



Australian Government

**House of Representatives Standing Committee
on Environment and Heritage**

Inquiry into Sustainable Cities 2025

**Submission by the
Department of the Environment and Heritage**

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1. Introduction

Human settlements, known as cities and towns, are where the majority of Australians live, where 95% work and 90% of the nation's GDP is generated. The design, planning, construction and operation of cities and towns are fundamental to the productivity and competitiveness of the economy, the quality of life of all citizens and the sustainability of the continent.

Australian cities (and their urban environments) are concentrated around the eastern seaboard, particularly the area from Brisbane to Adelaide. 83% of Australia's population live within fifty kilometres of the coast. The narrow zone within which the majority of our cities are located accentuates pressures on the natural environment, particularly the fragile coastal environment.

And further a field, our cities' consumption of resources and growing dependencies on trade result in an ecological footprint extending far beyond their geographical locations. And the continuing growth of our cities puts pressure on our historic built environment – our nation's heritage.

Recognising the importance for our cities to continue to function well and provide their current and future inhabitants with a high quality of life, the Australian Government, through the Department of the Environment and Heritage (DEH), has been very active in improving the sustainability of our cities.

At the very highest level, the Prime Minister has established the Sustainable Environment Committee (SEC) of Cabinet, which provides a whole of government focus on achieving environmental sustainability in Australia in co-operation with the Australian community.

And in a move to encourage greater community participation in planning our cities, suburbs, towns and regions, the Australian Government has proclaimed 2004 as the *Year of the Built Environment*. A focus of the Year will be to encourage development of a built environment that is sustainable, energy efficient, safe, healthy and comfortable.

Complementing *Year of the Built Environment* activities, the Government has introduced the Sustainable Cities Programme, which was developed in cooperation with the Australian Democrats as part of the 2003-04 Budget. The programme has a number of elements that are designed to ensure understanding of and action for sustainable Australian cities:

- an environment protection programme to continue the development of national standards and increase compliance and enforcement activities in areas such as air quality, fuel quality, the management and control of chemicals, pollutants, hazardous waste and ozone depleting substances; and
- an urban environment initiative that gives priority to national initiatives to address water quality, environmental information and education, air quality, renewable energy, chemicals, and waste management.

The Government has also implemented a number of other programmes that are designed to restore and protect Australia's fragile environment and heritage. These programmes, while not specifically targeting 'city life' do contribute to improving the sustainability of our cities. These programmes include:

- the Natural Heritage Trust, which has been established to help restore and conserve Australia's environment and natural resources by providing resources to community groups for on-ground environmental and natural resource management projects;
- *Distinctively Australian*, based upon the Government's new heritage legislation which will lead to the identification, protection and promotion of our nationally significant heritage places; and
- the Cities for Climate Protection™, an innovative programme that assists local governments and their communities reduce greenhouse gas emissions.

Legislative action to improve the sustainability of our cities includes the *Environment Protection and Biodiversity Conservation Act 1999*. This important piece of environmental legislation underpins the Australian Government's work under a range of other complementary regulatory instruments, such as the:

- National Environmental Protection Measure for Ambient Air Quality, which sets nationally consistent air quality standards designed to protect all Australians from the adverse impact of air pollution;
- *Fuel Quality Standards Act 2000*, which sets national fuel quality standards, enabling the adoption of tighter new vehicle emissions standards, which both lead to reductions in harmful vehicle emissions; and
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*, which allows the development of uniform Australia-wide regulations to control both the import and the end use of synthetic greenhouse gases and ozone depleting substances, reducing the threat to the ozone layer and cutting Australia's greenhouse gas emissions by the equivalent of nearly six million tonnes of carbon dioxide per year.

The Department also employs practices that aim to improve the sustainability of its own operations, as a city based institution. For example, DEH has improved the energy efficiency of its tenancy, encouraged car-pooling, utilised grey water recycling and composted organic refuse within the Department's main tenancy, the John Gorton Building in Canberra.

However, it must be recognised that unsustainable consumption of our finite, non-renewable natural resources will reduce certain opportunities for Australia's future generations. And as Australia's population grows and ages, the patterns of settlement will change, and that will also create challenges for sustainability.

This submission does not try to address every issue that impacts on the movement to sustainable Australian cities. This is only possible through a collective approach by all levels of government, corporate and industry sectors and the community. However, the submission highlights some of the key sustainability issues facing urban Australia. It also highlights mechanisms that are being employed and could further be employed in addressing urban sustainability at the national level.

2. What is the current state of our cities?

The Australian Government tabled the second national *State of the Environment* (SoE) Report¹ in Parliament in March 2002 (Australian State of the Environment Committee, 2001). The 2001 SoE Report is a snapshot of the condition of Australia's environment, and is prepared every five years by a committee of independent experts appointed by the Government.

The following is drawn from the 2001 SoE Report and related studies. More detailed findings of the 2001 SoE Report are found in Attachment A on page 32.

Overview

In examining urban environments, the 2001 SoE Report notes that over the five years since the first report (in 1996) there had been a number of positive developments relating to cities, including:

Human Settlements

- Streetscapes and parks in most urban centres have been improved significantly. There has also been some revitalisation of strip and village shopping centres.
- Energy efficiency in residences has improved as a consequence of a variety of energy efficiency programmes and increased use of insulation in buildings.
- The reuse of treated wastewater and stormwater is increasing, although it is still at low levels.
- Domestic water use per capita declined for most large urban centres during the 1990s because of water pricing, consumer education, use of water-saving appliances and higher residential densities (linked to lower outdoor water use).
- Industries have developed codes of practice on environmental management.

Atmosphere

- Urban air quality has generally improved. Concentrations of sulfur dioxide, nitrogen dioxide and lead are not of concern in any major urban area. Carbon monoxide is only of concern in a few specific urban locations.

Inland waters

- Some appropriate government responses to management of water resources have been adopted, although implementation is patchy, and the controls may not be sufficient.

Biodiversity

- Urban biodiversity initiatives have been implemented, such as the Western Australian Government's *The Bush Forever*.

The news is not all good however, and the 2001 SoE Report notes trends that need to be managed appropriately in order to achieve sustainability. The Report makes it clear that:

Human Settlements

- Existing pressures from human settlements are not consistent with a sustainable environment.
- Uneven distribution of wealth in our human settlements means that some communities (e.g. small rural towns) do not always have the capacity to look after their environment.

¹ <http://www.deh.gov.au/soe/>

- Most indicators of resource consumption continue to outpace population growth. An example is vehicle kilometres travelled, which is increasing in metropolitan areas due to increased ownership of motor vehicles.
- Despite improvements in energy efficiency, there is a high and increasing per capita usage of non-renewable energy in human settlements leading to increase in greenhouse gas emissions, particularly through electricity generation and transport usage.
- Environmental noise and its effects on residents are increasing as a result of trends such as increased residential density, traffic volumes and the '24-hour city'.

Atmosphere

- There has been no decline in four-hourly concentrations of ozone in urban areas, indicating that photochemical smog in those areas is still of concern.
- Dust and other particulates, including woodsmoke, are of concern in some regions and localities.

Inland waters

- Continued traditional patterns of urban development and stormwater management are increasing pollutant loads and threatening the values of Australia's coastal waters.

Implications of 2001 SoE Report and related findings

Drawing on the findings of the 2001 SoE Report and related reports, a number of key conclusions can be made that require consideration in developing and implementing policies and strategies to move Australian cities towards sustainability.

- Increasing urbanisation, in particular in the larger capital cities of the south eastern corridor and in coastal areas, and the construction of higher density housing within the inner suburbs of our cities, will need to be managed to ensure that the natural and built environment are appropriately protected.
- Unabated urban development in our coastal environment will put significant pressure on these fragile ecosystems.
- Continuing growth in per capita energy use is not sustainable in the long term.
- Increasing motor vehicle usage will need to be managed.
- Continuing growth and activity in our urban environment has led to significant increases in levels of environmental noise.
- Current trends regarding consumption of resources seem unlikely to be sustainable.
- Our current use of our water resources is not sustainable, although cities are not the major offenders. More accurate pricing, more effective policies on recycling and reuse will be needed to ensure that urban uses contribute to solving this most critical of Australia's environmental challenges.

In a number of other areas there is reason to believe that the trends are heading in the right direction, although further reinforcement may be needed:

- Generation of waste is high by international standards, but appears to have stabilised due to current policies on diversion of waste, recycling and waste avoidance;
- Ambient air quality in our cities has generally improved in recent years, but there are significant pressures, which, if left unaddressed, will reverse these gains. The impact of indoor air quality on human health is little understood.
- Growth in greenhouse emissions is being constrained, but global requirements may require consideration of further restraint.

A number of conclusions can be drawn, and these inform the remainder of this submission:

- Good urban and residential design, both at the macro and micro levels, is critical to sustainability.
- Energy efficiency and management will need to improve significantly if Australia is to achieve sustainability.
- Reducing transport demand new technologies based on renewable resources to improve sustainability. Actions include increasing the use of public transport, reducing motor vehicle emissions, new vehicle technologies such as hybrid-petrol/electric and hydrogen fuel cell, better urban design and use of new technologies, such as telecommuting and Internet shopping.
- The development and implementation of new technologies will assist in reducing adverse impacts to the environment from human activities. Some new technologies such as fuel-efficient vehicles and wastewater recycling systems are a key measure in the quest for sustainability.
- We need to maintain our efforts to improve air quality, otherwise, for example, total vehicle kilometres travelled (VKT), which continues to increase at a steady rate, will counteract improvements made over the past decade. Further understanding of the impacts of indoor air quality on human health is required.
- Water needs to be recognised as an urban issue, not just a rural one. There is much potential to reduce urban consumption just by more efficient water use in gardens, eg Xeriscape™² gardens.
- Urban sustainability is not just about the cities themselves, but also their hinterlands and coastal waters.
- Noise - an emerging issue arising through our increased living density and changing lifestyle – needs to be addressed as a serious and worsening threat to urban amenity.
- Material resource efficiency, including recycling and waste management, is a key issue in the move towards sustainability.
- The potential risk of chemical exposure to the environment and human health needs to be reduced and managed.
- Greenhouse gas abatement programmes will need to continue to target Australia's built environment, including the industry and transport sectors.

² Refers to a landscaping method that employs drought-resistant plants in an effort to conserve resources such as water.

3. Moving Australian cities towards sustainability

What is sustainable development?

Many definitions of sustainable development have been proposed. However, most definitions embody two central ideas.

Firstly, development is not sustainable unless it takes a long-term perspective that aims to get the best possible quality-of-life for both present and future generations. Secondly, economic and social development and environmental conservation are interconnected objectives, requiring the integration of economic, social and environmental policies and decision-making.

Put simply, sustainable development (“sustainability”) is “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*” (World Commission on Environment and Development, 1987). It is a matter of inter and intra generational equity, which requires a long-term perspective.

Put another way, sustainability is about improving the quality of life without increasing the use of natural resources beyond the capacity of the environment to supply them indefinitely. It recognises that ecological, social and economic wellbeing are intertwined, and effective integration of these considerations in decision-making processes is required in order to improve community well being and to benefit future generations.

Internationally, the need for sustainability was first acknowledged in 1972, and formed the central focus of the UN (Rio) Earth Summit in 1992. Since then it has become the key concern of many international organisations, including the Commission for Sustainable Development, the United Nations Environment Programme, the Organisation for Economic Co-operation and Development (OECD) and the World Business Council for Sustainable Development.

Within Australia, the importance of the need to achieve sustainable development has been adopted nationally and in national legislation, through such mechanisms as the 1992 Intergovernmental Agreement on Environment³, the National Strategy for Ecologically Sustainable Development⁴, and the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth)⁵.

What is a sustainable city?

The United Nations Human Settlements Programme⁶ describes a ‘sustainable city’ as one where achievements in social, economic and physical development are made to last. It is a city that has a lasting supply of the natural resources on which its development depends (using them only at a level of sustainable yield) while maintaining a lasting security from environmental hazards that may threaten development achievements (allowing only for acceptable risk).

³ <http://www.deh.gov.au/esd/national/igae/>

⁴ <http://www.deh.gov.au/esd/national/nsesd/>

⁵ <http://www.deh.gov.au/epbc/about/index.html>

⁶ <http://www.unchs.org/programmes/sustainablecities/general.asp>

Cities make an important contribution to social and economic development at international, national and local levels, and people are attracted to live in cities for a variety of reasons:

- cities are engines of economic growth;
- cities offer significant economies of scale in the provision of (and choice among) jobs, housing, goods and services, and amenities; and
- cities are important centres of social interaction.

If the activities of our cities are not sustainable, development can be obstructed by environmental degradation in and around growing urban centres. This environmental degradation threatens:

- economic efficiency in the use of scarce development resources;
- social equity in the distribution of development benefits and costs;
- sustainability of hard-won development achievements; and
- productivity in the urban economy in provision of goods and services.

Criteria of a sustainable city

The 2001 SoE Human Settlements Theme Report⁷ (Newton, Baum, Bhatia, Brown, Cameron, Foran, Grant, Mak, Memmott, Mitchell, Neate, Smith, Stimson, Speers, Tucker and Yencken, 2001) provides the characteristics of a city or urban form which meets both ecological and liveability⁸ criteria. Such a city would:

- provide excellent accessibility for personal and commercial uses, while strongly encouraging effective public transport services and usage;
- encourage sustainable transport modes, such as bicycles, reduce car travel, and provide a road network supportive of these aims;
- provide good and attractive access on foot to local shops, transport stops, parks, open space and recreational facilities;
- provide a variety of housing opportunities for all sections of the community and all household types without cost penalties for low-income households;
- provide accessible and well-planned and designed open space for all residents which also acts as an effective means of protecting urban biodiversity;
- use the existing infrastructure and stock of the city with maximum efficiency and effectiveness;
- provide an attractive setting for and encourage the active use of the public domain and thereby increase surveillance over and the security of public activity; and
- provide satisfying emotional experiences of natural and tranquil environments, spatial variety and well-designed urban settings.

An additional characteristic that could arguably be included is to provide information on sustainability issues to enable producers, consumers and individuals to make informed choices about behaviour that promotes sustainability (see section *Educating and encouraging*, page 24).

⁷ <http://www.deh.gov.au/soe/settlements/index.html>

⁸ Liveability can be defined as the degree to which an urban centre provides a safe, inclusive and environmentally benign basis for the social and economic life of all its citizens. (Newton, *et al*, 2001)

The 2001 SoE Report found that the existing pressures from human settlements are not consistent with a sustainable environment, and should current trends continue, Australian cities would not reach sustainability by 2025.

What do we need to do to achieve sustainable Australian cities?

The challenge facing our future cities is to achieve increased environmental efficiencies (lowered levels of resource use and waste generation), reduced environmental degradation and increased livability. This involves several broad strategies that could be considered by governments at all levels, industry and the community.

It should be noted that it is unlikely that a “one model fits all approach” is suitable for Australia’s diverse city type, and a range of innovative strategies and mechanisms will need to be considered and implemented to address sustainability across all of our cities.

1. Ensure long-term and strategic urban design for sustainability

Not all of today’s cities have long-term strategic plans for urban development. Cities need to look at alternate models to the ‘business as usual’ urban growth. There is a need for more integrated planning strategies and assessment tools, which address sustainability issues in a holistic manner, including addressing issues such as access to services (housing density; location of transport nodes, service centres, industries), improved infrastructure, land use planning, conservation of urban bushland and protection of urban and coastal waters. It is also essential that these plans have on-going high-level commitment and support.

The availability of private car travel has made low density residential development possible and, in turn, sprawling suburbs without adequate public transport services and infrastructure have made car travel essential. Cities that have large areas zoned for specific activities: residential, retail/commercial, education, industrial, sports/entertainment, have corresponding large movements of people as they travel between them.

While motor vehicles provide significant benefits, eg through improved personal mobility, they also have their negative impacts on urban life. Typically, the problem is at its worst in larger cities where congestion not only delays trips, but also contributes to increased air pollution when vehicles rely on fuels producing polluting emissions.

At the current level of resource and energy inputs, low-density cities reliant on car travel are unsustainable. This has been known and well understood for decades, but has generally not led to effective solutions. This can be attributed to a number of factors, including environmental and social costs not being factored into the market.

One option that could be considered is to address the issue of declining populations in inner suburbs and revitalise them through innovative urban design and redevelopment, infrastructure development, increased sustainable transport use, and improved traffic management, eg reduced motor vehicle use. Urban designs should locate services and transport nodes so that the use of sustainable transport is encouraged, such as walking, cycling and public transport.

2. Improve the efficiency of resource usage

There is inefficiency in the way we use and recycle our resources in cities today. Moves toward sustainability will require that these inefficiencies be significantly reduced.

Measures to increase the efficiency of energy use by all sectors and increase recycling of materials are currently being established. Such measures include building and construction guidelines, guidelines for energy rating for housing (mandatory scheme for new homes and renovations), urban planning requirements for solar orientation, building design and management requirements for energy efficiency for all government buildings, renewable energy targets, and national standards for energy efficiency in appliances and vehicles.

National Australian Built Environment Rating System (NABERS)

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 and greenhouse, water use, storm water runoff and pollution, sewage and waste, landscape diversity, indoor air quality, transport and occupant satisfaction.

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.

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. 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 health benefits. NABERS has been developed by the Australian Government and is currently the subject of public consultation (<http://www.deh.gov.au/industry/construction/nabers/index.html>).

Water use in Australia is not sustainable, and while cities are not the major end-users of water, they need to make a contribution in improving the efficiency of water use.

High quality water is supplied through reticulated networks to all Australian cities. However, the water use pattern suggests that the bulk of this water supply is used for non-potable purposes. Given forecasts of a long-term decline in rainfall in southern Australia, cities need to initiate urban water strategies to ensure sustainability of supply. These strategies could include full-cost pricing of water supply (including the true environmental cost), conservation and reduction targets, and guidelines for household use of grey water, water sensitive urban design, and wastewater reuse.

New and innovative ways of treating our wastewater should be considered. For example, the application of biotechnology rather than the use of chemicals to treat wastewater has numerous potential environmental benefits. These include the production of non-toxic by-products such as carbon dioxide and water. Small-scale biotechnological sewage systems that treat waste locally could be further investigated as they would minimise the costs of transporting waste over long distances and allow the treated water to be reused locally, for example for irrigation.

To meet future consumption needs and manage air emissions, the sustainable city must not only diversify its sources of energy generation and, where possible and appropriate, incorporate renewable energy sources, but it must also increase the efficiency of its energy use. Lower energy consumption, greater efficiency and increased use of renewable energy sources have potential benefits to city settlements in terms of infrastructure costs, air emissions and more secure long term access to energy sources.

Cities also can increase resource efficiency by sustainable production and consumption, including through increased resource recovery from waste. Australians send around one tonne of waste per person to landfill every year, with much of these wastes potentially valuable recoverable resources (Environment Australia, 1999). Companies and industry can also improve their efficiency through avoiding waste generation, by increasing the reuse and recycling of materials and their waste (see section *Industry Partnerships*, page 25).

3. Set environmental targets and standards to reduce the impact of emissions

Air

Sustainable cities require good air quality and, despite the improvements in fuel standards and vehicle technologies, transport continues to be a major contributor to air pollution in our larger cities. Domestic and commercial heating, industry and lawn mowers add to the mix.

Unlike European cities, electricity generation in Australia happens away from large centres and this is generally not a significant factor for urban air quality. While planning arrangements can influence the location of fixed sources, mobile sources are inextricably connected to urban form and are both a cause and consequence of the low-density cities in Australia.

Research undertaken for DEH by the Bureau of Transport and Regional Economics indicates that while total fleet emissions are generally expected to decline steadily over the next 20 years, output of most pollutants will still remain at significant levels. The total metropolitan vehicle kilometres travelled (VKT) was 113 billion kilometres in 2000. This is projected to increase by 46 per cent by 2020.

Progress to date to improve and protect air quality has generally been good, with the making of the National Environment Protection Measure (NEPM) for Ambient Air Quality⁹ in June 1998, signifying Australia's first national ambient air quality standards for the main (or criteria) air pollutants¹⁰. The standards apply to ambient (or outdoor) air quality as opposed to standards for indoor air quality and those that directly control emissions of air pollutants. The NEPM was recently amended to include monitoring and reporting standards for fine particles, known as PM_{2.5} (particles with an aerodynamic diameter of less than 2.5 μm).

The National Environment Protection Council (NEPC) is currently developing a National Environment Protection Measure for Ambient Air Toxics¹¹, dealing with emissions of 5 air pollutants known to be toxic to human health.

⁹ http://www.ephc.gov.au/nepms/air/air_nepm_downloads.html

¹⁰ Includes standards for carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, photochemical oxidants (measured as ozone) and particles (as PM₁₀, particles with an aerodynamic diameter of less than 10 μm).

¹¹ Includes proposed standards for benzene, formaldehyde, benzo(a)pyrene as a marker for polycyclic aromatic hydrocarbons (PAHs), toluene and xylenes (as a total of ortho, meta and para isomers).

It is necessary to continue to set and review national air quality standards for sustainable air quality, as emission volumes will continue to increase with urban growth.

Water

Urban water issues were recently investigated by the Senate Environment, Communications, Information Technology and the Arts Committee Inquiry into Australia's Urban Water Management, the final report of which was tabled in Parliament in December 2002. The final report¹² comprehensively addresses urban water sustainability issues.

The joint submission prepared by DEH and the Department of Agriculture, Fisheries and Forestry is available at http://www.aph.gov.au/Senate/committee/ecita_ctte/water/submissions/sub054.pdf.

In its 2001 Election Statement “A Better Environment”¹³, the Government announced a commitment to work with state/territory and local governments to achieve target reductions in pollution discharges to key urban and coastal water quality “hotspots”. In line with this commitment, the Government announced in November 2002 the “Coastal Catchments Initiative”¹⁴, which establishes and implements a joint planning and investment strategy to achieve sustainable pollution discharges to coastal water quality hotspots.

Coastal Catchments Initiative (CCI)

The 2001 SoE Report indicated that coastal and urban water quality was threatened by industrial activities, principally wastewater treatment plant discharges, and from diffuse source pollution from urban and peri-urban (agricultural) activity. The majority of water quality issues are attributable to nutrients (nitrogen and phosphorus) and suspended solids.

Since that time, the Australian Government has developed and commenced implementing its *Coastal Catchments Initiative* (CCI), a national component programme of the extension to the Natural Heritage Trust.

The objective of the CCI is to achieve targeted, sustainable, water quality objectives and outcomes, with the priority being urban coastal water, such as Adelaide’s Port Waterways, Port Phillip Bay, Moreton Bay and the increasingly urbanised catchment of the Peel Inlet and Harvey Estuary.

The CCI will achieve its objectives through developing and implementing Water Quality Improvement Plans (WQIPs), which focus on achieving river flow and total pollutant load objectives for associated coastal waters. WQIPs are to be prepared consistent with the Australian Government’s *Framework for Marine and Estuarine Water Quality Protection*, which highlights key water resource issues needed to be addressed for sustainability.

While WQIPs are being developed, the CCI is funding interim projects that:

- address the sources of water quality decline;
- develop models and decision-support tools for land use planning and environmental decision-making;

¹² http://www.aph.gov.au/Senate/committee/ecita_ctte/water/report/contents.htm

¹³ <http://www.liberal.org.au/archive/2001%20election/policy/environment.pdf>

¹⁴ <http://www.deh.gov.au/coasts/pollution/cci/index.html>

- establish competent water quality monitoring systems;
- institutionalise water sensitive urban design; and
- develop market-based instruments for water quality improvements.

Combined, the WQIP and interim projects establish a basis on which future cost-effective investments will be made in coastal water quality protection (for both quality and environmental flows).

Water quality could also be addressed through the establishment of national water standards. For example, the *National Environment Protection Council Act 1994*¹⁵ also provides for development of NEPMs to address water quality. Unlike the Ambient Air Quality NEPM (see above page 12), which addresses mainly public health issues, a water quality NEPM could address both human and ecosystem health issues associated with the values of fresh, marine and groundwater systems.

Whilst establishing standards for human health, eg pathogens, any possible NEPM would need to recognise regional variability in aquatic ecosystems and give flexibility to establishment of “water quality objectives” to protect ecosystem health. Based on the National Water Quality Management Strategy’s planning, management and monitoring frameworks, a water quality NEPM could provide a consistent high standard of protective management to Australia’s urban and coastal waters.

Noise

Growing concerns over increasing noise levels and its effects on residents have raised the profile of noise as an issue in our urban environments, resulting from trends such as increased residential density, traffic volumes and the 24 hour city.

The major sources of noise in urban areas include transport, industry, residential (noise arising from building construction and powered gardening tools), and recreational noise (from entertainment venues and marine vessels), and management of noise from these sources varies significantly according to source and jurisdiction.

For example, external noise from new motor vehicles is controlled through Australian Design Rules¹⁶ (ADRs), noise from airport transport is managed through the *Airport Act 1996* (Cwth)¹⁷, and noise from larger industrial premises is controlled through state and territory government regulations. Noise in residential areas is generally managed through a combination of state/territory and local government controls, however there is no uniform approach to residential noise management in Australia. Australian building standards are currently under revision by the Australian Building Codes Board, with sound insulation standards of interior walls being improved, (although no standards exist for exterior walls).

Possible action could include the requirement for nationally consistent targets and standards to control/manage for noise emissions.

¹⁵ <http://scaleplus.law.gov.au/html/pasteact/2/1168/pdf/NatEnvProCou1994.pdf>

¹⁶ ADR 28 - External Noise of Motor Vehicles

¹⁷ <http://scaleplus.law.gov.au/html/pasteact/1/940/pdf/Airports1996.pdf>

Chemicals

Addressing the generation, use and release of chemicals into the environment will be a significant challenge for the future sustainability of cities. Households are one of several sources where the use of chemicals is increasing.

Evidence indicates that these chemicals (cleaning agents, pharmaceuticals etc) are finding their way into the environment primarily by sewers, stormwater drainage, waterways and also grey water that is being sourced domestically and commercially for reuse. These releases will impact on sewage treatment systems, effluent and biosolid quality, recycling potential and ultimately ecosystems (eg fish, frogs, birds) and human health. The effects will manifest from immediate toxic effects through to slow bioaccumulation of chemicals and more subtle disruption of endocrine and immune systems.

The safe and sustainable use of chemicals depends on effective systems that identify the potential risks of chemical exposure - to the environment and human health - and provide governments, industry and the community with the right tools to reduce and manage those risks. The use of chemicals, and the promotion of initiatives to reuse waste and water will need to consider the fate of chemicals and their presence as potentially harmful contaminants in urban environments.

4. Address damage to urban biodiversity and heritage

The continuing green-fields expansion of cities into the urban fringes produces impacts on the surrounding ecosystems, including the loss of biodiversity. High level urban planning principles and standards would help address these impacts.

Of particular concern from an Australian Government perspective is the potential for urban development to have a significant impact on matters of national environmental significance protected by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EPBC Act requires a person not to undertake an action that has, will have or is likely to have a significant impact on a matter of 'national environmental significance' (NES) without approval under the Act. Matters of NES are World Heritage properties, Ramsar Wetlands, listed threatened species and ecological communities, migratory species, nuclear actions and the Commonwealth marine environment. The Australian Parliament has recently passed legislation to establish matters of national heritage significance as an NES matter. A person proposing to undertake an action that may require approval under the EPBC Act must refer the action to the Environment Minister for a decision on whether or not the action will require approval. An action requiring an approval under the EPBC Act is known as a 'controlled action'.

It is important for urban planners, councils etc to recognise the importance of integrating (as early as possible) in their planning processes the protection of matters of national environmental significance (NES). Identifying and planning for matters of NES in the early concept and planning stages of developments (including long-term land release strategies) can mean reducing or avoiding impacts on these matters; thereby contributing to an environmentally friendly design, and ultimately reduce the downstream requirement for individual land developers to seek approval for their development proposals under the EPBC Act.

Careful consideration needs to be given in the early strategic planning for sustainable cities of the cumulative and combined impacts of future development, including impacts on matters of NES, and for those impacts to be a major consideration in long-term land release and development strategies. Adopting a broad long-term strategic planning approach to urban expansion in Australia will reduce the number of sequential development proposals currently being referred under the EPBC Act.

Apart from providing a publicly transparent process for examining environmental issues associated with such matters as long-term land release and development strategies, the outcome of a strategic assessment may enable the Environment Minister to decide on a less onerous approach for assessing individual land development actions that fall within the matters considered under the strategic assessment.

DEH also supports a national approach to the conservation of the built heritage environment through whole of landscape planning. To ensure this, identification and education programmes are required, which will recognise built heritage values. The use of planning instruments will ensure that where values are identified they are appropriately integrated into planned developments.

The Hon Dr David Kemp MP, Minister for the Environment and Heritage, has declared next year to be the Year of the Built Environment 2004. The year will be celebrated with a programme of events and activities to encourage the community to appreciate and achieve built environments that are sustainable, practical and provide us with an improved lifestyle.

The idea of celebrating our built environment has been endorsed by all state and territory governments, peak building and construction industry organisations, professional bodies and a wide range of interest groups and individuals within our community. Steering committees have been established nationally and in each state and territory, and six fundamental themes have been identified:

- Towards sustainable communities
- Healthy environments
- Excellence in building
- Our built heritage
- Imagining the future
- Design for all

As part of the Year of the Built Environment in 2004, the Australian Government through DEH is developing a Heritage and Sustainability Project that aims to establish the relationship between sustainable development, embodies energy and our built heritage for key decision makers, including local and state/territory government planners and environment agencies, and the general public. It is anticipated that the project will promote the wide range of benefits arising from the adaptive re-use of heritage buildings.

5. Policy integration and government roles in a Federal system

Currently there are a number of Australian, state and territory government programmes and initiatives that address issues such as energy efficiency, traffic congestion and waste recycling.

However, while there has been an integrated approach for the protection and management of Australia's non-urban environment for a significant period of time, no such coordinated strategic approach exists for the urban environment, ie our cities. As such, the majority of government programmes designed to assist Australian cities move towards sustainability are generally implemented in isolation, without high level, strategic coordination.

In moving towards sustainable Australian cities, it is important to recognise the constitutional roles of the levels of government. Most of the constitutional power for urban sustainability issues rests with the state, territory and local governments. Current and future actions by the Australian Government must be undertaken in cooperation with state, territory and local governments who have jurisdictional responsibility for planning and management of their urban environments.

DEH, the Department of Transport and Regional Services, Department of Agriculture, Fisheries and Forestry, and Department of Health and Ageing all should have a strategic role in the management of urban Australia. As well as increased cooperation within government, existing efforts directed towards increased policy integration and cooperation should continue, while respecting the division of roles between the levels of government in Australia's Federal system.

4. The role and contribution of the Department of the Environment and Heritage

Achieving urban sustainability will require the combined efforts of all sectors of society:

- **governments** hold the key to long-term change in policy settings, resource planning and management practice, regulation, pricing and investment in key urban infrastructure that significantly affect the economies and environments of urban communities;
- **industry** will need to invest in new technologies and pursue “design for environment” and “eco-efficiency” approaches; and
- **individuals** will need to make informed choices for sustainable lifestyles and products.

The role of the Department of the Environment and Heritage

Recognising the respective roles of different levels of government in a Federal system, the Australian Government, in particular the Department of the Environment and Heritage, can play a key role through both continuing and enhancing efforts in the following areas:

- Developing and influencing international policies and agreements relevant to sustainable cities;
- Establishing national sustainability policies;
- Setting targets and benchmarks, including setting and strengthening national environmental standards;
- Showing leadership, including leading by example in ensuring its own actions are consistent with sustainable practices;
- Making investments to support the community in achieving sustainability;
- Responding to failures in national markets, for example by encouraging the reflection of environmental and social costs in the supply of goods and services; and
- Educating and encouraging industry and individuals to play their part, through awareness raising, education and disclosure of environmental performance.
- Tracking and forecasting environmental performance, eg through the national State of the Environment report, so that progress to sustainability can be measured and reported.

International sustainability policies and agreements

Active participation in international activities and policies is important to Australia’s ability to develop and maintain sustainable cities, for two reasons. First, the international environmental agenda has an increasing influence on domestic policies. It is important to engage in these discussions internationally to ensure that the Australian perspective, which can often differ from that of other countries, is considered in the decision-making. Second, Australia learns a lot from the experiences of other countries and that helps us in developing our own domestic policies and programmes.

The Department has the lead role on behalf of the Government in engaging on environment and heritage issues internationally. DEH led the Australian delegation to the World Summit on Sustainable Development (WSSD) in Johannesburg in September 2002 and its preparatory meetings. Though this process, a Plan of Implementation was negotiated covering a huge range of issues relating to sustainable cities, from poverty to education and sustainable consumption and production. This Plan will be followed up by discussions annually in the

Commission on Sustainable Development, where DEH also has the lead role on behalf of the Government.

Australia has become party to (or intends to become party to) a number of international agreements/conventions of relevance to developing sustainable cities, and again the Department leads the negotiations in these fora for Australia. The Department also develops and administers any legislation necessary to fulfil our obligations under these agreements.

Examples are the recent Government decision to join the Rotterdam Convention on the Prior Informed Consent (PIC) *Procedure for Certain Hazardous Chemicals and Pesticides in International Trade* and the Stockholm Convention on Persistent Organic Pollutants (POPS), both of which relate to chemicals management. Australia has been and continues to be a leader on phasing out ozone-depleting substances under the auspices of the Vienna Convention and the Montreal Protocol. And we administer the domestic legislation and lead in the international negotiations on hazardous waste issues under the Basel Convention.

It is important for good policy-making and programme development that Australia continues to engage in a range of international fora. For instance, over the years we have learned much from policies and programmes being developed by other countries to improve the sustainability of consumption and production practices. The lessons we learn are not only in terms of possible policies and programmes, but experiences in implementation, including successes and pitfalls. A positive engagement in the work of organisations such as the Commission on Sustainable Development (CSD), the United Nations Environment Programme (UNEP) and the Organisation for Economic Cooperation and Development (OECD) will continue to be very important in this regard.

National sustainability policies

As identified above (*Policy integration and government roles in a Federal system*, page 16), there is currently no national, integrated approach for the protection and management of Australia's urban environment.

Such an approach could ensure that measures to move Australian cities towards sustainability were consistent, efficient and nationally coordinated.

Issues that could be addressed in such a national strategy include the implementation of long term and strategic urban planning, improving the efficiency of resource usage across our cities (including water and energy), setting environmental targets and standards to improve/maintain good air and water quality, and addressing damage to urban biodiversity and impacts on ecosystems.

The strategy would set out areas that need to be addressed to achieve sustainability in our cities, including identification of current programmes and projects that are already in place to support this aim, and new programmes/projects that need to be implemented. It could also allocate responsibilities, eg to the Australian Government, state/territory governments, local governments, industry, and local communities.

Benchmarks and standards

The Australian Government has a role in setting and leading the setting of national goals and standards. These standards can be a powerful mechanism to ensure movement towards sustainability.

Goals and standards can take various forms:

- Commonwealth legislation, to give effect to international agreements, eg aspects of the Environment Protection and Biodiversity Conservation Act, or to regulate national markets, such as fuel and new vehicle emissions standards;
- National Environmental Protection Measures (NEPMs), such as air quality standards;
- Planning, management and monitoring standards such as those developed through the National Water Quality Management Strategy and investment in implementation of the Australian Government's *Framework for Marine and Estuarine Water Quality Protection*;
- Establishing minimum standards for categories of goods and services, such as the Minimum Energy Performance Standards (MEPS) in place for appliances through the National Appliance and Equipment Energy Efficiency Programme.
- Guidelines and agreements set by national policy bodies to which the Department contributes, eg the Building Code of Australia;
- Working with industry to set best practice standards through Standards Australia and other such bodies – a current example is the development of biodegradability standards for plastic bags; and
- Australian Government facilitated voluntary systems, such as the recently released National Building and Energy Rating System (NABERS).

Areas where DEH may have a future role are:

NEPMs

The National Environment Protection Council (NEPC), established under the National Environment Protection Council Act 1994 (*Cwth*) and corresponding state and territory legislation, has responsibility for setting national environmental protection measures. Members of NEPC are Ministers, not necessarily environment Ministers, appointed by first Ministers from each participating jurisdiction, ie Australian, State and Territory Governments. A two-thirds majority is required for the NEPC to make a NEPM.

To date, the NEPC has made a number of Measures that assist in the protection of the environment, including Ambient Air Quality, Diesel Vehicle Emissions, Site Contamination and Used Packaging Materials.

Section 14(1) of the NEPC Act allows NEPC to consider making NEPMs that relate to one (or more) of the following:

- ambient air quality
- ambient marine, estuarine and fresh water quality;
- the protection of amenity in relation to noise (but only if differences in markets for goods and services);
- general guidelines for the assessment of site contamination;
- environmental impacts associated with hazardous wastes;
- the re-use and recycling of used materials.

NEPMs may also relate to motor vehicle noise and emissions

In making NEPMs, the NEPC must have regard for a number of issues, including environmental, economic, and social impacts. Consideration of these issues ensures that the principles of sustainable development are fully recognised.

As such, there is significant further scope to develop NEPMs that would contribute to sustainable cities.

National Codes

The design and construction of new buildings are largely dictated by building codes standards and specifications, the majority of which give little consideration to eco-efficiency or sustainability principles. Energy efficiency measures for houses were only introduced into the Building Code of Australia (BCA) in January 2003. There is much potential to continue incorporating sustainability standards into the BCA.

For example, sustainability standards could cover building materials; building systems such as wastewater recycling, waterless toilets, rainwater tanks, storm water system design, etc; and environmental monitoring and reporting standards. Effective standards are highly visible and credible, and they often form the basis of appropriate legislation, so this approach would be an important strategic initiative.

Building rating schemes will increasingly provide both builders and customers with information that may result in price differentials in time. These schemes include the Australian Building Greenhouse Rating Scheme (which rates energy efficiency and greenhouse performance), and the Nation-wide Housing Energy Rating Scheme (NatHERS) (which rates energy efficiency of housing design). In addition, the newly developed sustainability rating schemes for commercial buildings, Green Star developed by the Green Building Council of Australia that rates building design and the National Australian Built Environmental Rating System (NABERS), developed by DEH that rates building performance on a number of criteria including energy, water, air quality, and waste management will increase both the awareness of, and the demand for, more efficient buildings.

To further improve urban design, consideration could also be given to establishing 'National Urban Design for Sustainability Principles'. These principles could address sustainability in urban design at a high level, including such issues as solar orientation, population density, greenspaces and urban corridors. While much of the detail would need to be left open to allow for local conditions, the adoption of appropriate, broad urban design principles nationally would lay a good foundation for urban sustainability.

Leadership

In order to be an effective advocate for urban sustainability, there is a need for government operations to become more efficient and mindful of sustainability principles. Through initiatives such as environmental purchasing guidelines, energy efficiency retrofits to buildings and the implementation of environmental management systems (EMS), government agencies can lead by example in improving the sustainability performance of their operations.

Government as tenants

As a major tenant in commercial buildings around Australia, governments have the capacity to send powerful market signals about the value of sustaining superior environmental performance over the term of the lease. Governments are increasingly driving change in the private sector as they reduce their property portfolios and private sector building owners seek to retain government tenants.

There has been significant success in improving the energy efficiency of government operations, including current high performing new construction projects such as the Belconnen North Building of the Department of Immigration. A policy for water efficiency in Australian Government operations could drive similar change in the urban marketplace, improving both the efficiency of use and the uptake of water reuse opportunities. As the Government is a large user of water (the Defence potable water bill is more than \$12 million per year), and is responsible for icon sites such as Parliament House, water efficiency in Government operations could both reduce Australian water use and demonstrate leadership to the community.

Investments

Investment is one of the key levers the Australian Government can use to achieve sustainability objectives and it has been used to great effect through processes such as the Natural Heritage Trust.

However, while government investment can be an effective driver to achieve specific environmental objectives, cost is often prohibitive. For this reason, the option is used mainly to stimulate transitions where market failure prevents the transition from occurring itself. In such cases, governments need to be convinced that direct public investment is the only effective means of achieving a significant environmental outcome.

Where considered appropriate, investments can be targeted directly at achieving outcomes, as in the case of grants programmes or environmental subsidies, or can be targeted at assisting the community in making the transition towards sustainability. However, it needs to be recognised that governments cannot 'buy' sustainability, as sustainability requires commitment and action from all stakeholders.

In taking an investment approach, the roles and responsibilities of the various stakeholders needs to be considered, and where the Australian Government is to make an investment a clear role exists. However, the best demarcation between Australian Government and state/territory government responsibilities is not always easily defined or clear-cut, particularly when environmental benefits and costs cross borders and much of Australia's industry operates in national and international markets.

To avoid duplication or unjustified cost-shifting, the Australian Government needs to cooperate with the states and territories to define where and how each can best add value to addressing environmental issues, and to ensure that the costs of achieving national environmental objectives are fairly allocated across the community.

National markets

Many environmental ‘market failures’ occur across state/territory and, at times, national borders. Generally, market failure occurs when the market price of a commodity does not reflect the true value to society of that commodity. Because the economic value of environmental goods and services are not reflected by markets in the form of prices, these type of goods are not used in a sustainable manner.

Examples include biodiversity and iconic heritage sites, which have value for all Australians, and problems like water quality in the Murray-Darling Basin and climate change are not contained within state/territory borders. Benefits in protecting the Great Barrier Reef for future generations of Melbournians are only going to hold limited sway for Queenslanders. And tardiness on the part of one state to reduce greenhouse gas emissions will undermine the efforts of other states in contributing to Australia’s national greenhouse targets.

At the same time, state/territory markets for products and services are becoming increasingly linked as air travel, freight and communication technology breaks down distance barriers. Cost-savings from poor environmental management of, for example, waste from the manufacture of a particular product in one location can undermine the ability of producers in other states to deliver their products in a cost-effective but environmentally friendly fashion.

For these reasons, there can be considerable incentives for individual states and territories to avoid being first movers or to lag behind the pack in addressing environmental issues in the national interest. Failure to address issues individually may have important ramifications for Australians in other states and territories. This defines a role for the Australian Government in using its revenue-raising and legislative powers to facilitate the development of consistent approaches to environmental issues across the nation, and ensure all states and territories are fairly and appropriately engaged.

At the same time, environmental policy is delivered more effectively and efficiently when different needs between states, regions and communities are recognised. The National Action Plan for Salinity and Water Quality and Natural Heritage Trust are key examples of national programmes established to drive a consistent biodiversity, salinity and water quality agenda across the nation, but which is delivered through a structure that is sensitive to variations in regional circumstances and objectives.

Other examples where the Department is encouraging the development of markets for environmental goods and services so that they are used sustainably into the future include:

- **The National Market Based Instruments Pilots Programme** – The Australian, state and territory governments are jointly funding 10 natural resource management projects under the first round of the National Market Based Instruments (MBI) Pilots Programme. The selected projects will investigate ways to use innovative financial arrangements to encourage better land and water management, and to reduce salinity in irrigation-based agriculture.
- **The National Water Initiative** – A recent decision by the Council of Australian Governments (COAG), a key objective is the establishment of best practice water pricing, based on the principles of user pays and full cost recovery. Best practice pricing will aim to include costs involved in water delivery and planning, and the environmental externalities associated with water extraction and water supply systems. It is anticipated

that pricing water to reflect the true costs of supply will encourage the adoption of more water-efficient technologies and practices.

- **Product Stewardship Arrangements for Waste Oil** – Introduced in 2001 to provide incentives to increase used oil recycling. The arrangements comprise a levy-benefit system, where a levy on new oil funds benefit payments to used oil recyclers. The arrangements aim to encourage the environmentally sustainable management and re-refining of used oil and its re-use, and provide incentives to increase used oil recycling

Educating and encouraging

The Australian Government has taken a leading role in educating and encouraging the corporate sector, industry, other levels of government, the community and individuals to play their part through a number of mechanisms. Improved awareness has been shown to lead to changed behaviour in support of a sustainable environment.

Following are some key examples of initiatives to date:

Corporate environmental responsibility

The objective in this area is to assist Australian businesses to incorporate environmental considerations into their decision-making and to voluntarily disclose their environmental performance to key stakeholders.

Through developing, disseminating and promoting voluntary corporate environmental disclosure initiatives, the Department aims to encourage comparison of corporate sustainability performance and enable capital markets and the finance sector, through their role in providing capital and insurance, to reward and drive enhanced sustainability performance, thereby contributing to the more efficient and sustainable use of Australia's natural resources and ultimately making urban settlements more sustainable.

For example, the Government recently released *The Mays Report*¹⁸, which argues that better management of the environmental and social dimensions of sustainability can add to the bottom-line performance of companies. The report aims to encourage further debate on the value of corporate sustainability by investors, boards and company management.

A small but growing number of companies are communicating how they are tackling sustainability by releasing Environmental, Sustainability or Triple Bottom Line (TBL) Reports.

TBL reporting can encourage organisations to understand and communicate to stakeholders the positive and negative impacts of their operations. In doing so, TBL reporting can form the basis of further engagement of their own people, the local community and key stakeholders to identify shared environmental and social goals that often lie beyond the limited focus that routine financial planning and auditing could provide.

To assist companies use TBL to improve their environmental performance, DEH has produced *Triple Bottom Line Reporting in Australia – A Guide to Reporting Against*

¹⁸ <http://www.ea.gov.au/industry/finance/publications/mays-report/index2.html>

*Environmental Indicators*¹⁹. The guide is applicable across all sectors but is particularly useful for those wishing to implement TBL for the first time.

Industry Partnerships

Involving business in sustainability is recognised as an important issue by all elements of society: government, community, NGOs and business itself.

Industry can play in a substantial role in reducing the environmental impact of cities by minimizing resource use and waste. The Australian Government can work with and encourage industry by creating a policy environment that encourages waste minimization, and by engaging in strategic partnerships with industry. These include promoting the voluntary adoption of eco-efficiency concepts and tools by industry as means of improved environmental and financial performance.

For example, DEH has established a number of eco-efficiency agreements with Australian industry sectors, including the Australian Chambers of Commerce and Industry²⁰, Australian Industry Group²¹ and the Electricity Supply Association of Australia²².

Noting that industry is a significant emitter of greenhouse gases in the urban environment, the Greenhouse Challenge Programme²³ is an important vehicle for engaging industry to improve its greenhouse gas performance. This programme is a voluntary partnership between the Australian Government and industry aimed at abating and managing greenhouse gas emissions.

Industry and industry associations can also implement strategies to improve their capacity to deliver more sustainable solutions. These are generally voluntary, and can be developed in partnership with governments. Examples include the Housing Industry of Australia's GreenSmart²⁴ programme, which assists customers to identify those with the capacity to construct sustainable homes, and Australian Council of Building Design Professions Ltd (BDP) Environment Design Guide²⁵, which facilitates cooperation between building design professionals when addressing built environment and environmental issues.

Individuals

All Australians have a responsibility to make the necessary changes to our everyday activities to improve sustainability. It is therefore important to provide the community and individuals with the information required to make informed choices for sustainable city living.

While the Department agrees with the seven objectives for a Sustainable City outlined in the 'Sustainable Cities 2025 - Discussion Paper', the objectives do not adequately recognise a city's human occupants. The functions and purposes of urban developments and the impacts of cities on ecological systems cannot be considered in isolation from the people who inhabit them.

¹⁹ <http://www.ea.gov.au/industry/finance/publications/indicators/foreword.html>

²⁰ <http://www.ea.gov.au/industry/corporate/eecp/agreements/chambers.html>

²¹ <http://www.ea.gov.au/industry/corporate/eecp/agreements/aig.html>

²² <http://www.ea.gov.au/industry/corporate/eecp/agreements/esaa.html>

²³ <http://www.greenhouse.gov.au/challenge/>

²⁴ <http://www.greensmart.com.au>

²⁵ <http://www.architecture.com.au/i-cms?page=60>

It is highly unlikely that sustainability mechanisms, measures, infrastructure and policies, however comprehensive, can achieve ecologically sustainable development if they are not supported and understood by citizenry. Therefore, an additional visionary objective for the Australian city of the future should articulate the need for sustainable cities to be occupied by environmentally informed and concerned citizens, who are motivated and capable of acting in support of ecologically sustainable development.

This can be achieved through environmental education. Environmental education aims to provide citizens with the knowledge, motivation, values, empowerment and skills to voluntarily act in support of sustainable development. Environmental education also seeks to incorporate environmental goals into mainstream society, according them equal priority to other legitimate social and economic objectives. While it does not purport to be the sole solution to urban sustainability challenges, it can however, be used effectively to complement other tools (such as legislation, incentive mechanisms, new technology, grants funding, etc) and increase the likelihood of successful, lasting change.

Some specific uses of environmental education relevant to the inquiry include:

- Promoting the uptake of renewable energy for residential and commercial properties;
- Generating community support for sustainable transport;
- Encouraging councils and companies to abandon existing waste water systems in favour of alternative waste water treatment methods;
- Encouraging responsible water consumption and re-use in residential and commercial enterprises; and
- Creating wide spread community acceptance of a sustainable city as the desired model.

In recognition of the fact that a range of organisations are currently pursuing environment education objectives in Australia, including the Australian Government, state and territory governments, local government bodies, schools, higher and further education institutions, community groups, industry, the media and environmental interest groups, the Australian Government released the *National Action Plan - Environmental Education for a Sustainable Future*²⁶ in July 2000 as a national framework for sustainability education in Australia. The Plan provides leadership to the many different sectors involved in environmental education and promotes better coordination and includes key initiatives to progress the objectives of environmental education on a national scale.

Examples where the Australian Government already undertakes and supports environmental education activities that contribute to sustainable development are:

- With other Departments – joint ventures including Natural Heritage Trust capacity building and the inclusion of environmental competencies in Vocational Education and Training;
- With states and territories – the National Environmental Education Network and the development of a nationally recognised Sustainable Schools programme;
- With local government – funding a Booroondara Council (Victorian local government) pilot project Sustainability and Small Business;
- With schools – development of a National Sustainable Schools programme, GLOBE programme and educational resources including the Hands on For Habitat Awards;

²⁶ <http://www.ea.gov.au/education/publications/nap/pubs/nap.pdf>

- With further and higher education – funding the Macquarie University Action research project as a model for incorporating sustainability study into all university courses and investigating opportunities to assist with reviewing the 77 Vocational Education and Training packages;
- With the community - strategic awareness raising through the National Environmental Education Council, the provision of funding to community groups and community education projects through the environmental education grants programme and the development of community education resources;
- With industry – provision of environmental grant funding to industry groups and review of industry attitudes to the environment through the National Environmental Education Council.
- Labelling (eg appliance, equipment and building)- enables consumer choice. An example is the national energy rating scheme²⁷ that provides consumer information on energy efficient appliances.

Your Home Guide Case Study

The Australian Government, in partnership with the design and construction industries, has developed the *Your Home* guide²⁸ to sustainable housing. The guide is part of the *Your Home* 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.

This best practice technical manual and supporting documentation has been widely distributed and forms the basis for training programmes with the Housing Industry of Australia and tertiary institutions. Negotiations are underway to extend its use as a more formal training course in tertiary institutions.

The products have been widely recognised by the industry as part of the GreenSmart awards. The Housing Industry of Australia recognises its members who have received training to build environmentally sustainable dwellings with a GreenSmart label that assists customers to identify those with the capacity to construct sustainable homes.

In light of the success of this initiative, the concept is being extended to the commercial sector.

Travel Demand Management Case Study

An example of a practical form of environmental education is Travel Demand Management (TDM), also known as Travel Behaviour Change. TDM is intervention (excluding the provision of major infrastructure) to modify travel decisions so that more desirable transport, social, economic and/or environmental objectives can be achieved, and the adverse impacts of travel can be reduced²⁹.

TDM uses a range of strategies designed to facilitate sustainable transport, while reducing the environmental impact of travel. Approaches include challenging traditional beliefs about

²⁷ <http://www.energyrating.gov.au/>

²⁸ <http://www.greenhouse.gov.au/yourhome/index.htm>

²⁹ IEAust, National Committee on Transport 1995:3. This definition is adopted by the Institute of Engineers and used in the AUSTROADS (1995) Guidelines.

travel by encouraging the use of cycling, walking and public transport, reducing single occupant vehicle use and reducing or removing the need to travel.

On the ground actions include such programmes as TravelSmart^{TM30}, which aim to encourage individuals to make small travel behaviour changes by providing information, advice and incentives that impact on travel choices; projects to engage individuals to identify transport options other than automobile travel and, where possible, to reduce single occupancy automobile use; and to assist organisations and government departments to develop travel access guides and to better manage the sustainable movement of people.

Tracking and forecasting

A significant challenge in seeking to make cities sustainable is not having enough data to allow policy makers and planners to design the most effective strategies to improve urban sustainability.

The Department tracks sustainability in a number of ways. Following are three key examples:

National Pollutant Inventory

The National Pollutant Inventory (NPI) is an Internet database of estimated emissions from diffuse sources such as motor vehicles and from point sources such as industrial facilities. The NPI reports on the estimated emissions for 90 substances from a wide range of diffuse sources and industry sectors. Industry operators estimate their own emissions annually and report them to the NPI. Data are presented on the Internet (www.npi.gov.au) through different user-generated reports, a 'make a map' tool or downloading data to analyse offline.

When examining air quality issues in both regional and urban areas, information on the location of sources of emissions and whether they are emitted to air, water or land is the first step in assessing the nature of pollution in Australia. This information can be provided by the NPI. The inclusion in the NPI of estimated emissions of diffuse sources is world leading as other inventories focus on emissions from large facilities.

State of the Environment Reporting

The national State of the Environment Report is the major mechanism in which resource management and environmental issues are comprehensively reported and analysed on scales that transcend state and territory boundaries. National SoE reporting is carried out at a continental scale on the land and for coastal and marine environments. The environment is covered in seven major themes: Atmosphere, Land, Inland Waters, Coasts and Oceans, Biodiversity, Human Settlements, and Natural and Cultural Heritage.

The *Environment Protection and Biodiversity Conservation Act 1999* requires that a national SoE Report be produced every five years. This provides scope for changes in environmental pressures and condition to be tracked over the long term.

³⁰ <http://www.travelsmart.gov.au/>

Meteorological

Sustainable cities, whether an evolution of existing cities or greenfield urban developments, will increasingly depend on “active” systems (probably small scale and locally located) for efficient management of stormwater, sewage, and heating and cooling.

These systems will be heavily dependent on high quality, long-term climate and hydrological data for their design, and on timely, accurate and fine scale weather forecasting for their ongoing operation. It is therefore essential that meteorological and hydrological data networks be maintained to ensure long term historical data series are available for design and that real time data are available to support ongoing forecasting operations. Careful consideration should also be given to the scale of networks available in existing urban areas and in areas of potential urban development so that mesoscale variability of climate information relevant to urban design is captured.

A nationally coordinated approach to enhance data is needed for:

- improved decision making
- better research and forecasting
- more cost effective use of limited resources
- better measurement of responses to decisions and actions.

The Environment Protection and Heritage Council (EPHC) has recently established a national committee to pursue this objective.

Better information, including better integration of information already held by various agencies at different levels of government, will allow progress towards sustainability to be measured and reported. This allows the government to identify areas where further attention and resources are required.

5. Concluding remarks

Urban sustainability embraces a multitude of complex and interwoven issues, affecting all sectors of society. These issues touch all individuals and organisations, and achieving sustainability will require the combined efforts of all.

As demonstrated in chapter 2 of this submission, the 2001 SoE Report indicates that we have made some good progress towards improving the sustainability of our cities. The Australian Government is continuing to implement a number of programmes that are assisting the move towards sustainability of our cities, including the Natural Heritage Trust, the Sustainable Cities Programme, Cool Communities and the Greenhouse Challenge. However, it is recognised that there is much more to do.

That being said, the Australian Government is only one stakeholder. Achieving sustainability of our cities will require cooperative action from all sectors of Australian society, each making their contribution to improve sustainability. Governments need to work together, ensuring good policy integration and taking responsibility for their respective roles. Governments also need to work in partnership with industry and the community.

There is a significant role for the Australian Government through the Department of the Environment and Heritage to continue its work of setting national standards, showing national leadership in planning and management responses, responding to failures in national markets and measuring progress towards sustainability, including sustainable cities. It is particularly important to inform all Australians of issues associated with urban sustainability and to encourage the choices that corporate and individual Australians will need to make for our cities to be sustainable.

If you require any further information on matters covered in this submission, please contact:

Mr Peter Burnett
Assistant Secretary
Environment Standards Branch
Policy Coordination and Environment Protection Division
Department of the Environment and Heritage
p 02 6274 1400 *f* 02 6274 1172 *e* Peter.Burnett@deh.gov.au

Information about the Department of the Environment and Heritage and its' programmes can be found at www.deh.gov.au. Information on Australian Greenhouse Office programmes can be found at www.greenhouse.gov.au.

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Attachment A ~ 2001 SoE Report findings in details

The findings of the 2001 SoE Report were guided by the production of seven theme reports³¹ that provided more detailed information.

Conclusions from the relevant theme reports are summarised as follows.

Population and housing

- Australia is characterised by high rates of urbanisation but low-density cities.
- The bulk of Australians live in urban settlements; three quarters of the population live in large cities (the eight capitals and 13 other cities).
- There has been growth in several inland regions, mainly the larger provincial towns, but the population of smaller towns and rural areas has declined.
- The scale and pattern of human settlement is expected to change very little in the medium term; Projections to 2011 indicate that 61.6 per cent of the population will live in the five largest metropolitan cities (currently at 61 per cent).
- Most growth of urban settlements is expected to happen in the mega-metropolitan areas surrounding the large cities, especially in the southeastern corridor.
- The growth of cities and mega-metro regions has significant impacts and accentuates pressures on the environment, particularly the fragile coastal environment.
- Between 1991 and 1996 all states and territories, except the NT and SA, have had higher rates of population growth in the 3km coastal zone compared to the rest of the entire state or territory.
- The pattern of urban growth has changed in the 1990s – while suburbanisation continues to be the dominant process, there is a trend toward re-urbanisation of the inner city, especially in Sydney and Melbourne.
- The urban form of our large cities is changing – from ‘dispersed’ cities they are tending towards becoming nascent ‘edge’ cities. (Edge cities are the urban form in which multiple urban cores exist; these cores materialise as a result of the movement of jobs to the middle and outer suburbs). This change is partly aided by the changing nature of our economy.
- The nature of housing is changing with more higher density housing being constructed in the inner suburbs. Approximately 80 per cent of all dwellings in Australia are classed as detached houses. While detached housing type dominates in all big cities, Sydney has the smallest share with 63.5 per cent of dwellings detached and 32.8 per cent being semi-detached dwellings or flats and apartments. The other cities have a much smaller proportion of medium-density (attached) dwellings.
- The number of dwellings per unit population is increasing for a variety of social reasons. The floor area per unit dwelling is also increasing.
- The nature and location of consumption and production spaces have changed. Large consumption spaces (‘shopping towns’) have been developed in outer suburbs while there has been a resurgence of the inner and middle suburb shopping strips and local consumer precincts. While office construction is still important, its share of the non-residential construction is much lower than in the early 1990s (down to 15.9% in 1997-98 from 35.4% in 1989-90). The middle and outer suburbs of the big cities are attracting larger shares of non-residential construction investment while the inner city suburbs are tending to attract smaller shares.
- Good urban design is one way of reducing environmental impacts.

³¹ The seven themes are Atmosphere, Biodiversity, Coasts & Oceans, Human Settlements, Inland Waters, Land, and Natural & Cultural Heritage.

Energy use

- As the major centres of population, construction and industrial activities, cities consume the bulk of the energy used in Australia. The data on utilisation of energy is not disaggregated into urban and non-urban categories, as most of the data available is presented by sectors of the economy.
- Australia's energy use per capita is amongst the highest in the world and continues to grow rapidly.
- Total energy use has doubled over the last 25 years and at a faster rate than the GDP.
- While Australia's consumption of conventional energy has continued to increase significantly, the increase in the consumption of renewable energy has increased only by 50% over the past 25 years.
- The main contributor to growth in energy use is the generation of electricity to support the needs of a range of end users.
- Programmes aimed at improving energy efficiency (particularly in the household sector) and the use of sustainable energy sources are not enough to offset the impact of increasing demand.
- Final energy consumption is dominated by industry and transport sectors while the commercial sector has shown the highest increase in energy use.

Transport

- The road network bears the largest share of the transport task.
- Total fuel consumption has grown at a slower rate than vehicle kilometres travelled (VKT) indicating improvements in vehicle fuel efficiency.
- VKT continues to grow at a steady rate (at a rate faster than population growth).
- Travel for all purposes is increasing, as are multi-purpose journeys, with car use dominating all journey purposes.
- The use of public transport by residents of outer and middle suburbs is low compared to those of inner suburbs.
- Increased reliance on private travel has resulted in increased access to amenities but has increased congestion, reduced air quality and increased noise in some areas of cities.

Emerging technologies

- Particulate emissions, a significant part of emissions in urban air, are expected to decline as new fuel quality standards are implemented.
- Bio-solids, a by-product of urban sewage treatment facilities, are increasingly being reused (from 67% in 1992-93 to 99.5% in 1997-98), eg Sydney Water Corporation produces 41 000 dry tonnes of bio-solids per year which are being reused mainly in agriculture and composting/horticulture.

Air quality

- Urban air quality of Australian cities is good, compared to cities of similar size worldwide.
- Outdoor air quality in cities is mainly influenced by emissions from motor vehicles. More than 75% of the carbon monoxide emissions, most emissions of oxides of nitrogen and the major part of the organic compounds in the urban air are sourced from traffic. Particulate emissions from motor vehicles are expected to decline with the implementation of new fuel standards.
- Nitrogen dioxide and sulfur dioxide from industrial sources, lead and sulfur dioxide from motor vehicles are no longer issues of concern in metropolitan Australia.

- Haze in Australian cities showed a declining trend in the 1980s. This, however, was reversed in the mid 1990s with haze occurring more than 10 per cent of the time.
- Indoor air quality is an issue of increasing concern as most urban dwellers spend 90 per cent of their time in enclosed environments (including vehicles).
- Insufficient information is available to determine changes in indoor air quality.

Pressures on water resources, including stormwater management and catchment

- Water use in Australia has been growing over the last 25 years. Total annual water use, across Australia and including agriculture, between 1985 and 1996/97 has increased by 65 per cent.
- Water use by urban and industrial sectors (domestic, industrial and commercial) accounts for 20 per cent of total water use. Irrigation is by far the greatest use of water, using about 75 per cent of water extracted.
- Residential water use in cities accounts for more than 50% of total water use in urban areas, with up to 70% of this being used for non-potable purposes.
- In spite of the increase in the domestic consumption of water over the last 30-40 years, the average daily per capita household water use in major urban areas has trended downwards during the 1990s (from 278 litres in 1993-94 to 253 litres in 1999-2000). This was a period during which significant reform in the water industry occurred and consumer awareness about water conservation increased.
- All Australians living in urban areas have access to reticulated water supply; sewerage services are yet to be made available to all urban dwellers.
- Demand for water use in urban areas is expected to increase, especially in areas such as the 'sun-belt' areas of Western Australia and Queensland.
- The reuse of treated wastewater is increasing, but is still at low levels in Australian cities. Data on wastewater reuse by major urban water authorities indicate only 4.9 per cent by volume of total wastewater output was re-used in 1996-97. Projections for 2001-08 are that 19 per cent by volume of total projected wastewater output from water utility wastewater treatment plants will be reused.
- There is no comprehensive data available on the extent of stormwater reuse in Australia, although anecdotal evidence would suggest that only a small proportion of stormwater generated from urban areas is utilised.
- Approximately 80 per cent of the total water used in Australia is extracted from surface water while 20 per cent is extracted from ground water.
- Groundwater use for urban and industrial purposes is generally low (ranging from 0 per cent in the ACT to 38 per cent in NT) except in WA where the figure is 72 per cent. In most states the larger proportion of the groundwater extracted is used in irrigation.

Urban impacts on coastal waters

- Coastal strip development and urban sprawl pose one of the most important pressures in the coastal zone.
- Eighty three per cent of Australians live within 50 km of the coast. The shift to the coastal margins, especially in Victoria, New South Wales, Queensland and Western Australia, is continuing.
- Population pressures are a major driver of environmental change in estuaries and coastal waters. This has effects as diverse as loss of important coastal and near shore habitats, loss of open space and natural landscape, increase nutrient loads to estuaries and increase stormwater runoff into coastal waters.
- Disturbance of coastal acid sulphate soils by development and land management practices pose a threat to estuarine ecosystems.

- Urban runoff and industrial discharges into coastal waters carry a range of pollutants, including nutrients (nitrogen and phosphorus), sediment, pathogens and toxicants.
- Of the wastewater that is discharged from urban areas nearly three quarters is disposed directly to coastal waters.
- Overseas studies indicate that in highly urbanised catchments, atmospheric sources of nitrogen (principally from vehicle emissions) are a major source of nitrogen to urban coastal waterways. This is a direct threat to the integrity of these systems.
- In 1994 an estimated 1224 GL of treated sewage was discharged to coastal waters from town sewage treatment plants, and this is predicted to increase to 1800 GL by 2020.

Noise

- In all Australian cities the overall amount of environmental noise is increasing and larger proportions of the population are suffering from exposure to noise.
- Increasing levels of traffic and increasing goods movements lead to increasing exceedances of transport noise level guidelines in cities.
- Transport noise, predominantly due to road and air traffic, is of particular concern in parts of the big cities, especially Sydney.
- The pattern of noise, in particular traffic noise, is also changing; noise in the larger cities extends over more of the day.

Material consumption and waste management

- Australia's economy remains heavily reliant on material consumption and export of raw materials.
- Cities are the producers of the bulk of the waste generated in Australia. In 1996-97 a total of 21.2 million tonnes of solid waste was received and disposed at landfills across Australia.
- Litter is also a significant problem and cost to many municipalities.
- Apart from the issues of potential leachates and emissions of methane from landfill disposal, the capacity of existing landfill sites in urban areas is decreasing. Finding new (commercially viable) landfill sites within and in close proximity to existing cities will be an issue in the near future.
- Across the major capital cities 40 per cent of overall waste is from municipal sources (much of this is from domestic households), 26 per cent from commercial and industrial sources and 34 per cent from construction and demolition sources.
- Construction and Demolition (C and D) of buildings contributes 30-40 per cent of all solid wastes disposed at landfill. This equates to approximately eight million tonnes nationwide or 430kg/year/per capita. Between 60-70 per cent of the C and D waste is generated during demolition of residential and commercial buildings.
- Commercial and industrial (C and I) wastes contribute 10-20 per cent of total urban solid waste generated in cities. The major sources of C and I wastes are commercial establishments and non-biodegradable wastes from industrial and manufacturing processes.
- The uptake of recycling of waste is mixed, depending on the waste streams. In some states, and for particular waste streams, recycling rates are approaching disposal rates.
- In spite of increased recycling rates, the absolute waste generation rates remain high.
- Waste reduction targets have generally not been met. In Sydney, the level of waste reduction achieved by 2000 against the 1990 baseline level was close to 18 per cent, well below the 60 per cent target set by the NSW Government.

- There has been a recent increase in the quantity of hazardous waste generated. For example, between 1992 and 1996 the amount of hazardous wastes generated in Sydney more than doubled, from 170 000 to 422 000 tonnes.

Chemicals

- Households are one of several sources where the use of chemicals is increasing, with evidence indicating that these chemicals (cleaning agents, pharmaceuticals etc) are finding their way into the environment primarily by sewers, stormwater drainage, waterways and grey water.

Greenhouse

- Unabated, the greenhouse impact of the built environment will continue to grow. The construction, operation and deconstruction of Australian buildings accounts for over 30% of all energy-related greenhouse emissions (Australian Greenhouse Office, 1999a and Australian Greenhouse Office, 1999b), and when travel demand related to building use is considered, the built environment is responsible for more than 50% of all of Australia's greenhouse gas emissions (Australian Greenhouse Office, 2003).
- Greenhouse emissions from building construction, operation and related travel demand are increasing more rapidly than overall economic growth. Studies have demonstrated that the more efficient use of natural resources, rather than increasing the use of resources, can achieve quality of life improvements³².

Climate variability and planning

The Intergovernmental Panel on Climate Change (IPCC 2001) and more recent Australian research have indicated that Australia is vulnerable to climate change across many sectors and natural and managed systems.

Climate change has the potential to influence the requirements of cities for energy in a variety of ways. On short to medium time-scales, changes in the seasonal distribution of weather patterns including, rainfall, wind regimes, humidity and, in particular, temperature have the potential to create combinations of climatic conditions quite different to those experienced over the past seven or so decades of energy creation and consumption in Australia. Climate change modelling suggests that impacts will vary considerably on a regional scale.

According to the CSIRO's latest climate change estimates (CSIRO, 2001), Australia³³ will be hotter and drier in the coming decades. Some key findings, using climate model simulations include:

- Over most of the continent, annual average temperatures will be 0.4 to 2°C greater than 1990 by 2030.
- Changes in rainfall relative to 1990 tend towards decreases in the southwest of Australia (-20% to +5%) by 2030, and in parts of the southeast and Queensland (-10% to +5%) by 2030.
- Evaporation will increase over most of the country. When combined with changes in rainfall, there is a clear decrease in available moisture across the country.

³² Studies include: Asaad, E., "Housing and health", University of Auckland, 2001; Anink D. Boonstra C. and Mak J., "Handbook of Sustainable Building", James and James Science Publishers, London, 1998; and Woolley T. Kimmins S. Harrison P. and Harrison R., "Green Building Handbook", E and F.N. Spon, London, 1997.

³³ CSIRO have also produced climate change estimates at a regional level.

Vulnerabilities of relevance to planning for sustainable cities include water resources (a drying trend over southern Australia); human health (spread of diseases); coastal communities and associated infrastructure (increased storm damage), and energy and water demands, particularly Perth and Adelaide (increased cooling requirements).

Other challenges arise from the fact that:

- Australia has invested relatively little in researching climate change impacts compared to significant funds directed at mitigation activities, and as a result our understanding is fragmented and limited;
- preparing for climate change will be informed by more precise climate change projections at regional and local scales, including cities that generate their own micro-climatic effects. This will require further improvement and downscaling of global climate models and calibration for Australian conditions; and
- coordinating a national response to climate impacts at regional and sectoral levels is difficult.