The Parliament of the Commonwealth of Australia

Sustainable Cities

House of Representatives
Standing Committee on Environment and Heritage

August 2005
Canberra

ISBN 0 642 78665 5 (printed version)

ISBN 0 642 78666 6 (HTML version)

Photo of Fuel Cell Bus on cover courtesy of Western Australian Department for Planning and Infrastructure

Contents

Foreword ix
Membership of the Committee xi
41st Parliament xi
40th Parliament xi
Terms of reference xiii
List of abbreviations xv
List of recommendations xvii

THE REPORT

1 A Vision for Sustainable Cities 1
Introduction 1
The inquiry 2
Structure of the report 4

2 Sustainability and Cities 7
What is sustainability? 7
Why cities? Statistical snapshots 10
Population increase and urbanisation 10
Environmental statistics 11
Human development index – energy and the environment 12
Health impacts 13
Economic impacts – the cost of city health 15
Sustainability impacts 16

Conclusion 17

3 Governance and policy frameworks – developing a national approach 19

Introduction 19
A vision for governance 20
Past and current Australian Government initiatives 21
Better Cities Program 22
Year of the Built Environment 22
Solar Cities 23
Funding to local government 23
The Australian Government influence on development 24
The National Summit of local government and planning ministers 25
The national agenda – a policy and governance framework 27
National leadership on urban policy 27
A national sustainability policy 28
A national sustainability charter 30
A national sustainability commission 32
Summary 36

4 Planning and settlement patterns 39

Recent trends – decreased household size and increased dwelling size 40
Shaping our cities 41
Densification or sprawl – responses 43
Coastal cities 48
A national population policy? 50
Building communities 51
Population health 51
Master communities 54
Consultation processes 55
Development Assessment Forum 57

5 Transport 59

Problems with transport sustainability 59
Current programmes 61

Auslink 61
Roads to Recovery 63
More urban rail – an alternative to more roads 65
Changing current transport patterns 67
Anticipating infrastructure needs 67
Infrastructure costs of road transport 68
Transport infrastructure provision and funding 69
Public private partnerships 70
Services to fringe developments 72
Changing transport modes 74
Impact of current policies in reducing car dependency 74
Fringe benefit tax concessions 75
Import duty for four wheel drives 77
Promoting and increasing the use of active transport and living 78
Benefits of active transport 80
Increasing the efficiency or environmental performance of transport modes 81
Emission standards 81

6 Water 85

Integrated water management 86
National Water Initiative 87
Australian Government Water Fund 88
Water efficiency and education 90
Water recycling and desalination 90
Water Efficiency Labelling and Standards Scheme 96
Water appliance labelling 97
Water efficiency for buildings 98
Water pricing 99
Water sensitive urban design 100
Decentralised water delivery 102

7 Building design and management 105

Residential buildings 105
Energy ratings 105

Going further 107
Your Home Guide 108
Commercial buildings 109
Features of green buildings 109
Solar orientation 109
Construction materials 110
Renovations and retrofitting 119
Regulation and awareness 121
Ratings tools, planning and materials technologies 122
BASIX 123
National Australian Built Environment Rating System 124
Nationwide House Energy Rating Scheme 124
Green Star rating tools 125
Incentives for sustainable building 126
Taxation 126
Green and location efficient mortgages 127
First Home Owner grant 128
Virtual building technology: life cycle analysis of design 129
Australian Government leadership 131

8 Energy 133

Australian Government Initiatives 134
National Framework for Energy Efficiency 134
Photovoltaic rebate programme 134
Other programmes 136
Energy delivery 138
Heating, cooling, lighting and insulation 139
Energy efficiency and education 141
Appliances 141
Renewable energy technologies 142
Energy pricing 147

9 Research and Feedback 149

Research 149

Feedback 151

The Swedish model 152

Australia's regional responsibilities 155

APPENDICES

Appendix A – List of submissions 157

Appendix B – List of exhibits 165

Appendix C – List of public hearings 171

Appendix D – Inspections and discussions 183

Foreword

Australia, like other countries around the world, is facing an immense challenge - to create sustainable cities for the future.

As one of the most urbanised countries in the world, with water shortages, transport congestion and high energy demands, Australia must take action now to address how our cities might develop in the future.

This committee's vision is for Australian cities that are vibrant and healthy – environmentally, socially and economically. Working towards this goal is not the responsibility of governments alone. It is the responsibility of all Australians and must be a priority for all Australians. The committee was heartened to see the commitment and dedication displayed by many individuals and organisations.

What is missing is coordinated and concerted action. This committee believes that that there is a need for the Australian Government to assume a leadership role. Accordingly, the committee's most important recommendations concern what form such leadership might take.

The House of Representatives Standing Committee on Environment and Heritage of the 40th Parliament began this inquiry. The current committee recognised the important work the previous committee undertook and chose to continue the inquiry. On behalf of the committee of the 41st Parliament, I would like to thank the previous committee for its important contribution, and particularly the Chair, the Hon Bruce Billson MP.

Dr Mal Washer
Chair

Membership of the Committee

41st Parliament

Chair	Dr Mal Washer MP	
Deputy Chair	Ms Jennie George MP	
Members	Mr Russell Broadbent MP	Hon Duncan Kerr MP
	Ms Kelly Hoare MP	Mr Stewart McArthur MP
	Mr Harry Jenkins MP	Mr Malcolm Turnbull MP
	Hon Jackie Kelly MP	Mr Jason Wood MP

40th Parliament

Chair	Mr Bruce Billson MP	
Deputy Chair	Ms Jennie George MP	
Members	Mr Phillip Barresi MP	Hon Duncan Kerr MP
	Mr John Cobb MP	Mr Peter Lindsay MP
	Mr Greg Hunt MP	Ms Kirsten Livermore MP
	Mr Harry Jenkins MP	Mr Stewart McArthur MP

Committee Secretariat

Secretary	Mr Ian Dundas
Inquiry Secretary	Ms Julia Thoener
Research Officer	Mr Robert Little
Administrative Officer	Mrs Marlene Dundas

Terms of reference

The Committee will inquire into and report on issues and policies related to the development of sustainable cities to the year 2025, particularly:

- The environmental and social impacts of sprawling urban development;
- The major determinants of urban settlement patterns and desirable patterns of development for the growth of Australian cities;
- A 'blueprint' for ecologically sustainable patterns of settlement, with particular reference to eco-efficiency and equity in the provision of services and infrastructure;
- Measures to reduce the environmental, social and economic costs of continuing urban expansion; and
- Mechanisms for the Commonwealth to bring about urban development reform and promote ecologically sustainable patterns of settlement.

List of abbreviations

ACCC	Australian Competition and Consumer Commission
ACF	Australian Conservation Foundation
ALGA	Australian Local Government Association
ANAO	Australian National Audit Office
ARC	Australian Research Council
ARTC	Australian Rail Track Corporation
BASIX	Building Sustainability Index
BCA	Building Code of Australia
BCP	Better Cities Program
COAG	Council of Australian Governments
CPTED	Crime Prevention Through Environmental Design
DAF	Development Assessment Forum
DOTARS	Department of Transport and Regional Services
ESD	Ecologically Sustainable Development
FAGs	Financial Assistance Grants
FBT	Fringe Benefits Tax
GST	Goods and Services Tax
HERS	House Energy Rating Software
HIA	Housing Institute of Australia
ICLEI	International Council for Local Environment Initiatives

LCA	Life Cycle Analysis
LGA(s)	Local Government Area(s)
LGPMC	Local Government and Planning Ministers' Council
MRET	Mandatory Renewable Energy Target
NABERS	National Australian Built Environment Rating System
NAEEEP	National Appliance and Equipment Energy Efficiency Programme
NatHERS	Nationwide House Energy Rating Scheme
NCC	National Competition Council
NCP	National Competition Policy
NFEE	National Framework for Energy Efficiency
NWI	National Water Initiative
PCA	Property Council of Australia
PIA	Planning Institute of Australia
PPP	Public Private Partnership
PVRP	Photovoltaic Rebate Programme
R & D	Research and development
SLA	Statistical Local Area
SoE	State of the Environment
STEG	Septic Tank Effluent Gravity
STEP	Septic Tank Effluent Pump
TBL	Triple line reporting
UFP	Urban Frontiers Program
WELS	Water efficiency labelling and standards
WSAA	Water Services Association of Australia
WSUD	Water Sensitive Urban Design

List of recommendations

3 Governance and policy frameworks – developing a national approach

Recommendation 1 31

The committee recommends that the Australian Government:

- establish an Australian Sustainability Charter that sets key national targets across a number of areas, including water, transport, energy, building design and planning.
- encourage a Council of Australian Governments agreement to the charter and its key targets.

Recommendation 2 32

The committee recommends that all new relevant Australian Government policy proposals be evaluated as to whether they would impact on urban sustainability and if so, be assessed against the Australian Sustainability Charter and the COAG agreed sustainability targets.

Recommendation 3 36

The committee recommends that:

- the Australian Government establish an independent Australian Sustainability Commission headed by a National Sustainability Commissioner;
- task the Commission with monitoring the extent to which Commonwealth funds and State and Territory use of Commonwealth funds promotes the COAG agreed sustainability targets; and
- task the Commission with exploring the concept of incentive payments to the States and Territories for sustainability outcomes along the lines of the National Competition Council model.

4 Planning and settlement patterns

Recommendation 4 58

The committee recommends that the Department of Transport and Regional Services raise with the Development Assessment Forum the proposal to extend membership of the forum to representatives from the Department of Environment and Heritage and the CSIRO.

5 Transport

Recommendation 5 64

The committee recommends that the Department of Transport and Regional Services, in consultation with the Department of the Environment and Heritage, investigate options to extend the Roads to Recovery programme to include other modes of transport as a step towards including sustainability in the funding criteria.

Recommendation 6 70

The committee recommends that:

- transport infrastructure planning decisions be benchmarked against the recommended Australian Sustainability Charter; and
- the Australian Government significantly boost its funding commitment for public transport systems, particularly light and heavy rail, in the major cities.

Recommendation 7 73

The committee recommends that the provision of Australian Government transport infrastructure funds include provision of funding specifically for sustainable public transport infrastructure for suburbs and developments on the outer fringes of our cities.

Recommendation 8 77

The committee recommends that the Australian Government review the current FBT concessions for car use with a view to removing incentives for greater car use and extending incentives to other modes of transport.

Recommendation 9 78

The committee recommends that the Australian Government review the tariff policy on four wheel drive vehicles with a view to increasing the tariff rate on four wheel drive vehicles, except for primary producers and others who have a legitimate need for four wheel drive capability.

Recommendation 10 81

The committee recommends that the Australian Government provide adequate funding to develop new programmes and support existing programmes, such as TravelSmart and the National Cycling Strategy, that promote and facilitate public and active transport options.

Recommendation 11 84

The committee recommends that the Department of Transport and Regional Services investigate developing emission standards for older vehicles and work with the States and Territories with a view to instituting mandatory testing and reporting at point of sale.

6 Water

Recommendation 12 93

The committee recommends that COAG, as part of the National Water Initiative, fund an education campaign educating the public about the benefits, economics and safety of using recycled water.

Recommendation 13 96

The committee recommends that the National Water Commission, in consultation with the States and Territories and the public, prepare an independent and transparent report on water options for each of the Australian capital cities and major regional centres.

Recommendation 14 98

The committee recommends that the Department of the Environment and Heritage undertake a public education campaign to increase community awareness of the Water Efficiency Labelling and Standards Scheme.

Recommendation 15 102

The committee recommends that the Australian Government ensure research and development regarding water resource management takes into account Water Sensitive Urban Design principles.

Recommendation 16 104

The committee recommends that the Australian Government commission research, either as part of the National Water Initiative or separately, to consider the economic viability and environmental benefits of decentralised water management systems.

7 Building design and management

Recommendation 17 106

The committee recommends that the Australian Government encourage the States and Territories to mandate disclosure of the energy efficiency and greenhouse performance of residences at point of sale and point of lease.

Recommendation 18 111

The committee recommends that the Australian Government, possibly through the CSIRO, investigate the value of a mass balance analysis for Australia.

Recommendation 19 114

The committee recommends that the Australian Government, in consultation with the Housing Industry of Australia, CSIRO and other industry and scientific bodies, investigate the establishment of a 'sustainable building material' labelling system.

Recommendation 20 120

The committee recommends that the Australian Government encourage the States and Territories to put in place a regime whereby approval for major residential and commercial renovations is conditional upon meeting energy efficiency and greenhouse performance requirements.

Recommendation 21 122

The committee recommends that the Department of the Environment and Heritage and the Australian Building Codes Board work with industry groups to raise awareness among builders, architects and developers of the economic and environmental benefits of sustainable building practices, including reusing and recycling building materials.

Recommendation 22 126

The committee recommends that the Australian Building Codes Board develop a nationally consistent building ratings tool that takes into account the range of environmental and sustainability factors dealt with by existing codes.

Recommendation 23 129

The committee recommends that the Australian Government increase the First Home Owner grant to $10,000 for those homes that meet a high standard of specified sustainability criteria and that these criteria be:

- stringent; and
- within the abilities of an HIA accredited builder.

Recommendation 24 129

The committee recommends that those States and Territories that do not have a 5 star rating system implement one as a priority.

Recommendation 25 131

The committee recommends that Australian Government departments and agencies that own property take steps to improve the sustainability of those buildings, at least to the 5 star rating, and that departments and agencies that rent property consider measures to improve building efficiency when seeking tenancy agreements.

8 Energy

Recommendation 26 135

The committee recommends that the Australian Government double the photovoltaic rebate to further encourage the uptake of photovoltaic systems.

Recommendation 27 137

The committee recommends that the Australian Government further develop its commitment to energy sustainability, particularly in the area of increasing the use of renewable energy.

Recommendation 28 139

The committee recommends that the Australian Government, through the National Framework for Energy Efficiency, examine the economic and environmental benefits of decentralised energy delivery and encourage investment in this area.

Recommendation 29 147

The committee recommends the Australian Government investigate US and German initiatives in the area of solar energy generation and purchase, and, where appropriate, implement or emulate them.

9 Research and Feedback

Recommendation 30 151

The committee recommends that the Australian Government:

- conduct an audit of existing research and funding opportunities for issues relating to the built environment and urban policy to ensure the adequacy of technical and policy research in this area; and
- give consideration to nominating the built environment as a national research priority.

Recommendation 31 155

The committee recommends that, with reference to the Swedish model of environmental objectives, the Australian Government:

- develop an accessible and identifiable set of national environmental (or sustainability) objectives for Australia (based on the Australian Sustainability Charter recommendation in chapter 3);
- implement a national report card for Australia which represents transparently and simply our progress towards the objectives; and
- encourage similar programmes at a community level, possibly emulating the Tidy Towns or Celebrate WA programmes, but focusing on sustainability.

Recommendation 32 156

The committee recommends that Australia investigate opportunities to establish a Sustainable Cities network across Australia and Asia, and extend its regional and international commitment to urban sustainability through avenues such as:

- Technology and research exchange;
- Pilot demonstration projects, particularly in the area of water and waste treatment;
- Increased aid for social development in urban areas; and
- Local government partnership programmes.

1

Sustainability is a journey, not a destination.

(Mr Chris Davis, Chief Executive Officer, Australian Water Association)[1]

A Vision for Sustainable Cities

Introduction

1.1 Australian cities are facing a number of crucial issues. Water shortages, congested transport, and demands placed on energy and urban development must be addressed.

1.2 Current indicators, such as greenhouse gas emissions, water consumption and energy use, suggest that future cities may develop in ways we do not desire.

1.3 Creating sustainable cities for the future requires planned action. Australia must proactively shape the growth and liveability of cities into the future.

1.4 Our cities must be inclusive, healthy environments that are rich in economic as well as social capital, and that are open, accessible and safe.

1.5 Australia has the opportunity to address the challenges that face its cities. In the course of this inquiry, the committee has observed many individuals, organisation and governments taking up these challenges and that much is already being done to bring about more sustainable cities.

---

1 Mr Chris Davis, Australian Water Association, *Transcript of Evidence*, 29 April 2005, p. 35.

1.6 This committee recognises that the issue of sustainable cities is an issue that affects all Australians and must be addressed by the Australian Government.

The inquiry

1.7 In August 2003, the then Minister for Environment and Heritage, the Hon Dr David Kemp, referred to the House of Representatives Standing Committee on Environment and Heritage the inquiry into *Sustainable Cities 2025*. Following the dissolution of the 40th Parliament, the inquiry lapsed.

1.8 In the 41st Parliament, the House of Representatives Standing Committee on Environment and Heritage sought a reference from the Minister for Environment and Heritage, Senator the Hon Ian Campbell, and resumed the inquiry in February 2005 with the same terms of reference.

1.9 The terms of reference for this inquiry are broad and outline an examination of the impacts and costs of sprawling urban development, the major determinants and benefits of different settlement patterns, mechanisms for urban reform, and a blueprint for sustainable Australian cities.

1.10 The inquiry into *Sustainable Cities 2025* comes more than a decade after the 1992 report *Patterns of Urban Settlement: Consolidating the Future?*, conducted by the House of Representatives Standing Committee for Long Term Strategies. Although many similar issues have been identified in the two reports, in 2005 the path to sustainable cities calls for a new set of initiatives from the Australian Government. It also puts out an urgent call for sustainable urban development to be placed at the forefront of government agendas.

1.11 The large number of submissions and the high level of media interest in the inquiry indicated that urban development is now a national priority and there is a local desire for change.

1.12 In the 40th Parliament, a total of 192 submissions were received to the *Sustainable Cities 2025* inquiry. So comprehensive and informative was the range of submissions that the committee of the 40th Parliament elected to conduct a number of roundtable forums in addition to public hearings and inspections around the country.

1.13 Roundtable forums brought together organisations with a similar focus or needs, such as local councils in one instance, to discuss the types of challenges faced in the implementation of sustainability policies. Another roundtable brought together a range of health professionals and researchers to detail the connection between urban environments and population health.

1.14 In conducting its public hearings, the committee of the 40th Parliament sought to hear from a broad range of witnesses. These witnesses represented organisations, industry, researchers and individuals. Public hearings were conducted in Adelaide, Melbourne, Canberra, Sydney and Brisbane.

1.15 A number of inspections were also held in the 40th Parliament. These inspections provided a first hand look at innovative energy technologies, greenfield housing developments, in-fill and retrofit developments, broad scale coastal development, community regeneration projects, water treatment systems, and conservation and recreation areas.

1.16 The committee of the 41st Parliament reaffirms the importance of sustainable Australian cities by resuming the inquiry and completing this report. The committee held additional public hearings and roundtable discussions in Perth and Sydney. The committee also conducted a number of inspections which provided insights into energy and waste management technologies.

1.17 The committee acknowledges the contribution of the previous committee, in particular, the previous Chairman, the Hon Bruce Billson MP, for his ongoing interest in this inquiry.

1.18 In conducting this inquiry, the committee was well aware that many issues relating to urban development are the responsibility of State and Territory or local governments. However, while not all issues are within the jurisdiction of the Australian Government, the performance and health of our cities impacts on Australia as a nation.

1.19 The committee determined that there is a critical role for the Australian Government to provide a holistic national vision and to establish a framework approach to integrate the components of a sustainable city. This framework of city sustainability should govern Australian Government policies and actions. It should also provide a connected framework to plan and fund sustainable Australian cities – the details and implementation of these plans are devolved to and determined by State, Territory and local governments as appropriate.

1.20 It is the vision of this committee that sustainable cities of the future will be vibrant urban regions which are economically productive, environmentally responsible, and socially inclusive. The conclusions in this report establish the objectives, mechanisms and commitment for the cooperative development of vibrant and sustainable Australian cities.

Structure of the report

1.21 The evidence gathered during the course of this inquiry is extensive. The summary of key issues and recommendations in this report is broad but it does not aim to be comprehensive. The report represents many of the thematic issues that emerged during the inquiry and it sets a direction for governments of all levels.

1.22 The issue of sustainable cities is vast and the approach of this inquiry was to initiate the establishment of a national framework of principles, targets and mechanisms towards sustainability.

1.23 The committee saw this task as encompassing five processes:

- Acceptance of the need for sustainability in our cities. This entails understanding our 'urban scorecard' and our comparative performance on sustainability indicators.
- Establishment by the Australian Government of future targets related to urban sustainability and the governance frameworks that are required to connect these targets with policy and funding decision-makers.
- Implementation of the sectoral programs and changes needed at a practical and grass-roots level to modify current unsustainable practices and to promote best practice in all aspects of urban development.
- Monitoring of progress towards sustainability, and transparently reporting back to all Australians (and internationally) on our successes and failures. We must be prepared to research and implement new technologies, and to review and adapt new and existing programs to better meet sustainability targets.
- Provision of accessible information so that the Australian public can make informed judgements about the issues addressed in this report.

1.24 The structure of this report broadly follows these key processes. The following chapter considers the current health of our cities in terms of economic performance, social well-being, population health and a number of other comparative international indicators. It provides a snapshot of our urban environments and an overview of the liveability of Australian cities.

1.25 Chapter 3 reviews the policy frameworks governing urban development and the role of the Australian Government in setting a national urban policy. It proposes a new model to enable governments to promote and include sustainability in future decision-making and funding.

1.26 Chapter 4 considers issues of settlement patterns, examines current trends in household and dwelling sizes and looks at different models of city development. It looks at the focus needed on building communities rather than just housing people, and finally considers consultation processes and the Development Assessment Forum.

1.27 Chapter 5 examines the transport needs of our cities. It looks at problems with transport sustainability and Australian Government funding for transport infrastructure. It considers ways in which car use can be reduced and the benefits of public and active transport. It also discusses options for increasing the efficiency or environmental performance of transport modes.

1.28 Chapter 6 examines water issues in relation to sustainable cities. It looks at water efficiency with an emphasis on water recycling and desalination, Water Sensitive Urban Design and finally, decentralised water delivery as a major challenge for urban environments.

1.29 Chapter 7 examines the efficiency and health impacts of commercial and residential building standards, and how appropriate current building practices are to provide sustainable buildings for our future. It looks at the myriad of standards, regulations and benchmarks and other concepts such as Life Cycle Analysis of Design that all impact on the sustainability of the built environment.

1.30 Chapter 8 focuses on energy delivery and energy efficiency. It examines the energy needs of cities and measures to reduce consumption, and increase efficiency and the take-up of renewable energy.

1.31 Chapter 9 examines the need to research and report on how we are performing in order to map and plan our path towards sustainability.

2

> … for the first time in human history more people live in cities than outside cities … cities are growing at 2.3 per cent per annum compared with rural areas at 0.1 per cent per annum worldwide. Cities are where it is all happening. If we are going to succeed in sustainability it is going to live or die in the cities.
>
> (Dr Harry Blutstein, Director of Integrating Sustainability)[1]

Sustainability and Cities

What is sustainability?

2.1 The committee received many submissions on the meaning of sustainability. Submissions drew attention to the fact that the factors relating to sustainability are many, varied, complex and inextricably interrelated.

2.2 Professor Valerie Brown from the ANU's Research School of Resources, Environment and Society raises questions that are at the core of the difficulty:

- The concept or idea of sustainability is multi-faceted and still emergent, and requires open-ended working definitions, related to an ideal goal, rather than a single recipe or fixed objective. Do we have a preferred working agenda?

---

1 Dr Harry Blutstein, Integrating Sustainability, *Transcript of Evidence*, 16 March 2004, p. 57.

- Sustainability is differently interpreted in each of the silos formed by the disciplines and administrative departments. How do we respect and bring together these interpretations in a collaborative and concerted way?[2]

2.3 In developing an understanding of the concept of sustainability, the committee had regard to the range of views put forward in the evidence. For example:

- Mr Andrew Inglis defines sustainability across three elements: environmental (maintaining planetary systems and human life), social (equity) and political sustainability (citizens participation and democracy).[3]
- One of Australia's leading sustainability experts, Professor Peter Newman, focuses on integration of the environmental, social and economic as a key concept of sustainability because the 'problems of sustainability just don't fit into the neat boundaries of the disciplines anymore'. [4] According to Professor Newman, the public sector should be guided by four key concepts:
  - Not all growth is sustainable development,
  - Sustainability requires integrative approaches,
  - All growth needs to be defined in terms of a new set of indicators and assessments,
  - Sustainability and participation cannot be separated.[5]
- Dr Harry Blutstein, Director of Integrating Sustainability, refers to the Melbourne Principles on Sustainable Cities, which were adopted at the Local Government Session of the World Summit on Sustainable Development held in Johannesburg in 2002. They were subsequently adopted by the Australian Local Government Association at its 2002 Congress in Darwin:

> The Melbourne Principles are ten simple principles by which a city could develop strategic and action plans. They address the urban environment holistically, and are based on a triple-bottom-line framework. The language of each principle is straightforward and can be easily communicated to decision-makers, stakeholders and

2 Professor Valerie Brown, ANU School of Resources, Environment and Society, *Submission 90*, p. 3.

3 Mr Andrew Inglis, *Submission 76*, p. 9.

4 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 9. Professor Peter Newman is the Director of Murdoch University's Centre for Sustainability and Technology Policy, Director of the WA Sustainability Policy Unit and NSW Sustainability Commissioner.

5 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 6.

> the general public. They apply to both developed and developing countries, and are designed to guide thinking and provide a strategic framework for action.[6]

2.4 The committee supports the approach of these ideals. However, it is a challenge to translate these ideals into a more tangible concept of a sustainable city in operation. According to Professor Anthony McMichael, from the National Centre for Epidemiology and Population Health, sustainability is about:

> … whether we have the collective wit to create urban living conditions that are good for human comfort, wellbeing and health and are supportive of the planet's life-supporting systems. It is for this reason that we are beginning to see explorations of less conventional, more integrative, indicators such as the "genuine progress indicator", the urban "ecological footprint", and indices of human wellbeing and health.[7]

2.5 Sustainability is a set of principles and practices; and therefore a dynamic concept implying a continual process of improvement.

2.6 The committee accordingly prefers to speak of a 'vision for a sustainable city' and a pathway to sustainability. The committee sought to articulate a set of principles for sustainable cities of the future: they will be vibrant urban regions which are economically productive, environmentally responsible, and socially inclusive. On a practical level, a sustainable Australian city should aim to:

- Conserve bushland, significant heritage and urban green zones;
- Ensure equitable access to and efficient use of energy, including renewable energy sources;
- Establish an integrated sustainable water and stormwater management system addressing capture, consumption, treatment and re-use opportunities;
- Manage and minimise domestic and industrial waste;
- Develop sustainable transport networks, nodal complementarity and logistics;
- Incorporate eco-efficiency principles into new buildings and housing; and

---

6 Integrating Sustainability, *Submission 27*, p. 5.

7 Professor Anthony J McMichael, National Centre for Epidemiology and Population Health, *Submission 102*, p. 2.

- Provide urban plans that accommodate lifestyle, employment and business opportunities.

2.7 The committee also believes that this future will not be achieved without planning and a clearly articulated strategy.

2.8 While not all encompassing, and the committee acknowledges that some submissions suggested additions to these objectives, the committee sees value in this set of objectives as articulating how we envisage a sustainable Australian city of the future.

2.9 Although sectoral issues are structured in this report under discrete headings for ease of reference, the committee is acutely aware of the interrelationship of all the factors in finding a pathway to sustainability.

2.10 Many of the committee's final recommendations will refer back to an overarching framework that integrates the components of a sustainable city. It is this framework that can provide an integrated method of policy consideration and take into account the interrelatedness of these sectoral issues.

Why cities? Statistical snapshots

2.11 By focusing on sustainable cities, the committee has a unique opportunity to influence the outcomes for over 80 per cent of the Australian population, given Australia is one of the most urbanised countries in the world.[8]

2.12 The following is a snapshot of Australia's performance across some population and key sustainability indicators. In many cases, the figures presented are an indictment of current unsustainable practices.

Population increase and urbanisation

2.13 Australia's estimated resident population at December 2004 was 20.2 million people, an increase of 230,000 people since December 2003. This represents an annual growth rate of 1.2 per cent.[9]

8 STEP Inc., *Submission 87*, p. 3: 83 per cent of Australians live in cities. 60 per cent live in 6 cities and 40 per cent live in Sydney and Melbourne alone.

9 Australian Bureau of Statistics, *Estimated Resident Population, Australian Demographic Statistics*, Catalogue 3101.0

2.14 The majority of Australia's growth is in the capital cities. At June 2003, the cities were home to 12.7 million people, or around two-thirds of Australia's population. Significantly, the growth of cities also accounted for 64 per cent of the total growth in 2002-03, indicating that Australia's population continues to increasingly be concentrated in urban areas.[10] The largest growth occurred in Melbourne, followed by Brisbane and Sydney.[11]

2.15 The highest growth rates in Australian cities were experienced in the inner city. The Local Government Area of Melbourne, for example, recorded an annual growth rate of 7.9 per cent, while those of Perth and Sydney also experienced rapid growth.[12]

2.16 However, a significant proportion of Australia's growth also occurred in the outer Local Government Areas of capital cities, particularly in Sydney and Melbourne. Melbourne's fringe Local Government Area of Melton recorded Australia's highest growth rate during 2002-03 (11.8 per cent or 6,900 people).[13]

2.17 With the numbers of urban residents increasing, our cities risk becoming more unsustainable across environmental, economic and social indicators. Larger cities are resulting in more urban travel, greater freight costs, less bushland, higher living costs, more social isolation, reduced air quality, greater water and energy consumption, decreased physical health, and increased levels of household and commercial waste.

Environmental statistics

2.18 The 2001 report *Australia State of the Environment – Human Settlements*[14] shows Australians to be high resource users and waste generators, and, in some instances, the 'world's worst':

- Greenhouse gas emissions are 27 tonnes per capita per year. This puts Australia's per capita rate as the world's highest.

---

10 Australian Bureau of Statistics, *Regional Population Growth Australia and New Zealand, 2003-04*, Catalogue 3218.0

11 Brisbane Statistical Division (SD) was the fastest growing capital city in Australia in 2002-03, increasing by 2.5 per cent, followed by Perth and Melbourne SDs (up 1.5 per cent and 1.3 per cent respectively).

12 Australian Bureau of Statistics, *Regional Population Growth, Australia and New Zealand, 2003-04,* Catalogue 3218.0

13 Australian Bureau of Statistics, *Regional Population Growth, Australia and New Zealand, 2003-04,* Catalogue 3218.0

14 Dr Peter W Newton, Lead Author, *2001 Australia State of the Environment – Human Settlements*, February 2003, p. 1.

- Water consumption is 1540 kilolitres per capita per year. This is also the highest per capita rate (North America is 1510; Europe 665; Asia 650; World 670).
- Dwelling space has increased 3 per cent per year for new dwellings (from 1992-1999), despite reductions in average household size.
- Energy use in the residential sector has increased 60 per cent since 1975, despite population increases of nearly half this (35 per cent). Commercial sector energy use is forecast to double between 1990-2010 under business-as-usual scenarios.
- Travel (vehicle kilometres travelled) has increased by almost 60 per cent in cities such as Sydney between 1980 and 2000. This increase adds significantly to congestion and air pollution.
- Material consumption, at 180 tonnes per capita per year, is the highest of all developed countries.
- Domestic waste stream is 620 kilograms per capita per year. This rate is second only to the United States of America.
- Construction and demolition waste is 430 kg per capita per year, and contributes approximately 40 per cent of all solid waste disposed to landfill.
- Outside of a small number of demonstration projects, stormwater is not being harvested as a resource and domestic wastewater is not regularly recycled and re-used.

2.19 These environmental statistics paint a bleak picture of the effects of unsustainable practices. Combined with an increasing population size, and the increasing concentration of population in urban and coastal areas, the case for action on sustainable cities becomes more urgent.

Human development index – energy and the environment

2.20 The Human Development Index (HDI) is a measure of national emissions and electricity consumption on a per capita basis. It provides a comparative means to evaluate the impacts of human settlements across developed nations.

Table 2.1

		Carbon dioxide emissions per capita (metric tons) 2000	Electricity consumption per capita (kilowatt hours) 2001
HDI rank			
High human development			
1	Norway	11.1	29,290
2	Sweden	5.3	17,355
3	Australia	18.0	11,205
4	Canada	14.2	18,212
5	Netherlands	8.7	6,905
6	Belgium	10.0	8,818
7	Iceland	7.7	28,260
8	United States	19.8	13,241
9	Japan	9.3	8,203
10	Ireland	11.1	6,417

Source *United Nations Human Development Report 2004*

2.21 Anthropogenic (human originated) carbon dioxide emissions stem from the burning of fossil fuels, gas flaring and the production of cement. The latter is a significant contributor to carbon dioxide emissions from developed nations.

2.22 Australia is second only to the United Sates of America in its emission rate per capita, and significantly above many other developed nations.

2.23 Electricity consumption per capita (in kilowatt-hours) refers to gross production, which includes consumption by station auxiliaries and any losses in the transformers that are considered integral parts of the station.

2.24 Australia is ranked sixth amongst the nations listed in terms of its per capita electricity consumption.

Health impacts

2.25 The preceding statistics demonstrate the importance of working towards sustainable cities, particularly when considering the evidence connecting health and urban design. Increasingly, researchers are determining strong links between urban living and the rising incidence of certain diseases:

> A healthy environment that includes effective water management, clean air and biological diversity will also be the basis for a healthy population. Protection, reinforcement and rehabilitation of the natural systems will be integral to a healthy environment.[15]

15 Australian Institute of Landscape Architects, *Submission 19,* p. 2.

2.26 Canberra Environment Centre argues that current dominant approaches to health and the environment are 'based on solving the problem after it has been created'.[16] Professor Steven Boyages suggests that this situation - and its associated costs - could be reversed. Links between health and the urban environment is emerging as a new area for study and, as Professor Boyages explained, Australia is 'probably leading the world in understanding how we translate the problems into some form of action'.[17]

2.27 In its submission, the Western Sydney Area Health Service lists the range of health influences and impacts of urban living as follows:

- physical activity
- social cohesion
- personal safety
- food supply
- air and water quality, and
- open space.

> Health outcomes as diverse as mental health, obesity, injury, violence, asthma and infectious diseases are affected by these and other aspects of the urban environment. The relationships encompass social, physical, behavioural and economic determinants. In addressing these relationships we must consider potential short, medium and long term health consequences.[18]

2.28 Evidence suggests that that there are three main health issues that are impacted by the urban environment: obesity, cardiovascular disease and diabetes. Obesity does not stand alone as a health issue, but is also a major risk factor for cardiovascular disease, for which 'physical activity is a major modifiable risk factor'.[19]

2.29 Obesity impacts on the health of many Australians and, due to large healthcare costs, on the Australian economy. Over half of all adults were considered overweight or obese in 1995, second only to the levels reported in the United States.

2.30 The committee heard further evidence that, by living on a freeway 'you are four times more likely to be obese than if you do not live on a freeway.'[20]

---

16 Canberra Environment Centre, *Submission 6,* p. 1.

17 Professor Steven Boyages, Western Sydney Area Health Service, *Transcript of Evidence*, 27 January 2004, p. 34.

18 Western Sydney Area Health Service, *Submission 106*, p. 2.

19 Central Sydney Area Health Service, Health Promotion Unit, *Submission 18*, p. 2.

20 Professor Rob Moodie, Victorian Health Promotion Foundation, *Transcript of Evidence*, 27 January 2004, p. 77.

2.31 The committee noted, in particular, the importance of physical activity for children:

> Travel behaviour patterns are formed as children, and cycling, walking and public transport as part of the journey to and from child-care or school represents an opportunity to promote regular physical activity for many pre-school and school age children.[21]

2.32 Mental health is also affected by the level of physical activity, since exercise is 'acknowledged as an effective treatment for depression'.[22]

2.33 Another significant health impact of our cities concerns rising rates of respiratory illnesses. In its submission, the Bus Industry Confederation refers to a number of studies that demonstrate linkages between air pollution and respiratory illness, including respiratory mortality, with cars and industry the main source of pollutants. Further:

> It is now widely accepted that transport related emissions are associated with short-term health effects at the concentrations found in most cities. There is also a broad consensus that the effects of these pollutants on health can be quantified using exposure-response relationships based on epidemiological studies that link pollution concentrations or increments to levels of health effects. These health effects are usually valued using willingness to pay (WTP) estimates.[23]

Economic impacts – the cost of city health

2.34 Numerous submissions[24] to the committee commented on the health cost of unsustainable practices to the Australian economy.

2.35 The CSIRO believes that, by 2025, health impact statements will be used much in the same way that environmental impact statements are used in the planning process today.[25]

---

21 Australian Bicycle Council, *Submission 70*, p. 4.

22 Australian Bicycle Council, *Submission 70*, p. 4.

23 Bus Industry Confederation, *Submission 97*, p. 24.

24 See Central Sydney Area Health Service, Health Promotion Unit, *Submission 18,* p. 1; Railway Technical Society of Australasia, *Submission 188*, p. 2; Australian Bicycle Council, *Submission 70,* p. 2; Australian Conservation Foundation and Environment Victoria, *Submission 162,* p. 10.

25 CSIRO, *Submission 91*, p. 24.

2.36 The Australian Bicycle Council also drew attention to the linkages between health care costs, poverty and transport infrastructure:

> Nationally, the annual direct health care cost attributable to physical inactivity has been estimated at $377 million per year. The cost of obesity in Australia has been estimated at between $680 and $1,239 million per year. Besides cost savings in our health and infrastructure budgets available through increased use of active transport, evidence from the United States shows that on the micro scale, transportation costs are now just below housing costs as the leading household expenditure item. Australia is undoubtedly following this trend as we see the creation of poverty traps and poor childhood environments for low income families that are denied access to safe active transport or public transport facilities and therefore become dependent on their cars.[26]

2.37 Several submissions[27] supported the view that poor transport planning can be a determinant of poverty. The Bus Industry Confederation gave an example of this stating that:

> . . . the gaps between transport provision and those with limited transport choices results in non-participation in employment, education, social and leisure activities. This tends to affect the young, those on low incomes, women, the elderly and the disabled more than other groups in society. It is a significant contributor to poverty in Australia.[28]

Sustainability impacts

2.38 One concept used to measure sustainability is the 'ecological footprint'. This can be applied to Australia as a whole:

> On a global level, Australia's ecological footprint of 8.1 hectares per capita indicates that its citizens are consuming between two and four times their 'fair share' of the world's ecologically productive land placing it among the top five consuming nations of the world.[29]

---

26 Australian Bicycle Council, *Submission 70*, p. 4.

27 See Australian Bicycle Council, *Submission 70*, p. 4, Alexandra and Associates Pty Ltd, *Submission 22*, p. 1 and Committee for Melbourne, *Submission 187*, p. 2.

28 Bus Industry Confederation, *Submission 97*, p. 22.

29 Dr Peter Newton, 'Urban Australia 2001', *Australian Planner,* Vol 39, No 1, p. 37.

2.39 The concept can also be applied to industrial cities. Professor Anthony McMichael also observes that, for example, Sydney's ecological footprint is 150 times greater than the area of Sydney itself, which means:

> … in order to supply the materials and energy that people living in Sydney need and to absorb the waste, the Sydney population depends on an area of the earth's surface about 150 times greater than the full area of Sydney.[30]

Ecological Footprint

The environmental economist William E. Rees, Professor of Community and Regional Planning at the University of British Columbia co-invented the 'ecological footprint' concept with then PhD student Dr Mathis Wackernagel. He defines the concept as follows:

> The ecological footprint is the corresponding area of productive land and aquatic ecosystems required to produce the resources used, and to assimilate the wastes produced, by a defined population at a specified material standard of living, wherever on Earth that land may be located.

2.40 The committee agrees with Professor Peter Newman's observation that a city would be become more sustainable if it reduced its ecological footprint at the same time as improving its liveability.[31]

Conclusion

2.41 Environmentally, socially and economically, unsustainability exacts a high cost. The longer that Australia delays the move to adopt sustainable practices, the greater those long term costs will be.

30 Professor Anthony McMichael, National Centre for Epidemiology and Population Health, *Transcript of Evidence*, 27 January 2004, p. 83.

31 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 4.

3

. . . we must not think of sustainable cities as being some sort of cost that we have to bear in the interests of a greener and more sustainable future. The fact is that, if we had sustainable cities, there would be a significant productivity dividend to the country. In other words, GDP would be greater, other things being equal, if we had better functioning and efficient cities.

(Mr Marcus Spiller, National President, Planning Institute of Australia)[1]

Governance and policy frameworks – developing a national approach

Introduction

3.1 During the inquiry the committee formed the view that the Australian Government has a responsibility to provide national leadership in urban policy as it impacts on the sustainability of Australian cities. The committee regards a national governance structure as the appropriate means to ensure a strategic approach across all levels of Australian government.

3.2 Many organisations in their submissions advocated that the Australian Government take a more overt policy role in the development of Australian cities.

---

1 Mr Marcus Spiller, Planning Institute of Australia, *Transcript of Evidence*, 29 April 2005, p. 3.

3.3 Triple bottom line (TBL) reporting, with the three pillars of environmental, social and economic performance, is now a familiar and often well integrated concept in business and government reporting frameworks. Suggestions have been made more recently for a quadruple bottom line, where the fourth pillar would be governance performance.

3.4 The committee agrees with the need to recognise good governance as a key element in implementing balanced TBL accountability and sustainability principles. However, it is also the committee's view that the current three pillars of TBL should never be viewed as discreet arenas of performance measurement. Good governance should connect and ensure appropriate balances and accountability between the objectives of each pillar.

3.5 Several submissions called for Australian Government leadership in the area of sustainable cities, such as a national sustainability commission, and referred to a need for an appropriate national governance structure that coordinates a holistic and integrated approach to the sustainable development of our cities.

3.6 Governance structures for sustainability are, in many regards, the precursor to establishing a path to sustainability. Coordinated governance is essential to 'translate' the vision of sustainability into targets, and to plan, implement and review the programmes that will achieve those targets.

3.7 Having provided in the previous chapter a snapshot of Australia's urban and environmental health, this chapter addresses the issue of governance – that is, the overarching frameworks and mechanisms appropriate to direct progress towards urban sustainability.

A vision for governance

3.8 Early into this inquiry, the committee became aware of the very different context in which it was operating from the 1992 committee inquiry into patterns of urban settlement.[2]

2 House of Representatives Standing Committee for Long Term Strategies, *Patterns of Urban Settlement: Consolidating the Future?* Parliament House, Canberra, August 1992.

3.9 The 1992 report focused on land availability, infrastructure, and population distribution and densification. Sectoral issues, such as water services, transport networks, energy efficiency and building design were acknowledged and mentioned. However, the 1992 committee noted the lack of reliable data on, and research into, urban performance.[3]

3.10 By contrast, there is now almost an abundance of research in the context of this inquiry. However, in 2005, directions for actions are lacking. It is now crucial to consider sectoral issues as they affect or are affected by urban development: water services and consumption; public, private and active transport options; renewable energy and reduction in energy usage; and both commercial and residential building design.

3.11 These sectoral issues are inevitably interrelated; and although they are discussed in this report as separate chapters, many of the recommendations refer back to a proposed overarching framework. It is this framework that can provide an integrated method of policy consideration and take into account the interrelatedness.

3.12 There is no single or simple solution to the challenges of urban development. A recommendation may directly improve sustainability outcomes. Other recommendations aim to ensure that future policy decisions made to address one sectoral issue do not have adverse consequences in another area of urban sustainability.

3.13 Accordingly, the committee believes it important to first consider a new overarching framework for sustainability governance, so that the principles of sustainability are placed on the national agenda and at the forefront of urban development.

Past and current Australian Government initiatives

3.14 The Australian Government has initiated a number of programmes in the past that have involved it more directly with urban planning, traditionally the preserve of the States and Territories. Initiatives included the Better Cities Program, introduced in 1991, and the Year of the Built Environment in 2004.

3 House of Representatives Standing Committee for Long Term Strategies, *Patterns of Urban Settlement: Consolidating the Future?* Parliament House, Canberra, August 1992, p.vii.

Better Cities Program

3.15 Under the Better Cities Program, the Commonwealth funded urban improvements. The programme also aimed at encouraging micro-economic and institutional reform, improving social justice and the environment and developing more effective coordination between the levels of government.[4]

3.16 In evidence to the committee, several local councils commented positively on the Better Cities Program as instrumental in assisting local government to achieve sustainable infrastructure and planning which would have been beyond their financial capabilities. The programme also 'raised the understanding and level of debate phenomenally'.[5] A similar project on a broader scale, such as a 'national cities program' was endorsed by a number of local councils.[6]

3.17 The committee notes the achievements of the Better Cities Program and considers it a valuable Australian Government initiative at that time, particularly in relation to managing funding relations between the Commonwealth and the States.

Year of the Built Environment

3.18 The committee acknowledges that the Year of the Built Environment 2004 (originally a Western Australian initiative subsequently endorsed by the Australian Government) promoted education and debate and raised awareness of the built environment and sustainability issues. However, the committee has found it difficult to identify tangible outcomes or directions, following the year's focus on these issues.

3.19 The committee hopes that the exposure during 2004 of sustainability as a critical issue facing Australian cities assists in moving good environmental design to centre-stage – where it is incorporated as a standard approach in everyday design practices.

4 Australian National Audit Office, *Building Better Cities*, October 1996.

5 Ms Dyan Currie, Toowoomba City Council, *Transcript of Evidence*, 6 April 2004, p. 24.

6 Ms Dyan Currie, Toowoomba City Council, *Transcript of Evidence*, 6 April 2004, p. 24; also Councillor Susan Robbins, Gold Coast City Council, *Transcript of Evidence*, 6 April 2004, pp. 9-10.

Solar Cities

3.20 The Australian Government has committed $75 million to fund trials of a new solar city programme. The programme aims to incorporate solar technologies and energy efficiency measures into existing and new buildings. Expressions of interest from industry have been called for.[7]

3.21 The Solar Cities programme will go beyond the current photovoltaic rebate scheme to concentrate solar efficient housing in one urban area. It will also establish a number of households engaged in solar generation and able to 'sell back' to the electricity grid.

3.22 One of the key issues for solar technologies is the link between price and uptake of the technology:

> Simplified and standardised procedures for connecting photovoltaic systems and optimised planning protocols that recognise solar access would reduce the delays currently experienced by some consumers and facilitate greater uptake of solar technologies.[8]

3.23 The Solar Cities programme aims to support at least four Solar City projects in grid-connected urban areas across Australia.[9]

3.24 The committee endorses the Solar Cities programme. Critical mass remains a key impediment to reducing unit costs of solar technologies (which will in turn generate more market demand) and generating sufficient units of electricity to contribute usefully to urban supply levels during times of peak loading.

Funding to local government

3.25 The response from local governments and local government organisations to the committee's inquiry has been substantial. The committee recognises the crucial role local governments play in the creation of sustainable cities. Local government generally presented a unified approach to both the challenges and the vision for sustainable cities.

---

7 Joint Media Release, Minister for Environment and Heritage and Minister for Industry, Tourism and Resources, *Solar Cities programme moves step closer*, 15 April 2005.

8 Department of Environment and Heritage, *Solar Cities Programme Guidelines* http://www.greenhouse.gov.au/solarcities/pubs/solarcities-guidelines.pdf p. 3.

9 Department of Environment and Heritage, *Solar Cities Programme Guidelines* http://www.greenhouse.gov.au/solarcities/pubs/solarcities-guidelines.pdf p. 8.

3.26 The Australian Government provides financial assistance directly to local governments under the Local Government (Financial Assistance) Act 1995, which is administered by the Department of Transport and Regional Services. In 2003-04, the grants provided around $1.5 billion to local government. The grants are untied and councils can spend according to their communities' priorities, with the objective of strengthening local government to 'enable it to provide a wider range of services and to promote equity between councils and certainty of funding'.[10]

The Australian Government influence on development

3.27 Many Australian Government policies have impacted on the structure of Australian cities, and continue to do so, although these impacts are often not coordinated to promote harmonised and sustainable development.

3.28 In addition to specific programmes such as the Better Cities initiative, Australian Government policies have always indirectly influenced urban development. Examples include road funding, immigration policy and the First Homeowner Grant; however, in the absence of national urban policies and integrating urban impacts into policy-making, cities have developed as 'chaotic responses to discrete programmes and policies'.[11]

3.29 Local councils identified several 'missed opportunities' where it was suggested that Governments did not pursue opportunities to promote sustainability alongside achieving other policy objectives.[12]An example is the First Homeowner Grant, which appeared to lack a formalised national urban agenda and policy framework, and could have incorporated a sustainability rating.[13]

3.30 Councils also commented on policy outcomes with unintended adverse environmental costs, such as the Fringe Benefits Tax on cars with its criterion of 'kilometres travelled', and the tariff reduction on four wheel drives (this will be discussed in more detail in chapter 5). Mr Wallace Wight, Coordinator of the Northern Subregional Organisation of Councils in Queensland, referred to these as 'counterincentives' and commented that 'the public is getting mixed messages'.[14] He told the committee that,

10 Department of Transport and Regional Services, *Submission 140*, p. 22.

11 Mr Marcus Spiller, *Which Way on a Better Cities Policy for Australia,* see www.sgs-pl.com.au

12 See for example Townsville City Council, *Submission 161*, City of Port Phillip, *Submission 40;* Northern Subregional Organisation of Councils, *Submission 21.*

13 Mr Peter Marshall, Wodonga City Council, *Transcript of Evidence*, 16 March 2004, p. 104; see also Councillor Elizabeth Johnstone, Mayor of the City of Port Phillip, *Transcript of Evidence*, 16 March 2004, p. 84.

14 Mr Wallace Wight, Northern Subregional Organisation of Councils, *Transcript of Evidence*, 6 April 2004, p. 33.

to avoid unintended, counterproductive consequences, any such tax decision should meet sustainability criteria and it should be determined whether its imposition would lead to more or less sustainable behaviours.[15]

3.31 The committee recognises that policy decisions made in relation to industry or economic objectives may well impact adversely on city conditions.

3.32 The committee agrees with Mr Kevin Breen from the City of Darebin that more integrated approach across the three levels of government and a more active role taken by the federal government is 'critical for the future prosperity of the nation'.[16]

The National Summit of local government and planning ministers

3.33 The committee agrees that sustainable urban development requires the cooperative approach of the three tiers of government. Most local planning issues are made at the local government level, and constitutional responsibility for local government lies with the States and Territories.

3.34 In 2003, the Council of Australian Governments (COAG) established the Local Government and Planning Ministers' Council (LGPMC). The inaugural meeting of the LGPMC was in mid-2003 and discussed the priority issues of:

- Urban Water Reuse and Recycling;
- National Charter on integrated Land Use and Transport Planning; and
- Urban Sustainability.

3.35 The LGPMC was responsible for the National Summit on the Future of Australia's Cities and Towns, which was held in Canberra on 3 -4 June 2004, with planning ministers, representatives of local government, officials from Australian Government and State agencies, industry, academia and social service groups.

15 Mr Wallace Wight, Northern Subregional Organisation of Councils, *Transcript of Evidence*, 6 April 2004, p. 17.

16 Mr Kevin Breen, City of Darebin, *Transcript of Evidence*, 16 March 2004, p. 82.

3.36 The Summit identified major issues facing Australia's cities and towns, and concluded that:

> to be successful into the future, the vision for Australia's cities and towns must:
>
> - Be diverse, vibrant and inclusive communities
> - Be globally competitive
> - Reduce ecological impacts
> - Enhance equity of access
> - Demonstrate good quality design.[17]

3.37 The Summit also developed a number of strategic areas where actions were required in order to achieve this vision. Actions included the need for a national shared vision; an integrated governance framework; an improvement in the information base; development of a national settlement policy; improving infrastructure; and a sustainability audit of taxes and charges.[18] These strategies are to form the basis of a National Action Framework. The draft Framework has the following 11 components:

- A shared national vision
- Benchmarking framework
- Office of sustainable communities
- National information exchange and analytical tools
- Community engagement
- Reduced car dependency
- Equitable broadband connectivity
- Managed growth and decline
- Cities for climate protection
- National infrastructure funding program
- A signed Kyoto protocol[19]

3.38 The Framework is to be considered at the next Ministerial Council meeting on 4 August 2005, and the committee looks forward to the outcome.

---

17 Australian Local Government Association, Communique, *National Summit on the Future of Australia's cities and towns*, Canberra, 4 June 2004.

18 Australian Local Government Association, Communique, *National Summit on the Future of Australia's cities and towns*, Canberra, 4 June 2004.

19 Australian Local Government Association, Communique, *National Summit on the Future of Australia's cities and towns*, Canberra, 4 June 2004.

The national agenda – a policy and governance framework

National leadership on urban policy

3.39 In terms of direct intervention, earlier models of Australian Government activity are no longer appropriate in a post-GST environment, nor are they necessarily the most effective means of driving sustainability.

3.40 However, evidence to the committee suggests that there is certainly a central role to play by the Australian Government in relation to urban policy and in developing a national urban agenda. The Australian Government is able to provide leadership and put in place systems of governance to coordinate urban issues, and ensure that national policies facilitate sustainable urban practices, at the very least at the broad strategic policy level.[20]

3.41 The critical issue therefore is to reconceptualise the Australian Government's role through a new policy framework and cooperative governance that enables, rather than prescribes, a path towards sustainability. There needs to be a fresh policy approach that is relevant to the economic, environmental and social drivers of today:

> We need to look beyond the previous models of Commonwealth involvement in urban policy … and look at engaging all three spheres of government to work more cooperatively to achieve the sorts of outcomes that are implicit in the terms of reference of the inquiry: sustainable cities and towns, socially, economically and environmentally.[21]

3.42 Jurisdictional boundaries and the responsibilities of different levels of government mean that a cohesive and integrated approach to urban frameworks is essential. A coordinated national approach needs to underpinned by an overarching policy framework.

---

20 See for example Mr Richard Hancock, City of Latrobe, *Transcript of Evidence*, 16 March 2004, p. 98.

21 Ms Di Jay, Planning Institute of Australia, *Transcript of Evidence*, 8 June 2004 p. 82.

A national sustainability policy

3.43 Many organisations have called for a national sustainability policy and have drawn parallels between national competition policy and sustainability reform. For example, the Australian Conservation Foundation (ACF) called for a commitment by all Heads of Government to a national sustainability policy, similar to the national competition policy.[22] Similarly, the Planning Institute of Australia (PIA) views national competition policy as a sound model to connect the work of all Australian Governments in relation to urban policy.[23]

3.44 The PIA explores the comparison with national competition policy and refers to studies that have shown the boost to the NSW economy by improved urban structuring of the Sydney metropolitan region:

> When considered across the whole of urban Australia, this economic pay off from good urban management is likely to be of a scale comparable to National Competition Policy.[24]

3.45 By contrast, the cost of poorly managed urban development is significant: neighbourhoods that face spatial barriers to employment and training may result in successive generations trapped in welfare dependency. Per capita health costs are also likely to rise in poorly planned urban areas where active transport options are minimal due to planning, safety, or distance barriers.

3.46 The PIA endorses the subsidiarity model, based on international examples, as an approach to sustainability governance in Australia. Subsidiarity essentially means that policy development and implementation is undertaken by the lowest possible level of governance – the level closest to the local community, but is:

> … consistent with the discipline that such policy development does not compromise agreed objectives at the regional, state and national levels.[25]

22 Environment Victoria and the Australian Conservation Foundation, *Submission 162*, p. 4; see also *Transcript of Evidence*, 16 March 2004, p. 4.

23 Ms Di Jay, Planning Institute of Australia, *Transcript of Evidence*, 8 June 2004 pp. 82-83.

24 Planning Institute of Australia, *Liveable Communities,* National Policy Statement, February 2004, p. 7.

25 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, p. 14.

3.47 Again, the National Competition Policy (NCP) model is appropriate:

> … the Council of Australian Governments (COAG) signed off on a set of overarching principles to boost the openness of, and level of competition in, Australian markets. The Australian Government established a system of incentives by which the States and Territories would be encouraged to accelerate legislative and administrative reforms in line with NCP principles. But, in the end, it was left up to the States and Territories to determine their programs for implementation and to decide whether reforms to open up competition in particular markets within their jurisdictions were warranted in social cost benefit terms.
>
> In this context, the debate about whether deregulation and competition are good things is not relevant. The key observation is that the Commonwealth led national reforms in a host of areas which were the constitutional responsibility of the States and Territories, without direct intervention and with due respect for the other jurisdictions in the federation. A similar approach is required for effective Commonwealth involvement in urban and regional policy.[26]

3.48 Alexandra and Associates Pty Ltd also calls for Commonwealth leadership on settlement patterns and for a COAG based agreement to achieve more ecologically sustainable development in urban areas:

> The Commonwealth government needs to exercise leadership to induce urban development reform. The directions that are set are of national strategic significance. They will literally set in concrete patterns of consumption for the foreseeable future. COAG-based agreement on urban form and settlement patterns which empowers the utilisation of strategic and statutory planning controls, as well as other policy mechanisms is required in order to enhance state and local governments' capacity to ensure sustainable patterns of settlement.[27]

26 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, pp. 14-15.

27 Alexandra and Associates Pty Ltd, *Submission 22*, p. 7.

A national sustainability charter

3.49 The PIA proposes an 'Australian sustainable development charter', signed off by COAG. Underpinning this charter, the PIA suggests that:

> … COAG would set time bound triple bottom line targets, so there would be targets and objectives set around economic, social and environmental outcomes.[28]

3.50 The PIA also provides some specific examples of such targets and criteria under the objectives of environmental, social and economic sustainability.[29]

3.51 The PIA explains that the targets would be defined by measurable outcomes, over a certain period, with intermediate milestones:

> The essential point is that progress towards the targets must be capable of independently verifiable measurement.[30]

3.52 The PIA suggests that the charter would cover all aspects of regional and urban policy making, and through it all governments would commit to this framework and to the development of sustainability plans and programmes. Public policy action might extend to, amongst others, improved administrative arrangements for infrastructure projects, better development approval arrangements, and marketing and education campaigns.[31]

3.53 The committee envisages that the charter and its associated targets as measures of sustainability progress would take into account the concerns raised by the CSIRO with regard to reporting frameworks. The CSIRO recommends improved benchmarking and reporting processes, as well as the upgrading of State of Environment reporting across all levels of government.[32]

---

28 Ms Di Jay, Planning Institute of Australia, *Transcript of Evidence*, 8 June 2004 p. 83.

29 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, p. 2.

30 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, p. 14.

31 Planning Institute of Australia, *Liveable Communities,* National Policy Statement, February 2004, p. 15.

32 CSIRO, *Submission 91*, p. 6.

3.54 The committee believes that the State of Environment reporting framework is an ideal mechanism to report on urban sustainability indicators in order to provide benchmarking and monitoring data. The framework could therefore be adapted and improved to form the basis for the development of targets and measures of sustainability progress under the Australian Sustainability Charter.

3.55 The CSIRO's proposal of a sustainability matrix which would form the basis of greater accountability is also pertinent in this context. The CSIRO recommends that:

> … Australia's three tiers of government proceed towards development and use of a total capital accounting framework for budgeting and reporting.[33]

3.56 The evidence suggests that it would be appropriate to establish an Australian Sustainability Charter that sets national targets across a number of key objective areas, following consultation with State, Territory and local governments, as well as peak industry and environmental groups.

3.57 The committee also wishes to note that the charter would need to be regularly reviewed and updated; it must be a 'living' document in line with the definition of sustainability as a journey and a set of principles and practices.

Recommendation 1

3.58 **The committee recommends that the Australian Government:**

- **establish an Australian Sustainability Charter that sets key national targets across a number of areas, including water, transport, energy, building design and planning.**
- **encourage a Council of Australian Governments agreement to the charter and its key targets.**

3.59 The committee considers that new relevant policy proposals should be evaluated as to whether they would impact on urban sustainability and if so, be assessed against the agreed sustainability targets. Such assessment would provide a 'checklist' of major issues and ensure that the proposed policy would not have unintended and adverse impacts on sustainable development.

33 CSIRO, *Submission 91*, p. 7.

3.60 In this manner, it may have been possible for example to add additional criteria to the First Home Owner Grant scheme to leverage more awareness and competitiveness for eco-efficient housing.

3.61 Similarly, any transport programmes would need to provide analysis on the impact of car usage or public transport options. It is not intended that the sustainability analysis necessarily block a new policy proposal. It is intended that the requirement for a sustainability analysis ensure that, wherever appropriate, leverage is used to encourage sustainable options.

3.62 In addition, it is intended that the sustainability analysis ensure that all criteria and options are considered and that the long term public good is fully taken into account through reference to sustainability objectives.

Recommendation 2

3.63 **The committee recommends that all new relevant Australian Government policy proposals be evaluated as to whether they would impact on urban sustainability and if so, be assessed against the Australian Sustainability Charter and the COAG agreed sustainability targets.**

A national sustainability commission

3.64 Many organisations have proposed, or endorsed the concept of, a national body that can drive sustainability, and engage all levels of government in their decision making processes.[34]

3.65 The ACF lists the establishment of such a body, reporting to COAG and with powers similar to that of the National Competition Council (NCC) as a key recommendation:[35]

> Competition and regulation of anti-competitive business behaviour have been key drivers for economic and social reform in the late 20th century. Sustainability reform should be seen as a key driver of environmental, social, and economic reform at the start of the 21st century. One of the best ways to achieve this would be to

34 See for example Mr Justin Sheppard, Environment Business Australia, *Transcript of Evidence*, 29 April 2005, p.3; Dr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 29 April 2005, p.4; Mr Marcus Spiller, Planning Institute of Australia, *Transcript of Evidence*, 29 April 2005, p. 71.

35 Environment Victoria and the Australian Conservation Foundation, *Submission 162*, p. 6.

> create a similar body to the National Competition Council to commit governments to, and to monitor implementation of, sustainability reform.[36]

3.66 The PIA is also in favour of such a body, which would administer and certify appropriate plans and policies under the Australian Sustainability Charter. The commission would be an independent Commonwealth body that would audit policies and:

> … monitor actual progress towards the sustainability targets and milestones in each jurisdiction. The Commission would report directly to Parliament.[37]

3.67 Similarly, the ACF went on to suggest that the committee consider the establishment of a sustainability commissioner:

> State and territory governments need to have clear strategies in place to demonstrate how they are going to deliver sustainability reforms. Equally importantly, there needs to be a strong mechanism for the ongoing monitoring of the expenditure of those funds to ensure we are getting environmental outcomes for that funding. For example, you may have a sustainability commissioner who performs an ombudsman role.[38]

3.68 The Local Government Association of Queensland supported the idea of a national body, but emphasised the need to engage all levels of government and the Commonwealth should not unilaterally decree what should happen.[39] A number of Queensland local governments also expressed strong support for a sustainability commission-type body and a national charter for sustainability.[40]

3.69 The committee agrees that the Australian Government should not prescribe regional solutions. Rather, any such body would facilitate coordinated planning that achieves demonstrable progress on the path to sustainability.

---

36 Environment Victoria and the Australian Conservation Foundation, *Submission 162*, p. 5.

37 Planning Institute of Australia, *Liveable Communities,* National Policy Statement, February 2004, p. 3.

38 Mr Wayne Smith, Australian Conservation Foundation, *Transcript of Evidence*, 16 March 2004, p. 5.

39 Mr Greg Hoffman, Local Government Association of Queensland, *Transcript of Evidence*, 6 April 2004, p. 37.

40 See for example Ms Dyan Currie, Toowoomba City Council, *Transcript of Evidence*, 6 April 2004, p.24; Mr Bill Forrest, Nillumbik Shire Council, *Transcript of Evidence*, 16 March 2004, pp. 103-4.

3.70 A similar proposal for a national sustainability commission has been developed by the PIA and the Property Council of Australia (PCA), in association with a number of contributory organisations, to 'create a much closer and more efficient nexus between policy making and implementation'.[41]

3.71 In the PIA's model, the commission would have responsibilities and powers similar to those of the NCC, the Australian Competition and Consumer Commission (ACCC) and the Auditors General at the State/Territory level:

> Its role would be to scrutinize and endorse (or otherwise) the sustainable development plans and policies proposed by signatory governments and to rigorously monitor progress towards the agreed sustainability outcomes in each jurisdiction.[42]

3.72 The proposed body would be headed by an independent Chair who would 'report directly to the parliament of Australia, as do the State Auditors General'.[43]

3.73 The committee notes that the choice of Chair would be integral to the success of the proposed Australian Sustainability Commission. The committee believes the person would need to be an excellent communicator, negotiator and have high level advocacy skills.

Accountability and funding

3.74 The PCA emphasised the need to adequately fund and 'join-up' the levels of government. Responsibilities should be linked to accountability and funding. Rather than changing the relationship between the Australian, the State and Territory and the local governments, the PCA is looking for a new agreement about who does what.[44]

41 Mr Peter Verwer, Property Council of Australia, *Transcript of Evidence*, 11 March 2004, p. 14.

42 Planning Institute of Australia, *Liveable Communities,* National Policy Statement, February 2004, p. 16.

43 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, p. 16.

44 Mr Peter Verwer, Property Council of Australia, *Transcript of Evidence*, 11 March 2004, p. 16.

3.75 The committee was impressed by the comprehensive proposal submitted by the PIA which includes the principle, level and use of funding.[45] The Institute argues that the new governance structure and funding model is more appropriate than earlier interventionist styles of Commonwealth involvement in urban planning.[46]

3.76 The proposal from Environment Victoria and the ACF also emphasises 'a bucket of money for a substantial national sustainable cites programme' and ensuring that this 'is linked to the broader sustainability reform agenda through a national sustainability council'.[47]

3.77 The PCA had earlier commissioned two reports from The Allen Consulting Group on 'Recapitalising Australia's Cities' and 'Funding Public Infrastructure'. The research from these reports has formed much of the basis for the current policy recommendations regarding governance and funding arrangements, linked to a Sustainable Communities or Sustainable Development Commission.

3.78 The PCA has worked on a joint policy statement 'Capitalising Sustainable Communities'. The committee understands that the recommendations are consistent with those put forward in the PIA submission and 'Liveable Communities' National Policy Statement.

3.79 According to Environment Victoria and the ACF, funding, where those funds come from, criteria for receiving funding, and measurable outcomes are key issues in the consideration of national leadership and gaining State and Territory cooperation. While there was already a large amount of Federal money going to environmental programmes, there was a need for:

> . . . better monitoring the allocation of that funding, ensuring that there are clear environmental outcomes for both environment programs and other programs that have potential environmental outcomes.[48]

---

45 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, pp. 19-20.

46 Planning Institute of Australia, *Liveable Communities*, National Policy Statement, February 2004, pp. 4-5.

47 Mr Wayne Smith, Australian Conservation Foundation, *Transcript of Evidence*, 16 March 2004, p. 5.

48 Mr Wayne Smith, Australian Conservation Foundation, *Transcript of Evidence*, 16 March 2004, p. 4. Examples of Federal environmental funding include the Natural Heritage Trust; the National Action Plan for Salinity and Water Quality; Roads to Recovery; and AusLink.

3.80 According to Environment Victoria and the ACF, the success of a national sustainability agenda was reliant on the mustering of funding under that framework, and demonstrable outcomes on sustainability reform. The ACF spoke of stronger performance indicators and outcome measures in existing funding; as well as funding to the States that is tied to outcomes, similar to competition policy, because:

> State governments need to demonstrate that they are delivering greater sustainability through the use of Commonwealth funds.[49]

Recommendation 3

3.81 **The committee recommends that:**

- **the Australian Government establish an independent Australian Sustainability Commission headed by a National Sustainability Commissioner;**
- **task the Commission with monitoring the extent to which Commonwealth funds and State and Territory use of Commonwealth funds promotes the COAG agreed sustainability targets; and**
- **task the Commission with exploring the concept of incentive payments to the States and Territories for sustainability outcomes along the lines of the National Competition Council model.**

Summary

3.82 The importance of this inquiry and its outcomes is reflected in the substantial structural reform which the committee is considering. Such reforms represent a crucial first step in establishing the right processes and setting the right direction for Australian cities.

3.83 It is also the view of the committee, and of many of those who gave evidence to the inquiry, that sustainability must not be regarded as a discrete objective. Rather, it must be integral to all policy development.

---

49 Mr Wayne Smith, Australian Conservation Foundation, *Transcript of Evidence*, 16 March 2004, p. 4.

3.84 The reform to governance structures and the introduction of sustainability as a criterion for new policy are essential if we are to recognise sustainability as more than an optional add-on. Sustainability is integral to our future economic wealth and well-being. The recommendations set out in this chapter represent the means to make real Australia's commitment to sustainability.

3.85 The committee urges in the strongest possible manner that these recommendations be implemented in totality in the shortest possible timeframe. The time is right and as a nation we need to make the right decisions.

4

… to maintain a business as usual model of urban development is to condemn the future population and industry of that city to a sub-optimal living and working environment.

(Dr Peter Newton, *Reshaping the future of cities)* [1]

Planning and settlement patterns

4.1 There is an increasing number of urban dwellers; however, this increased population is not homogenous. Rather, the increase in city inhabitants is accompanied by a diversification of lifestyle preferences, ranging from high density inner city apartment dwellers to the small acreage on city outskirts to self-contained village type suburban lifestyles.

4.2 In growing urban and suburban areas, a dichotomy of development is emerging that features both larger dwellings on smaller allotments and 'rural residential living' – both claiming lifestyle appeal. 'Empty nesters' and ageing communities continue to occupy large family homes and are reluctant to leave familiar neighbourhoods and valued services.

4.3 There are a number of possible planning scenarios that could shape our future cities. However, allowing cities to continue to grow without strategic forethought can only result in more dispersed cities characterised by economic stratification, high infrastructure costs, and inequitable access to and provision of public services.

---

1 Dr Peter Newton,'Reshaping the future of cities', *Ecos,* Jan-Mar 2004, p. 9.

Recent trends – decreased household size and increased dwelling size[2]

4.4 Australia has a culture and an expectation of home ownership. With city growth inflating land and so housing prices in inner urban areas, the issue of housing affordability is relevant to discussions on creating liveable cities.

4.5 The strong desire for home ownership is not unique to Australia. 70 per cent of Australians either own their home outright (30 per cent) or are paying off a mortgage (40 per cent). This is a somewhat higher level of homeownership than the United States (67 per cent) and United Kingdom (69per cent) but lower than New Zealand (71 per cent) and several European countries including Spain at 83per cent. France (55 per cent), Germany (45 per cent) and the Netherlands (51 per cent) are significantly lower.[3] Despite the increased difficulty of entering the housing market (in some areas), housing preference studies indicate that close to 90 per cent of Australians aspire to owning their own home and that home ownership is an integral part of the traditional 'Aussie dream'.

4.6 The drift to urban fringe areas where land prices are lower makes possible for many the 'dream' of home ownership. The Productivity Commission reports that because of house price growth outpacing incomes, the affordability point beyond which houses are affordable for families on average weekly earnings has moved several kilometres away from the city centre in both Sydney and Melbourne.[4] These calculations of affordability, whether undertaken by economists or by potential home buyers, do not appear to take into consideration the longer term transport costs associated with life in some outer suburbs, where public transport is poorly provided, if provided at all.

4.7 However, aside from price increases, perhaps the most radical shift in home ownership profiles is the move to larger dwelling size and reduced household numbers.[5] This has the effect of further increasing the relative cost of home ownership.

---

2 Australian Bureau of Statistics, *Australian Social Trends 2003: Housing – housing arrangements: Home ownership across Australia*.

3 Productivity Commission, *Report on First Home Ownership*, Canberra, June 2005, Table 2.3, p. 33.

4 Productivity Commission, *Report on First Home Ownership*, Canberra June 2005, p. 25.

5 From 1991 to 2001, Australia's population increased by just over 10 per cent and yet the number of dwellings increased by more than 20 per cent. Further, between 1992 and 1999, the average house size of new private sector houses in Australia increased by around 15 per cent (from 187 to 215 square metres).

4.8 While the number of three bedroom houses decreased only slightly over the last 30 years or so (from 50.3 to 48.1 per cent), the change in dwelling size is demonstrated by four or more bedroom houses nearly doubling (from 13.3 to 25.7 per cent).

4.9 Over the same period, the number of households with five or more residents reduced by more than a third (from 33.3 to 10.6 per cent), and the number of one resident households nearly doubled (from 13.6 to 24.0 per cent).[6]

4.10 The effect of such a shift has been described to the committee as 'under-occupation' of houses. For example, Mr Karel Eringa of Shelter WA told the committee that in Perth, between 40 and 50 per cent of houses are under-occupied, meaning that they have spare bedrooms.[7]

4.11 The change in dwelling size and household numbers has not been accompanied by any marked change in (or preference for) the *type* of housing. There remains a strong preference (93 per cent describing it as either 'very' or 'quite' attractive) for 'stand alone type' housing on a separated block of land. This is despite a high level of support expressed for sustainable urban design. In the matter of home ownership, the low density suburbia model remains dominant and most attractive.

4.12 The committee stresses this data and settlement preferences as it indicates strongly the apparent contradiction between community support for sustainable living principles, and individuals' preferences for settlement and housing options.

Shaping our cities

4.13 As discussed in the previous chapter, shaping our future cities requires a national agenda of coordinated governance on sustainability.

4.14 The shape of our cities will largely determine the social connectedness of communities, the transport networks required, and the physical size of our cities. Researchers have modelled a number of possible planning designs for the future, including:

- The 'compact' city, which increases the proportion of high density inner city living. The inner city region remains the 'hub' for central business and development radiates out around this focus. This model has been

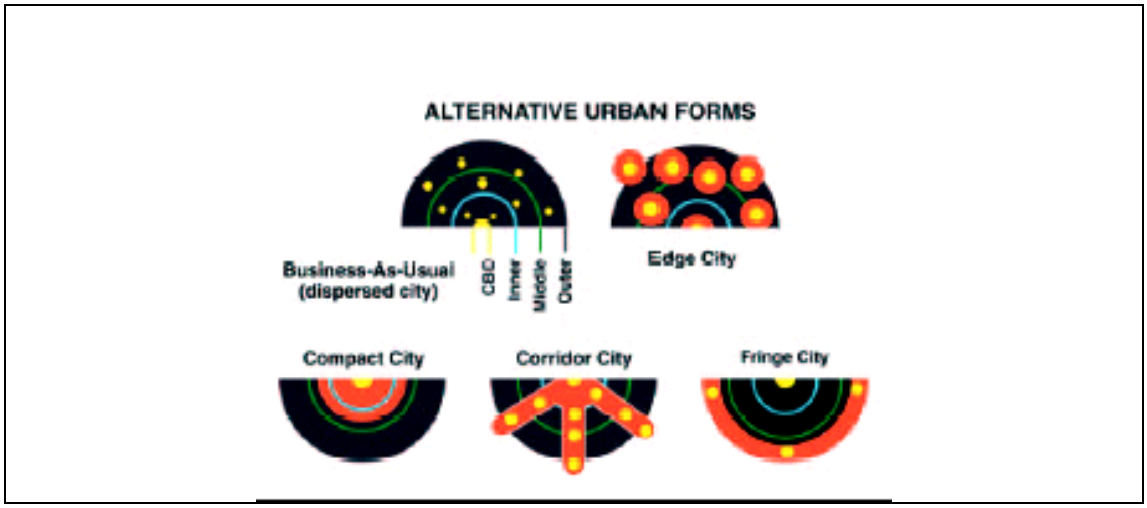
6 In the five years between 1996 and 2001, of the number of additional households, around one third (approximately 154,600) consisted of a single person.

7 Mr Karel Eringa, Shelter WA, *Transcript of Evidence,* 31 March 2005, p. 54.

the traditional development pattern of most cities, with development (and services) becoming gradually less dense, the further from the central city area.

- The 'edge' city, which increases population density at selected outer nodes and increases investment in public transport and freeway networks to interconnect these nodes. This pattern has developed to a limited extent in some city regions where expansions have 'enveloped' what were once smaller regional towns (for example Dandenong or Frankston in the Melbourne area). The townships then become suburbs of the larger metropolitan area, but usually retain a central business and shopping area, and already have an established range of services and infrastructure. This model would see the development of these nodal 'townships' to form cities within cities. However, the 'townships' are not necessarily evenly spread around a city area and there may be limited scope for connections into the central city area.
- The 'corridor' city, which encourages nodal growth along city arterials and retains the inner city as the central hub with upgraded public transport radial links.
- The 'fringe' city, which expands to develop new centres on the outer regions of the city.
- The 'ultra' city which stimulates business centres in surrounding regional townships and provides high speed commuter linkages.[8]

Figure 4.1 Dr Peter Newton's Model of Cities



Source Dr Peter Newton, 'Reshaping the future of cities', *Ecos*, Jan-Mar 2004, p. 8.

8 These possible models are based on the six scenarios examined in the 2004 CSIRO study 'Reshaping Cities for a More Sustainable Future', *Ecos,* Jan-Mar 2004.

4.15 Integral to some of these designs are decentralised concentrations of residential and commercial developments, or 'urban hubs'. Urban hubs typically include a range of community and support facilities, recreational services, public spaces and residential complexes.

4.16 There are advantages and challenges to each model. To a large extent, it is the implementation, provision of services, and community development within each model that will determine the liveability of an area, its environmental sustainability, and its economic performance. Most large urban areas incorporate aspects of each model – cities within cities.

Densification or sprawl – responses

4.17 The inquiry has generated substantial debate about desirable levels of housing density in our cities, the creation of cities within cities or 'hubs', the provision of services to greenfield sites, the integration of housing types in newly developed areas, housing affordability, and how we develop communities rather than only build housing estates.

4.18 The variation of views on these issues was substantial, and comments ranged from citizen concern over changes to the character of a local neighbourhood to policy concerns linking urban form to economic wealth and social well-being.

4.19 Issues of urban infill and higher density housing in our cities are particularly emotive. Much evidence to the committee considered the move to higher density housing as detrimental to the liveability of a city, destroying the character of areas, and as leading to social isolation and a number of social problems.

4.20 This view appears to be related to earlier models of high density public housing that feature in many cities. Governments are now looking to move to more positive and integrated models of public housing that do provide opportunities for community involvement, incorporate public spaces and recreation facilities, and are well serviced by public transport, schools and employment opportunities. The committee notes that much of the community concern about higher density development relates to the traffic congestion occasioned by an increase in population (and consequently automobile) density. Increasing population density without improving the provision of public transport is a recipe for congestion. On the other hand, if greater density enables the provision of significantly improved public transport, the consequence may be a reduction in car use and, as a result, less congestion.

4.21 The committee recognises, in some of the community fears expressed, the desire not to repeat the mistake of this type of urban development that is often considered both a physical eyesore and the site of many social problems.

4.22 However, the committee believes it important to ensure that high density is 'uncoupled' from an association with this earlier form of high-rise housing.

4.23 An example of a modern approach to high density is Inkerman Oasis in Melbourne, a recently developed set of inner city apartments.

Case Study: Inkerman Oasis *D*evelopment

The Inkerman Oasis development is an inner city housing redevelopment site. It incorporates many sustainability features in terms of urban layout, design and solar orientation of units, natural ventilation, water treatment, and open community space. It is designed to integrate into the existing character of the neighbourhood and provide a mix of housing styles and affordability.

Port Phillip Council developed the site jointly with private company Inkerman Developments. A proportion of housing units developed are designated for community housing.

The project has recycled the architecturally significant 'Destructor Building' and includes ecologically sustainable design features, integrated art and public walkways. Constructed over a 4 year period, beginning in late 2000, as a $50 million residential development, it consists of 237 units in 6 buildings of 3 to 5 levels. The project comprises 32 units of social housing, which are largely indistinguishable from the private apartments.

The project has the following sustainable design features:

• Orientation of most of the buildings to achieve optimum solar access to living areas for a majority of units (66 per cent facing north, 22 per cent facing east-west, 12 per cent facing south);

• Solar hot water for 16 of the community housing units located within one building;

• Solar communal lighting along public access walkways across the project;

• Roof gardens on top of the 240-car sub-basement car park. The car park includes bicycle storage areas;

• Non-mechanical ventilation of the sub-basement car park by natural air movement created by voids cut out of the sub-basement car park roof;

• Cross flow ventilation of units from louvered windows at each end of units and connected to internal passages and shafts in buildings to increase natural ventilation and minimise use of mechanical ventilation or air conditioning;

• Landscaping largely with native plants;

• Units designed to generally have an energy rating of 3.5-4.5 stars; and

• Two public pedestrian routes through the site to guarantee pedestrian permeability.

4.24 While many people are concerned that higher density inner city housing causes increasing social isolation, others favour those options as injecting a new community spirit or vitality into existing areas of older type housing, and also as meeting increasing housing demand while minimising sprawl into bushland or the development of remaining urban green areas:

> Most cities are in need of an urban growth boundary. This not only protects significant bushland but stimulates re-growth in otherwise older defunct areas. It essentially re-vitalises older suburbs by re-developing with higher densities to accommodate the increase in population.[9]

4.25 The National Trust of Australia (Victoria) also suggests that the population increase of cities need not be at the expense of heritage buildings or bushland areas. Buildings may be of 'architectural and historic merit' and parklands are 'not pools of land waiting to be diverted to a more profitable use'.[10] The Trust supports higher urban densities to reduce urban sprawl:

> … but only where this can be accommodated in an overall aim, that of maintaining and enhancing a varied and interesting urban, suburban and rural fringe environment. The preservation of heritage assets, including buildings, streetscapes, parklands, rural and bushland environments is a critical component of this process.[11]

9 Mr Laurel Smith, *Submission 16*, p. 2.

10 The National Trust of Australia (Victoria), *Submission 28,* p. 2.

11 The National Trust of Australia (Victoria), *Submission 28*, p. 2

4.26 The committee notes that the term 'sprawl' is usually applied in a pejorative sense and implies an unplanned and chaotic spread of homogenous housing, usually in fringe areas bereft of services or in gated-type communities. Higher density housing is often posed as the antidote to urban sprawl and, in some instances, vice versa – Greenfield urban expansion is considered the antidote to lifeless inner city apartment complexes.

4.27 The committee considers both views to be emotive reactions that do not allow for the possibility of planned developments – either in city expansion at the edges or through the densification of infill city areas. The committee is also of the view that there are many examples to be seen of both 'worst practice' sprawl and densification. However, these examples of worst practice should not be taken as automatic condemnation of any city expansion or densification. As our city populations increase, we will need to both expand the city fringe and to increase housing densities. The issue is to what degree this takes place and how these developments are managed to create sustaining communities and liveable cities.

4.28 The National Trust of Australia (Victoria) draws comparisons between the population and land area of Melbourne and London, and Australian trends to greater private car transport and decreasing household size. The Trust comments on the Australian preference for individual homes and private cars which has:

> . . . fostered the development of spreading suburbs and continuing encroachment of housing into the rural fringe around our cities.[12]

4.29 The Trust also quotes the 1996 Australia State of the Environment Report's figures on the decline of the average household size as the other factor driving the city expansion, commenting that 'there are more houses for the same number of people'. Melbourne, for example:

> … has a population density of 13-18 persons per hectare, compared to 54 and 160 in Europe and Asia respectively (Australia's State of the Environment Report, 1996, p.3-10).[13]

12 The National Trust of Australia (Victoria), *Submission 28,* p. 1.

13 The National Trust of Australia (Victoria), *Submission 28*, pp. 2-3. The Trust points out that Melbourne, which has a population of just over three and a half million people, occupies an area around the size of Greater London, which has a population of nine million. Melbourne will 'inevitably grow', given a further one million people are expected over the next three decades, needing a further 730,000 households approximately.

4.30 The committee is aware that there is some strong opposition in many communities to higher density housing options in cities. Save Our Suburbs NSW Inc, for example, refutes what it cites as the rationale for a shift to higher density housing, arguing that:

> There is no developed high-density city in the world which does not experience extreme traffic congestion (even with highly developed public transport systems)… As typically only 40% of a city is comprised of residential areas the area saved by higher population densities (unless these are truly heroic) is negligible…[14]

4.31 On the other hand, research and consultancy firm Alexandra and Associates Pty Ltd advised the committee that:

> … allowing further urban sprawl on the fringes of large cities generates a wide range of significant social and environmental impacts. …poor planning decisions frequently result in isolated "poverty traps" on the periphery of our large cities, where transport costs are high and social infrastructure often poor.[15]

4.32 According to Alexandra and Associates Pty Ltd, urban consolidation and urban sprawl are currently occurring simultaneously, with large numbers of new fringe estates while high and medium density housing is being built in established areas. This suggests a failure of policy makers and planners to facilitate a consumer shift from the traditional 'quarter acre block', which 'remains the dominant model on the outskirts of Australia's major cities'.[16]

4.33 Mr Daniel Ouma-Machio also told the committee that development must be moderated within the greater framework of sustainable communities and serviced cities:

> Australian cities could in this instance learn from the British approach where urban redevelopment and renewal programmes must result in improvements to the environment, the social services as well as the economic/employment opportunities and transport services of the targeted communities.[17]

---

14 Save Our Suburbs NSW Inc, *Submission 23*, pp. 2-3. The submission comments on increased traffic congestion, which increases atmospheric pollution and mentions the high correlation between population density and concentration of exhaust pollutants. Further, it argues that multiunit housing costs 1 ½ to 2 more than a single residential housing and that higher density retrofitting does not save long-term infrastructure expenditure, because 'the existing infrastructure is then overloaded, necessitating expensive inefficient piecemeal upgrades'.

15 Alexandra and Associates Pty Ltd, *Submission 22*, p. 1.

16 Alexandra and Associates Pty Ltd, *Submission 22*, p. 4.

17 Mr Daniel Ouma-Machio, *Submission 65*, p. 3.

4.34 The committee has drawn two conclusions from the evidence. Firstly, there is no simple solution to the expansion or consolidation of our cities. Neither concept is in itself the answer to a more sustainable city, nor intrinsically an indicator of an unsustainable city.

4.35 Given that city populations are not static and substantial population increases are expected in some cities, it is to be expected that all our cities will need to plan for a measure of consolidation and expansion. However, the evidence received indicates strongly the need for local consultations, appropriate approval processes, and an approach to planning which has a holistic regard for building vital communities.

4.36 Secondly, current growth patterns (incorporating both consolidation and expansion) are to a large degree driven by consumer demand. Some sectors of the population are seeking large housing estates on the fringe of the city, because of the prohibitive cost of housing closer to central city areas or the sense of safety of fringe housing estates. Others seek high density inner city housing to reduce commuting time, achieve low maintenance type living, and reduce housing costs due to down-sized dwellings (although high density complexes can range from affordable to exorbitant depending on locality and features).

Coastal cities

4.37 The committee did not receive many submissions from coastal areas addressing the particular concerns that may affect coastal city sustainability. The committee notes, however, that Australian Local Government Association (ALGA), with financial assistance from the Australian Government, recently undertook a survey of coastal councils.[18]

4.38 A quarter of all Australians live within three kilometres of the coast, and this proportion continues to increase. The survey found that 87 per cent of coastal councils experienced population increases over the last five years and of these, over 60 per cent have experienced annual growth rates of three per cent or more. This massive population influx makes planning and provision of infrastructure and services difficult for many councils. These communities are also attracting and retaining a very high percentage of older Australians. Many coastal communities already have more than 25 per cent of their population aged over 65; the percentage of over 65s Australia is projected to have by mid century.[19] This movement to non-metropolitan coastal communities has been described as the 'sea

18 Australian Local Government Association, *Coastal survey report,* February 2005.

19 See ABS Population Projections for Statistical Local Areas 1999-2019, Catalogue Number 3220.0.

change' phenomenon and has been the subject of several conferences and studies aimed at developing a national approach to managing and co-ordinating coastal development and infrastructure.

4.39 In addition, 67 per cent of coastal councils reported experiencing increased pressure from tourism over the last five years. For instance, on average, coastal shires in Victoria must plan for their population to increase two and a half fold during peak tourism periods.

4.40 Coastal councils' environmental challenges are a consequence of the rapid growth and demographic composition of their population. Often, inadequate endeavours have been made to maintain high quality urban design which preserves biodiversity and natural beauty. Water management is a major issue, both in terms of ensuring water supply is adequate and in managing run-off and stormwater.

4.41 The committee is aware that another issue of concern to coastal communities is the encroachment of unsustainable and inappropriate developments and the absence of Australian Government guidelines in these areas.

4.42 Along these lines, with significant population pressures, coastal areas of Australia often lack the infrastructure, such as transport and public health, that their growth in population demands. Consistent with recommendations relating to outer urban areas, the committee views settlement patterns and our response to them as integral to the creation of more sustainable cities.

4.43 The committee concludes that problems experienced in coastal areas may be more acute than those in the major cities. However, the same principles apply - if change in the types of consolidation and expansion is to take place, then there must also be a shift in consumer drivers to value developments that plan for and incorporate the features of a sustaining community – whether these be greenfield or infill type developments, and medium or high density housing.

4.44 The committee notes the existence of the National Sea Change Task Force and believes that work carried out by this organisation in the areas of governance, infrastructure funding, planning and urban design responses to population pressure will further address the issues discussed above.

A national population policy?

4.45 A number of submissions received to the inquiry argued the need for a national population policy. Submissions referred to a range of reasons for a population policy, including the need to limit cities to an optimal population size, promoting regional settlement to counter urban drift and limiting immigration numbers in order to control population growth.[20]

4.46 Sustainable Population Australia (Canberra Region) identified its central concern as population size and growth, and the impact of resource constraints in Australia and worldwide, noting that these issues are frequently overlooked in debate on public policy:

> More people, more demand for goods and services, greater and greater pressure on limited and diminishing resources - that is the reality of our world.[21]

4.47 The organisation regards the point that Australian cities will continue to grow in numbers as an assumption, which it would expect, given the 'explosive growth' in the size and number of cities and 'the projection of future population increases for Australia' to 2025:

> Further growth, however, will add to the challenge of maintaining existing standards, let alone improving the efficiency of cities.[22]

4.48 Sustainable Population Australia (Canberra Region) concludes that further growth will exacerbate the problems:

> Unless humanity becomes far less wasteful of the world's precious and limited resources, our very survival is not assured. The more of us there are, the more difficult the challenge becomes to live within the earth's capacity to sustain us.[23]

20 See for example Sustainable Population Australia (Canberra Region), *Submission 49*; Mr Gordon Hocking, *Submission 26*.

21 Sustainable Population Australia (Canberra Region), *Submission 49*, p. 45.

22 Sustainable Population Australia (Canberra Region), *Submission 49*, p. 451.

23 Sustainable Population Australia (Canberra Region), *Submission 49*, p. 452.

4.49 Similarly, Mr Gordon Hocking comments that sustainability cannot be achieved without limits to city growth and population numbers and points out that:

> … sustainability is about limiting the demands of society on environmental and material resources in order to maintain a predictable and sufficient yield from those resources.[24]

4.50 The committee notes that Mr Hocking's concerns about the growth of particular cities are widespread, but recognises that in a free society, it is simply not possible to prevent people from living in a city if they choose to do so. Restricting development in a city, with a view to constraining population growth, runs the risk that lower income earners are simply priced out of the city. This is not only indefensible in terms of social equity, but fails to recognise that every city needs workers at ever income level in order to function. A city cannot function if nurses, teachers, labourers and waiters cannot afford to buy a home. As discussed in a subsequent chapter, a large part of the answer lies in swift, reliable and affordable public transport.

4.51 While the terms of reference, direction of the inquiry, and the majority of the evidence received did not address issues of population policy, a concern of the committee is the shaping of settlement patterns across Australia. The committee expects that a future sustainability charter would address issues of population and settlement policy.

Building communities

Population health

4.52 The committee received a substantial amount of evidence on the importance of developing integrated and connected communities within our cities. As cities grow, it was suggested that people will identify more with the local area than with the larger city, and so local connections and community interactions are critical in establishing a sense of well-being and identity.

24 Mr Gordon Hocking, *Submission 26*, p. 148.

4.53 The committee was made aware of research relating to Crime Prevention Through Environmental Design (CPTED).[25] CPTED strategies focus on the design and management of the built environment towards creating safer, more liveable and sustainable urban communities.

4.54 Health professionals and researchers stressed the importance of urban design to ensure the health and well-being of urban populations.[26] The committee heard that in the past, the emphasis had been on a responsive health care approach to treat illness. The challenge for the future is to halt the growing incidence of preventable diseases and conditions, many of which are regarded as a direct result of urban living patterns.

4.55 Obesity, diabetes, heart conditions, depression, mental illness and high blood pressure have increased markedly in the last few decades, in particular in urban areas where the rate of physical activity is reduced and social isolation is increased.

4.56 The key message from health professionals is that sustainable cities are a population health issue. Designing urban areas with recreational spaces, and scope for a variety of safe and accessible active transport options encourages a fit and healthy population.

4.57 Further, communities with a sense of identity and social support encourage more active lifestyles and social interaction. This can provide vital support and is an important element in the social well-being of urban residents.[27]

4.58 Health professionals stressed the need for public spaces where communities can share ownership of the facilities – whether these are community buildings or open park spaces. Local shopping areas also serve a vital social role, particularly for the elderly and young families.

---

25 See Dr Paul Cozens, *Urban Sustainability and Crime Prevention Through Environmental Design (CPTED) in Western Australia.* Paper presented at the 175th Anniversary State Conference: Western Australian 2029 – A Shared Journey. See also 'Sustainable Urban Development and Crime Prevention Through Environmental Design for the British City. Towards an Effective Urban Environmentalism for the 21st Century' in *Cities: The International Journal of Urban Policy and Planning.* Volume 19 Number 2, pp. 129-137.

26 Dr Steven Boyages, Western Sydney Area Health Service and Dr Anthony Capon, Western Sydney Area Health Service, *Transcript of Evidence*, 27 January 2004, pp. 26-37; see also Ms Helen Jones, Sydney South West Area Health Service and Dr Anthony Capon, Western Sydney Area Health Service, *Transcript of Evidence,* 29 April 2005, pp. 20- 22.

27 A particular example of an organisation providing a sense of identity and social support is Celebrate WA; see www.celebratewa.com.au

4.59 The committee also notes that city expansion has the potential to create locational disadvantage, including lack of employment opportunities, transport difficulties and social isolation. Mrs Marilynn Horgan, from the Perth Area Consultative Committee, told the committee that:

> Social issues were particularly pertinent in the outer metropolitan area: isolation, marginalisation, youth employment and dissociation issues reflected high levels of concern, as well as low incomes, high welfare dependency and low school retention rates … [28]

4.60 Consideration of population health is therefore a key issue in building sustainable cities. In addition to the importance of open spaces and urban layouts which encourage physical activity, health professionals also raised accessibility (in both cost and availability) to fresh produce as a key issue for future population health.

4.61 As cities grow and land prices increase, house allotments become smaller and apartment or townhouse style living becomes more prevalent. This makes households less able to support the traditional 'backyard vegetable garden' and more reliant on the purchase of fresh fruit and vegetables. 'Time poverty', due to increased travel time, is also cited as a reason for the decline of the individual vegetable garden. This greater reliance on the purchase of fresh produce can impose greater living costs on families and affirms the need for affordable available fresh produce in urban areas.

4.62 As the physical size of our urban areas increases, the distance between agricultural growing areas and retail outlets also increases, resulting in increased transport costs and an increased risk of spoilage (additional costs passed on to the consumer). Timely and cost effective freight networks (considered in chapter 5) are important.

4.63 The committee also heard evidence on the possibility of utilising otherwise 'unusable' space (such as rooftops) for produce growing, and also evidence on the social benefits of community allotments for vegetable gardening. Roof top gardens can serve as dual purpose as they 'provide building insulation and extend communal green space'.[29] They should be 'routinely designed into high rise buildings'.[30]

---

28 Mrs Marilynn Horgan, Perth Area Consultative Committee, *Transcript of Evidence*, 31 March 2005, p. 20.

29 Urban Ecology Australia Inc, *Submission 63*, p. 3.

30 Australian Farmers' Market Association, *Submission 174*, p. 8.

4.64 The committee also sees great benefits in community gardening or cooperative neighbourhood allotments for fresh produce and enhancing social networks.

4.65 The committee urges local governments to consider mechanisms to provide seed funding to initiate projects of this type, or access to local government owned land for community gardening projects.

Master communities

4.66 'Master communities' are large new home communities that typically feature parks, recreational areas, schools and community shopping.

4.67 The committee visited some master community developments that incorporated innovative approaches to biodiversity (through the protection of threatened habitat areas), storm water recycling, recreation spaces and considered future public transport options.

4.68 The developments are planned and sold as master communities – implying that community development is an integral element of the holistic construction of the area. However, it appeared that, in many instances, they provided largely homogenous housing with few facilities in proximity, or opportunities for neighbourhood or community development.

4.69 The committee observed several weaknesses in the approach to such master communities, due to a failure to integrate master communities with surrounding community infrastructure. Local government often does not have the resources to properly regulate and respond to master community developments. Often the disparity in resources between local governments and developers capable of undertaking master community development leaves local government unable to negotiate on equal terms. The committee is concerned that these master communities may increasingly take on the form of gated communities.

4.70 The committee recognises that each spatial location will bring its unique set of challenges and constraints; however, as a vision for what will create sustaining and healthy communities, it is productive to clearly establish what are seen as our goals in terms of community needs. How these needs are factored into the construction of an area will necessarily vary and the committee has no intention of setting down prescriptive requirements.

4.71 Development companies should integrate research about future communities and excel at what we regard now as best practice in certain areas of sustainability (such as water management, or biodiversity). Companies must take a greater initiative in directing potential buyers to

value the long term benefits of community developments, to provide developments which are amenable to changing family needs, and cater to a range of housing affordability options.

Consultation processes

4.72 Most submissions to the inquiry endorsed the need for the conservation of biodiversity and the preservation of green and open spaces within our urban areas. However, few submissions provided detail about how this should be achieved or how green our cities should be.

4.73 One issue which did receive some comment was the use of green zones or green wedges placed around metropolitan areas to curtail further development or conserve remnant bushland.

4.74 The strength of personal concerns raised in a number of submissions drew the committee's attention to the importance of consultation processes and facilitation to provide a 'fair hearing' and to ensure that reasoning behind decisions made is communicated effectively to those affected.[31]

4.75 Another example of polarisation and scepticism about consultation processes occurred during a committee public hearing in Canberra, where demonstrators from the 'Save the Ridge' group disrupted the evidence being given by the National Capital Authority and the Australian Capital Territory Government. The Save the Ridge representatives wished to register their opposition to the clearing of bushland in order to extend a connecting roadway through to the suburb of Gungahlin.[32]

4.76 Without offering an opinion on the issue, it is clear that the process of community decision-making can not be said to have succeeded in this case– different community and local government groups were 'at loggerheads'.

4.77 Such divisive situations are no doubt detrimental to the vision of vibrant communities and local governments working to achieve a sustainable future.

4.78 The committee was impressed by Professor Valerie Brown, who outlined a comprehensive consultation and negotiation process in regard to community planning and decision making. Professor Brown made the point that, through discussions and facilitation, the seemingly divergent views of developers, planners and policy makers, and local community

31 An example of a lack of such processes was related to the committee by the residents of Park Orchard, reaffirming to the committee the sensitive nature of planning decisions. See Ms Beverly Olsson, *Submission 10.*

32 *Transcript of Evidence*, 4 March 2004, p. 14.

were able to discover common goals and achieve an uncontested planning decision. Referring to one particular case, Professor Brown explained that the protracted process of consultation was more than rewarded by the community development that took place and the planning outcomes and local support for appropriate changes which was achieved:

> … after a process that brought these people together so that they heard each other they put in a structure plan which allowed farmers to remain where they were, estate agents to make a profit and young people to earn a living. [33]

4.79 The committee strongly encourages local government to consider these innovative types of approaches and to view consultation not as a process to seek agreement to proposed changes, but as an opportunity to negotiate towards amenable outcomes, while engendering community spirit and support.

4.80 Dr Andrew Montgomery of the Western Australian Government also gave evidence that the planning process is becoming more inclusive:

> The old days of technical- or professional-led planning—the 'have we got a plan for you' type of thing—have really rolled right out, and now we are talking about a lot of the processes rather than the plans. We want to develop processes, frameworks and policy strategies which are more flexible rather than to say, 'This is the plan; we have got the final plan and we will sign off on a particular date.'[34]

4.81 The committee believes it is important to stress to local governments in the strongest possible terms the importance of achieving agreed outcomes wherever possible, and the virtue of investigating facilitated decision making models (such as that espoused by Professor Brown). While the physical outcomes of planning decisions are often dramatic, potentially more damaging may be the cost to a community.

---

33 Professor Valerie Brown, ANU School of Resources, Environment and Society, *Transcript of Evidence*, 12 February 2004, p. 3. Professor Brown pointed out that only six objections to the structure plan were received, as opposed to the usual 300.

34 Dr Andrew Montgomery, Western Australian Department for Planning and Infrastructure, *Transcript of Evidence*, 31 March 2005, p. 7.

Development Assessment Forum

4.82 Development assessment and approval processes were raised by some as a flawed decision-making process and not conducive to the effective planning for future cities.

4.83 The committee is aware that this is an area in which a number of reforms are under way. The Development Assessment Forum (DAF) was established in 1998 in response to a review on compliance and paperwork burden imposed on small business, and in recognition of the need for regulatory reform in development building approval processes.

4.84 DAF was formed to bring together stakeholders in the development sector to reach agreement on ways to streamline development assessment and approval processes, and includes representatives from the Commonwealth, each State and Territory, local government, industry associations and professional associations.[35]

4.85 The committee notes the achievements of DAF to date and the cooperative manner in which DAF is coordinating the three tiers of government, communities and industry. Mr Peter Verwer, Chair of DAF and Chief Executive, explained the role of DAF:

> [DAF] is a process. It is a content-free zone because it is really the community, local councils and state governments which should decide what the planning policies are. DAF is just a better way of making decisions about whether a project conforms with criteria—whether it be environmental criteria or heights or whatever ...
>
> DAF separates the role of policy making – which is the proper role of the local parliament, the council – from development assessment … It is a complete kit which is designed to speed things up.[36]

4.86 A number of focus groups have been run by DAF around Australia and the committee supports both the reforms proposed though DAF and the consultation process regarding the proposed model for a uniform development assessment system. In particular, the committee sees merit in the separation of the three stages of development approval into policy-making, assessment and regulation.

---

35 Development Assessment Forum, *Submission 138,* p. 1.

36 Peter Verwer, Property Council of Australia (and Chair and Chief Executive of DAF), *Transcript of Evidence*, 11 March 2004, p. 19.

4.87 While DAF refers to community values and impacts on built and natural environments, the committee suggests a reframing to make overt that leading practices are based on sustainability principles.

4.88 The committee also notes that State and Territory governments are represented by departments responsible for planning, infrastructure and environmental issues, while at the federal level, representation comes from departments that are more focused on business and regulatory requirements.[37]

4.89 The committee considers that extending membership of the forum to the Department of Environment and Heritage and to the CSIRO would be beneficial in bringing national concerns and expertise regarding sustainability and urban design into DAF discussion.

Recommendation 4

4.90 **The committee recommends that the Department of Transport and Regional Services raise with the Development Assessment Forum the proposal to extend membership of the forum to representatives from the Department of Environment and Heritage and the CSIRO.**

4.91 The committee believes the Australian Sustainability Commission could usefully promote an informed understanding of, and debate about, sustainability. This would be achieved by regularly publishing studies of the way in which sustainability is being affected by developments in cities. This would be done with a view to creating a national database where Australians are able to track actual sustainability outcomes against initial forecasts.

37 Commonwealth representatives are the Department of Transport and Regional Services, the Department of Industry, Tourism and Resources and the Australian Building Codes Board.

5

A sustainable transport and access system will simultaneously address economic, social and environmental issues. It will pursue enhancement of a city's economic performance, its social equilibrium and justice and the state of the urban and natural environment.

(Planning Institute of Australia) [1]

Transport

Problems with transport sustainability

5.1 Australian cities have largely been constructed around the automobile, creating a culture heavily reliant on private automobile access. Impacts are:

- environmental (such as urban sprawl, smog and air pollution);
- economic (from providing urban infrastructure across a more dispersed geographical area); and
- social (including isolation, economic stratification of areas and reduced access to public services).

5.2 The transport sector is a user of energy, a contributor to greenhouse gas emissions and a user, through infrastructure, of large tracts of public land.

5.3 Sustainable transport logistics are vital to reversing the problems caused by automobile dependence and to building cities which are equitable, accessible and economically viable.

---

1 Planning Institute of Australia, *Submission 168*, p. 52.

5.4 Transport systems encompass more than the movement of people or commuters across the city. Transport logistics must also take into account the needs of businesses and industry to service the city and manage incoming and outgoing goods. The transport logistics of a sustainable city recognise the need for a more comprehensive network of complementary transport systems with transport nodes forming the focus of urban villages. As Mrs Marilynn Horgan states, transport infrastructure needs to be:

> . . . long term and integrated, and not just integrated at a local community level. It needs to be through the federal, state and local government, particularly in the area of transport strategies and integrated transport strategy at three levels of government to address the issues of movement of freight and issues of huge volume of traffic growth and things like that—maybe as part of the AusLink program.[2]

5.5 This transport network has multiple systems operating in a decentralised manner that enables a web of travel directions and nodal hubs of work, industrial, residential and recreational connections. Many major cities have been constructed around a feeder transport system that channels cars and public transport into the city centre – which is the traditional employment and commercial hub. The sustainable city must deal with these issues. However, a transformation must take place alongside changes in residential planning patterns and employment centres.

5.6 Transport logistics must also ensure that alternative means of transport, such as train, tram, pedestrian or cycling, are well serviced.

5.7 The infrastructure must exist to facilitate interconnecting commuting travel (eg bus-rail interchanges, commuter parking at major railway stations, lockable bicycle sheds at transit nodes, workplaces with showering facilities, well lit pedestrian walkways which bypass major road crossings), as well as a range of public transport systems which are complementary, safe and affordable.

5.8 The opportunity to secure the advantages offered by different nodes of transport needs to be pursued with measures to enhance their complementarity through coordination and integration.

---

2 Mrs Marilynn Horgan, Perth Area Consultative Committee, *Transcript of Evidence*, 31 March 2005, p. 28.

5.9 The need for a complementary array of public transport systems is also underpinned by the possibilities of using renewable energy sources to power these vehicles, further reducing air emissions and reliance on conventional fuels.

5.10 There are at least three options to improving the sustainability of transport. These are:

- Change current transport patterns.
- Change transport modes.
- Increase the efficiency or environmental performance of transport modes.

Current programmes

5.11 Prior to addressing how these options might be pursued, the committee looked at the contributions of two existing Federal Government programmes: 'Auslink' and 'Roads to Recovery'.

Auslink

5.12 In June 2004, the Australian Government released its new land transport plan, AusLink. It sets out $11.8 billion in land transport spending, including a large scale upgrade of Australia's east coast road and rail systems.[3]

5.13 It is a $3.6 billion increase in the Government's land transport funding, and is in addition to the $872 million that the Australian Rail Track Corporation (ARTC) will invest in the east coast rail system as a result of its lease of the NSW interstate and Hunter Valley rail systems.

5.14 The highlights of the major projects in the plan are:

- $765 million to upgrade the Pacific Highway in NSW and Queensland and $714 million for the Hume Highway in NSW and Victoria. The Government's aim is to duplicate the Pacific Highway by 2016 in partnership with NSW, and to duplicate the Hume Highway by 2012. The Government will also contribute $253 million towards building a new connector between the F3 and the New England Highway at Branxton.

3 See Department of Transport and Regional Services, www.dotrs.gov.au/auslink/index.aspx

- a $422 million contribution to the Scoresby Freeway, provided the Victorian Government reverses its decision to impose tolls. The Government will also contribute $186 million to the Geelong Bypass, $114 million to the Calder Highway and $80 million to start work on the Deer Park Bypass and Leakes Road Interchange.
- $627 million to improve the major urban links in Brisbane, particularly the Ipswich Motorway, as well as $429 million to upgrade the Bruce Highway.
- a $96.8 million contribution to complete the Port River Expressway in Adelaide and the associated road and rail upgrades on the LeFevre Peninsula, as well as continued improvements to the major highways in South Australia.
- an investment of up to $150 million to extend the Kwinana Freeway and construct the Mandurah Bypass in Western Australia, as well as $14 million to improve rail links between the Kewdale intermodal precinct and the Port of Fremantle.
- $68 million to complete the duplication of the Bass Highway between Burnie and Devonport in Tasmania and $57 million to replace the Bridgewater Bridge on the Midland Highway.
- a $13.7 million contribution to upgrade the road access to the East Arm Port in Darwin, including the construction of an overpass over the new Adelaide-Darwin railway.
- a total of $1.8 billion in rail projects, including the $872 million that the Australian Rail Track Corporation (ARTC) will invest under its 60-year lease of the NSW interstate and Hunter Valley rail networks.
- $4 billion for local roads, under the extended Roads to Recovery programme and untied road grants to local councils.

5.15 The committee notes that sustainable transport is not provided for under Auslink. The funds are being spent mainly on additional traditional road infrastructure. The South East Queensland Regional Organisation of Councils observes that:

> Despite its critical role in achieving a more sustainable pattern of growth in Australian cities, sustainable urban transport has not been a funding priority for the Commonwealth Government. The responsibility for efficient, safe and environmentally responsible transport infrastructure and services in urban areas has been directly deferred to state, territory and local governments and the private sector.

> The current Commonwealth policy on non-investment in urban transport and its focus on investment outside of the city regions should be questioned.[4]

5.16 Ms Lisa Brideson from the Conservation Council of Western Australia suggests that the Federal Government broaden Auslink's scope to include 'urban passenger transport' and projects for funding be 'subject to independent sustainability assessment – the triple bottom line assessment'.[5]

5.17 The committee believes that the COAG agreed targets and contingent funding control discussed in chapter 3 would ensure future funding will take into account sustainable outcomes and will examine all transport options in order to develop sustainable and integrated transport links for all Australians.

Roads to Recovery

5.18 The Roads to Recovery programme is designed to provide road infrastructure funding for expenditure by local governing bodies.

5.19 The annual allocations for Roads to Recovery are:

- 2000-2001: $150 million
- 2001-2002: $300 million
- 2002-2003: $200 million
- 2003-2004: $300 million
- 2004-2005: $250 million
- 2005-2006: $340 million[6]

5.20 The distribution of the Roads to Recovery funds between States and Territories is based on historical precedents, length of local roads and population.

---

4 South East Queensland Regional Organisation of Councils, *Submission 60*, p. 12.

5 Ms Lisa Brideson, Conservation Council of Western Australia, *Transcript of Evidence*, 31 March 2005, p. 32.

6 *Building the future of our local roads,* Budget media releases, TRS12/Budget, 10 May 2005.

5.21 Allocations between councils within each State are in accordance with formulae adopted by State Grants Commissions for the distribution of Financial Assistance Grants identified for roads. The allocations to councils are fixed for the life of the programme. Local councils must maintain their own roads spending.

5.22 Commenting on Roads to Recovery, the Bus Industry Confederation proposes that this funding be linked to public passenger transport planning and infrastructure provision.[7]

5.23 The Australian Bicycle Council also believes that Roads to Recovery delivers benefits directly to communities but should be expanded so councils can 'invest in improving non-motorised transport infrastructure to encourage sustainable modes for local travel'.[8] Bicycle New South Wales goes further and proposes that active transport should be promoted above road development projects, which may necessitate a 'Paths to Recovery' programme.[9]

5.24 The committee recognises that many of the innovative funding arrangements for road transport could be extended to other modes of transport and suggests that the Department of Transport and Regional Services investigate options to facilitate this. This could be done in conjunction with the Australian Sustainability Commission as outlined in chapter 3.

Recommendation 5

5.25 **The committee recommends that the Department of Transport and Regional Services, in consultation with the Department of the Environment and Heritage, investigate options to extend the Roads to Recovery programme to include other modes of transport as a step towards including sustainability in the funding criteria.**

7 Bus Industry Confederation, *Submission 97,* p. 8.

8 Australian Bicycle Council, *Submission 70*, p. 6.

9 Bicycle New South Wales, *Submission 54*, p. 3.

More urban rail – an alternative to more roads

5.26 One particular mode of transport that appears to be overlooked is that of rail, particularly light rail.[10]

5.27 Professor Peter Newman and Dr Garry Glazebrook alerted the committee to the many benefits expanded rail networks (both heavy and light rail) could provide for Australian cities. Reliable, swift and affordable urban rail systems can have positive impacts on savings (both personal and city), health, and transit speed.

5.28 The committee notes that one of the most important aspects of encouraging use of any rail transport is security. There is little benefit in having on time, efficient and cost effective rail transport, if people are unwilling to use it because of perceived or real security issues.

5.29 The committee was informed that if one car is saved within a family, that family will save $750,000 in superannuation equivalent and that strong rail cities are 45 per cent wealthier than weak rail cities. Strong rail cities spend less on road transport and are more cost effective in their transit operations. Public transport in those cities is faster than the vehicle traffic, which is an encouragement to use the public transport system. Proper use of rail saves money and time.[11]

5.30 Dr Philip Laird from the Railway Technological Society of Australasia also pointed out the very real energy saving benefits that comes with the use of rail transport:

> One fully laden train uses 20 per cent of the energy that a person uses sitting in an average sized family car. It is so much safer, it is so much more energy efficient.[12]

10 Heavy rail is an electric with the capacity for heavy – volume of traffic, and characterised by exclusive rights-of-way, multi-car trains, high speed and rapid acceleration, sophisticated signalling, and high platform loading. Light rail is an electric railway with a light volume traffic capacity compared to heavy rail. Light rail may use shared or exclusive rights-of-way, high or low platform loading, and multi-car trains or dingle cars. (Definitions from the American Public Transit Association).

11 Professor Peter Newman, *Transcript of Evidence*, 28 April 2005, p. 19.

12 Dr Philip Laird, Railway Technological Society of Australasia, *Transcript of Evidence*, 8 June 2004, p. 67.

5.31 Train lines take up considerably less space than freeways. If the passengers currently used rail to travel each day to the Sydney CBD were to shift to private automobiles, an additional 65 lanes of freeway and 782 hectares of car parks would be required. This would require a multi-storey car park 1,042 floors high.[13]

5.32 The committee was also told that individuals do not take into account all of the costs associated with using their cars. The average person perceives the cost per kilometre for car use as being six cents for every passenger kilometre, for train use as being 11 cents and 20 cents for bus use. Once externalities are taken into account, the actual cost of car use is in fact around 60 cents per passenger kilometre, with the true cost for trains and buses being 20 to 30 cents per passenger kilometre. Individuals perceive only one-eleventh of the true cost.[14]

5.33 One of the main issues identified, particularly in Sydney, is that the train system is getting slower, while cars are getting faster through improved road infrastructure. Transport choices are informed by this. Looking at distanced travelled as a temporal and not a purely linear concept it does not come as a surprise to observe that people are quite prepared to pay for travel time savings.[15]

5.34 Parking policies, road pricing and real time road pricing needs to be considered in order to change people's mode of transport. For instance, a lot of retailers provide 'free' parking which is actually subsidised by prices of goods and by those people who do use public transport.[16]

5.35 It was suggested to the committee that Sydney needs, and Perth is moving towards this already, a public transport system that is faster than cars in all main corridors and urban areas need to be built around this.[17] Since 1994, 100 cities worldwide have now built or reintroduced light rail systems, but in Australia, government funding for urban rail transport is lacking.[18]

13 Professor Peter Newman, *Transcript of Evidence*, 28 April 2005, p. 21; see also Mr Andrew Inglis, *Submission 76*, p. 12.

14 Dr Garry Glazebrook, *Transcript of Evidence*, 28 April 2005, p. 27.

15 Dr Garry Glazebrook, *Transcript of Evidence*, 28 April 2005, p. 28.

16 Dr Garry Glazebrook, *Transcript of Evidence*, 28 April 2005, p. 30.

17 Professor Peter Newman, *Transcript of Evidence*, 28 April 2005, p. 24.

18 Dr Garry Glazebrook, *Transcript of Evidence*, 28 April 2005, pp. 34-35.

5.36 A congestion tax, as introduced recently in London, may be on option. The revenues of the tax are being invested in mass transport and traffic management.[19]

5.37 The committee is confident that its recommendation requiring innovative funding arrangements for road transport being extended to other modes of transport will go some way to dealing with the issue of mass urban transit.

Changing current transport patterns

5.38 Transport usage patterns are closely linked to types of settlement patterns. In developing new settlements, infrastructure needs must be considered during the initial planning.

Anticipating infrastructure needs

5.39 Mr Matthew Pike drew attention to the difficulty of establishing public transport infrastructure:

> With public transport, do you put the infrastructure in first or do you put it in after there is demand? It probably makes more sense to put it in after the demand has already grown. But to ensure that that can happen you need to make sure that the corridors remain open so that there is somewhere for that public transport.[20]

5.40 Delfin Lend Lease told the committee that it designs communities with active transport in mind, ensuring that internal car trips are minimised through the provision of walking and cycling paths that 'link homes to local facilities such as parks, schools and shops'.[21]

5.41 The Hickinbotham Group also emphasised the need to plan transport infrastructure within its developments before going ahead with building a community. [22]

19 International Association of Public Transport, *Submission 171*, p. 6.

20 Mr Matthew Pike, Engineers Australia, *Transcript of Evidence*, 17 June 2004, p. 11.

21 Delfin Lend Lease, *Submission 66*, p. 19.

22 Hickinbotham Group, *Submission 51*, p. 2.

Infrastructure costs of road transport

5.42 In 2002-2003, the Australian Government spent $1.72 billion on roads Australia-wide.[23] Table 5.1 shows the Bureau of Transport and Regional Economics (BTRE) Road Construction and Maintenance Price Index. It depicts the increasing cost of constructing and maintaining road infrastructure.[24]

Table 5.1 BTRE road construction and maintenance price index

Year	**Index**
1989-90	89.5
1990-91	96.2
1991-92	97.0
1992-93	98.8
1993-94	100.0
1994-95	102.3
1995-96	102.9
1996-97	103.6
1997-98	103.9
1998-99	104.9
1999-00	109.1
2000-01	115.1
2001-02	117.7
2002-03	124.0

Source *http://www.btre.gov.au/docs/indicate/r_construct.htm*[25]

23 See Bureau of Transport and Regional Economics, *Australian Transport Statistics June 2005*, table 10, p. 13.

24 The index allows the Australian road industry to monitor price movements of inputs to road construction and maintenance. It is an input-price index and does not measure movements in the actually cost of provision of roads. It is a means of calculating real changes in road expenditures and government road funding levels. Input components for the index include salaried labour, other labour, bitumen, concrete, quarry products, plant hire and depreciation and fuel. Where possible, time series for these components are based on nation-wide information. Weights for the input components are based on information obtained from a survey of state road authorities, local government authorities and private contractors. Thanks to Mr Tony Carmody, Senior Research Officer from the Bureau of Transport and Regional Economics for the explanation of the Index.

25 Index figures up to 1993-94 are not directly comparable with later years because, the method of constructing the index was modified in 1994-95.

Transport infrastructure provision and funding

5.43 The committee believes that the way in which transport infrastructure is currently budgeted for undermines the type of transport interconnectedness that is necessary for sustainability. The PIA draws attention to the fact that there are still separate budgets for roads, public transport, airports and pedestrian and cycling infrastructure, leading to a 'rather narrow vision'. [26]

5.44 The PIA suggests that transport infrastructure funding should actually aim to reduce private transport needs. The way infrastructure is conceived of can add to the sustainability of the transport system:

> An infrastructure approach more in tune with sustainability goals would look into transport reduction potential rather [than] trying to further expand mobility. For instance, this approach would examine how the excess of traffic demand that leads to congestion could be shifted to other modes of transport, to closer destinations and even prevented through alternative, non-transport inducing activities such as working at home or shopping through the internet. This highlights the importance of a close integration of infrastructure (supply) management and travel demand management approaches.[27]

5.45 The Australasian Railway Association puts the case for increased use of rail as the safest form of land transport and also the lowest contributor to greenhouse gas emissions, commenting that 'the sustainability advantages of rail are often not taken into account in infrastructure investment decisions'.[28]

5.46 The PIA also highlighted the lack of funding for rail infrastructure, pointing out that there is no designated Commonwealth funding programme for urban railway infrastructure similar to those for freeway construction. This is 'severely out of tune with urban transport funding regimes in practically every other OECD country' and explains why 'Australian urban rail systems have been struggling to keep up with the pace of metropolitan growth'.[29] This means outer suburbs are highly car-dependant. The Institute recommends a 'significantly boosted federal

26 Planning Institute of Australia, *Submission 168*, p. 56.
27 Planning Institute of Australia, *Submission 168*, p. 56.
28 Australasian Railway Association Inc, *Submission 82*, pp. 2-3.
29 Planning Institute of Australia, *Submission 168*, p. 56.

commitment to upgrading and expanding fixed public transport systems'.[30]

5.47 Decisions on infrastructure that are made now will have an impact on future sustainability. The committee reiterates that it is important for decision-makers to understand the interconnectedness of the urban environment settlement and transport environment.

5.48 The Australian Government has an opportunity to benchmark infrastructure planning decisions against the recommended Australian Sustainability Charter and make a commitment to boosting funding to public transport systems in major cities.

Recommendation 6

5.49 **The committee recommends that:**

- **transport infrastructure planning decisions be benchmarked against the recommended Australian Sustainability Charter; and**
- **the Australian Government significantly boost its funding commitment for public transport systems, particularly light and heavy rail, in the major cities.**

Public private partnerships

5.50 In commenting on the AusLink green paper, the Australian Trucking Association observes that finding alternative methods of road and infrastructure funding is a priority. The Association believes that the public private partnerships (PPP) model is underutilised and could be advantageous, as long as monopolistic power is not exercised and that the safety of road users is not compromised by the return expected by investors.[31]

30 Planning Institute of Australia, *Submission 168*, p. 56.

31 Australian Trucking Association, *Submission 125*, p. 4.

5.51 The South Sydney Development Corporation advised the committee on the set-up of public private partnerships, including a public/ private board structure, and ensuring that the limited taxpayers' money available can be used to leverage additional funds from the private sector while still allowing the government to deliver on its responsibilities.[32]

5.52 There are advantages to the PPP approach:

> Experience is showing that professional consortia can access the international capital and technical expertise to implement world's best practices, and to do so cost-competitively.[33]

5.53 However, entering into a PPP needs to be done carefully. The Railway Technical Society of Australasia suggests that:

> Australia's record is mixed with situations such as Sydney's Airport Rail Link showing a need for caution. PPP should not be seen as getting public debt off the government balance sheets or 'finding a market response' to funding requirements. Lumbering future generations with inappropriate debt - unable to generate returns, should be guarded against.[34]

5.54 The exact terms of a PPP can vary and will depend on the nature of the government agency and the commercial consortium involved. Mr Geoff Noonan explained to the committee that the important issues to focus on are owners, operators and accountability.[35]

5.55 Aspects that will influence the agreement include:

- the level of up-front government funding offered;
- whether the assets created eventually transfer to government ownership;
- whether the government regulates the prices charged for the public's use of the service;
- who negotiates with the community involved;
- who is accountable for any breaches of environmental or planning permits;
- who is responsible for correcting faults; and

32 South Sydney Development Corporation, *Submission 169*, p. 2.

33 The Middle Way Pty Ltd, *Submission 32*, p. 22.

34 Railway Technical Society of Australasia, *Submission 166*, p. 11.

35 Mr Geoff Noonan, The Middle Way Pty Ltd, *Transcript of Evidence*, 8 June 2004, p. 9.

- whether communities have sufficient recourse to make sure sustainability criteria are met by developers.[36]

5.56 The committee has not sought to evaluate the benefit, per se, of PPPs and is aware that there is considerable debate in the community regarding this funding mechanism. Nonetheless it appears likely that PPPs will remain at least to some degree a significant aspect of future transport infrastructure provision and will therefore impact on transport patterns. It is important therefore that PPP arrangements incorporate sustainability principles.

Services to fringe developments

5.57 The City of Newcastle's submission advised the committee that:

> The concentration of residential populations at the urban fringe creates community isolation, increased car dependency and the growth of residential populations without basic support services, facilities or transport.[37]

5.58 Developments on the fringe of cities generally lack public transport infrastructure and there is no option other than car use. This deficit in public transport is 'particularly exposed in the new release areas'.[38]

5.59 The committee also noted that a lack of public transport often increases social division within Australia:

> Higher-income groups tend to be located in well-serviced, inner urban areas where they are mobility-rich; while lower-income groups tend to be located in poorly-serviced areas, often at the fringe of cities where they are mobility-poor.[39]

5.60 Delfin Lend Lease, within its Fully Planned Community, acknowledges the need for transport infrastructure to be set up early in the development process to establish public transport use. In several Delfin Lend Lease projects, this has 'encouraged the development of meaningful public transport initiatives'.[40]

---

36 The Middle Way Pty Ltd, *Submission 32*, pp. 21-22.

37 City of Newcastle, *Submission 147*, p. 3.

38 Urban Frontiers Program, *Submission 113*, p. 6; Mr John Stanley, Bus Industry Confederation, *Transcript of Evidence*, 13 May 2004, p. 19.

39 Planning Institute of Australia, *Submission 168*, p. 51; see also Regional Cities Victoria, *Submission 98*, p. 6.

40 Delfin Lend Lease, *Submission 66*, p. 18.

5.61 Regional Cities Victoria's submission also draws attention to the importance of the 'social cohesion' of communities relying on 'their ability to access efficient and coordinated transport systems':

> It encourages interaction between communities and individuals, improves accessibility to education, health and community services, attracts more skilled workers, improves links between townships and encourages locally employed communities.[41]

5.62 The City of Newcastle's submission gives examples of fringe developments in its locality and sums up the impact as follows:

> . . . suburbs developed at lower densities and without adequate public transport infrastructure are having a long term significant impact both on the local natural environment and ultimately, social and economic impacts for the residents.[42]

5.63 It is a matter of great concern to the committee that there is adequate sustainable transport infrastructure to service newly developed communities, particularly in urban fringe areas.

5.64 The committee feels that, as part of the planning approval process, there must be requirements for state governments and/or developers to include the provision of transport infrastructure to new (and especially fringe) developments.

Recommendation 7

5.65 **The committee recommends that the provision of Australian Government transport infrastructure funds include provision of funding specifically for sustainable public transport infrastructure for suburbs and developments on the outer fringes of our cities.**

41 Regional Cities Victoria, *Submission 98*, p. 6.

42 City of Newcastle, *Submission 147*, p. 4.

Changing transport modes

Impact of current policies in reducing car dependency

5.66 The committee was advised that a reduction in car dependence could have a vast impact on current and future land usage. As Bicycle New South Wales points out, inherent in Australia's pattern of urban sprawl is use of the car as the dominant mode of transport:

> As a result of this up to one third of Sydney's 'available' public land is dedicated to car usage through the provision of roads, parking and areas to support motor vehicles. This is an inefficient use of space that could be alternatively used as urban green zones or as community space.[43]

5.67 The committee is concerned that some Australian Government policies may be having the unintended outcome of encouraging car usage (through FBT concessions) and the purchase of less fuel efficient vehicles (through four wheel drive import concessions).

5.68 Mr Wallace Wight from the Northern Subregional Organisation of Councils commented on FBT and taxation incentives for four wheel drives:

> Various taxation systems have quite a lot of unintended consequences. An example might be the fringe benefits tax formula that encourage people to drive large cars long distances. That has implications for the transport systems, people's behavioural choice in choosing locations to live and work–all having a negative effect on sustainability. Another example is the incentives to import wasteful vehicles …While there may be a good reason somewhere along the line to have those sort of things, the unintended consequences of them can be quite counterproductive.[44]

43 Bicycle New South Wales, *Submission 54*, p. 1.

44 Mr Wallace Wight, Northern Subregional Organisation of Councils, *Transcript of Evidence*, 6 April 2004, p. 17.

Fringe benefit tax concessions

5.69 The committee was advised that 'at the moment over $750 million per annum is spent on subsidising car use'.[45]

5.70 One of the impediments to reducing car dependency on Australian roads is the ability of people to salary sacrifice for the novated lease of a car and the incentives to increase the kilometres travelled.

5.71 In this taxation scheme, a deduction is made from employees' gross salary so they are able to salary sacrifice (use pre-tax dollars) the lease payments and the running costs of the vehicle. Fringe benefits tax (FBT) is then payable. Salary sacrificing for a car means that the more kilometres a person travels in an FBT year, the less tax is assessed.

5.72 The following scale (table 5.2) is used to determine the statutory percentage. This is based on the number of kilometres travelled each FBT year. The greater the distance travelled, the lower the taxable value will be. At the beginning of the lease, estimated kilometres supplied by the lessee for the FBT year are used for the initial calculations. Included in the statutory percentage is an assumption of implied business use.

Table 5.2 Statutory percentages of FBT for vehicle use

Number of Kilometres per FBT year		**Statutory %**
From	**To**	
0	14,999	26%
15,000	24,999	20%
25,000	40,000	11%
40,000	And above	7%

Source *Australian Taxation Office*

45 Dr Gabrielle Kuiper, Bicycle New South Wales, *Transcript of Evidence*, 27 January 2004, p. 6.

5.73 Below is an example calculating taxable value and FBT payable: vehicle travelling 20,000 km pa with a base value of $20,000, available for the full year with no after tax contributions.

Vehicle base value			$20,000
Multiplied by Statutory Percentage		20%	$ 4,000
(as per table above)			
Taxable value			**$4,000**
Multiplied by Gross up		2.129189	$ 8,517
Total FBT payable	48.5%		**$ 4,131**

5.74 Several submission and witnesses drew attention to the fact that the above concessions are not available to other forms of transport such as public transport or bicycle riding and that 'the whole system is skewed towards car use'.[46] FBT concessions should be taken off cars and put on other forms of transport, and the money saved 'could be invested by the Commonwealth in public transport infrastructure'.[47]

5.75 Dr Chloe Mason told the committee that, in Sydney, some 50 per cent of car use during peak hour is estimated to be a result of Commonwealth concessional car use. To avoid 'political mayhem', Dr Mason advocates the gradual claw-back of the FBT concessions to 'provide the signal' that it is not a sustainable concession.[48]

5.76 Mr Hugh Ralston, Director of the Warren Centre for Advanced Engineering, also supported these arguments and described the salary-sacrificing scheme for cars as a distorting tax and 'against the use of public transport'.[49]

46 Dr Gabrielle Kuiper, Bicycle New South Wales, *Transcript of Evidence*, 27 January 2004, p. 10; see also Mr Neil Tonkin, Bicycle New South Wales, *Transcript of Evidence,* 27 January 2004 and Dr Chloe Mason, *Transcript of Evidence*, 27 January 2004.

47 Dr Gabrielle Kuiper, Bicycle New South Wales, *Transcript of Evidence*, 27 January 2004, p. 6.

48 Dr Chloe Mason, *Transcript of Evidence*, 27 January 2004, p. 88.

49 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 8 June 2004, p. 16.

5.77 Evidence to the committee also suggested that Australia is seen as out of step with world thinking in relation to FBT. Mr Peter Moore, Executive Director of the International Association of Public Transport, Australia and New Zealand, told the committee that 'Europeans are totally perplexed' by this policy and also suggested that companies be encouraged to provide tax incentives for the use of public transport.[50]

5.78 The committee agrees that there is a need to review the current regulations regarding salary packaging of cars and FBT concessions.

Recommendation 8

5.79 **The committee recommends that the Australian Government review the current FBT concessions for car use with a view to removing incentives for greater car use and extending incentives to other modes of transport.**

Import duty for four wheel drives

5.80 Another distorting Australian Government policy appears to relate to the reduced tariff rate on four wheel drives. Originally conceived to assist primary producers, the concession is now subsidising vehicles that are creating 'additional, unnecessary environmental impacts and reducing the sustainability of Australian cities'.[51]

5.81 This is because, while once mainly used by farmers, four wheel drives are now 'increasingly common on urban roads', making up over 20 per cent of new car sales. The tariff rate on four wheel drives is 10 per cent lower than for all other imported cars, providing 'an incentive to the urban use of the least efficient, most polluting and dangerous forms of passenger transport'.[52]

50 Mr Peter Moore, International Association of Public Transport, Australia and New Zealand, *Transcript of Evidence*, 19 February 2004, p. 11.

51 Bayside City Council, *Submission 101*, p. 6.

52 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 19.

5.82 The issue of safety is also of particular concern to the committee. Of note is that the 2004 report on National Road Safety by the Transport and Regional Services Committee recommended that the Australian Government:

> … bring the tariff on four wheel drive vehicles into line with the tariff on other imported cars, with genuine primary producers and others who have legitimate need for four wheel drive capability receiving tariff exemption.[53]

5.83 The committee believes that, given the environmental impact of increasing private use of four wheel drives, in addition to the safety concerns, the Australian Government should go further in its review of the tariff policy in this area.

Recommendation 9

5.84 **The committee recommends that the Australian Government review the tariff policy on four wheel drive vehicles with a view to increasing the tariff rate on four wheel drive vehicles, except for primary producers and others who have a legitimate need for four wheel drive capability.**

Promoting and increasing the use of active transport and living

5.85 The committee noted earlier in this report that there is increasing evidence of urban living contributing to increasing incidence of a wide range of illnesses. There is no doubt that greater physical activity would contribute to lowering these incidences. Mr Neil Tonkin uses the term 'active transport', referring to walking, cycling and public transport, 'as forms of transport that involve human physical activity with substantial benefits to health, safety and wellbeing'.[54]

53 House of Representatives Standing Committee on Transport and Regional Services, *National Road Safety: Eyes on the road ahead*, Parliament of the Commonwealth of Australia, Canberra, June 2004, Recommendation 27.

54 Mr Neil Tonkin, Bicycle New South Wales, *Transcript of Evidence*, 27 January 2004, p. 3.

5.86 The committee was told that the TravelSmart household programme in Perth, which provides information on walking, cycling and public transport to receptive households has achieved a 14 per cent reduction in the use of cars.[55]

5.87 Dr David Worth from the Sustainable Transport Coalition of WA characterised TravelSmart as a 'personalised marketing system', where people living in a particular area are asked questions about their travel habits. Around 40 per cent of people have been found to be interested in further information. The information prepared is personalised to the circumstances of that household; for example, the bus company would prepare an individual map. [56]

5.88 Dr Christopher Rissel, Director of the Health Promotion Unit of the Central Sydney Area Health Service explained how he is copying the TravelSmart system:

> We have developed transport access guides, which are maps of facilities which illustrate ways of getting to a destination without driving …
>
> We have coupled this with communication strategies about the value of not driving and of walking, cycling or using public transport instead. We have also spent time doing some individual marketing where we talk through people's individual issues about transport. . . [57]

5.89 The committee notes that the Australian Government supports these initiatives through information offered on its website www.travelsmart.gov.au.

5.90 While acknowledging the usefulness of TravelSmart, Mr Stephen Lucas from the Bus Industry Confederation pointed out that information does not always equal use:

> There is no point having the best information system in the world if you are giving information about a service that people do not want.[58]

---

55 Sustainable Transport Coalition of WA, *Submission 148*, p. 2.

56 Dr David Worth, Sustainable Transport Coalition of WA, *Transcript of Evidence*, 29 April 2004, p. 17.

57 Dr Christopher Rissel, Central Sydney Area Health Service, *Transcript of Evidence*, 27 January 2004, p. 18.

58 Mr Stephen Lucas, Bus Industry Confederation, *Transcript of Evidence*, 13 May 2004, p. 19.

5.91 One of the difficulties again appears to be services to outer areas where there might be significant gaps between services and nothing at night and weekends.[59] In addition to issues relating to frequency of service, the committee also noted the need for people to feel safe on their transport.[60]

5.92 Encouraging the use of public transport services can be part of a broader planning strategy to increase densification around public transport hubs. Dr Andrew Montgomery of the WA Government informed the committee:

> We are looking at focusing our efforts within the metro area on a development spine—urban corridors and densification or concentration around nodes such as railway stations. We have a substantial programme of transit oriented development—TOD, as we refer to it here—where we look at developing around all the railway stations. If you go to some of our existing railway stations that were developed 20 or 50 years ago you will see low-density development right up to the railway station. All of the new stations in our new initiative are being planned as more intense nodes. Again, we are looking at the mix of land uses to attract that. We are adopting more of an incentive based approach rather than a restrictive based approach of saying, 'This is the line and you can't go over it.' Obviously, that is not the approach that is not taken by the sensible people who are working with urban growth boundaries.[61]

Benefits of active transport

5.93 Instituting active transport regimes would have a vast beneficial impact on Australia's environment, health and transport congestion, particularly in the main cities. Mr Neil Tonkin told the committee that this would be 'especially achievable in Sydney' where '55 per cent of all car journeys are of less than five kilometres and 33 per cent are of less than three kilometres'.[62]

59 Mr John Stanley, *Transcript of Evidence*, 13 May 2004, p. 19.

60 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 8 June 2004, p. 14; see also Mr Martin Laird, Railway Technical Society of Australasia, *Transcript of Evidence*, Sydney, 8 June 2004, p. 67.

61 Dr Andrew Montgomery, Western Australian Department for Planning and Infrastructure, *Transcript of Evidence*, 31 March 2005, p. 14.

62 Mr Neil Tonkin, Bicycle New South Wales, *Transcript of Evidence*, 27 January 2004, p. 3.

5.94 Bicycle NSW is also in favour of an integrated transport system that would include bicycle lockers at bus and train stations and making bicycles free of charge on trains. This would aid in 'reducing the amount of car dependence' and would optimise 'the access and liveability of urban communities'.[63]

5.95 The committee was told of a need to reinvigorate the National Bicycle Strategy with Australian Government funding,[64] and the committee notes that the Australian National Cycling Strategy 2005-2010 is currently being prepared by the Australian Bicycle Council.[65]

5.96 The committee was impressed with the outcomes of TravelSmart and similar schemes and would recommend that the Australian Government link its funding of road transport to the setting-up of such schemes in all council/local government areas.

Recommendation 10

5.97 **The committee recommends that the Australian Government provide adequate funding to develop new programmes and support existing programmes, such as TravelSmart and the National Cycling Strategy, that promote and facilitate public and active transport options.**

Increasing the efficiency or environmental performance of transport modes

Emission standards

5.98 Transport, and in particular motor vehicles, is a major contributor to diminishing air quality in cities. Sustainability, as well as addressing transport patterns and changes to the predominant transport mode, must increase the efficiency of vehicles, to significantly reduce current environmental impacts of fuel emissions.[66]

63 Bicycle New South Wales, *Submission* 54, p. 2.

64 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 20.

65 Department of Transport and Regional Services, see www.abc.dotars.gov.au/downloads/NationalCyclingStrategy_Draft_12April2005.pdf

66 Bicycle New South Wales, *Submission 54*, p. 2.

5.99 The City of Newcastle's submission drew attention to the effect of motor vehicle emissions on regional air quality and advised that over 50 per cent of nitrogen oxide emissions and nearly 80 per cent of carbon monoxide emissions are attributable to motor vehicles.[67]

5.100 Ventura Bus Lines suggests the use of ethanol to tackle this problem as ethanol 'is totally renewable and is cleaner than diesel, emitting half the amount of emissions.'[68]

5.101 The committee was impressed by Perth's current trial of running zero emission hydrogen buses.

Case Study: Hydrogen Powered Buses

'EcoBus' - Perth

As part of the Western Australian Government's commitment to working towards sustainable transport energy solutions, a number of initiatives are being introduced to encourage the development of clean fuels.

Since 2004, Perth has participated in one of the first major trials of hydrogen fuel cell buses in the world. Three Daimler Chrysler hydrogen fuel cell buses are being trialled on normal Perth service routes for two years.

Participation in the trial brings Western Australians close to the global development of this exciting technology, and will allow a full evaluation of the potential of hydrogen and fuel cells as one of the possible transport energy solutions of the future.

The hydrogen used in EcoBuses is produced by the BP Oil Refinery. The fuel cell buses use hydrogen and oxygen to create electricity through an electro-chemical process. The by-products of this chemical reaction are pure water vapour and heat, resulting in no pollution.

At the moment, fuel cell buses and hydrogen are too expensive to make the fuel cell buses competitive with conventional buses on a purely financial basis. There are several factors that could change this in the future. The costs of fossil fuels like diesel and compressed natural gas will rise, the costs of fuel cells will decrease when they are mass produced and the health and environmental costs to society caused by pollution will become more important.

67 City of Newcastle, *Submission 147*, p. 3.

68 Ventura Bus Lines Pty Ltd, *Submission 9*, p. 2.

5.102 The committee notes that there have been significant improvements in relation to toxic emission standards for motor vehicles. The Australian Automobile Association advises that today's new car is around 30 times cleaner than a new car in the early 1980s:

> This trend toward cleaner cars will continue with the introduction of new emissions standards and cleaner fuels. Euro 3 standards which come into effect in 2005 will reduce existing emissions by half, and Euro 4 standards to be introduced around 2008, will reduce emissions by a further 50 per cent.[69]

5.103 Emission standards for highway vehicles and engines are adopted by the Department of Transport and Regional Services. Australian emission standards are based on European regulations with certain US and Japanese standards accepted for selected applications. The long term policy is to fully harmonise Australian regulations with European standards.

5.104 New, more stringent emission standards have been adopted with an implementation schedule from 2002-03 to 2006-07.

5.105 The new Australian Design Rules apply to new vehicles fuelled with petrol, diesel, as well as with LPG or natural gas. Coupled with reviews of fuel quality and emission standards,[70] this will have a positive impact on the new vehicle fleet's emissions.

5.106 Another new Australian Design Rule is for fuel consumption labelling and will require all new model vehicles to display a label on the windscreen which states the fuel consumption in L/lOOkm and CO2 emissions in g/km of that particular model.[71]

5.107 The committee is heartened that the issue of motor vehicle emissions is being addressed. However, the committee nevertheless strongly advocates greater use of public and active transport modes (and a resultant reduction in private car use) as the most effective means of reducing car emissions in the long term.

5.108 The emission standards will have a significant impact on new vehicles entering service in Australia. There remains a large fleet of older cars on Australia's roads, and these cars are likely to deteriorate with age and continue to cause high emission rates.

69 Australian Automobile Association, *Submission 121*, p. 1.

70 Department of Transport and Regional Services, *Submission 140*, p. 24.

71 Department of Transport and Regional Services, *Submission 140*, p. 25.

5.109 The committee believes a mandated emission standard appropriate for all older vehicles which could be disclosed at point of sale. This standard would need to be developed with due consideration for the age of existing vehicles. With the wide range of vehicles on Australia's roads the committee recommends that the Department of Transport and Regional Services develop appropriate standards and work to have these standards adopted by State and Territories to ensure compliance at point of sale.

Recommendation 11

5.110 **The committee recommends that the Department of Transport and Regional Services investigate developing emission standards for older vehicles and work with the States and Territories with a view to instituting mandatory testing and reporting at point of sale.**

6

> … no higher quality water, unless there is a surplus of it, should be used for a purpose that can tolerate a lower grade.
>
> (United Nations Economic and Social Council, 1958)

Water

6.1 The management of water is one of the most critical issues faced by Australian cities face today and into the future. While every city's situation and water resources are different, all Australian cities are facing a growing water deficit as population growth drives demand and, most ominously, climate change causes a reduction in rainfall and a consequent much greater reduction in run-off. For example, the mean yearly stream flow from 1911-2003 in the Perth catchment was 285 billion litres. From 1975-2033, it had reduced to 164 billion litres.[1] The Committee was left in no doubt that several of our cities, especially Sydney and Perth, are in danger of significant water shortages.[2]

6.2 Dr John Marsden discussed these two cities with the committee at a Sydney hearing, but argued that while their challenges are similar, their responses are not:

> Putting it in a wider context, this supply gap issue is occurring in most Australian cities. The climate risk and the long-term climate variability issues will affect them all. The strategic responses across Australian cities are highly variable. They are probably best in Perth. The analogy that we have been discussing is that Perth knows that it is on a cliff. In fact, it is on the cliff face, it has its ropes on, it has its mountain climbing boots on and it has all the

1 Barton Group, *Australian Water Industry Roadmap*, 15 June 2005, p. 14.

2 See for example Port Jackson Partners Limited Report prepared for the Business Council of Australia, *Reforming and Restoring Australia's Infrastructure*, March 2005, pp. 74-75.

> gear. It knows it is there and it is scaling it, whereas in Sydney I think up until very recently it has been wandering around in a fog denying that there might be a cliff anywhere.[3]

6.3 The committee received evidence on a range of measures that can be employed to harvest more water for our cities and use less of it. Water has to be regarded as a vital, valuable commodity. Our water use has been so wasteful that in many respects the problem is not one of water shortage, but of wasteful, unsustainable and environmentally irresponsible management of water. The solution does not lie in one approach or one technology. Australia's cities have an urgent need for an integrated approach to water management which:

- reduces water use by more efficient use of water;
- recycles waste water; and
- adds to the water supply of our cities through better harvesting of run-off and in those cities where it is required by desalination.

All management, use and delivery methods should be used where appropriate, rather than having different methods competing against each other.

Integrated water management

6.4 Dr Harry Blutstein explained that the community needs to have a better understanding of the environmental consequences of different types of urban development as they impact on water usage:

> People say, 'I'd love a really great tarmac here and a footpath here—and I don't want any potholes in it,' but they are not saying it with an understanding of sustainability. Once they understand that, people might say, 'We want grass nature strips. We don't want concrete drains; we want grassed swales that will take the water and absorb it.' So suddenly we start to re-envisage our landscape. But that can only happen if people ask for it; if you try to do it without the education it will not happen.[4]

3 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 13.

4 Dr Harry Blutsein, Integrating Sustainability, *Transcript of Evidence*, 6 March 2004, p. 63.

6.5 The committee received a considerable amount of evidence on the integration of all aspects of water management. In a submission to the committee, the CSIRO summarised ways to address issues relating to water provision in urban areas and the treatment of wastewater and stormwater. This included research programmes, a Commonwealth investment package, major policy and institutional changes, and 'scorecards' for water efficiency of appliances and buildings.[5]

6.6 The committee notes that the Australian Government has taken a leadership role and acknowledged the importance of integrated water management through the National Water Initiative, but that much remains to be done in relation to the education of the public.

National Water Initiative

6.7 At its meeting of 25 June 2004, COAG agreed to a National Water Initiative (NWI), a comprehensive strategy driven by the Australian Government to improve water management across the country.[6]

6.8 The NWI encompasses a wide range of water management issues and encourages the adoption of best-practice approaches to the management of water in Australia.

6.9 In particular, the NWI should result in:

- expansion of permanent trade in water, bringing about a more economic and efficient use of water and more cost-effective and flexible recovery of water to achieve environmental outcomes;
- more confidence for those investing in the water industry due to more secure water access entitlements, better and more compatible registry arrangements, better monitoring, reporting and accounting of water use, and improved public access to information;

5 CSIRO, *Submission 91*, p. 14.

6 The information on the National Water Initiative (including the Australian Government Water Fund, Water Smart Australia, Raising National Water Standards and Australian Givernment Water Fund Communities) comes from the Department of Prime Minister and Cabinet, see www.pmc.gov.au/nwi .The committee notes that Tasmania and Western Australia did not sign the agreement.Western Australia did not see a real benefit for the state, while Tasmania will continue to discuss opportunities with the Australian Government for cooperation on water reform.

- more sophisticated, transparent and comprehensive water planning that deals with key issues such as the major interception of water, the interaction between surface and groundwater systems, and the provision of water to meet specific environmental outcomes;
- a commitment to addressing water systems where users have been allocated more water than can be sustainably drawn from that water system as quickly as possible, in consultation with affected stakeholders, addressing significant adjustment issues where appropriate; and
- better and more efficient management of water in urban environments, for example through the increased use of recycled water and stormwater.

6.10 Water reform is driven at the national level by the National Water Commission, which is an independent statutory agency within the Prime Minister's portfolio. The Commission's role is to help implement the NWI agreement, and invest under the Australian Government Water Fund.

Australian Government Water Fund

6.11 On 13 September 2004, the Prime Minister announced a major commitment to the Australian Government Water Fund.

6.12 The Australian Government Water Fund is an investment of $2 billion over five years by the Australian Government in water infrastructure, improved knowledge and water management, and better practices in the stewardship of Australia's scarce water resources. The Fund is made up of three programmes:

- Water Smart Australia;
- Raising National Water Standards; and
- Australian Government Water Fund Communities.

6.13 The National Water Commission will advise and make recommendations to the Commonwealth in relation to two programmes under the Australian Government Water Fund: Water Smart Australia and Raising National Water Standards.

Water Smart Australia

6.14 The Water Smart Australia programme is designed to accelerate the development and uptake of smart technologies and practices in water use across Australia.

6.15 Competitive bidding will be the primary mechanism for allocating grants. The type of projects that could be eligible include:

- improving river flows;
- on-farm water use efficiency improvements;
- cost-effective recycling and re-use of urban stormwater and grey water; and
- more efficient water storage and transmission facilities.

Raising National Water Standards

6.16 The Raising National Water Standards programme will invest in Australia's national capacity to measure, monitor and manage its water resources. These investments will be designed to help achieve NWI outcomes. Projects that could be eligible include:

- facilitating a nationally consistent system for collecting and processing water data;
- strategic assessment of groundwater resources;
- working with local communities to improve the conservation of water systems with high environmental values through measures such as planning, voluntary conservation agreements and improved knowledge; and
- establishing and promoting the Water Efficiency Labelling Scheme for household appliances, and implementation of the Smart Water Mark regime for household gardens.

Australian Government Water Fund Communities

6.17 The Australian Government Water Fund Communities programme will provide grants to communities to promote wise use of water. This programme will be administered by the Department of the Environment and Heritage.

6.18 The committee believes that the NWI will yield benefits for urban water management. The NWI also provides an integrated approach to water management.

6.19 The committee has considered water management as three elements, and provides analysis of each of these:

- Water efficiency and education;
- Water sensitive urban design; and

- Decentralised water delivery.

Water efficiency and education

Water recycling and desalination

6.20 The committee is of the view that Australia urgently needs to substantially increase the amount of wastewater which is recycled. While some communities in Australia do recycle a substantial amount of their wastewater, overall Australia's record on recycling is very poor and compares unfavourably with the position in other, comparable, developed countries. Sydney is probably the worst case, recycling less than 3 per cent of its wastewater and pumping about 450 billion litres or nearly 75 per cent of its annual water usage out to sea as barely treated sewage.

6.21 The committee notes the water systems in Australian cities operate on a two pipe system only: a pipe with fresh, potable water coming into the home or business premises and a pipe with waste water or sewage going out. In an ideal world, premises would receive an additional, third, pipe which would deliver recycled water to be used for purposes other than human consumption. The bulk of water used in Australian homes is not consumed by humans, but is rather used on the garden, flushing lavatories, washing cars and for many other purposes that do not involve ingestion of the water. While there is no scientific or medical obstacle to rendering recycled water safely drinkable (as is the case in many cities overseas), there is perceived to be public reluctance to allow recycled water directly into the drinking water system. Consequently, the lack of a third pipe is often cited as a reason or excuse for not engaging in recycling and reuse of water.

6.22 There are at least two responses to this objection:

- There are already considerable opportunities to substitute fresh potable water with recycled water which do not require a major re-plumbing of Australia's cities. These include large industrial users, parks, golf courses, agriculture and, most importantly, the restoration of environmental flows in rivers which have been depleted by water harvesting by dams.
- Recycling of wastewater represents in the case of most of our cities the only opportunity (apart from desalination) to add substantially to the sustainable yield of water.

6.23 The committee notes that the Victorian Parliament's Outer Urban/Interface Services & Development Committee's report *Inquiry into sustainable urban design for new communities in outer suburban areas* makes the following recommendation regarding third pipe systems:

- Funding of further pilot projects to advance the use of third pipe systems; and
- That the Victorian Government undertake a study into the long term savings and broader social gains of water recycling technologies, particularly third pipe systems.[7]

6.24 The committee supports these recommendations.

6.25 The City of Melbourne has also instituted its WaterMark campaign which aims to:

- Drive improvements in the efficiency of water consumption
- Seek alternative water supplies to replace potable water consumption where potable water is not required (eg: irrigation)
- Maximise opportunities for water recycling

The Campaign will involve residential, industrial and commercial sectors of the municipality as well as City Council's own operations. Each sector will be assigned a reduction target relevant to the sector's water usage profile and its potential for efficiency gains. Global Compact signatories can contribute to the achievement of the efficiency targets through participating in a City-led water efficiency program.[8]

6.26 The Department of Environment and Heritage is already utilising grey water recycling within its main tenancy, the John Gorton Building in Canberra.[9] The committee believes that all government departments and agencies that own property should follow this example. Agencies that rent property should consider building efficiency, including grey water re-use, when seeking tenancy agreements. This is further explored in chapter 7.

6.27 The committee notes that some councils have been inundated with applications by residents to install grey water recycling in their home and business premises.[10]

---

7 Parliament of Victoria Outer Suburban/Interface Surfaces Development Committee, *Inquiry into sustainable urban design for new communities in outer suburban areas*, September 2004, p. 121.

8 City of Melbourne, *Submission 187*, p. 11; see also Dr Phil McManus, *Transcript of Evidence*, 29 April 2005, p. 42.

9 Department of Environment and Heritage, *Submission 157*, p. 4.

10 Ms Juanita Manahan, Southern Sydney Regional Organisation of Councils, *Transcript of Evidence*, 29 April 2005, p. 47.

6.28 Environment Business Australia comments that not only are we losing potentially re-usable water, but soil nutrients as well:

> Water recycling and stormwater capture and use should be top priorities instead of allowing polluted water to leak into waterways or to be discharged via deep (or not very deep in some cases) ocean outfalls. Much needed soil nutrients are being disposed of instead of being returned to replenish thin and nutrient depleted soils.[11]

6.29 The committee was made aware of the unfortunate situation where, when options for water savings are put to the general public, the option of water recycling is not presented as the judgement is made that the public is not ready for it.[12] The committee believes Australia is out of step with global developments in this regard. It notes that Israel, for example, recycles 70 per cent of its wastewater and in the United States (especially in California), there are many communities which have achieved similar or higher levels of recycling. The committee notes that in countries where several cities or towns are located on the banks of great rivers (such as in Europe) every community is, in effect, drinking the recycled water of the upstream communities, as water is drawn from the river, consumed by residents, recycled and then returned to the river to flow downstream to the next town.

6.30 If third pipe systems are put in at the greenfield stage of a development, they will not add significantly to the cost of water services. Retrofitting is a more expensive process.[13]

6.31 Another barrier to water recycling is marketing. Some produce markets that sell fresh produce try to differentiate themselves as *not* using recycled water, thus adding to the misplaced perception that recycled water use is somewhat unhealthy or undesirable.[14]

6.32 Recycled water is able to be substituted with existing sources and, when done on a large enough scale, it will make a large difference to the water demands of a city and larger localities. As outlined above, there is currently timidity with producers using recycled water.[15]

---

11 Environment Business Australia, *Submission 92*, p. 6.

12 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 3.

13 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 3 and p. 5.

14 Mr Peter Jacob, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 4.

15 Dr John Marsden, Marden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 5.

6.33 The committee heard evidence that current recycling technologies are adequate for current needs:

> Frankly, with off-the-shelf solutions and suitable regulatory monitoring by existing agencies, such as health agencies and EPAs we have adequate technology to deliver safe and secure potable water to urban population using existing recycling technology.[16]

6.34 It is clear to the committee that what is lacking is public knowledge and understanding of the desirability of the use of recycled water. The committee notes that in the State of California, there has been a continuing debate about recycling and desalination and that this debate has been informed by a considerable amount of material being made available to the public and to communities to enable them to make informed decisions.[17]

Recommendation 12

6.35 **The committee recommends that COAG, as part of the National Water Initiative, fund an education campaign educating the public about the benefits, economics and safety of using recycled water.**

6.36 The committee learned that the situation in Sydney provides an excellent example of how a major water recycling campaign could change the water situation.

6.37 In a May 2005 report, the NSW Auditor-General observed that:

> Sydney has been using more water than its storage system can provide. Sydney's water scarcity is not simply a problem related to drought. Sydney's water supplies are inadequate to meet long-term metropolitan demand requirements.
>
> While it is possible to over use water in the short to medium term, the long-term result will be an increase in water shortages and the need for earlier and more stringent water restrictions.[18]

16 Mr Dennis O'Neill, Australian Council for Infrastructure Development, *Transcript of Evidence*, 29 April 2005, p. 41.

17 For further information on recycling in California, see www.owue.water.ca.gov/recycle/index.cfm

18 Auditor-General's Report, Performance Audit, *Planning for Sydney's Water Needs,* May 2005, Executive Summary.

6.38 The current Metropolitan Water Plan in Sydney prepared by Sydney Water is based on work by the Sydney Catchment Authority. Criticisms of this plan suggest that the plan ignores environmental flows, is based on continued restrictions,[19] and is based on rainfall and run-off averages over the past ninety years, which overstate the current sustainable yield because of the recent, significant, reduction in rainfall caused by climate change.[20]

6.39 The committee heard evidence that an alternative proposal by Services Sydney, involving a large recycling strategy, would meet water requirements.[21] That proposal allows a buffer for a downward revision in sustainable yields, taking into account environmental flows and, based on conservative estimates, represents a lower cost solution than the only other alternative of large scale desalination.[22]

6.40 The committee is not in a position to make a conclusive recommendation in relation to these two plans. The committee notes that other cities similarly situated are embracing recycling and that Sydney's persistence in disposing of almost all of its wastewater as partially treated sewage is almost without counterpart. The committee believes that there needs to be a robust and well informed debate about recycling in Sydney and other Australian cities. Further, it is the kind of debate that is stifled when water recycling is taken off the public agenda.

6.41 Another of the major options for increased water supply currently being investigated in a number of cities is desalination.

6.42 The committee heard evidence that, while desalination may be a good option for Perth, in a city such as Sydney, much more needs to be done with water infrastructure and re-use before genuinely considering desalination.[23] The committee notes that in response to public concern about the energy requirements (and greenhouse implications) of desalination, the NSW Government has announced contingency plans, so that by mid-2006 construction could commence on a desalination plant capable of producing 500 million litres per day on the Kurnell peninsula unless there is a break in the drought. The consultants report,[24] published

19 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 12.

20 Auditor-General's Report, Performance Audit, *Planning for Sydney's Water Needs,* May 2005, Executive Summary.

21 Mr Peter Jacob, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 10.

22 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, pp. 10- 12.

23 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 28 April 2005, p. 46.

24 GHD Fichtner, *Planning for Desalination*, Report prepared for Sydney Water, July 2005, p. 43, Table 8.1; see www.sydneywater.com.au/EnsuringTheFuture/Desalination

by Sydney Water at the time of the announcement, projects a capital cost of $1.75 billion for the plant with a levelised cost of freshwater of $1.44 per kilolitre or $252 million per annum for the total output of 180 billion litres. The committee notes that a necessary component in the financing of such a large plant would be a take or pay contract, such that if improved rainfall resulted in the desalinated water not being necessary, Sydney Water would nonetheless be obliged to pay a large percentage (typically 60 per cent) of the contract price. This could, therefore, result in Sydney Water being liable to the operators of the plant for $150 million in a year when no freshwater was produced at all.

6.43 The committee is aware that there are other issues that need to be considered when examining options to increase water supply. A major consideration is energy use in water treatment. A research brief prepared by the Parliamentary Library found that the treatment of wastewater to a high level can be very energy intensive. The type of water targeted for recycling or reclamation is therefore an important consideration. Energy consumption requirements, per kilolitre of potable water produced, are as follows:

- 3 to 5 kilowatt hours (kWh) for reverse osmosis of seawater (desalination);
- 0.4 to 0./6 kWh for conventional water treatment;
- 0/7 to 1.2 kWh for brackish reverse osmosis; and
- 0.8 to 1.0 kWh for wastewater reclamation.[25]

6.44 A crucial step when planning water treatment plants is to take into account the energy efficiency of plant operations and the type of energy used. While desalination of seawater uses the most energy, it is noted that wastewater treatment plants generate substantial greenhouse gas emissions, particularly methane. The committee notes that the Water Corporation in Western Australia, for example, is attempting to move toward carbon-neutrality by reducing energy use and greenhouse gas emissions from its water treatment and wastewater treatment plants. [26]

25 Dr Sophia Dimitriadis, 'Issues encountered in advancing Australia's water recycling schemes', *Parliamentary Library Research Brief,* Parliament of Australia, 16 August 2005, p. 27.

26 Dr Sophia Dimitriadis, 'Issues encountered in advancing Australia's water recycling schemes', *Parliamentary Library Research Brief,* Parliament of Australia, 16 August 2005, p. 27.

6.45 The committee stresses that one cannot be prescriptive at this stage and draws attention to the fact that what may work for one Australian city may not work for another. However, time is of the essence and a full and informed debate on the impact of wide-scale water recycling, desalination and other options in Australia's major cities needs to take place now.

Recommendation 13

6.46 **The committee recommends that the National Water Commission, in consultation with the States and Territories and the public, prepare an independent and transparent report on water options for each of the Australian capital cities and major regional centres.**

Water Efficiency Labelling and Standards Scheme

6.47 While water recycling and desalination certainly provide potential options for future water requirements, such options do not alleviate the growing need to reduce urban water consumption across Australia. Decreased usage is particularly necessary, given Australia's increasing population and predictions of more frequent extreme dry weather conditions as a result of climate change.

6.48 To aid this on a national scale, the Water Efficiency Labelling and Standards (WELS) Scheme was launched on 19 August 2004. WELS introduced national mandatory water efficiency labelling and minimum performance standards for a range of domestic water-using devices.

6.49 The aim of WELS is to encourage the uptake of water efficient products and appliances in domestic and commercial areas, while maintaining individual choice and accounting for regional variations in water supply in urban Australia.

6.50 The water-using products covered by WELS initially include showerheads, washing machines, dishwashers, toilets, taps, flow regulators and urinals. Mandatory labelling applies, except for flow regulators for which labelling will be optional. Once a product is registered under the scheme, compliance with the scheme is obligatory. In addition, a mandatory minimum standard applies to toilets. Further products are expected to be added to the scheme over time.

6.51 The feasibility phase of WELS included an assessment of how such a scheme would address the issue of high domestic water consumption by providing nationally consistent water efficiency information to consumers at point of purchase, and regulating manufacturers to stimulate design of more water efficient products.

6.52 The programme is drawing upon the experience of the mandatory energy efficiency labelling system in place across Australia, which has seen an energy efficiency improvement for refrigerators and freezers of 50 per cent over a 13 year period, and projected improvements of 70 per cent over 25 years. Similar improvements may be possible for some water using products over time.[27]

Water appliance labelling

6.53 The Water Services Association of Australia made four observations about appliance labelling:

- Sydney Water's demand management and water efficient appliance retrofitting programme has resulted in reductions in water use by 20.9KL per household or approximately 10 per cent of household water use. This has been accompanied by reduced sewer flows, and fewer energy costs and greenhouse emissions.
- Further demand management activities will require active intervention to improve information to customers on water efficiency of appliances and the Association strongly supports the initiative by the States and Federal Government for mandatory efficiency labelling of water using appliances.
- The Association is working with a number of groups to establish a 'Smart Water Mark' scheme to label appliances that save water, but cannot be covered under the mandatory scheme, such as trigger hoses.
- As consumers install newer appliances, the water efficiency of the household can improve. In the absence of consumer information on appliance water use, the rate of introduction of these more efficient appliances may be slowed.[28]

27 Department of Environment and Heritage; see www.deh.gov.au/water/urban/scheme.html

28 Water Services Association of Australia, *Submission 149*, p. iii and p. 9.

6.54 The committee applauds the new water labelling initiatives. However, consumer market knowledge of the schemes appears limited and the committee is not aware of any major campaign to inform consumers of the schemes, particularly WELS. The committee believes that a public education/marketing campaign would help inform the public of WELS.[29]

Recommendation 14

6.55 **The committee recommends that the Department of the Environment and Heritage undertake a public education campaign to increase community awareness of the Water Efficiency Labelling and Standards Scheme.**

Water efficiency for buildings

6.56 The committee was informed of a number of ways of increasing the water efficiency of buildings. Playford Council, for example, pointed out that stormwater can be retained in buildings and put to a number of uses, including landscape irrigation, toilet flushing, washing and drinking, but building practices are yet to implement these methodologies on large scale:

> On a macro scale water is now retained in open space for purification and amenity purposes. Financial support for storm water and riparian management on a local and regional scale is strongly advocated.[30]

6.57 However, there appears to be some progress; for example, new housing developments in areas of Sydney feature improved recycling and collection regulations, permitting the use of rainwater tanks to provide garden and lavatory water.[31]

6.58 According to the Committee for Sydney:

> These new developments account for 30% of growth to the Sydney residential areas. The majority of new development is in existing urban areas. The cost of retrofitting established water and

29 See Mr Chris Davis, Australian Water Association, *Transcript of Evidence*, 29 April 2005, p. 35.

30 Playford Council, *Submission 57*, p. 2.

31 The Committee for Sydney, *Submission 151*, p. 8. The submission points out that the Rouse Hill residential development in Sydney incorporates 'a dual water system, including treated waste recycled water for gardens and lavatories in all new houses'.

> sewerage systems to maximise recycled water use is significant. Commercial buildings have significant water requirements, but only a small proportion of the water needs to be drinking quality. Installation of treatment and recycling plants in all new commercial buildings requires serious consideration.[32]

6.59 The committee agrees that new commercial buildings should be incorporating on-site water treatment and recycling. The committee suggests that peak industry bodies work more cooperatively to disseminate information on possible technologies and to promote their more widespread installation.

Water pricing

6.60 The committee believes that, despite currently available water saving technologies and other reforms, water consumption is unlikely to decrease significantly without appropriate and transparent water pricing. Australia's urban water prices are remarkably low; less than half of those in Europe for example, where rainfall is generally higher and more reliable. There is other research that supports such contentions.[33]

6.61 The Department of Environment and Heritage explained to the Committee that a key objective of COAG's NWI is to implement best practice pricing, incorporating costs involved in water delivery and planning, and the environmental externalities associated with water extraction and water supply systems. This should encourage the adoption of more water-efficient technologies and practices.[34]

6.62 The Roundtable Renewable and Sustainable Energy agrees:

> Price signals in the form of moving water pricing up to the cost of desalinisation and introducing a carbon credit scheme along with an embodied water trading scheme on a national level would ensure long term market transformations.[35]

---

32 The Committee for Sydney, *Submission 151*, pp. 8-9.

33 See Port Jackson Partners Limited Report prepared for the Business Council of Australia, *Reforming and Restoring Australia's Infrastructure* , March 2005, p. 78. The Report contends that Sydney Water for example is not recovering any return for the value of the water itself: the low price of urban water is sufficient only to cover operating expenditure, depreciation and a financial return on the assets employed. According to the report, 'The water commodity is priced at zero; it should be priced at the cost of the next supply increment', p. 77, exhibit 55.

34 Department of Environment and Heritage, *Submission 157*, pp. 23-24.

35 Roundtable Renewable and Sustainable Energy, *Submission 117*, p. 16.; see also Engineers Australia, *Submission 103*, p. 5, Australian Water Association, *Submission 112*, p. 11.

6.63 It should be noted, however, that there are limitations to constraining urban demand by price increases alone. A study by the Victorian Essential Services Commission study concluded:

> The overall elasticity of demand for water is generally regarded as being low, around -0.1 to -0.3, that is, a 10 per cent increase in price results in a 1 to 3 per cent reduction in total demand.[36]

6.64 Nonetheless, the committee supports the Australian Government objective to establish better pricing mechanisms for water use.

Water sensitive urban design

6.65 Delfin Lend Lease explains that water sensitive urban design (WSUD) is:

> . . . a more natural way of replicating the power of the natural system as a water cleansing and regulation agent. It considers treatment for the 'whole of catchment' not just individual development sites.[37]

6.66 The International Council for Local Environmental Initiatives – Australia/New Zealand believes that local government has a significant role to play in influencing local communities to put in place land use policies that encourage WSUD.[38]

6.67 A number of councils are active in this area. Brisbane City Council, for instance, lists community awareness, guidelines for WSUD private and public sector development activities, and development of publications to foster WSUD ideals as some of the cornerstones to its water management objectives.[39]

6.68 According to the Australian Water Association, WSUD must be embraced and that developments that embrace WSUD principles are more sustainable than conventional ones. While such developments require more attention to detail, a well-conceived subdivision embodying WSUD concepts can be constructed more cheaply than a conventional design.[40]

---

36 Essential Services Commission, *Water Price Review Vol 1: Metropolitan and Regional Businesses' Water Plans – Draft Decision 2005-2006 to 2007-2008*, p. 58, footnote 4.

37 Delfin Lend Lease, *Submission 66*, p. 15.

38 International Council for Local Environmental Initiatives – Australia/New Zealand, *Submission 72*, p. 8.

39 Brisbane City Council, *Submission 131*, p. 13.

40 Australian Water Association, *Submission 112*, p. 5.

6.69 The management and use of stormwater is a major part of WSUD. A number of submissions note the current wastage of potable water for the majority of household and industrial applications that do not require it. Australian cities require a 'more enlightened approach' that incorporates harvesting stormwater and restoring streams and canals to a more natural condition.[41]

6.70 The Australian Bicycle Council brings an additional perspective, by drawing attention to the current car dominated transport systems as a major source of water pollution, and further:

> The stormwater networks in some cities offer transport corridor opportunities for cycling and walking. Any reduction in the demand for road infrastructure can arrest the trend to pave even more urban surface area. The combination of roofs and roads direct an ever greater proportion of run-off into the stormwater systems, rather than to be absorbed in what remains of exposed earth and vegetation.[42]

6.71 The committee takes note, however, of the point made by Mr Christopher Walsh that the focus on use of storm water:

> . . . should not be interpreted as an endorsement of the exploitation of all storm runoff (such that it perpetuates the often stated fallacy that large quantities of water flowing down a river to the sea are a waste of a precious resource). *Uses of stormwater runoff that export water from the catchment (e.g. through the sewerage system) will contribute to the continued degradation of waterways in urban areas.*[43]

6.72 The evidence gathered by the committee demonstrates that in Australia today:

- water consumption, at 1540kl per capita per year (high by international comparison), is unsustainable;
- potable water is used where other water could be used; and,
- water is used once and then considered waste, creating a management issue.

6.73 The committee endorses the Government's policy of wise water use in which $200 million over 5 years is being provided to reward a culture of wise water use.[44]

---

41 STEP Inc., *Submission 87*, p. 7; see also Total Environment Centre, *Submission 42*, pp. 2-3.

42 Australian Bicycle Council, *Submission 70*, p. 6.

43 Mr Christopher J Walsh, *Submission 58*, p. 2 (author's emphasis).

44 *Environment Budget Overview 2005-06,* see www.deh.gov.au

6.74 WSUD is an important element in reducing water consumption and encouraging water reuse. The committee recommends that the Australian Government make sure that all research and development regarding water resource management takes into account WSUD principles.

Recommendation 15

6.75 **The committee recommends that the Australian Government ensure research and development regarding water resource management takes into account Water Sensitive Urban Design principles.**

Decentralised water delivery

6.76 With urban sprawl and the expansion of low density housing at city outskirts, cities of the future will undoubtedly exceed the existing capacity of surrounding water supplies and receiving waters.

6.77 It is clear that the characteristic approach of many large cities to water management (that is, piping in large water supplies and piping out equally large quantities of waste water), cannot be maintained as cities expand both geographically and in population. New water management methods are needed alongside changed settlement patterns.

6.78 Treated waste water and collected stormwater is traditionally discharged to the coast or waterways. This practice is detrimental to the marine or riparian environment, and represents a waste of what might otherwise be a valuable water resource.

6.79 With the development of more high density and transit-orientated urban villages, there is the potential to develop more localised, small scale systems of urban water treatment, including water harvesting, treatment and recycling.

6.80 The majority of Australia's water services are centralised. The CSIRO believes that the sustainability of Australia's water supply can be improved by providing water services at different scales, such as at the urban, sub-urban, local and individual property level.[45]

45 CSIRO, *Submission 91*, p. 14.

6.81 One of the submissions received by the committee provided more information about the alternatives types of decentralised (or localised) water systems. Ms Sarah West explained that a decentralised sewerage system has five components:

> 1. household watertight interceptor tank (anaerobic or aerobic) with effluent filter
>
> 2. primary treated effluent from the interceptor tanks is reticulated through small diameter watertight polyethylene pipes to the community treatment plant
>
> 3. effluent pump in the interceptor tank where the house is below the main sewer line, otherwise gravity flow is utilized
>
> 4. the community sewage treatment plant is a fixed substrate (sand, textile, foam or plastic) trickling filter plus Ultra-Violet disinfection
>
> 5. treated effluent with a quality of <10 mg/L of BOD / TSS (Biochemical Oxygen Demand / Total Suspended Solids) is locally reused via sub-surface irrigation in gardens, parks, sporting fields, woodlots, agriculture and horticulture.[46]

6.82 New standards would be required for some plumbing work and the ingredients in cleaning agents to make this a viable solution.[47]

6.83 In its submission, Integrating Sustainability points to the link between more environmentally friendly and cheaper urban fringe developments and decentralised water management:

> The cost of service provision needs to be studied, as in many cities the cost of providing reticulated water and sewerage is cross-subsidized. This has meant that environmentally dubious developments on the urban fringe are being under-priced. If this situation were addressed it could provide an economic impetus to urban consolidation and encourage developments on the urban fringe to treat and reuse water on site.[48]

6.84 The committee identifies a need for further research into the environmental and economic viability of more decentralised water management systems.

---

46 Ms Sarah West, Eco-Village Empowerment, *Submission 38*, pp. 1-2.

47 Ms Sarah West, Eco-Village Empowerment, *Submission 38*, p. 2.

48 Integrating Sustainability, *Submission 27*, p. 14.

Recommendation 16

6.85 **The committee recommends that the Australian Government commission research, either as part of the National Water Initiative or separately, to consider the economic viability and environmental benefits of decentralised water management systems.**

6.86 While every city's situation and water resources are different, all Australian cities are facing a growing water deficit as population growth drives demand and, most ominously, climate change causes a reduction in rainfall and a consequent much greater reduction in run-off. The committee was left in no doubt that several of our cities, especially Sydney and Perth, are in imminent danger of significant water shortages.

7

If you think about the public buying cars, they are pretty well informed not just on price but on performance, reliability and depreciation of a vehicle, but you never see them thinking about those things when they buy a house.

(Professor Lindsay Johnston, Chair, Royal Australian Institute of Architects Environment Committee)[1]

Building design and management

7.1 The committee's vision is one of a built environment in which the usually competing issues of profitability, environmental sustainability and safety complement one another and become segments of the whole sustainable building process.

Residential buildings

Energy ratings

7.2 By moving towards more sustainable residential buildings, Australia can improve the sustainability indicators of its cities as a whole.

7.3 The current Building Code of Australia (BCA) mandates a minimum level of energy performance for new and refurbished houses in Australia. Using House Energy Rating Software (HERS), houses must have a minimum of 4 stars in order to comply. The committee was advised that the Building Codes Board is looking at introducing mandatory energy ratings for both commercial and multistorey residential buildings by mid-2005.[2]

---

1 Professor Lindsay Johnston, Royal Australian Institute of Architects, *Transcript of Evidence*, 11 March 2004, p. 8.

2 Mr Neil Savery, Australian Capital Territory Planning and Land Authority, *Transcript of Evidence*, 4 March 2004, p. 24.

7.4 In Victoria, all new homes are required by legislation to meet 5 star energy ratings. It is also a requirement for homes in the ACT to be rated for energy efficiency at the time of sale.[3] Evidence to the committee supported these concepts, pointing out that mandatory disclosure of energy efficiency at point of sale would empower consumers and enable them to take energy efficiency into their living choices.[4]

7.5 Origin Energy drew to the attention of the committee the savings that can be made with energy efficient homes:

> What is currently missing is a comprehensive appreciation of the value of ecoefficiency. For example, a home that uses 50% less energy than an average house will save its occupants around $800p.a. Assuming a mortgage rate of 7% and inflation of 2.5%, this would mean that the buyer could afford to spend $12,000 on the house and be no worse off.[5]

7.6 The committee believes that it is sensible that there be mandatory disclosure of the energy efficiency and greenhouse performance of residences at point of sale and point of lease. This would require State and Territory governments legislating appropriately.

Recommendation 17

7.7 **The committee recommends that the Australian Government encourage the States and Territories to mandate disclosure of the energy efficiency and greenhouse performance of residences at point of sale and point of lease.**

3 Australian Conservation Foundation Sydney Branch, *Submission 44*, p. 5.

4 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 10; see also Mr Ric Brazzale, Australian Business Council for Sustainable Energy, *Transcript of Evidence*, 16 March 2004, p. 55.

5 Origin Energy, *Submission 143*, p. 9.

Going further

7.8 The committee was advised that, while Australia is a world leader in the energy star rating system with regard to cars and appliances, our building standards are 'lower than some other developed countries'; however:

> Once the financial and comfort benefits of mandated 5 star rated homes are widely recognised, the momentum and consumer support will exist to lift to 6 star and beyond.[6]

7.9 The Royal Australian Institute of Architects also believes we should go much further than a star rating system, arguing that current energy performance measures 'appear to be largely ineffective' and:

> … address only a small part of a much bigger problem – unnecessarily large houses are rewarded, total energy consumption in dwellings is ignored and initiatives apply only to new dwellings which are, in any one year, a tiny proportion of the total housing stock. In a radical vision of a sustainable city, domestic rates might be calculated on annual energy consumption or emissions per resident.[7]

7.10 Further, while the star rating system is an excellent tool, it only has value if consumers are aware of, and concerned about, residential energy ratings. There is a need to do more to educate the public. Professor Lindsay Johnston thought that houses could be, much like cars, 'road-tested' in magazines, because issues such as airconditioning and heating costs are currently 'not actually penetrating in the housing market'.[8]

7.11 Mr Michael Robb from the Hickinbotham Group prefers an incentive approach (such as tax incentives) to a coercive approach to have more energy efficient buildings.[9]

7.12 Two factors are currently inhibiting the growth of sustainable housing; the comparative upfront costs, and lack of easily accessible information. Origin Energy noted, for example, that 'most home and building buyers are concerned about the up-front amount rather than the whole-of-life cost'.[10]

---

6 Origin Energy, *Submission 143*, p. 10.

7 Royal Australian Institute of Architects, *Submission 159*, p. 7.

8 Professor Lindsay Johnston, Royal Australian Institute of Architects, *Transcript of Evidence*, 11 March 2004, p. 8.

9 Mr Michael Robb, Hickinbotham Group, *Transcript of Evidence*, 29 April 2004, p. 47.

10 Origin Energy, *Submission 143*, p. 9.

7.13 Ms Monica Richter believes it cannot be left to the consumer alone to choose the benefits of sustainable housing. Builders must have the knowledge and incentive to build sustainable housing at the same cost as other housing; smart design options should not be more costly – they 'should be moving towards having a zero net cost'.[11]

Your Home Guide

7.14 The Australian Government, in partnership with the design and construction industries, has developed the *Your Home Guide* to sustainable housing.

7.15 The guide is part of a suite of consumer and technical guide materials and tools developed to encourage the design, construction or renovation of homes to be comfortable, healthy and more environmentally sustainable.

7.16 This manual and supporting documentation has been widely distributed and forms the basis for training programmes with the Housing Industry of Australia and tertiary institutions.

7.17 In addition, the Housing Institute of Australia introduced its *HIA GreenSmart* programme to promote sustainable building practices within the industry. Members of the Housing Institute of Australia, such as builders, manufacturers and suppliers, have to undertake GreenSmart training to obtain GreenSmart professional status.

7.18 The committee is pleased that this important tool is being used to increase the awareness of professionals in the building industry of sustainable building concepts and encourages any further initiatives in this area.

7.19 The committee heard from the Department of Environment and Heritage that the *Your Home Guide* concept is being extended to the commercial sector.[12]

11 Ms Monica Richter, Australian Conservation Foundation, *Transcript of Evidence*, 16 March 2004, p. 6.

12 Department of Environment and Heritage, *Submission 157*, p. 27.

Commercial buildings

7.20 Integrating Sustainability makes the point that it is the very way in which commercial buildings are developed that make them unsustainable:

> The delivery of commercial buildings and developments is complex, and depends on a dysfunctional supply chain, in which each component operates within its own silo. This discourages joint problem solving, which is necessary to build "green" buildings and developments.[13]

7.21 The committee notes that achieving green buildings in the commercial sector is extremely challenging. Perhaps change in this area can only be effected as tenants place a greater value on green buildings and so increase market pressures. However, the committee notes that the extension of energy efficient measures to commercial buildings is under way and 'this should assist in reducing the infrastructure demands placed on cities by new dwellings'.[14]

Features of green buildings

7.22 The following discussion and recommendation apply equally to residential and commercial buildings. Further consideration of building issues such as energy efficiency, heating, cooling, insulation and lighting and water management is provided in chapters 6 (water) and 8 (energy).

Solar orientation

7.23 It is well known that good solar orientation assists in home cooling in summer and heating in winter. Delfin Lend Lease designs its communities with solar orientation at the dwelling level being considered as 'one of the urban design constraints'.[15]

13 Integrating Sustainability, *Submission 27*, p. 18.

14 Western Australian Government, Sustainable Energy Development Office, *Submission 89*, p.4.

15 Delfin Lend Lease, *Submission 66*, p. 14.

7.24 The committee was advised that in cities such as Perth, the orientation of a building could play a large role in sustainable building, but the opportunity is not being taken up:

> There is a sustainable home in the city of Subiaco that has been built to demonstrate that with careful design you can keep a home at a temperature of between 20 degrees and 30 degrees all year around in the Perth climate. So it is shame that we have just one or two houses in the city that actually meet those standards. I think we are building about 17,000 to 20,000 new homes in the Perth area every year. The vast majority of those homes require incredible amounts of energy just to maintain a comfortable climate inside.[16]

Construction materials

7.25 Sustainable construction materials, by the sheer volume of their use, would be 'imperative to the development of sustainable cities':

> The extraordinary mass and volume of these materials that are used in the construction of our cities simply dwarfs that of any other industry.[17]

7.26 However, the committee was advised that a major obstacle to changing current unsustainable uses of materials is a lack of data on construction material life cycles; there are only a 'handful' of countries that work to 'understand eco-efficiency and eco-effectiveness of their raw materials and construction resources'.[18]

7.27 Examples of such countries include the United Kingdom, which has instigated a 'mass balance' study on construction material flows in its economy.

7.28 The mass balance concept is based on the principle that, for all practical purposes, matter can neither be created nor destroyed. Therefore, the mass of inputs to a process, industry or region balances the mass of outputs as products, emissions and wastes, plus any change in stocks. When applied, this concept of balancing resource use with outputs can provide a methodology for analysing resource flows.[19]

---

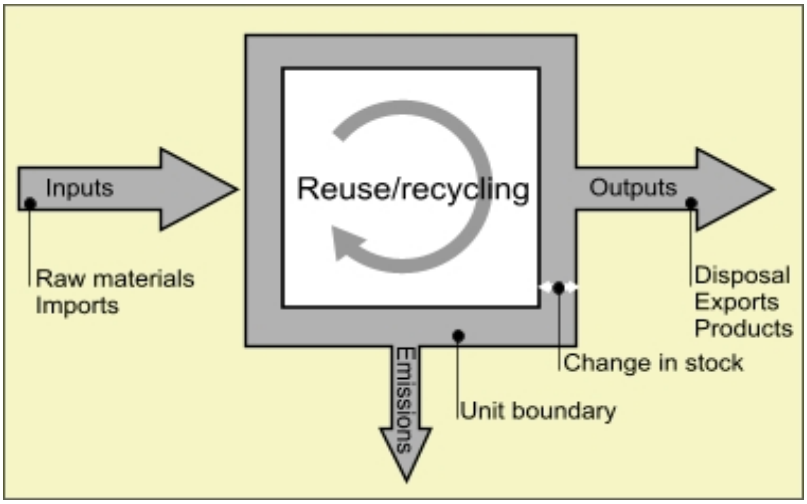
16 Mr Christopher Tallentire, Conservation Council of Western Australia, *Transcript of Evidence*, 31 March 2005, pp. 30-31.

17 Association for the Advancement of Sustainable Materials in Construction, *Submission 190*, p. 5.

18 Association for the Advancement of Sustainable Materials in Construction, *Submission 190*, p. 21.

19 See www.massbalance.org

Figure 7.1



7.29 The committee considers that this concept has value and recommends that the CSIRO investigate a mass balance analysis for Australia.

Recommendation 18

7.30 **The committee recommends that the Australian Government, possibly through the CSIRO, investigate the value of a mass balance analysis for Australia.**

7.31 The committee received evidence from TecEco about the amount of CO2 generated by the production of cement and concrete. The company has had trouble getting building approval for new materials.[20] The committee believes important product advances, such as concrete that sequesters rather than emits greenhouse gases, would make a global difference. The committee believes that regulatory systems must be open to assist and not block such advances.

7.32 An alternative approach to rating a building's sustainability is the 'carbon signature' measurement. The City of Townsville explained that a carbon signature refers to the:

- embedded energy (carbon) of the materials;
- the greenhouse emissions associated with transport of the materials, the carbon signature of powering the building;

20 TecEco, *Submission 75*, p. 21.

- the carbon signature of decommissioning/recycling or removing the structure at the end of its life.

Buildings with a low construction carbon signature would typically have a high quantity of construction materials made of natural materials (wood, earth, and stone) and low energy demand in operation.

Alternatively, buildings with a high construction carbon signature would have energy intensive materials such as stainless steel and aluminium, and would be energy intensive to operate (eg. to heat/cool and light).

Carbon intensity alone is not a total sustainability indicator but is a good proxy indicator for many aspects of sustainability.[21]

7.33 The Plantation Pine Framing Alliance points to the different environmental impact between timber and steel construction and reiterates how important sustainable construction material use is:

> . . . building all of these houses with steel frames results in 426.6 kilo-tonnes of CO_2, compared to the 63.2 kilo-tonnes generated if they are built using timber frames. (This example is indicative only; the PPFA understands that not all of the 158,000 forecast new dwellings are necessarily four-bedroom on 180 square metres.)
>
> Extrapolate this scenario over the 22 years to 2025 and the scope for dramatically improving the ecological footprint of new housing stock built in this time, through choice of materials, becomes apparent.[22]

Life cycle assessment of materials

7.34 The Royal Australian Institute of Architects points out that all aspects 'from extraction, processing and transport through to possible fire, demolition and disposal or reuse' need to be considered when selecting construction materials.[23] Further:

> Balancing design decisions and materials choices for sustainable buildings requires integrated life cycle assessment that will evaluate the relationship between, first, investment in embodied energy, second, commitment to long term operational energy consumption energy use and, third, concomitant environmental performance, such as thermal comfort and natural light. Studies have indicated that annual operational energy of most buildings,

21 City of Townsville, *Submission 161*, p. 34.

22 Plantation Pine Framing Alliance, *Submission 5*, p. 4.

23 Royal Australian Institute of Architects, *Submission 159*, p. 25.

> and associated greenhouse emissions, currently far outweigh the total embodied energy amortized into an annual component over a life cycle of, say, forty years.[24]

7.35 The committee notes that PVC for example, traditionally thought of as a non-green building material, has benefited from life cycle assessment. The Vinyl Council Australia cites a CSIRO study that reports that there is little conclusive evidence that PVC has significantly more effect on the environment than alternative materials and notes that:

> Indeed, in respect of thermal efficiency, uPVC window profiles consistently rate five stars under the Australian Window Energy Rating Scheme, and this is in addition to low maintenance and long-term durability.[25]

7.36 By encouraging life cycle assessment of materials, the Conservation Council of Western Australia believes the 'full impacts of products, including environmental and social, are factored into the cost'.[26] Similarly, Bayside City Council believes that:

> 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. . .[27]

Eco-labelling

7.37 Eco-labelling is becoming well known as greater emphasis is placed on the need for environmentally friendly products and services. There is considerable scope within the construction materials industry to further develop this concept.

7.38 Eco-labelling is an attempt to encourage the manufacturing of products with a reduced impact on the environment and to address public concerns about raw material scarcity and the impact of pollutants on the air and water. Eco-labelling also enables consumers to make an informed purchase choice.

7.39 Eco-labelling represents another combined measure of sustainability, initially used to endorse products. This has since evolved into methods for assessing entire buildings, such as the Building Council of Australia's Green Star building rating scheme.

---

24 Royal Australian Institute of Architects, *Submission 159*, p. 14.

25 Vinyl Council Australia, *Submission 24*, p. 1.

26 Conservation Council of Western Australia, *Submission 139*, p. 2.

27 Bayside City Council, *Submission 101*, p. 14.

7.40 The development and promotion of sustainable materials and their labelling against a credible rating system would benefit the built environment and represents a non-regulatory method of fostering consumer demand for cradle-to-cradle materials.[28]

7.41 Accordingly, the committee endorses the following recommendation made by the House of Representatives Standing Committee on Environment and Heritage report *Employment in the Environment Sector: Methods, Measurements and Messages*:

> The Committee recommends that the Australian Government:
>
> - Develop a national policy for the environmental labelling of consumer goods;
> - Ensure the establishment of a national environmental labelling program that is widely recognised, consistent and meaningful to both producers and consumers; and
> - Undertake a national campaign to raise awareness of environmental labelling.[29]

7.42 The committee recommends that the Australian Government look to creating a 'sustainable building material' label that encompasses environmental sustainability in its construction and/or harvesting processes.

Recommendation 19

7.43 **The committee recommends that the Australian Government, in consultation with the Housing Industry of Australia, CSIRO and other industry and scientific bodies, investigate the establishment of a 'sustainable building material' labelling system.**

Green spaces

7.44 Appropriately designed housing with energy efficient landscaping would also result in reduced energy use for cooling and heating.[30]

28 Association for the Advancement of Sustainable Materials in Construction, *Submission 190*, pp. 11-12.

29 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector: Methods, Measurements and Messages*, Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 115.

30 Mordialloc Beaumaris Conservation League Inc, *Submission 77*, p. 5.

7.45 There is, however, a tension between the maintenance and size of green spaces. As Lend Lease explains in its submission, Australian natives would therefore be the preferred option, representing lower maintenance, improving 'biological conservation corridors' and being 'in keeping with the bushland setting that represents traditional Australian living'.[31]

7.46 The Shoalhaven City Council points out that green spaces, in addition to flora and fauna benefits, can provide recreation and social benefits as well, as long as the areas are well planned and incorporate an analysis of needs.[32]

7.47 The inclusion of green spaces in developments is a matter for the developer, local and State governments and, ultimately, the Australian community. The committee urges these stakeholders to work towards creating more green spaces in newer development areas.

7.48 Christie Walk, a housing complex in Adelaide, and the 60L commercial building in Melbourne, are examples of different approaches to sustainable building that utilise 'green' building materials and incorporate green spaces in their design.

Case Study: 60L Green Building – a sustainable commercial refurbishment

The 60L office building in Carlton, Melbourne, was completed in September 2002. It was developed by the Green Building Partnership and is a prototype for Australia's sustainable commercial building sector.

In contrast with conventional buildings, the 60L Green Building has minimal environmental impact, and was built for a cost similar to that of a less-sustainable commercial building. Its design also guarantees significantly lower running and tenancy costs.

The project aimed to provide an environmentally healthy building for its occupants and also to raise awareness within the construction industry. Accordingly, the project deliberately used mainstream architect and construction companies to demonstrate how achievable it is to design and furbish a sustainable inner-city commercial building.

Economic returns

Construction and refurbishment costs of the sustainable 60L Green Building are comparable to standard construction and refurbishment costs. However, the 60L building delivers significant environmental benefits, comfort and health benefits to the building occupants and significantly reduced running costs. In comparison to a conventional office building, the 60L Green Building has:

31 Lend Lease, *Submission 71*, p. 15.

32 Shoalhaven City Council, *Submission 20*, p. 2.

- Expected energy savings of over 65 per cent;
- Reduction in lighting costs of over 80 per cent;
- Over 60 per cent reduction in equipment, ventilation, heating and cooling costs;
- Approximately 100 per cent reduction in annual carbon dioxide emissions; and
- 90 per cent savings in average annual mains water consumption.

While some commercial buildings incorporate particular energy efficiency features, 60L is unique in achieving high environmental standards and efficiency in all areas of construction and operation. It is also unique in providing a workplace largely free of toxic emissions from furniture and fittings.

Construction materials

- Approximately 80 per cent of the timber used in 60L is recycled. The remaining 20 per cent is from plantation timber;
- All bricks used have been recycled and cleaned without acid;
- Reinforcing steel is from recycled sources;
- Galvanised steel has been used in preference to stainless steel which requires higher levels of energy in its production process;
- PVC use has been reduced by 50 per cent and, wherever possible, low toxic materials have been used;
- The concrete used has a 60 per cent recycled component; and
- Carpets are made from recycled and low-toxic materials.

Energy consumption and generation

60L maximises the use of thermal mass for heating and cooling. The building's computerised environmental management system automatically adjusts internal and external louvres to retain even temperatures.

The building incorporates double-glazing, low energy glass, and north and west windows for winter sun. It utilises light shelves, light wells and an atrium to provide natural lighting, supplemented by high efficiency fluorescent lights when required.

60L has rooftop photovoltaic arrays for electricity generation. Any additional energy requirements are purchased through a green-power scheme. The use of embodied energy in construction materials has been off-set by purpose-specific tree planting in western Victoria.

Water management

60L uses 90 per cent less mains water than a similar conventional building. Rainwater is collected, micro-filtered and UV sterilised for use within the building.

Water-efficient showers are fitted in the building.

All waste water passes into an in-house biological sewage treatment plant after which it is used for toilet flushing, the rooftop and internal gardens. Excess water is discharged, as treated water, to the municipal sewage. The residual solid sewage waste is utilised on farms in western Victoria.

Alternative transport and green spaces

The workplace facilitates walking and cycling by incorporating a bicycle storage area, on-site showers and change rooms.

A rooftop garden has been designed to enhance the aesthetics of the inner city and provide an outdoor space for employees. The garden uses native plants and is watered using on-site treated waste water.

Case Study: Christie Walk – a sustainable housing development

Christie Walk is a community housing development on a 2000 square metre block of land in inner-city Adelaide. It is being developed as a pilot project, demonstrating how communities can provide sustainable inner city living through:

- Water and energy conservation;
- Material reuse and recycling; and
- Shared landscaped areas and community spaces.

Stages 1 and 2 of the project have been completed and stage 3 is under way. The project consists of 14 dwellings which include four linked, three-storey townhouses, a three storey block of six apartments, four stand-alone cottages and a 'community house'. The land is owned by the Wirranendi development co-operative during construction and individual properties are sold on a community title. A range of dwelling types are represented in the project, with differing configurations, orientations and construction systems to demonstrate the variations of environmental design to meet lifestyles choices and climatic conditions.

Purchasers own their own dwelling and also share ownership and responsibility for the landscaped community areas. These areas include a community garden, and a 'cohouse' (community house) with a kitchen, small general purpose hall and a laundry. To date, properties in the development have sold well.

Construction materials

Timbers are plantation or recycled. Floor decking is generally made from a

compressed straw product, which is equivalent to particle board, but contains no woodchips or formaldehyde. Paving, carports and feature elements incorporate bricks, stone, steel and timber retrieved from the demolition of pre-existing structures on the site.

All concrete in slabs and mass walls contains the maximum percentage of flyash permitted. Flyash is a waste product from power stations and its addition reduces the amount of new cement used in the construction (cement production is one of the largest single global contributors to greenhouse gas emissions).

All finishes, including paint and varnishes, are chosen on the basis of environmental and non-toxic criteria.

Energy generation and efficiency

Mains electricity is drawn from the grid, but photovoltaic panels generate electricity for sale to the local energy utility. On completion, it is expected that the site will be a net energy exporter for much of the year, as the design and efficiency of the dwellings means that energy requirements are minimal.

All dwellings have solar hot water and a shared system of banked solar panels. All new appliances have high energy efficiency ratings; companies with a recycling programme were favoured when specifying appliances.

Heating, cooling, lighting and insulation

Each house works as a 'thermal flue', allowing controlled release of warm air while drawing in filtered, cooled air from the vegetated, landscaped surroundings. Window placement and planned vegetation planting ensures that natural lighting is maximised. Most windows are double-glazed. Rooftop gardens provide a thermal buffer to the upper floor apartments.

The concrete slabs provide substantial internal mass, particularly to the cottages and apartments. External and internal walls are made from either an aerated concrete product or other materials which have high thermal and acoustic insulation properties. This places an additional thermal mass between the townhouses and also assists in noise reduction between dwellings.

The apartments use cross-ventilation and high thermal mass for cooling. Some ceiling fans are included to assist in maintaining air flow on still days. However, there are no heaters or air conditioners and the expectation is that none will be needed to supplement the passive heating and cooling of the houses.

Water management

All water shed by the roofs, balconies and other impervious surfaces is collected for use on site. After filtering, the water is used for irrigation and toilet flushing, reducing the total water importation to the site. An onsite chlorine-free sewage treatment system is being purchased. Composted solids will be taken to rural sites

as fertiliser and the filtered effluent returned to the second-class water supply through the on-site stormwater system.

Access and green spaces

The development is designed to take advantage of its inner-urban location and maximise access to a range of public transport services. There is no internal traffic within the development and there is limited provision for car parking.

Outdoor spaces encourage walking. Low water use plantings favour native species. Some exotics have been chosen where appropriate to suit passive design considerations.

Renovations and retrofitting

7.49 A number of organisations expressed support for retrofitting and renovation of residential and commercial buildings as one way to achieve more sustainable cities. The Royal Australian Institute of Architects refers to the 'adaptive reuse of existing building stock' as a 'primary strategy towards sustainable cities' for two main reasons:

> First, to 'throw away' the existing buildings is to throw away much of the energy consumed in their making (embodied energy) and to generate more demand for more energy consumption and associated greenhouse gas emissions. Second, notwithstanding the possibility of increasing intensity of land use through demolition and redevelopment, existing buildings are often located where there is good local infrastructure, particularly transportation, and the re-use of this valuable serviced land through recycling of the existing building stock for new uses makes good energy sense in comparison to constructing new buildings on the city fringes. Because of the longevity of the building stock, opportunities to affect energy consumption occur more frequently in renovations and retrofits than in new construction.[33]

33 Royal Australian Institute of Architects, *Submission 159*, p. 8.

7.50 The Centre for Sustainable Energy Systems explains that retrofitting is particularly important in Australia due to the low turn-over of buildings which limits 'the rate at which greenhouse gas emissions from buildings can be reduced by building better buildings':

> Mass retrofitting of energy saving devices and renewable energy equipment to houses, commercial buildings and industrial sites will be required to meet greenhouse targets.[34]

7.51 The Western Australian Government, however, drew to the committee's attention the fact that materials used for building a house in the first place will impact on the ability for retrofitting:

> . . . 'standard practice' does not lend itself to adaptable or modified retrofitting. Further, the materials are manufactured from non-renewable resources that require energy intensive production processes. Promoting (and where necessary developing) building materials and components that incorporate the principles of cleaner production and include recycled and/or recyclable materials and can be easily modified for redesign will address many aspects of resource depletion, energy use, and building adaptability.[35]

7.52 The Australian Conservation Foundation and Environment Victoria also advocate that energy efficiency requirements extend to major renovations and that there should be rebates and incentives for retrofitting for improved energy efficiency.[36]

7.53 The committee considers that there should be mandatory energy efficiency and greenhouse performance requirements before approval is given for major renovations. This would need to be implemented through State and Territory legislation.

Recommendation 20

7.54 **The committee recommends that the Australian Government encourage the States and Territories to put in place a regime whereby approval for major residential and commercial renovations is conditional upon meeting energy efficiency and greenhouse performance requirements.**

---

34 Centre for Sustainable Energy Systems, Australian National University, *Submission 5*, p. 2.

35 Western Australian Government, *Submission 173*, attachment 1, p. 19, and attachment 3, p. 4.

36 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 11.

Regulation and awareness

7.55 The committee notes that:

> . . . the building industry has worked constructively with regulators to introduce energy efficiency requirements into the Building Code of Australia . . .'[37]

7.56 The Electricity Supply Association of Australia also identifies standards and regulation as an area of great opportunity to create sustainable building practices, including 'aspects such as thermal mass, orientation and fenestration, as well as setting standards for lighting, heating, cooling and ventilation'.[38]

7.57 Introducing energy standards and making developers, architects and builders more aware of the benchmarks would help the drive toward sustainability. It would also improve profitability: the Centre for Photovoltaic Engineering advocates fast-tracking of the introduction of uniform and mandatory energy standards for both new buildings and major retrofits, advising that:

> Renewable energy options from passive solar design through to solar water heaters and photovoltaic (PV) systems can readily be included. Such an approach will immediately alert developers to the cost effectiveness of correct building orientation and preservation of solar access. This in itself is the crucial first step in facilitating the use, either at construction or later on, of solar technologies.[39]

7.58 Lend Lease argues that education is the best way to increase building sustainability, but commented that financial and statutory influences offer the best opportunity for progressing building sustainability.[40]

7.59 In some instances, the regulatory relationship between developers and building owners and building occupants and energy providers can be a barrier to sustainable building. Further, legislation is often inconsistent between States.[41]

37 Planning Institute of Australia, *Submission 168*, p. 33.

38 Electricity Supply Association of Australia, *Submission 13*, p. 3.

39 Centre for Voltaic Engineering, *Submission 84*, p. 2.

40 Lend Lease, *Submission 71*, p. 11.

41 Lend Lease, *Submission 71*, p. 19.

7.60 The National Trust of Australia (New South Wales) explained how making developers aware of the advantages of reusing and recycling material can benefit both Australian heritage and the developer's bottom line:

> Despite the developer preference for starting afresh rather than adaptation there have been notable examples where the sensitive conservation, reuse and adaptation of existing building fabric has resulted in cost savings and higher property resale values. There are demonstrable financial benefits in adopting this approach.[42]

7.61 The committee believes that a campaign to make builders more aware of the economic and environmental benefits of sustainable building practices, including reusing and recycling building materials, is a better alternative to any regulatory intervention in this area.

Recommendation 21

7.62 **The committee recommends that the Department of the Environment and Heritage and the Australian Building Codes Board work with industry groups to raise awareness among builders, architects and developers of the economic and environmental benefits of sustainable building practices, including reusing and recycling building materials.**

Ratings tools, planning and materials technologies

7.63 There are currently a range of planning and building sustainability rating tools in operation in different States and Territories. What is lacking is a nationally accepted and implemented building rating tool.

7.64 Integrating Sustainability argues that Australian Standards, Building Standards and council regulations are conservative. They:

> … don't encourage innovation and often result in buildings and development infrastructure that are often over-designed, resulting in poor sustainable outcomes. While there has been a move towards performance based standards, this process needs to be accelerated.[43]

42 National Trust of Australia (New South Wales), *Submission 50*, p. 1.

43 Integrating Sustainability, *Submission 27*, p. 18.

BASIX

7.65 The NSW Government has developed a comprehensive planning tool, the Building Sustainability Index (BASIX), to standardise good development practices across NSW and help streamline the planning process.

7.66 It is a web-based planning tool, designed to assess the potential performance of new homes against a range of sustainability indices: landscape, stormwater, water, thermal comfort and energy. BASIX aims to reduce the environmental impact of developments and to produce homes that are more comfortable and cheaper to run than most existing homes.

7.67 BASIX sets energy and water reduction targets for new homes and apartments. The energy target is 25 per cent across the State, and will increase to 40 per cent in July 2006. A typical single dwelling design will meet the minimum 25 per cent target if it includes:

- an efficient hot water system; and
- design features that make the most of natural heating, cooling, and lighting.

7.68 The water target ranges from 40 per cent to 0 per cent across NSW, taking into account the significant variances in the climate:

- 90 per cent of new residential development will be covered by the 40 per cent water target.
- No new home built in NSW will use more water than the current State average.
- The area covered by the 40 per cent target represents 98 per cent of the State's population growth.

7.69 The first stage of BASIX focuses on reducing water and energy use. BASIX has set targets for these indices which all new developments must meet. Landscape, stormwater and thermal comfort indices are also activated because information relating to these indices impacts on water consumption and greenhouse gas emissions.

7.70 The BASIX online assessment requires information about the proposed development, such as site location, dwelling size, floor area, landscaped area and services. BASIX compares the proposal to average existing homes. The proposal is scored according to its potential to consume less mains supply water and energy than an average existing home.[44]

44 For further information on BASIX, see www.basix.nsw.gov.au/information/about.jsp

National Australian Built Environment Rating System

7.71 The National Australian Built Environment Rating System (NABERS) is a unique rating system that will focus on the environmental impacts of existing commercial office buildings and residential homes, rather than the intentions of the building design. It evaluates key environmental criteria including energy use and greenhouse emissions, water use, storm water runoff and pollution, sewage and waste, landscape diversity, indoor air quality, transport and occupant satisfaction.

7.72 The rating system is a flexible, user-friendly system that can be adapted to suit the needs of different building types, including homes, apartments and commercial offices.

7.73 NABERS is a voluntary system that will enable building owners, users and tenants to rate the environmental performance of existing buildings and increase their awareness of the importance of sustainability in the built environment.

7.74 Implementation of NABERS will encourage better informed choices and greater investments in buildings that have a low environmental impact, while providing accompanying financial savings, improved comfort and heath benefits. NABERS has been developed by the Australian Government and is currently the subject of public consultation.[45]

Nationwide House Energy Rating Scheme

7.75 The Nationwide House Energy Rating Scheme (NatHERS) is a CSIRO developed programme. It is based on the allocation of star ratings to houses according to how well they are designed to minimise the need for energy use to maintain comfort (such as whitegoods are currently star rated and labelled).

7.76 The proposed building's size, orientation and construction materials used are entered into the programme. This building description with the postcode of the building site, to determine climate, is used to work out a zero to five star rating, where four or five star signifies a thermally comfortable house that minimizes heating and cooling needs.

45 Department of Environment and Heritage, see www.deh.gov.au/industry/construction/nabers/index.html

7.77 Mr Steve King, however, advised the committee that one of the unintended consequences of the way NatHERS rates houses was that it encouraged large houses:

> It has been known since the day after it was introduced that one of its effects was: the bigger the house, the less critical it was for it to perform well. That is because big houses have small surface-to-volume ratios and therefore they achieve the ratings easily, because the ratings were originally designed to deal with an equity issue, which is: do not penalise people who need big houses. So the indicator became rate of energy use per square metre, instead of rate of energy use all up.[46]

Green Star rating tools

7.78 The Green Building Council of Australia aims to define and develop a sustainable property industry in Australia and to drive the adoption of green building practices through market-based solutions.

7.79 The Council has developed the Green Star set of rating tools and also promotes economic incentives, government initiatives and programmes, new technologies and industry knowledge.

7.80 Each Green Star rating tool is based on a standard framework. Green Star establishes a number of categories under which specific key criteria are grouped and assessed. These categories include management, indoor environment quality, energy, transport, water, materials, emissions, and land use, site selection and ecology.

7.81 The focus for the Green Star rating tool development has been commercial office buildings. To date, rating tools have been developed for the design and the construction of commercial office buildings. A pilot rating tool for interiors is being finalised.

7.82 Green Star will also have rating tools for different phases of the building life cycle (e.g. design, construction and operation) and for different building classes (office, retail, industrial, residential etc). These rating tools will use the best regulatory standards to encourage the property industry to improve the environmental performance of development.

46 Mr Steve King, Centre for a Sustainable Built Environment, *Transcript of Evidence*, 8 June 2004, p. 33.

7.83 The City of Melbourne recommends that the Green Star rating system be expanded to residential and other building types.[47] There is some anecdotal evidence to suggest that developers would find it useful if there were a single standard of building rating system such as Green Star.[48]

7.84 In evidence to the committee, Mr Ric Brazzale was encouraged by the States' individual initiatives, but emphasised that:

> … we must make sure that the rating tools that we use to measure and assess performance are all consistent and can be applied across states.[49]

7.85 The committee is of the view that the Australian Building Codes Board should evaluate the various ratings tools and develop a nationally consistent tool that takes into account the range of the environmental and sustainability factors dealt with by existing codes.

Recommendation 22

7.86 **The committee recommends that the Australian Building Codes Board develop a nationally consistent building ratings tool that takes into account the range of environmental and sustainability factors dealt with by existing codes.**

Incentives for sustainable building

Taxation

7.87 The committee was advised that the Australian Government could provide a range of taxation incentives to encourage sustainable building practices. The South East Queensland Regional Organisation of Councils believes that 'Australia has dumb taxes that encourage unsustainable patterns of consumption' and advocates the introduction of 'smart' taxes to encourage more efficient urban development, such as increased densities around transport nodes and disincentives for sprawl.[50]

47 City of Melbourne, *Submission 109*, p. 16.

48 City of Melbourne, *Submission 109*, p. 8.

49 Mr Ric Brazzale, Australian Business Council for Sustainable Energy, *Transcript of Evidence*, 16 March 2004, p. 49.

50 South East Queensland Regional Organisation of Councils, *Submission 60*, p. 5.

7.88 Delfin Lend Lease suggests that research and development incentives be provided via the taxation system to promote sustainable residential building.[51]

7.89 The committee notes this proposal. However, it considers that at this time there may be more cost effective and less administratively complex means to provide incentives.

Green and location efficient mortgages

7.90 Origin Energy explained to the committee that the public largely ignores the savings available due to eco-efficiency; consumers consider the up-front cost of a home rather than its whole of life cost. There are, however, banks that are willing to factor in this variable in their mortgage lending, and offer lower mortgage rates for eco-homes, recognising that 'lower energy bills mean that homeowners are more able to pay off their mortgage and therefore represent a lower risk'.[52]

7.91 The Southern Sydney Regional Organisation of Councils also supports such financial products, and points out that some institutions also encourage environmentally friendly retrofitting, which may lower the lender's financial risk due to reduced operating costs.[53]

7.92 The committee also heard evidence of 'location efficient' mortgages that operate in the United States, where people may borrow more and can locate somewhere where a car may not be necessary, thus lowering their transport costs and thereby increasing their disposable income available for loan service.[54] A location efficient mortgage:

> … gives lower income people the opportunity to get a mortgage which might not otherwise be available to them on the basis that they live in an area with good public transport and make a commitment to only having one car in that household. Their rationale is that the high cost of buying and maintaining a car offsets their lack of income under a normal mortgage process, so it is actually rewarding people for choosing public transport and recognising that they are more able to pay their mortgage.[55]

---

51 Delfin Lend Lease, *Submission 66*, p. 11; see also Lend Lease, *Submission 71*, p. 11.

52 Origin Energy, *Submission 143*, p. 9.

53 Southern Sydney Regional Organisation of Councils, *Submission 150*, pp. 12-13

54 Mr David Wake, Conservation Council of Western Australia, *Transcript of Evidence*, 31 March 2005, p. 33.

55 Ms Nicole Hodgson, WA Collaboration, *Transcript of Evidence*, 31 March 2005, p. 58.

7.93 The committee strongly urges all financial institutions to offer their customers 'green' and 'location efficient' mortgages and to consider residential and commercial building sustainability ratings and building operating costs in their assessments.

First Home Owner grant

7.94 Mention was made earlier in this report of the possibly unintended negative effects of the First Home Owner grant on urban sustainability.

7.95 The Australian Government introduced the First Home Owner grant in 2001 to offset the impact of the introduction of the goods and services tax (GST).

7.96 The broad principles of the grant include a one-off payment to eligible applicants; that it must be the principal place of residence; and that the grant is not means tested. Some changes have been made to the grant since 2001.

7.97 According to the City of Port Phillip, such schemes contribute to housing price inflation, which in fact reduces home ownership affordability, and the grant should actually target lower income households.[56]

7.98 The City of Newcastle argued that the First Home Owner grant scheme encourages urban fringe development and affects the environmental sustainability of the homes built and that:

> The concentration of populations at the urban fringe creates community isolation, increased car dependency and the growth of residential populations without basic support services, facilities or transport.
>
> This form of fringe development also results in significant impacts on the environment, as the ability of new development to meet the principles of Environmental Sustainable Development (ESD) is limited.[57]

7.99 It was suggested to the committee that the First Home Owner grant should be scrapped altogether.[58] The committee does not agree. Its sees potential for the scheme to be modified to provide incentives for sustainable building construction.

---

56 City of Port Phillip, *Submission 40*, p. 21.

57 City of Newcastle, *Submission 147*, pp. 3-4.

58 Mr Marcus Spiller, Planning Institute of Australia, *Transcript of Evidence,* 29 April 2005, p. 50.

7.100 The committee believes that, as an incentive for sustainable building practices, the Australian Government should increase the grant to $10,000 for those homes that meet specified sustainability criteria. The committee also adds that, in order to make a significant impact, the criteria used be stringent, though within the abilities of an HIA accredited builder.

7.101 The committee considers that those States and Territories that do not have a 5 star rating system should implement one as a priority.

Recommendation 23

7.102 **The committee recommends that the Australian Government increase the First Home Owner grant to $10,000 for those homes that meet a high standard of specified sustainability criteria and that these criteria be:**

- **stringent; and**
- **within the abilities of an HIA accredited builder.**

Recommendation 24

7.103 **The committee recommends that those States and Territories that do not have a 5 star rating system implement one as a priority.**

Virtual building technology: life cycle analysis of design

7.104 Life cycle analysis (LCA) of design enables building design professionals to make informed decisions on the environmental impact of commercial buildings, by providing detailed environmental and cost measures for different materials, products and designs, automatically from their 3D computer-aided design drawings. It aims to meet a growing need from designers and regulators for real-time appraisal of design performance of built assets against an emerging set of sustainability criteria.

7.105 Benefits of LCA Design include:

- Automated environmental assessment direct from 3D computer-aided design drawings;
- Choice of environmental impact and performance measures;
- Detailed design evaluation;

- Comparative ratings of environmental impacts of alternatives at all levels of design analysis; and
- Comprehensive graphical and tabular outputs.

7.106 LCA Design has been specifically designed to:

- Drive innovative and eco-efficient building design through an automated environmental impact assessment design tool for building design professionals;
- Audit and assess current and future building codes and standards;
- Harmonise with simpler checklist and other environmental rating tools; and
- Provide a method for environmentally conscious design which aligns with the International Standards Organisation framework for assessment of building environmental performance.[59]

7.107 According to the CSIRO:

> Life-Cycle Analysis (LCA) Design and Energy Express software can automate the process of green design direct from 3D computer aided design (CAD) models. This can be augmented by checklist systems such as Green Star and NABERS for auditing performance of *existing stock* (approximately 98% of total buildings).[60]

7.108 Dr David Ness points out that life cycle thinking will enable designers of new buildings to:

> … design for adaptability and re-use so that, after one life, a building component or entire building may be adapted or converted easily to a new use. Adopting the industrial ecology concepts being implemented in the product field, buildings and their components can be designed for disassembly or deconstruction.[61]

7.109 The committee sees this as a useful tool to further sustainable building design in the future. The committee encourages builders, designers and architects to make full use of this technology.

59 See www.cmit.csiro.au/brochures/tech/lcadesign

60 CSIRO, *Submission 91*, p. 8.

61 Dr David Ness, *Submission 25*, p. 2.

Australian Government leadership

7.110 Australian Government agencies are required to refer proposals for new capitals works or major refurbishments valued in excess of $6 million to the Joint Standing Committee on Public Works.

7.111 The Joint Standing Committee on Public Works refers proposals to the Australian Greenhouse Office for advice on the proposal's compliance with Government policy on improving energy efficiency in its own operations.

7.112 Dr David Ness suggested arrangements for improving the sustainability of Government leasing arrangements; for instance, the Government leasing solar panels that would be maintained and replaced as appropriate by a solar panel manufacturing company.[62]

7.113 The committee considers that all Australian Government departments and agencies that own property should take appropriate measures to improve the sustainability of these buildings. There is also scope for agencies to improve the efficiency and sustainability of tenanted buildings. Agencies that rent property should consider building efficiency, including grey water re-use, when seeking tenancy agreements.

Recommendation 25

7.114 **The committee recommends that Australian Government departments and agencies that own property take steps to improve the sustainability of those buildings, at least to the 5 star rating, and that departments and agencies that rent property consider measures to improve building efficiency when seeking tenancy agreements.**

62 Dr David Ness, *Transcript of Evidence*, 29 April 2004, p. 60.

8

> … we now know that the impacts of our present fossil fuel-based, centralised energy supply systems are unsustainable. We need to rethink the way we supply and use energy: and, since most of our energy use is either in or for cities, they must be a key focus of our attention.
>
> (Planning Institute of Australia)[1]

Energy

8.1 As cities grow and energy needs escalate, meeting the supply of inner city and industrial areas, and providing the infrastructure to deliver energy to spreading developments becomes increasingly difficult. Inefficient energy usage results in higher energy needs and increased air emissions.

8.2 To meet future consumption needs and manage air emissions, the sustainable city must diversify its sources of energy generation and, where possible and appropriate, incorporate renewable energy sources.

8.3 A sustainable city would successfully uncouple economic growth from increased energy consumption.

8.4 Lower energy consumption rates, greater efficiency and increased use of renewable energy sources have potential benefits for cities in terms of reduced infrastructure costs and air emissions, and more secure long term access to energy sources.

8.5 A number of issues related to energy have already been discussed in previous chapters of this report, including energy efficiency building in chapter 7. In this chapter, the committee considers:

---

1 Planning Institute of Australia, *Submission 168*, p. 26.

- Australian Government initiatives;
- Energy delivery; and
- Energy efficiency and education.

Australian Government Initiatives

National Framework for Energy Efficiency

8.6 The Ministerial Council on Energy was established in June 2001 by the COAG. A key task of the Ministerial Council is to identify policies and programmes that will deliver improvements in energy efficiency through coordinated action by federal, state and territory governments.

8.7 The purpose of the National Framework for Energy Efficiency (NFEE) is to access the economic potential of energy efficient technologies and processes to achieve a major enhancement of Australia's energy efficiency performance.

8.8 The Ministerial Council on Energy has committed to implement, over three years, a package of policy measures comprising Stage One of the NFEE. Ministers also agreed to consider other incentives for energy efficiency that will constitute Stage Two of the NFEE. Stage Two is to be developed in the context of the Productivity Commission inquiry into the economic and environmental potential offered by energy efficiency.

8.9 The committee believes that, with the implementation of the recommendations contained within this Chapter and of the NFEE, Australia will be better served in the area of efficient energy use.

Photovoltaic rebate programme

8.10 Photovoltaic systems convert sunlight into electricity. Under the Photovoltaic Rebate Programme (PVRP), which commenced on 1 January 2000, cash rebates are available to householders and owners of community use buildings who install grid connected or stand alone photovoltaic systems.

8.11 In this year's budget, the Government has committed to provide $11.4 million over two years to extend the Photovoltaic Rebate Programme.[2] This measure will involve funding of $5.7 million in 2005-06 and $5.7 million in 2006-07. The cost of this measure will be met from existing resources for the Greenhouse Gas Abatement Programme.[3]

8.12 The programme offers incentives in three main areas:

- Supporting residential property developments (up to $1million will be offered to residential property developers to support the installation of photovoltaic systems);
- Supporting the use of photovoltaic systems on residential buildings; and
- Supporting the use of photovoltaic systems on community use buildings such as schools.

8.13 The rebate level for new systems is currently $4 per peak watt, capped at $4000 (or 1.0 kW) per residential system and $8000 (2.0 kW) per Community Building system. The rebate level for upgrades to existing systems is $2.50 per peak watt capped at $2500 (1.0 kW).

8.14 Some submissions to this inquiry suggested that the programme does not have enough funding to keep up with the demand for rebates. Increased rebates and a widening of the programme's coverage to include solar hot water systems were recommended to encourage higher take-up.[4]

8.15 It appears from information available that there is a need for increased funding for installation of photovoltaic systems whether for electricity output or water heating.

Recommendation 26

8.16 **The committee recommends that the Australian Government double the photovoltaic rebate to further encourage the uptake of photovoltaic systems.**

2 See www.budget.gov.au/2005-06/bp2/html/expense-10.htm

3 See www.budget.gov.au/2005-06/bp2/html/expense-10.htm

4 See Southern Sydney Regional Organisation of Councils, *Submission 150*, p. 6; City of Darebin, *Submission 29*, p. 37; Ms Juanita Higgs, Southern Sydney Regional Organisation of Councils, *Transcript of Evidence*, 27 January 2004, p. 51.

8.17 The committee is hopeful that the expansion of the Solar Cities programme, as discussed in chapter 3, will also further address the need for increased funding in this area.

Other programmes

8.18 The Government's Mandatory Renewable Energy Target (MRET) commenced on 1 April 2001. The *Renewable Energy (Electricity) Act 2000* requires the generation of 9,500 gigawatt hours of extra renewable electricity per year by 2010, enough power to meet the residential electricity needs of four million people.[5]

8.19 The committee notes that a recent independent review of MRET recommended that the target be extended from 9,500 gigawatts by 2010 to 20,000 gigawatts by 2020. The Australian Government believes that the costs involved do not justify this target[6].

8.20 The House of Representatives Standing Committee on Environment and Heritage report *Employment in the Environment Sector: Methods, Measurements and Messages* examined the MRET. The committee found that, although mandated requirements are not always an appropriate driver of sustainability, there is a clear role for MRET in providing growth opportunities for the environmental sector and that the policy should be retained and targets increased.[7]

8.21 The report made the following recommendation:

> . . . that the Australian Government:
>
> - Retain the Mandatory Renewable Energy Target;
> - Substantially increase the Mandatory Renewable Energy Target as part of a multifaceted approach to increase market demand for and supply of renewable energy and; and
> - Implement a timely review of the Mandatory Renewable Energy Target for beyond 2010 with a view to furthering the uptake of renewable energy on Australia.[8]

---

5 See www.greenhouse.gov.au/markets/mret/index.html

6 See Department of Prime Minister and Cabinet, *Securing Australia's Energy Future,* 2004, p. 148; see www.dpmc.gov.au/publications/energy_future/docs/energy.pdf

7 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector. Methods, Measurements and Messages,* Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 128.

8 House of Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector. Methods, Measurements and Messages,* Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 128.

8.22 The Australian Government is implementing the following policy initiatives in support of renewable energy, and as strategies to reduce Australia's greenhouse gas emissions:

- the Renewable Remote Power Generation Programme, which supports renewable energy in remote areas;
- the Renewable Energy Equity Fund, which provides venture capital for small innovative renewable energy companies;
- the Low Emissions Technology Demonstration Fund to accelerate the demonstration of new low emission technologies to achieve significant greenhouse abatement; and
- the Alternative Fuels Programme, which aims to use alternative fuels to reduce greenhouse gas emissions from road transport.

8.23 The committee also notes the Energy Efficiency Assessment and the Renewable Energy Development Initiative programmes, which are to be administered by the Department of Industry, Tourism and Resources.[9]

8.24 The committee suggests that these programmes and activities be monitored closely for their effectiveness, and that outcomes be communicated comprehensively to industry and the public. The committee envisages that monitoring, reporting and communicating outcomes would be the responsibility of the Australian Sustainability Commission.

Recommendation 27

8.25 **The committee recommends that the Australian Government further develop its commitment to energy sustainability, particularly in the area of increasing the use of renewable energy.**

9 See *Environment Budget Overview 2005-06* at www.deh.gov.au/about/budget/2005/ebo/chapter3.html#opportunities

Energy delivery

8.26 The PIA suggests that the old centralised forms of energy supply systems must be re-thought:

> While our large, hierarchical energy supply systems have made sense over the past 60 years, as society has developed rapidly using crude and inefficient technologies (which use energy very wastefully), we now know that the impacts of our present fossil fuel-based, centralised energy supply systems are unsustainable. We need to rethink the way we supply and use energy: and, since most of our energy use is either in or for cities, they must be a key focus of our attention.[10]

8.27 The committee was advised that decentralised generation and distribution of energy may be a way of increasing efficient energy use. Further, decentralised energy generation and distribution is most suitable for renewable energy sources. According to Origin Energy:

> Renewable energy delivery is most effective at the single dwelling level. This has many advantages:
>
> - It can drive the cost of renewable technologies down faster because the higher volume of unit sales will increasingly turn pv modules into accessible appliances, available from a wide range of suppliers.
> - It improves the user's understanding of energy - which in turn can lead to behavioural change as consumers become more responsible (less wasteful) with energy use as they attempt to balance energy consumption with generation from their system.
> - It increases the number of generators - reducing the risk of system outages.
> - The generators are spread across the city (eg solar systems on every roof) eliminating the need for large, cumbersome and real-estate intensive generators.
> - Provides local employment.[11]

8.28 The City of Melbourne also favours a decentralised local model because 'there is no doubt that transmission losses can be minimised by localising generation plants.'[12]

---

10 Planning Institute of Australia, *Submission 168*, p. 26.

11 Origin Energy, *Submission 143*, pp. 5-6.

12 City of Melbourne, *Submission 109*, p. 7.

8.29 On the other hand, the Western Australian Sustainable Energy Office questions the benefit of decentralisation:

> In terms of the need to facilitate a shift away from large-scale, centralised energy generation plant and a reliance on transmission and distribution infrastructure to supply the energy produced to end users, and towards an alternative model consisting of smaller and more distributed energy generation, there is a need to ask whether the environmental, economic and social benefits of such a shift would outweigh the costs of making that transition.[13]

8.30 The committee was not presented with any hard data outlining potential costs versus long term savings of decentralised models, and was advised that this may be a result of a reluctance to invest in this area.[14]

Recommendation 28

8.31 **The committee recommends that the Australian Government, through the National Framework for Energy Efficiency, examine the economic and environmental benefits of decentralised energy delivery and encourage investment in this area.**

Heating, cooling, lighting and insulation

8.32 The heating, cooling, lighting and insulation of buildings can considerably increase or decrease the energy consumption of that building.[15]

8.33 Currently in Australia, heating and cooling account for 39 per cent of the total residential energy consumption and 15 per cent of residential sector greenhouse gas emissions.[16] This can be reduced by good building design (as considered in chapter 7) and appropriate insulation.

13 Western Australian Sustainable Energy Development Office, *Submission 89*, p. 3.

14 Mr Justin Sherrard, Environment Business Australia, *Transcript of Evidence*, 29 April 2005, p. 63.

15 Mr David Parken, Royal Australian Institute of Architects, *Transcript of Evidence*, 29 April 2005, pp. 50-1.

16 CSIRO, S*ubmission 91*, p. 12.

8.34 Professor Nicholas Low explains the value of good insulation, advocating an 'overcoat' of insulation of roofs, walls and floors, as well as triple-glazing. The principles adopted in Europe apply in reverse in Australian cities, because:

> What works to keep warmth in also works to keep excessive afternoon heat out.[17]

8.35 The committee is confident that observations contained within chapter 7 relating to nationally consistent ratings tools will incorporate issues relating to insulation.

8.36 The use of lighting also adds to the energy use of a particular dwelling. According to the Royal Australian Institute of Architects:

> Regulation of energy consumption in commercial buildings will accelerate adoption of energy saving lighting systems and use of movement sensors to switch off lighting areas not in use. In the residential sector, widespread adoption of compact florescent globes should be a priority.[18]

8.37 Street lighting has an impact on a wide variety of areas and the impact on energy use is enormous and costly:

> It has been estimated that one third of all US light is wasted at a total cost of about 30 million barrels of oil valued at about $US 2 billion per annum.[19]

8.38 The committee notes that several local councils are moving to renewable energy sources for lighting, with some areas introducing more efficient types of street lighting and purchasing Green Power. For example, the City of Darebin currently purchases 20 per cent Green Power for street lighting and intends to increase this to 30 per cent next year.[20]

8.39 The committee is aware that the resources of local councils are stretched and it can be difficult to research alternative energy technologies or appropriate sustainable designs. The Department of Environment and Heritage could, as part of their website, include case studies on local councils' sustainability initiatives. This would provide clear information and incentives for other local councils (and industry) to access. The committee suggests that this may supplement the excellent information provided in the *Your Home Guide* referred to in chapter 7.

---

17 Professor Nicholas Low, *Submission 74*, pp. 7-8.

18 Royal Australian Institute of Architects, S*ubmission 159*, p. 12.

19 Dr Bill Hampel and Ms Mary Rimington, S*ubmission 123*, p. 6.

20 City of Darebin, *Submission 29*, p. 25.

Energy efficiency and education

8.40 Australians must not only use less energy; the energy they use must be used efficiently. The Electricity Supply Association of Australia explains:

> *Effective energy use* relates to using the most "sustainable" energy source for the "right" energy service. *Energy efficiency* relates to using the energy source as efficiently as possible for the required energy service. In moving towards more sustainable cities, issues related to energy supply, energy effectiveness and energy efficiency may need to be addressed in a more integrated manner.[21]

8.41 However, the PIA drew to the attention of the committee that markets are 'heavily stacked against energy efficiency', particularly because there are 'highly resourced marketing groups working for energy suppliers whose job it is to steal market share from their competitors'.[22] Further:

> … for energy suppliers, there is much more profit at the margin from selling one extra unit of energy than from saving it, because a large proportion of their costs are sunk capital, which they have to pay for whether it is used or not.[23]

Appliances

8.42 Household appliances are one place where there is a particular bias against energy efficiency, because salespeople have a vested interest in selling bigger, less efficient models. This applies even to houses.[24]

8.43 The committee considers it unfortunate that energy efficiency is often associated with higher upfront purchase costs. Although consumers may take efficiency ratings into account when purchasing appliances, it is difficult to translate these star ratings into an understanding of the difference in ongoing operating costs.

8.44 Dr Lorraine Stephenson informed the committee of Origin Energy's social hardship program, which involves 'home auditing' that:

> … allows those that are most disadvantaged to reduce their bills–so they are very attuned to what it is costing them–and then to provide [high-efficiency] appliances or other options.[25]

21 Electricity Supply Association of Australia, S*ubmission 13*, pp. 2-3.
22 Planning Institute of Australia, *Submission 168*, p. 35.
23 Planning Institute of Australia, *Submission 168*, p. 35.
24 Planning Institute of Australia, *Submission 168*, p. 35.
25 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

8.45 The Ministerial Council on Energy is responsible for the National Appliance and Equipment Energy Efficiency Programme (NAEEEP), which involves implementing voluntary and regulatory programmes to improve the energy efficiency of domestic appliances and industrial and commercial equipment. The programme has been demonstrated to be one of the most cost-effective ways to improve energy efficiency, enhance our international competitiveness and reduce greenhouse gas emissions.[26]

8.46 The committee strongly endorses the work being carried out by the Ministerial Council on Energy in the area of appliances. However, consumer awareness and choice are also key factors in changing market demand. The committee suggests that the Department of Environment and Heritage provide on its website, and perhaps also in brochure form, information on the different operating costs of appliances.

Renewable energy technologies

8.47 The committee supports the use of pilot projects such as Solar Cities and anticipates the expansion of this programme to include metropolitan areas in other cities, but notes that funding is a major impediment to the development of renewable energy technologies.[27]

8.48 The committee is pleased to note that the Australian Government, under the Renewable Energy Development Initiative, has provided $100 million over seven years to support strategically important renewable energy initiatives with strong commercial potential, and emissions-reduction potential. This initiative will provide grants to firms for the development and commercialisation of new products, processes and services in the following renewable energy technology sectors: wind, solar photovoltaics, solar thermal, biomass, geothermal energy, wave/ocean energy, hydro and related enabling technologies.[28]

26 See www.industry.gov.au

27 Centre for Sustainable Energy, *Submission 5*, p. 2.

28 See *Environment Budget Overview 2005-06* at www.deh.gov.au/about/budget/2005/ebo/chapter3.html#needs

CASE STUDY: EASTERN CREEK UR-3R FACILITY

ENERGY FROM WASTE

The Eastern Creek Urban Resource – Reduction, Recovery & Recycling (UR-3R) Facility uses cutting edge technology to recover thousands of tonnes of reusable materials placed in general garbage.

The public private partnership between Waste Service NSW and Global Renewables will divert more than 80 per cent of household waste from landfill using a Greenpeace UK endorsed Mechanical Biological Treatment.

The Creek UR-3R Facility's groundbreaking separation process will recover an extra 23,000 tonnes of plastic, paper and metal recyclable materials each year.

After household waste is sorted, the part that is rich in organics - such as food and garden waste - is separated out and sent to the ISKA® Percolator.

This ISKA® Percolation works a little like a coffee percolator to transform the

organic waste into a consistent quality and, while at it, also:

- reduces its odour;
- condenses it;
- recovers energy; and
- rids the organic waste of contaminants.

Warm recycled water is sprayed over the material in the ISKA® Percolator which separates contaminants and rapidly breaks down the organic material before it is discharged as a cleaned solid product suitable for the composting process.

The liquid product from the percolation process is also recovered and digested to make biogas before being re-used on-site. The biogas is used to generate electrical power for the facility, with power exported to the grid as 'green energy'.

The composting is driven by trillions of microscopic garbage eating bugs that munch over an eight to twelve week period until the resulting mulch can be used for quality compost.

The Creek UR-3R Facility is completely self-sufficient in energy and water.

By using liquid captured on-site it takes none of Sydney's water resources. It generates enough green energy to meet its own needs and feeds the rest back into the power grid.

8.49 The Centre for Sustainable Energy Systems pointed to Sliver Cell Technology and the Combined Heat and Power Solar System as two renewable energy technologies that have benefited from previous Government support.[29]

8.50 The committee also received evidence on other forms of renewable energy. For example, the Renewable Energy Generators of Australia noted that:

> Hydro-electricity is a major renewable energy resource that can play an increasingly important role in enabling cities around the world to meet sustainability objectives. As a high quality, reliable and flexible energy source it has a pivotal role in integrated energy systems.[30]

8.51 In 1999, Ventura Bus Lines Pty Ltd introduced two buses that operated on ethanol:

> We see *Ethanol* as a sustainable alternative to Diesel powered buses. The emission from one ethanol bus is half that of a diesel bus. *Ethanol* has the potential to be great for Australia economically as we can produce a totally renewable fuel locally that is in no way linked to rising world oil prices.[31]`

8.52 The committee was advised that Australia is mainly powered by coal, and our lack of diversification exposes Australia. Accordingly, there is an added imperative to adopt renewable energy technologies for diversification purposes.[32]

8.53 The committee was interested to learn that disaster management is one of the additional benefits renewable energy may provide. As Lend Lease points out, sustainable technologies (primarily renewable energy systems) provide excellent short-term replacement to lost infrastructure and 'therefore should be fostered as part of disaster response'.[33]

8.54 The committee notes that the public needs to be made aware of the benefits of renewable energy technology. Origin Energy points out that energy, electricity, is not fully appreciated because 'it is inexpensive, invisible, and readily available at the flick of a switch' and suggests that:

> Energy awareness is therefore a vital pre-requisite for a change to renewable energy to occur. This awareness can be provided by

29 Centre for Sustainable Energy, *Submission 5*, p. 4.

30 Renewable Energy Generators of Australia, *Submission 116*, p. 4.

31 Ventura Bus Lines Pty Ltd, *Submission 9*, p. 2; author's emphasis.

32 Dr Martin Poole, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 29 April 2005, p. 66.

33 Lend Lease, *Submission 71*, p. 40.

> initiatives including introducing energy into school curricula and rewarding best practice.[34]

8.55 One way to inform consumers of renewable energy benefits is electricity labelling. This gives them 'more power to make choices in the electricity market by making them aware of the greenhouse impact of their energy purchasing decisions'.[35]

8.56 The committee endorses the following recommendation made by House of Representatives Standing Committee on Environment and Heritage report *Employment in the Environment Sector: Methods, Measurements and Messages*:

> … that the Australian Government through the Mandatory Renewable Energy Target pursues the mandatory disclosure for all electricity retailers of:
>
> - Relative sources of supplied energy;
> - Associated greenhouse gas emissions; and
> - Advice on how consumers can increase their purchase of Green Power.[36]

8.57 The committee did not receive any submissions advocating the use of nuclear power. However, the committee notes that there is some base of support for 'reopening the nuclear debate' – nuclear power may be an option for a clean and sustainable power supply.[37]

8.58 Solar power is the most widely recognised form of renewable energy. It is an energy system that can result in significant savings for Australian communities. As STEP Inc. states:

> … if each of the 1.8 to 2 million homes in Sydney installed a 1kilowatt solar power system on its roof, we would defer the need to build a new power station for 50 to 80 years.[38]

8.59 As well as increasing the use of renewable energy, Dr Lorraine Stephenson explained to the committee that use of solar power increases the public's awareness of their energy needs and costs of energy use:

> We hear from many customers that once they have a solar PV system they inherently become attuned to their energy needs. They actually understand the flows, the total energy use of the

34 Origin Energy, *Submission 143*, p. 4.

35 RoundTable Renewable and Sustainable Energy, *Submission 117*, p. 11.

36 House or Representatives Standing Committee on Environment and Heritage, *Employment in the Environment Sector: Methods, Measurements and Messages*, Parliament of the Commonwealth of Australia, Canberra, November 2003, p. 138.

37 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 29 April 2005, p. 68.

38 STEP Inc., *Submission 87*, p. 8.

> household and leakage of energy, and they are frustrated by that because they are not optimising their own financial situation as much as anything else.[39]

8.60 As with energy efficient appliances, Dr Stephenson explains how the public is unaware of the long term benefits of solar energy and remains focused on the up front cost, rather than the very low ongoing operating costs:

> If you had a well-designed residential development that has solar PV or solar hot water and it was solar passive in terns of its design, you would actually have a very low ongoing energy bill. That can then be an incentive for the up-front capital because you will find financial services that are offering good loans for eco-houses, which could be quite beneficial.[40]

8.61 In 2003, Germany enacted a law forcing utility companies to pay higher rates to commercial and residential premises that generate solar (or wind) energy and feed it back to the grid. With this source of guaranteed revenue, solar panel installation have become commonplace in Germany. The law forces utility companies to buy all wind and solar power generated by all users at a price 10 times higher than the rate that users are charged for the electricity provided by the utilities from other forms of power. [41] Higher tariff rates were introduced in 2004, further driving demand by providing attractive investment returns. Germany now leads the world in solar PV power and a number of other countries are in the process of implementing the German model.[42]

8.62 BP Solar told the committee that, last year, Germany installed 320 MWp of PV power as opposed to Australia's 7 MWp installed in 2004. Government policy has been instrumental in the increased use of solar power.[43]

8.63 The committee was impressed with the German approach to public policy in this area and sees a significant opportunity for the Australian Government to increase the use of PV generated energy.

---

39 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

40 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 57.

41 Mr Robert Collier, 'Germany shines a beam on the future of energy', *Energy Bulletin*, 21 December 2004, see www.energybulletin.net/print.php?id=3696

42 Private briefing by BP Solar, 26 May 2005. Countries implementing the German model are France, Spain and Portugal, and the model is being considered by Italy and California.

43 Private briefing by BP Solar, 26 May 2005.

8.64 The committee also noted the US's Million Solar Roofs Initiative. Launched by President Clinton in 1997, the objective is to facilitate the sale and installation of one million 'solar roofs' by 2010. The US Department of Energy describes the initiative as practical and market-driven approach - 'a unique public-private partnership, aimed at overcoming barriers to market entry for selected solar technologies'. [44]

Recommendation 29

8.65 **The committee recommends the Australian Government investigate US and German initiatives in the area of solar energy generation and purchase, and, where appropriate, implement or emulate them.**

Energy pricing

8.66 Origin Energy points out that the pricing of different energy sources is not always level and may work against renewable energy sources, such as solar energy:

> The current price of solar is high compared with grid power in Australia, however large-scale grid power rarely represents the true cost of delivered electricity. Large power stations in Australia are mostly coal-fired and the price of the electricity produced does not include the externality costs of:
>
> - Greenhouse emissions and
> - Pollution in the form of air pollution and waste material from scrubbers
>
> Including the full costs of electricity generated and delivered to consumers would substantially improve the economics of distributed renewable generation including solar photovoltaics, small scale wind, and run-of-the-river micro-hydro as renewable generation avoids these externalities. Of these, only solar photovoltaics can be used in all Australian geographic regions to power most homes.[45]

44 See www.millionsolarroofs.org

45 Origin Energy, *Submission 143*, p. 3.

8.67 The Australian Conservation Foundation and Environment Victoria also make the point that electricity prices in Australia are some of the lowest in the OECD and that this pricing does not take into account the environmental and health costs of burning fossil fuels.[46]

8.68 However, the committee is pleased to note that the gap in price between renewable and coal generated electricity appears to be narrowing somewhat, with cost reductions that have been passed on to consumers.[47]

8.69 The Australian Business Council for Sustainable Energy also points to the disconnect between what consumers pay for energy and its actual cost. For instance, people do not receive price signals for their use of power at peak times. Peak power needs determine the total required network and generation capacity. The negligible peak price signal means that customers typically pay less than 5 per cent of the true cost of supplying the peak power in summer.[48]

8.70 Mr Ric Brazzale gave the installation of air conditioners as one example of peak power costs that do not flow through to the consumer:

> . . . customers that install airconditioners impose a significant cost on the electricity system but do not pay for it because they only pay an average price. They do not pay for the peak power they use and they do not pay for the peak network infrastructure that they use to deliver that power.[49]

8.71 The committee is pleased to note the development of smart meters which show users how much power they consume and what that power costs in real time. This allows consumers to choose to operate appliances at non-peak periods and save. In NSW, Country Energy conducted a trial of smart meters in 200 homes in the Queanbeyan area.

---

46 Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 10.

47 Dr Lorraine Stephenson, Origin Energy, *Transcript of Evidence*, 8 June 2004, p. 51.

48 Australian Business Council for Sustainable Energy, *Submission 134*, p. 6.

49 Mr Ric Brazzale, Australian Business Council for Sustainable Energy, *Transcript of Evidence*, 16 March 2004, p. 48.

9

> … sound urban growth management policy must be based on sound and well funded research and information… We owe it to our cities and their inhabitants to do no less.
>
> (Urban Frontiers Program)[1]

Research and Feedback

9.1 The committee is acutely aware that there are no 'quick fix' solutions to many of the environmental challenges Australia faces. The aim of the report and recommendations is to direct Australian urban policy onto a path of sustainability by 2025.

9.2 The final issues the committee addresses in this report concerns the research needs to build sustainable cities, the need to report back to all Australians, and Australia's regional responsibilities.

Research

9.3 During the course of the inquiry, the committee received evidence that suggests that, despite the wealth of information on sustainability that is available today, there may be a number of gaps in research and lack of funding for some areas of research.

---

1 University of Western Sydney Urban Frontiers Program, *Submission 113*, p. 12.

9.4 The Urban Frontiers Program at the University of Western Sydney, for instance, drew the committee's attention to the lack of available data and research work to inform current planning policies. Urban Frontiers comments on funding cuts to research into urban policy, with a detrimental effect on sound policy initiatives. [2]

9.5 The committee notes, however, that the Australian Government has increased funding for environmental research, and the committee supports funding for environmental R&D and innovation programmes, administered by the Environment and Heritage portfolio.[3]

9.6 In terms of urban research, the committee notes that CSIRO's research programme related to urban systems performance is worth around $30 million per year.[4] There are also a number of Cooperative Research Centres currently engaged in work related to the built environment, urban materials and sustainable technologies.

9.7 There may, however, be a case for enhancing urban policy research, possibly through the development of an Institute for Urban Sustainability and Population Health, which would bring together professionals across a number of fields.

9.8 The committee was also told that Australia has a 'natural advantage' in a number of research areas (coal, uranium, 'dryness') and the Government should be providing research support where Australia can lead and export.[5]

9.9 The CSIRO also recommends that capabilities and data be assembled to 'develop blueprints for sustainable cities'.[6]

9.10 The committee was unable to form a more developed view regarding the level of research into sustainable cities and believes that an audit of such research would be an appropriate first step.

9.11 The committee considers that such an audit may be undertaken by the Australian Sustainability Commission recommended in chapter 3. The results of the audit would form the basis for future policy in this area.

---

2 University of Western Sydney Urban Frontiers Program, *Submission 113*, p.12.

3 Department of Education Science and Training, *Budget Information 2005 at a Glance*, see http://www.dest.gov.au/portfolio_department/dest_information/publications_resources/resources/budget_information/budget_2005_2006/at_a_glance.htm

4 CSIRO, *Submission 91*, p. 9.

5 Mr Hugh Ralston, Warren Centre of Advanced Engineering, *Transcript of Evidence*, 29 April 2005, pp. 71-72.

6 CSIRO, *Submission 91*, p.7.

Recommendation 30

9.12 **The committee recommends that the Australian Government:**

- **conduct an audit of existing research and funding opportunities for issues relating to the built environment and urban policy to ensure the adequacy of technical and policy research in this area; and**
- **give consideration to nominating the built environment as a national research priority.**

Feedback

9.13 As partly canvassed in chapter 3, the committee considers that reporting mechanisms are vital for Australia to measure its achievements and monitor areas where further initiatives are needed.

9.14 Reporting frameworks are critical; however, they do not contribute in a meaningful way to a commitment to sustainable living practices at the household or neighbourhood or even city level.

9.15 Previous chapters have drawn attention to the need for education of industry and the public. However, the committee is also keenly aware that sustainability is not a path that people or industry can be forced to take.

9.16 Minimum regulatory requirements will set a direction; however, real change comes from a personal commitment to achieve best practice and from a drive for innovation that develops new and more efficient and sustainable materials.

9.17 Thus, the committee identifies a need for feedback at the local level, to challenge the mentality that the problem of sustainability is overwhelming or is the responsibility of someone else.

9.18 It is not within the powers of the Australian Government to set up reporting and feedback mechanisms at the local neighbourhood, regional or even city level. For the most part, this must be driven by local governments, and the committee sees great value in providing resources that may assist local governments in this task.

9.19 The committee urges State and Territory governments, and local governments to give consideration to this concept.

The Swedish model

9.20 At the 2004 National Conference of Parliamentary Public Works and Environment Committees, representatives of this committee in the 40th Parliament heard the Swedish Government outline its process of setting sustainability objectives, mapping the steps to achievement of those objectives, and the intermediate assessment system to report on progress.

9.21 In 1999, the Swedish Parliament had voted to adopt 15 environmental objectives:

- Reduced climate impact;
- Clean air;
- Natural acidification only;
- A non-toxic environment;
- A protective ozone layer;
- A safe radiation environment;
- Zero eutrophication;
- Flourishing lakes and streams;
- Good-quality groundwater;
- A balanced marine environment, flourishing coastal areas and archipelagos;
- Thriving wetlands;
- Sustainable forests;
- A varied agricultural landscape;
- A magnificent mountain landscape; and
- A good built environment.[7]

7 For further information on Sweden's environmental objectives, see www.miljomal.nu

9.22 Underpinning these national objectives are five fundamental principles:

- Promoting human health;
- Safeguarding biological diversity;
- Protecting cultural heritage;
- Preserving long term productive capacity of the ecosystem; and
- Ensuring that natural resources are properly managed.

9.23 The committee has chosen to refer to the Swedish model as a paradigm for Australia for two reasons. Firstly, the Swedish Parliament has established a high benchmark that is not framed around the usual rhetoric of sustainability. Sweden frames its overall challenge as one of 'handing over to the next generation a dynamic but sustainable society in which the major environmental problems have been solved.'[8] This challenge demands of the nation not only targets of sustainability, but solutions to current environmental issues.

9.24 Secondly, the Swedish system has introduced an approachable set of objectives and system of public reporting. The objectives themselves are in plain language (with the exception of one specialised technical term), in keeping with this as a national set of objectives that the population must relate to and identify with.

9.25 The committee considers that there is a valuable lesson in this for Australia. The Australian charter of sustainability and the COAG agreed targets (as outlined in chapter 3) are important measures and would form the basis for policy funding decisions. However, on a more practical level, policy must connect to and become part of Australian everyday life. This is a vital 'feedback' and engagement process.

9.26 A vision for sustainability must engage Australians and have meaning – it must close the gap between policy makers and the lived reality of Australians who will, ultimately, be the practitioners of sustainability principles.

9.27 The Swedish model has taken this philosophy a step further in its reporting process. Each objective is measured against a set of defined targets and timeframes. Some objectives are represented by several targets, other by only one or two. Similarly, the targets range in timeframes.

---

8 Mr Jan Bergquist, Chairman of the Environmental Objectives Council, Sweden, Presentation to the National Conference of Parliamentary Public Works and Environment Committees, Melbourne, July 2004.

9.28 Sweden reports to its people its national progress in a one page chart, with measurement of progress towards each target falling into one of three categories and represented pictorially:

- Difficult to achieve;
- More action needed; or
- Achievable.

9.29 In the example presented to the 2004 conference, there were a range of happy, sad and neutral symbols to represent successes and areas where evaluation of programmes and additional effort was required. This allows people to gauge, at a glance, achievements and progress.

9.30 It is the view of this committee that Australians deserve the same type of engagement and feedback in the form of a snapshot report card.

9.31 In addition to the Swedish model, which has been developed specifically to measure sustainability, the committee notes Australian models, such as the Tidy Town competition or Celebrate WA as useful examples that might be emulated. The latter is a not for profit organisation that fosters pride in Western Australia, by:

- Recognising the contribution and achievements of individuals, groups and the State
- Developing a sense of community
- Engaging the community in celebratory and commemorative activities
- Building on our unique heritage, culture, identity and location [9]

9.32 The committee considers that if we expect a change in behaviour and consumption patterns, we need a set of objectives, targets and a reporting system that closes the information loop and reports back in a way that makes sense to all.

9 See Celebrate WA at www.celebratewa.com.au

Recommendation 31

9.33 **The committee recommends that, with reference to the Swedish model of environmental objectives, the Australian Government:**

- **develop an accessible and identifiable set of national environmental (or sustainability) objectives for Australia (based on the Australian Sustainability Charter recommendation in chapter 3);**
- **implement a national report card for Australia which represents transparently and simply our progress towards the objectives; and**
- **encourage similar programmes at a community level, possibly emulating the Tidy Towns or Celebrate WA programmes, but focusing on sustainability.**

Australia's regional responsibilities

9.34 In making its recommendations in this report, the committee recognises that many issues fall under State and Territory or local government jurisdiction. However, sustainable cities are a matter of national priority, which must also be given direction, governance, and where needed, funding, from the Australian Government.

9.35 Further, this committee believes that, as part of its national responsibility, Australia must extend the commitment to sustainable cities beyond its borders. As one of the major developed nations into the Southern Hemisphere and in particular in the Asia Pacific region, Australia has a greater responsibility to demonstrate to its neighbours that sustainability and development are not mutually exclusive, and sustainability does not need to impose an economic penalty.

9.36 In the most basic sense, we are impacted by the sustainability (or lack thereof) of the cities in neighbouring countries. Their pollution or waste or economic prosperity directly impacts on Australia. It is therefore in our interests to foster sustainability on an international basis.

9.37 The committee notes that there are currently several international sustainable cities networks operating. For instance, the International Centre for Sustainable Cities is a non-profit organisation based in Canada. It has projects operating in several Asian cities.[10] The World Health Organisation also runs an extensive Healthy Cities programme across Europe. [11]

9.38 The committee considers that Australia should take a leading role in initiating a Sustainable Cities network across Australia and Asia.

Recommendation 32

9.39 **The committee recommends that Australia investigate opportunities to establish a Sustainable Cities network across Australia and Asia, and extend its regional and international commitment to urban sustainability through avenues such as:**

- **Technology and research exchange;**
- **Pilot demonstration projects, particularly in the area of water and waste treatment;**
- **Increased aid for social development in urban areas; and**
- **Local government partnership programmes.**

Dr Mal Washer

Committee Chair

August 2005

10 See www.icsc.ca for an outline of the Centre's objectives and current work.

11 See www.who.dk/healthy-cities

A

Appendix A – List of submissions

Number	Organisation
1	Ms Pamela Sanders
2	P & A Mummery
3	Mr George Koshy
4	Mr Colin McKenna
5	Australian National University
6	Canberra Environment Centre
7	City of Swan
8	Smithson Planning
9	Ventura Bus Lines Pty Ltd
10	Ms Beverley Olsson
11	Fremantle Ports
12	Ms Dianne Davis
13	Electricity Supply Association of Australia
14	SL & LY Woodberry
15	Sustainable Gardening Australia
16	Mr Laurel Smith
17	Landmatters Pty Ltd
18	Central Sydney Area Health Service
19	Australian Institute of Landscape Architects

20	Shoalhaven City Council
21	Northern Sub-Regional Organisation of Councils
22	Alexandra and Associates Pty Ltd
23	Save Our Suburbs NSW Inc
24	Vinyl Council of Australia
25	Dr David Ness
26	Mr Gordon Hocking
27	Integrating Sustainability
28	National Trust of Australia (Victoria)
29	City of Darebin
30	Mr Tom McNeilly
31	Ms Susan Cunningham
32	Middle Way Pty Ltd
33	Mr Peter Mills
34	Dr Robert Samuels
35	Australian Housing and Urban Research Institute
36	Mr Louis du Plessis
37	Mr Richard Aumann
38	Ms Sarah West
39	Mr Mike Thomas
40	City of Port Phillip
41	University of New South Wales
42	Total Environment Centre
43	National Museum of Australia
44	Australian Conservation Foundation Sydney Branch
45	Mr Warren Grzic
46	International Association of Public Transport SUPPLEMENTARY (to Submission No. 171)
47	Healthy Cities Illawarra

48	Gold Coast City Council
49	Sustainable Population Australia (Canberra Region)
50	National Trust of Australia (New South Wales)
51	Hickinbotham Group
52	Ms Louise Crabtree
53	Clay Brick and Paver Association of Victoria
54	Bicycle New South Wales
55	Coast and Wetlands Society
56	Mr Len Puglisi
57	City of Playford
58	Mr Christopher Walsh
59	Ms Bernadette Foley
60	South East Queensland Regional Organisation of Councils
61	Cardinia Shire Council
62	Perth Area Consultative Committee
63	Urban Ecology Australia Inc
64	Prof Frank Fisher
65	Mr Daniel Ouma-Machio
66	Delfin Lend Lease
67	Mr James Kilby
68	Ms Maree Ellis
69	Mr Tomas Nilsson
70	Australian Bicycle Council
71	Lend Lease
72	International Council for Local Environmental Initiatives
73	The Warren Centre for Advanced Engineering
74	Professor Nicholas Low
75	Raising Community Awareness about the health effects of Burning wood in Residential Areas (CABRA)

76	Mr Andrew Inglis
77	Mordialloc Beaumaris Conservation League Inc.
78	Mr Tom Errey
79	Integral Design Group
80	Peak Environmental Enterprises
81	Gecko-Gold Coast & Hinterland Environment Council
82	Australasian Railway Association
83	Local Government Association of Queensland
84	University of New South Wales
85	Mr James Lillis
86	Mr Keith Jones
87	STEP Inc
88	EcoDemocrats
89	Western Australia Government-Western Australian Sustainable Energy Development Office
90	Professor Valerie Brown
91	CSIRO
92	Environment Business Australia
93	CRC for Construction Innovation
94	Greenfleet Australia
95	Sinclair Knight Merz Pty Ltd
96	Professors Ian Gray & Geoffrey Lawrence
97	Bus Industry Confederation
98	Regional Cities Victoria
99	Manly Council
100	Mr Daryl Cox
101	Bayside City Council
102	Professor A J McMichael
103	Engineers Australia

104	Mornington Peninsula Shire
105	Plantation Pine Framing Alliance
106	Western Sydney Area Health Service
107	Dr Jeff Kenworthy
108	Ms Suzanne Gordon
109	City of Melbourne
110	Advocates for Clean Air
111	Australian Community Foods
112	Australian Water Association
113	University of Western Sydney - Urban Frontiers Program
114	Shore Regional Organisation of Councils
115	Western Sydney Regional Organisation of Councils
116	Renewable Energy Generators of Australia Limited
117	RoundTable Renewable and Sustainable Energy
118	Leichardt Council
119	Urban Agriculture Network-Western Pacific
120	Mr Andrew Tidswell
121	Australian Automobile Association
122	Housing Industry Association Ltd
123	Dr B Hampel & Ms M Rimington
124	Hornsby Shire Council
125	Australian Trucking Association
126	Central Coast Community Environment Network Inc.
127	Professor Allan Rodger
128	South Australian Government
129	Master Builders Australia Inc.
130	City of Mandurah
131	Brisbane City Council
132	Professor Frank Stilwell

133 Cycle Safe and the Armidale Air Quality Group

134 Australian Business Council for Sustainable Energy

135 Urban Bushland Council WA Inc

136 Australian Council of National Trusts

137 Nillumbik Shire Council

138 Development Assessment Forum

139 Conservation Council of Western Australia Inc

140 Department of Transport and Regional Services

141 WA Collaboration

142 Brisbane Institute

143 Origin Energy

144 National Capital Authority

145 Department of Health and Ageing

146 Interface Councils

147 City of Newcastle

148 Sustainable Transport Coalition of WA

149 Water Services Association of Australia

150 Southern Sydney Regional Organisation of Councils

151 Committee for Sydney

152 Lane Cove Council

153 Hunter Environment Lobby

154 ACT Government

155 Toowoomba City Council

156 Government of Victoria

157 Department of the Environment and Heritage (Environment Australia)

158 Urban Development Institute of Australia

159 Royal Australian Institute of Architects

160 Blue Mountains Commuter & Transport Users Association

161	Townsville City Council
162	Australian Conservation Foundation and Environment Victoria
163	Cooperative Research Centre for Landscape Environments and Mineral Exploration
164	Ms Margot Black
165	Australian Building Codes Board
166	Railway Technical Society of Australasia
167	Bicycle Federation of Australia Inc
168	Planning Institute of Australia
169	South Sydney Development Corporation
170	University of Western Sydney - Urban Frontiers Program SUPPLEMENTARY (to Submission No. 113)
171	International Association of Public Transport
172	Australian Institute of Landscape Architects SUPPLEMENTARY (to Submission No. 19)
173	Government of Western Australia
174	Australian Farmers Markets Association
175	TecEco Pty Ltd
176	Mr Alan Parker
177	Gecko-Gold Coast & Hinterland Environment Council SUPPLEMENTARY (to Submission No. 81)
178	Urban Agriculture Network-Western Pacific SUPPLEMENTARY (to Submission No. 119)
179	Australian Institute of Landscape Architects SUPPLEMENTARY (to Submission No. 172)
180	Gecko-Gold Coast & Hinterland Environment Council SUPPLEMENTARY (to Submission No. 177)
181	Mr Michael Andersson
182	City of Onkaparinga
183	Mr Martin Olmos
184	Mr Maris Bruzgulis

185 Urban Development Institute of Australia SUPPLEMENTARY (to Submission No. 158)

186 Railway Technical Society of Australasia SUPPLEMENTARY (to Submission No. 166)

187 Committee for Melbourne

188 Railway Technical Society of Australasia SUPPLEMENTARY (to Submission No. 186)

189 Mr Martin Laird

190 Association for the Advancement of Sustainable Materials in Construction

191 Australian Council for Infrastructure Development Limited

192 Urban Bushland Council WA Inc SUPPLEMENTARY (to Submission No. 135)

193 Conservation Council of Western Australia Inc SUPPLEMENTARY (to Submission No. 139)

194 Sustainable Transport Coalition of WA SUPPLEMENTARY (to Submission No. 148)

195 GRD Ltd

196 Save Our Suburbs Adelaide Inc

B

Appendix B – List of exhibits

1. Paper *Sustainable Energy* to the ISOS Rolling Internet Conference, by Andrew Blakers, 28 February 2003, forwarded by Sustainable Population Australia.

2. Paper *Agenda for Urban Quality in Queensland*, forwarded by the Queensland Environment Protection Agency.

3. Copy of a submission by Mr and Mrs J Kavanagh to the Department of Infrastructure, (Victoria), 10 February 2003 forwarded by Mr and Mrs Kavanagh.

4. Paper *Housing and Sustainability* by Prof Peter Newman, 31 October 2002

5. Reports forwarded by the Property Council of Australia prepared by the Allen Consulting Group:

   - *Recapitalising Australia's Cities – A strategy in the National Interest,* May 2003, Discussion Paper for the Property Council of Australia; and
   - *Funding Urban Public Infrastructure - Approaches Compared*, August 2003, Report for the Property Council of Australia.

6. Documents tabled by Bicycle NSW, at a public hearing in Sydney on Tuesday, 27 January 2004:

   - *Improving the State for Cycling in New South Wales,* Bicycle New South Wales Policy 2002-2003;
   - *Pedalling forward: Case studies in active transport initiatives from Sydney's Inner West,* State of Australian Cities National Conference 2003, prepared by Gabrielle Kuiper and Chloe Mason;
   - *Cycling in Sydney – Bicycle ownership and use,* March 2003, prepared by Transport NSW;

- *Cycling to work, works! – for employees, for business and for the environment,* prepared by Roads and Traffic Authority, August 2003;
- *Off to work? On your bike! – A guide for easy and enjoyable cycling to work,* prepared by Roads and Traffic Authority, August 2003;
- Inner west bike map - smart routes getting from A to B, produced by Chain Gang Press for Marrickville-South Sydney Bicycle Group, September 2003; and
- The RTA BigRide – *Mid North Coast to Sydney* – Experience more than just a ride!, 20-28 March 2004.

7. Documents tabled by Western Sydney Area Health Service, at a public hearing in Sydney on Tuesday, 27 January 2004:

- *The bubble-wrap generation,* Good Weekend, January 17, 2004;
- *Planning as a Public Health Issue,* Urban Policy and Research, Vol. 21, No. 4, 317-319, December 2003, prepared by Carfax Publishing;
- *Urban Sprawl and Public Health – Designing, Planning, and Building for Healthy Communities,* prepared by Howard Frumkin, Lawrence Frank, and Richard Jackson; and
- Graph – Healthcare costs and Time.

8. Documents tabled by the Australian Farmers Markets Association at a public hearing in Sydney on Tuesday, 27 January 2004:

- *Charter, Australian Farmers Markets Association, December 2002,* prepared for Australian Farmers Markets Association by Jane Adams Communications; and
- *The Real Rood Revolution – How growers' markets are changing the way we eat,* article in The Bulletin, May 21, 2002.

9. Presentation tabled by the Southern Sydney Regional Organisation of Councils at a public hearing in Sydney on Tuesday, 27 January 2004.

10. Documents tabled by the School of Health Sciences, Deakin University, at a public hearing in Sydney on Tuesday, 27 January 2004:

- *Transport access for job seeking: a pilot program,* prepared by Chloe Mason and Robert Lake for GROW Employment Council, July 2001;
- *Public Goods, Economics and Obesity,* prepared by Colin D Butler, National Centre for Epidemiology and Population Health, Australian National University;
- *Transport and health: en route to a healthier Australia?* The Medical Journal of Australia, 6 March 2000, Volume 172, Number 5;
- *Producing and using Transport Access Guide – Reducing greenhouse gas emissions from transport,* Roads and Traffic Authority;

- *Healthy Parks Healthy People* - The Health Benefits of Contact with Nature in a Park Context, Parks Victoria, November 2002;
- *ARC Linkage project – Part E – Project Description;*
- *Urban Sprawl and Public Health,* Public Health Report, May-June 2002, Volume 117;
- *Exploration of the Health and Wellbeing – Benefits of Membership of Damper Creek Friends Group,* Final Report, August 2003, prepared by Dr Mardie Townsend & Ms Cecily Maller; and
- *But will we want to live there? – planning for people & neighbourhoods in 2020,* prepared by C Lesley Andrews, Wendy Reardon-Smith and Mardie Townsend.

11. Paper *Ageing and the built environment,* tabled by Professor Hal Kendig, Faculty of Health Sciences, University of Sydney, at a public hearing in Sydney on Tuesday, 27 January 2004.

12. Document *Planning for Health – Healthy Urban Environments, Walking School Bus, Research on Parks,* prepared by VicHealth Letter, Issue No. 19 Summer 2003 tabled by Victorian Health Promotion Foundation, at a public hearing in Sydney on Tuesday, 27 January 2004.

13. Documents tabled by the Centre for Mental Health, NSW Health Department at a public hearing in Sydney on Tuesday, 27 January 2004.

14. Documents presented by Dr Harry Blutstein, Integrating Sustainability at the roundtable discussion on Tuesday, 16 March 2004.

15. Documents presented by Mr Geoff Lawler, Director, Sustainable Development and Strategy, City of Melbourne at the roundtable discussion on Tuesday, 16 March 2004.

16. Paper *Funding Choices for Sustainable Transport* presented by Cr Liz Johnstone, Mayor, City of Port Phillip at the roundtable discussion on Tuesday, 16 March 2004.

17. Paper *Liveable Communities: How the Commonwealth can foster sustainable cities and regions* presented by Mr Bill Forrest, Group Manager, Environment & Community Services, Nillumbik Shire Council at the roundtable discussion on Tuesday, 16 March 2004.

18 Presentation presented by Mr David Turnbull, Director, Planning and Development, City of Whittlesea at the roundtable discussion on Tuesday, 16 March 2004.

19. Documents presented by Mr Mark Ricketts Senior Officer, Waste & Sustainability Brisbane City Council at the public hearing on Tuesday, 6 April 2004 -

    - *Economic, Social and environmental analysis of the draft Sustainable Housing Code Version 7x – Volume 1*
    - *Economic, Social and environmental analysis of the draft Sustainable Housing Code Version 7x – Volume 2 Appendices*

20. Booklets, CD-ROMS and a print out of a power point presentation, tabled by Mrs Ann Bunnell, Deputy Mayor, Chair Environment Services, Townsville City Council, at the public hearing on Tuesday, 6 April 2004

21. Documents presented by Mr David Worth, Sustainable Transport Coalition WA at the public hearing in Adelaide on Thursday, 29 April 2004:

    - *Investment Bankers to the Energy Industry,* Simmons & Company International
    - *Petrol Sales, Leaded and Unleaded. Australia 1987 – 2008*
    - *Horizons – New Thinking Needed for Exploration?* Energy Issue 15 January 2004, Wood Mackenzie
    - *General Interest,* Oil & Gas, 17 February 2003
    - *Oil: Living with Less,* Sustainable Transport Coalition Policy Statement.

22. Magazine '*Homeart*' – Inspiring Homes Smart Decorating Design Solutions Colour Advice Cooking Hints & Lots More, presented by Mr Alan Hickinbotham, Hickinbotham Group at the public hearing in Adelaide on Thursday, 29 April 2004.

23. Paper *CSIRO – Sustainability Network,* Sustainability Network Update 36E presented by Dr David Ness at the public hearing in Adelaide on Thursday, 29 April 2004.

24. Document *Transport for Australians: A sustainable future* presented by Australasian Railway Association at the public hearing in Canberra on Thursday, 13 May 2004.

25. Paper '*Funding Choices for Sustainable Transport*' forwarded by Metropolitan Transport Forum on 3 June 2004.

26. Presentation tabled by Dr Lorraine Stephenson, National Manager, Sustainability, Origin Energy at the public hearing in Sydney on Tuesday, 8 June 2004.

27. Paper *'Capitalising Sustainable Communities'*, a program for Urban, Regional and Rural Australia, December 2004, draft eight forwarded by Royal Australian Institute of Architects.

C

Appendix C – List of public hearings

Tuesday, 27 January 2004 - Sydney

Individuals

Dr Chloe Mason

Professor A J McMichael, Director, National Centre for Epidemiology & Population Health

Columbia University, New York

Dr Stephen Leeder, Visiting Senior Research Scientist, Centre for Global Health and Economic Development,

Australian Community Foods

Mr John Brisbin, President

Australian Farmers Markets Association

Ms Jane Adams, Chair

Bicycle Federation of Australia Inc

Mrs Fiona Campbell, Committee of Management

Bicycle New South Wales

Dr Gabrielle Kuiper, President

Mr Neil Tonkin, Chief Executive

Central Sydney Area Health Service

Dr Chris Rissel, Director, Health Promotion Unit

Centre for Health Equity Training, Research & Evaluation

Ms Elizabeth Harris, Director

Centre for Mental Health

Professor Beverley Raphael, Director

Deakin University

Dr Mardie Townsend, Senior Lecturer and Leader of the NiCHE, School of Health and Social Development

Public Health Association of Australia

Ms Pieta-Rae Laut, Executive Director

Southern Sydney Regional Organisation of Councils

Ms Juanita Higgs, Regional Projects Manager

University of Sydney

Professor Hal Kendig, Dean, Faculty of Health Sciences

University of Western Sydney - Urban Frontiers Program

Dr Ray Bunker, Senior Adjunct Research Fellow

Mr Darren Holloway, Senior Research Officer

Ms Anne Hurni, Research Fellow

Professor Bill Randolph

Victorian Health Promotion Foundation

Professor Rob Moodie, Chief Executive Officer

Western Sydney Area Health Service

Associate Professor Steven Boyages, Chief Executive Officer

Dr Tony Capon, Medical Officer of Health

Western Sydney Regional Organisation of Councils

Mr Colin Berryman, Senior Project Officer-Human Sevices

Thursday, 12 February 2004 - Canberra

Individuals

Professor Valerie Brown, Director, Local Sustainability Project

Thursday, 19 February 2004 - Canberra

Australian Automobile Association

Mr Lauchlan McIntosh, Executive Director

Mr John Metcalfe, Director, Research & Policy

International Association of Public Transport

Mr Peter Moore, Executive Director

Thursday, 4 March 2004 - Canberra

ACT Government

Mr Neil Savery, Chief Planning Executive

National Capital Authority

Mr Bruce Chalmers, Landscape Architect

Mr Graham Scott-Bohanna, Managing Director Design

Mr David Wright, Director National Capital Plan

Save the Ridge

Ms Christal George, Sustainability Campaigner

Mr Anton Vikstrom, Sustainability Campaigners

Thursday, 11 March 2004 - Canberra

Property Council of Australia

Mr Peter Verwer, Chief Executive

Royal Australian Institute of Architects

Ms Christine Harvey, Chief Executive Officer

Professor Lindsay Johnston, Chair, National Environment Committee

Mr David Parken, President

Tuesday, 16 March 2004 - Melbourne

Australian Business Council for Sustainable Energy

Ms Julia Birch, Research and Policy Officer, National Office

Mr Ric Brazzale, Executive Director, National Office

Australian Conservation Foundation

Ms Rowena Joske, Strategies Assistant

Ms Monica Richter, Coordinator, Sustainability Programs

Australian Conservation Foundation and Environment Victoria

Mr Wayne Smith, National Liaison Officer

Bayside City Council

Dr Phillip Johnstone, Manager, Environmental Sustainability

Cardinia Shire Council

Mr Phil Walton, Manager, Strategic Development

City of Darebin

Mr Kevin Breen, General Manager, Strategy & Governance

City of Melbourne

Mr Geoff Lawler, Director, Sustainable Development and Strategy

City of Port Phillip

Cr Elizabeth Johnstone, Mayor

City of Whittlesea

Mr David Turnbull, Director, Planning & Development

CSIRO

Dr Peter Newton, Chief Research Scientist, Manufacturing & Infrastructure Technology

Department of Infrastructure, Victoria

Dr Timothy Patton, Acting Director, Corporate Planning & Performance, Planning & Policy Division

Department of Sustainability and Environment, Victoria

Mr Julian Hill, Acting Director, Melbourne 2030 Implementation

Mr Peter Watkinson, Director, Urban Programs

Environment Victoria

Ms Suzie Brown, Director, Sustainable Production & Consumption Program

Hume City Council

Mr Darrell Treloar, Chief Executive Officer

Integrating Sustainability

Dr Harry Blutstein, Director

International Council for Local Environmental Initiatives

Ms Maria Simonelli, Executive Manager

Mornington Peninsula Shire

Mr Alex Atkins, Director, Sustainable Environment

Nillumbik Shire Council

Mr Bill Forrest, Group Manager, Environment and Community Services

Regional Cities Victoria

Mr Richard Hancock, Member, Reg. Cities Vic. & CEO of City of Latrobe

Wodonga City Council

Mr Peter Marshall, Chief Executive Officer

Thursday, 25 March 2004 - Canberra

Australian Institute of Landscape Architects

Mr Paul Costigan, Executive Director

Mr Tony Cox, National President

Mr Neil Hobbs, National Councillor

Thursday, 1 April 2004 - Canberra

Australian Building Codes Board

Mr Ivan Donaldson, Executive Director

Mr John Kennedy, Project Manager, Energy Efficiency

Master Builders Australia Inc.

Mr Neil Evans, National Director Technical & Regulatory Policy

Mr Wilhelm Harnisch, Chief Executive Officer

Tuesday, 6 April 2004 - Brisbane

Individuals

Mr James Lillis

Brisbane City Council

Mr Mark Ricketts, Senior Officer, Waste & Sustainability Pollution Prevention Health & Safety

Brisbane Institute

Professor Peter Spearritt, Executive Director

Delfin Lend Lease

Mr Robert Ball, Engineering Services Manager-Qld

Mr Carl Bruhn, Project Director-Varsity Lakes

Mr Michael Chapman, General Manager Urban Design & Landscape

Mr Guy Gibson, General Manager - Queensland

Mrs Nerida Thomas, Urban Designer

Gecko-Gold Coast & Hinterland Environment Council

Ms Sheila Davis, Campaign Coordinator & Member of Management Committee

Gold Coast City Council

Cr Susan Robbins, Councillor Division 14

Local Government Association of Queensland

Mr Greg Hoffman, Director, Policy and Representation

Northern Sub-Regional Organisation of Councils

Mr Wally Wight, Coordinator

Toowoomba City Council

Ms Dyan Currie, Manager, Development Assessment

Townsville City Council

Mr Greg Bruce, Manager, Environmental Management Services

Mrs Ann Bunnell, Deputy Mayor, Chair Environmental Services

Urban Agriculture Network-Western Pacific

Mr Geoff Wilson, President

Thursday, 29 April 2004 - Adelaide

Individuals

Dr David Ness

Hickinbotham Group

Mr Alan Hickinbotham, Chair and Founder

Mr Michael Hickinbotham, Managing Director

Sustainable Transport Coalition of WA

Mr David Worth, Convenor

Urban Ecology Australia Inc

Mr Matt Fisher, Convenor

Mr Michael Robertson, Board Member

Thursday, 13 May 2004 - Canberra

Australasian Railway Association

Mr Bryan Nye, Chief Executive Officer

Ms Kathryn Rayner

Bus Industry Confederation

Mr Michael Apps, Executive Director

Mr Stephen Lucas, Chairman

Mr John Stanley, Director

Tuesday, 8 June 2004 - Sydney

Individuals

Mr Martin Laird

Australian Water Association

Mr Chris Davis, Chief Executive Officer

Housing Industry Association Ltd

Mr Wayne Gersbach, Executive Director, Planning and Environment

Middle Way Pty Ltd

Mr Geoff Noonan, Principal

Origin Energy

Dr Lorraine Stephenson, National Manager Sustainability

Planning Institute of Australia

Ms Dianne Jay, Chief Executive Officer

Railway Technical Society of Australasia

Dr Philip Laird, Chair, Government Relations Committee

Mr John Watsford, National Chairman

University of New South Wales, Centre for a Sustainable Built Environment

Dr John Blair, Research Associate

Mr Peter Graham, Technology Stream Leader-Architecture Program

Mr Steve King, Associate Director

Mr Benjamin Roche, Coordinator, Sustainable Living Project Environment

University of Sydney, Warren Centre for Advanced Engineering

Mr Piers Brogan, Member, Steering Committee, Sustainable Transport in Sustainable Cities Project

Mr Hugh Ralston, Director

Thursday, 17 June 2004 - Canberra

Engineers Australia

Mr Malcolm Palmer, Research Officer

Mr Matthew Pike, Member of Canberra Division Environmental Engineering Society

Mr Peter Taylor, Chief Executive

Thursday, 31 March 2005 - Perth

Conservation Council of Western Australia Inc

Ms Lisa Brideson, Sustainable Transport Officer

Mr Chris Tallentire, Director

Mr David Wake, Sustainable Transport Officer

Perth Area Consultative Committee

Ms Marilynn Horgan, Executive Officer

Shelter WA

Mr Karel Eringa, Executive Officer

Urban Bushland Council WA Inc

Ms Mary Gray, President

Mr Robert Greenwood, Vice-President

WA Collaboration

Ms Nicole Hodgson, Coordinator

WA Government - Department for Planning and Infrastructure

Dr Andrew Montgomery, Program Leader, Urban Growth Management Urban Policy Division

Western Australia Government-Western Australian Sustainable Energy Development Office

Mr Tony Stewart

Thursday, 28 April 2005 - Sydney

Individuals

Dr Garry Glazebrook

Marsden Jacob Associates PL

Mr Peter Jacob, Director

Dr John Marsden, Director

Murdoch University

Prof Peter Newman, Institute for Sustainability and Technology Policy

Friday, 29 April 2005 - Sydney - Roundtable

Individuals

Dr Garry Glazebrook

Dr Phil McManus

Australian Council for Infrastructure Development Limited

Mr Dennis O'Neill, Chief Executive Officer

Australian Water Association

Mr Chris Davis, Chief Executive Officer

Delfin Lend Lease

Mr Michael Chapman, Principal Urban Designer & Landscape Architect

Environment Business Australia

Mr Justin Sherrard

Marsden Jacob Associates PL

Mr Peter Jacob, Director

Planning Institute of Australia

Mr Marcus Spiller, National President

Royal Australian Institute of Architects

Mr David Parken, Chief Executive Officer

Southern Sydney Regional Organisation of Councils

Ms Rosalind Gibbons, Clean Air Program Coordinator

Ms Juanita Manahan, Regional Projects Manager

Sydney South West Area Health Services

Ms Helen Jones, Health Promotions Officer, Health Promotions Unit

The Warren Centre for Advanced Engineering

Mr Peter Fagan, Technology and Sustainability Committee

Dr Martin Poole, Energy Committee

Mr Hugh Ralston, Director

Mr Richard Walker, Executive Secretary

Western Sydney Area Health Service

Dr Tony Capon, Medical Officer of Health

D

Appendix D – Inspections and discussions

Sydney – Wednesday, 28 January 2004

Inspections

The committee conducted a site visit of the Hub at Miller in Green Valley.

Meetings and discussions at Miller in Green Valley with:

Community Development Service Management

Health Equity Training Management

Inspections

The committee conducted an inspection of the new Miller Police Citizens Youth Club.

The committee conducted an inspection of Gard Park.

Meetings and discussions at Western Sydney Regional Parklands with:

Greening Australia

New South Wales Department of Infrastructure, Planning and Natural Resources

New South Wales National Parks and Wildlife

Inspections

The committee undertook an inspection of the Western Sydney Regional Parklands.

Meetings and discussions at Western Sydney International Dragway with:

URS Corporation

Meetings and discussions at Green Square with:

South Sydney Development Corporation

Inspections

The committee undertook an inspection of the Green Square Town Centre.

Melbourne - Wednesday, 17 March 2004

Inspections

The committee conducted an inspection of the Cairnlea development site at Melbourne's western suburbs.

Meetings and discussions at Cairnlea development site with:

Representatives of the Cairnlea Land Sales Centre

Inspections

The committee conducted a site visit of a VicUrban sustainable development site at Cairnlea.

Meetings and discussions at the St Kilda Town Hall offices of the City of Port Phillip with:

Mayor of Port Phillip

Representatives of the Integrated Transport Strategy Team

Inspections

The committee undertook an inspection of the Inkerman Oasis development.

Meetings and discussions with:

Victorian Parliament's Outer Suburban/Interface Services & Development Committee

Brisbane - Wednesday, 7 April 2004

Inspections

The committee travelled to the Gold Coast Marina Mirage Helipad, Seaworld.

The committee conducted an aerial inspection of the Gold Coast region.

The committee met and held discussions with:

Delfin Lend Lease

Gold Coast City Council

Inspection

The committee travelled to Coomera and conducted a site inspection of the Coomera Pimpama Water Futures Project.

Inspection

The committee travelled to Woongoolba and conducted an inspection of the Rocky Point Co-generation Plant.

Brisbane - Thursday, 8 April 2004

Inspection

The committee travelled to the Queensland University of Technology at Gardens Point.

The committee met and held discussions with:

CRC for Construction Innovation

The committee travelled to the Kelvin Grove Urban Village met and held discussions with:

Queensland University of Technology

Queensland Department of Housing

CRC for Construction Innovation

Inspection

The committee conducted a site inspection at Kelvin Grove.

Meetings and discussions at the Luggage Point Wastewater Treatment Plant at Myrtletown with:

Brisbane Water

Inspection

The committee undertook an inspection of the Luggage Point Wastewater Treatment Plant.

Adelaide - Thursday, 29 April 2004

Meetings and discussions at the Christie Walk with:

Urban Ecology Australia

Inspections

The committee inspected the Christie Walk.

Lucas Heights - Wednesday, 9 June 2004

Meetings and discussions at Lucas Heights Science and Technology Centre with:

Australian Nuclear Science and Technology Organisation

Inspections

The committee conducted inspections of the Science and Technology Centre.

Perth – Wednesday, 30 March 2005

Meetings and discussions at Gosnells Council with:

The Mayor and Council officers

Inspections

The committee inspected the Agonis Building.

Meetings and discussions at Murdoch University with:

Representatives of the Environmental Technology Centre

Inspections

The committee conducted a site visit of the APACE -Grid-connected renewable energy system.

Perth – Thursday, 31 March 2005

Meetings and discussions with:

Manager, Perth Fuel Cell Bus Trial, Department for Planning and Infrastructure

Inspections

The committee travelled to the Perth Bus Depot in an Ecobus where it inspected operations.

Meetings and discussions at the Duxton Hotel with:

Representatives of the Motor Trades Association

Representatives of Celebrate WA

Perth – Friday, 1 April 2005

Meetings and discussions at Carabooda with:

The Executive Officer of the Water Taskforce, Department of the Environment and the President of the Avocado Growers Association of Western Australia

Sydney – Thursday, 28 April 2005

Meetings and discussions with:

Managing Director of Global Resources and the Director of Corporate Affairs

Inspections

The committee conducted a site visit of the Eastern Creek UR-3R (waste to resources) facility.