solid municipal wastes and household recyclables managed by the Western Metropolitan Regional Council and its member local governments.

Through the Water Corporation the government has undertaken a full feasibility study of this concept. The study recommends that the Shenton Sustainability Park comprise:

• a Centre of Excellence in Municipal Resource Recovery and Re-use to address the significant technological, social and environmental research challenges in developing new products from solid wastes and achieving large-scale re-use of treated domestic wastewater

• demonstration of hydroponic horticulture and ornamental aquaculture activities to re-use treated wastewater and

• a Sustainable Urban Living Interpretive Centre to operate as a learning centre for children through to adults and to promote resource recovery and re-use and to maximise community participation in the Park's activities.

The Shenton Sustainability Park is envisaged as being Australia's first integrated eco-industrial park and a major initiative in implementing the State Water Strategy; it supports the State Government's objective of moving towards zero waste by 2020. It also supports the development of an informed community committed to taking responsibility for reducing the environmental footprint of its consumption patterns.

The Water Corporation, together with key stakeholders in the Park, is currently developing a community consultation strategy and an implementation strategy to see this project come to fruition over the next few years.

In short...

Vision

Water is used with care and is provided sustainably to meet needs.

Objectives

• Reduce water consumption.

• Extend responsibility for water supply to the planning system (water sensitive design) and to local government (Regional Councils) for groundwater supplies.

• Achieve significant wastewater re-use.

• Investigate long-term innovative water supply options that have broad sustainability outcomes.

Actions underway

• The Premier's Water Taskforce has developed the State Water Strategy.

• A draft State Water Conservation Strategy has been released for public comment in 2002 and integrated into the State Water Strategy.

• Draft guidelines for the re-use of grey water by households have been released.

• The Water Corporation and Department of Environment operate a number of programs directed at water conservation.

• The Premier's Water Foundation is in the process of being established.

In short cont'd...

Actions

4.67 Implement the State Water Strategy.

4.68 Use the Sustainability Scorecard to demonstrate sustainable water use in building and development before phasing it in to all development controls.

4.69 Through the Sustainability Roundtable create demonstration projects with local government and regional councils on how to manage regional groundwater and drainage.

4.70 Establish a local government water campaign to implement a sustainable water management program in partnership with the Western Australian Local Government Association and the International Council of Local Environmental Initiatives, to assist local government to address local water management issues. Include initiatives such as:

• research and trial innovative approaches to support sustainable drainage management and establish a series of pilot projects for drainage water re-use at neighbourhood and/or streetscape level

• undertake education and training of local government and key stakeholders on good planning and on-ground stormwater management using the Stormwater Management Planning approach.

4.71 Review the irrigation system to ensure it complies with sustainability principles.

4.72 Provide for Perth's long-term water supply needs through a sustainability assessment of the next major water supply source.

Global opportunities in sustainable water

Other areas of the world have water constraints like Perth. If the city can overcome these in a sustainable way then the results will be seen globally.

Further information

www.watercorporation.com.au/owf

The Government is commited to achieving 20 per cent reuse of treated wastewater by 2012. Significantly increased use of reclaimed water for industry will be required to achieve this target.

Source: Water Corporation

> SUSTAINABLE ENERGY

Energy is central to all aspects of human activity. Whether the energy is used for domestic, commercial or industrial purposes, there are opportunities to practise energy conservation and to utilise alternative fuels, technologies and energy sources to provide an efficient and sustainable service to the economy while helping to build communities in a healthy environment.

Developing a pathway to a more sustainable energy system will position Western Australia to respond and adapt to changing environmental imperatives as well as profit from any opportunities that arise. Achieving this will depend on encouraging and facilitating movement away from our current reliance on combustion of fossil fuels to practices that conserve energy and encourage the use of more benign alternative forms of energy, including renewable energy.

Many alternative energy technologies are now commercially proven while numerous others are under development and, over time, may prove effective. Western Australia has a fertile history of activity and innovation in developing and commercialising new energy efficiency and renewable energy technologies. Some examples are:

- solar water heating (Western Australia has led the world in this technology)
- remote area power systems that use solar photovoltaic and wind turbines combined with diesel generators for small, isolated communities
- the Albany wind farm that uses world best practice turbine technology and has demonstrated a new control system that maximises wind turbine performance
- an innovative 1 MW integrated wood processing plant at Narrogin using oil mallee biomass that has the potential to provide multiple sustainability benefits to rural Western Australia, and
- the hydrogen fuel cell bus project.

In order to fulfill the commitment made in its Sustainable Energy for the Future policy, the Western Australian Government has created the Sustainable Energy Development Office. The Sustainable Energy Development Office is charged with implementing government sustainable energy policy, advising government on sustainable energy issues and providing information and assistance regarding sustainable energy practices to business, government and the community.

BOX 54   EDUCATION/INCENTIVE PROGRAMS FOR SUSTAINABLE ENERGY

The programs currently managed by the Sustainable Energy Development Office which provide information and support renewable energy include:

- Energy Smart Line (telephone advice service)
- Energy Smart Community and Business Brochures
- Reach for the Stars (high efficiency appliance program)
- Sustainable Energy Seminars
- Australian Building Greenhouse Rating for commercial office buildings
- FirstRate for new houses
- Solar Water Heating Subsidy
- Photovoltaic Rebate Program
- Renewable Remote Power Generation Program
- Renewable Energy Water Pumping Program
- Remote Area Power Supply Program, and
- Sustainable Energy Development Office Grants Committee Funding Rounds

BOX 55   GEOTHERMAL-BASED HEATING AND COOLING AT EDITH COWAN UNIVERSITY, JOONDALUP

Source: Edith Cowan University

The new Ecology and Health building at the Joondalup campus of Edith Cowan University is an eco-design that utilises geothermal energy. A deep bore supplies hot water that provides air-conditioning for the building and all other buildings on the campus through a heat exchanger and heat pumps.

There are several important initiatives occurring within the energy portfolio that have the potential to lead to more sustainable outcomes in the development of our energy systems and to move Western Australians towards more sustainable practices in the way we view and use energy. Initiatives include:

- Public power procurement processes to facilitate the replacement of old inefficient electricity generators in regional areas of the State with new, cleaner and more efficient technologies at the most economic price.
- The Electricity Reform Implementation Process is examining institutional aspects of electricity provision and in combination with State actions and Federal initiatives, such as MRET (see Box 56), will act to increase the amount of energy generated from renewable sources and recognise the benefits of demand-side initiatives for energy conservation. Overseas evidence suggests that renewable energy growth is associated with electricity market liberalisation (see Reuters Business Insight 2003).
- A Western Power public procurement process aimed at ensuring as much of Western Australia's MRET requirement is met through locally produced renewable energy certificates as possible.

BOX 56   MANDATORY RENEWABLE ENERGY TARGET

The Mandatory Renewable Energy Target (MRET) was announced by the Prime Minister in his 'Safeguarding the Future' policy in 1997 and, after several years of development, launched nationally in 2001. The MRET is a market-based scheme designed to encourage investment in renewable energy generation capacity, contribute to development of an Australian renewable energy industry and to cut greenhouse gas emissions from electricity generation. MRET operates by placing a responsibility on wholesale electricity purchasers to source an additional 9500 GWh (total) of electricity annually from renewable sources by 2010.

The Western Australian Government has been active in supporting the national target and in attracting renewable energy investors to provide the renewable energy certificates necessary to satisfy Western Australia's liability from within the State.

The focus on sustainable energy practices and systems will continue and is likely to increase over time. As our capacity to predict the future improves and the need for action is reinforced we will need to respond to those new imperatives. Building in flexibility to account for a rapidly changing global environment and markets is vital. Moreover, the need for policies promoting sustainable energy to interact with the other sections of this strategy and other strategies produced by the Western Australian Government will be crucial.

BOX 57   BIOENERGY AND BIO-PRODUCTS – NEW INTEGRATED SUSTAINABLE INDUSTRY DEVELOPMENT

Throughout Western Australia there are established, new and emerging industries that are based on biological sources and which produce a range of products, including energy. These industries have the potential to be scaled to fit easily into local economies and ecosystems, to assist in the amelioration of environmental problems such as salinity and land degradation, and to produce energy with relatively low levels of associated greenhouse gas emissions. They signal a move towards adding value to the current resource-based economy and are also likely to provide significant local employment and hence contribute to local communities.

Projects are emerging based on oil mallees (see case study) and other tree crops, on aquaculture, on cultivation of native species, and a whole range of integrated associated industries based on recycling and re-use. Extraction and processing of local products (e.g. the sandalwood and emu oil-based products of Mt Romance in Albany) are also part of this growing local industry.

Another example of the potential for regional-based integrated sustainable industries is a proposal for the Great Southern District to use residues from timber plantations to produce electricity, some of which would be used for a desalination plant to provide water for vineyards and town supply. The plant would also produce bio-fertilizer from ash and fish waste for use on plantations and vineyards, and the co-production of veneer, activated carbon and other products. The siting can enable an inland port to be created around the complex with many future synergies by co-location. High technology geo-polymers and other materials can emerge from these new bio-industries.

The proposed project involves development of technology and a centre of excellence in bioenergy technologies and in water treatment, with forty people directly employed. During this decade the project will produce 60 MW of electricity from renewable sources. However, it has been estimated with the long-term potential for energy crops qualifying for Renewable Energy Certificates there could be many modular expansions of this electricity generation capacity in the South West. Western Australia's long-term economic future can begin to be seen in these emerging bio-industries.

In short...

Vision

Western Australia's transition to a sustainable energy future is globally responsible and locally innovative.

Objectives

- Reduced reliance on fossil fuels and increased reliance on renewable forms of energy in Western Australian energy systems.

- Adoption of best practice energy management in the Western Australian community, including government.

- Greater awareness of the environmental, economic and social benefits of energy efficiency and renewable energy by all Western Australians.

Actions underway

- A plant replacement program at Western Power aimed at replacing old, less efficient generators with high efficiency, combined cycle gas turbines, achieving energy production with a lower environmental footprint.

- Development of renewable energy projects, such as the Albany wind farm, the Denham hybrid wind/ diesel system, the Narrogin integrated wood processing plant and a new wind farm at Esperance.

- The establishment of the Sustainable Energy Development Office is assisting in creating opportunities for innovation in the ways we view and use energy.

- The Sustainable Energy Development Office is enabling government to lead by example with the Energy Smart Government program.

In short cont'd...

Actions

4.73   Develop a State renewable energy strategy and a bio-industry policy.

4.74   Further promote the use of existing house energy rating schemes as a means to meet and exceed the Building Code of Australia's mandatory energy efficiency requirements for new homes, additions and renovations.

4.75   Investigate the introduction of mandatory disclosure of house energy ratings, using existing house energy rating schemes, at the time of sale.

4.76   Ensure urban land developments maximise the potential of all lots, to allow for passive solar dwelling design and construction.

4.77   Encourage building design and management for energy efficiency in all government-owned and tenanted buildings.

4.78   Promote energy efficient office buildings through improved design, maintenance and management, within the commercial property industry.

4.79   Investigate use of eco-loans as part of the existing KeyStart program, initially for solar hot water systems to save energy through the design and construction of the home.

4.80   Demonstrate government leadership in sustainable energy through sustainability action plans.

4.81   Continue trialling innovations in transport fuels including gas, hydrogen fuel cells and biodiesel demonstrations and publish and promote the results.

4.82   Encourage the use of sustainable energy products, services and market-based strategies for demand management purposes.

4.83   Facilitate renewable energy generation, demand management and distributed generation in the electricity market by removing impediments and ensuring the new electricity market provides opportunities for effective participation.

4.84   In meeting the Mandatory Renewable Energy Target investigate the scope for mechanisms to ensure that Renewable Energy Certificates are sourced locally.

4.85   Continue to support the use of renewable energy in Remote Area Power Supply systems.

4.86   Seek to maximise energy efficiency in Western Australia by:

- providing information on energy efficiency options to households, businesses and government

- including energy efficiency in school curricula

- supporting mandatory national standards for energy efficiency in appliances and vehicles

- promoting the purchase of high energy star-rated appliances through consumer awareness campaigns and training of appliance retailers

- promoting the use of the Australian Building Greenhouse Rating scheme for benchmarking and improving the energy efficiency of office buildings

In short cont'd...

- utilising accredited Australian Building Greenhouse Rating in the assessment of new government office tenancies

- ensuring government procurement is based on lifecycle costing to properly account for the cost of energy

- using sustainability assessment to include lifecycle analyses on all such decisions.

4.87 Use the Sustainability Scorecard to demonstrate sustainable energy options in building before phasing it in to all development control.

Global opportunities in sustainable energy

The world has entered a phase of very rapid development of sustainable energy solutions.

Further information

Carlton, J 2002, *Wind Energy in Western Australia*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/windenergy/windenergy.htm

Combes, D 2002, *Gas as a Transition Fuel: Western Australia's Natural Alternative*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/gasastranstion/gasastransition.htm

Cool Communities program
http://www.coolcommunities.org

Electricity Reform Task Force
http://www.ertf.energy.wa.gov.au

Garrity, L 2002, *Hydrogen Fuel Cell Buses: The Future for Sustainable Transportation in Western Australia and Around the World*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Hydrogen.htm

Passey, R 2002, *Biodiesel: A Fuel for the Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/biodiesel/biodiesel.htm

Reuters Business Insight 2003, *The German Green Energy Outlook to 2002: Current Status and Future Prospects*, www.researchandmarkets.com/reports/29974

Stanton-Hicks, E 2002, *Oil Mallees: Native Flora with Myriad Benefits*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/OilMallee/OilMallee.htm

Sustainable Energy Development Office
http://www.sedo.energy.wa.gov.au

Western Power
http://www.westernpower.com.au

Solar water pump at Serpentine.

Source: Sustainable Energy Development Office

> CONSERVING CULTURAL HERITAGE AND LANDSCAPES AND CREATING 'SENSE OF PLACE'

Western Australians have long been considered a group of people with a strong sense of local identity, who feel proud of their State and who prefer to live here rather than any other part of Australia. It is a State with a beautiful coastline, clean and orderly cities and towns. The Western Australian Government recognises that 'sense of place' is important in the psyche of Western Australians. Maintaining and building on this sense of place will contribute to sustainability by fostering a spirit of pride and optimism that will encourage innovation and creative problem solving.

Cultural landscapes are … considered to be about people gaining and maintaining a 'sense of place' in their community, and people in a place feeling confident in that place. Our recognition of a site as being pleasant or important is a first step in planning how it can be preserved and managed for the enjoyment of people.

Coral Pepper, Discussion Paper - Sustainability of Cultural Heritage and Landscapes.
Background Paper for the State Sustainability Strategy.

Over the years, however, there has been an erosion of the very 'place' values that create identity and belonging, as the impacts of western-style development have manifested. The feelings of loss within the community have been mixed with feelings of powerlessness, reducing the capacity of individuals and the community as a whole to participate in, and contribute to solutions. This is a factor of vital concern in any discussion of sustainability.

This sense of belonging, of attachment to and ownership of particular places, is our 'sense of place.' The loss of a 'sense of place' within sectors of the community is of vital concern in this discussion of sustainability of cultural heritage and landscapes (see Box 58). It is also very important to other social justice issues as identity is a necessary part of empowerment. Its link to most environmental issues is obvious – people want to look after a place that means a lot to them personally.

Our cultural heritage is what we pass on to future generations and it is expressed in how we build and how we shape our landscapes. Beautiful and culturally significant buildings, townscapes and landscapes are preserved because we feel they are important expressions of who we are. The protection and enhancement and of cultural heritage and landscapes is a fundamental means of creating and maintaining a 'sense of place'.

Heritage conservation does not stand in isolation, but is inseparably linked with economic development, tourism, urban 'liveability', reduction of waste, and the social cohesion of communities. It is a major asset in promoting goals in these related areas, and it helps provide the 'glue' that holds them together.

The benefits of heritage conservation are often discussed in social terms: heritage contributes to an understanding of ourselves and the development of our society; and heritage enhances the continuity, familiarity and beauty of our surroundings. However heritage conservation can also have important economic benefits that are sometimes overlooked, including the following:

- attracts people and investment, as a result of its positive effect on urban amenity or liveability

- stimulates and supports tourism

- creates proportionately more jobs than new construction, and provides better local expenditure-retention in regional areas

- aids economic diversification, and

- promotes cost-efficient and energy-efficient building practices (e.g. less demolition waste).

Many factors can contribute to a sense of place. For example, a good knowledge of the geography of the area or region in which people live and of the State as a whole. People should feel free to move around and interact with others in the streetscapes and landscapes with which they are familiar. They converse freely with others about travels, and have some picture in their mind's eye of the places being described.

A sense of place can be generated by a familiarity with and fondness for particular streetscapes and landscapes across a range of scales, from the local precinct to a region to the whole of the State. Invariably the streetscapes are not dominant and overpowering–the buildings are on a human scale. And the landscapes do not feel threatening; they are vegetated with familiar plants and contain familiar animals.

Good relationships with other members of the local community including neighbours and near-neighbours and even local shopkeepers engender a sense of being part of a community, with all the potential for support that this creates, especially for young people as they grow up.

Much can be done to facilitate the sense of place through a range of infrastructure improvements to minimise car use and maximise walking and cycling in a local area. However the social infrastructure of a community is also critical through various community services and the local expressions of culture and the arts, especially Indigenous arts (see *Sustainability through culture and the arts*). The local planning system can be a powerful mechanism for facilitating sense of place. Heritage regulation in the past has been seen as an impediment to the economy just as environmental regulation once was. However, there are now many examples to demonstrate that once heritage values have been preserved in buildings (like the Fremantle Arts Centre), townscapes (like Fremantle or Subiaco or many other inner city areas) and landscapes (like the Swan Valley or the Hills), the economy and the community has benefited.

BOX 58   THE KOJONUP RECONCILIATION CENTRE: 'KODJA PLACE'

An outstanding example of how a local community has strengthened the 'sense of place' within that community is the town of Kojonup's Reconciliation Centre. This centre is named 'Kodja Place' after the stone axes that local Aboriginal people used in the past. The Centre has been planned and constructed as a combined reconciliation and community-based project where a combination of facilities is provided for all members of the community to access.

Resources in the museum and multi-media laboratory demonstrate the development of the town and the landscapes through to the present day. The laboratory has facilities for interested members of the community to scan family photos and to blend them with scenes of the evolving townscape and landscapes to create videos that best represent their own life stories in and around Kojonup. Many Aboriginal elders have had their stories recorded. The process of describing these stories will undoubtedly strengthen and enliven the sense of place.

Since its opening in April 2002, the multi-media laboratory has been used extensively by a broad cross-section of the community. Members of the community are working together so that capacity building is occurring within the community. Further, it seems that younger members of the community who formerly felt dispossessed are now finding their place. See photos on page 67.

There has been in recent times, something of a reaction to heritage because of concerns about individual property rights. At the same time, it is clear that residents of most of the older, established suburbs prefer the existing style and ambience of those suburbs and are not keen for these areas to be redeveloped with different architectural styles. A useful approach to dealing with these apparently conflicting issues is for residents of local precincts to develop guidelines for planning and development for their precinct that identify, protect and enhance the essential character of the precinct and identify opportunities for redevelopment rather than being heavily regulation oriented. This has been the characteristic approach of successful heritage areas where development is facilitated by the guidelines, and the heritage qualities become part of the full triple bottom line advantages to living or working in such places.

The integration of the social component of sustainability into economic and environmental considerations is never more obvious and necessary than in the careful consideration and protection of cultural values in the built heritage. Transparency and engagement are essential to the proper development and acceptance of 'sense of place'.

Finally, it is important in discussing heritage and sense of place to emphasise the importance of city centres and other urban centres such as Fremantle, Bunbury and Geraldton, as an expression of who we are. They are the soul of the city as they represent in the style of their architecture, their public spaces and their level of human interest and creativity, what the underlying values and priorities of the community are. They are in simple terms the physical expression of our economic health, our environmental sensitivity and our cultural and community values. They are sustainability profiles or indicators.

The city centres of Perth and Fremantle, other sub-centres in Perth, and regional town centres need a vision of how they can become more sustainable, more interesting and attractive places to visit as well as to live and work in. They need to have cultural and architectural features that represent the community and its aspirations. They need community art and they need high culture as both are part of who we are.

Greater Perth has incorporated a discussion paper titled 'Can Perth Be More Creative'. This draws heavily on a working paper by British author and consultant Charles Landry.[39]

In a recent study of Australian cities[40], Perth was rated third in terms of creativity. Perth is a city with a lifestyle amongst the best in the world, a fact recognised by the *Economist* which ranked Perth as the third easiest city in the world in which to live.[41] International recruitment firms also rate Perth highly – 10th equal in environmental terms (no Australian city ranked above Perth) in 2002 and 18th equal overall out of 215 cities surveyed.[42]

As the world's urban hierarchy is reshaping the global economy, cities making the most of their creative potential are succeeding. This demands rethinking competitive resources such as language, time zone, image, lifestyle and cultural depth. Creativity is an important planning initiative that facilitates the expression of community values in the city and other centres. The key question is how can Greater Perth complement its existing attributes—Australia's western gateway, a minerals and resource service centre, tourism, cultural diversity and harmony, and quality infrastructure – by creatively planning an urban environment that offers the city as experience, tells a story and creates a sense of place that is unique. The key is to nurture, mobilise and measure Greater Perth's ideas, talents and creative organisations, provide solutions not obstacles and create a (as Charles Landry says) 'yes' attitude to ideas and opportunities. A Creative City Policy will be developed as part of Greater Perth to facilitate this environment.

Jump Rock Lake Kununurra: an altered landscape now an important part of the East Kimberley 'sense of place'.

Source: Brian Prince

[39] C Landry, Can Perth Be More Creative?, Future Perth Working Paper No.12.

[40] See Box 73 in *Sustainability through Culuture and the Arts*.

[41] *Economist*, 12 October 2002, pg. 102

[42] See William M Mercer survey at www.wmmercer.com

In short...

Vision

Western Australia's built heritage and special qualities of place are valued and enhanced in all development.

Objective

Create a quality built environment in Western Australia through the conservation of cultural heritage, the development of quality urban design creating a 'sense of place' in new and revitalised areas, and the active development of quality public spaces.

Actions underway

- Accelerated compilation of the State Heritage Register.

- Protection of heritage places by local governments through municipal inventories and town planning schemes

- Area-based conservation such as that achieved in the West End in Fremantle.

- Active involvement of State and local governments in public spaces and community art in city centres.

- Community-based programs such as the development of a multi-media laboratory by members of the Kojonup community.

- Preparation of a Creative City Policy as part of Greater Perth.

Actions

4.88 Prepare a heritage tourism strategy for Western Australia, including more use of Aboriginal names to create 'sense of place' and tourism interest.

4.89 Improve knowledge of the condition of the State's heritage by periodic survey work coordinated by the Heritage Council and local governments and promote a wider appreciation of the value of cultural heritage, including knowledge of the economic benefits of heritage conservation.

4.90 Investigate non-regulatory mechanisms for promoting conservation outcomes through greater planning flexibility, financial incentives, and possibly a voluntary offsets program for the built environment.

4.91 Improve legislative protection of the State's built heritage through reviewing the Heritage Act.

4.92 Improve the standards of local government heritage protection and quality urban design with reference to best practice, including best practice in guidance of infill and redevelopment in heritage areas.

4.93 Support opportunities for Indigenous people to promote cultural awareness within their own communities.

4.94 Develop a Built Environment Policy during the Year of the Built Environment that focuses attention on Western Australia's architectural features and promotes quality architecture that enhances our 'sense of place'.

In short cont'd...

4.95 Ensure that heritage conservation and quality urban design for new areas are important considerations in major planning policies or reviews.

4.96 Complete the Creative City Policy as part of the Greater Perth project to promote Perth's creative potential and facilitate expression of community values in the region.

Global opportunities

Although needed most at local level, the principles and practices of cultural heritage can be applied everywhere.

Further information

Pepper, C 2002, *Sustainability of Cultural Heritage and Landscapes*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Rebbettes, D 2002, *Fremantle: Thriving Economically through an Urban Heritage Focus*, sustainability case study, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Fremantle%20Heritage/fremantleheritage.htm

Walker, S 2003, *Storytelling and community visioning: Tools for sustainability*, background paper, State Sustainability Strategy CD-Rom, Department of the Premier and Cabinet, Perth.

Fremantle's heritage and sense of place have become vital to its economy.

Source: Peter Newman

> BUILDING SUSTAINABLY

Building sustainably would result in buildings that are simultaneously less resource-intensive and provide a better environment in which to live and work. The Western Australian Government has a number of initiatives that share this goal including the Greenhouse Strategy, Housing Strategy WA and the Building WA Strategy

The pursuit of sustainable development brings the built environment and the construction industry into sharp relief. This sector of society is of such vital innate importance that most other industrial activities in the world simply fade in comparison.

Confederation of International Contractors' Associations[43]

In every country, the construction industry is both a major contributor to socio-economic development and a major user of energy and natural resources; therefore its involvement is essential to achieve sustainable development in our society.

United Nations Environment Programme[44]

The benefits of designing sustainable homes and buildings are well understood. However, sustainable building also requires a sympathetic planning system and an enthusiastic market. Dispelling any myths or scepticism that industry or the public may have would require the efforts of government in partnership with key stakeholders to achieve a smooth and comprehensive transition.

Planning for building development, especially residential planning, requires rethinking the existing approvals process to explicitly support sustainable building guidelines in terms of placement, access, shape, orientation, and the renovation and re-use of existing building stock. This would give building designers a huge boost in delivering a passive solar, energy efficient, accessible and more liveable environment (see Boxes 59 and 60). Arguably appropriate improvements in the approvals process that support passive solar design could deliver a built product with no or minimal capital cost increases.

Building materials should be manufactured, supplied and recycled within the framework of sustainability. This will require increasing effort to develop guidelines for manufacturers and for the building and construction industry. A key issue for government in creating a comprehensive sustainable building materials catalogue would be in enlisting and supporting private industries to develop their own environmental management systems. This could be achieved in partnership with industry peak bodies such as the Royal Australian Institute of Architects, the Institution of Engineers Australia, Housing Industry Association and the Master Builders Association.

Construction of sustainable homes and buildings requires an understanding of the impacts of construction methods and resource use by the builder and contractor. Specific training and short courses for builders on site and construction impacts, environmental management (including waste minimisation and recycling) could be provided through TAFE colleges and industry-based training programs.

Universal design, a cornerstone in any discussion on sustainable housing and building, requires that structures are designed and built to be accessible to all members of the community, which ultimately reduces costs for refitting and modifications as our population ages.

[43]Confederation of International Contractors' Associations, *Industry as a Partner for Sustainable Development: Construction*, Confederation of International Contractors' Associations and United Nations Environment Programme, United Kingdom, 2002, p. 7.

[44]United Nations Environment Program, *Energy and Cities: Sustainable Building and Construction*, International Environmental Technology Centre, Japan, 2000, viewed 15 August 2002, http://www.unep.or.jp/ietc/Focus/Sustainable_bldg1.asp

Education for the public on all aspects of sustainability is essential to successful implementation. For example, the home is an excellent vehicle to demonstrate the benefits of sustainable living and change attitudes and behaviour. The development of a comprehensive 'sustainable home living package' that addresses the key elements of sustainability that homeowners can adopt would be beneficial. This sustainable home living package should build on and support the Cool Communities initiative.

BOX 59 PLANNING FOR INCLUSIVE COMMUNITIES.

People with disabilities consistently report that, because of inappropriate planning, they are unable to enter public buildings and facilities to use the services available within these buildings.

Currently 19.5% of the population, or approximately one in five people in Western Australia, have a disability. While people may have a disability at any age, the likelihood of having a disability increases significantly as people get older. As our community ages it is predicted that the number of people with disabilities will significantly increase.

These changing demographics and increased community awareness have led to the introduction of legislation by both the Commonwealth and State governments that recognises that people with disabilities have the same rights as other citizens, including access to premises.

It is being increasingly recognised that good access also benefits business and the overall economy as well as people with disabilities, their families, friends and carers. It is an important factor in the achievement of sustainable communities. Indeed inclusion of people with disabilities has become a 'touchstone' indicator of whether the 'human' component of sustainability has been included in development.

In response to a need for technical information identified by the design and construction industries, the Disability Services Commission formed a reference group that produced the resource manual 'Buildings-A Guide to Access Requirements.'

An accompanying pamphlet was also produced for local governments to distribute when a planning or building permit is requested. The manual, which is freely available from the Commission's website <www.dsc.wa.gov.au> was purchased by the Building Designers' Association for each of its members.

BOX 60 ATWELL SOUTH SCHOOL - A SUSTAINABLE DESIGN FOR A SUSTAINABLE SUBURB

The Department of Education has commissioned a 'sustainable' school to be built at South Atwell, 35 km south of Perth in the City of Cockburn. South Atwell is a new subdivision that is being developed along the sustainable construction principles of 'Liveable Neighbourhoods' with solar orientation and 'GreenSmart' buildings. It will be adjacent to the new southern railway.

The South Atwell Primary School will be the first government school in Western Australia that aims to develop and apply some of the key principles of sustainable building and construction. This project will push the benchmark for future developments and will provide a valuable test case study for environmental technologies and the involvement of sustainability in the curriculum through the school building and school grounds.

The key sustainability components that this school aims to incorporate include:

- Energy efficiency and some use of renewable energy.
- Transport efficiency; development of clean transport options.
- Water efficiency and reduced offsite wastewater treatment.
- Landscaping with native species to moderate the micro-climate and for low water use.
- Materials sourced from local, recycled, and low-impact sources.
- Construction waste management and low site impact.
- Waste management and composting.
- Low-allergen, low-emission materials and ventilation systems.

The South Atwell Primary School provides a great opportunity to develop sustainable institutional facilities and public spaces. Being such a highly visible site its success will do much to promote and enhance what the future of building and construction could be. It is due for completion in early 2004.

BOX 61   YEAR OF THE BUILT ENVIRONMENT

The State Government has proclaimed 2004 to be the Year of the Built Environment. The Commonwealth Government has supported the concept and has allocated funding for its involvement in 2004.

The aim of the Year of the Built Environment is to encourage Australians to celebrate and understand how the built environment makes a difference to their quality of life and foster a sense of community and purpose by setting directions for a positive and sustainable future.

BOX 62   GOVERNMENT OFFICE ACCOMMODATION

The Australian Building Greenhouse Rating (ABGR) is a world-first initiative for rating the greenhouse and energy performance of commercial office buildings. The ABGR aims to encourage building owners and tenants to reduce energy use and costs, and greenhouse gas emissions.

The Department of Housing and Works, which has responsibility for the State Government's office accommodation requirements, is supporting this initiative by introducing ABGR requirements for all government-leased and owned accommodation.

In short...

Vision

Innovations in sustainable building and construction rapidly become mainstream.

Objective

- Encourage the widespread adoption of sustainable building and construction.

Actions underway

- The Housing Industry Association provides the Greensmart Accreditation Program.

- The Housing Industry Association of Australia's GreenSmart Program for sustainable building and construction is being used in projects such as Atwell South, Wellard, Brighton, Ellenbrook.

- The Department of Education and Training's new primary school at Atwell South will be a model eco-school built to sustainability principles.

- Landcorp has established a Sustainability Officer position to coordinate input to development projects.

- The Liveable Neighbourhoods code.

- An amendment of the Building Code of Australia requiring the implementation of energy efficiency into the design of new homes and major renovations was introduced in Western Australia on 1 July 2003.

- Industry groups are developing rating tools and guides to promote sustainability in the commercial property sector.

- The Disability Services Commission is working in partnership with a number of State government departments, Commonwealth Government departments and other State agencies developing 'Welcome: Design Ideas for Accessible Homes', which identifies a range of strategies to build accessible housing according to universal design principles.

- The Disability Services Commission is working in partnership with the City of Subiaco in the development of their sustainable house to be ready at the end of 2003.

In short cont'd...

- The Disability Services Commission is involved in a seminar with architects later in 2003 to discuss heritage issues and access for people with disabilities.

Actions

4.97   Demonstrate the use of sustainability benchmarks, including the Sustainability Scorecard for government building projects to show leadership to the building industry and facilitate the introduction of sustainability to development control.

4.98   Promote the application of mandatory minimum building standards that support sustainability in the Building Code of Australia.

4.99   Appoint a government architect to encourage good design and construction, particularly in government buildings, and assist in the implementation of sustainability initiatives in the building industry.

4.100   Identify, develop and promote best practice sustainability standards and incorporate these standards into all government housing and buildings through sustainability benchmarks as they relate to sustainable buildings.

4.101   Support best practice standards through government procurement policies.

4.102   Compile a sustainable land development and built form toolkit, which includes guidelines and checklists, in close consultation and cooperation with relevant government agencies and authorities. Ensure best practice standards are incorporated into the guide.

4.103   Progressively incorporate the principles of sustainable planning, building and construction into:

- relevant State government documents such as a Statement of Planning Policy, Residential Design Codes and local town planning schemes through the Sustainability Scorecard, and

- relevant documents such as the Building Codes of Australia and other statutory documents.

4.104   Develop regulatory frameworks and associated incentives for sustainable building and construction including conservation, adaptive re-use and renovation.

4.105   Progressively introduce environmental rating of buildings, and promote the disclosure of this rating at the time of sale or lease of the building.

4.106   Develop a close partnership between government and industry for the support of research and development to facilitate sustainable homes and buildings.

4.107   Develop policies and guidelines for the minimisation of construction and demolition waste, including conservation, adaptive re-use and renovation.

4.108   Demonstrate the business benefits of sustainable housing through research and pilot programs to help transform the house construction market to one receptive to sustainable development.

4.109   Develop a sustainable home living package as a way to educate homeowners on the benefits of sustainability in their homes.

In short cont'd...

5

Global opportunities

The building industry globally is looking for innovation in sustainability. The United Nations Environment Program through the Environmental Technology Centre at Murdoch University has established a Co-operation Centre that is primarily aimed at bringing sustainability innovations in building and construction to the Asia-Pacific Region. This is typical of the opportunities for Western Australian firms to be involved in this rapidly growing market.

Further information

Beyer, D 2002, 'Sustainable building and construction implementing green building in Western Australia', a joint Honours thesis and input to the SSS written and developed intentionally as academic and applied research.
http://www.sustainability.dpc.wa.gov.au/docs/SustainabilityInformation.htm

Beyer, D 2002, *Sustainable Building and Construction: Initiatives and Regulatory Options towards a Sustainable Planning, Building, Design and Construction Sector in Western Australia*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Beyer, D 2002, *Pinakarri Community: An Intentional Co-Housing Cooperative*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002,
http://www.sustainability.dpc.wa.gov.au/CaseStudies/pinakarri/PinakarriCommunity.htm

Bourne, M 2002, *Piney Lakes Environmental Education Centre: an Innovative Project with Multiple Benefits*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002,
http://www.sustainability.dpc.wa.gov.au/CaseStudies/PineyLakes/pineylakes.htm

Cool Communities
http://www.greenhouse.gov.au/coolcommunities

Hart, R 2002, *Housing of the Future: Ellenbrook Solar Housing*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002,
http://www.sustainability.dpc.wa.gov.au/CaseStudies/Ellenbrook/ellenbrookhousing.htm

Sustainability and community

Vision for Western Australia

Western Australian communities in cities and in regions have a strong sense of place, are inclusive of all citizens and have supportive networks receptive to local needs, and through this can respond uniquely to the sustainability agenda.

Goal

Support communities to fully participate in achieving a sustainable future.

Priority areas for action

[Social sustainability] … seems frequently to fall off the sustainability agenda or to take second place to environmental and economic concerns, despite the fact that it is so critical to the lives of individuals and communities and to the overall health of our society.

L Barron and E Gauntlett[45]

The traditional politics of Left and Right cannot help us in understanding this new world. The flow of trust and reciprocity in the community cannot be adjusted by pulling levers in government or adjusting economic management devices. It cannot be legislated for. Trust and reciprocity are generated primarily in civil society, in the relationships and institutions of civil life—families, friendship groups, neighbourhoods, churches, clubs, and voluntary associations. From there they shape the effectiveness of other institutions such as the market and government.

Vern Hughes, Social Entreprenours Network, on Perspective ABC Radio National, 6 August 2003.

A sustainable community would be secure, healthy and equitable, with a clear sense of place.

Environmental Protection Authority (2002). Towards Sustainability. Preliminary Position Statement No. 6. Environmental Protection Authority, Perth.

…the creative engine of social, cultural and economic improvement lies primarily with individuals and the voluntary associations they form and interests they pursue – in businesses, academia, the arts, community services and activities, interest groups, etc.

CCI response to the WA Draft State Sustainability Strategy

A strong case has been made in this Strategy to better integrate the social dimension of development and human activity into sustainability. The most fundamental concept behind social development is the importance of community.

This section gathers together core issues that focus on the social and that enhance our sense of community.

The rationale as to why community is so important to sustainability and to all of our lives is set out in Figure 11 below showing the roles and functions of government, the market and community.

Figure 11 The interconnection of community, government and the market
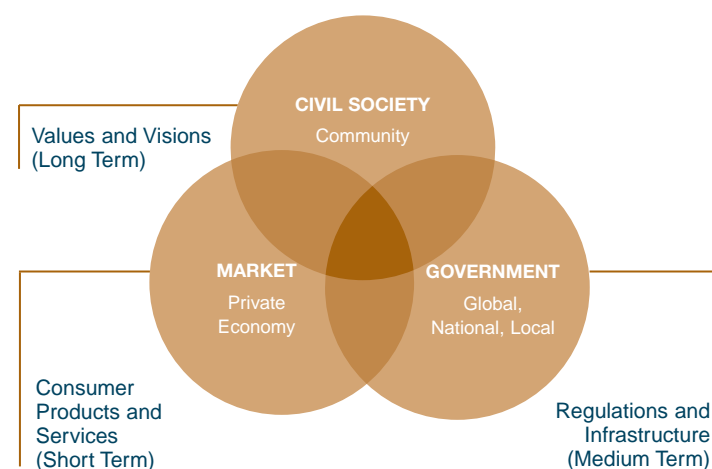
The primary function of government is to provide regulation and infrastructure; the market's function is to provide goods and services–but neither of these is about the direction and purpose of development. The community is the major provider of the values and visions for the future. It can then express these through the market and through government (see quote at start). When all three overlap and become one functioning society, then there is harmony and the opportunities for sustainability are increased. This section will consider the values and visions set by the community and will emphasise the importance of finding partnerships that enable a true interconnection between government, market and civil society. At times of transition it is necessary to find leadership in the community, in the market and in government. All three have been expressed in the process of developing this Strategy.

The section will focus on what sustainability could mean for health, housing, education, the arts and multiculturalism. There are a range of government agencies with responsibility for community related services. The primary interest and focus of most of these agencies is the social dimension of sustainability. Their submissions and those of the community with interests in this area, concentrated on how 'the social' can be linked to economic and environmental processes.

The general sustainability implementation model established in *Sustainable natural resource management* and *Sustainability and settlements* also appears to be relevant to the community with some important provisos. These relate to the necessity to be fine-grained, local community oriented and bottom-up. The Sustainability Roundtable can consider how local government and regional councils can assist with issues, such as addressing the issues in this Strategy, related to Indigenous people, health, education, justice, disability services, community welfare, housing and the arts. In each region there will be special needs and the issues will overlap. It is proposed that a mechanism to implement social sustainability be developed based on the need for a greater degree of integration and co-location of services.

Social and community issues are considered throughout this Strategy. In this part, however, particular attention is focussed on the provision of socially sustainable housing, how to develop and sustain healthy communities, the importance of formal and non-formal education in raising community awareness of sustainability, and cultural aspects of sustainability.

The arts and culture can play a critical role in raising community awareness and interest in sustainability at a deeper level. Culture and the arts provide the community with the creative edge needed to face the new and potentially difficult problems of sustainability, to find the ethics which underlie every element and every issue in sustainability. Multiculturalism provides the opportunity for different answers to be found and to build a whole of community approach to sustainability.

These issues are important in themselves and together form the basis of how the community can be motivated for sustainability reform.

[45]L Barron and E Gauntlett, *Housing and Sustainable Communities Indicators Project - Consultation Paper*, Western Australian Council of Social Services, Perth, 2002.

> COMMUNITY SERVICES AND DEVELOPMENT

Community is critical to how we live and how we feel about the future. Strong communities are more sustainable in themselves and are able to contribute to sustainability in general.

Social interactions affect what happens in the economic and environmental spheres. Promoting social sustainability therefore promotes sustainability overall and vice versa.

Western Australian Council of Social Services

The synergies between community building and other aspects of sustainability are developed through a series of social policy areas that are presented to show how they are directly and indirectly, dimensions of sustainability. The social policy areas: integration of community services; sport and recreation; social justice as it applies to disabilities, multiculturalism and gender; and the role of community aspirations.

Community services integration as a dimension of sustainability

Government agencies involved in the delivery of community services include the Departments of Housing, Police, Health, Education and Training, Disability Services, Community Development, Justice, Indigenous Affairs, Local Government and Regional Development, Planning and Infrastructure and Sport and Recreation. This Strategy is premised on the assumption that their services can be better coordinated to meet community needs and assist with the development of our 'social capital.'

'Social capital' is an important concept for the State Sustainability Strategy. It is about the extended networks that link us together in our communities. It measures the sense that people are involved in the immediate society within which they live and work and in which they are, or can be, empowered to be involved. Participation and the ability to access information are two vital attributes in this regard.[46]

Sustainability can be understood in terms of the relationship between financial capital, natural capital (the biodiversity and ecological integrity of an area) and social capital. Each has intrinsic worth and influences the other. Not only is social capital important in determining how people value and enjoy their community, but it also contributes to an informed and participative community (which is best placed to enhance financial and natural capital). Understanding how to improve social, natural and financial capital in an integrated way is one of the central challenges of this Strategy.

Sustainability through social capital improvement can be conceived through a number of community-centred ideas[47] including sustainable communities, community strength, resilient communities, community development, healthy communities and community capacity (see Boxes 63, 64 and 65).[48] All depend on the integrated provision of community services.

The government is committed to integrating community services based on:

- communities' strengths
- equality of citizens, and
- partnerships with community organisations, private sector and non government sector organisations.

A focus on sustainable community should also encourage resilience and capacity at critical life stages. This can mean the development of skills and resilience in the early years, the integration and acceptance of young people, support for families in their important social role, and facilitation of the continuing involvement of seniors in the Western Australian community. It can also include an ongoing commitment to the support of volunteers, and the foundation of community-based organisations.

[46]For a comprehensive overview to these issues, see the Western Australian Council for Social Services' submission to the State Sustainability Strategy, April 2002 and the background paper by Kerry Stoll *Youth and Sustainability: Social Capital, Social Entrepreneurship and Youth Civic Engagement*.

[47]Community can refer to both geographical communities and communities of common interest. Moreover people can be simultaneously involved in a number of different communities and move between them over a short period of time. To actively enhance communities also requires an understanding of what people perceive as their community.

[48]Barron, L and Gauntlett, E. *Housing and Sustainable Communities Indicator Project - Consultation Paper*, WACOSS, December 2001.

BOX 63   THE KALGOORLIE PROJECT

Capacity building and community partnerships are key ingredients of this project, which was established to address youth crime in Kalgoorlie-Boulder. The project has set out to achieve a strong local commitment to reduce youth crime and boost pro-social development through a strong collaborative approach. Starting out by identifying factors that influence a child to engage in crime, the process includes community consultation, engagement and ownership of the issues.

Lotterywest was the initial funding supporter of this project through its 'Connected Communities' Grants. Key to Lotterywest's support was that the young people, identified as involved in crime and 'anti-social' behaviour, were also heavily engaged in the development of the project proposal. The engagement of young people is a feature of this project, in addition to cross-agency collaboration and partnerships.

All members of the community with an interest in youth have been mobilised to help establish a shared vision and shared priorities for action. The process undertaken has focused on long-term solutions and the implementation of sustainable strategies.

While it is at the local government level that local communities and government most directly interact, at the State level responsibility for engaging Western Australians with the development and strengthening of their communities rests with the Department for Community Development. The range of services, programs and initiatives undertaken by the Department are numerous.

BOX 64   COMMUNITY DEVELOPMENT IN THE PEEL REGION

The Peel Development Commission in its report entitled 'Peeling Away the Mask' identified a range of challenges facing this rapidly growing region. Its report clearly showed how difficult it is to build sustainable communities when the balance is not maintained between economic, environmental and social bottom line outcomes.

In the case of the Peel region, low economic growth had led to a number of undesirable social outcomes including low retention rates at high school, high youth unemployment rates and a large commuting workforce to Perth, all of which have had a significant impact on the community and its ability to build a sustainable future.

Key stakeholders from both the community and government are now working to address these emerging issues, effectively diverting resources and evolving a more sustainable model for the community. Principles pertaining to community development, capacity building and community regeneration have all been employed. As in work also carried out by the City of Gosnells, one of the many tangible outcomes to date has been the crime prevention benefits, a result of community development and capacity building within the Peel community.

Overall, the aims of these programs and services are threefold:

- to strengthen communities so that individuals and families are able to meet their own needs, achieve self-reliance and contribute to their own solutions
- to promote a just and equitable community enriched by diversity and increased social participation, and
- to support families and communities to provide for the care and safety of their members.

Sport and recreation as a dimension of sustainability in communities

Sport and recreation are significant tools in Australian suburbs and regions for building healthy and functioning communities and contributing to an integration of environmental protection, social development and economic prosperity.

Sport and recreation contribute to sustainability simultaneously through improving health, community, the economy and the environment in an integrated way.

Health

Enabling people to be physically active, especially through walking, is the basis of biological and mental health. The epidemic of obesity and disease related to inactivity are part of the modern western lifestyle with its car dependence and labour-saving devices such as remote controls for TV. Physical activity enables the heart and lungs to work to capacity and to enable bones and muscles to work as they were designed. Such activity has been proven to have anti-anxiety and mood-enhancing effects. It is associated with creativity enhancement and self-esteem. The State Government's Physical Activity Taskforce is a cross-government approach to facilitating a more healthy, active society in Western Australia (see Case Study). Health from physical activity is fundamental to each of the other factors below.

Community

Community building is a combination of enabling individuals to be better human beings and providing links and networks that are meaningful and creative for community.

Physical activity, especially in groups and teams, builds up life skills through character development and greater self-esteem. Adolescents who exercise regularly have higher self-esteem and physical activity improves the self-esteem of disadvantaged individuals and groups. Membership of sporting and other groups helps develop leadership and team skills.

Sport and recreation connect people. Individuals and groups come together from a wide variety of backgrounds, creating life-long friendships and networks and breaking down barriers of prejudice. Sport and recreation provide opportunities for young people to meet and become role models and to develop community skills. Sporting programs are also associated with reduced crime and delinquency.

Sporting and recreation clubs help develop community pride and belonging that is critical to the development of sense of place, for example when a country town or an urban area loses an important sporting team there is a significant loss of community morale. When they are doing well, the community is boosted in many ways.

About twenty per cent of Western Australians volunteer to assist in sport and recreation associations, providing a major institutional structure that maintains community life. Poorly designed suburbs and towns where walking is difficult and that do not provide interesting public spaces are not able to facilitate the associational activity that is the basis of community (see *Sustainable urban design*). Poor services for sport and recreation similarly will have a negative impact on community life.

BOX 65   LOTTERYWEST

Lotterywest's direct grant opportunities are a key source of support for bottom-up community development initiatives and initiatives linking community development and sustainability.

Lotterywest is the State-owned lottery in Western Australia. It is unique as the only Australian lottery to have a direct funding role in the community, with support provided to hospitals, sports and the arts through annual allocations to State Treasury and direct grants to thousands of community organisations and local government authorities for charitable and benevolent purposes.

In 2002-03 Lotterywest's sales turnover translated into a total of $134.772 million in funding; including $51.36 million in more than 1,500 direct grants to 1,139 community organisations or local government authorities.

Grants contributed significantly to the breadth of Western Australian community life and are reflected by the five key areas for Lotterywest grants that have evolved in response to community priorities:

- Enhancing community development initiatives
- Strengthening community service delivery
- Advancing participation in community life
- Valuing our State's heritage and
- Extending not-for-profit capacity.

Economy

Robert Putnam studied why particular regions of Italy were more wealthy than others. He was surprised to find that the most powerful association was with the number of soccer clubs and choral societies. His analysis provided the basis for understanding how social capital is fundamental to how an economy works. Markets are available to develop everywhere but to bring together the required components of finance, government approval and community support requires the social infrastructure of networks and trust.

Sport and recreation are critical to building social capital, to creating the networks and trust between business, government and community which are totally intermixed and integrated when people join sporting groups and voluntary community associations.

As well as helping provide the glue of economic activity, sport and recreation provide the health that enables people to be economically active. Ill health is also a major drain on the economy.

Sport and recreation are also major direct contributors to the economy, with almost $13 billion in 1994-95 in turnover (1.2% of GDP) and with some $432 million in exports associated with sport and recreation.

BOX 66   NO POOL, NO SCHOOL

A program of installing public swimming pools in remote Aboriginal communities has had multiple benefits. The communities had endemic eye and ear health problems which were the primary target of the program as the 'sandy blight' can be significantly stemmed by regular washing. This was quickly observed after regular swimming began to occur, however the linking of children's pool swimming with school attendance has meant a significant reduction in truancy and improvement in skills within the community. Evaluations have found that the "No Pool, No School" program has demonstrated benefits to health, education, local employment and community morale. See photo on page 232.

Environment

As outlined in this Strategy, 'sense of place' is the basis of why people become involved in environmentally-oriented activity and why they give priority to environmental issues in political life. The development of 'sense of place' is closely linked to community associations through sporting and recreational activity.

The building of local community has direct environmental benefit with groups such as Landcare, bush regeneration and wildflower groups (eg Malleefowl Group – see Box 31), volunteers with CALM (see Box 30) and all the other parts of the voluntary conservation movement. It has indirect environmental benefit due to the reduced travel associated with local community activity.

Reducing car dependence through urban design, better infrastructure for public transport, walking and cycling is a part of the process of building local community but will only work if there is a parallel and integrated facilitation of community associations through the provision of services for sport and recreation as well as other community services outlined in this section.

The State Government has released a new report Strategic Directions for Western Australian Sport and Recreation. This is the third such strategic plan. 'SD3' has a new emphasis on sustainability as a major goal and role for sport and recreation in Western Australia.

Building equity and diversity as a dimension of sustainability in communities

Sustainability requires us to develop and use the talents of all the people in our communities. An approach that focuses on the talents and skills of individuals and avoids discriminatory practices such as exclusion, elitism, polarisation and cliques is essential to successful and vibrant communities[49]. In this regard the Western Australian Council of Social Services argue for the importance of establishing processes that, among other things:

[49]A Carr, Grass Roots and Green Tape, Federation Press, Sydney 2002, p. 18

- support a diverse range of people to participate in all decisions and processes
- build capacity at the local level
- are based on collaboration and partnerships
- support local solutions and initiatives and
- incorporate formal and informal interactions.[50]

The basis of this non-discriminatory approach which builds on our diversity is the fundamental value of human rights. This is expressed in the second sustainability principle (in *Framework*) called Equity and Human Rights:

'Sustainability recognises that an environment needs to be created where all people can express their full potential and lead productive lives and that significant gaps in sufficiency and opportunity endanger the earth.'

Some of the mechanisms for understanding how embracing diversity contributes to sustainability are described below.

Providing for people with disabilities creates better cities

The Australian Bureau of Statistics survey of Disability, Ageing and Carers 1998, identifies 19.5%, or one in five people in Western Australia as having a disability. The rate of increase of people with disabilities is higher than the general population increase. Since people with disabilities were ascribed rights in law the Federal, State and local governments have been implementing processes to make buildings, footpaths and transport systems more 'accessible'. Facilities and services suitable for people in wheelchairs and with other walking disabilities, and for people with hearing and sight difficulties, also make the physical environment more accessible for others (see Box 67).

[50]Western Australian Council for Social Services' submission to the State Sustainability Strategy p.16.

BOX 67   PROVIDING FOR PEOPLE WITH DISABILITIES CREATES BETTER CITIES

Under the *Disability Discrimination Act 1992*, *Equal Opportunity Act 1996*, and the *Disability Services Act 1993*, people with disabilities have rights and responsibilities which require their full inclusion as members of the community.

A sustainability-oriented community is one that provides for full inclusion of people of all ages and abilities. People with disabilities, their families, friends and carers form a significant and increasing part of the community, however they do not have the same opportunities as other citizens to access fundamental aspects of daily life including education, employment, transport, recreation and leisure, and justice.

The Australian Bureau of Statistics survey of Disability Ageing and Carers 1998 showed that 93% of people with a disability live in the community. People may have a disability at any age, however the likelihood increases as people get older. For example, almost 5% of the population under 5 years has a disability compared to almost 50% of Western Australians over 60 years. On the basis of ABS disability data and mid level population projections, the Disability Services Commission estimates that the total number of disabled people will increase by 48% by the year 2021.

The creation of an inclusive community is vital for people with disabilities, their families, friends and carers, and strongly supports the achievement of sustainability. The Disability Services Commission is working in partnerships across government and the private sector to create this inclusive community.

The primary focus of initiatives is to encourage local communities to support people with disabilities, their families, friends and carers. The provision of accessible information, services and facilities is fundamental to the achievement of this aim.

The State Government's commitment to people with disabilities is strongly reflected in the *Disabilities Services Act 1993* which requires all State government agencies and local government authorities to develop disability service plans to ensure that their services are accessible to people with disabilities.

These plans address issues relating to:
- existing services being adapted to meet the needs of people with disabilities
- access to buildings and facilities being improved
- information about services being provided in formats which meet the communication requirements of people with disabilities
- advice and services being delivered by staff who are aware of and understand the needs of people with disabilities, and
- opportunities being provided for people with disabilities to participate in public consultation, grievance mechanisms and decision-making processes.

Once provided, the advantages for everyone become obvious as cities become simpler and friendlier for everyone. Apart from those with disabilities, children and older people gain most from these facilities and services. As the population ages the need becomes more and more obvious but in reality it means everyone has better facilities for walking and public transport. The city is given infrastructure that contributes to multiple areas of sustainability and allows all people to participate in its activities.

Multiculturalism creates opportunities and innovation

Anti-discrimination when it applies to other cultures can lead to opportunities and innovation in unexpected ways, e.g. the indirect economic boost found after immigration. This is pursued under *Sustainability through multi-culturalism* to show the advantages of culturally different approaches for sustainability.

The intersection of gender and sustainability

Sustainability requires the full participation of all members of our society. This includes the need to recognise and increase the involvement of women in the sustainability agenda. This outcome can be supported through mainstreaming consideration of gender differences in the development of policies or initiatives in support of sustainability. Gender influences the way in which services are delivered, how providers view consumers and ultimately the effectiveness and degree to which services respond to consumers, needs. For policy to be effective it is essential to recognise gender inequalities and plan to address the issues that arise from these.

Many countries around the world have embraced gender and other equity issues as central to achieving sustainability:

'Governments have expressed their commitment to creating a new development paradigm that integrates environmental sustainability with gender equality and justice within and between generations.'

(United Nations, 1995, Beijing Declaration and Platform for Action, Para 249).

For example, women must be recognised as key consumers and important decision-makers in families and communities. Programs aimed at behavioural change need to recognise the role of women in decision-making. Or for example, when responding to a health issue, consideration should be given to who you are working with and who is not represented. Understanding the demographics of an area and being aware of the people or groups who are not currently using the service is essential to good and inclusive practice. Having identified who the service should be reaching, it is important to understand the gender issues; women are 51% of the population and belong to varied cultural, racial, ethnic and other marginalised groups. Not all women and men are the same; gender issues differ according to age, culture and experience.

The Office of Women's Policy is developing a gender assessment tool in order to support improved policy development processes in government.

Community aspirations (storytelling and visioning) as a dimension of sustainability

In the section *Sustainability in the regions*, an approach was outlined to regional sustainability strategies that suggested the 'missing link' was developing ways to highlight 'community aspirations' and link these to environmental, social and economic plans and programs.

A background paper outlining how this can be done has been provided by Susan Waller (on the CD-ROM and sustainability web site). Storytelling is seen to be a powerful tool for sharing and understanding the many and diverse stories, or place narratives, of regional communities, including the Indigenous and European stories. When these stories are woven together they form a *shared story*, and help to define a region's community values, sense of place, and aspirations for the future, as successfully demonstrated at Kodja Place (see Box 58). Community visioning is a process whereby a community envisages the future it wants, i.e. a *shared vision* of the future, and identifies actions to

achieve it. Visioning uses a range of techniques to engage the community, including workshops, surveys, public meetings, community tours, publications, and special events. Community visioning is a similar process to 'Dialogue with the City' (see *Sustainability and settlements* and Box 68 below).

BOX 68   DIALOGUE WITH THE CITY

The Western Australian State Government, through the Department for Planning and Infrastructure, is currently conducting a comprehensive community engagement process for the future planning of Perth. This process, known as 'Dialogue with the City', aims to address Perth's high population and economic growth rates, and the significant impacts that they will have on land, resources, environment, employment, transport and housing.

Dialogue with the City aims to engage the Western Australian community in the future planning of Perth and empower them in identifying planning issues and solutions. A number of ways to engage the community have been chosen, including:

- a survey of 8,000 households
- competitions for primary and high schools
- sessions with young, Aboriginal and non-English speaking people
- an interactive web site, with access to the latest research and experts from Perth, Australia and overseas
- a television program on the potential futures for Perth in the metropolitan area and
- a consultative forum with 1,300 citizens.

The State Government aims to use the community views expressed through Dialogue with the City to form guidelines, policies and a strategic plan that focuses on making Perth the most liveable city.

Government of Western Australia, "Dialogue with the City" *Intersector: Official Magazine of the Western Australian Public Sector*, Vol 9, No. 15, Aug 1, 2003: p 7.

In short...

Vision

Communities develop through close participation in solving their own sustainability issues. In particular, they are able to help overcome the divisions and disparities in opportunity across cities, and towns and between regions. Coordinated government services are vital to this process.

Objectives

- To link community development and sustainability.
- To develop holistic partnerships across community, government and business to drive and support sustainability objectives.
- To more efficiently and effectively provide community services.
- To facilitate community development 'bottom-up'.

Actions underway

- An Early Years Taskforce has been established to develop Statewide strategies to enhance services for young children and their families through community engagement and better interagency collaboration.
- The Family Strength Program is to be extended to include new Indigenous family strength services and community-based child and family centres.
- The government and ATSIC have signed a Statement of Commitment requiring a partnership approach.

In short cont'd...

- There is a commitment to move towards the concept of an Enabling State which recognises that the role of government is to enable, resource and empower local communities to be a part of the solutions to their social problems.
- The promotion of partnerships between all layers of government, ATSIC, community organisations and the business community is crucial to developing whole of community solutions to social problems as exemplified by the work of the Citizens and Civics Unit and the ATSIC and WALGA Partnership Agreements, and the development of the Industry Plan process with the non-government community services sector.
- The government will be working to develop coherent and sustainable State, regional and local processes to ensure holistic responses across the range of human services.
- The 'Strategic Directions for Western Australian Sport and Recreation' report (SD3) was produced by the Department of Sport and Recreation.
- The development of an Aboriginal Justice Plan, for the Indigenous Affairs Advisory Council, which will involve Indigenous people by the development of regional and local partnerships to improve the delivery of justice services to Aboriginal people.
- Crime mapping is underway to assess the extent of safety as a liveability tool in communities.
- Lotterywest endorses sustainability objectives and will continue to factor sustainability considerations into its grant-making and community development activities.

Actions

5.1 Develop an integrated community services policy framework that sets out the core principles and processes for providing more holistic service to help achieve sustainability goals.

5.2 Investigate the establishment of a neighbourhood renewal initiative to contribute to a sustainable future for local communities through:
- building connection, caring, civic pride and common good through engaging local communities in social planning, service delivery and other projects
- creating links between and/or rationalising the plethora of pre-existing local advisory networks on specific social issues
- leveraging other government, business and community resources, and
- linking with revitalisation initiatives (see *Revitalising declining centres and suburbs*).

5.3 Develop a coherent process to support joined-up responses from all levels of government and the private and community sectors to enhance the way sustainability is related to community building.

5.4 Use *Consulting Citizens: a Resource Guide* and *Consulting Citizens: Planning for Success* to promote effective public consultation and active citizenship.

5.5 Ensure links between crime prevention programs and community development initiatives as a way of focusing partnerships in areas of multiple social disadvantage.

5.6 Ensure links to Lotterywest's direct grant opportunities as a source of support for bottom up community development initiatives and initiatives linking community development and sustainability, consistent with Lotterywest adopting a sustainability-oriented approach to its grant-making and broader activities.

In short cont'd...

5.7 Through the Sport and Recreation Strategic Directions report 'SD3' provide a sustainability oriented coherent approach to the provision of sport and recreation services linked to better urban design and infrastructure for walking/cycling and public transport, and funding through government and Lotterywest.

5.8 Through the Physical Activity Taskforce provide educational and organisational coordination for the facilitation and expansion of physical activity for community health.

5.9 Develop equity and diversity programs to provide community-building and sustainability perspectives as well as human rights and anti-discrimination.

5.10 Provide support for community aspirations (storytelling and visioning) projects as part of regional sustainability strategies.

Global opportunities

Community-based approaches to development are now the basis of most major international aid projects and are required as part of AusAID projects. Western Australian experience in this technique will be of international significance.

Further information

Garlick, K 2002, *Carers: Putting the Soul Back into Community*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Carer/Carers.htm

Dialogue with the City
www.dpi.wa.gov.au

Lotterywest Grants
<www.lotterywest.wa.gov.au>

Newman, L 2002, *Permaculture: Designing For A Sustainable Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/permaculture/Permaculture.htm

Samani, S 2002, *The Internet Community Hour: Sustainability and Community-Based Training to Overcome the Digital Divide*, http://www.sustainability.dpc.wa.gov.au/CaseStudies/communityinternethour/communityinternethour.htm

Stange, L 2002, *Perth City Farm: Cultivating a Vital Urban Community*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/cityfarm/cityfarm.htm

Stoll, K 2002,*Youth and Sustainability: Social Capital, Social Entrepreneurship and Youth Civic Engagement.* State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

Waller S, 2003, *"Community Aspirations – Storytelling and Visioning"*, sustainability background paper. State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

A Swimming Carnival held at Burringurrah Aboriginal remote community 400Km East of Carnarvon in December 2001 with the motto "No school No pool". Royal Life Saving Swimming Instructors and the Department of Sport and Recreation conducted the carnival. See Box 66.

Source: Department of Sport and Recreation

> HOUSING AND SUSTAINABILITY

Good housing should provide shelter, safety, security, a sense of community and local access to amenities such as parks, schools and shops. Inadequate housing can exacerbate family pressures, harm health, limit educational achievements, strain family budgets and enforce long commuting trips to shops, schools and work.[51]

Housing …plays a significant role in supporting connections between people as well as being one of the most important factors in people's levels of poverty or wealth…it is a key factor in terms of people having a sense of empowerment and responsibility and a sense of safety in their community.

Western Australian Council of Social Services

The emergence of the working poor as a result of economic reform, the loss of low cost rental housing, reduced public housing funds and the changing role of the housing sector to support those in greatest need calls into question the long term sustainability of current social housing settings.

Department of Housing and Works

A growing body of research evidence has highlighted the critical role of housing in people's lives and the interconnectedness of housing, employment, health, education, land use and other social and economic factors.[52]

This social dimension of housing and the positive impact it can have on community development is the reason why housing is dealt with twice in this Strategy. *Building sustainably* dealt with housing as a shell, its ecological footprint and how it can be improved as well as better located. This section deals with housing as a means of better addressing social justice problems, as a facilitator of local community and as a core element in people's quality of life.

Given the significant increase of people with disabilities in the community as Western Australians age, research is required to develop housing which incorporates basic universal design principles, for use by people throughout their life cycle without the need for expensive modifications. When people have to leave their home because of declining ability there is frequently severe dislocation of their social and support networks as well as financial hardship. Demonstration housing needs to be developed that is access friendly, environmentally sustainable and cost-effective to construct.

The global innovation of universal design is directly linked to social, environmental and economic sustainability. Western Australia, through innovations such as disability service plans, is a leader in creating accessible and sustainable communities and is attracting worldwide recognition. For example, in 2002 the Western Australian Universal Design Network hosted the Inaugural Universal Design Stream of the 6th International Global Conference on Ageing.

Sustainable housing must confront the issue of providing affordable housing. This needs to be done in innovative ways, given that the Commonwealth-State Housing Agreement has diminished the States' capacity to provide public housing (the amount of public housing in Australia is now down to 5-8% of all housing). Western Australia has been able to provide more housing than any other State in recent years due to innovative land-banking approaches that have enabled it to do joint venture developments.

These developments have seen one in twelve lots being set aside for construction of public housing and more affordable private homes. There has however been a contraction in the low cost end of the private rental market across Australia. There are now 20 to 22,000 low income people in WA living in private rental accommodation, paying more than 30% of their income in rent.

Perth first homebuyers have been able to purchase homes at a lower price than almost anywhere else in Australia. This is at least in part due to the approach to housing through partnership between government and the private sector. Such partnership needs to continue. It is important that it now take-on other sustainability elements as discussed elsewhere in the Strategy, such as innovations in sustainable building and construction (as in Atwell South) and in location (adjacent to railway stations as in Wellard, Atwell South, Brighton and Clarkson) so that on-going costs in energy, water and travel are also reduced as well as the environmental and community benefits.

[51]Housing Industry Association submission to the State Sustainability Strategy p.5.

[52]Barron, L. and Gauntlett, E. ibid p.4.

One important way to ensure this is through a greater proportion of affordable housing in areas being renewed and revitalised. This contributes to the process of building sustainable communities by ensuring that people of all backgrounds have access to good facilities and services (see Box 69 and P Newman's Bartnett Oration 2002).

BOX 69   SUBIACO'S HOUSING

The Subiaco centre redevelopment, called Subi-Centro, has attracted worldwide attention for its architectural and urban design qualities, as has the redevelopment of East Perth.

A common criticism of Subi-Centro, however, is that it is too expensive and therefore inaccessible to many people. While the East Perth redevelopment set aside 10% for social housing (a condition of funding from the Commonwealth Government's Better Cities Program), none was provided in Subi-Centro.

To address this situation, the City of Subiaco Council has developed a policy of building Council housing on Council land so that Subi-Centro will now have 10% social housing. Council plans to lease this housing to both Homeswest and various Housing Associations to enable people to live near all the good facilities and services of Subiaco, including the train system. As the Mayor of Subiaco has said, 'Why shouldn't ordinary people live in the best part of the city? Indeed everyone gains from having a social mix'.

The provision of public housing and affordable private housing is near world best practice standard in urban areas in Western Australia. However the provision of community housing is not. Community housing is a housing option where the housing is managed by a non-government housing association or cooperative. It can also include shared–equity schemes. There is potentially a real market for this type of development which is also well placed to address sustainability issues (see Box 70).

BOX 70   ECO-VILLAGES AND COOPERATIVES – SUSTAINABILITY IN ACTION?

Several background case studies have been written for this Strategy on innovative housing developments that incorporate both ecological factors and social factors. These include the South Beach Eco Village, Pinakarri and Rosneath permaculture village.

Housing cooperatives supply only a small part of the housing market in Western Australia. However they have the potential to tap the public sentiment to 'belong' and contribute to sustainability.

An example of a new cooperative is the Somerville Eco Village at Chidlow. Seventy-four members of this non-profit association are planning their village over the next two years. In a detailed submission to the State Sustainability Strategy the group stated, 'Our objective is to promote the eco village concept as a practical environmental and socially responsible alternative to land settlement.'

Community housing lends itself to the sustainability agenda as communities can provide the synergies and appropriate scale of technology, e.g. community bores, community grey water recycling to gardens and, of course, community support for linking growth and development.

Community housing needs facilitation. In particular it needs a framework that establishes quality assurance in management and this provides the framework for attracting finance. It is also the type of housing in which local government can become more involved, as it reflects a community focus. In addition, local governments often have land available on which community housing, demonstrating sustainability principles, could be developed. Indeed, local government is already active as a joint venture partner in developing community housing (see P Newman 2002 Bartnett Oration).

To ensure common good outcomes, the government has a role to play in the location of public housing, affordable private housing and community housing. There is a need to work out region-by-region the most appropriate mix of these housing options. This is an ideal process to be on the agenda of the State-Local Government Sustainability Roundtable and for the development of a policy on public, community and affordable private housing, which should also scope the use of planning mechanisms, such as a Statement of Planning Policy, for implementation.

The State Government's housing strategy, Housing Strategy WA, will specifically provide strategies that address the affordability, accessibility and sustainability of Western Australian housing in the short, medium and long term.

In short...

Vision

A responsive housing system in Western Australia that meets the changing needs, aspirations and choices of all citizens in a sustainable way.

Objectives

- Provide the appropriate mix of public housing, affordable private housing and community housing.
- Ensure that this housing provides ongoing sustainability benefits.

Actions underway

- Housing Strategy WA is being developed.
- Residential Design Codes have been revised.
- Landstart's support for the Housing Industry Association's GreenSmart program evidenced by the development in Broome of culturally responsive design for Indigenous housing.
- New urban centres are being developed or re-developed in conjunction with the future northern rail link and the south west metropolitan rail line.
- Homeswest tenants are being employed in construction and landscaping of new estates on the urban fringes, alleviating local unemployment levels.
- Indigenous housing programs encourage community input into the design and siting of housing, while the remote area essential services program includes community participation and training in maintenance and management support.
- A new Indigenous housing agreement has recently been signed with the Commonwealth Government.
- The State Homelessness Strategy is being implemented.

Actions

5.11 Develop a policy on public housing, community housing and affordable private housing with groups of local regional councils to ensure there is an appropriate distribution of housing tenures. Guidelines to deliver sustainable and appropriate housing stock will be combined with planning incentives through the Sustainability Scorecard.

5.12 Finalise and implement the Housing Strategy WA.

5.13 Develop a Community Housing Framework involving standards and accreditation to ensure world best practice in the provision of this housing type and create opportunities for partnerships between community housing associations and local government.

5.14 Use the sustainability agenda to facilitate the community housing sector through its ability to create synergies such as community scale technologies, local government support and ethical investment.

5.15 Develop regional housing strategies to ensure housing diversity is appropriate and sustainable.

5.16 Demonstrate the business benefits of diverse and affordable housing to sustainable communities through research, pilot projects and mainstreaming of sustainability in social housing.

5.17 Educate the community about the benefits of diverse and affordable housing to sustainable communities through demonstration projects and information programs.

5.18 Create economic opportunities for Indigenous people through their involvement in government housing projects.

In short cont'd...

Global opportunities

Western Australia already provides consulting services in housing to other parts of the world. Innovations in sustainable housing will be of global interest.

Further information

Armstrong, R 2002, *Reurbanisation in Perth: East Perth and Subiaco Contributing to a Growing Trend Towards a More Sustainable Perth*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Subiaco/Subiaco.htm

Beyer, D 2002, *Pinakarri Community: An Intentional Co-Housing Cooperative*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/pinakarri/PinakarriCommunity.htm

Bourne, M 2002, *Piney Lakes Environmental Education Centre: an Innovative Project with Multiple Benefits*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/PineyLakes/pineylakes.htm

Hart, R 2002, *Housing of the Future: Ellenbrook Solar Housing*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/Ellenbrook/ellenbrookhousing.htm

Newman, L 2002, *Permaculture: Designing For A Sustainable Future*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/permaculture/Permaculture.htm

Newman, P 2002, *Sustainability and Housing: More than a Roof Overhead,* J Oswald Barnett Oration, CD-Rom.

Ruane, S 2002, *South Beach Village: Prospects for a Sustainable Urban Settlement*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/southbeach/southbeach.htm
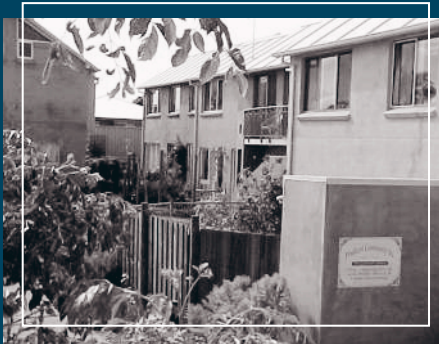
Pinakarri, an intentional co-housing community in suburban Perth, is demonstrating how to live in a way that is environmentally sound and socially supportive.

Source: Peter Newman

Harvest Lakes is Landcorp's flagship program for demonstrating sustainable land development. This is Western Australia's first, and Australia's largest, HIA Greensmart Village, featuring solar-oriented lot design, water management and community development programs with mandatory energy efficiency measures in all homes. The first two stages of land release sold out very rapidly.

Source: Landcorp

> SUSTAINING HEALTHY COMMUNITIES

While most Western Australians have never lived as long, or as well, as they do now, good health and well-being are linked with the state of the environment. As our lifestyles, consumption patterns, development and continuous urban growth continue to degrade the environment, new hazards and diseases will emerge.

The maintenance and improvement of health should be at the centre of concerns about the environment and development. Yet health rarely receives high priority in environmental policies and development, rarely figures as an important item in environmental or development programs despite the fact that the quality of the environment and the nature of development are major determinants of health.

World Health Organisation[53]

Innovative approaches are needed to help the Australian population to understand and act on the subtle links between environment, sustainability and health, and between local and global action.

Guest, Douglas, Woodruff and McMichael[54]

People who live in walkable neighbourhoods walk one hour per week more than those who live in less walkable neighbourhoods. By doing so they meet 40% of their physical activity target and halve their risk of being overweight. Developing neighbourhoods where people can walk must be a key component of public policy.

Tolley, R and Walker, J (2003) Walk21-IV: Health, Equity & Environment: The Fourth International Conference on Walking in the 21st Century, Portland Oregon, USA, May1st-3rd 2003:Conference conclusions, unpublished.

Good health is the most important asset of any country. Without a healthy population, productivity is low, health care costs are high and there is diminished capacity for skills development and social advancement. Gains experienced in Western Australia's human life expectancy rates have predominantly been achieved by improved nutrition, housing, and safe and clean food and water, and have followed on from the economic success of our primary industries.

Continued improvements in human health are possible and will enhance our local wealth. They will rely not only on advances in medical science but also on the management of the resources of the State to ensure hazards to human health are controlled and the resilience of the community to cope with ongoing change is enhanced.

A population's health, both physical and mental, is a sensitive indicator of the health of the physical and social environment. One of the challenges for the health system is to protect the health of the population in the face of ongoing environmental and social changes.

Sustainability seeks to maintain and improve the environment and ensure that the natural ecological, physical and chemical systems that support life continue to function effectively. If we are successful, we will hand future generations the same potential for health and well-being that we have enjoyed.

The links between sustainability and health

The environment in which humans live affects them through the physical, chemical, biological, social, cultural and economic conditions to which they are exposed. Some of these are hazardous to health. Many of these hazards have been known for a long period of time, while others have arisen more recently through lifestyle choices, the effects of environmental degradation, social change, and an ageing population.

[53]World Health Organisation, *Our Planet, Our Earth: Report of Commission on Health and Environment*, World Health Organisation, Geneva,1992.

[54]CS Guest, RM Douglas, RE Woodruff, AJ McMichael 1999, *Health and the Environment*, Tela Series Issue 1, Australian Conservation Foundation and Australian Medical Association, 1999, p. 35.

Existing environmental hazards

Most Western Australians enjoy a lifestyle free of the traditional environmental hazards to health. The expectation that food will be safe, drinking water clean, the air unpolluted and our personal safety unchallenged has almost been fully met. This excellent physical environment has been achieved by the sustained efforts of agencies to identify and control sources of contamination and potential contamination. These efforts must be ongoing and involve investment in skills and knowledge, surveillance and monitoring and the implementation of effective control strategies.

Not all Western Australians have such a healthy environment. Environmental hazards are still inadequately controlled in remote Indigenous communities. Health problems, particularly infections, diabetes and injuries, are common and are directly related to the lack of clean water, lack of waste disposal, poor housing, overcrowding, dust and poor nutrition. There are also signs that prevention and early intervention strategies are needed to optimise the development of all children and young people in Western Australia (see Box 71).

BOX 71   EARLY INTERVENTION AND SUSTAINABILITY

Sustainability is about 'meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity,' yet there is little thought given to how we target children now.

Professor Fiona Stanley, Australian of the Year for 2003, has highlighted the strategic importance of prevention and early intervention to avoid multiple problems in later life. Professor Stanley describes the 'dilemma' facing all decision makers, about how best to invest in prevention and early intervention, without detracting from the vital services and supports required for children who have already lost precious opportunities in early life.

'But there are significant, economic, social and environmental advantages,' she said. 'There is mounting national and international epidemiological data showing that welfare, education, health and crime costs could be curbed dramatically if children can be kept on the right path early in life.'

Professor Stanley's vision includes 'enriched eraly childhood services to be freely available, especially in disadvantaged areas.' Research demonstrates that quality 'early childhood activities' can make a significant difference for both disadvantaged and all children, families and their communities.

In 2002, the State Government responded to this evidence by establishing an Early Years Taskforce to progress the early years agenda in Western Australia. The Early Years Taskforce recognised that family and community are central to the health and well-being of children and drew upon local expertise and resources, as well as contemporary research, to develop an Early Years Strategy. The Early Years Strategy will aim to ensure that all children, whatever their circumstances, get off to the best start possible. The Strategy will set a clear mandate for government and non-government agencies, to collaborate with local communities to deliver comprehensive and coordinated services and support for children 0–8 years of age.

The government has also recently announced a $75m program to implement recommendations in response to findings of the Gordon Inquiry into the needs of Indigenous children, especially in remote communities. Together these two major initiatives will form an integral part of Western Australia's commitment to sustaining healthy communities by investing in the early years of life.

New hazards arising from environmental and social change

Rapid social, technological, industrial and economic changes are all contributing to a new set of health hazards. Being of more recent origin, the impact of these hazards on health is less well understood, and effective control strategies may not yet be known, much less effectively implemented.

Following the control of infectious diseases, chronic illnesses such as cancer, heart disease, respiratory illness and diabetes have assumed a much higher importance in our community. The prevalence of these chronic diseases is increasing, fuelled by unhealthy lifestyle choices, such as tobacco use, inappropriate nutrition and lack of physical activity.

Tobacco use is the single most important risk factor for chronic diseases. Tobacco consumption is a causal risk factor for a range of diseases, including heart disease, stroke, peripheral vascular disease, many cancers and lung diseases. While smoking rates have been falling since the 1970s, about 20% of the population still smoke. Reducing tobacco use will continue to be a priority for a health sector focused on improving a population's health, and will, over time, translate to a significant reduction in demand for health care for illnesses caused by tobacco.

The risk of infection with native mosquito-borne diseases, such as Ross River virus, will increase with continued development in high risk areas where natural wetlands and surrounding bushland are retained for conservation purposes. Strategies for managing stormwater (e.g. infiltration structures) and drinking water (e.g. rainwater tanks) will need to include requirements for appropriate design and maintenance so as not to enhance the receptivity of urban areas for native and exotic mosquito-borne diseases. Other factors, such as climate change, some infrastructure and agriculture projects, insect-resistance to pesticides, loss of biodiversity and increasing international travel and freight, may also facilitate transmission of mosquito-borne diseases.

Inappropriate nutrition accounts for more than 30% of all cancers, and contributes to the growing prevalence of overweight and obesity. Low levels of physical activity compound the contribution of over-nutrition to obesity. The cost attributable to the six most prevalent illnesses related to low levels of physical activity (heart disease, stroke, non-insulin dependent diabetes mellitus, colon cancer, breast cancer and depression) has been estimated at $36 million per year in Western Australia.

The past decades have seen enormous social change. Urbanisation is increasing and some small rural communities have become unviable. A high proportion of families have both parents in fulltime employment, with children in childcare from an early age and older children unsupervised and unsupported after school. Our society is being increasingly divided, as the gap between the most wealthy and poorest increases. Research on the health effects of social inequality, where the society has a mix of people with vastly different economic status and social empowerment shows the detrimental effects on personal and community health.

Urban sprawl and time pressures promote dependence on the car. Western Australians make 63% of all personal trips by car as the driver. Increasing car dependence impacts on business efficiency, environmental quality, community cohesion and personal quality of life. Residence in a suburb with little public transport and no access to a car creates social isolation, poor employment prospects and economic disadvantage. Good physical and mental health are jeopardised in these circumstances and as such health needs to be partnered with town planning processes.

Better work practices and healthy physical and mental work environments can also prevent potential mental health problems. In recent years many studies have documented the significant effects that issues such as extended working hours, bullying in the workplace and work-related stress can have on mental health, the economy, family life and the broader community. 'Sense of place' is not just a good feeling; it is how we grow. The development of community, the importance of walking and of safe and supportive work environments, are all part of the sustainability health agenda.

New environmental hazards to health have also arisen from developments that have occurred without sufficient environmental safeguards and which have involved the unsustainable consumption of natural resources. Wastes are produced at a rate that is above the capacity of the environment to absorb, leading to landfills for solid waste, chemical emissions and changes in air quality and the atmosphere. Landfills must be appropriately sited to avoid pollution of groundwater and old landfills appropriately used to avoid human exposure to chemical emissions. Nutrient runoff from agricultural and residential lands has resulted in toxic algal blooms in our rivers, overgrowth of sea grasses, fish death and exacerbation of nuisance and disease-carrying insects. Nutrient use and runoff from agricultural and domestic land needs to be better managed. Within Western Australia, health will need to contribute to solutions to problems we have inherited and to change our development techniques to ensure that the environment is not further degraded.

With the advent of new technologies, community concern has been heightened about the potential of new environmental hazards to health, particularly in regard to the commercial release of genetically modified organisms (GMOs). While licensing companies supplying GMOs are under the control of the Commonwealth Office of the Gene Technology Regulator, the administration and enforcement of requirements to protect the community and the environment from irresponsible application of GMOs is a State responsibility shared across several government departments, including the Department of Health.

New perspectives on ecological health are showing the links between health and the release of new diseases from the destruction of forest habitat, climate change, global over-population, loss of biodiversity, depletion of fish stocks, stratospheric ozone depletion and depletion of fresh water (see background paper *Health and Sustainability* by Thomas, Douglas and Cohen). All such trends will need to be assessed and managed; for example, loss of the ozone layer has increased exposure to ultraviolet radiation and increased the risk of skin cancers, necessitating more attention to the provision of shade and use of protective clothing.

The links between the health of the environment and the health of the population are clear and inextricable. The health system has a central role to play in the sustainability agenda outlined in this Strategy. This role should encompass:

- Continued efforts to improve the living conditions of remote Indigenous populations, and to improve the health and life expectancy of Indigenous people. This is a long-term agenda, and success will require persistence and creativity as well as commitment to difficult programs such as controlling the spread of sexually transmitted disease; managing alcohol, tobacco and substance abuse; and improving the key basic health determinants of nutrition and physical exercise.

- The provision of advice on the health impact of new developments, new technologies and new industries to ensure that hazards to health are avoided where possible or kept below levels that are hazardous to health. Health impact assessments are a vehicle for achieving this.

- The continuation of strategies to remedy existing environmental hazards and to avoid exposures that may damage health.

- Continuing to promote a health agenda that seeks to improve health, as well as to treat illness and care for those with ill health. Tobacco control provides a model to be followed by other programs which seek to reduce exposure to significant health risk factors.

- The development and implementation of programs, incentives and disincentives to combat obesity and to make healthy lifestyle choices easier. The Western Australian Government's Physical Activity Taskforce is an example of such an initiative. It will be important that such strategies are well linked. Understanding the factors that make communities and individuals resilient to change, and promoting these to develop a population that is skilled, educated and robust in the face of change.

- Partnerships with planning agencies to develop friendly and health-promoting urban developments; with environmental agencies to ensure that health concerns are integral to environmental decisions; with transport agencies to promote safer and more accessible forms of transport; with education to ensure the next generation of Western Australians is well informed on sustainability.

- The development and implementation of partnerships to improve food quality, safety and nutrition, particularly to high risk consumers who are at risk of food-borne illness, such as the elderly, the very young and people whose immune system is impaired.

The health sector itself, along with health sectors across all developed countries, is confronted by ever-increasing cost pressures stemming, in part, from increasing community expectations, an ageing population and new technologies. Demographic pressure associated with increasing urbanisation and the parallel diminution of small country communities add to these cost pressures and multiply their impact on the sector's ability to provide sustainable health services. Consequently, the health sector needs to aim for sustainability of service delivery by improving its efficiency while at the same time raising community awareness about the importance of prevention and early intervention. These themes are central to a new focus on the development of sustainable health systems and services. For example, the goal of the newly established Western Australia Country Health Service is 'to provide a robust and sustainable system of health service delivery that meets contemporary needs'.

The community and health sector need to work collaboratively to determine how to achieve the greatest health gains for the greatest number of people while recognising the continuing disadvantages faced by some sections of the community, such as Indigenous people. The health sector's contribution to the maintenance of a clean and safe environment for the majority of Western Australians is unseen and unacknowledged. Its essential role in providing our current levels of good health must be supported.

Failure to maintain the viability of the health sector will deprive the drive for sustainability of a major source of strength and advice, and a powerful resource ensuring that the current excellent health expectations are passed to future generations.

Not only is the health sector an important partner in reducing the detrimental effects of environmental change, it is also a potential contributor to environmental damage, through use of and disposal of drugs, chemicals, and radioactive materials. Health care centres are also potentially hazardous sites for both workers and patients and adherence with the State Sustainability Strategy will emphasise this ongoing commitment to safety.

In short...

Vision

The health of all people, especially Indigenous people, continues to improve and the health system also becomes a means for the promotion of sustainability.

Objectives

- Reduce the health disadvantage endured by remote Indigenous communities and communities with multiple social disadvantage.

- Create greater links between health and other elements of sustainability.

- Reduce the incidence and severity of disease by increasing the focus of the health sector on primary and secondary prevention.

Actions underway

- Significant research is being undertaken (e.g. the EnHealth Program) to investigate the links between environmental degradation and health.

- Government agencies are working collaboratively to incorporate health impact assessment into the environmental impact assessment process.

- Funding for medical and health research infrastructure is supporting high quality medical research and assisting the development of a strong medical research sector.

In short cont'd...

- A new set of Statewide programs for 0-2 year olds is using evidence-based approaches for identifying children at risk and supporting family and community environments that are aligned with positive child development.

- Health is part of a multi-agency commitment to the better delivery of services to 0-8 year olds and their families/carers.

- A new Primary Health Partnerships model is supporting collaboration on health issues between community health, public health and general practice divisions at a Statewide and local level.

- The development and funding of new programs to promote a healthy lifestyle and prevent disease should reduce future demands on health services. The programs aim to improve nutrition, reduce smoking, encourage responsible drinking and increase physical activity.

- Initiatives are encouraging the contribution by volunteers to the delivery of health care services.

- Initiatives to attract and retain medical practitioners and other health professionals in rural and remote areas (e.g. rural scholarships) are assisting to build and sustain health services in these areas.

- Telehealth is being trialled and evaluated as a vehicle for expanding access to health services into rural and remote communities.

- A major review of country services has set the framework for establishing networks of sustainable health services with clearly delineated roles and minimum standards within each country region.

- Country Hospital and Health Service Boards of Management have been phased out and replaced by new District Health Advisory Councils. These will facilitate community participation and involvement in rural health services and represent the start of an exciting new era in community participation.

- The development of a Rural Clinical School in conjunction with the Commonwealth Government, with teaching sites located in Kalgoorlie, Geraldton, Pilbara and Kimberley, will assist medical students to obtain rural and Indigenous health exposure.

- The recently launched WA Drug and Alcohol Strategy 2002–2005 provides a framework for a comprehensive and coordinated response to drug use, involving all layers of government working in partnership with non-government agencies and the community.

- Statewide training of local government environmental health officers, environmental health workers and officers from other government departments in the awareness and management of vector-borne diseases.

- Interagency collaboration to ensure planning approvals address the issue of environmental hazards, such as mosquito-borne diseases.

- The development of the new Food Act, which provides greater flexibility and responsibility for industry, while introducing new enforcement tools for regulatory agencies.

- An Environmental Health Network, established and funded by the Office of Aboriginal Health and monitored by Environmental Health Directorate, is addressing the issues of lack of clean water, lack of adequate waste disposal, poor housing, overcrowding, poor food handling/storage and lack of dust control. An Environmental Health Needs Survey of over 300 Aboriginal communities throughout Western Australia is currently identifying the specific environmental health deficiencies in the various communities, to allow planning and budgeting to occur to rectify these deficiencies.

In short cont'd...

- An 'Early Years' Taskforce has been established.

- The government developed a $20 million program in response to the Gordon Inquiry.

Actions

5.19 Ensure the health system provides sustainability outcomes through the control of environmental hazards and ecological health issues, the development of community public health programs that deal with long-term health issues and cost-effective health priorities.

5.20 Continue to take account of cultural dimensions in health programs, particularly as they apply to remote Indigenous communities and in areas of multiple social disadvantage.

5.21 Use the implementation of the government's response to the Gordon Inquiry to help integrate community services, health and sustainability through 'place management' approaches in Indigenous communities.

5.22 Provide effective links between the health sector and other agencies to create whole of government approaches to reduce lifestyle choices that cause disease and disability and new environmental hazards that affect health.

5.23 Develop and implement health impact assessments as part of the sustainability assessment process.

5.24 Undertake an Early Years Strategy, a joined-up government initiative involving key government agencies and local communities, to enhance community capacity to support the development of young children aged antenatal to 8 years and their families and carers.

Global opportunities

Health impact assessment and successful Indigenous health programs will attract considerable global interest as has already occurred with some of Western Australia's more successful community public health programs.

Further information

George, S 2002, *WA Physical Activity Taskforce: Helping Create a More Sustainable WA*, sustainability case study, Department of the Premier and Cabinet, Perth, http://www.sustainability.dpc.wa.gov.au/CaseStudies/PhysicalActivity/PhysicalActivity.htm

Thomas, T, Douglas, C and Cohen, H 2002, *Health and Sustainability*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

> **EDUCATION AND COMMUNITY AWARENESS FOR SUSTAINABILITY**

Education is vitally important as it plays a key role in raising awareness and changing individual attitudes and behaviour towards achieving sustainability. People's awareness that they are part of their environment and 'not that the environment is something out there separate from them' is an issue that can be largely addressed by both formal and non-formal education.

Education needs to be focused on enabling people to become informed so that they can take up … what they want and prefer for their future … Such education is part of a process that continues from primary school through tertiary levels and into adulthood, so that people are full participants in creating more sustainable futures.

Environmental Alliance

There is a major need for education … to be a key factor in the Sustainability Strategy. Public support and interest is essential to ensuring sustainability is economically viable on a large scale, otherwise key issues and opportunities for sustainability will not be addressed to the full extent.

Danielle Brown

Education will help everyone to realise that what we do today will affect our children's lives and further generations to come.

Kim Reid

Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues… It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision making.

Agenda 21 report of the 1992 UNCED, Chapter 36, page 2

Most people in the world today have an immediate and intuitive sense of the urgent need to build a sustainable future. They may not be able to define 'sustainable development' or 'sustainability' but they can clearly sense the danger and the need for informed action. They smell the problem in the air; they taste it in they water; they see it in more congested living spaces and blemished landscapes; they read about it in newspapers and hear about it on radio and television.

UNESCO Report

British science writer HG Wells commented a century ago: 'Life is a race between education and disaster'. One hundred years later, that observation applies more than ever to sustainability. It is apparent that, particularly in young people, there is little optimism for a sustainable future within the community. For example in a study conducted by the Australian Science and Technology Council more than half of the 16 to 24 year olds surveyed expressed little hope for a sustainable future. When asked about living conditions in 2010, more than half said that they believed that the natural environment, the gap between the rich and the poor, and crime and violence would be worse than now.

Any attempt to incorporate sustainability in the public, business and community sectors must explicitly address awareness raising, public participation and education. We need to raise awareness of sustainability and provide education *for* sustainability if we are to shift to a more sustainable society.

Education for sustainability seeks to develop civic virtues in, and engage, motivate and empower all Western Australians, through formal and non-formal educational experiences, to change their lifestyle choices, undertake personal and social change and to work towards achieving a sustainable future.

Education for sustainability can be described in four phases:

- Awareness raising – 'Does it matter to me?'
- Shaping of values – 'Should I do something about it?'
- Developing knowledge and skills – 'How can I do something about it?'
- Making decisions and taking action – 'What will I do?'

To achieve this, pre-primary, primary and secondary schools in both the public and independent school sectors, together with TAFE colleges and universities, each have a critical role to play.

Schools are especially important. Sustainability in areas such as health and community services and development can be supported through the school as a central facility and resource for these services. Children's school education, in partnership with community education, can also be a powerful way to embed the principles of sustainability and long-term change in behaviour.

But educational and awareness raising opportunities must also be available to the whole community of Western Australia, for example through:

- a targeted media and advertising campaign that highlights the issue of sustainability to the community
- support for community sustainability education initiatives and
- the development of innovative community education sustainability programs that engage and empower people to change or modify their behaviours.

The Western Australian education system has gone some way towards embracing the need to educate about and for sustainability. The Curriculum Framework to be implemented by 2004 supports sustainability. The concept of sustainability is embedded in outcomes for students from kindergarten to year 12. In addition, the development of the new Courses of Study for years 11 and 12 also includes a focus on sustainability where appropriate.

A range of school and community-based partnerships, such as Ribbons of Blue, the Gould League, Waste Watch, WaterWise, Bush Rangers, AirWatch and TravelSmart Schools are supporting this implementation. As well, the new Education for Sustainability Award is enabling students to develop school projects on sustainability and school administration to examine how to apply sustainability principles to buildings, land and school programs.

The Department of Education's 'inclusive schooling' policy is working towards building a greater sense of community and commonality. Similarly the community involvement mandated under the *Education Act 1999* has provided a sound basis for involving and educating the wider community. Schools are involved in a range of broader community programs including Landcare, Coastcare, Bushcare and Rivercare.

The Department's new school in South Atwell, which will open in 2004, has been designed according to world's best practice in sustainability. In addition, the Department's commitment to the WA Cleaner Production Statement will achieve a 10% reduction in energy utilisation and waste over the next 3 years in central and district education offices. Similarly, ground works at schools promote recycling of green waste and, while many schools are already chemical free, there is also a commitment to phase out chemical use over the next five years. In addition, the Department has commenced a program for sustainable water use by reducing grassed areas at schools and an ongoing program of installing automatic reticulation. Some fifty-two schools are currently using reclaimed effluent water as the preferred water source.

The Department of Education and Training is now focussing on sustainable practice and management of native bush in its redevelopment of current school sites and its development of new school sites (see Box 72 Coogee Primary School).

BOX 72 COOGEE PRIMARY SCHOOL – BUSHLAND MANAGEMENT AND ENVIRONMENTAL EDUCATION

Over the last ten years, Coogee Primary School has restored a piece of bush on the school site and created a living library. The bush had to be fenced and weeded with involvement from school children, staff and parents and has now flourished as a source of native species.

The area has been given to the City of Cockburn as a public park but continues to be used as a place for student projects on biodiversity. Funding grants have been attracted to continue work on the site and a native vegetation trail has been created.

The manager of the neighbouring Water Corporation sewerage works noticed how successfully the bush had been restored. The Corporation has now funded the school to participate in restoring the bush on the neighbouring site. The library is growing.

Coogee Primary School has rehabilitated some local bush and uses it as a biodiversity 'living library'.

Source: Keith Brown

The Department of Environment has developed an Environmental Education Strategy that establishes a framework for enhancing environmental education outcomes for the next three years, and also raises the priority of environmental education as an important tool to achieve sustainability.

There is a need to address the lack of formal accreditation of environmental education training and to continue to work to bring sustainability to universities, Catholic and independent schools. As is outlined in *Sustainability and business: Training and facilitation for sustainability*, TAFE does have a commitment to sustainability. As a corollary, the University Partnership Program has resulted in forty case studies and eighteen background papers being written as part of the State Sustainability Strategy.

There is also potential for State and local government sustainability education initiatives to enhance the localisation and on-the-ground effectiveness of programs. This could also involve the development of appropriate training programs for local government, both in general sustainability education management and in capacity building for the delivery of specific environmental programs in partnership with the State government.

Strategies to assist education for sustainability will need to link in with other programs to facilitate school curriculum and teacher development in sustainability and to create school buildings and grounds as demonstrations of sustainability.

One strategy to raise community awareness about sustainability is to give public recognition to outstanding achievement. To this end the Western Australian Government will establish an annual award that will recognise major achievement in sustainability in schools.

In short...

Vision

Education becomes the means by which current and future generations are inspired to live more sustainably and to find innovative solutions for the future.

Objectives

- To develop a clear strategy for developing a community that embraces and works to achieve sustainability.

- To develop curriculum support for sustainability education.

- To use educational buildings and grounds to demonstrate sustainability.

- To assist teachers to develop their understanding and skills in sustainability.

Actions underway

- An understanding of sustainability is being introduced progressively through the curriculum.

- The community has been involved with schools closely since 1973 and this is mandated under the *School Education Act 1999*, providing a basis for community involvement and education through programs like Landcare, Coastcare, Bushcare and Rivercare.

- Many school-based partnerships are already underway, including Ribbons of Blue, Gould League, Waste Watch and WaterWise, Bush Rangers, AirWatch, TravelSmart Schools and others.

- The Premier's Sustainable Schools Competition was launched in February 2003 as a category of the Western Australian Environment Awards.

- South Atwell Primary School has been designed in accordance with sustainable building design and all design briefs for new schools direct architects and builders to give priority to sustainability considerations including natural thermal comfort and minimisation of energy consumption.

- Department of Education and Training has reviewed air-conditioning standards to meet best practice environmental standards, implemented a utilities management trial in which schools share in savings made in utilities costs, reviewed water usage to effect savings and worked to reduce under-utilised but serviced land holdings.

- Department of Education and Training's 'inclusive schooling' policy promotes acceptance of diversity and aids community development.

- Department of Education and Training is a signatory to the Western Australian Cleaner Production Statement and is on target to achieve a 10% reduction in energy utilisation and waste in central and district offices over the next three years.

Actions

5.25 Develop a comprehensive communications strategy on sustainability that includes all aspects of formal and informal education.

5.26 Implement the Environmental Education Strategy to support education for sustainability.

5.27 Assign a senior officer in the Department of Education and Training with responsibility for formal environmental and sustainability education through the Curriculum Framework.

In short cont'd...

5.28 Continue to introduce sustainability into the curriculum as the Curriculum Framework and the new courses of study are implemented in all schools in Western Australia.

5.29 Continue to maintain and build a diversity of programs that support the achievement of learning outcomes that develop students' understanding of sustainability in, for example, TravelSmart Schools Teachers Resource Kit which contains a range of cross-curricula classroom activities designed to raise childrens' awareness about the effect of cars and identify actions they can take to reduce school trips.

5.30 Support the further use of schools and museums as community hubs.

5.31 Move towards new schools being built according to sustainability principles, including universal design, and progressively convert existing schools.

5.32 Continue to orient schools to an ecological ethic, for example through school bushland projects, growing native trees from seeds, composting, using water runoff for gardens as provided by the Department of Education and Training's Guidelines for Developing Schools Grounds.

5.33 Develop and support partnerships on sustainability education with other sectors (such as local government and the WA Collaboration) to maximise the delivery of sustainability education.

5.34 Develop partnerships that provide ongoing support to community-based groups to assist in delivering school and community-based programs that link to current curriculum initiatives such as the implementation of the Curriculum Framework. And engage children in activities that contribute to reducing car use for school trips, such as the partnership between the Department for Planning and Infrastructure's TravelSmart Schools program and Millennium Kids, including the promotion of proficient bicycle use.

5.35 Promote and expand travel choice, cycling and walking behaviour change programs including the annual Bike to School Day during Bikeweek and the annual Walk to School Day during the Walk There Today week of walking events, and the TravelSmart to School and the Walking School Bus programs.

5.36 Establish an annual award to recognise significant achievement in sustainability in schools.

Global opportunities

Education for sustainability is a global need and innovation in this area will attract global interest. This has been clearly recognised as the United Nations has declared that 2005-15 is the decade of education for sustainability.

In short cont'd...

Further information

Bourne, M 2002, *Piney Lakes Environmental Education Centre: an Innovative Project with Multiple Benefits*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/PineyLakes/pineylakes.htm

Holland, K 2002, *Ribbons of Blue: Communities Caring for Water Catchments*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/ribbonsofblue/ribbonsofblue.htm

Holland, K, Lewis, T & Ruane, S 2002, *Sustainability in Schools: Growing Greener Futures for Our Children*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002 http://www.sustainability.dpc.wa.gov.au/CaseStudies/sustainabilityinschools/sustainabilityinschools.htm

Marquis, J 2002, *Naragebup: Rockingham Regional Environment Centre*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/rockingham/rockingham.htm

Ruane, S 2002, *Fairbridge Western Australia: Embracing the Concepts of Sustainability*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/fairbridge/fairbridge.htm

Samani, S 2002, *The Internet Community Hour: Sustainability and Community-Based Training to Overcome the Digital Divide*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/communityinternethour/communityinternethour.htm

Stange, L 2002, *Perth City Farm: Cultivating a Vital Urban Community*, sustainability case study, Department of the Premier and Cabinet, Perth, viewed 15 August 2002, http://www.sustainability.dpc.wa.gov.au/CaseStudies/cityfarm/cityfarm.htm

Wooltorton, S 2002, *Education and Sustainability*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.
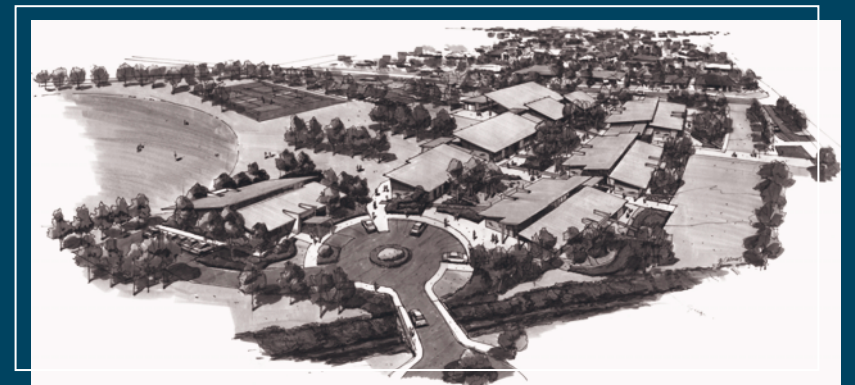
Atwell South Primary School in the new Greensmart suburb of Harvest Lakes is being built based on world best practice sustainable design.

Source: Department of Education and Training

> SUSTAINABILITY THROUGH CULTURE AND THE ARTS

The arts and culture are central to the identity of a healthy and vibrant society. The arts forge connections between people and their natural and built environments and contribute to regional and international understandings.

The Department of Culture and the Arts contends that culture informs the human response to the environmental, economic and social life of the State….The journey towards ecological sustainability must also be a journey towards economic, social and cultural sustainability.

Department of Culture and the Arts

A vibrant culture, one encouraging diversity, equity and creativity, is at the very basis of a sustainable society.

Western Australian Museum

How a community embraces culture and the arts from all spheres of life, will dictate the attitudes of that community.

City of Kalgoorlie- Boulder

They have a role to play in providing much of the interpretive work in exploring and communicating the issues, which are at the heart of sustainability. This can be through educative exhibitions, film, television and multimedia, story telling, public art, the performing arts, literature, visual art and the crafts. The arts and culture can be used extensively as a medium for cultivating sustainable development goals in the community through identification of problems and solutions, communication, collaboration and celebration. In addition, arts and cultural organisations have the capacity for reflection, criticism and articulation of community concerns.

In arguing that to ignore the importance of culture in development programs was to risk failure, the 1995 UNESCO Report, Creative Diversity, noted that:

It is culture that connects people with one another and makes the development of the individual possible. It is culture that defines how people relate to nature and their physical environment, to the earth and to the cosmos and through which we express our attitudes to and beliefs in other forms of life both plant and animal. It is in this sense that all forms of development including human development, ultimately are determined by cultural factors... It is meaningless to talk about the relation between culture and development as if they are two separate concepts, since development and the economy are part of, or an aspect of a people's culture.

Culture shapes attitudes to sustainability and the environment

Culture shapes community values, beliefs and meanings and how people view the environment. These in turn will shape attitudes and actions with respect to sustainability. If Western Australian life is to be sustainable, what needs to be sustained for future generations are its cultural, social, natural and built environments.

'Sense of Place' through art in the Wheat belt. International Art Space Kellerberrin Australia

Cathy Barber, Untitled, video projections on silos, Tammin, 2000.

Photograph: Acorn Photography

A whole of government approach

A whole of government and integrated approach to arts and culture is being actively pursued by the Department of Culture and the Arts as an issue of balance and sustainability. Examples of this are the Arts and Education partnership, which fosters a high quality arts education for young people; the Percent for Art Scheme which involves the commissioning of artworks which are integrated into the fabric and landscaped environments of the State's public buildings and open spaces; and involvement with the Department for Planning and Infrastructure through the *Can Perth Be More Creative?* contribution to the strategic plan for Greater Perth.

Innovation, creativity and cultural capital

Rapid technological change and the information revolution have had a major impact on society, requiring people to be increasingly inventive and innovative in meeting the challenges of a vastly transformed world. Historically, governments in Western Australia have relied heavily on the State's finite mineral and agricultural resources, often overlooking the very significant and renewable cultural and intellectual capital existing in Western Australia.

Creativity, which involves the ability to make new forms and products via the development of a knowledge economy, is now a decisive source of competitive advantage. It is a sustainability and economic imperative for Western Australia to position itself as a creative and innovative society. Creative industries include the fashion industry, architecture, design, interactive games, publishing and contemporary music.

BOX 73 SUSTAINABLE CITIES OF THE 21ST CENTURY ARE GENERATORS AND CREATORS OF NEW IDEAS PRODUCTS AND SERVICES

Sustainable and prosperous cities and regions of the twenty-first century will be those which are information rich and are generators and creators of new ideas, products and services which minimise negative impacts on the environment and provide a high level of public amenity and an enviable lifestyle for their citizens. Perth ranked fourth on a creativity index for its capacity to attract and retain creative professionals in a recent report of the Australian Local Government Association's State of 64 Regions. The index combines high tech output, innovation, diversity and human capital into a score that represents the region's potential for future growth and prosperity.

The State's artists, scientists, film-makers and historians have a direct role to play in innovation and in positioning Western Australia as a creative and competitive region which can, in the future, maximise trade derived from its intellectual and cultural capital. Artists are a dynamic force in the life of communities as communicators, animateurs, provocateurs and as social critics, and in exploring and reflecting the natural and social world.

An expanding role for art and culture in community engagement

It is clear that the arts and culture are playing an increasingly significant role in community engagement, in health and well-being, in social inclusion of communities of all kinds (including youth, Indigenous, the aged, those of different cultural and geographic origins and the socially marginalised) and importantly in reconciliation and the life of people in regional communities.

Cultural identity and sense of place

Artists and cultural organisations are critical to the development of a 'sense of place' and identity. They can heighten the character of a place, counter anonymity and differentiate one place from another, creating a sense of meaning and belonging for people. This in turn invokes a sense of community involvement, pride and guardianship in the built, natural and cultural environment, essential to sustainable communities.
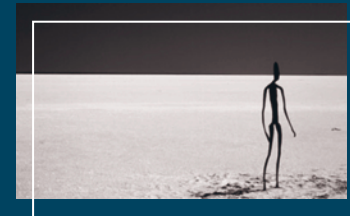
In the public and local government sectors, artists are already involved in the design of buildings, parks and streetscapes to help make them more memorable and regionally distinctive. They have a vital and under-utilised role to play in the planning of the built environment and in engaging the community in the planning process.

Sculpture in Lake Ballard near Menzies. 'Inside Australia' by Antony Gormley, 2003 Perth International Arts Festival. A documentary by Thunderbox in association with Artemis International film. Funding assistance from ScreenWest and Lotterywest.

Photograph: Ashley de Prazer, 2003

A range of artists and cultural organisations contribute to the cultural life of Western Australia. Some, such as the Community Arts Network of Western Australia have long been active in community cultural development, partnering a range of agencies and community groups across the State including Indigenous communities. This often involves close partnerships with local governments. Metropolitan and country local governments make significant commitments to the artistic and cultural life of their communities through libraries, provision of cultural venues, programs, local museums and community cultural development activities which build the cultural capacities of their residents. Community-based cultural development can actively acknowledge, preserve and enhance the culture of many communities and play a role in townscaping. The involvement of the Ieramagdu Indigenous community in the Roebourne cultural planning process has, for example, led to a range of cultural and other initiatives which have contributed to a more sustainable lifestyle for the Ireamagdu people.

Story telling is undertaken by all art forms and can help develop a deeper 'sense of place' (see Box 74). In particular, performing arts groups, writers, historians and film-makers are telling Western Australian stories through literature, film, oral and written histories and theatre productions, often with local and regional themes. In addition, libraries play a vital role through collection, documentation and dissemination of information on industry and commerce and on the natural and cultural heritage capturing the stories of place and people.

BOX 74   THE ARTS, FOOTBALL AND A 'SENSE OF PLACE'

The Fremantle Dockers use local performing art groups such as Deckchair Theatre to entertain football followers before home games. This award winning collaboration includes the now famous Len Hall Day on Anzac Day that has seen a huge public response to the dramatisation of Anzac themes.

Deckchair Theatre tries to help people to see the football arena as a public event celebrating 'sense of place'— in this case the Fremantle region. Its themes are designed to help people reflect on what is special about their place and celebrate it. Such use of the arts is an important element of community development.

Cultural tourism

A far greater recognition is now given to the potential for cultural tourism to generate jobs in a sustainable way. Arts and cultural experiences can act as magnets to draw people into towns, cities and regions and can extend visitor stays. They have the capacity to increase local and visitor appreciation and understanding of the unique social dimensions of each location. Historically, the State has concentrated on high yield tourism strategies based around its natural resources, yet these are its most fragile and least renewable resources.

In 2003, the Bureau of Tourism Research reported that cultural visitors contributed proportionally more to the Australian economy in terms of gross value added, gross domestic product, employment, wages and consumption than their non-cultural counterparts.

There is strong tourist interest in Indigenous arts and culture. Many Indigenous communities in Western Australia are acknowledged as important centres for cultural exploration, innovation and artistic excellence. Arts and cultural practice is often a valued and major income-earning activity and social development tool for these communities. There is significant potential to learn from successful communities and individual artists in order to further develop and expand the Indigenous cultural sector. The outcomes are likely to impact strongly on the local economy and facilitate progress towards reconciliation. Indigenous Cultural Centres in Western Australia have the potential to contribute significantly to community and regional identity and to tourism, but are currently suffering from a significant reduction in Federal funding. This has left many such centres without vital base funding. Sustainability of these centres requires a Federal and State (whole of government) response.

The State is now committed to greater diversification of tourism experiences and to placing more emphasis on cultural and Indigenous products.

Interpretation and sustainability

The cultural sector has a major role to play in providing quality interpretation of the State's natural and social environments to increase community and visitor appreciation of its unique qualities and to encourage responsible engagement with it. Western Australia's 250 local and independent museums have the potential to play a greater role in promoting understanding, not only of the State's social and natural heritage but also of its Indigenous heritage.

The Western Australian Museum is delivering a range of programs designed to engage the community with sustainability issues. These include Museumlink, Biosphere West and three educational exhibitions, *Sustainability WA*, the Power of Wind at Work and the forthcoming Watching Waste, which encourage Western Australians and visitors to consider the economic, environmental and social issues that must be addressed to move to a more sustainable future. Other initiatives include the Lurjarri Dreaming Trail in Broome and the Kimberley Coastal Odyssey which serves to interpret local and marine life. In addition, the Western Australian Museum Documentary Unit is creating a visual record of the State's environmental assets and, at the same time, vastly expanding its audiences.

BOX 75   WA MUSEUM DOCUMENTARIES TAKE BIODIVERSITY MESSAGE TO THE WORLD

Life on the Edge Down Under, on the creatures and ecosystems of the Dampier Archipelago, has now been sold to nine countries, reaching an audience in excess of 50 million people. The Unit is currently involved with *NHK (Nippon Hoso Kyokai)*, Japan's largest public broadcaster and *Storyteller Productions on Operation Leo* about the exciting new megafauna fossil finds on the Nullarbor Plain. A third project (it has twelve social and natural history projects in train), focuses on a new species of reptile in Indonesia and involves a partnership between *National Geographic* and *Artemis International*. These initiatives have important ancillary benefits for tourism and international partnership as well as for sustainability of the natural environment

Regional cultural development

Arts and cultural development can stimulate economic activity and operate as an effective tool in regional development. A culturally rich environment has great appeal to residents, tourists, business leaders and investors. There are numerous examples around Australia of where arts and culture have been crucial elements in regional regeneration and in boosting local development.

Supporting a vibrant culture not only advantages the broader Western Australian community, it makes good business sense. Art and cultural experiences can provide points of attraction in urban and regional centres, create new products in the market place, add value to others, assist in trade, corporate and customer relations and help create quality environments and desirable base locations from which business can operate. In this sense, the arts and culture are active contributors to a sustainable and desirable commercial environment.

Cultural infrastructure

Cultural infrastructure is essential to a sustainable culture. It underpins and facilitates cultural expression, the communication of ideas and the provision of a rich cultural life for all Western Australians. It has the potential to be iconic in nature and can contribute significantly to urban and regional landscapes. It can have significant implications for tourism and the economy. Development of this infrastructure should be seen as a tourism and economic investment as well as a cultural investment. Greater access for Western Australians to cultural activities, as both participants and audiences, is critical to the development of a sustainable and uniquely Western Australian culture. The Western Australian Government plays a key role in planning, upgrading and building arts and cultural facilities for this purpose. To effect this, the Government has committed to a 10-year capital works plan designed to provide up-to-date infrastructure for a wide range of arts and cultural purposes including a new performing arts venue, the relocation of museum collections and museum planning for the future, and artist studio spaces.

Creating 'sense of place' through art in Kalgoorlie. A Percent for Art Scheme Project Eastern Goldfields Senior School Campus Artist: Tony Pankiw

Source: Courtesy of the Artist

The Shark Net is about Perth's 'sense of place' - its treasured coastal environment, relaxed lifestyle and coming of age as a city.

The Shark Net - A Taylor Media Production financed by ABC TV, Australian Film Finance Corporation, Screenwest and Optus Television.

Source: David Dare Parker

Cultural hot spots

A thriving contemporary arts base is essential to a sustainable cultural life for the State.

Screen industry

Film and television production has a vital role to play in Western Australian culture. The Screen Industry Partnership Fund and the ABC co-production deal for local industry development purposes will assist in the promotion of more localised film and television production and assist the performing arts generally. This key support will encourage the industry to become more stable and attract significant funding from other sources to contribute to the State's activities.

Biodiversity

The south west corner of Western Australia is one of the world's biodiversity hot spots. A recent paper in the prestigious science journal *Nature*, identified twent-five hot spots around the world where biodiversity is especially high. The south west is the only one of these hot spots in a developed country. The Western Australian Museum has a major commitment to sustainability and to biodiversity research and public programs (see also *Contributing to global sustainability*).

### BOX 76   WESTERN AUSTRALIA A BIODIVERSITY HOT SPOT

Our understanding of biodiversity in this country is still basic. For hot spot areas, we have barely scratched the surface in documenting the diversity of life. Just last year, Western Australian Museum researchers were involved in the discovery and description of a new species of mammal, a species of Pseudantechinus. There are very few places in the world where new mammals are still being found.

Contemporary design

At a micro level, the *Designing Futures* project has been initiated by Craftwest to significantly elevate the role of design as a tool in key Western Australian industries to stimulate innovation and products. The project has been designed with an initial, but not exclusive focus on the timber and wood industry in the south west and will be applied to a range of industries and product designs.

BOX 77   GENERATING EMPLOYMENT AND INNOVATION IN ESTABLISHED INDUSTRIES INCLUDING THE TIMBER INDUSTRY WITH FINE WOOD CRAFTS

Designing Futures is a creative partnership with industry to cultivate innovation and a strong design culture in Western Australia. It will have tangible employment, business and environmental outcomes, which capitalise on Western Australia's intellectual and creative resources. It involves a series of residencies, exhibitions, seminars and cultural exchanges, which bring together top international designers with Western Australian artists to extend local design skills and create new products and processes. Designing Futures links artists, manufacturers, industry and the training sector together. Its initial goal is to help create a more sustainable timber industry for the State. Other areas of focus are glass and ceramic production and jewellery design in association with the State's mineral and pearling industries.
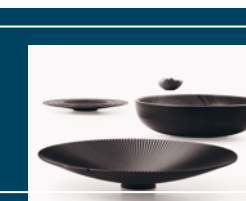
Leading, contemporary Western Australian fine wood crafts by Vaughn Richmond, Tim Leaversuch and Clive & Jenny Kendrick, produced as part of Craftwest's Designing Futures initiative.

Source: Craftwest

The project has already attracted partners in Rio Tinto, Wesfarmers, the Departments of Industry and Technology, Local and Regional Government, and Culture and the Arts, ArtsWA, the Australia Council and the Lotteries Commission.

Broome

The fusion of Asian, Indigenous and European cultures in the Broome and Kimberley region has stimulated a vibrant contemporary arts practitioner and cultural resource base. This includes an Indigenous music corporation, a regional Indigenous publishing house, radio and television stations as well as film production and contemporary music teams and a flourishing performing and visual arts scene. These contribute actively to the cultural identity of the region and the State.

Contemporary Music

Western Australia's isolation from the east coast of Australia has spawned a flourishing independent contemporary music scene and unique sound, with the quality of its musicians and their bands now attracting significant interest from Eastern States and overseas managers, promoters and labels, leading one national newspaper to describe Perth as the new 'Liverpool of contemporary music.'

Box 78 illustrates how the arts and culture can bring sustainability to life for people. This is one of many across Western Australia, each of which addresses issues pertaining to sustainability. In this instance, art has been used to communicate in a culturally relevant way, a potential solution to the growing diabetes problem among members of remote Indigenous communities in the north west of the State (see also *Sustaining healthy communities*).

BOX 78   HONEY ANT DREAMING

Over a year ago, Roebourne's Cheeditha Aboriginal community and the West Pilbara College of TAFE started an Indigenous art program in a disused heritage building in Cossack.

One participant, Mr Terry Willis, created a work called Honey Ant Dreaming, depicting ants' nests full of eggs with males collecting sugar. Purchased by diabetes nurse educator, Ms Sam Chandler, it was subsequently used as a teaching aid for a pilot diabetes project run by the Mawarnlkarra Health Service, the Pilbara Division of General Practitioners and the West Pilbara Health Service.

Ms Chandler noticed that the painting depicted how insulin works in the body, 'There's the sugar and the body cells and the ants, which are insulin from the pancreas'. One in two Aboriginal people in the region have diabetes and this is a good example of art informing and educating for sustainability. The program itself also provided those with health problems a reason to feel and get well.

'Healthy interest in art helps beat diabetes', *West Australian* 3 July 2002, p.13

Public submissions demonstrate that the role the arts and culture can play in the sustainability agenda can be enhanced in three ways:

- consolidating the role that all arts and cultural activity can play in enhancing a 'sense of place' including community arts
- enhancing the capacities and viability of arts and cultural organisations through a changed focus in funding and support programs, and
- embedding arts and cultural considerations in the sustainability assessment of projects, programs and policies.

Enhancing the capacities and viability of artists, arts and cultural organisations.

A sustainable cultural life for all Western Australians necessarily involves support and partnership from all levels of government (State, Federal and local) complemented by the entrepreneurial and marketing endeavours of the State's arts and cultural organisations. The need to pursue strategies that address the lack of economic status and financial viability of artists is also essential. This is being addressed through the review and development of a number of arts and cultural policies in Western Australia. These include a review of arts development policy, a regional cultural policy, a contemporary music policy, an arts and education policy, an Indigenous arts and cultural policy, a re-focused cultural tourism strategy, a capital works policy and a policy on small and independent museums. Two major national reports will also influence future funding practices. These are the *The Small to Medium Arts Sector Report* and the *National Arts and Crafts Inquiry (Myer)*. These developments are all intended to contribute to a more progressive funding and support system for arts and cultural organisations.

Other trends requiring greater attention are the 'demand driven' funding strategies used to support touring networks and the importance of touring itself. The opportunity for Western Australian artists, arts and cultural organisations to tour and export services nationally and internationally is fundamental to their growth and viability, given the limitations to their growth

resulting from the State's small population base. These strategies can mobilise community interest in the arts and culture, empower communities to express their preferences for a range of cultural experiences and create a viable and exciting arts and cultural profile for the State.

Embedding arts and culture in sustainability assessment

Social assessment (incorporating arts and cultural considerations) is a major component of the triple bottom line process proposed in the State Sustainability Strategy. Such an approach is supported by the World Bank, which has argued the need to marry cultural activity to economic development.

The framework for social assessment is still in development and is clearly an interesting and emerging discipline. Similarly, the quantitative measures for the arts and cultural contribution are yet to be fully defined, with many OECD governments currently giving this attention. However there is widespread recognition that they have a valued role to play in a balanced and sustainable society and as active contributors in examining social concerns. Examples of this are the contribution of the Western Australian Museum to the debate on the protection of the rock art of the Burrup Peninsula and the ongoing role of the Western Australian cultural sector in the performing arts, literature and visual arts in reconciliation and in expanding understanding and appreciation of Indigenous culture in all its forms in Western Australia and overseas.

The assessment of the cultural dimension of all projects will inevitably include consideration of existing cultural networks and how they can be maintained and enhanced, how the cultural and artistic significance of places is understood and supported and how Indigenous issues can be assessed.

Global opportunities

Western Australia's gateway position on the Indian Ocean Rim creates many untapped opportunities for celebration, cultural exchange, development of relations in the region and expansion of needed markets for the State's arts and cultural organisations to help sustain them. Important research partnerships between the Western Australian Museum and regional neighbours are critical contributors to understanding and sustaining shared species and environments.

In addition, the Western Australian screen industry continues to consolidate production and market relationships with key worldwide partners. Opportunities for animation, including continuous 24 hour film work production cycles between the Atlantic and Indian Ocean zones, are being developed in Western Australia.

Important opportunities exist to:

- Take advantage of the new ABC production facilities and associated funding to ensure a local film and television production industry develops in Western Australia.
- Enhance Indigenous employment opportunities in the arts and cultural sector to encourage greater representation of Indigenous culture and history in local museums, particularly the globally significant Burrup rock art.
- Embed art in the health system and other arts and health partnerships to improve health outcomes.
- Develop a range of strategies to make Perth (city centre and sub centres) more culturally vibrant and thereby a better place to visit and live.
- Achieve tourism investment in the Western Australian Museum's eco and Indigenous tourism products.
- Institutionally integrate the use of art and artists in planning processes and in land developments so as to help create a sense of difference and enhance urban settlements.
- Have artists work alongside scientists addressing the sustainability agenda to generate new products and to offer new solutions to complex problems.

- Develop new capital infrastructure for the arts and culture.
- Establish a Cultural Property Bank for medium-term lease of government properties and land holdings for temporary use on peppercorn rents as artists' studios.
- Encourage the Federal government to introduce *droite de suite* (resale royalties) on artworks and intellectual property rights for individual artists.

In short...

Vision

Culture and the arts are essential to a rich and sustainable life for Western Australians. They are a source and a catalyst for developing the Western Australian community's sense of identity, place and vision for a sustainable future.

Objective

- Reinforce a sense of place and identity in the community.
- Include creativity and the arts in policy development, implementation and sustainability assessment of new projects, policies and programs.
- Increase industry's utilisation of the arts and creative industries in research, innovation and entrepreneurship in the arts.
- Encourage greater personal creativity and participation in the arts and cultural activities.
- Develop a vibrant and competitive economy for the arts and creative industries.
- Contribute to urban regeneration and planning processes and projects.

Actions underway

- The Department of Culture and the Arts is encouraging a whole of government approach to arts and culture.
- The Department for Planning and Infrastructure's Working Paper No. 12 *'Can Perth Be More Creative?'* supports a shift to innovation and creative industries and a proposal to move the arts and culture centre stage in Perth.
- Community Arts Networks of Western Australia has been working with local governments to develop cultural plans and has conducted cultural planning with Aboriginal communities such as the Ieramagadu (Roebourne) community.
- Expansion of the Percent for Art scheme.
- A package of support to underpin and extend the reach of the Western Australian contemporary music industry.
- MuseumLink's *Sustainability WA* exhibition and *Watching Waste* toured the metropolitan area and regional areas. *The Power of Wind* exhibition is being developed.
- The Western Australian Museum is playing a leading role in promoting and understanding the biodiversity of the State.
- Fremantle Aboriginal Heritage Walking Tour has been established.
- A cultural tourism strategy for Western Australia which capitalises on renewable resources is being developed.
- *Symbiotica* - A science/arts project.
- The Culture and the Arts portfolio is committed to improving the diversity of its workforce.

A Percent for Art Scheme Project for the Broome Health Services. This project exemplifies sustainability in art practices. The artists were involved at the earliest stage of the building project and the artworks are highly integrated with the building materials. The motifs and themes of the work respect the cultural norms and traditions of the local Indigenous communities.

Artist: Francine (Ngardarb) Riches with mentor Tony Riches

Source: Malcolm McGregor

In short cont'd...

Actions

5.37 Through the Sustainability Roundtable and in close cooperation with arts and cultural organisations, hold a Sustainable Living Festival to showcase innovative approaches to sustainability with a focus on culture and lifestyle.

5.38 Develop programs, partnerships and incentives that encourage research, for example into cultural heritage, innovation, new products, entrepreneurship (new distribution channels) and business sponsorship through the arts around key sustainability issues.

5.39 Encourage funding criteria that facilitate endeavours in arts and cultural activities that promote sustainability.

5.40 Ensure that sustainability is embedded in the goals of community arts and community cultural development processes.

5.41 Involve Indigenous people directly in planning, especially for new developments so that regional Indigenous stories and perspectives can be built into the emerging story of the region.

5.42 Support cultural tourism endeavours that meet heritage, reconciliation, environmental and community access and development criteria.

5.43 Continue to shape a redevelopment plan for the Western Australian Museum, which examines ways to utilise the new facilities as sustainability and educational tools for the public.

5.44 Identify new land development and planning projects, which can involve artists to create a sense of difference and relate people to their land.

5.45 Take advantage of the new ABC production facility to create new production partnerships in Western Australia that can focus on urban and regional sense of place.

5.46 Work with the Department for Planning and Infrastructure, local government and relevant cultural and other organisations to embed cultural planning in town planning to achieve an integrated sustainability approach to the development of new and revitalised communities.

5.47 Through the Western Australian Museum continue to make major commitments to the preservation of the biodiversity and cultural diversity of the State, including by establishing a Sustainability Unit, the first of its kind in an Australian museum.

5.48 Enable communities to develop their own exhibitions at the Fremantle, Perth, Kalgoorlie, Albany and Geraldton Museums to enhance local sense of place.

5.49 Initiate a Culture and the Arts Portfolio statement of principles, policy and action plan for Indigenous Western Australians that incorporates sustainability.

5.50 Develop a framework for support for local and independent museums in Western Australia that enables them to better facilitate 'sense of place'.

5.51 Formulate a new Arts Development Policy for Western Australia incorporating sustainability.

Further information

Department of Culture and the Arts: *Cultural Capital – A Response to Focus on the Future: Opportunities for Sustainability in Western Australia.*

Rhodes, A 2002, *The Heart of Sustainability*: *An Encore for Culture and the Arts*, sustainability background paper, State Sustainability Strategy CD-ROM, Department of the Premier and Cabinet, Perth.

> SUSTAINABILITY THROUGH MULTICULTURALISM

Western Australia is a highly diverse community which provides extra opportunities to address the global and local sustainability agenda.

Although the definition (of sustainability) includes the concept of social, the definition used for conceptualising sustainability is inadequate as it excludes the concept of culture … An inclusion of the concept of culture not only recognises the cultural dimension of sustainability, but also provides a space/place in which different groups (Indigenous, women, youth, ethnic minorities) needs and aspirations can be valued.

Community Arts Network

Historically, multiculturalism evolved primarily as a philosophy of settlement countering the orthodox views of monoculturalism or assimilation. Today, multiculturalism in Western Australia is a commitment to social equality based on four key principles: civic ideals, fairness, equity, and participation.

Multiculturalism is based on democratic pluralism and a shared citizenship, and reinforces the equal rights and responsibilities of all Western Australians. However, for sustainability to be achieved equality should not reflect sameness. Service providers, policy makers, and the like have to be prepared to treat people differently to sustain equality.

While the explicit acknowledgement of the demographic and cultural diversity of Western Australia indicates the role and nexus between migration and sustainability, multiculturalism as a critical framework that offers insights about how members of communities live and/or co-exist is a critical factor in the overall conceptualisation and development of the State Sustainability Strategy.

The inclusion, participation and contribution of people from different ethnic, religious and linguistic backgrounds is critical to the effectiveness of the State Sustainability Strategy. As elaborated in *The conceptual basis: developing a framework for sustainability*, little progress has been made on resolving the social aspect of development. Incorporating the social dimension into the economic development process is necessary to achieve creative partnerships that can contribute to sustainability.

Today's Western Australia is a multi-ethnic and multicultural society whose members are drawn from a rich heritage of cultural traditions and histories. Ethnic, religious and linguistic diversity poses a number of challenges to decision-makers, service providers and policy makers.

The central issue relates to creating and sustaining a cohesive, cultural and political identity. This means enabling, empowering and ensuring that all citizens have a legitimate voice as Western Australians. It demands inclusion, and not exclusion based on the grounds of race, ethnicity, national origin, language, as well as factors such as the length of time spent in Western Australia. Excluding those who appear or are considered to be 'different' threatens the sustainability of a stable and productive State.

The benefits of multiculturalism to sustainability come from the benefits of recognising difference. Different cultures have different approaches that can be utilised for solving the multiple problems of sustainability. Their integration and application to sustainability comes from a mutual recognition of the fundamental principles underlying sustainability. If sustainability is to be achieved, the one size fits all approach to the development and implementation of social policy and programs is inadequate to address the State's cultural, linguistic, and religious diversity. The need for appropriate interventionist and proactive initiatives must move from the rhetoric to the pragmatic and real. Sustainable development demands that multiculturalism becomes part and parcel of the norm rather than an adjunct relating to the 'other'.

Multiculturalism challenges 'old' or traditional ways of conceiving how a community may live, work and grow together when that community is heterogenous, rather than homogenous or mono-cultural in terms of practices and beliefs. Therefore, to develop a multicultural State, community groups must be empowered to participate as well as confront the many challenges we all continue to face in terms of prejudice, discrimination and invisibility. If sustainability is to be achieved, it is critical for the rights of all Western Australians to be safeguarded, and for diversity to be promoted and recognised.

Multiculturalism, and the notion of diversity, should help inform and shape the planning, development and delivery of services. Such an approach necessarily means processes that facilitate clients and customers from diverse backgrounds to participate in the design and delivery of services and products from the outset, and not as an afterthought. Including diverse people in the conceptualisation of services will result in the delivery of responsive and cost-effective services, as well as greater innovation, creativity and productivity.

Sustainability is about building communities and strengthening the bonds between them. The *Community services and development* section explored some of the principal ways in which that can be done. Multiculturalism and sustainability mean that the cultural needs of all citizens must be recognised and that they be empowered to participate effectively, creatively and critically in community life. This includes ensuring that the necessary assistance for people from culturally and linguistically diverse backgrounds is made available so that they are able to participate in a meaningful way.

It also means that there is a greater representation of diversity in decision making processes and that an emphasis is placed on community partnerships through meaningful consultation and negotiation on policy development and implementation. Some measures are already being implemented to give effect to an even more inclusive and diverse Western Australia. These include the establishment of an Anti-Racism Strategy (see Box 79).

BOX 79   ANTI-RACISM STRATEGY

The purpose of the Western Australian Government's Anti-Racism Strategy is to eliminate racism in all its forms by first understanding racism in all its manifestations and then taking action to address the social and structural issues. It is a strategy that supports sustainability principles. It seeks to meet its objectives by:

• Forming strategic and community partnerships with other bodies in relation to anti-racism.

• Increasing public awareness of racism.

• Empowering groups which are targets of racism, through advocacy, public education and the provision of credible and persuasive information.

• Strengthening the *Equal Opportunity Act 1984*.

• Addressing issues as they arise in the short-term and developing and implementing longer term strategies to target specific structures and behaviours.

• Encouraging and acknowledging positive initiatives in the elimination of racism and the promotion of harmonious relations in the community.

On the basis of a wide-ranging consultation process, a committee, chaired by the Premier, is developing the Anti-Racism Strategy.

There are a number of constraints to the achievement of the ideals of multiculturalism in Western Australia, including:

• the many definitions associated with multiculturalism over a considerable period of time which have caused much confusion and, at times, discontent amongst Western Australians

• the perception that multiculturalism refers to a policy perspective which provides special treatment for people of diverse backgrounds

• the association of multiculturalism primarily with the practice and preservation of traditional cultures, including food, song and dance

• the lack of recognition of the unique status of Aboriginal people as the first Australians in previous policies relating to multiculturalism, which has contributed to the rejection of multiculturalism by Aboriginal Australians

• the attachment of some Western Australians to a monocultural Western Australia

• the refusal by some Western Australians to treat people of diverse backgrounds as equals worthy of dignity and respect

• the anxiety/fear of difference felt amongst some Western Australians and

• tension amongst and between Western Australians of diverse backgrounds.

However, there are also some promising opportunities for sustainability in the achievement of multiculturalism which include:

• Western Australia, as confirmed through the 2001 Census, has the highest proportion of persons born overseas of any Australian State or Territory

• research shows that migrants help make links to the global economy and contribute significantly to the local economy

• partnerships between the government sector, non-government sector and community groups in the development and implementation of joint initiatives which promote multiculturalism, and

• collaboration across the public sector to ensure strategies are sustainable and effective.

In short...

Vision

An inclusive Western Australia where all individuals and groups participate equitably and in a spirit of mutual respect, enriching, developing and sustaining the social, economic and environmental development of our State.

Objectives

• Building and sustaining the democratic and egalitarian traditions of this State by enabling all its members, drawn from a rich heritage of cultural traditions and histories, to enjoy individual freedom, mutual respect and equality of opportunity to participate equitably in all spheres of life.

• Developing strategies for public sector services to respond to the needs of diverse groups of clients, including newly arrived migrants, refugees, women, seniors and youth.

• Utilising the State's diversity to generate greater innovation, creativity and productivity for the State's development and sustainability in the future.

Actions underway

• The implementation of the government's Charter of Multiculturalism, including a format for reporting on progress being made towards the ideals of multiculturalism.

• The development of an Anti-Racism Strategy for Western Australia to address issues relating to individual and systemic racism.

• Implementation of strategies to empower diverse communities to achieve a more inclusive society.

• The development and implementation of a community education strategy to achieve better understanding of multiculturalism and related concepts.

• Further development and implementation of the government's language services policy to develop communication strategies that improve access to services by people with a limited proficiency in English.

• Developing strategies for reflecting greater diversity in representation.

In short cont'd...

Actions

5.52 Through the Sustainability Roundtable hold a seminar entitled Many Cultures: One Earth to consider sustainability in Western Australia from an ethical and cultural perspective and involve the authors of background papers on the ethics of sustainability.

5.53 Finalise and implement the Anti-Racism Strategy including consideration for developing racial and religious vilification legislation and provision of anti-racism training.

5.54 Explore the establishment of a skilled migration unit within the public sector.

5.55 Continue to develop multicultural policies and perspectives which link multiculturalism to sustainability outcomes so that ecological, social and economic spheres benefit by the contributions of minority groups.

Global opportunities

Multicultural perspectives in sustainability are a truly global phenomenon and should be pursued in this context.

Further information

People from a diverse range of creeds, traditions and philosophies were invited to submit submissions on ethics and sustainability. These are available on the CD-ROM and the sustainability web site.

Multiculturalism is celebrated in the Fremantle sculpture of Italian-born sculptor Porcelli, who made statues of famous Western Australians but was little known himself. The influence of Italian culture in Fremantle led to alfresco dining which has helped to revitalise inner city areas across Perth.

Source: Peter Newman

Sustainability and business

6

Vision for Western Australia

Western Australian businesses, large and small, are globally innovative and receptive, leading to the resolution of sustainability issues at home and abroad and achieving competitive advantage and prosperity.

Goal

Assist business to benefit from and contribute to sustainability.

Priority areas for action

I personally believe that sustainability is the most important issue facing…industry… in the 21st century. We look at it not just as a requirement, but as an incredible opportunity. I see a day when everything my company does - our facilities, our products, our services - contribute to a sustainable future. We have an opportunity to have a major positive impact on society. We cannot afford to miss this opportunity.

William Clay Ford, Jr., Chairman, Ford Motor
Quoted in The Chamber of Minerals and Energy submission

Through responsible entrepreneurship, progress towards sustainability can be won for all.

Sustainability Through the Market, WBCSD

In recent years, the concept of sustainability has increasingly been considered part of mainstream economics, industry development and business practice as governments, opinion leaders, business, media and the broader community seek to confront a range of environmental and social challenges.

As part of this dynamic, there has also been a growing recognition of the essential link between the goals of sustainability and economic development. Instead of viewing economic growth purely as a constraint on the achievement of sustainability, it is increasingly acknowledged that business efficiency, trade competitiveness and technological change are vital prerequisites for achieving those outcomes which sustainability seeks to enshrine - the sustainable use of resources, proper management of the environment and equity of opportunity to participate in prosperity and progress.

Businesses contribute to social advancement and environmental protection through a range of ways including through the payment of taxes and rates. Without a growing business sector, our capacity to engage in current and future environmental protection and social responsibility will be severely compromised.

Change for sustainability will still need businesses to grow. Economic development invariably involves technology breakthroughs or innovations in a product; these can bring significant benefits for sustainability if community demands through the market are pushing in that direction, e.g. the replacement of plastic bags will lead to the growth in more acceptable containers.

The challenge for business is to recognise that globalisation, economic deregulation, emerging technologies and new cultural values have changed the way we do business, what consumers want and what is expected of the business sector. Like the industrial age before it, the onset of the digital or knowledge age is ushering in a new set of economic and social values. Fierce competition and surplus capacity are forcing businesses to rethink their strategies and search for better ways of creating value and economic sustainability for the future. As the old strategies become less relevant and less profitable, companies are searching for new business models and new relationships with consumers to satisfy public demand.

As a result, business organisations around Australia and the world have been examining over the past ten years how the economy and their individual business operations can make a positive contribution to sustainability. Individual companies in Western Australia are also taking innovative approaches to sustainability (see Box 11 on Hamersley Iron's sustainability assessment process in *Sustainability and governance: Sustainability assessment* and as well as many of the Sustainability Case Studies <http://www.sustainability.dpc.wa.gov.au/docs/CaseStudies.htm>).

Businesses have also identified a range of new opportunities arising from the sustainability agenda. As BP Australia has demonstrated, there are real niche opportunities for the early movers in sustainability (see BP Submission). As economic reforms for sustainability take effect, the shift of capital to investments in sustainability will accelerate. Innovation will become vital for industry to adjust to the financial and economic reforms likely to occur globally in response to the challenge of sustainability. In the future, sustainability and social responsibility will be as important as brand identity and, as a result, businesses are increasingly developing and realising their knowledge and practice of sustainability.

Government also has a critical role to play in promoting greater business sustainability through:

- strengthening and reinforcing a common understanding of the value of economic growth, technology and trade for sustainability

- setting fair, equitable and transparent governance arrangements that provide the right conditions for business and investment, and

- encouraging and supporting business, both large and small, to make the transition to sustainability and take advantage of the significant economic opportunities in the global sustainability agenda by providing market intelligence, promoting market access and by assisting with the skilling of business.

One of the most significant aspects of this new business environment for both business and government is the partial transfer of public expectation for leadership in solving social problems from the public to the private sector.

Accordingly, there is a need for a new system of partnership between the government, business and civil society, recognising the need for the market to operate consistent with a shared commitment to sustainability. This new partnership will enable Western Australia to seize the economic opportunities that the sustainability agenda can provide.

The active promotion of this partnership is the first stage in recognising that economic growth and technological change can be solutions to our environmental and social challenges.

The World Business Council for Sustainable Development is the peak business organisation examining the business case for sustainability, and draws its membership from high profile global corporations, including some with substantial operations in Western Australia. Business organisations have consistently recommended that governments establish a more appropriate market context for business to assist in the transition to sustainability. The World Business Council for Sustainable Development has identified seven key changes required if business is to assist in achieving sustainability through the market (see Box 80).
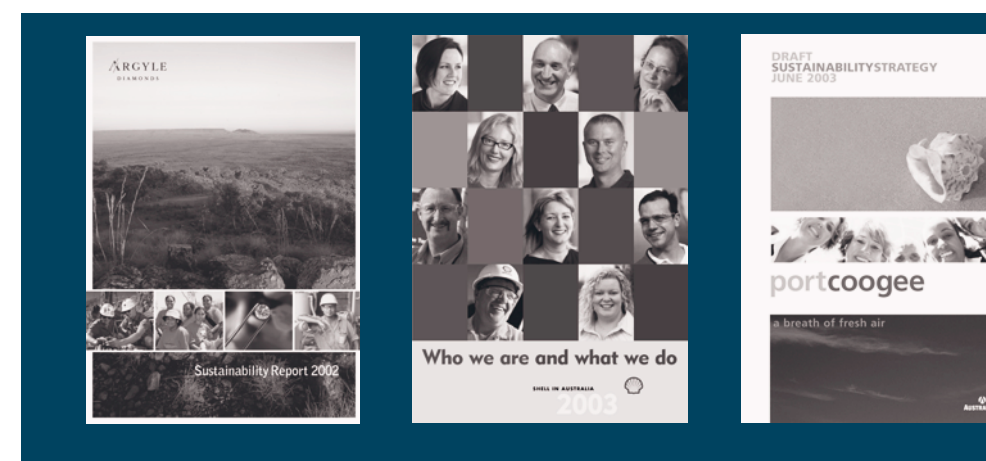
Businesses are increasingly doing 'sustainability reports' as a means of integrating their triple bottom line reporting processes.

Source: Argyle, Australand and Shell

Key 1 Innovate
Establish a culture and capacity for technological and social innovation to generate sustainable solutions, products and services.

Key 2 Practise eco-efficiency
The World Business Council on Sustainable Development defines eco-efficiency as being 'achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the Earth's estimated carrying capacity.'

There are three areas that are critical to practising eco-efficiency:

• reducing resource use, impacts, and operational costs

• cooperation between companies to improve cost efficiencies while moving towards a zero waste target; and

• delivering better design and functions for lower impact in use and higher market share.

Key 3 Move from stakeholder dialogues to partnerships for progress
Promote the establishment of partnerships for progress which are built on common goals, empathy, open feedback, flexibility, ability to compromise, and shared rewards. Such alliances can offer business, government, and civil society new solutions to common concerns facing us all.

Key 4 Provide and inform consumer choice
Business, government and community organisations using the media, advertising and other forms of communication, combined with behavioural change programs to promote sustainability messages, fostering a consumer culture that helps people wield the power of demand in a thoughtful way.

Key 5 Improve market framework conditions
Market aspects which hinder sustainability include monopolies, perverse subsidies, and prices which do not reflect real economic, social, and environmental costs. Legislation and regulations to address these market failures are required for business to help achieve sustainability.

Key 6 Establish the worth of Earth
Create accurate and timely price signals so that resources are conserved and future opportunities are not squandered. Markets should reflect the true environmental and social costs of goods and services, requiring the removal of perverse subsidies. The use of economic instruments such as tradeable permits is recommended.

Key 7 Make the market work for everyone
Ensure that new technologies and sustainable goods and services are affordable to all in society, and that they are transferred to developing regions of the world to alleviate poverty and increase intra-generational equity. To do this will require overcoming protectionism and spreading purchasing power to those who most need it. Partnerships with government and civil society can also make markets work better.

A significant issue for business if it is to make a real contribution to sustainability will be the ability to mobilise sufficient human and financial resources to make the transition to the new business environment. This section of the Strategy discusses four areas where support will be necessary.

Firstly, the overall thrust of the economy towards knowledge-based goods and services is an important component of sustainability, particularly in generating the new jobs required to achieve sustainability. Business, particularly small to medium-sized businesses, require support in building their capacity for sustainability, including the provision of training for a knowledge-based sustainability economy.

Likewise, the innovation needed to make a contribution to sustainability also requires a new kind of research and development. The *Sustainability and governance* section of this Strategy contains a proposal to facilitate sustainability science in Western Australia and the Global Centre for Sustainability is suggested as a vehicle for attracting large sustainability projects to Western Australia.

Secondly, financial reform and the ongoing development of robust economic policy are also essential for the emergence of more sustainable businesses. Important changes are emerging in financial markets where large streams of capital dedicated to socially responsible investment are stimulating new sustainable business activity. Government has an important role to play in encouraging a greater proportion of capital to be directed to sustainability.

A third section discusses and identifies opportunities for implementing sustainability by promoting industrial ecology, eco-efficiency and cleaner production.

Finally, the need for a greater sense of active partnership between industry and government has been identified. Consequently, corporate social responsibility and industry sustainability covenants, an innovation recently investigated by the Victorian Government, are also considered in this section of the Strategy. These covenants would enable businesses to achieve increases in environmental and social performance while improving the economic bottom line by committing to key sustainability outcomes in their goods or services.

These covenants are also an aspect of a larger partnership, which will be established with business to further explore how the Strategy can be finalised and implemented. A range of peak professional organisations exist to represent business and all of these are committed to exploring what sustainability means for their members. All of them were actively involved in the workshops and submissions related to the development to the Sustainability Strategy. Figure 12 outlines the proposed Partnership Projects with business that have either already been mentioned in other parts of this Strategy or are outlined in this section. The peak bodies which are designated to help develop these Partnership Projects through the Sustainability Roundtable are also listed.

Figure 12   Partnership projects for sustainability and business
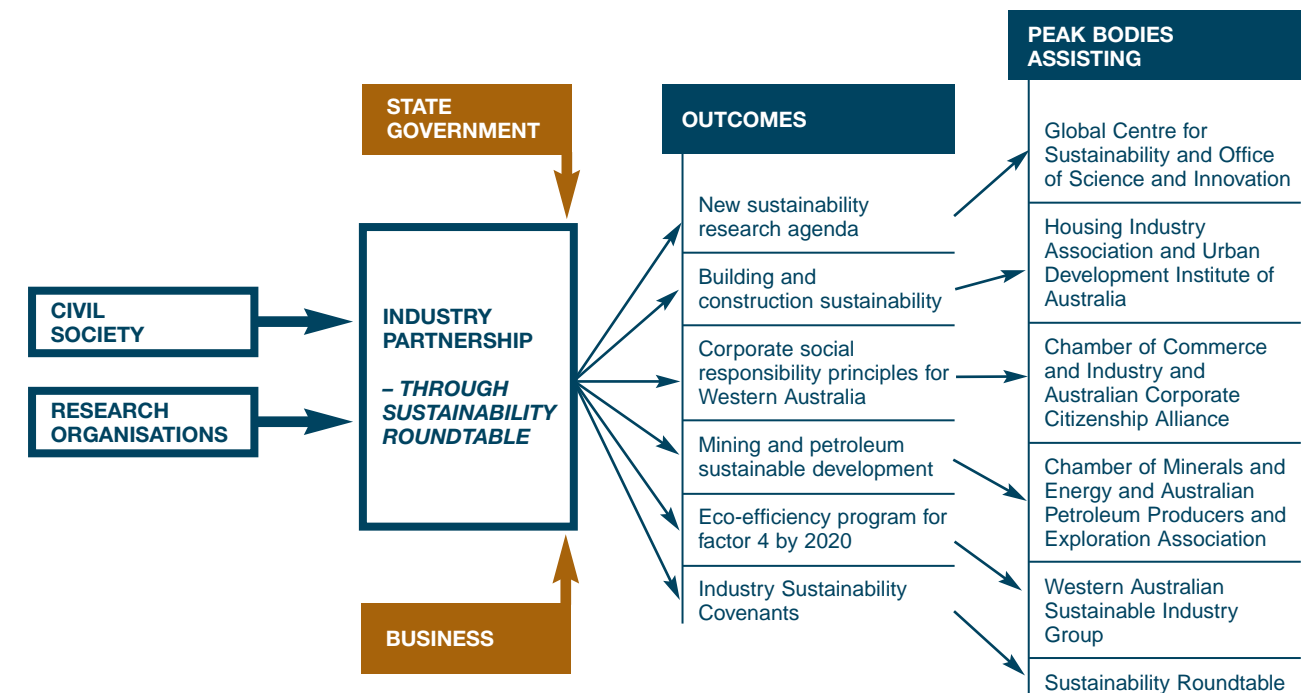
> TRAINING AND FACILITATION FOR SUSTAINABILITY

The new global economy of sustainability requires new concepts to be applied in business and industry and this requires training, and facilitation of sustainability enterprises.

TAFE colleges afford us the opportunity to transmit the core skills and values associated with sustainability both through formal programs and through general awareness raising initiatives.

Department of Education and Training

Each of the many emerging opportunities in sustainability requires a skilled workforce. Universities are able to assist through emerging disciplines such as environmental science, sustainable development, environmental engineering, environmental design and environmental health. However it is the vocational education and training sector that is best able to respond quickly to the needs of industry for many of its re-training and accreditation requirements.

TAFE in Western Australia has been developing a range of new courses that build on the Department of Educations and Training's Green Jobs report (see <http://www.accessallareas.westone.wa.gov.au/enviro/report/enviro1.pdf>). Innovative training programs have begun in bush regeneration, aquaculture, land management, renewable energy, water conservation, risk management, building and energy rating. TAFE is also well placed to provide accreditation for sustainability professionals.

Research is underway on the growth of green jobs, identifying emerging green jobs and potential skill shortages. Recently completed research has identified bioprospecting or niche 'bush product' opportunities in the south west. Similarly, four products (Blister Bush Oil, Sandalwood Nuts, Warrigal Greens and Swamp Sheoak) were identified as having high commercial potential. Work is continuing on sandalwood plantations and Kimberley wild flowers.

TAFE has become a model for the early implementation of the Cleaner Production Statement and one college has recently completed a model Environmental Audit. Consideration is also being given to establishing a specialisation in TAFE as a way of coordinating the new training agenda in sustainability. This can be an important link to the Global Centre for Sustainability, as major projects such as those envisaged for the Global Centre often require the kind of practical orientation that TAFE can provide.

The Department of Education and Training will also be involved in the implementation of the Australian National Training Authority's next national strategy to run between 2004 and 2008. This strategy will reflect 'triple bottom line' thinking and translate that thinking into specific programs and actions within the training framework, consistent with sustainability objectives.

Finally, employment creation is not just about education and training; it is also about facilitation of people with good ideas and skills to enable them to create partnerships for marketing and finance. This kind of facilitation can be done at the community level in ways that have much deeper sustainability outcomes, especially in rural areas. Western Australia has such enterprise facilitation programs in place via the Small Business Development Corporation, Business Enterprise Centre Network and the Department of Industry and Resources (in particular, the Office of Aboriginal Economic Development). A recent example of business enterprise facilitation in support of sustainability outcomes is provided at Box 81.

BOX 81   CLIENT BASED BUSINESS PLANNER PROGRAM

The Client Based Business Planner Program is a good example of the sustainability model in enterprise and training development.

This original program, operated by the Office of Aboriginal Economic Development (OAED) within the Department of Industry and Resources, looks at sustainability in Indigenous enterprise and employment. The program involves funding, or part-funding, an experienced enterprise and/or economic development planner, who preferably has experience implementing small to medium business within enterprise development such as the community development employment program (CDEP) organisations. The position has been called a Client Based Business Planner (CBBP) although its role is more extensive than simply planning.

The objective of the program is to provide a dedicated officer within the enterprise who, firstly, identifies sustainable enterprises which meet the needs of the organisation and its members, and secondly, sources funding, undertakes business planning and establishes the business when appropriate. Once established, the CBBP maintains a cursory overview of the business to ensure it continues to meet the overarching organisation's objectives. The CBBP is not responsible for the ongoing management of the business.

OAED officers provide initial assistance to the organisation in identifying whether a CBBP program is appropriate, sourcing joint funding where available and assisting with completion of application forms. Ongoing support is provided to the CBBP by OAED when requested and specialist assistance provided where necessary. The program funds the position on a reducing basis over three years to ensure that costs are borne by the expanding activities of the recipient organisation and that the program itself is sustainable.

In short...

Vision

Training leads Western Australia into major global market opportunities in sustainability as well as solving global problems.

Objectives

- Western Australia has a world-class training and education program for sustainability.

- There is a cohesive and proactive approach to training and education in Western Australia.

- There is a high level of understanding of sustainability and a skill base to enable Western Australia to take maximum advantage of the economic opportunities from the global sustainability agenda.

Actions underway

- In November 2001, the then Department of Training together with several TAFE colleges became signatories to the Western Australian Cleaner Production Statement.

- Selected TAFE courses promote sustainability principles.

- The Australian National Training Authority is addressing sustainability in its 2004-08 training framework.

- The Department of Education and Training has conducted research into 'green jobs' and the Department's web site provides information on 'green jobs' through 'Enviroworks'.

- Regional employment coordinators support the development of niche industries and jobs in sustainability.

In short cont'd...

Actions

6.1 Work towards establishing a centre of specialisation in applied sustainability in TAFE to coordinate the new training agenda in sustainability.

6.2 Expand the Green Jobs work of the Department of Education and Training to incorporate the various initiatives in the State Sustainability Strategy on new global employment opportunities in sustainability.

6.3 Ensure that when enterprise facilitation programs are being developed by the State government, sustainability principles are given consideration, and that there are developmental and community-based approaches to enterprise facilitation, especially in rural areas.

6.4 Provide leadership on certification and accreditation for professional activities.

6.5 Provide low cost, easily accessible and readily understandable information, education, awareness and referral measures to inform small business operators about sustainability, including actions arising from the State Sustainability Strategy, the opportunities this will present for small business and the ways to address these.

Global opportunities

Many global aid projects today are training for sustainability. A coherent training program in sustainability will lead to significant opportunities overseas, especially if it is in partnership with government, TAFE, universities and industries.

Further information

Annandale, D 2002 *The Potential for Green Jobs in Western Australia: A Report to the Department for Training*, Institute for Environmental Science, Murdoch University, Perth. http://www.training.wa.gov.au/sub-sites/access/content/enviroworks-report.pdf

The Environmental Technology Centre at Murdoch University was recently made a partner centre for the United Nations Environment Program. This enables the centre to provide training throughout the Asia-Pacific Region.

Source: Environmental Technology Centre, Murdoch University

> FINANCIAL REFORM AND ECONOMIC POLICY FOR SUSTAINABILITY

Business practices have undergone major changes in recent times in response to challenges arising from the sustainability debate, particularly the ongoing challenges for environmental stewardship and social responsibility.

Business can be most effective in the development of innovative approaches to help achieve sustainable development,

World wide Fund for Nature Australia

We need to put a true monetary value on our enjoyment and use of our natural environment and biodiversity. The quality of life we enjoy because of living in a healthy environment, being able to visit a clean beach with clear water, being able to enjoy a walk in the Karri forest needs to be measured.

Sylvia Tetlow

… innovative and entrepreneurial companies can take advantage of new technology and/or consumer preferences to deliver more sustainable products and services which take into account the environmental or social benefits. Government can assist this process through financial support, taxation changes or preferential purchasing policies.

Halliburton KBR

The Government recognises that one of its primary roles is to promote a sound, stable and competitive business environment that encourages sustainable business activity, promotes market competition and encourages future growth in competitiveness, employment and productivity. This role is as important for the achievement of sustainability as it is for encouraging industry development and business growth.

Creating the right conditions to support local businesses to responsibly and confidently exploit the available opportunities in sustainability is essential if Western Australia is to maximise its potential and provide a superior quality of life for all members of the community.

To this end, the government is committed to developing its Industry Policy and other economic development strategies in a manner that is consistent with community expectations regarding environmental stewardship and social responsibility.

A critical issue for business if it is to make a significant contribution to sustainability will be the ability to mobilise sufficient financial resources to make the transition. Important changes are emerging in financial markets where large streams of capital dedicated to 'ethical investment' are stimulating new sustainable business activity. Currently the Australian ethical investment sector totals $10.8 billion and grew by 80% in 2000. The Dow Jones Sustainability Index and other similar indices are showing consistently higher rates of return for investors than traditional indexes. The scale and rate of growth of the global ethical investment sector, and the incorporation of sustainability principles into the investment behaviours of the market in general has enormous implications for the development and transfer of sustainable technologies and businesses.

BOX 82   MARKETS AND SUSTAINABILITY – THE BUSINESS PERSPECTIVE[56]

Sustainable development is best achieved through open, competitive, rightly framed international markets that honour legitimate comparative advantages. Such markets encourage efficiency and innovation, both necessities for sustainable human progress.

Business remains the most potent force for wealth creation. The extent to which that wealth goes toward poverty alleviation depends largely on societal choices. Countries do not have low incidence of poverty because of their welfare programs, but largely because they have created frameworks that encourage business enterprise. These enterprises offer people tools – business opportunities, jobs, wages, investment possibilities, training, and pensions – with which to build secure lives.

Governments that make it hard for business to do business and that try to take the place of business in meeting people's needs keep their people poor…

Business should contribute and play a role in building a free and equitable international market – a market in which trade is not distorted by subsidies, tariffs and non-tariff barriers.

Government has an important role to play in encouraging the direction of a greater proportion of capital to sustainability. In particular, small and medium-size businesses often have difficulty accessing ethical investment funds, and government can play a useful role in linking Western Australian innovations for sustainability with these funds.

The structure of the economy is partly determined by the subsidies and indirect support that has been used to attract and support particular industries. A 1996 study of subsidies by the Commonwealth Government[57] in Australia was able to identify $13.7-14.8 billion provided for the use of natural resources. These subsidies are often important in maintaining international competitiveness, supporting new industries and jobs and can enable the state to ensure that the economy moves in a particular strategic direction. However, they also distort the market, and can encourage unsustainable patterns of development.

The government also provides a range of incentives and support measures to assist in the development of business in Western Australia. There is potential to guide the allocation of these measures to promote sustainability.

The government can take a lead in generating the necessary financial reforms and economic policies for sustainability. In addition, the government will examine the potential for allowing public sector investment activities, such as employee superannuation funds, to be voluntarily directed towards sustainability investments.

[56]C O Holliday, S S Schmidheiny, P Watts, Walking the talk: The Business case for sustainable development, Green Leaf Publishing Ltd, 2002.

[57]National Institute of Economic and Industry Research Subsides to the use of natural resources, Department of the Environment, Sport and Territories, Canberra, 1996.

In short...

Vision

Market forces begin to align more comprehensively with sustainability objectives as subsidies that promote unsustainable behaviour are phased out and incentives to overcome market failures are phased in.

Objectives

- Pursue the government's economic objectives in a way that does not compromise the commitment to sustainability, by ensuring that economic policy in Western Australia is consistent with the principles of sustainability.

- Stimulate economic responses to sustainability by eliminating financial and market barriers and by providing incentives and motivators.

- Promote innovation by Western Australian businesses and assist in gaining access to the financial resources that are required to develop a strong sustainability-based economy.

In short cont'd...

- Encourage and support local industry to take advantage of the economic opportunities presented by sustainability, especially in relation to Western Australia's leading expertise and experience in the application of environmental and bioscience technologies and knowledge.

Actions underway

- Development and release of the Government's draft Industry Policy Statement.

Actions

6.6 Support sustainability investment tours to link venture capital with Western Australia innovations in sustainability.

6.7 Continue to document and celebrate the best examples of industry innovation in sustainability.

6.8 Develop an education program on the opportunities of sustainability investment for business and the wider community.

6.9 Encourage tertiary education institutions to incorporate sustainability principles into university courses that relate to economic development, such as economics, commerce, business and law degrees.

6.10 Work to facilitate greater access to venture capital for Western Australian sustainability businesses and innovators.

6.11 Provide leadership for the encouragement of sustainable investments by adopting sustainability principles in the way government conducts its own business practices.

6.12 Investigate the potential for State government superannuation funds to allow government employees to voluntarily direct a proportion of their contributions to nominated sustainability investments.

6.13 Examine the ways in which subsidies and other financial mechanisms are having positive or negative effects on the health of the environment, society and economy and how they can contribute to the desired changes in business behaviour and investment patterns.

6.14 Require all business recipients of significant government grant funding to demonstrate the potential contribution to sustainability in the event that funding is provided.

6.15 Work progressively to better articulate the triple bottom line in State government reporting.

6.16 Finalise and implement the government's Industry Policy Statement based on public discussion of the draft and ensure consistent application of sustainability principles.

In short cont'd...

Global opportunities

Western Australian financial reform for sustainability can become a model with opportunities in major global development and aid projects.

Further information

Ryan, P. *Supporting Sustainability through Socially Responsible Investing* June 2002
http://www.sustainability.dpc.wa.gov.au/CaseStudies/ethicalinvestment/SR1.htm

Commonwealth of Australia (1996) *Subsidies to the Use of Natural Resources*
http://www.ea.gov.au/pcd/economics/subsidies/pubs/subsidies1.pdf

Australia Institute (1997) *Ecological Tax Reform in Australia: Using Taxes, Charges and Public Spending to Protect the Environment without Hurting the Economy*
http://www.tai.org.au/Publications_Files/DP_Files/DP10SUM.PDF

Tiwest's Synthetic Rutile Plant in Kwinana has made significant eco-efficiency gains since it began in 1991. In an example of industrial ecology, waste hydrocholoric acid is converted by a neighbouring company into ammonium chloride for use at another Tiwest operation which supplies the pigment plant.

Source: Tiwest

> ECO-EFFICIENCY AND INDUSTRIAL ECOLOGY

Industrial ecology involves better planning, design and management of industrial activity, so that material, energy and water is not wasted and industrial opportunities are maximised. Industrial ecology requires a completely different approach to industrial development, where industrial facilities are planned, designed and managed to mimic ecological processes.

By employing eco-efficient processes, companies can diminish the costs of production and site operations. The re-engineering of processes along eco-efficient lines is likely to include a reduction in the use of resources, and a reduction in pollution.

World Business Council on Sustainable Development

Cleaner production and eco-efficiency are the most practical starting points for businesses to contribute to sustainable development.

WA Sustainable Industry Group

Our economy tends to separate the production of primary materials from the manufacture of products and the consumption of these products. This is a major barrier to closing the production loop and efficient resource use. There is need for a new approach to ensure product and resource stewardship on the part of industry, government and the consumer.

Scientists, engineers and planners are beginning to work collaboratively with local communities to create urban and industrial developments that mimic ecological relationships. This idea of urban and industrial ecology illustrates how we can close the loop in the way we consume natural resources. The wastes from one activity can be the raw materials for a range of others, resulting in large reductions in the amount of resources required while increasing economic effectiveness. This approach to technology development can also have profound social benefits. Employment opportunities can be boosted, resources saved can be channelled into socially productive activities, and the infrastructure of communities can better service peoples' needs. Increasingly, technology development will occur within this context (see Box 83).

BOX 83   KWINANA SYNERGIES PROJECT – INDUSTRY SUSTAINABILITY INNOVATION

One of the best examples in the world of industrial ecology is at Kwinana. For the past fifteen years the Kwinana Synergies Project (set up by the Chamber of Commerce and Industry) has been working with industry and the community to create collaborative arrangements for the re-use of wastes, the sharing of resources and infrastructure. Over 100 separate linkages between industries have been established. The latest project is the joint treatment of sewage from the Water Corporation pipeline and its recycling as process water to replace scheme water. The project is also leading to large reductions in industrial wastewater that would have flowed into Cockburn Sound.

The importance of this globally significant industrial ecology project goes well beyond the reduction of ecological footprint and increased efficiency of the industries. As Martin Taylor the manager of the KSP said 'The importance of this project is that industries now work together to solve problems. For example training and employment of locals is more coordinated and industry are more sensitive to their environment responsibilities. There is always much more to do but Kwinana has started down a path which industrial complexes overseas are amazed to see.'

The Western Australian economy uses a large amount of materials, energy and water for every unit of economic production. Preliminary analysis by Curtin University and the Department of the Premier and Cabinet has found that Western Australia has a very large total 'ecological footprint'.[59] On average each Western Australian effectively uses between 17 and 31 ha of land to maintain their standard of living. This is more than double the national average (due to large agriculture and pastoral land uses). Eco-efficiency will reduce our ecological footprint.

The United Nations and the World Business Council for Sustainable Development have established high-level targets for industrialised countries. They have estimated that industrialised countries such as Australia need to achieve a 10-fold reduction in our consumption of resources and a 20-fold increase in resource efficiency by 2040. At the same time there must be rapid transfers of knowledge and technology to developing countries.

While this may appear to be a daunting task for any economy, it is important to put these increases in eco-efficiency into a historical context. In the past 200 years human productivity has increased 200-fold. Large-scale economic change often goes unnoticed. Innovation, continual improvement in efficiency and 'technology leap frogging' can drive major shifts in the shape of the economy. A significant part of the challenge is to turn these economic drivers around to focus on protection and repair of the local and global environment, while providing a better, fairer, more equitable and just society.

In short...

Vision

Western Australian industry responds to the global challenge of eco-efficiency and finds new economic opportunities from the expertise gained.

Objectives

- To achieve a four-fold increase in eco-efficiency and to reduce the ecological footprint of the Western Australian economy by a factor of two by 2020.
- Promote eco-efficiency and encourage the development of expertise and the application of new sustainability processes and technologies.
- Greater emphasis on effective planning to overcome and prevent the negative externalities which potentially accompany economic growth, such as environmental damage, land degradation, waste management and the problems associated with urban sprawl.

Actions underway

- Government currently provides financial and other support to Curtin University's Centre of Excellence in Cleaner Production, and the Western Australian Sustainable Industry Group.
- Several government agencies have already signed the Western Australian Sustainable Industry Group's Cleaner Production Statement and are taking steps to become more eco-efficient. The Cleaner Production Statement has been signed by sixty-seven Government departments, businesses and other organisations, and provides a program of action to increase the eco-efficiency of these organisations. This approach is demonstrating that eco-efficiency can be practised in all businesses and organisations.

In short cont'd...

Actions

6.17 Through the Sustainability Roundtable and the WA Sustainable Industry Group set out a program for how the World Business Council for Sustainable Development's goal of 'factor 4 by 2020' can be achieved in Western Australia.

6.18 Encourage the adoption of the Western Australian Sustainable Industry Group's Cleaner Production Statement by all government agencies as part of their Sustainability Action Plans.

6.19 Continue to develop the Shenton Sustainability Park concept.

6.20 Work to extend the Kwinana Synergies Project concept to other industrial precincts in Western Australia.

6.21 Explore the development of a Sustainable Industries Section within the Department of Environment.

6.22 Expand the promotion and adoption of the successful Industrial Waste Exchange program, and investigate its use as part of the environmental assessment and licensing system.

6.23 Encourage the establishment of sustainability business and research clusters in Western Australia, primarily based around resource recovery precincts and industrial parks.

6.24 Provide a central information hub with information on sustainable technologies and business solutions on the Sustainability Online web site, in conjunction with the Western Australian Sustainable Industry Group, Centre of Excellence in Cleaner Production at Curtin University and Environmental Technology Centre at Murdoch University.

6.25 Ensure that Western Australia implements and actively participates in national eco-labelling programs, such as the standards set by the Australian Environmental Labelling Association.

Global opportunities

Eco-efficiency and industrial ecology are major global areas of intense interest and those few places showing innovation will gain access to markets for the services associated with them.

Further information

Ruane, S. *Cleaner Production and Eco-Efficiency: Strategies for Improving Sustainability in WA* March 2002
http://www.sustainability.dpc.wa.gov.au/CaseStudies/cleanerproduction/cleaner production.htm

George,S. Shenton *Sustainability Park: Prospects for an Eco-Industrial Park* June 2002
http://www.sustainability.dpc.wa.gov.au/CaseStudies/shenton%20sustainability%20park/shentonpark.htm

Australian Environmental Labelling Association
http://www.aela.org.au/

Curtin University Centre for Cleaner Production
http://cleanerproduction.curtin.edu.au/

> **> CORPORATE SOCIAL RESPONSIBILITY AND INDUSTRY SUSTAINABILITY COVENANTS**

Government needs to go beyond traditional command and control regulation that minimises harm, and find new ways to encourage business to create economic, environmental and social benefits. This requires corporate responsibility. The Western Australian Government can facilitate this further by entering into 'sustainability covenants' with progressive industry associations and companies.

There is an opportunity for business to move from a paradigm of compliance with community and environmental standards to one in which business is valued for its contribution to improving the community.

Australian Corporate Citizenship Alliance

Partnerships between industry, government and communities are a key way of pursuing sustainability programs.

Rio Tinto

Progressive businesses can drive major changes to more sustainable industry practices. Government has a role in encouraging this by:

- recognising and encouraging the efforts of progressive businesses
- disseminating information about the activities engaged in by those businesses, and
- encouraging other businesses to rise to the standard set by the leaders in their sector.

In order to do this, the government can encourage corporate social responsibility by helping to establish principles that are adopted by industry and government through a partnership.

Corporate social responsibility has emerged as one way for business to address the sustainability agenda. There are many publications and organisations that have set out such principles (see case study by Christian Marriot from Hartleys www.sustainability.dpc.wa.gov.au). The Australian Corporate Citizenship Alliance (see Box 84) and the Chamber of Commerce and Industry are actively involved in these debates.

BOX 84   BUSINESS AND ETHICS

The Australian Corporate Citizenship Alliance (ACCA) was established to help Australian businesses incorporate the principles and practices of corporate social responsibility. In its submission to the State Sustainability Strategy the Alliance describes itself as seeking to assist Australian business, 'to sustain their success in ways that demonstrate respect for ethical values, people, communities and the natural environment'.

It is proposed therefore to establish a Partnership Project where the Chamber of Commerce and Industry and the Australian Corporate Citizenship Alliance through the Sustainability Roundtable create a document on 'corporate social responsibility principles for Western Australia.

As well as adopting a set of principles there are many companies who want to demonstrate publicly their innovations in sustainability. For such companies it is proposed to provide a new mechanism of recognition or partnership called Industry Sustainability Covenants.

Sustainability covenants will be non-binding agreements between government and progressive companies or industry associations. They can be developed in partnership with local communities and relevant public interest organisations.

Sustainability covenants will cover all aspects of a company or industry's economic, social and environmental performance and will commit the company or industry sector to creating net benefits in each of these areas and reporting on them.

Once produced, sustainability covenants will be published on the Internet and promoted as a model for other businesses.

Companies and industry sectors that sign up to sustainability covenants and meet the obligations in those covenants will be able to 'badge' their products with a logo endorsed and promoted by government.

The first company wanting to go down this path—Australand—has approached the State government and discussions on the nature of a Sustainability Covenant for it has begun. The company has completed a Sustainability Strategy of their projects and produces an annual Sustainability Report.

In short...

Vision

Industry sustainability covenants become a feature of how progressive and innovative businesses in sustainability are recognised and supported.

Objectives

- Recognise and encourage the efforts of progressive businesses to move towards sustainability.
- Disseminate information about the activities engaged in by those businesses.
- Encourage other businesses to rise to the standard set by the leaders in their sector.

Actions underway

- Specific initiatives have been developed in particular areas, for example the National Packaging Covenant in respect of used packaging materials, but a scheme for comprehensive sustainability covenants is unprecedented.

Actions

6.26 Through the Sustainability Roundtable create a partnership project with the Chamber of Commerce and Industry and the Australian Corporate Citizenship Alliance to create Corporate Social Responsibility Guidelines for Western Australia.

6.27 Through the Sustainability Roundtable, develop a sustainability covenant program and associated implementation framework to give support to partnerships with industry innovators in sustainability. Sustainability covenants will:

- be non-binding agreements entered into between government and progressive companies or industry associations
- be developed in partnership with local communities and relevant public interest organisations

In short cont'd...

- cover all aspects of a company or industry's economic, social and environmental performance and will commit the government and company/ industry sector to use their best endeavours to create net benefits in each of these areas, and

- bind the company to reporting regularly on the outcomes to which they are committed.

Global opportunities

Sustainability covenants will help drive industry innovation, and create new technologies and production methods that can be used overseas.

Further information

Victorian Sustainability Covenanting Program
http://www.epa.vic.gov.au/Waste/resource_efficiency_bill.asp
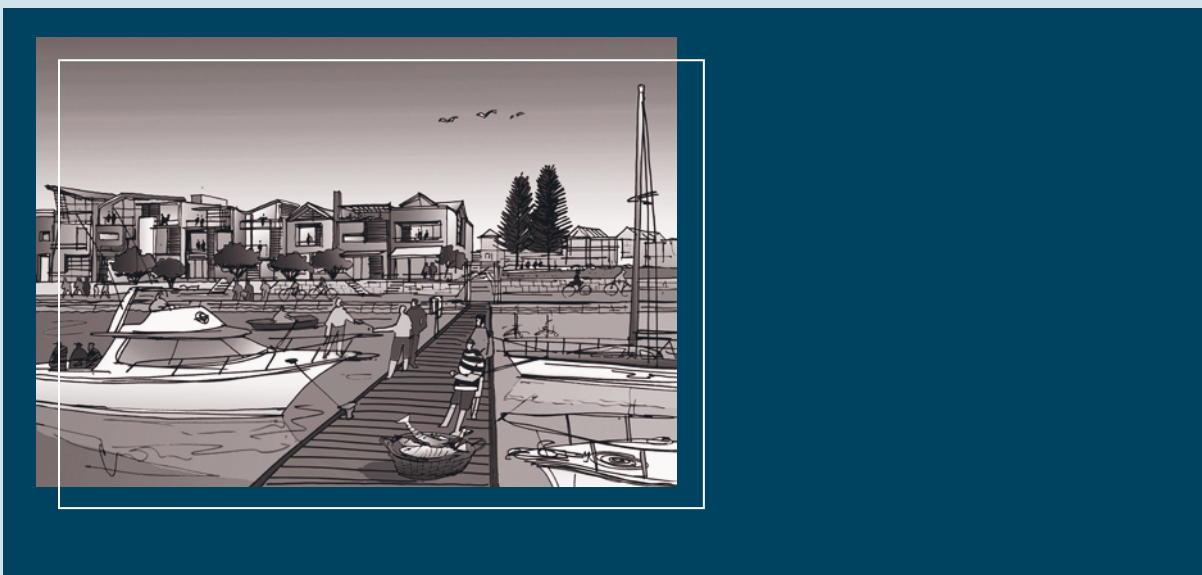
Australand have committed to developing the first Western Australian Industry Sustainability Covenant to cover their commitments and reporting on the Port Coogee Development.

Source: Australand

Implementation and Action Plan

"On his 80-somethingth birthday the great Spanish cellist Pablo Casals contemplated the state of the world and said, very sadly to the assembled media, "the situation is hopeless". After a pause he added a few more words, thus creating my favourite aphorism. We must take the next step".

Phillip Adams AO, Letter seeking sponsorship on behalf of Oxfam Community Aid Abroad, undated.

The State Sustainability Strategy provides an overarching framework for sustainability in Western Australia and identifies specific actions in forty-two priority areas. These actions illustrate how the government sees sustainability principles being applied across the whole of its activity. The actions and the responsible agencies are listed at the end of this document. This is the Action Plan for the State Sustainability Strategy.

The State Sustainability Strategy provides a perspective on issues that span the whole of government in Western Australia with the aim of showing how it is possible to integrate environmental protection, social advancement and economic prosperity.

Figure 13 shows how the sustainability framework, consisting of eleven underlying principles, applies to the six main areas of action and within that to a series of sections where action is undertaken. The model is applied to natural resource management by way of example.[57] Other areas, such as business and governance, also have thematic policy sections that are the focus of actions. The focus is on cooperative management (partnerships), public involvement, transparency and verification processes (as shown in the figure).

Figure 13 Applying the sustainability framework
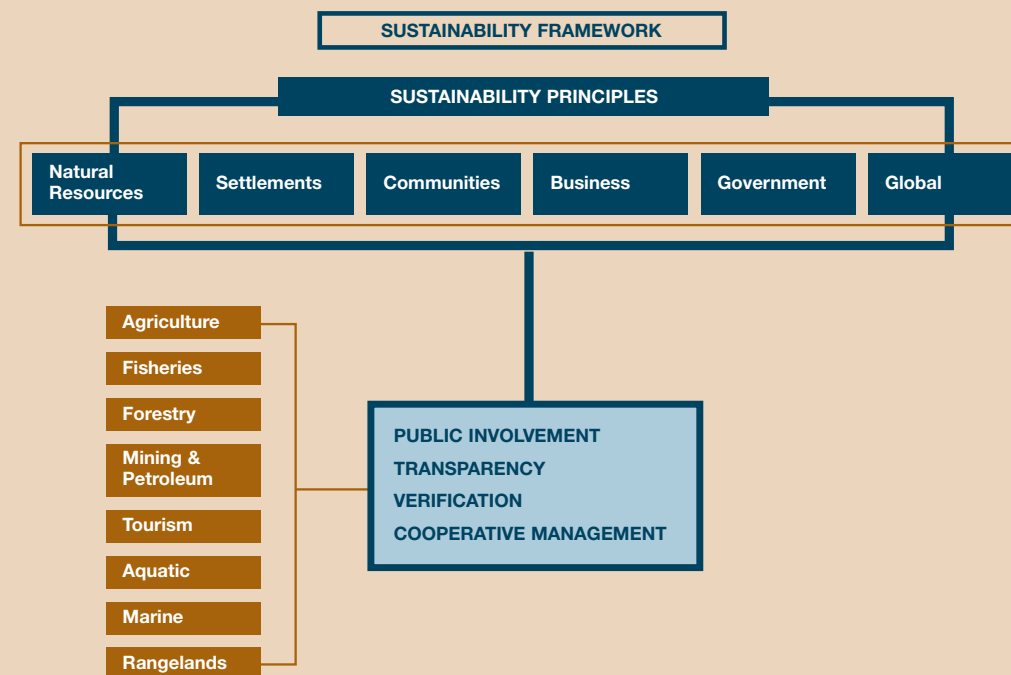
[57]The figure is adapted from a diagram developed by the Australian Petroleum Production and Exploration Association.

Partnerships

Some important partnerships have already been established in response to the government's sustainability agenda and the draft State Sustainability Strategy:

- the State-Local Government Sustainability Roundtable was established at the suggestion of the Western Australian Local Government Association to develop a State-Local Government Sustainability Partnership Agreement

- four Western Australian universities, TAFE and CSIRO have formalised the establishment of the Global Centre for Sustainability to progress research initiatives for sustainability, and

- the WA Collaboration, an historic partnership of non-government organisations committed to a just and sustainable Western Australia, was established with the support of Lotterywest and has undertaken a range of initiatives to contribute to the development of the sustainability agenda in Western Australia.

Partnership approaches have also been discussed with industry organisations but not progressed. These will need to be further developed through the Sustainability Roundtable (see Table 7). The various partnership proposals are outlined in Figure 13 in *Sustainability and Business*.

Table 7 Suggested outcomes from sustainability business partnerships and relevant peak bodies	
OUTCOMES	PEAK BODIES
New sustainability research agenda	Global Centre for Sustainability and Office of Science and Innovation
Building and construction sustainability	Housing Industry Association and Urban Development Institute of Australia
Corporate social responsibility principles for Western Australia	Chamber of Commerce and Industry and Australian Corporate Citizenship Alliance
Mining and petroleum sustainable development	Chamber of Minerals and Energy and Australian Petroleum Producers and Exploration Association
Eco-efficiency program for factor 4 by 2020	Western Australian Sustainable Industry Group
Industry sustainability covenants	Sustainability Roundtable

The government recognises that sustainability is both a journey and a destination and that partnerships between government, industry and community are vital to achieving a sustainable future for Western Australia. It is likely that partnerships involving all stakeholders will continue to form and reform around particular projects and issues. This approach is the heart and soul of implementing the State Sustainability Strategy.

Arrangements for implementing the sustainability agenda in Western Australia

Processes for implementing sustainability can be divided into those that are:

- internal to government (to ensure government is demonstrating leadership in sustainability through its agencies) and

- external to government (how government agencies influence sustainability issues in the community and industry and help create opportunities for the future).

These arrangements are described in Figures 14 and 15 and set out the main approaches that the government will adopt to support sustainability through its own agencies and external to government.

In summary, internal to government sustainability is pursued through the Sustainability Act, the Sustainability Code of Practice for Government Agencies and the development of Sustainability Action Plans, internal sustainability assessment of policies, programs, plans and the whole of government Sustainability Procurement Policy.

External to government, the main focus of the State Sustainability Strategy is supported through the establishment of the Sustainability Roundtable to assist the government to progress sustainability with initiatives like local government, community and industry partnerships, the development of regional sustainability strategies, industry accreditation for sustainability and sustainability reporting.

There are also a range of other mechanisms through which the Government liaises with community and industry stakeholders in support of sustainability. Mechanisms are being established through the strategic and statutory planning system, such as a Standing Committee of Western Australian Planning Commission to deal with Sustainability and Development Assessment. Arrangements are also being developed for sustainability assessment of complex or strategic projects. Clearly there are many other agencies with sustainability responsibilities that have not been created in response to the State Sustainability Strategy. They are however highly significant to the process of making sustainability meaningful.

The new structures outlined here have been established as part of the State Sustainability Strategy.

Figure 14 Embracing sustainability internally – government leading by example
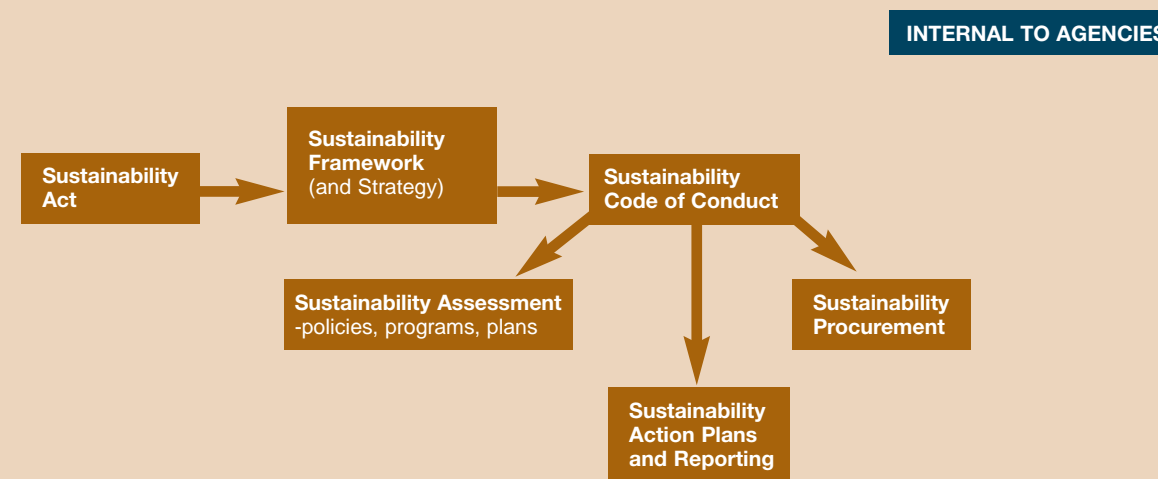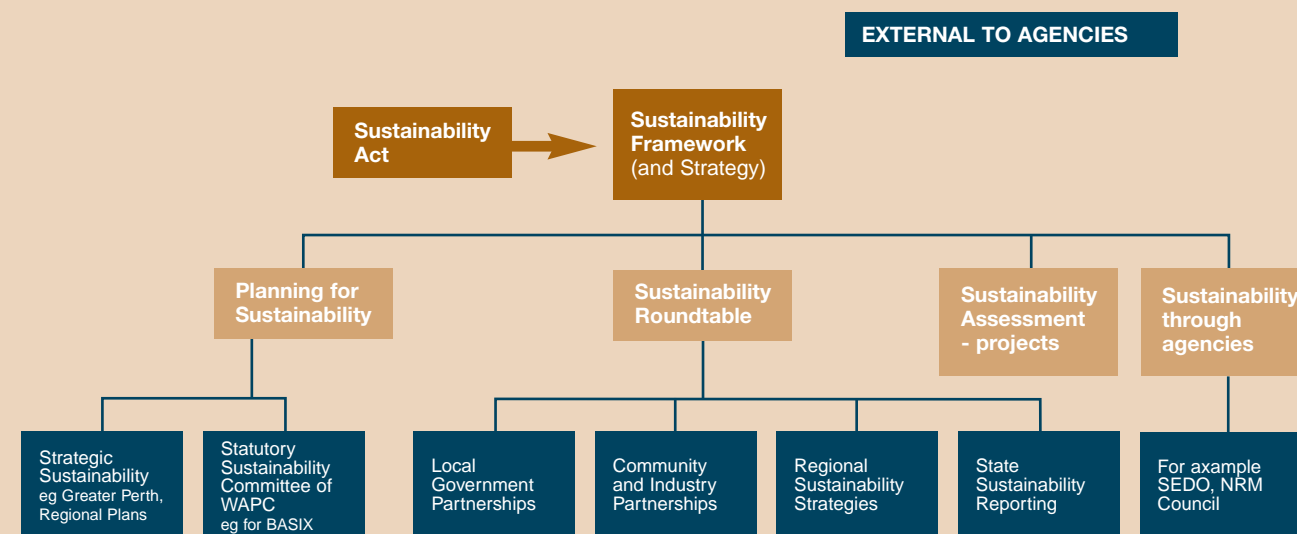

Figure 15 Embracing sustainability externally – creating opportunities for the future with community and industry

Relationship to other government strategies

The framework informs all government policy in a range of areas. For example, it informs and is informed by the State Strategic Planning Framework to the Public Sector, Regional Policy, Waste Management Strategy, Housing Strategy, Coastal Policy, State Planning Strategy, etc.
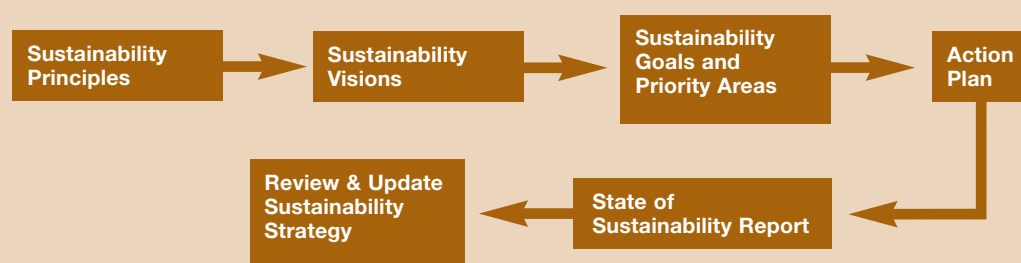
Timeline for implementation

The Sustainability Roundtable will be established and begin operating in 2004. Sub-committees will be established as necessary to work on partnership projects, indicators and reporting, community and household sustainability issues, regional sustainability strategies, etc. The sustainability Code of Practice for Government Agencies will be completed in 2003, and Sustainability Action Plans will be prepared by agencies in 2004. These Action Plans will provide timelines for actions and appropriate performance measures.

Reviews of the State Sustainability Strategy

It is proposed that the Strategy be reviewed by the Sustainability Roundtable (with the Sustainability Policy Unit) every two years. As set out in Figure 16 this will incorporate the State of Sustainability Report that will enable an assessment to be made of broad headline indicators. This will involve assessing whether the objectives of the framework have been achieved, examining the action items and what will next be required to progress sustainability. It will also examine whether the framework needs revising.

Figure 16 Review process for the State Sustainability Strategy

Sustainability Principles → Sustainability Visions → Sustainability Goals and Priority Areas → Action Plan → State of Sustainability Report → Review & Update Sustainability Strategy → (back to Sustainability Principles)

Community-oriented facilitation

So much of the transition to sustainability requires government leadership. However real change must also come from the community allowing dreams and energy to be expressed in new ways. Community development has been demonstrated as essential for sustainability and it is therefore important to emphasise the need for community-based change processes. This will require facilitation of the arts that can help us resolve deeper issues in our community, as well as discussions on ethics, spirituality and sustainability.

Corporations and businesses that are person-centred, receptive to industrial democracy and develop real partnerships involving the creativity of their work force are good examples of sustainability at work. It will also be essential for the implementation of this strategy that all government agencies work in a genuine partnership with the community. There is a need for community facilitators to be trained within government so that each area of sustainability can be given community sensitivity and direction.

Government will implement the State Sustainability Strategy with awareness that community sensitivity and a commitment to transparent, participatory processes are essential to achieving sustainability. Only in this way is it possible to create hope for the future.

Action Plan

For key to agencies see last page.

SUSTAINABILITY AND GOVERNANCE

> Sustainability assessment

1.1 [MSC] Undertake sustainability assessment on those complex or strategic projects selected by Cabinet.

1.2 [MSC] Improve the capacity of government to undertake integrated sustainability assessment with skills being developed in economic and social assessment and in the integration of individual factors making up the sustainability assessment.

1.3 [MSC] Develop the process of sustainability assessment by building on the present assessment system and with the involvement of stakeholders.

1.4 [DPC] Facilitate sustainability assessment of Cabinet Submissions and government projects, plans, policies or programs through a variety of techniques such as checklists, multi-criteria analysis and sustainability scorecards in the development control system.

> Institutional change

1.5 [DPC] Establish a Sustainability Act to:

- establish the principles of sustainability that can then be incorporated by reference into relevant legislation as it is reviewed or developed, and

- support the development of guidelines or codes for the implementation of sustainability principles into the operations of relevant government agencies, including reporting.

1.6 [DPC] Require the Sustainability Policy Unit to:

- support sustainability assessment

- assist agencies to implement the State Sustainability Strategy within their own areas of responsibility

- monitor implementation of the State Sustainability Strategy and coordinate sustainability reporting across government, including the production of the State of Sustainability Report

- provide general policy advice on sustainability

- support regular communication, information exchange and capacity building in sustainability across the public sector

- support community awareness and education programs on sustainability.

1.7 [DPC] Establish a Sustainability Roundtable that reports to the Chairs of the Cabinet Standing Committees on Environmental, Economic, Social and Regional Policy to facilitate key community and regional actions within the State Sustainability Strategy including:

- implementation and further development of the State-Local Government Sustainability Partnership Agreement

- development of the methodology for Regional Sustainability Strategies

- contributing to global sustainability, including through overseas aid

- community partnership projects

- industry partnership projects

- coordinate State of Sustainability Reporting and

- a biennial review of the State Sustainability Strategy.

The Sustainability Roundtable will be broadly representative of key skills in sustainability in the community and industry and will also have government agency representation. Subcommittees to address particular areas of responsibility will be established as necessary.

1.8 [DPC] Establish a network of skilled staff across government to support sustainability capacity building and contribute to integration.

> Embracing sustainability in government agencies

1.9 [DPC] Develop a State Strategic Planning Framework for the Public Sector that reflects sustainability and the triple bottom line.

1.10 [All] Incorporate sustainability principles and practices based on the Sustainability Act into relevant legislation as it is reviewed or drafted.

1.11 [DPC] Finalise a Sustainability Code of Practice for Government Agencies to guide planning, managing, reporting on and operationalising sustainability after trialling a Draft Code with selected agencies and in consultation with community and industry stakeholders.

1.12 [DPC] Review the annual reporting framework for government agencies and incorporate sustainability reporting, including through key performance indicators.

1.13 [All] In response to the Sustainability Code of Practice for Government Agencies, require agencies to create Sustainability Action Plans that reflect their commitments and response to sustainability. A Sustainability Resource Guide will be developed to assist agencies in this process.

1.14 [SSC] Implement a whole of government Sustainability Purchasing Policy framework through:
- developing sustainability purchasing guidelines
- reviewing the State Supply Commission Risk Management Policy to ensure that sustainability procurement is directly addressed in all government agency Procurement Plans
- ensuring that new whole of government contracts are consistent with the Sustainability Purchasing Policy, and
- ensuring that government agencies and suppliers are provided with information about sustainability purchasing principles and practices, for example through the development of case studies in best practice, information sessions for purchasing officers and suppliers to government and, where appropriate, trade events and exhibits to promote sustainable products and services to government.

1.15 [SSC] Apply the Sustainability Purchasing Policy to the following priority areas:
- consumable office supplies (paper, envelopes and stationery)
- personal computers including printer cartridges
- photocopiers
- vehicles and fuels (including seeking offsets for greenhouse emissions)
- design and construction of government buildings.

1.16 [SSC] Progressively implement the Sustainability Purchasing Policy to ensure continuous improvement in the application of the policy including an independent review.

1.17 [DPC/SSC] Work with local government to identify opportunities for State and local government purchasing to jointly support sustainability.

> **Partnerships for action**

1.18 [DPC] Through the Sustainability Roundtable implement the State-Local Government Sustainability Partnership Agreement and create further State-Local Government partnerships to promote sustainability at community and regional levels.

1.19 [DPC] Through the Sustainability Roundtable examine the appropriate scale for sustainability actions including the role of Regional Councils of local government in supporting sustainability, the implementation by individual local governments and the role of the State government in enabling local governments to fulfill these roles.

1.20 [DPC] Through the Sustainability Roundtable, work with the WA Collaboration and industry stakeholders to implement the State Sustainability Strategy through partnership processes.

1.21 [DOIR] Develop a protocol that establishes broad principles and procedures to facilitate communication and discussion between the Department of Industry and Resources and relevant local authorities in regard to projects of significance to the State, future State Agreements and variations to existing State Agreements.

> **Planning for sustainability**

1.22 [WAPC] Create a Standing Committee of the Western Australian Planning Commission to deal with sustainability and development assessment and to advise on methodology for, and coordinate the implementation of, sustainability through the planning system in association with the Sustainability Roundtable.

1.23 [WAPC] Develop and trial a Sustainability Scorecard through the Western Australian Planning Commission's Sustainability and Development Assessment Committee for application through the Model Scheme Text in local Town Planning Schemes.

1.24 [NRMC/DPC/WAPC] Through the Natural Resource Management Council, the Sustainability Roundtable and the Sustainability and Development Assessment Committee of the Western Australian Planning Commission, support the increased involvement of local government in planning for natural resource management, including issues of agricultural sustainability, particularly regional drainage, biodiversity conservation, regional revegetation programs, water quality and soil acidity.

1.25 [DPI] Establish a Sustainability Directorate within the Department for Planning and Infrastructure to assist in the implementation of new initiatives in the State Sustainability Strategy relating to planning.

1.26 [DPI] Develop Statements of Planning Policy on the more sustainable planning, provision and maintenance of transport and infrastructure, the integration of land use and transport and the maintenance of the freight network.

> **Sustainability in the regions**

1.27 [DPC] Through the Sustainability Roundtable and the Western Australian Planning Commission develop a methodology for Regional Sustainability Strategies after reviewing the methodology adopted for the demonstration project in the Pilbara region. These strategies will provide an opportunity to apply the broad framework of the State Sustainability Strategy in cooperation with local governments, Regional Councils, Regional Development Commissions and the Western Australian Planning Commission. These strategies will build on and link regional plans, natural resource management plans, economic development plans, regional 'sense of place' stories and future aspirations for regions.

1.28 [DLGRD] Amend the *Regional Development Commissions Act 1993* to ensure that the activities of the Regional Development Commissions are consistent with sustainability principles.

> **Indigenous communities and sustainability**

1.29 [DCLM] Implement an Indigenous Protected Areas Program to enhance long-term employment for Indigenous people in their regions, based on joint management, cultural heritage and training. These will be expanded in the longer term into partnership agreements and regional agreements under the Statement of Commitment to a New and Just Relationship.

1.30 [DPC/DIA] Develop Indigenous 'place narratives' that will feed into Regional Sustainability Strategies and regional agreements as set out in the Statement of Commitment to a New and Just Relationship jointly agreed by the Western Australian Government and the Aboriginal and Torres Strait Islander Commission.

1.31 [DPI] Use Indigenous names of places to help all Western Australians develop an enhanced sense of place and to assist Indigenous tourism.

1.32 [DCA] Assist Indigenous communities to establish keeping places and interpretive centres to preserve and showcase Indigenous culture and support the intellectual property rights of Indigenous communities and artists.

1.33 [DPC] Expand Indigenous cross-cultural awareness training within the Western Australian public sector, for all staff working with Aboriginal people, to build trust and improve service delivery.

1.34 [DOIR] Work with Indigenous and industry stakeholders to meet jointly agreed targets for Indigenous employment in major new resource development projects.

1.35 [DHW/DOH] Continue to work in a collaborative manner with Indigenous Western Australians to enhance housing and health outcomes through improved service delivery.

> **Research and development for sustainability**

1.36 [OSI] Use the Western Australian Major Research Facilities Program to successively establish globally significant research centres on the sustainability science associated with energy, salinity, water supply and marine issues.

1.37 [DPC] Build on the Global Centre for Sustainability as a partnership for sustainability research and development in Western Australia with a focus on attracting global research funds.

1.38 [OSI] Continue to support bids for Commonwealth funding for cooperative research centres and other research funding programs related to sustainability.

1.39 [OSI] Endorse the CSIRO's commitment to implement the Healthy Country initiative in the South West of Western Australia.

1.40 [DOA] Establish an agricultural research institute to coordinate work currently undertaken by the Department of Agriculture, Curtin University of Technology, Murdoch University, the University of Western Australia, to increase economics of scale and better address agricultural sustainability issues.

> **Measuring and reporting on sustainability**

1.41 [DPC] Through the Sustainability Roundtable develop headline sustainability indicators for Western Australia and regularly review and report this information.

1.42 [DPC] Establish an ongoing State of Sustainability reporting framework to measure and report on the goals and objectives of the State Sustainability Strategy together with headline sustainability indicators and environmental, economic and social 'bottom lines'.

1.43 [DPC/DOE] Work to establish Sustainability Online as a source of sustainability information in Western Australia.

CONTRIBUTING TO GLOBAL SUSTAINABILITY

> Population, development aid and environmental technology

2.1 [DPC] Facilitate the development of the Global Centre for Sustainability to bring Western Australian expertise into global development aid projects and facilitate global contributions to sustainability.

2.2 [DPC] Encourage the Commonwealth Government to increase its commitment to aid projects for global sustainability.

2.3 [DOIR] Assist government agencies where appropriate to be positioned to secure or participate in global aid projects in developing countries.

2.4 [DOIR] Promote market development of Western Australian environmental technologies in global trade and aid through the International Development Business Unit in the Department of Industry and Resources.

2.5 [OSI] Facilitate research and development in environmental technology through the support of new and continuing State Centres of Excellence in Science and Innovation and Commonwealth Cooperative Research Centres.

> Maintaining our biodiversity

2.6 [DCLM] Replace the Wildlife Conservation Act 1950 with a new Biodiversity Conservation Act for Western Australia, which is focussed on providing protection for all biodiversity. Develop a State Biodiversity Conservation Strategy to complement and guide the application of the Biodiversity Conservation Act.

2.7 [DCLM/DCA (WAM)] Continue to carry out the on-going systematic regional biogeographic survey throughout Western Australia.

2.8 [DCLM/DCA (WAM)/WALIS] Seamlessly link environmental databases in a whole-of-government environmental database that incorporates the results of the on-going biological surveys and monitoring program, and the research and development programs dealing with management of the biodiversity values in-situ, and ensure that communities wishing to be involved in management, research and monitoring of biodiversity have access to this database.

2.9 [DCLM&DCA (WAM)&BGPA] Establish a plan for a Biodiversity Research Consortium that includes marine and estuarine capability and brings together the research and databasing capacity of the Department of Conservation and Land Management, the Western Australian Herbarium, the Western Australian Museum, and the Botanic Gardens and Parks Authority.

2.10 [DCLM/DCA (WAM)] Complete the Biological Survey for the Pilbara Bioregion by 2010.

2.11 [DCLM] Continue to identify and acquire land for addition to the terrestrial conservation reserve system so that it is comprehensive, adequate and representative.

2.12 [DCLM] Implement within the State, Australia's international commitments concerned with environmental protection and biodiversity, and establish a long-term monitoring and reporting program to demonstrate that the State is fulfilling its global biodiversity conservation obligations.

2.13 [DCLM] Continue to work towards meeting national biodiversity conservation objectives and targets to which the State is a signatory.

2.14 [DCLM] Identify key threatening processes that result in the loss of Western Australia's biodiversity, and develop mechanisms (such as threat abatement plans, recovery plans or management plans) that will control or manage the impacts of the threatening process.

2.15 [DCLM&DOE&DPI&DOIR] Account for biodiversity conservation in all land-use planning, where clearing of native vegetation is involved, and management decisions in Western Australia.

2.16 [DCLM] Ensure that mechanisms are in place for the identification, protection and recovery of Western Australia's threatened and specially protected biota.

2.17 [DCLM&DOE&DPI&DOIR] Ensure that all landholders, managers and project proponents take into account the requirements for biodiversity conservation as a standard and vital component of their planning and management activities.

2.18 [DCLM] Continue to expand off-reserve conservation programs, such as conservation agreements, nature conservation covenants and Land for Wildlife.

2.19 [DCLM] Expand the natural diversity recovery catchment system from 6 to 25 recovery catchments over the next ten years in partnership with the community and the Commonwealth Government under programs such as the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust.

2.20 [DCLM] Review and improve the current licensing system to ensure that access to biological resources is properly regulated, and develop wildlife management plans to ensure that the use of particular biological resources is ecologically sustainable.

Ensure that the right of Indigenous people to use native biota for customary purposes is continued on a sustainable basis.

2.21 [DCLM&WATC] Facilitate opportunities for nature-based recreation and tourism in Western Australia that are compatible with, and promote, the State's biodiversity conservation status.

2.22 [DCA (WAM) with partners] Plan a major science-education facility that can assist in the education of the community on Western Australia's biodiversity.

2.23 [DCLM&DCA (WAM)] Increase opportunities for the community to learn about and gain hands-on experience with biodiversity conservation issues.

2.24 [DCLM] Establish and implement a program for monitoring and evaluation to measure trends in resource conditions and management actions for biodiversity conservation in Western Australia.

> Responding to greenhouse and climate change

2.25 [Greenhouse Taskforce] Finalise and implement the Western Australian Greenhouse Strategy after consultation.

> Oil vulnerability, the gas transition and the hydrogen economy

2.26 [DPI/PTA] Ensure all future buses purchased for the Transperth bus fleet are powered by compressed natural gas.

2.27 [DPI] Finalise and implement the report of the Transport Energy Strategy Committee after public consultation.

2.28 [DPI] Evaluate the effectiveness of the Department for Planning and Infrastructure's Sustainable Transport Energy Program and provide recommendations on broadening its implementation across government and into the first steps towards a hydrogen economy.

2.29 [DTF] Adopt a revised government vehicle fleet environmental policy to increase the use of 4 cylinder vehicles and significantly reduce fuel consumption (and CO_2-emissions) per km, provide a greenhouse emissions offset option, and continue the use of LPG powered vehicles where appropriate.

2.30 [DPC/OSI] Examine the feasibility of the Kimberley as a demonstration area for the hydrogen economy.

2.31 [DPI/PTA] Commence the hydrogen fuel cell bus trial in July 2004 with three test buses.

SUSTAINABLE NATURAL RESOURCE MANAGEMENT

> Sustainable agriculture

3.1 [NRMC/DPC/WAPC] Through the Natural Resource Management Council, the Sustainability Roundtable and the Sustainability and Development Assessment Committee of the Western Australian Planning Commission, support the increased involvement of local government in planning for natural resource management, including issues of agricultural sustainability, particularly regional drainage, biodiversity conservation, regional revegetation programs, water quality and soil acidity.

3.2 [DOA] In collaboration with regional natural resource management groups conduct resource risk assessments and develop regional targets for natural resource condition, for incorporation into regional natural resource management plans.

3.3 [DOA] Carry out strategic land use analyses in relation to resource condition targets and support diversification and landscape-scale change towards sustainable land use.

3.4 [DOA] Continue to develop the Western Australian Government's policy on genetically modified food crops including through the enactment of the Gene Technology Bill 2001 and the Genetically Modified Crops Free Area Bill 2003.

3.5 [DOA] Research and extend the productive use and rehabilitation of saline lands including management of the Western Australian component of the Sustainable Grazing on Saline Lands program involving participative research by up to sixty farmer groups in agricultural areas.

3.6 [DOA] Develop with industry participation, standards and best practices for agricultural systems at regional and enterprise scale to provide the basis for accreditation of sustainable agriculture practices and to support regulatory processes.

3.7 [DOA] Investigate economic incentives and innovative instruments such as biodiversity offsets, integrated ecosystem services trading, tax incentives and environmental stewardship rebates as well as land purchase, as drivers of land use change towards more sustainable use.

3.8 [DOA] Support the sustainability of farming enterprises and improved self-management of price, climate and other risks associated with agriculture through:

- research into improved risk prediction mechanisms, e.g. seasonal weather forecasting

- promoting a better understanding and use of risk management strategies such as enterprise diversification, Farm Management Deposits, price risk management and off-farm investment, and

- reforms to support schemes such as Exceptional Circumstances to ensure they meet broader sustainability needs.

3.9 [DOA] Investigate the application of the EMU Plus process developed in the rangelands as a means of empowering farmers and catchment groups, building capacity, facilitating change and leveraging private investment towards sustainable agriculture.

3.10 [DOA] Work with grower groups to implement Water Wise on the Farm, a training program for irrigators to improve irrigation skills and conduct research and extension programs to improve the productivity, efficiency and sustainable use of water.

3.11 [DOA] Manage bio-security threats to sustainability through:

- pre-border and border controls to minimise the introduction of non established animals and plant pests and diseases

- maintaining a capacity and capability to manage incursions of non-established animal and plant pests and diseases and

- reviewing, with the Agriculture Protection Board, industry, community and local government participation, the funding and decision making arrangements for management of widespread declared plant and animal pests.

3.12 [DOA] Work towards a greenhouse-neutral agriculture including by collaborating nationally on research to quantifying the emissions of non-CO_2 greenhouse gases from agriculture and quantify the impacts of changed management on these emissions.

3.13 [DOA] Promote industry development opportunities such as bio-energy production and 'carbon farming'.

> **Sustainable fisheries and aquaculture**

3.14 [DOF] Expand the scope of the existing and proposed environmental assessments of fisheries and aquaculture sectors to include social and economic components in order to meet government policy and legislative objectives.

3.15 [WAPC] Develop a State marine planning strategy through the Coastal Planning and Coordination Council.

3.16 [DOF] Develop a long-term aquatic ecosystem strategy to rehabilitate freshwater ecosystems and establish a freshwater native fish sub-program within the Department of Fisheries to conserve and protect the native freshwater fish populations of the State.

3.17 [DOF] Continue to establish fish habitat protection areas to complement the marine park and reserve system.

3.18 [DCLM] Continue to expand the State's marine conservation reserve system, by meeting the government's commitment to establish five new marine parks and reserves over the next 18 months.

3.19 [DOF] Continue and expand targeted education and training programs to promote sustainable fisheries and aquaculture throughout Western Australia.

3.20 [DOF] Support the development of an integrated fisheries management strategy and supporting processes taking into account the needs of all stakeholders on a bioregional basis (e.g. commercial, recreational, conservation, Indigenous, tourism, pearling and aquaculture).

> **Sustainable forestry and plantations**

3.21 [FPC] Continue to support restructuring of the native forest timber industry, giving particular support to value-adding opportunities in the timber processing and wood working areas, especially production and marketing of fine timber products made from specialty native hard woods.

3.22 [FPC] In native forests, promote the efficient use of all logs, development of high value-added timber utilisation, and forest structure based on maintaining the full range of forest values including sawlog production.

3.23 [FPC] Actively support the Action Plan for Tree Farming in Western Australia and the Forest Product Commission's INFINITREE™ initiative for the further development of a plantation industry on previously cleared agricultural land within the guidelines being developed by the Western Australian Planning Commission to retain viable rural communities. Particular attention should be given to production of sawlogs as a substitute for the declining yield from native forests and for carbon credits.

3.24 [DOIR/FPC] Work to create new bio-industries including bio-energy from plantations across the state.

3.25 [DCLM] Finalise the boundaries of the thirty new forest national parks committed to by the government after consultation with the public.

3.26 [FPC&DCLM] Review the sandalwood industry in Western Australia, the present and projected resource availability, the manner and pattern of exploitation of the resource, and the role that it might play in regional development and ecologically sustainable management of the rangelands. Develop sandalwood management having regard to principles of ecologically sustainable forest management.

3.27 [DCLM] Seek to minimise the loss of natural values from State forests and timber reserves and all other reserve categories within the south west as a consequence of the extraction of low value bulk commodities such as sand and gravel.

3.28 [DCLM] Create a comprehensive dieback strategy to:

- establish and maintain a database on the distribution of *Phytophthora* species throughout the south west for use in planning timber harvesting operations and other activities

- develop and implement rehabilitation plans for selected disease-affected areas

- promote the use of best practice hygiene procedures in the Western Australian nursery industry to help eliminate *Phytophthora* species from all seedlings and propagating material

- work with relevant Commonwealth agencies to help prevent the introduction of new plant diseases into Australia that could impact on forest ecosystems and forest-based industries

- develop an education program for the general public, and private and public organisations whose activities involve use of land in dieback susceptible vegetation types, and

- examine the establishment of a centre of excellence for *Phytophthora* research into ecological impacts on key elements of the biota, methods of managing and counteracting impacts of diseases, and monitoring spread.

3.29 [FPC] Support accreditation of native forest and plantation management to sustainability standards as an important part of maintaining sustainable forest management in Western Australia.

> **Sustainable mining and petroleum production**

3.30 [MSC] Work towards sustainability assessment of complex or strategic mining and petroleum projects using sustainability criteria (consistent with the Keating Review).

3.31 [DOIR] With key stakeholders, develop a set of agreed sustainability operating principles for the mining and petroleum Sectors through a working group or groups managed through the Department of Industry and Resources and the Sustainability Roundtable.

3.32 [DOIR] Foster local community involvement (particularly Aboriginal communities, pastoralists and local shires) as part of the sustainability assessment process.

3.33 [DOIR] Establish transparent processes to enable community awareness of the day-to-day regulatory system for exploration, mining and minerals processing including through the web site of the Department of Industry and Resources.

3.34 [DOIR] Work with industry on the development of voluntary accreditation for mining and petroleum industry sustainability.

3.35 [DOIR&DLGRD&RDCs] Implement strategies that support the use of local employment in mining ventures, particularly using regional centres as employment hubs, and encourage mining companies to maximise their purchasing of goods and services within regions.

> **Sustainable tourism**

3.36 [WATC] Promote the sustainable development of niche markets for which Western Australia has a unique advantage in nature-based, cultural and heritage tourism.

3.37 [WATC] Help to reinforce Western Australia's sense of place and the sustainable development of cultural, heritage and nature-based tourism within Western Australia.

3.38 [WATC] Support the Western Australian Indigenous Tour Operators Committee.

3.39 [DPI] Support development of materials on the Aboriginal names of places in Western Australia.

3.40 [WATC] Focus on developing sustainable niche product sectors such as trails, dive tourism etc.

3.41 [WATC] Link tour operator licensing and marketing with accreditation to foster private sector commitment to sustainability principles.

3.42 [WATC] Support the expansion of existing sustainable tourism accreditation in Western Australia.

3.43 [WATC] Support the application of appropriate accreditation to a local government area as a way of demonstrating area-wide tourism sustainability.

3.44 [WATC] Develop accreditation for authentic Indigenous tourism operations.

3.45 [WATC] Create partnerships between the arts and tourism industries to maximise cultural tourism opportunities and foster 'sense of place', and universities and tourism industries working to build on the global market for wilderness and indigenous-based learning experiences.

> **Protecting drinking water and aquatic systems**

3.46 [DOE] Develop benchmark environmental quality criteria for aquatic systems to assist in the long-term assessment of progress towards meeting objectives, for example to assist community water quality monitoring programs of aquatic systems such as Ribbons of Blue.

3.47 [DOE] Develop processes that ensure social, environmental and economic values of aquatic systems are incorporated into regional sustainability strategies and regional natural resource management plans, and embed these within appropriate management tools, for example planning schemes.

3.48 [DOE] Work to ensure all present and future drinking water resources are fully protected.

3.49 [DOE] Expand the assessment of the ecological water requirements of the State's rivers, wetlands and estuaries, especially of existing regulated systems or systems planned for water resource development, and continue to allocate water to the environment through the State's allocation process, incorporating this approach in regional, sub-regional and local water resource management planning.

3.50 [DPI&DOE&DCLM] Implement and assess strategic and statutory planning processes and documents to achieve better protection of aquatic systems, including:

- the development of model scheme texts to assist local government in incorporating aquatic systems management into planning schemes [DPI]

- developing a water resources statement of planning policy to describe key management actions to protect aquatic systems for incorporation into the planning system [DPI]

- continuing the work of the State Wetlands Coordinating Committee to ensure that the objectives and actions of the State Wetlands Conservation Policy are implemented and continuing the update of the classification and

evaluation method for Swan Coastal Plain wetlands and inventories of wetlands throughout Western Australia, [DCLM/DOE] and

- continuing the process of nominating significant wetlands for inclusion on the Ramsar Convention list of Wetlands of International Importance [DCLM].

3.51 [DOE] Ensure that activities in catchments are actively managed and sustainable and that environmental values are not compromised, degraded or destroyed, through:

- management

- community partnerships and education

- development and implementation of best management practice guidelines

- legislation

- transferable rights, incentives that encourage and aid landowners to protect and manage aquatic systems on their properties, and pollution offset schemes

- integrated property management plans for accredited water cycle management

- investigation of the impact of active catchment management strategies that enhance water quality and quantity outcomes, and

- a whole of government review of irrigation activities throughout the State that may also lead to better management of off-site discharges.

> **Sustainable coastal and marine environments**

3.52 [DCLM&DPI] Ensure that the management regime for the Ningaloo coast, following public consultation, provides for the proper protection and appropriate and sustainable development of this unique area.

3.53 [DPI] Complete the Carnarvon-Ningaloo Coastal Regional Strategy to define the location and character of preferred development and use of the coast in the context of the proposed World Heritage nomination. Ensure adequate planning and development controls are established to implement the outcomes of the Strategy.

3.54 [DCLM] Create five new marine reserves by 2005 to ensure Western Australia's unique coastal and marine environment is preserved in perpetuity.

3.55 [DCA (WAM)&DCLM] Progress the survey of marine biodiversity, especially in the State's marine biodiversity hotspots.

3.56 [WAPC] Develop a State Coastal Strategy and a State Marine Planning Strategy with appropriate consultation.

3.57 [DOE] Progressively identify the environmental values and designate environmental quality objectives for all of the State's marine ecosystems on a priority basis.

3.58 [DOE] On a priority basis, progressively implement scientific programs to derive environmental quality criteria for all of the State's marine ecosystems.

3.59 [DOE] Reinforce and promote the principles of best management practice in coastal and marine management and continuous improvement for existing activities, and ensure they are demonstrated for new proposals.

3.60 [DOE] Recognise and consider the potential for cumulative impacts and synergistic effects of multiple activities on coastal and marine systems in environmental impact assessments of new proposals and in the management of ongoing activities.

3.61 [DOE] Evaluate the findings of the North West Shelf Joint Environmental Management Study in terms of a decision-making strategy based on the principles of sustainability.

3.62 [DOF] Prepare an introduced marine pest response strategy for Western Australia to exclude pests that already occur in other parts of Australia or may be introduced from overseas.

3.63 [DPI] Work with the Commonwealth Government for regional marine planning beyond three nautical miles to ensure effective and integrated, and adequate, comprehensive and representative marine planning.

> **Sustainable rangelands management**

3.64 [DPI] Implement policy initiatives arising from the government's response to the five pastoral industry working groups: alternative models of land tenure; Aboriginal access; access to pastoral leases; pastoralism for sustainability; and pastoral industry economic monitoring requirements.

3.65 [DPI/NRMC] In making the government response to the five pastoral working groups, take account of the vision for the rangelands and identification of priority issues for sustainability in the rangelands provided by the Rangelands Working Group of the Natural Resources Management Council.

3.66 [DPI] Complete the negotiations for the 2015 pastoral lease exclusion process to define the future structure of the pastoral estate and future use of the excluded land.

3.67 [DPI&DCLM] Review the arrangements for managing unallocated Crown land within the rangelands to ensure that these arrangements are appropriate to protect the biodiversity conservation values and potential future uses of these lands.

3.68 [DOA] Support the roll-out of the EMU Plus project across the southern rangelands and into the Pilbara and Kimberley, recognising the potential of this project to improve environmental management through building capacity in the rangelands, and to underpin future accreditation.

3.69 [DOA] Further develop the environmental management systems currently being trialled within the Gascoyne-Murchison Strategy Regional Environmental Management Program to provide a framework for accreditation of sustainable pastoralism in the rangelands, and consider the application of the accreditation process for the new pastoral lease arrangements after 2015.

3.70 [DOA] Support the development of regional and sub-regional Natural Resource Management strategies for the rangelands region as the basis for future investment under the Natural Heritage Trust, and the involvement of local governments and local communities, including Indigenous communities, in that process.

3.71 [DPC] Encourage universities to do more research and teaching on sustainable rangeland management in recognition of the significance of the region to Western Australia.

SUSTAINABILITY AND SETTLEMENTS

> **Managing urban and regional growth**

4.1 [DPI] Consider and decide on the establishment of an urban growth boundary as part of the Greater Perth process and fully assess new developments in terms of their economic, social and environmental impacts.

4.2 [DPI] Promote ongoing public discussion and debate on the future of Perth's urban form through exercises like Dialogue with the City to raise public awareness of the issue and contribute to the solutions we can adopt.

4.3 [DPC] Facilitate projects to provide sustainability gains for country towns including regional sustainability strategies that build on the 'sense of place' stories of each community.

4.4 [DPI] Through urban design encourage employment initiatives such as the creation of 'knowledge economy' jobs and small business incubator projects as a catalyst for 'growing' job opportunities in outer metropolitan and regional centres.

4.5 [DPI] Develop strategies to proactively manage the location of urban development, including:

- consultative agreements with local government on land release, and

- using the Metropolitan Development Program and the Country Land Development Program match land supply to the cost-efficient provision of infrastructure, and building this into the operation of the Sustainability Scorecard through locational parameters impacting on employment, transport, infrastructure provision, social facilities and the environment.

4.6 [DPI] Use demonstration projects that actively address the community's concerns and the perceived negative impacts of increased residential densities.

> **Revitalising declining centres and suburbs**

4.7 [DPI] Create a Revitalisation Directorate within the Department for Planning and Infrastructure with the objective of developing, promoting, and managing revitalisation programs and initiatives, and providing advice and assistance to other agencies, to local government and to the community on revitalisation issues in Western Australia.

4.8 [WAPC] Develop a program that will provide guidance and resources to assist in revitalising declining centres and suburbs, with the objective of creating viable investment opportunities through more effective planning and design, local infrastructure improvements and the promotion of partnerships between government, community and business.

4.9 [DPC/DPI] Support the Maddington-Kenwick Sustainable Communities Initiative as a demonstration project and consider extending this approach to similar areas.

4.10 [DPI&DPC] Link revitalisation projects to the development of the neighbourhood renewal initiative (see S*ustainability and community*).

> **Sustainable urban design**

4.11 [DPI] Based on the review of the Liveable Neighbourhoods design code, ensure that there is an increased commitment to sustainable urban design which creates community-oriented city spaces and networks, economically facilitated-mixed housing types and business spaces, and ecologically sensitive design.

4.12 [DPI] Develop a State urban design charter to promote development based on the principles of sustainable urban design, to guide the private and public sectors and develop a manual of guidelines for urban design in Western Australia. [DPC/DPI]

4.13 [DPI] Continue the development of Statements of Planning Policy linking ecological processes to strategic and statutory planning. Develop local planning strategies that can apply these general principles to specific areas and regions.

4.14 [DPI] Extend and expand educational programs to enable more ecological understanding to be integrated into planning and design knowledge and practices.

4.15 [DPI] Complete implementation of Bush Forever through amendments to the Metropolitan Region Scheme and an associated Statement of Planning Policy to guide the management of urban conservation and preparation of local bush protection strategies that can build on community involvement and help create 'sense of place'.

4.16 [DPI] Extend Bush Forever to the Peel and Bunbury regions.

4.17 [DCLM&DPI&BGPA] Use the development of the State Biodiversity Strategy and the South West Australia Ecoregion Initiative to develop a partnership approach between city and regional biodiversity management. The partnership should involve Botanic Gardens and Parks Authority, the Herbarium, the Zoo, Department of Conservation and Land Management Regional Natural Resource Management Groups, community organisations, schools, volunteers and local government through local bush protection strategies. The partnership will help create biodiversity refuges, rehabilitation areas and intensive horticultural production of rare plant species.

> **Integrating land use and balanced transport**

4.18 [DPI] Provide by the end of 2004 a world-best SmartRider ticketing system for integrated public transport incorporating promotional and incentive activities for passengers, greater security at stations and faster boarding.

4.19 [DPI] Reduce the need to travel by car through:

- the application of locational and design criteria in the Sustainability Scorecard

- application of the Liveable Neighbourhoods code and related policy options

- continuing to improve public transport infrastructure (e.g. the Building Better Stations Program) and encourage behaviour change (e.g. the TravelSmart Household Program) in favour of public transport and other transport options, and

- initiatives to promote regional and district centres and encourage jobs growth in non-CBD locations (thereby developing an opportunity to increase travel demand in non-peak directions and allow greater use of existing resources and capacity on the Transperth train and bus system).

4.20 [DPI] Encourage pedestrians and bicycle use through:

- developing friendly environments in town centres

- improving pedestrian and bicycle access on local streets

- continue the implementation of the TravelSmart Household Program and complementary TravelSmart initiatives

- providing guidelines which assist local government to audit and improve the accessibility of their pedestrian and cyclist infrastructure and updating the Perth Bicycle Network Plan.

4.21 [DPI] Promote further integration of buses and other travel modes (such as cycling) to the existing train system, and actively prioritise improvements to new station precincts where better integration is possible, thereby ensuring that residents have the opportunity to complete their entire journey using public transport.

4.22 [DPI] Research and document vehicle trip behaviour and personal travel mode choices to establish planning implications for land development, traffic management, bus priority measures and cycling infrastructure projects.

4.23 [DPI] Provide safe and economical bike parking at train and bus stations and car parking at designated Park and Ride Stations.

4.24 [DPI] Develop programs that increase mixed-use development in strategic and other regional centres with good public transport provision, and where possible identify public transport requirements and funding support as part of development applications.

4.25 [DPI] Encourage local government to provide for flexibility in residential zoning, which allows small businesses and 'corner shop' retail facilities to locate in existing suburban communities.

4.26 [DPI] Encourage flexibility in local government parking policy in areas where there is good public transport; research parking demand at suburban centres and build on the success of the *Perth Parking Management Act 1999*.

4.27 [DPI] Review and update the Metropolitan Transport Strategy and develop a long term public transport strategy which reflects the New Metro Rail Project, the integrated bus, pedestrian and cycle networks with potential future upgrading, and the continuation of the TravelSmart program.

4.28 [DPI] Support Commonwealth Government investigations into the extension of Australian Design Rules to cover noise and other environmental issues for all vehicles.

4.29 [DPI] Work to remove inequitable taxation treatments and salary packaging arrangements that do not allow public transport travel and bicycles as options.

4.30 [DPI] Within the Department for Planning and Infrastructure establish and implement a whole of portfolio prioritisation model to enable funding priorities for integrated land use and transport planning and balanced multi-modal transport based on sustainability objectives.

4.31 [DPI] Consider the cross-government benefits of cycling and pedestrian programs for health and environmental benefits in an effort to better coordinate program and funding arrangements.

4.32 [DPI] Expand research and training on the integration of transport and land use for more balanced transport outcomes and recommend this for inclusion in the proposed Masters in Transport Studies being established between the universities.

4.33 [DPI] Continue integrated transport planning across regional council groupings in association with the development of corridors and sub-regional areas.

4.34 [DPI] Develop a Statement of Planning Policy on the sustainable planning, provision and maintenance of transport and infrastructure and the integration of land use and transport.

> **Managing freight and regional transport**

4.35 [DPI] Implement the Freight Network Review including the switch to rail freight in the Fremantle Port from 3% to 30% of all containers, the more efficient use of trucks through modal interchange nodes and an acceleration of strategic planning for the Outer Harbour.

4.36 [DPI] Extend the Freight Network Review principles and concepts to the whole State, through discrete projects in the regions.

4.37 [DPI] Develop a mechanism to manage conflicts between freight and residential activity, using zoning options to create incentives for property owners and site management options where necessary.

4.38 [DPI] Encourage the expansion of freight rail infrastructure to effect modal change.

4.39 [DPI] Ensure that all complex and contentious road and rail planning is done using sustainability techniques such as the multi-criteria analysis process developed for the review of Roe Highway, the citizen jury approach used for Reid Highway and land use/transport modelling (see *Sustainability assessment*).

4.40 [DPI] Develop a long-term strategy for country passenger rail.

4.41 [DPI] Create regional transport plans with Regional Councils for freight and passenger services in country and city regions.

> ### Preserving air quality

4.42 [DOE] Continue implementation of the Perth Air Quality Management Plan, focusing on coordinated action to work towards Perth having the cleanest air of any city of its size in the world.

4.43 [WAPC/DOE] Develop a Statement of Planning Policy for Integrated Land Use Planning and Transport that demonstrates, among other things, how local planning can minimise air pollution.

4.44 [DOE] Work with local government to help them in general community liaison on air pollution issues, especially smoke haze from woodheaters, and through the application of the Sustainability Scorecard to air emissions from housing, and location of development.

4.45 [DOE] Continue to provide community information and education aimed at changing individual behaviour, especially the use of domestic woodheaters and to encourage a shift to non-car modes of transport.

4.46 [DOE] Continue to monitor the air quality criteria set by National Environmental Protection Measures.

4.47 [DOE] Continue to develop air quality guidelines and standards through national forums and further develop methods for assessing the impacts of air quality on human health and the environment.

4.48 [DOE] Ensure that air quality factors are fully considered in sustainability assessments.

> ### Reducing waste and managing it as a resource

4.49 [DOE] Finalise the Strategic Framework for Waste Management to guide the management of waste in Western Australia towards zero waste by 2020 and liaise with stakeholders and the community on the implementation of the Framework.

4.50 [DOE] Recognise the success of those individuals, innovators, industries and councils who are successfully implementing a Zero Waste Framework.

4.51 [DOE] Introduce and enact the Resource Recovery and Waste Avoidance Bill.

4.52 [DOE] Enact the Contaminated Sites Bill.

4.53 [DOE] Prepare detailed business plans to support and prioritise the strategic activities to support the goal of moving towards zero waste by 2020.

4.54 [DPC] Encourage all government agencies to reduce consumption and waste by undertaking a comprehensive audit of resource consumption and waste and setting targets for reductions as part of their Sustainability Action Plans.

4.55 [SSC] Encourage the use of recycled products by all government agencies through the Government's Sustainability Procurement Policy.

4.56 [DPC] Encourage recycling of paper, glass, plastics, metals and organic waste using the Sustainability Code of Practice for government agencies.

4.57 [DOE] Work with local governments to expand the scope of their waste management plans to be consistent with the Strategic Framework for Waste Management, and support markets for recovered materials through the use of the Sustainability Scorecard in development applications involving construction and demolition waste.

4.58 [DOE] Examine how the landfill levy can better reflect environmental and social costs of waste disposal.

4.59 [DOE] Set mandatory hazardous waste targets for industry and target cleaner production programs towards industries producing hazardous waste so that a plan can be created for zero hazardous waste by 2020.

4.60 [DOE] Develop policies and legislation to encourage or require producers of hazardous and problematic wastes to share the responsibility for managing and reducing these wastes until they are phased out by 2020.

4.61 [DOE] Actively engage the community to determine appropriate siting and establishment of industrial/hazardous waste precincts for the metropolitan region until such waste is phased out by 2020.

4.62 [DOE] Ensure appropriate regulations exist to effect the safe transportation, storage and disposal of hazardous and controlled wastes in the period leading to the phase out of such wastes.

4.63 [DOE] Develop a comprehensive and clear waste classification and recording system for all wastes across Western Australia.

4.64 [DOE] Develop and report effective indicators to measure progress toward zero waste for each sector of society, including industry, community and government.

4.65 [DPC] Strengthen the *Nuclear Waste Facility (Prohibition) Act 1999* so that it prohibits the transportation or storage of any nuclear waste in Western Australia.

4.66 [DPC] Prevent the establishment of an Intermediate level radioactive waste repository in Western Australia.

> ### Our water future

4.67 [Water Taskforce] Implement the State Water Strategy.

4.68 [DPI] Use the Sustainability Scorecard to demonstrate sustainable water use in building and development before phasing it in to all development controls.

4.69 [DPC] Through the Sustainability Roundtable create demonstration projects with local government and Regional Councils on how to manage regional groundwater and drainage.

4.70 [Water Taskforce] Establish a local government water campaign to implement a Sustainable water management program in partnership with the Western Australian Local Government Association and the International Council of Local Environmental Initiatives, to assist local government to address local water management issues. Include initiatives such as:

- Research and trial innovative approaches to support sustainable drainage management and establish a series of pilot projects for drainage water re-use at neighbourhood and/or streetscape level [DOE].

- Undertake education and training of local government and key stakeholders on good planning and on-ground stormwater management using the stormwater management planning approach [DOE].

4.71 [Water Taskforce] Review the irrigation system to ensure it complies with sustainability principles.

4.72 [Water Taskforce] Provide for Perth's long-term water supply needs through a sustainability assessment of the next major water supply source.

> ### Sustainable energy

4.73 [SEDO/DOIR] Develop a State renewable energy strategy [SEDO] and a bio-industry policy [DOIR].

4.74 [SEDO] Further promote the use of existing house energy rating schemes as a means to meet and exceed the Building Code of Australia's mandatory energy efficiency requirements for new homes, additions and renovations.

4.75 [SEDO] Investigate the introduction of mandatory disclosure of house energy ratings, using existing house energy rating schemes, at the time of sale.

4.76 [DPI] Ensure urban land developments maximise the potential of all lots to allow for passive solar dwelling design and construction.

4.77 [DHW/SEDO] Encourage building design and management for energy efficiency in all government-owned and tenanted buildings.

4.78 [SEDO] Promote energy efficient office buildings through improved design, maintenance and management within the commercial property industry.

4.79 [DHW] Investigate use of eco-loans as part of the existing KeyStart program, initially for solar hot water systems, to save energy through the design and construction of the home.

4.80 [DPC] Demonstrate government leadership in sustainable energy through Sustainability Action Plans.

4.81 [DPI] Continue trialling innovations in transport fuels including gas, hydrogen fuel cells and biodiesel demonstrations and publish and promote the results.

4.82 [SEDO] Encourage the use of sustainable energy products, services and market-based strategies for demand management purposes.

4.83 [OOE] Facilitate renewable energy generation, demand management and distributed generation in the electricity market by removing impediments and ensuring the new electricity market provides opportunities for effective participation.

4.84 [OOE] In meeting the Mandatory Renewable Energy Target investigate the scope for mechanisms to ensure that Renewable Energy Certificates are sourced locally.

4.85 [SEDO] Continue to support the use of renewable energy in Remote Area Power Supply systems.

4.86 [SEDO&DOE&CC&DHW&SSC] Seek to maximise energy efficiency in Western Australia by:

- providing information on energy efficiency options to households, businesses and government [SEDO]

- including energy efficiency in school curricula [DOET/CC]

- supporting mandatory national standards for energy efficiency in appliances [SEDO] and vehicles [DPI]

- promoting the purchase of high energy star-rated appliances through consumer awareness campaigns and training of appliance retailers [SEDO]

- promoting the use of the Australian Building Greenhouse Rating Scheme for benchmarking and improving the energy efficiency of office buildings [SEDO]

- utilising accredited Australian Building Greenhouse Rating in the assessment of new government office tenancies [DHW]

- ensuring government procurement is based on lifecycle costing to properly account for the cost of energy [SSC]

- using sustainability assessment to include lifecycle analyses on all such decisions [DOE].

4.87 [DPI] Use the Sustainability Scorecard to demonstrate sustainable energy options in building before phasing it in to all development control.

> **Conserving cultural heritage and landscapes and creating 'sense of place'**

4.88 [HC] Prepare a heritage tourism strategy for Western Australia, including more use of Aboriginal names to create 'sense of place' and tourism interest.

4.89 [HC] Improve knowledge of the condition of the State's heritage by periodic survey work coordinated by the Heritage Council and local governments and promote a wider appreciation of the value of cultural heritage, including knowledge of the economic benefits of heritage conservation.

4.90 [HC] Investigate non-regulatory mechanisms for promoting conservation outcomes through greater planning flexibility, financial incentives, and possibly a voluntary offsets program for the built environment.

4.91 [HC] Improve legislative protection of the State's built heritage through reviewing the Heritage Act.

4.92 [HC] Improve the standards of local government heritage protection and quality urban design with reference to best practice, including best practice in guidance of infill and redevelopment in heritage areas.

4.93 [DIA] Support opportunities for Indigenous people to promote cultural awareness within their own communities.

4.94 [DHW] Develop a Built Environment Policy during the Year of the Built Environment that focuses attention on Western Australia's architectural features and promotes sustainable architecture that enhances our 'sense of place'.

4.95 [DPI] Ensure that heritage conservation and quality urban design for new areas are important considerations in major planning policies or reviews.

4.96 [DPI] Complete the Creative City Policy as part of the Greater Perth project to promote Perth's creative potential and facilitate expression of community values in the region.

> **Building sustainably**

4.97 [DPI/DHW] Demonstrate the use of sustainability benchmarks, including the Sustainability Scorecard for government building projects to show leadership to the building industry and facilitate the introduction of sustainability to development control.

4.98 [DHW] Promote the application of mandatory minimum building standards that support sustainability in the Building Code of Australia).

4.99 [DHW] Appoint a government architect to encourage good design and construction, particularly in government buildings, and assist in the implementation of sustainability initiatives in the building industry.

4.100 [DHW/DPI] Identify, develop and promote best practice sustainability standards and incorporate these standards into all government housing and buildings through sustainability benchmarks as they relate to sustainable buildings.

4.101 [SSC] Support best practice standards through government procurement policies.

4.102 [DPI] Compile a sustainable land development and built form toolkit, which includes guidelines and checklists, in close consultation and cooperation with relevant government agencies and authorities. Ensure best practice standards are incorporated into the guide.

4.103 [DPI] Progressively incorporate the principles of sustainable planning, building and construction into:

- relevant State government documents such as a Statement of Planning Policy, Residential Design Codes and local town planning schemes through the Sustainability Scorecard and

- relevant documents such as the Building Codes of Australia and other statutory documents.

4.104 [DHW/HC] Develop regulatory frameworks and associated incentives for sustainable building and construction including conservation, adaptive re-use and renovation.

4.105 [DHW] Progressively introduce environmental rating of buildings, and promote the disclosure of this rating at the time of sale or lease of the building.

4.106 [DHW] Develop a close partnership between government and industry for the support of research and development to facilitate sustainable homes and buildings.

4.107 [DHW/HC] Develop policies and guidelines for the minimisation of construction and demolition waste, including conservation, adaptive reuse and renovation.

4.108 [DHW] Demonstrate the business benefits of sustainable housing through research and pilot programs to help transform the house construction market to one receptive to sustainable development.

4.109 [DPC] Develop a sustainable home living package as a way to educate homeowners on the benefits of sustainability in their homes.

SUSTAINABILITY AND COMMUNITY

> **Community services and development**

5.1 [DPC] Develop an integrated community services policy framework that sets out the core principles and processes for providing more holistic service to help achieve sustainability goals.

5.2 [DPC] Investigate the establishment of a neighbourhood renewal initiative to contribute to a sustainable future for local communities through:

- building connection, caring, civic pride and common good through engaging local communities in social planning, service delivery and other projects

- creating links between and/or rationalising pre-existing local advisory networks on specific social issues

- leveraging other government, business and community resources, and

- linking with revitalisation initiatives (see *Revitalising declining centres and suburbs*).

5.3 [DPC] Develop a coherent process to support joined-up responses from all levels of government and the private and community sectors to enhance the way sustainability is related to community building.

5.4 All use Consulting Citizens: a Resource Guide to promote effective public consultation and active citizenship.

5.5 [DPC] Ensure links between crime preventions programs and community development initiatives as a way of focusing partnerships in areas of multiple social disadvantage.

5.6 [LW] Ensure links to Lotterywest's direct grant opportunities as a source of support for bottom-up community development initiatives and initiatives linking community development and sustainability, consistent with Lotterywest adopting a sustainability-oriented approach to its grant-making and broader activities.

5.7 [DSR] Through the Sport and Recreation Strategic Directions report SD3 provide a sustainability-oriented coherent approach to the provision of sport and recreation services linked to better urban design and infrastructure for walking/cycling, public transport, and funding through government and Lotterywest.

5.8 [DPC] Through the Physical Activity Taskforce provide educational and organisational coordination for the facilitation and expansion of physical activity for community health.

5.9 [OMI] Develop equity and diversity programs to provide community-building and sustainability perspectives as well as human rights and anti-discrimination.

5.10 [DPC] Provide support for community aspirations (storytelling and visioning) projects as part of regional sustainability strategies.

> **Housing and sustainability**

5.11 [DHW/DPI] Develop a policy on public housing, community housing and affordable private housing with groups of local regional councils to ensure there is an appropriate distribution of housing tenures. Guidelines to deliver sustainable and appropriate housing stock will be combined with planning incentives through the Sustainability Scorecard.

5.12 [DHW] Finalise and implement the Housing Strategy WA.

5.13 [DHW] Develop a Community Housing Framework involving standards and accreditation to ensure world best practice in the provision of this housing type and create opportunities for partnerships between community housing associations and local government.

5.14 [DHW] Use the sustainability agenda to facilitate the community housing sector through its ability to create synergies such as community scale technologies, local government support and ethical investment.

5.15 [DPI/DHW] Develop regional housing strategies to ensure housing diversity is appropriate and sustainable.

5.16 [DHW] Demonstrate the business benefits of diverse and affordable housing to sustainable communities through research, pilot projects and mainstreaming of sustainability in social housing.

5.17 [DHW] Educate the community about the benefits of diverse and affordable housing to sustainable communities through demonstration projects and information programs.

5.18 [DHW] Create economic opportunities for Indigenous people through their involvement in government housing projects.

> **Sustaining healthy communities**

5.19 [DOH] Ensure the health system provides sustainability outcomes through the control of environmental hazards and ecological health issues, the development of community public health programs that deal with long-term health issues and cost- effective health priorities.

5.20 [DOH] Continue to take account of cultural dimensions in health programs, particularly as they apply to remote Indigenous communities and in areas of multiple social disadvantage.

5.21 [DLGRD/DPC] Use the implementation of the government's response to the Gordon Inquiry to help integrate community services, health and sustainability through 'place management' approaches in Indigenous communities.

5.22 [DOH] Provide effective links between the health sector and other agencies to create whole of government approaches to reduce lifestyle choices that cause disease and disability and new environmental hazards that affect health.

5.23 [DOH] Develop and implement health impact assessments as part of the sustainability assessment process.

5.24 [DCD] Undertake an Early Years Strategy, a joined-up government initiative involving key government agencies and local communities, to enhance community capacity to support the development of young children aged antenatal to 8 years and their families and carers.

> **Education and community awareness for sustainability**

5.25 [DPC] Develop a comprehensive communications strategy on sustainability that includes all aspects of formal and informal education.

5.26 [DOE] Implement the Environment Education Strategy to support education for sustainability.

5.27 [DOET] Assign a senior officer in the Department of Education and Training with responsibility for formal environmental and sustainability education through the Curriculum Framework.

5.28 [DOET] Continue to introduce sustainability into the curriculum as the Curriculum Framework and the new courses of study are implemented in all schools in Western Australia.

5.29 [DPI] Continue to maintain and build a diversity of programs that support the achievement of learning outcomes that develop students' understanding of sustainability in for example, TravelSmart Schools Teachers Resource Kit which contains a range of cross-curricula classroom activities designed to raise children's awareness about the high impacts of cars and identify actions they can take to reduce school trips.

5.30 [DOET&DCA (WAM)] Support the further use of schools and museums as community hubs.

5.31 [DOET] Move towards new schools being built according to sustainability principles including universal design and progressively convert existing schools.

5.32 [DOET] Continue to orient schools to an ecological ethic, for example through school bushland projects, growing native trees from seeds, composting, using water runoff for gardens as provided by the Department of Education and Training's 'Guidelines for Developing Schools Grounds'.

5.33 [DPC] Develop and support partnerships on sustainability education with other sectors (such as local government and the WA Collaboration, WA Museum and Scitech) to maximise the delivery of sustainability education.

5.34 [DPI] Develop partnerships that provide ongoing support to community-based groups to assist in delivering school and community-based programs that link to current curriculum initiatives such as the implementation of the Curriculum Framework. And engage children in activities that contribute to reducing car use for school trips, such as the partnership between the Department for Planning and Infrastructure's TravelSmart Schools program and Millennium Kids, including the promotion of proficient bicycle use.

5.35 [DPI] Promote and expand travel choice, cycling and walking behaviour change programs including the annual Bike to School Day during Bikeweek and the annual Walk to School Day during the Walk There Today week of walking events and the TravelSmart to School and the Walking School Bus programs.

5.36 [DOE] Establish an annual award to recognise significant achievement in sustainability in schools.

> **Sustainability through culture and the arts**

5.37 [DPC/DCA (WAM)] Through the Sustainability Roundtable and in close cooperation with arts and cultural organisations, hold a Sustainable Living Festival to showcase innovative approaches to sustainability with a focus on culture and lifestyle.

5.38 [DCA] Develop programs, partnerships and incentives that encourage research for example into cultural heritage, innovation, new products, entrepreneurship (new distribution channels) and business sponsorship through the arts around key sustainability issues.

5.39 [DCA] Encourage funding criteria that facilitate endeavours in arts and cultural activities, that promote sustainability.

5.40 [DCA] Ensure that sustainability is embedded in the goals of community arts and community cultural development processes.

5.41 [DPC] Involve Indigenous people directly in planning, especially for new developments, so that regional Indigenous stories and perspectives can be built into the emerging story of the region.

5.42 [WATC] Support cultural tourism endeavours that meet heritage, reconciliation, environmental and community access and development criteria.

5.43 [DCA] Continue to shape a redevelopment plan for the Western Australian Museum, which examines ways to utilise the new facilities as sustainability and educational tools for the public.

5.44 [DCA] Identify new land development and planning projects, which can involve artists to create a sense of difference and relate people to their land.

5.45 [DCA] Take advantage of the new ABC production facility to create new production partnerships in Western Australia that can focus on urban and regional sense of place.

5.46 [DPI&DCA] Work with the Department for Planning and Infrastructure, local government and relevant cultural and other organisations to embed cultural planning in town planning to achieve an integrated sustainability approach to the development of new and revitalised communities.

5.47 [DCA (WAM)] Through the Western Australian Museum continue to make major commitments to the preservation of the biodiversity and cultural diversity of the State, including by establishing a Sustainability Unit, the first of its kind in an Australian museum.

5.48 [DCA (WAM)] Enable communities to develop their own exhibitions at the Fremantle, Perth, Kalgoorlie, Albany and Geraldton Museums to enhance local 'sense of place'.

5.49 [DCA] Initiate a Culture and the Arts Portfolio statement of principles, policy and action plan for Indigenous Western Australians that incorporates sustainability.

5.50 [DCA] Develop a framework for support for local and independent museums in Western Australia that enables them to better facilitate 'sense of place'.

5.51 [DCA] Formulate a new Arts Development Policy for Western Australia incorporating sustainability.

> **Sustainability through multiculturalism**

5.52 [DPC] Through the Sustainability Roundtable hold a seminar entitled Many Cultures: One Earth to consider sustainability in Western Australia from an ethical and cultural perspective and involve the authors of background papers on the ethics of sustainability.

5.53 [OMI] Finalise and implement the Anti-Racism Strategy including consideration for developing racial and religious vilification legislation and provision of anti-racism training.

5.54 [OMI] Explore the establishment of a skilled migration unit within the public sector.

5.55 [OMI] Continue to develop multicultural policies and perspectives which link multiculturalism to sustainability outcomes so that ecological, social and economic spheres benefit by the contributions of minority groups.

SUSTAINABILITY AND BUSINESS

> Training and facilitation for sustainability

6.1 [DOET] Work towards establishing a centre of specialisation in applied sustainability in TAFE to coordinate the new training agenda in sustainability.

6.2 [DOET] Expand the Green Jobs work of the Department of Education and Training to incorporate the various initiatives in the State Sustainability Strategy on new global employment opportunities in sustainability.

6.3 [SBDC] Ensure that when enterprise facilitation programs are being developed by the State government, sustainability principles are given consideration, and that there are developmental and community-based approaches to enterprise facilitation, especially in rural areas.

6.4 [DOET] Provide leadership on certification and accreditation for professional activities.

6.5 [SBDC] Provide low cost, easily accessible and readily understandable information, education, awareness and referral measures to inform small business operators about sustainability, including actions arising from the State Sustainability Strategy, the opportunities this will present for small business and the ways to address these.

> Financial reform and economic policy for sustainability

6.6 [DLGRD] Support sustainability investment tours to link venture capital with Western Australian innovations in sustainability.

6.7 [DOIR] Continue to document and celebrate the best examples of industry innovation in sustainability.

6.8 [DPC] Develop an education program on the opportunities of sustainability investment for business and the wider community.

6.9 [DPC] Encourage tertiary education institutions to incorporate sustainability principles into university courses that relate to economic development, such as economics, commerce, business and law degrees.

6.10 [DOIR] Work to facilitate greater access to venture capital for Western Australian sustainability businesses and innovators.

6.11 [DPC] Provide leadership for the encouragement of sustainable investments by adopting sustainability principles in the way government conducts its own business practices.

6.12 [DPC] Investigate the potential for State government superannuation funds to allow government employees to voluntarily direct a proportion of their contributions to nominated sustainability investments.

6.13 [DTF] Examine the ways in which subsidies and other financial mechanisms are having positive or negative effects on the health of the environment, society and economy and how they can contribute to the desired changes in business behaviour and investment patterns.

6.14 [SBDC] Require all business recipients of significant government grant funding to demonstrate the potential contribution to sustainability in the event that funding is provided.

6.15 [DTF/DPC] Work progressively to better articulate the triple bottom line in State government reporting.

6.16 [DOIR] Finalise and implement the government's Industry Policy Statement based on public discussion of the draft and ensure consistent application of sustainability principles.

> Eco efficiency and industrial ecology

6.17 [DPC] Through the Sustainability Roundtable and the Western Australian Sustainable Industry Group set out a program for how the World Business Council for Sustainable Development's goal of 'factor 4 by 2020' can be achieved in Western Australia.

6.18 [DPC] Encourage the adoption of the Western Australian Sustainable Industry Group's Cleaner Production Statement by all government agencies as part of their Sustainability Action Plans.

6.19 [WC] Continue to develop the Shenton Sustainability Park concept.

6.20 [DOIR] Work to extend the Kwinana Synergies Project concept to other industrial precincts in Western Australia.

6.21 [DOE] Explore the development of a Sustainable Industries Section within the Department of Environment.

6.22 [DOE/DOIR] Expand the promotion and adoption of the successful Industrial Waste Exchange program, and investigate its use as part of the environmental assessment and licensing system.

6.23 [DOIR] Encourage the establishment of sustainability business and research clusters in Western Australia, primarily based around resource recovery precincts and industrial parks.

6.24 [DPC/DOE] Provide a central information hub with information on sustainable technologies and business solutions on the Sustainability Online web site, in conjunction with the Western Australian Sustainable Industry Group, Centre of Excellence in Cleaner Production at Curtin University and Environmental Technology Centre at Murdoch University.

6.25 [SSC] Ensure that Western Australia implements and actively participates in national eco-labelling programs, such as the standards set by the Australian Environmental Labelling Association.

> Corporate social responsibility and industry sustainability covenants

6.26 [DPC] Through the Sustainability Roundtable create a partnership project with the Chamber of Commerce and Industry and the Australian Corporate Citizenship Alliance to create Corporate Social Responsibility Guidelines for Western Australia.

6.27 [DPC] Through the Sustainability Roundtable, develop a sustainability covenant program and associated implementation framework to give support to partnerships with industry innovators in sustainability. Sustainability covenants will:

- be non-binding agreements entered into between government and progressive companies or industry associations

- be developed in partnership with local communities and relevant public interest organisations

- cover all aspects of a company or industry's economic, social and environmental performance and will commit the government and company/industry sector to use their best endeavours to create net benefits in each of these areas, and

- bind the company to reporting regularly on the outcomes to which they are committed.

Key to agencies responsible for actions

BGPA	Botanic Gardens and Parks Authority
CC	Curriculum Council
DCA	Department of Culture and the Arts
DCA (WAM)	Western Australian Museum
DCD	Department for Community Development
DCLM	Department of Conservation and Land Management
DHW	Department of Housing and Works
DIA	Department of Indigenous Affairs
DLGRD	Department of Local Government and Regional Development
DOA	Department of Agriculture
DOE	Department of Environment
DOET	Department of Education and Training
DOF	Department of Fisheries
DOH	Department of Health
DOIR	Department of Industry and Resources
DPI	Department for Planning and Infrastructure
DPC	Department of the Premier and Cabinet
DSR	Department of Sport and Recreation
DTF	Department of Treasury and Finance
FPC	Forest Products Commission
HC	Heritage Council
MSC	Ministerial Steering Committee for the Review of the Project Development Approvals System
NRMC	Natural Resource Management Council
PTA	Public Transport Authority
OMI	Office of Multicultural Interests
OOE	Office of Energy
OSI	Office of Science and Innovation
RDCs	Regional Development Commissions
SBDC	Small Business Development Corporation
SEDO	Sustainable Energy Development Office
SSC	State Supply Commission
WALIS	Western Australian Land Information System
WAPC	Western Australian Planning Commission
WATC	Western Australian Tourism Commission
WC	Water Corporation