NSW PARLIAMENTARY LIBRARY RESEARCH SERVICE

Sustainable Development

by

Tom Edwards

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SUMMARY

Sustainable development is an evolving concept that emerged in the 1980s in response to a growing realisation of the need to balance economic and social progress with concern for the environment and the stewardship of natural resources.

Perhaps the most famous statement on sustainable development comes from the World Commission on Environment and Development (popularly known as the Brundtland Commission) in its report *Our Common Future* published in 1987:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

What this statement means in practice has proven elusive, and many different definitions of sustainable development have been suggested. The uniquely Australian concept of Ecologically Sustainable Development was proposed in the 1990s and has been defined as:

> using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

In New South Wales the *Protection of the Environment Administration Act 1991* gives an extensive definition of how ecologically sustainable development can be achieved. A further definition is given by the NSW Whole of Government Sustainability Principles which were published in 2006:

> Sustainability in the NSW public sector means addressing the needs of current and future generations through the integration of social justice, economic prosperity and environmental protection in ways that are transparent, accountable and fiscally responsible.

A number of different approaches have been taken to measuring sustainable development using indicators. One approach is to use a composite indicator, the other has been to define a set of indicators of sustainability which are reported on over time.

The Ecological Footprint measures how much land area is required to provide the resources consumed and absorb the wastes generated in ‘global hectares’. In 2005, the World’s ecological footprint was estimated at 2.7 global hectares per capita, against a global biocapacity of 2.1 hectares, an overshoot of 29%. Australia’s ecological footprint was recently estimated at 7.8 hectares per capita. In other words it would take more than three planets to provide the natural resources and absorb the waste if everybody lived like Australians. On the other hand, Australia’s endowment of natural resources mean it has a biocapacity of 15.4 hectares, giving it a reserve of 7.6 hectares per person. NSW’s ecological footprint

was estimated in 2001 to be 5.92 ha per capita.

The Environmental Sustainability Index attempts to define and standardise measures of sustainability to enable comparison between nations. It is based on indicators in five categories: environmental systems; environmental stresses; human vulnerability to environmental risk; social and institutional capacity to respond to issues; and global stewardship. Australia's performance was rated 13th overall out of 146 countries in 2005.

The Environment Performance Index records performance against targets in six policy categories – environmental health; air quality; water resources; productive natural resources; biodiversity and habitat; and sustainable energy – and two overall dimensions of environmental health and ecosystem vitality. Australia rates less well on the EPI, being placed 20th overall out of 133 countries. The dimensions in which Australia's performance on the EPI lags in particular are greenhouse gas emissions and the protection of biodiversity.

Sustainable development has been seen as the simultaneous satisfaction of a number of policy objectives. Another approach to measure progress in achieving sustainable development has been to develop a set of indicators that can show progress in meeting such policy objectives. It is difficult to make judgements about exactly what result for an indicator means that sustainable development has been achieved, or to decide how to weight the importance of individual indicators. However, tracking the progress over time of a set of indicators can give an impression of whether development is becoming more or less sustainable.

In 2001, Commonwealth Ministers endorsed a set of 24 headline sustainability indicators for Australia. A report published by Environment Australia in 2002 included data allowing trends in some of these indicators to be assessed. The report found that Australia’s development path was enhancing individual and community welfare and wellbeing; and equity within generations was increasing. However, the report found it was not clear whether economic development was safeguarding the welfare of future generations, or whether biological diversity and essential ecological processes and life-support systems were being protected. The idea was that subsequent reports would allow trends in the indicators to be tracked. To date, no update reports have been published.

The UK and the European Union have also developed indicators of sustainable development to accompany and monitor progress with their sustainable development strategies. The UK has 20 framework indicators which are common to all UK administrations, and a further 48 indicators which are specific to England. The EU has a total of 128 indicators, arranged in ten themes. Recent assessments against the indicators show progress in some areas, but a lack of progress or deterioration against other indicators. The most recent EU assessment concluded that it was clear that the EU was not yet on a sustainable development path.

The Intergovernmental Agreement on the Environment which establishes arrangements by which Commonwealth, State/Territory and Local Governments interact on environmental matters refers to the importance of both ecologically

sustainable development and sustainable economic development.

Australia's National Strategy for Ecologically Sustainable Development was Australia's response to the Brundtland Commission's report. The Strategy was adopted by Australia's three tiers of Government: Commonwealth (Federal), State and Local in December 1992. The strategy's goal is to achieve:

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

Under the Environment Protection and Biodiversity Conservation Act 1999 the annual reports of Commonwealth departments, authorities, companies and other agencies must report on how the agency's activities have accorded with the principles of Ecologically Sustainable Development (ESD)

Other important aspects of Commonwealth sustainability policy aim to make its own activities more sustainable, for example by improving the energy efficiency of government buildings, changing the ways government employees travel, and making government procurement more sustainable.

In New South Wales, the Department for Environment and Climate Change's responsibilities under the Protection of the Environment Administration Act 1991 include to "protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development". The Act also requires the Department to produce a report on the State of the Environment in NSW every 3 years. The most recent report, published in 2006, describes a range of policies which the NSW Government is implementing to make progress towards sustainability. For example:

- the NSW Greenhouse Plan 2005, and the Greenhouse Gas Abatement Scheme, which aim to cut NSW greenhouse gas emissions
- the Metropolitan Strategy, which provides a planning framework for population growth in Sydney until 2030, based on the guiding principles of economic, social and environmental sustainability
- the Metropolitan Water Plan to manage Sydney's water supply and demand, encourage recycling, make provision for the current drought and population growth, and improve river health
- the Building Sustainability Index (BASIX), which enhances the performance of new and redeveloped housing on sustainability criteria, particularly water and energy consumption

The Department of the Environment and Climate Change is also responsible for a number of initiatives aimed at making NSW's households, businesses and communities more sustainable. For example, by providing advice on how households can cut their water and energy use and reduce the use of chemicals around the home, and environmentally friendly features to look for when buying or renovating a home.

The Victorian Department of Sustainability and the Environment was created in December 2002 and has the lead responsibility for sustainability policy in the Victorian Government. Its work on sustainability is assisted by Sustainability Victoria which was created by the Sustainability Victoria Act 2005. Victoria also has a Commissioner for Environmental Sustainability whose role is to report on progress in achieving sustainable development.

Victoria's Environmental Sustainability Framework was published in April 2005. The Framework set three strategic directions for environmental sustainability and thirteen environmental quality objectives. The Framework sets a goal of making significant progress towards these objectives within a generation. To measure progress, the Framework also set a series of interim targets. The Department of Sustainability and the Environment reports biennially on progress towards meeting the targets.

The Victorian Government published an Environmental Sustainability Action Statement in July 2006. It sets out how the Victorian Government intends to implement the Environmental Sustainability Framework. The Action Statement contained 150 sustainability initiatives with government spending of $200 million. In August 2008 the Victorian Department of Sustainability and the Environment published a report on progress against the interim targets between 2005 and 2007. Some targets had already been met while there had been little or no progress towards meeting others.

Following devolution in the 1990s, the UK administrations of England, Scotland, Wales and Northern Ireland are each taking forward separate sustainable development strategies. In 2005 they agreed on a common overarching framework, common objectives, and a common set of indicators for measuring progress. The UK also has an independent watchdog, the Sustainable Development Commission. It monitors and reports on progress in implementing sustainable development policies, and audits reports from UK government departments and agencies on the work they are doing to make their own activities more sustainable. Since 1997, the UK Parliament has also had an Environmental Audit Committee whose remit is to consider how government policies and programmes contribute to sustainable development. The Committee has regularly reported on sustainable development matters.

1. INTRODUCTION

This paper first explores what is meant by sustainable development, considering the different definitions which have been proposed for the term and the debate around the concept as it has evolved. It then considers some of the approaches that have been taken to measuring sustainability using composite indicators and sets of indicators. Finally it sets out the main elements of sustainable development policies adopted by the Commonwealth and New South Wales Governments, and for comparison, those adopted in Victoria, and in the UK.

2. WHAT IS SUSTAINABLE DEVELOPMENT?

Sustainable development is an evolving concept that emerged in the 1980s in response to a growing realisation of the need to balance economic and social progress with concern for the environment and the stewardship of natural resources. It has proven difficult to encapsulate sustainable development in a short, punchy definition, which is also precise and unambiguous. This is reflected in the fact that there is no internationally agreed definition of what is meant by sustainable development. A number of general statements of broad principle have been made and have been widely accepted, but it has been left to nations, organisations and individuals to come up with more precise definitions. Accordingly, hundreds have been offered, and the meaning of sustainable development has become an area of intense academic debate in itself.

UNESCO has said:

> Some argue that there is no need for one agreed definition of sustainable development; instead, sustainable development should be seen as a process of change that is heavily reliant upon local contexts, needs, and priorities. Clearly, while there is no one definition, the global dimensions and impacts of the challenges facing the 21st Century require extensive international co-operation, political commitment and stewardship, and energy to move forward into a sustainable future.[1]

Sustainability, in the broadest sense, is the ability to maintain a certain process or state at a certain rate or level over time. It can be applied in environmental, social, or economic contexts:

- Environmentally e.g. the ability of a fish population to sustain a certain level of harvesting without becoming depleted
- Socially e.g. in demographics, the ability of a population to sustain itself, by having a birth rate that matches the death rate
- Economically e.g. the ability of a company to sustain a certain level of production

[1] UNESCO. *Sustainable development an evolving concept.* http://www.unesco.org/education/tlsf/TLSF/decade/img/DESDbriefWhatisSD.pdf

Munro (1995) gave a definition of development:

> Development is any and all kinds of activities that increase the needs or capacities of people or the environment to meet human needs or improve that quality of human life. The product of development is people who are healthy, well-nourished, clothed and housed; engaged in productive work for which they are well-trained; and able to enjoy the leisure and recreation which we all need. Thus development includes not only the extraction and processing of resources, the establishment of infrastructure, and the buying and selling of products, but also and of equal importance activities such as health care, social security, education, nature conservation, and supporting the arts, among other things. Development is a complex of activities, some with social, some with economic objectives, some based on material resources, some based on intellectual resources, all enabling people to reach their full potential and enjoy a good life.

He then went on to describe sustainable development:

> For development to be sustainable, it must continue, or its benefits must be maintained, indefinitely. This means that there must be nothing inherent in the process or activity concerned, or in the circumstances in which it takes place, that would limit the time it can endure. It also means that it must be worthwhile; it must meet the social and economic objectives just noted. To characterise an activity as sustainable, or to refer to sustainability, is to predict the future – an activity that is risky at best. It follows then that sustainability is inevitably an uncertain characteristic, and that the best we can do is to chose activities that careful analysis tells us are likely to be sustainable. There are many grounds for such choices as well as for rejecting activities that are clearly unsustainable. To summarize then, sustainable development is the complex of activities that can be expected to improve the human condition in such a manner that the improvement can be maintained.[2]

Perhaps the most famous statement on sustainable development, taken from the World Commission on Environment and Development (popularly known as the Brundtland Commission) in its report *Our Common Future* published in 1987:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[3]

This statement has been widely adopted in subsequent discourse on the topic,

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2 Munro, D. *Sustainability: Rhetoric or reality?* In *A Sustainable World: Defining and measuring Sustainable Development.* 1995. Earthscan.

3 World Commission on Environment and Development. *Our Common Future.* 1987. http://www.un-documents.net/wced-ocf.htm

being adapted by the OECD in its sustainable development glossary, and acknowledged by the European Union at the forefront of its strategies on sustainable development.[4]

The roots of the Brundtland Commission's definition are seen as being the 1972 UN Stockholm Conference on the Human Environment, where the conflicts between the environment and development were first acknowledged, and in the 1980 World Conservation Strategy of the IUCN which argued for conservation as a means to assist development and specifically for the sustainable development of species, ecosystems and resources.[5] Bell and Morse further explored the Brundtland Commission's definition:

> Like other development approaches, sustainable development is all about an improvement in the human condition, yet unlike many of the others it does not emphasise human growth or production. The difference rests on the underlying philosophy that what is done now to improve the quality of life of people should not degrade the environment and resources such that future generations are put at a disadvantage. In other words we (the present) should not cheat the future; improving lives now should not be at the price of degrading the quality of life of future generations. At the same time, the sustainable element does not imply stasis. Human societies cannot remain static, and the aspirations that comprise a part of 'needs' constantly shift. [6]

The Brundtland Commission's report said that sustainable development contains within it two key concepts:

> the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
>
> the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

It went on to further elaborate that sustainable development requires:

> Meeting the basic needs of all for food, clothing, shelter and jobs

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4 OECD. *Sustainable Development, in Sustainable Development Glossary.* http://www.oecd.org/glossary/0,3414,en_2649_37425_1970394_1_1_1_1,00.html#1970340

European Commission. *A Sustainable Europe for a Better World. A European Union Strategy for Sustainable Development.* May 2001. http://europa.eu/eur-lex/en/com/cnc/2001/com2001_0264en01.pdf

5 Kates, R, Parris, T & Leiserowitz, A. (2005) *What is Sustainable Development?* Environment. Vol 47(No 3), pp 8-21. http://research.yale.edu/environment/leiserowitz/Sustain_assets/WhatIsSustainableDevelop.pdf

6 Bell, S & Morse, S. *Measuring Sustainability.* 2003. Earthscan.

> The promotion of living standards that are ecologically possible (as opposed to living beyond the world's means, for instance in our patterns of energy use)
>
> Increasing productive potential and ensuring equitable opportunities for all
>
> Demographic developments that are in harmony with the productive potential of the ecosystem
>
> Avoiding overexploiting resources that would prevent a society meeting its needs in the future, and recognising that while technological developments may solve some immediate problems they can lead to even greater ones
>
> That the natural systems that support life on Earth: the atmosphere, the waters, the soils, and living organisms are not endangered. It requires that the adverse impacts on the quality of air, water, and other natural elements are minimized so as to sustain the ecosystem's overall integrity
>
> Recognition of the limits in terms of population or resource use beyond which lies ecological disaster, and requires that long before these are reached, the world must ensure equitable access to the constrained resource and reorient technological efforts to relieve the pressure
>
> That renewable resources like forests and fish stocks should not be depleted and non-renewable resources such as fossil fuels and minerals should be used to ensure that the resource does not run out before acceptable substitutes are available. Species, once extinct, are not renewable. The loss of plant and animal species can greatly limit the options of future generations; so sustainable development requires the conservation of plant and animal species.

Jordan (2008) commented on the definition given by the Brundtland Commission:

> In some ways it is hardly surprising that the world is still struggling to solve the riddle of sustainability twenty years after the landmark Brundtland report. After all, the tense relationship between the two central themes of sustainable development – the simultaneous desire for economic prosperity and environmental protection – has lain at the heart of environmental politics and policy since time immemorial. Brundtland tried to address these tensions by sending out the intuitively appealing message that it is possible to have both at the same time.[7]

At the United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, the Rio Declaration was signed, which contains 27 "principles"

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[7] Jordan, A. *The governance of sustainable development: taking stock and looking forwards.* Environment and Planning. Vol 26, p17-33

for sustainable development. These include the principle of intergenerational equity (considering the needs of future generations), making environmental protection part of the development process and not separate from it, and the eradication of poverty as a requirement of sustainable development. [8]

The political declaration of the World Summit on Sustainable Development, held in Johannesburg in 2002 reflects the conceptualization of sustainable development by referring to the three reinforcing pillars of sustainable development of economic development, social development and environmental protection.[9] More recently, the case has been made for a fourth pillar to be added - cultural diversity. Some authors have identified that the abiding appeal of the definition given by Brundtland is that it is flexible and open to interpretation, and that it is this that has allowed a broad consensus to be built in support of it.[10] Others have suggested that the term is open to such broad interpretation that it is effectively meaningless.[11]

Harding (2006) suggested a pragmatic way forward:

> The concept of sustainability has been much discussed over the past 17 years. Despite millions of articles, thousands of proposed definitions and the attention of a very large number of government and non-government bodies around the world, sustainability remains a contested concept. We seem unable to agree on exactly what sustainability means and how the concept should be interpreted in particular situations.
>
> What is clear however is that the way in which we use resources and deal with waste products requires urgent attention. This is evident due to the declining state of many natural resources and the potential for continuing, and most likely increasing, human pressure on these resources. This pressure comes from population growth, the need to provide for development in poorer nations, and continuing growth in consumption. Hence at this time, it is best to urgently address the unsustainable nature of natural resource use, rather than putting this on hold while we argue endlessly about exactly what sustainability means.[12]

Kates et. al (2007) also suggested different ways of understanding what sustainable development means other than defining the terms – considering what it

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8 Report of the United Nations Conference on Environment and Development. *Rio Declaration on Environment and Development.* June 1992. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

9 United Nations. *Johannesburg Declaration on Sustainable Development.* September 2002. http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POI_PD.htm

10 Jordan, A. *op.cit.* & Kates, R, Parris, T & Leiserowitz, A. *op.cit.*

11 Beckerman, W. *The Chimera of "Sustainable Development".* The Electronic Journal of Sustainable Development. 2007. Vol 1. p. 17-26

12 Harding, R. (2006) *Ecologically sustainable development: origins, implementation and challenges.* Desalination. Vol 187. pp229-239.

seeks to achieve; the way it is measured; the values it encompasses; and the way it is put into practice. They suggested three examples of what sustainable development seeks to achieve: the Millennium Development Goals; the goals set for 2050 by the US Board on Sustainable Development, and the long-term goals (post-2050) set by the Global Scenario Group. Examples given of the values which underpin sustainable development are the Millennium Declaration and the Earth Charter.[13] The following sections of this paper consider the way sustainable development can be measured, and the sustainable development policies that have been put in place.

2.1 Australian definition – ecologically sustainable development

Following the call at the Rio Summit for all nations to develop sustainable development strategies, Australian Governments adopted a National Strategy for Ecologically Sustainable Development (ESD) in December 1992. The Strategy defines ESD as:

> using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.[14]

The Strategy goes on to explain that ESD "is development which aims to meet the needs of Australians today, while conserving our ecosystems for the benefit of future generations", paraphrasing the words of the Brundtland Commission.

Harding (2006) explains that "Ecologically Sustainable Development":

> is a peculiarly Australian term and arose in the early stages of a government initiated discussion of sustainable development in Australia in 1990. It seems that the environmental groups, concerned that the sustainable development discussion process would be hijacked by business and industry and interpreted as just *economically* sustainable development, successfully fought for the inclusion of the *ecologically* in the "official" terminology. This is the term that has been used since then in Australia including in legislation and policy. [15]

2.2 New South Wales

In New South Wales, the *Protection of the Environment Administration Act 1991* gives an extensive definition of how ecologically sustainable development can be achieved:

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13 Kates, R, Parris, T & Leiserowitz, A. *op. cit.*

14 Council of Australian Governments. *National Strategy for Ecologically Sustainable Development.* 1992. http://www.environment.gov.au/esd/national/nsesd/strategy/index.html

15 Harding, R. *op. cit.*

Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) the precautionary principle-namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

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

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

(b) inter-generational equity-namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) conservation of biological diversity and ecological integrity-namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms-namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays-that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems. [16]

The definition of sustainability in the *Protection of the Environment Administration Act 1991* is amplified by the NSW Whole of Government Sustainability Principles which were released in 2006. In 2005, a survey of 38 budget and off-budget agencies in NSW found that they had different views on what the word "sustainability" means, and this undermined the potential for joint action by multiple agencies to address common issues. The Principles provide a common definition of sustainability for use across the NSW public sector. The definition of sustainability and the principles are as follows:

4.1 Definition

Sustainability in the NSW public sector means addressing the needs of current and future generations through the integration of social justice,

[16] *Protection of the Environment Administration Act 1991*, section 6(1)(a) and (2)

economic prosperity and environmental protection in ways that are transparent, accountable and fiscally responsible.

4.2 Principles

4.2.1 Foundation principles

Inter-generational equity

The quality of life of the current generation of people in NSW does not reduce the capacity of future generations to enjoy a similar quality of life.

Sustainable communities

Human settlements maximise social, economic, environmental and cultural opportunities for all residents.

Economic prosperity

Economic resources (such as land, labour, capital and technology) are used in ways that maximise productivity, minimise pollution and waste, and meets the social needs of all, now and for future generations.

Ecologically sustainable development

Economic, social and natural resources are used in ways that conserve and enhance ecological processes, on which life depends, so that quality of life is improved, now and in the future.

Full pricing

The prices of natural resources are set to at least recover the full social and environmental costs of their extraction, use and where appropriate, restoration.

Bio-diversity

The conservation of biological diversity is a fundamental consideration in all economic and social decision-making and action.

The precautionary principle

Where there are risks of serious or irreversible damage, lack of scientific certainty shall not be used as a reason to postpone cost-effective measures to prevent environmental degradation or reduce social harm.

4.2.2 Process principles

Sustainable practice

All NSW government agencies implement their legislation, policies and programs in ways that meet the needs of current and future generations.

Stewardship

Public sector agencies are responsible for the long-term stewardship of the resources under their control and for accounting publicly for the resource use.

Shared responsibility

NSW government agencies work in partnership with other governments, Local Councils, the private sector, non-government organisations, communities, households and individuals on sustainability issues.

Participation

All people likely to be affected by the decisions of agencies have the opportunity to contribute to the decision-making before the decision is made, and to participate in any review of the decision.

The local-global principle

The sustainability of NSW is not achieved at the expense of other jurisdictions or regions.[17]

3. MEASURING SUSTAINABLE DEVELOPMENT

A number of different approaches have been taken to measuring sustainable development using indicators. One approach is to use a single indicator or a composite indicator, the other has been to define a set of indicators of sustainability which are reported on over time.

3.1 Composite Indicators

3.1.1 Ecological Footprint

The concept of the ecological footprint was developed in the 1990s by Mathis Wackernagel and William Rees at the University of British Columbia. It has become a popular benchmark of sustainability. Part of its popularity stems from the fact that it can be used to convey messages about sustainability in a way which can be easily grasped. However, as it concentrates on resource use it is not a measure of overall sustainability and should be considered alongside other social and economic indicators.

The Ecological Footprint measures how much biologically productive land and water area is required to provide the resources consumed and absorb the wastes generated by a human population, taking into account prevailing technology. The annual production of biologically provided resources, called biocapacity, is also measured as part of the methodology. The Ecological Footprint and biocapacity are each measured in global hectares, a standardised unit of measurement equal to 1 hectare with global average bioproductivity.[18]

Estimates suggest that the world has been in overshoot since the 1980s – that more global hectares are required to produce the natural resources used and absorb our waste than the available annual biocapacity can sustain, indicating that at a global level stocks of renewable natural resources such as forest, soils and fish are being depleted. Overshooting has been described as “no longer living on nature’s interest, but drawing down its capital”.[19]
In 2005, the World’s ecological footprint was estimated at 2.7 global hectares, against a global biocapacity of 2.1 hectares, an overshoot of 29%. Footprinting also illustrates the inequities in the way resources are used around the world: high

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17 Department of Premier and Cabinet. *New South Wales Whole of Government Sustainability Principles*. 2006. http://www.dpc.nsw.gov.au/__data/assets/pdf_file/0017/40148/NSW_Whole-of-Government_Sustainability_Principles.pdf

18 Global Footprint Network. *Footprint Basics - Overview* http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/

19 WWF *Living Planet Report 2006.* http://assets.panda.org/downloads/living_planet_report_2008.pdf

income countries have a footprint of 6.4 global hectares; middle income countries 2.2 global hectares and low income countries 1.0 global hectare.

Australia's ecological footprint was recently estimated at 7.8 hectares per capita. In other words it would take more than three planets to provide the natural resources and absorb the waste if everybody lived like Australians. On the other hand, Australia's endowment of natural resources mean it has a biocapacity of 15.4 hectares, giving it a reserve of 7.6 hectares per person – Australians' consumption of natural resources could double, and be within the biocapacity of Australia.[20]

NSW's ecological footprint was estimated in 2001 to be 5.92 ha per capita, an increase since 1996, when it was estimated to be 5.63ha per capita. Residents of Sydney's metropolitan area have been estimated to have a slightly larger footprint than the State as a whole, 6.18 ha per Sydneysider in 2001, again an increase since 1996 (5.87 ha). [21]

In Australia, ecological footprinting has also been adopted by the Environment Protection Authority of Victoria, which commissioned a study to calculate Victoria's footprint. This found that:

> The average Victorian needs 8.1 global hectares of land to sustain his or her lifestyle. Like the rest of Australia, Victorians' Footprint is large because they generally live in large cities, in relatively large houses, travel long distances, and their energy needs are currently sourced primarily from fossil fuels.[22]

An example of the use of ecological footprinting internationally is provided by Wales. Devolution within the UK in 1999 gave Wales a new tier of government and a legislative assembly responsible for certain policy areas. Under the *Government of Wales Act 1998* the Welsh Assembly Government became one of the first administrations in the world to be subject to a statutory duty to promote sustainable development[23]. Wales' first statutory scheme for sustainable development was published in 2000, and in 2001 a set of twelve indicators of sustainable development was adopted, including Wales' ecological footprint. Wales' sustainable development indicators have since been revised, and now comprise four headline indicators, one of which is the ecological footprint, and a further 25 other indicators. The latest assessment uses 2003 data, and shows Wales footprint

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20 WWF *Living Planet Report 2008.* October 2008 http://assets.panda.org/downloads/living_planet_report_2008.pdf

21 Department of Environment and Conservation. *NSW State of the Environment 2006.* May 2007. http://www.environment.nsw.gov.au/soe/soe2006/

22 Environment Protection Authority Victoria. *Victoria's Ecological Footprint.* http://www.epa.vic.gov.au/ecologicalfootprint/ausFootprint/default.asp

23 This duty now falls to Welsh Assembly Government under Section 79 of the Government of Wales Act 2006

is 5.2 global hectares, almost three times the average earth share.[24] The Welsh Assembly Government is currently consulting on proposals to revise its sustainable development scheme. The consultation document says that:

> Within the lifetime of a generation we want to see Wales using only its fair share of the earth's resources, and where our ecological footprint is reduced to the global average availability of resources – 1.88 global hectares per person.[25]

In the context of the European Union's natural resources strategy, which seeks to decouple economic growth from the use of natural resources, the suitability of the ecological footprint as an indicator was reviewed. The review found that:

> The Ecological Footprint is a useful indicator for assessing progress on the EU's resource policies and is unique among the reviewed indicators in its ability to relate resource use to carrying capacity
>
> [It] is an intuitively appealing indicator (easy to communicate and understand with a strong conservation message). The indicator is most effective, meaningful and robust at aggregate levels (national and above).
>
> Further improvements in data quality, methodologies and assumptions are required. There remains a lack of transparency regarding certain aspects.
>
> The Ecological Footprint is designed to measure a specific aspect of sustainability (i.e. human demand for renewable resources for production and consumption as compared to available biocapacity). It is not designed to comprehensively measure overall sustainability. Therefore, many aspects of sustainability are missing from the calculation that should be covered by complementary indicators. [26]

3.1.2 Environmental Sustainability and Performance Indices

The Environmental Sustainability Index attempts to define and standardise measures of sustainability to enable comparison between nations. It is based on 21 key indicators derived from 76 underlying data sets. The indicators fall into five broad categories: environmental systems; environmental stresses; human vulnerability to environmental risk; social and institutional capacity to respond to

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[24] Based on an average earth share of 1.8 global hectares per person, which is lower than the area used in the calculations quoted for Australia above. Welsh Assembly Government. *Sustainable Development Indicators for Wales 2008.* August 2008. http://new.wales.gov.uk/statsdocs/sustain/susdevind2008e.pdf

[25] Welsh Assembly Government. *One Wales: One Planet, Consultation on a New Sustainable Development Scheme for Wales*. November 2008. http://wales.gov.uk/docs//desh/consultation/081119oneplaneten.pdf?lang=en

[26] Best, A et.al. *Potential of the Ecological Footprint for monitoring environmental impacts from natural resource use.* Report to the European Commission, DG Environment. May 2008

issues; and global stewardship. Australia's performance was rated 13th overall out of 146 countries in 2005.

The Environment Performance Index records performance against targets for 16 specific indicators in six policy categories – environmental health; air quality; water resources; productive natural resources; biodiversity and habitat; and sustainable energy – and two overall dimensions of environmental health and ecosystem vitality. The EPI provides a common platform for examining the relationship between economic competitiveness and environmental performance. Australia rates less well on the EPI, being placed 20th overall out of 133 countries. The dimensions in which Australia's performance on the EPI lags in particular are greenhouse gas emissions and the protection of biodiversity.

The NSW State of the Environment 2006 report compared Australia's Ecological Footprint and its ESI and EPI scores with a selection of other countries. This table is reproduced below.

Table 1 - Performance of selected countries on a variety of sustainability measures

Country	Ecological footprint		Environmental Sustainability Index (ESI)		Environmental Performance Index (EPI)	
	Rank (1 = worst)	Size (ha/capita)	Rank (1 = best)	Score (1–100)	Rank (1 = best)	Score (1–100)
United States	2	9.7	45	52.9	28	78.5
Canada	3	7.5	6	64.4	8	84
Australia	5	7	13	61	20	80.1
Finland	6	6.8	1	75.1	3	87
New Zealand	7	6	14	60.9	1	88
United Kingdom	11	5.6	65	50.2	5	85.6
Sweden	13	5.5	4	71.7	2	87.8
Spain	16	4.9	76	48.8	23	79.2
Russia	22	4.4	31	56.9	22	79.4
Germany	22	4.4	40	53.7	27	78.7
The Netherlands	22	4.4	33	56.1	32	77.5
Japan	25	4.3	30	57.3	14	81.9
South Africa	48	2.4	93	46.2	76	62
Argentina	53	2.2	9	62.7	30	77.7
Brazil	57	2.1	11	62.2	34	77
China	70	1.6	133	38.6	94	56.2
Total no. of countries	149		146		133	

Notes:

- The countries with the 10 largest ecological footprints were: United Arab Emirates; US; Canada; Kuwait; Australia; Finland; NZ; Norway; Estonia; Cyprus
- The countries with the 10 best Environmental Sustainability Index scores were: Finland; Norway; Uruguay; Sweden; Iceland; Canada; Switzerland; Guyana;

Argentina; Austria

- The Countries with the 10 best Environmental Performance Index scores were: NZ; Sweden; Finland; Czech Republic; UK; Austria; Denmark; Canada; Malaysia; Ireland

3.1.3 Indicator of Genuine Progress

GDP is perhaps the most popularly used indicator of economic performance. Commentators have suggested problems with the use of GDP. For example, GDP often counts pollution as a double gain: once when it is created, and then again when it is cleaned up. If today's economic activity depletes the physical resource base available for tomorrow, then it is not creating well-being; rather, it is borrowing it from future generations. The GDP counts such borrowing as current income.

The Indicator of Genuine Progress is an attempt to address these shortcomings. It was created by Redefining Progress, a US environmental think tank.

It starts with the same consumption data that the GDP is based on, but then makes some crucial distinctions. It adjusts for factors such as income distribution, adds factors such as the value of household and volunteer work, and subtracts factors such as the costs of crime and pollution.

Comparing world GDP and GPI data from 1950 to 2004 shows an average annual growth rate of 9% for GDP compared to 4% for the GPI. When the indicators are compared per capita, while GDP per capita rose from $11,672 in 1950 to $36,596 in 2004, GPI has remained relatively flat since 1978, rising from $8,611 to over $15,000 in 1978, and remaining around $15,000 ever since.

Commenting on these findings, the reports authors said that this implies that "since 1980 or so the marginal benefits associated with growth […] have been offset by the marginal costs", and that this finding, and the findings of similar studies was evidence of a so-called "threshold effect":

According to Max-Neef (1995) 'for every society, there seems to be a period in which economic growth brings about an improvement in the quality of life, but only up to a point – the threshold point – beyond which, if there is more economic growth, quality of life may begin to deteriorate.'[27]

The authors report that while other commentators have argued that the threshold effect observed in GPI data is more an artefact of flawed method than a true reflection of welfare decline, they believe that their latest work (with the results noted above) had at least partially remedied these concerns. [28]

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[27] Max-Neef (1995) cited in Redefining Progress. *The Genuine Progress Indicator 2006.* February 2007. http://www.rprogress.org/publications/2007/GPI%202006.pdf

[28] Redefining Progress. *Op. cit.*

3.1.4 The Happy Planet Index

The Happy Planet Index is another composite indicator. It has been proposed by the New Economics Foundation (NEF). It combines three separate indicators: ecological footprint, life-satisfaction and life expectancy, and is a way of reflecting the average years of happy life produced by a given society, nation or group of nations, per unit of planetary resources consumed. It is calculated on a scale from 0 to 100. The HPI is not an indicator of the happiest country on the planet, or the best place to live. Nor does it indicate the most developed country in the traditional sense, or the most environmentally friendly. Instead, the HPI combines all of these providing a method of comparing countries' progress towards the goal of providing long-term well-being for all without exceeding the limits of equitable resource consumption. In the NEF's 2007 assessment, the country with the highest HPI was Vanuatu, with a score of 68.2. The lowest, and perhaps less surprising than some other results, is Zimbabwe's at 16.6. No country achieves an overall high score and no country does well on all three indicators. Australia scored 34.1, 139th out of the 178 countries in the assessment. [29]

3.2 Sets of indicators

Sustainable development has been seen as the simultaneous satisfaction of a number of policy objectives – social; economic and environmental. Therefore one approach which has been taken to measure progress in achieving sustainable development has been to develop a set of indicators which can show progress in meeting such policy objectives. It is difficult to make judgements about exactly what result for an indicator means that sustainable development has been achieved, or to decide how to weight the importance of individual indicators. However, tracking the progress over time of a set of indicators can give an impression of whether development is becoming more or less sustainable. The choice of indicators will depend in part on the definition of sustainable development that is used, and also on the availability and ease of collection of indicator data.

Australia has produced a set of national indicators of ecologically sustainable development. Two further examples of the development of sustainable development indicators are provided by the UK and the European Union.

3.2.1 Australia

In 2001, Commonwealth Ministers endorsed a set of 24 headline sustainability indicators for Australia. These indicators are shown in the table:

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[29] New Economics Foundation. *Countries of the World in rank HPI order.* http://www.happyplanetindex.org/list.htm

Table 2 – Australia's indicators of Ecologically Sustainable Development

Australia's indicators of Ecologically Sustainable Development
Real Gross National Income (GNI) per capita
Real Gross per capita disposable income
Percentage of people aged 25-64 who have attained upper secondary and/or higher level of qualifications
Disability adjusted years life expectancy (DALE)
Number of occasions where concentrations of pollutants exceeded NEPM standards for ambient air quality in major urban areas
Total SOx, NOx and particulate emissions
Growth in Multi-factor Productivity (Gross product per combined unit of labour and capital)
Real GDP per capita
National Net Worth and National Net Worth per capita
Proportion of surface water management areas and groundwater management units with diversions within 70% of sustainable yield
Total area of all forest type
Percentage of major Commonwealth managed harvested wild fish species classified as fully or under-fished
Renewable energy use as a proportion of total and Total renewable and non-renewable energy use
Net value of rural land
Adult female full time (ordinary time) average weekly earnings as a proportion of adult male full time (ordinary time) average weekly earnings
Percentage difference in the year 12 completion rate between bottom and top socio-economic decile
Percentage difference in burden of life years lost due to i. disability and ii. Mortality between bottom and top socio-economic quintile
Percentage difference in the year 12 completion rate between urban and remote locations
Proportion of bio-geographic sub-regions with greater than 30 per cent of original vegetative cover (as a percentage of 354 sub regions) and proportion of bio-geographical sub-regions with greater than 10% of the sub-region's area in protected areas at 2000
Number of extinct, endangered and vulnerable species and number of endangered ecological communities
Total net greenhouse gas emissions
Proportion of estuaries in near pristine or slightly modified condition
Proportion of freshwater assessed sites which are with high in-stream biodiversity
Proportion of assessed catchments that are in moderate or good condition

Source: Environment Australia. *Are We Sustaining Australia? Report Against Headline Sustainabilty Indicators.* 2002.
http://www.environment.gov.au/esd/national/indicators/report/index.html

A report published by Environment Australia in 2002 described the 24 indicators, and the rationale for choosing them. For some of the indicators the report included

data allowing trends in the indicator to be assessed, while for others the report stated the value for the indicator for the baseline year. The report made an assessment of progress against the three objectives of Australia's Strategy for Ecologically Sustainable Development. It found that Australia's development path was enhancing individual and community welfare and wellbeing; and equity within generations was increasing. However, the report found it was not clear whether economic development was safeguarding the welfare of future generations, or whether biological diversity and maintaining essential ecological processes and life-support systems were being protected.[30] The idea was that subsequent reports would allow trends in the indicators to be tracked. To date, no update reports have been published.

Some of the indicators of Ecologically Sustainable Development are the same as the fourteen headline indicators used by the Australian Bureau of Statistics in its Measures of Australia's Progress. The first such report was published in 2002, and summary indicators are updated each year[31]. More detailed reports are published on a five-yearly cycle with the most recent report being published in 2006, and the next update due to be published in 2011[32].

3.2.2 The UK

The UK produced its first sustainable development strategy in 1994. It issued a revised strategy in 1999. This was accompanied by a large suite of indicators, 149 in total, with fifteen 'headline' indicators. The Government reported on progress against these indicators annually. The UK Government's watchdog, the Sustainable Development Commission recommended that these indicators should be revised as part of an overall assessment it made of UK SD policy in 2004.[33] In 2005, the UK's sustainable development strategy was revised. In the intervening time devolution had changed the political landscape in the UK, with devolved administrations in Scotland, Wales and Northern Ireland taking forward their own sustainable development policies. This is recognized in the revised strategy which contains a set of 20 framework indicators which are common to all UK administrations and a further 48 indicators which are specific to England.[34] Some

30 Environment Australia. Are We Sustaining Australia? Report Against Headline Sustainabilty Indicators. 2002. http://www.environment.gov.au/esd/national/indicators/report/index.html

31 Australian Bureau of Statistics. *Measures of Australia's Progress: Summary Indicators, 2008*. September 2008. http://www.abs.gov.au/ausstats/abs@.nsf/productsbytitle/8744F8D3918161FCCA25717E008351A8?OpenDocument

32 Australian Bureau of Statistics. *Measures of Australia's Progress, 2006.* May 2006 http://www.abs.gov.au/ausstats/abs@.nsf/productsbytitle/8CCED7939CA66EC6CA25717F0019014A?OpenDocument

33 Sustainable Development Commission. *Indicators.* http://www.sd-commission.org.uk/pages/indicators.html

34 DEFRA. *Sustainable Development. Reviewing Progress* http://www.defra.gov.uk/sustainable/government/progress/index.htm

indicators are made up of more than one measure, so there are a total of 128 measures. Some examples of the indicators and measures are shown in the table:

Table 3 - UK Sustainable Development Indicators

Type of indicator (number of indicators)	Example of a measure
Greenhouse gas emissions (3)	Total greenhouse gas emissions (excluding aviation and shipping), data available 1990-2007
Electricity generation (2)	Renewable energy as a % of electricity generation, data available 1990-2006
Carbon dioxide and other emissions (7)	Heavy Goods Vehicle (HGV) CO2 emissions, freight moved and Gross Domestic Product, 1990 to 2006
Resource use (5)	Domestic water consumption, Litres per person per day, 1995 to 2006
Waste (2)	Total waste from all sectors disposed of in landfill sites, 1998 to 2006
Natural resources (12)	Percentage of fish stocks harvested sustainably around the UK 1990 to 2006
Contextual indicators (5)	Gross Domestic Product, 1990 to 2007
Society (3)	Number of crimes: (a) vehicle thefts (b) domestic burglary (c) violent crime, 1991 to 2007-8
Employment and poverty (7)	People of working age in employment, 1990 to 2007
Education (2)	19 year-olds with level 2 qualifications and above, 1990 to 2007
Health (6)	Healthy life expectancy (a) men and (b) women, 1991 to 2004
Mobility and access (4)	How children get to school, 1989-91 to 2006
Social justice/environmental quality (8)	Number of homeless people sleeping rough, 1992 to 2007
International (1)	UK overseas development aid as a % of Gross National Income, 1990-2006
Wellbeing (1)	Overall life satisfaction, % of people reporting overall life satisfaction ratings, on a scale from 0 to 10, 2007 to 2008

Source: DEFRA. *Sustainable development indicators in your pocket 2008* . July 2008.
http://www.defra.gov.uk/sustainable/government/progress/documents/SDIYP2008_a6.pdf

The Government reports on progress against the indicators annually. For each indicator the reports show whether since the last measurement there has been either: a clear improvement; little or no change; a clear deterioration; or there is insufficient information. The latest assessment, published in 2008 showed that since 1990: 49 measures showed an improvement; 11 were unchanged; 16 showed a deterioration; and 24 showed no change. Compared to 1999: 53

measures showed an improvement; 30 were unchanged; 11 showed a deterioration; and 6 showed no change. [35]

3.2.3 European Union

The European Union developed its first sustainable development strategy in 2001. It was revised in 2006. The strategy required the European Commission to develop a set of sustainable development indicators. A first set was agreed in 2005, and revised in 2007. There are a total of 128 indicators, arranged in ten themes. Indicators are arranged in three "levels" with level 1 indicators relating to the lead objectives of each theme, a second level of indicators related to the other main objectives of each theme, and a third level of indicators related to specific actions envisaged under each theme. Examples of the three levels of indicator are shown in the table.

Table 4 – European Union Sustainable Development Indicators

Theme	Level 1	Level 2	Level 3
Socio-economic development	Growth of GDP per inhabitant	Business investment, total gross fixed capital formation (GFCF) expressed as a percentage of GDP, for the private sector.	Unemployment rate by gender
Resource use and waste	Resource productivity (GDP divided by domestic material consumption)	Electricity consumption by households	Area under organic farming
Social inclusion	Persons at risk of poverty, by gender	Early school leavers	Individual's level of internet skills
Demographic changes	Employment rate of older workers	Life expectancy by gender	Average exit age from the labour market
Public health	Healthy life years and life expectancy at birth by gender	Death rate due to chronic diseases by gender	Population exposure to air pollution by particulate matter
Climate change and energy	Greenhouse gas emissions	Energy dependency (reliance on imports to meet energy needs)	Electricity generated from renewable sources
Sustainable transport	Energy consumption by transport mode	Modal split of passenger transport	Average CO2 emissions per km from new

[35] DEFRA. *Sustainable development indicators in your pocket 2008* . July 2008. http://www.defra.gov.uk/sustainable/government/progress/documents/SDIYP2008_a6.pdf

			passenger cars
Natural resources	Fish catches from stocks outside safe biological limits	Ratio of fellings to timber increment	Land at risk of soil erosion
Global partnership	Development assistance as a share of gross national income	EU imports from developing countries by income group	Foreign direct investment in developing countries by income group
Good governance		Shares of environmental and labour taxes in total tax revenues	E-government online availability

Source: Eurostat. *Sustainable development indicators.* http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1998,66119021,1998_66391726&_dad=portal&_schema=PORTAL

Eurostat, the European Union's statistical office, produces an assessment of trends in the indicators every two years. The most recent report was published in 2007, and summarised its findings as follows:

> An evaluation of progress since 2000, based on the headline indicators, presents a rather mixed picture. Recent developments can be considered as favourable for four of eleven indicators, namely those for: socioeconomic development, GDP growth increased by 1.6 % per year on average in the EU-27, from 2000 to 2006; sustainable consumption and production, resource productivity increased by 2.3 % per year on average between 2000 and 2004 in the EU-15, showing decoupling between resource use and economic growth; demographic changes, the employment rate of older workers increased by 6.6 % between 2000 and 2006 in the EU-27, making it possible to reach the target of 50 % by 2010 if this rate of growth is sustained; and global partnership, the EU-15 official development assistance, as a share of gross national income increased overall by 5.1 % per year on average between 2000 and 2005, and the 2005 intermediate target was exceeded.
>
> Changes are clearly unfavourable for the two indicators related to climate change and energy: EU-15 emissions of greenhouse gases had decreased by 2% in 2005 compared to their Kyoto base year value, when the objective is a decrease of 8% by 2008-2012. The share of renewables stood at only 6.7% in the EU-27 in 2005, compared to a target of 12% by 2012. Nevertheless, measures either planned or implemented mean that the Kyoto target can still be achieved and that further progress on the share of renewables is likely.
>
> There has been moderate progress for the four other indicators monitoring the key challenges related to transport, natural resources, and public

> health. There are no real signs of decoupling of energy consumption of transport from economic growth. The common birds index has been relatively stable since 2000, and fish catches taken from stocks outside safe biological limits showed levels in 2005 comparable to those of 2000. Healthy life-years at birth are growing more quickly compared to life expectancy, but by less than 1 % per year.

The report concluded that:

> The objective of this report is not to give an absolute evaluation of whether the EU is sustainable, as there is no political or scientific consensus as to what this state of sustainability would be, nor on what are the optimal levels for many of the indicators presented in this report. The EU sustainable development strategy highlights commonly agreed objectives to put Europe on what has been implicitly defined as a sustainable development path. This report therefore provides a relative assessment of whether Europe is moving in the right direction given these objectives and targets. In doing so, the focus is on 'sustainable development' rather than 'sustainability', as described in the introduction.
>
> Based on the evaluation of the objectives and targets highlighted in the sustainable development strategy, the analysis in this report clearly shows that the European Union is not yet on a sustainable development path. This is particularly the case for the key challenge on climate change and clean energy, where, based on historical trends, none of the targets are within reach at this stage, although a number of measures and policies are now in place which should have a positive impact.[36]

[36] Eurostat. *Measuring progress towards a more sustainable Europe. 2007 monitoring report of the EU sustainable development strategy.* 2007 http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-77-07-115/EN/KS-77-07-115-EN.PDF

4. SUSTAINABLE DEVELOPMENT POLICIES

4.1 Australia

The Intergovernmental Agreement on the Environment of 1 May 1992 which establishes arrangements by which Commonwealth, State/Territory and Local Governments interact on environmental matters refers to ecologically sustainable development:

> 3.2 The parties consider that the adoption of sound environmental practices and procedures, as a basis for ecologically sustainable development, will benefit both the Australian people and environment, and the international community and environment. This requires the effective integration of economic and environmental considerations in decision-making processes, in order to improve community well-being and to benefit future generations.
>
> 3.3 The parties consider that strong, growing and diversified economies (committed to the principles of ecologically sustainable development) can enhance the capacity for environmental protection. In order to achieve sustainable economic development, there is a need for a country's international competitiveness to be maintained and enhanced in an environmentally sound manner.[37]

4.1.1 National Strategy for Ecologically Sustainable Development

Australia's National Strategy for Ecologically Sustainable Development was its response to the Brundtland Commission's report. In 1989 the Australian Government released a proposal to develop a National Strategy for Ecologically Sustainable Development. The process of developing the strategy was carried out over two years from the end of 1990 to the end of 1992. Australia's three tiers of Government, Commonwealth (Federal), State and Local, adopted the National Strategy for Ecologically Sustainable Development in December 1992 at a meeting of the Heads of Government of each jurisdiction.

The Strategy is in four parts. The first part sets out the definition of ecologically sustainable development (see section 2.1 of this paper above), explains the process by which the strategy has been developed and who will be affected by it, describes how it links in to other government policies and sets out the objectives of the strategy. The goal of the strategy and its core objectives are as follows:

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

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[37] Department of the Environment, Water, Heritage and the Arts. *Intergovernmental agreement on the environment.* http://www.environment.gov.au/esd/national/igae/index.html

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

As part of the process of developing the strategy, nine working groups were established to consider sectoral areas, such as agriculture and mining. The second part of the strategy sets out a number of Government commitments and actions related to a number of core objectives. For each sector, the strategy contains a "challenge" which is an overall goal for that sector to contribute to sustainable development, for example, for agriculture the challenge is:

> To facilitate the ecologically sustainable development of agricultural industries so that they contribute to long-term productivity and to Australia's economic well-being, and protect the biological and physical resource base on which agricultural industries depend, and improve human health and safety.

The third part of the strategy sets out a diverse set of 22 "intersectoral" issues which the strategy incorporates including "developing pricing and taxation arrangements which reflect social and environmental costs of resource use" and "developing policies which seek to influence and respond to population change so as to advance Australia's well-being in relation to economic progress, ecological integrity, social justice and responsible international involvement". This part of the strategy draws on a report on intersectoral issues which was prepared by the chairs of the sectoral working groups.

The fourth and final part of the strategy deals with the future development of Ecologically Sustainable Development in Australia. It sets out a process for monitoring implementation and reviewing the strategy. The strategy envisaged that the Intergovernmental Committee on Ecologically Sustainable Development would have the lead responsibility for this work. [38]

4.1.2 Reporting under the Environmental Protection and Biodiversity Act 1999

Under Section 516A of the Environment Protection and Biodiversity Conservation Act 1999 the annual reports of Commonwealth departments, authorities, companies and other agencies must report on environmental matters in their annual reports. The annual reports must:

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[38] Council of Australian Governments. *National Strategy for Ecologically Sustainable Development.* December 1992. http://www.environment.gov.au/esd/national/nsesd/strategy/index.html

- report how the agency's activities have accorded with the principles of Ecologically Sustainable Development (ESD)
- identify how their departmental outcomes contributed to ESD
- document the agency's impacts upon the environment and measures taken to minimise those impacts
- identify the review mechanisms in place to review and increase the measures the agency takes to minimise its impact upon the environment

4.1.3 Sustainability within Government

As well as policies to make society more sustainable, the Australian Government also has a number of policies which aim to make its own activities more sustainable, for example by improving the energy efficiency of government buildings, changing the ways government employees travel, and making government procurement more sustainable.

Energy efficiency

Energy Efficiency in Government Operations (EEGO) aims to improve energy efficiency, and consequently reduce the whole of life cost and environmental impact of Government operations. EEGO comprises three major elements:

- Annual reporting of energy performance by agencies
- Portfolio energy intensity targets by 2011
- Minimum Energy Performance Standards (MEPS) for office buildings, appliances, vehicles.

Environmental management systems

An Environmental Management System (EMS) is a tool for measuring and improving an organisation's compliance with regulations and management of environmental risks. It is a structured system designed to help an organisation to reduce these impacts through targeted continuous improvement in its environmental management, leading to improvements in its environmental performance, while delivering “bottom line” benefits through reduced operating costs.

The International Standards Organisation (ISO) has developed a series of standards for environmental management systems, the ISO 14000 series, and Standards Australia has adopted a number of these documents, for use by Australian organisations. These standards provide a helpful framework for organisations wishing to develop a high quality EMS, regardless of whether or not they intend to achieve accreditation to the EMS standard.

The Commonwealth Department of the Environment, Water, Heritage and the Arts has produced a "Model" EMS that individual Australian Government agencies can adapt to their own specific requirements.

4.2 New South Wales

In New South Wales, the *Protection of the Environment Administration Act 1991* established the Environment Protection Authority. Since it was formed in April 2007

the Department for Environment and Climate Change has exercised the Authority's functions under the Act. The Act states that one of the objectives of the Authority is to "protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development".

The Act requires the Environment Protection Authority to produce a report on the State of the Environment in NSW every 3 years.[39] The most recent report, published in 2006, is the sixth report in the State of the Environment series. The first chapter reports on progress towards environmental sustainability. It describes a range of actions which the NSW Government is taking to make progress towards sustainability:

- water-sharing plans to allocate water for environmental flows and human use, and water buy-back to increase its availability for environmental flows
- fundamental and far-reaching reforms to threatened species legislation and biodiversity policy which place a greater emphasis on dealing with threats
- a proposed "biobanking" scheme, which will establish a market-based framework for offsetting ecosystem damage that may be caused by development
- reforms to vegetation legislation and policy to stop broadscale clearing and encourage better land management practices
- ongoing programs to extend the coverage and representativeness of the terrestrial reserve system and marine protected areas
- the NSW Greenhouse Plan 2005, which describes mandatory targets for electricity retailers and strategies to achieve them, and the Greenhouse Gas Abatement Scheme which establishes a local market for emissions reductions and greenhouse credits
- the Metropolitan Strategy, which provides a planning framework for population growth in Sydney until 2030, based on the guiding principles of economic, social and environmental sustainability
- the Metropolitan Water Plan to manage Sydney's water supply and demand, encourage recycling, make provision for the current drought and population growth, and improve river health
- the Building Sustainability Index (BASIX), which enhances the performance of new and redeveloped housing on sustainability criteria, particularly water and energy consumption
- the NSW Waste Avoidance and Resource Recovery Strategy 2003, which creates a framework and targets to reduce waste and make better use of resources, including proposals for extended producer responsibility mechanisms
- the Action for Air strategic plan, to improve air quality
- restructure of the fishing industry and buy-back of commercial fishing licences to ensure the sustainability of fishing stocks

[39] *Protection of the Environment Act 1991*, Section 10.

- the Policy for Sustainable Agriculture in NSW and the Soilworks program that promote the use of environmental management systems in primary industries
- the NSW Biodiversity Strategy to improve knowledge of biodiversity and involve landholders and the community in conserving biodiversity on public and private land the use of economic incentives and market-based approaches to reduce pollution, such as the Hunter River Salinity Trading Scheme and load-based licensing for major pollution emitters
- the three-year State environmental education plans, Learning for Sustainability, to increase community awareness and interest in the environment and sustainability
- the statewide community education campaign "Our Environment – It's a Living Thing", which promotes awareness of sustainable living behaviour.[40]

The Department of the Environment and Climate Change is responsible for a number of initiatives aimed at making NSW's households, businesses and communities more sustainable. These include:

- Providing advice on how households can cut their water and energy use; reduce the use of chemicals around the home; and environmentally friendly features to look for when buying or renovating a home

- Engaging communities in environmental planning and decision making; working with Aboriginal and ethnic communities; and a sustainable schools and education programme

- Providing advice to businesses on how they can improve their sustainability in their industry sector

- Signing sustainability compacts with NSW businesses - compacts are voluntary three to five year agreements on the joint implementation of sustainability projects between the Department of Environment and Climate Change NSW and leading Australian companies

- The Department encourages industries to take voluntary action to reduce the environmental impacts of their products; if performance does not improve the industries may be subject to mandatory extended producer responsibility (EPR) schemes.

- Help for business to reduce energy usage, make the shift to a low carbon economy and do their bit for the environment is available under the Energy Efficiency for Small Business Program and Sustainability Advantage Energy Saver.

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[40] Department of Environment and Conservation. *NSW State of the Environment 2006.* May 2007. http://www.environment.nsw.gov.au/soe/soe2006/

- The Sustainability Advantage Program assists businesses to achieve good environment performance that will reduce risk, lower costs, improve productivity and enhance reputation. DECC invites businesses to partner in this program to achieve business sustainability.[41]

4.3 Victoria

The Department of Sustainability and the Environment was created in December 2002 and has the lead responsibility for sustainability policy in the Victorian Government.

The Department's work on sustainability is assisted by Sustainability Victoria which was created by the Sustainability Victoria Act 2005. It combined the functions of the Sustainable Energy Authority Victoria and EcoRecycle Victoria. The Act provides that the objective of Sustainability Victoria is to facilitate and promote environmental sustainability in the use of resources.[42] The Act prescribes 21 functions for Sustainability Victoria which include providing information and advice on sustainable resource use, and developing and contributing to sustainability policy and monitoring its implementation.[43]

Victoria also has a Commissioner for Environmental Sustainability. The role was created by the Commissioner for Environmental Sustainability Act 2003. The Commissioner has four statutory objectives:

- Reporting on matters relating the natural environment of Victoria
- Encouraging decision making that facilitates ecologically sustainable development
- Enhancing knowledge and understanding of ecologically sustainable development and the environment
- Encouraging sound environmental practices and procedures to be adopted by the Government of Victoria and local governments as a basis for ecologically sustainable development.[44]

The Commissioner fulfils these objectives by:

- completing the State of the Environment Report for Victoria
- carrying out an audit of the progress the State Government and public authorities have made in introducing Environmental Management Systems

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41 These programmes are described on the Department of Environment and Climate Change website: http://www.environment.nsw.gov.au/sustainingourenvironment.htm

42 *Sustainability Victoria Act* 2005, s.6

43 Ibid, s.7

44 Commissioner for Environmental Sustainability Act 2003, s.7

- carrying out the Public Education Audit, assessing the Victorian Government's environmental sustainability education programs and advising the Minister for Environment of any changes required
- advising the Minister for Environment in relation to any matter referred to the Commissioner by the Minister. Current work includes preparing a report on government procurement[45]

Victoria's Environmental Sustainability Framework was published in April 2005. The Framework:

- outlines the key environmental challenges Victoria faces
- explains what "environmental sustainability" is and why it is important
- identifies the strategic directions to become environmentally sustainable
- sets out objectives to be achieved and interim targets for measuring progress towards the objectives
- identifies steps for putting the Framework into action

The Framework set three strategic directions for environmental sustainability, and thirteen environmental quality objectives. It sets a goal of making significant progress towards these objectives within a generation. To measure progress in achieving these objectives, the Framework also set a series of interim targets related to the objectives. The Department of Sustainability and the Environment reports biennially on progress towards meeting the targets. The directions, objectives, and interim targets are shown in the table:

Table 5 – Directions, objectives and targets in Victoria's Environmental Sustainability Framework

Direction	Objective	Interim Targets
Maintaining and restoring natural assets	Healthy and productive land	By 2015 there will be a real reduction in the environmental and economic impacts of salinity
	Healthy and productive water systems	Significantly improve the health of Victoria's rivers Return the Snowy river to 21% of its original flow by 2011 and over time to 28% Recover 500 gigalitres of water over 5 years to improve the flows at 6 icon sites along the Murray river

[45] Commissioner for Environmental Sustainability. *About Us.* *http://www.ces.vic.gov.au/CES/wcmn301.nsf/childdocs/-2159FBE93013A83ACA256F250028BECC?open*

		Over the next 5 years provide ecologically sustainable water reserves in 21 priority unregulated rivers
	Healthy marine and coastal areas	
	Flourishing biodiversity in healthy ecosystems	A reversal across the entire landscape of the long-term decline in extent and quality of native vegetation, leading to net gain
	Clean air	Improve air quality and meet the national ambient air quality goals by 2008
	Comprehensive network of parks	
Using our resources more efficiently	Less waste and increased resource efficiency	The quantity of solid waste reduced and the amount recovered for re-use, recycling and energy generation increased
	Sustainable forests	As further licenses are surrendered or expire, provide further protection to other native forest areas in the Otway Ranges
	Increased water, energy and materials efficiency	Increase the efficiency of irrigation systems across the State by 25% by 2020 Increase waste water re-use in Melbourne to 20% by 2010 Reduce Melbourne's water usage by 15% per capita by 2010
Reducing our everyday environmental impacts	Reduced climate impact	Increase the share of Victoria's electricity consumption from renewable resources to 10% by 2010 Facilitate the development of up to 1000 Megawatts of wind energy in environmentally acceptable locations in Victoria by 2006
	Communities with a water, energy and materials saving ethic	
	Liveable cities and towns	There will be a greater percentage of new dwellings located at strategic redevelopment sites in metropolitan urban areas

	Efficient transport systems	Public transport use in Melbourne as a proportion of trips taken by motorised means will increase from 11% in 2202 to 20% by 2020

Source: Department of Sustainability and Environment. *Our environment, our future – Victoria's environmental sustainability framework.* April 2005. http://www.dse.vic.gov.au/CA256F310024B628/0/57E3ADC456387BFCCA256FE800239E30/$File/Enviro-Sustainability-Framework-Final.pdf

The Victorian Government published an Environmental Sustainability Action Statement in July 2006. It sets out how the Victorian Government intends to implement the Environmental Sustainability Framework. The Action Statement contained 150 sustainability initiatives with government spending of $200 million. The main actions were described under five headings:

1. Reducing Greenhouse Gas emissions
Energy retailers will be required to buy 10% of their energy from renewable sources, guaranteeing a market for renewable energy in Victoria;
$12.5 million for renewable energy research and commercialisation;
Victoria's biggest 250 energy and water users will be required to cut waste under new laws;
$14.8 million for research to help communities across the State to better understand and prepare for the local impacts of climate change
A roll out of "smart" energy meters to every electricity user across the State to help households and businesses reduce their energy use costs and greenhouse gas emissions.

2. Maintaining and restoring our natural assets
$21 million to provide economic incentives for landowners to participate in solving problems;
New legislation to protect 18 heritage rivers including the Yarra and Mitchell from damming;
$6 million to improve water quality and reduce algal blooms in the Gippsland Lakes;
$4.5 million for an EPA Strike force to track illegal pollution sources into the Yarra
A White Paper on protecting biodiversity and restoring land.

3. Using our resources more efficiently
New legislation to enable a ban on free plastic shopping bags;
$4 million for 12 waste recovery centres for old paint, batteries, computers and other goods;
A four-fold increase in land fill levies on hazardous industrial waste to fund waste reduction and reduce the volume of industrial hazardous waste going to landfill;
$15 million for industry grants to help businesses avoid waste;
$4 million to support the dairy industry to save water; and

$5 million to protect Victoria's State forests by limiting access to trail bikes and other recreational vehicles.
4. Reducing our everyday impacts
$4 million to roll-out the GreenHome program showing householders how to save water, energy and reduce waste;
$7.5 million for a community campaign to save energy and reduce waste in households;
$1.5 for new rebates to low income earners to encourage replacement of old fridges, heaters and air conditioners with 5 Star alternatives;
$5.9 million to help Victorians live more sustainably through community grants, incentives and local programs;
$1 million on equipping trades people to meet the growing demand for sustainable services;
$10 for a new National Centre for Sustainability to teach environmental sustainability.

5. Government leadership - $12.6 million to:
$4 million to upgrade all public housing to AAA shower heads and dual flush toilets;
Green the Government car fleet by removing the restriction on the Government purchasing hybrid cars and requiring drivers of Government cars to use ethanol fuel where it is available;
Introduce 5 Star minimum standards for new office accommodation
$7.2 million for hospitals and aged care facilities to be energy and water smart; and
Mandatory Recycling or reuse all Government computers and support for suppliers who take back packaging.[46]

The Victorian Department of Sustainability and the Environment published a report on progress against the interim targets between 2005 and 2007 in August 2008.[47] The report showed that some of the interim targets related to sustainable forests, Melbourne water usage and re-use, and wind energy had been met, other targets were on track, while others were proving more challenging – public transport as a share of total trips in Melbourne had decreased, there continued to be a net loss in native vegetation and irrigation systems had become less efficient, and bushfires in 2007 had meant that the air pollution standard had not been met for particulate matter.

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46 Premier of Victoria. *Environmental Action for a Sustainable Future.* Media Release 17 July 2006.http://www.dse.vic.gov.au/ourenvironment-ourfuture/documents/060716%20ESAS.pdf

47 Department of Sustainability and Environment. *Our environment, our future – Victoria's environmental sustainability framework progress report*. August 2008. http://www.dse.vic.gov.au/CA256F310024B628/0/1B88865519AD74DECA2574D300017C2C/$File/OEOF+ESF+Progress+Report.pdf

4. 4 United Kingdom

4.4.1 Governance

Following devolution in the 1990s, separate sustainable development policies have been developed by devolved administrations in Scotland, Wales and Northern Ireland. They have developed a joint UK sustainable development strategy with the UK Department for Environment, Food and Rural Affairs (DEFRA). DEFRA also takes the lead in work to make other Whitehall departments more sustainable.

Since 1997, the UK Parliament has had an Environmental Audit Committee whose remit is to "consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development." The Committee exists in addition to other Select Committees that scrutinise the work of Government Departments. The Committee was first established in November 1997 reflecting a manifesto commitment on the part of the incoming Labour Government.[48] The Committee regularly considers sustainable development issues as part of its work. For example in July 2008 the Committee reported on the Government's progress in making its operations more sustainable. [49]

The Sustainable Development Commission is a Non-Departmental Public Body that was established in 2000, replacing the UK Round Table on Sustainable Development and the British Government Panel on Sustainable Development. The Commission's remit was expanded in 2005 from an advisory and advocacy role to become the UK's watchdog on Sustainable Development. The Commission scrutinises the UK Government's progress on implementing its sustainable development strategy, and monitors performance against targets on the sustainable management of the Government estate and sustainable procurement. The Commission consists of a board of 18 Commissioners, from a mix of academic, scientific, business and NGO backgrounds, chaired by Jonathon Porritt, and supported by 46 policy staff.

4.4.2 Sustainable development strategies

The UK adopted its first sustainable development strategy in 1994. A revised strategy entitled "A Better Quality of Life" was published in 1999. [50]

In March 2005, the UK launched "One Future – Different Paths", the UK

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48 House of Commons. *Environmental Audit Committee.* http://www.parliament.uk/parliamentary_committees/environmental_audit_committee.cfm

49 House of Commons Environmental Audit Committee. *Making Government operations more sustainable: A progress report.* 7th report 2007-08. http://www.publications.parliament.uk/pa/cm200708/cmselect/cmenvaud/529/52902.htm

50 Department of the Environment Transport and the Regions. *A better quality of life – strategy for sustainable development for the UK.* 1999. http://collections.europarchive.org/tna/20080530153425/http://www.sustainable-development.gov.uk/publications/uk-strategy99/index.htm

Government and the Devolved Administrations' shared framework for sustainable development.

The framework sets an overall goal for sustainable development in the UK:

> The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations.
>
> For the UK Government and the Devolved Administrations, that goal will be pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment, and a just society that promotes social inclusion, sustainable communities and personal well-being. This will be done in ways that protect and enhance the physical and natural environment, and use resources and energy as efficiently as possible.
>
> Government must promote a clear understanding of, and commitment to, sustainable development so that all people can contribute to the overall goal through their individual decisions.

The Framework establishes four priority areas for action across the UK:

- Making production and consumption more sustainable by using resources more efficiently
- Reducing greenhouse gas emissions and profoundly changing the way energy is generated and used
- Protecting natural resources and restoring degraded environments to ensure a decent environment for everyone
- Creating sustainable communities[51]

The UK Government and the Devolved Administrations have identified five principles for sustainable development policy. For a policy to be sustainable, it must respect all five principles. The principles are shown in the diagram:

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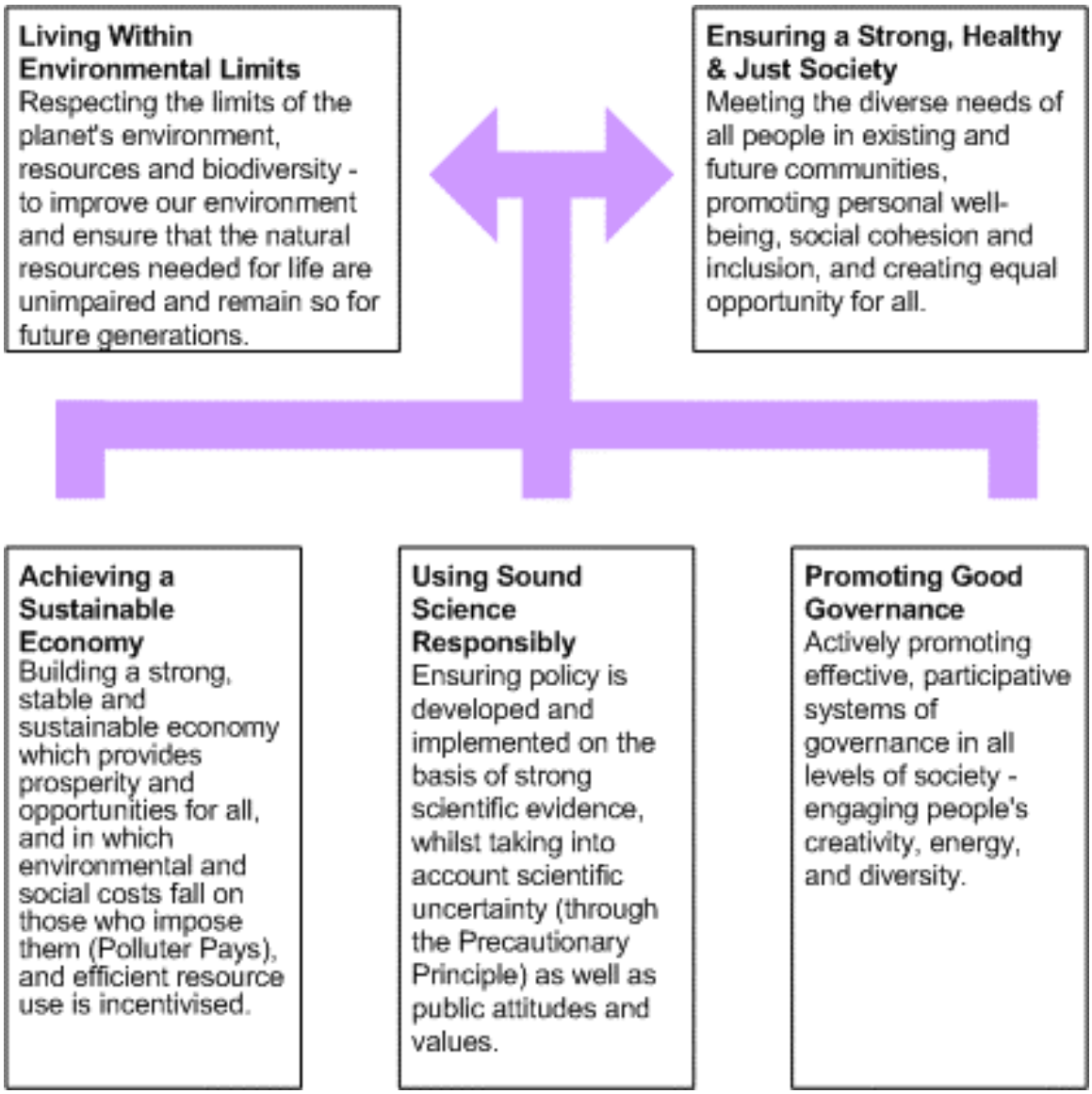
51 HM Government, Scottish Executive, Welsh Assembly Government & Northern Ireland Office. *One future, different paths. The UK's shared framework for sustainable development.* March 2005. http://www.defra.gov.uk/sustainable/government/documents/SDFramework.pdf

Figure 1 – The 5 principles of the UK sustainability policy framework



Source: HM Government, Scottish Executive, Welsh Assembly Government & Northern Ireland Office. *One future, different paths. The UK's shared framework for sustainable development.* March 2005. http://www.defra.gov.uk/sustainable/government/documents/SDFramework.pdf

The UK approach to Sustainable Development Indicators has been described above. Alongside the framework are a set of 20 indicators. The UK Government and Devolved Administrations report annually on trends in these indicators. [52]

Beneath this UK wide framework are four sustainable development strategies, "Securing the Future" published by DEFRA in March 2005 covers England and

[52] DEFRA. *UK Government Sustainable Development Framework Indicators.* http://www.defra.gov.uk/sustainable/government/progress/national/framework.htm

non-devolved issues, and there are separate sustainable development strategies prepared by the devolved administrations in Scotland, Wales and Northern Ireland. Choosing our future: Scotland's Sustainable Development Strategy' was published in December 2005. The current version of Wales' Sustainable Development Scheme 'Starting to live differently' was published in March 2006. Northern Ireland's first sustainable development strategy, 'First Steps towards sustainability', was published on 9 May 2006.[53]

Securing the Future included over forty commitments for government action. Some of the major commitments included:

- An evaluation of the use of environmental taxes
- Strengthening measures to improve the environmental performance of products and services, including improved product design
- Reviewing waste strategy including reducing waste at source and reusing it as a resource
- Reducing greenhouse gas emissions by 60% by 2050, and 20% below 1990 levels by 2020
- Introducing a carbon offsetting scheme for government air travel
- Reorganising government responsibilities for land and marine nature conservation
- Placing sustainable development at the heart of the planning system
- Providing better information to the public on their local environment
- All government departments and their agencies will produce sustainable development action plans by December 2005
- A revised set of indicators of sustainable development, comprising the 20 UK framework indicators, and an additional 48 indicators, to be reported on annually

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53 DEFRA. *Securing the Future - UK Government sustainable development strategy.* March 2005. http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/; Scottish Executive. *Choosing our future: Scotland's sustainable development strategy.* December 2005. http://www.scotland.gov.uk/Publications/2005/12/1493902/39032; National Assembly for Wales. *Starting To Live Differently - The Sustainable Development Scheme of the National Assembly for Wales.* March 2006. http://new.wales.gov.uk/topics/sustainabledevelopment/publications/startlivedifferently/?lang=en & Office of the First Minister and Deputy First Minister for Northern Ireland. *First steps toward sustainability.* May 2006. http://www.ofmdfmni.gov.uk/sustain-develop.pdf

- The Sustainable Development Commission to report on the Government's progress on sustainable development[54]

[54] DEFRA. *Securing the Future - UK Government sustainable development strategy.* March 2005. http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/

5. CONCLUSION

From its origins in the 1980s, sustainable development has become a feature of the policymaking landscape. Although the precise meaning of the term remains elusive, a number of approaches based on indicators reveal mixed progress in making society more sustainable. There has undoubtedly been economic and social progress in Australia, and in many countries around the world. Some aspects of environmental protection have improved, but significant challenges remain if the prosperity we enjoy today is not to come at an environmental cost to be borne by future generations, perhaps exemplified by the challenge posed by climate change. Climate change has become such a pre-eminent issue that it has to an extent overtaken policy on sustainability more generally.