

Thursday 11<sup>th</sup> May 2006

James Lillis

Environment and Heritage Committee  
House of Representatives  
Parliament House  
Canberra ACT 2600

**SUBMISSION NO. 32**

Dear Sir/Madam,

**RE: Submission to Federal House of Representatives Standing Committee on  
Environment and Heritage 'Inquiry into a Sustainability Charter'**

Please find my submission to the Federal House of Representatives Standing  
Committee on Environment and Heritage attached.

Please accept my congratulations on the Sustainable Cities report released in August  
2005 and for following through on one of the key recommendations of this report,  
namely the current undertaking to produce a National Sustainability Charter for  
Australia. The Sustainable Cities report stands the Australian people in good stead for  
the tasks ahead, including this inquiry.

After working in town planning development assessment for a District Council in the  
London (UK) Green Belt earlier this year, I am now living and working as a volunteer  
at the Sunseed Desert Technology research project in Andalucia, Spain. The primary  
aim of the project is to conduct practical research into sustainable living in semi-arid  
environments. The work of the project has significant relevance to the challenges  
facing Australia and has allowed me to experience and follow through on many of the  
concepts I discussed in my submission to the Sustainable Cities inquiry. Somewhat  
ironically, while my work at Sunseed has allowed me to experience sustainable living  
first hand, my involvement with the work of the project has meant that I have not had  
an ideal amount of time or resources to prepare this submission. I anticipate that I will  
return to Australia later this year and would appreciate the opportunity to make a  
supplementary submission (particularly in relation to objectives and indicators) to  
compliment this submission if possible.

As with my previous submission, the content of the submission is intended to reflect  
only the views of the author. The submission is not connected with or necessarily  
reflective of the views of any companies, government authorities, professional  
organisations or community groups with which the author has been or is associated  
with. Given this, much of the commentary is provided from a first person perspective.

Thank you for your time in reviewing this submission.

Best regards,

James Lillis  
BRTP (Hons.)

## **Structure of the Submission**

This submission is divided into two sections. These are:

- **'Approach to the Charter'**, which discusses general considerations relating to the Charter;
- **'Drafting the Charter'**, which puts forward a potential model for the final Charter and the types of objectives and indicators that may potentially be used in the final Charter. A tabular format has been used to set out the objectives and indicators in this section.

## **Approach to the Charter**

### *Support for Ecological Footprint Approach*

I would like to express my support for the use of an ecological footprint approach to the charter, as discussed tentatively in both the Discussion Paper for the current inquiry and in the Sustainable Cities report. The ecological footprint approach presents a number of key benefits which I believe would enhance the effectiveness of the charter. The ecological footprint approach is:

- Scientifically well founded and accepted;
- Easy to understand;
- Readily measurable at a range of scales (i.e. by households, businesses or local governments);
- Already in popular use (e.g. through ecological footprint calculators widely available on the internet);
- Based on the idea of a finite ecological carrying capacity.

Essentially, I envisage that the footprint concept would be used as the basis for both the general principles and objectives of the Charter.

### *Criticisms and Additions to the Ecological Footprint Approach*

For the record, if this approach is to be followed, note should be made of the criticisms which have been made of ecological footprinting:

- Rees (co-founder of the ecological footprint concept) in 2000 pointed out that the ecological footprint does not present a complete picture of ecological sustainability as it is only possible to include the major categories of consumption and the measurement cannot cope with toxic substances that cannot be assimilated at all into the ecosystem. Rees also states that ecological footprinting may be overly simplistic and highlights the lack of prediction or solutions offered by the method;
- Wackernagel and Rees (1996) and Chambers et al. (2000) suggest that calculation procedures used are likely to mean that the ecological footprint for any given area is underestimated.
- Van Den Burgh and Verbruggen (1999) were concerned that the ecological footprint may be considered a literal figure rather than a hypothetical one. They also note that the ecological footprint does not identify causes of unsustainable land uses shown by large ecological footprints and is therefore unhelpful for the creation of policy objectives. They point out that ecological

footprint could even support unsustainable, inefficient and immoral policy options because there are a variety of ways that footprints can be reduced and this could be through socially unjust means. They also claim that the approach neglects other solutions to sustainability issues in favour of the ideal of self-sufficiency.

(Paraphrased from Van Bengan, N. (2005) *Putting a Foot in it: A critique of the Ecological Footprint concept as a measure of sustainability for policy*. Unpublished thesis, University of Cambridge, UK p12-13)

While these criticisms are worthy of attention, I believe that they can be overcome by being mindful of the ecological footprint's function as an indicative measurement rather than a precise measurement of a real world situation. Also, by acknowledging the impact of toxic waste materials and harmful non-renewable energy sources, the technical efficacy of the approach is improved significantly.

Another aspect which appears to be lacking in the use of the ecological footprint approach is human health and general well being. It is with great reticence that I must make one criticism of the Discussion Paper produced for this inquiry. There appears to be a relative absence of discussion on human health and wellbeing issues. A number of submissions and panels at public hearings for the Sustainable Cities inquiry highlighted the links between human health and urban sustainability issues. A number of indicators in the existing State of the Environment reporting for Human Settlements take account of these issues, reflecting their importance. I trust that these issues will be taken into consideration and will be represented in the final Charter. Taking this into account, I have attempted to structure my own Draft Charter in this submission to take account of these issues.

Similarly, cultural and social values do have a significant role to play in the Charter. Indeed, the ideal of ecological sustainability itself is a cultural and social value which will need to become more prominent in our society if we are to make progress towards ecological sustainability. In my Draft Charter I have also attempted to encompass this aspect.

#### *Charter Links to State of the Environment Reporting*

I am in full support of the idea of linking the Charter to the State of the Environment (SoE) report. The Charter can be used in part to frame the indicators used in the State of the Environment report. A copy of the Charter should appear in each SoE report following the forthcoming 2006 report. This should be accompanied by a simple 'national report card', similar in nature to the Swedish model as outlined in the Discussion Paper. In seeking to draft a Sustainability Charter, we are fortunate to have the executive summary of the SoE report which already has a function as a national report card.

The report card to support the Charter should be simple and should compel individuals, households, businesses and governments to reduce their ecological impact. Many ecological footprint assessments provide a result which reflects the number of planets that would be required if every person had the same footprint as the person under examination. I believe this measurement is a simple but effective tool in

reminding people of the scope and magnitude of the situation. The prospect of looking at the impact of the 'average' Australian in this manner could also be instructive and should be investigated for inclusion on the future national report card.

This national level of reporting could be augmented by Statewide, regional or local ecological footprint report cards (especially in urbanised areas where the specialists to conduct such assessments are generally available). These local report cards could be used for comparative purposes against the national report card. I have included a case study below on the effectiveness of a 'report card' mechanism at the local level to motivate action.

**Local ecological report card – a brief case study of the Maroochy River and the Healthy Waterways Annual Report Card**

I can testify to the effectiveness of report card mechanisms from my own experience as a resident of the Shire of Maroochy in Queensland.

The Maroochy River is located wholly within the Shire of Maroochy. It has a pivotal role in the geography, economy and social life of the Shire. Its importance to a number of primary community activities (agriculture, wastewater disposal, recreation) has resulted in a considerable impact on the health of the river.

Since the introduction of the Healthy Waterways' Ecosystem Health Monitoring Program for South East Queensland, the quality of the river has been recorded as being in decline. The programme assesses the quality of estuarine and freshwater stretches of the subject river, assigning a grade of A (highest) to E (lowest) depending on the findings of the assessment.

When in 2003 and 2004 the Maroochy River received D+ and D ratings respectively, the Council was provoked into action. The fact that the river systems in neighbouring Shires received A or B ratings added insult to the injury of the D ratings. The simplicity of the rating system meant that it was easily understood by all sections of the community and the local media, who contributed significantly to the pressure for change.

The Maroochy River Recovery project was launched by Council with the aim of improving the water quality of the river. A key item in the range of works and programmes to be undertaken as part of the project was the upgrade of a major sewage treatment plant.

Encouragingly, in 2005 the Maroochy River received a C rating. It is acknowledged that the improvement of water quality in the river has a long way to go and the project continues to be one of high priority to the Council.

*Public Education and Involvement in Ecological Footprinting*

As part of the move towards the use of the ecological footprint method, it may be helpful for Environment Australia to publish a list of recommended ecological footprint calculators for use by individuals. There are many such calculators currently available which vary in their rigour and comprehensiveness and thus can produce

inconsistent results. The Australian public should be advised of the most accurate calculators so that our personal efforts to reduce our ecological impact may be as informed and intelligent as possible. The national report card and ecological footprint materials need to become something of a 'fridge magnet' type of document in terms of their practical usage.

Corresponding public education programmes would aid greatly in raising awareness. Indeed, it may be possible to conduct a National Ecological Footprint questionnaire. Participation in such an exercise should be strictly optional and confidential, with the possibility of related incentives for participation e.g. discounts/rebates on sustainable household appliances, free public transport tickets etc. Such an exercise could be conducted alongside the national Census or as a stand-alone exercise. Such an exercise, if conducted well, would be a triumph in raising awareness and collective action, as well as being a source of valuable information on the state of Australia's residential ecological footprint. Indeed, if forms were to be coded by location (i.e. suburb or municipality), the need for local assessments of ecological footprint may be lessened.

#### *Implementation Arrangements for Charter*

The usefulness of reporting at a number of levels reflects the need for commitment to the Charter at all levels of government in Australia. As local government is a key agent in implementing ecological sustainability, well-resourced engagement in this sector is critical. The Charter, in order to be successful, will most likely require increased levels of funding for SoE reporting as well as programmes and reporting to be undertaken at the local level.

It follows that the Charter should compliment the National Strategy for Ecologically Sustainable Development and should be ratified by COAG.

The use of incentive payments to State and local levels of government presents a potentially difficult issue. Such a regime, once agreed to at COAG, would require lasting commitment from all parties over and above political issues of the day. I am in favour of a mix of incentive payments based on achievements, progress made and need. The negotiations over how funds are allocated could be particularly sensitive. There is an urgent need in this situation for constructive engagement – perhaps a minimum guaranteed dividend of funds for each State for sustainability projects and programmes can be provided to prevent disengagement from sustainability objectives by any disillusioned parties.

#### *Urban and Rural Coverage of the Charter*

An interesting aspect of the current inquiry is the way that it has been conceived. The aim of this inquiry is to produce a National Sustainability Charter. This presumably encompasses both rural and urban areas, and in this respect expands on the Sustainable Cities inquiry which focused specifically on urban areas. Solidarity and coordination between the rural and urban sectors is vital if significant progress towards ecological sustainability is to be made, hence a combined charter is a welcome development. However, the final Charter must relate equally to the somewhat different demands of rural and urban sustainability. I must caution in this

respect that I am less qualified to comment on issues of rural sustainability than I am on issues of urban sustainability.

### **Drafting the Charter**

In this section of the submission, I have presented a draft Charter for scrutiny. This is not intended in any way to usurp the final Charter which will be arrived at through the inquiry. Rather, it is my hope that this draft Charter is considered as 'food for thought'.

#### *Suggested Structure of the Charter*

I believe that the charter should be structured as follows:

- Preamble (to set the context and discuss the challenges of sustainability)
- General Principles (to provide general guidance on what people can do to achieve the objectives)
- Objectives and Indicators (related to specific fields of activity e.g. transport)

#### *Charter Preamble*

The Charter must be a source of inspiration and motivation for all Australians to work towards the achievement of ecological sustainability. Accordingly, the principles and objectives of the Charter should be preceded by an opening preamble or statement of purpose which sets the context for the Charter. It must speak directly to the Australian people in plain terms. I have attempted to draft such a preamble below:

*“As we enter into the 21<sup>st</sup> Century, Australians have emerged into an age of unprecedented technological innovation and human progress. This has been achieved through the hard work of generations of Australians, to whom we have to thank for the quality of life we enjoy today. However, this rapid process of innovation and progress has also presented us with a great challenge – to maintain and improve our quality of life in a way that is in harmony with the environmental limits of our land. This challenge has come to be known worldwide as the issue of ‘ecological sustainability’.*

*Ecological sustainability is an issue for the entire planet. It is particularly important in Australia due to the uniquely fragile nature of our land. Our development and use of our land and water since European settlement is causing cumulative impacts that place our whole way of life under threat.*

*In order to maintain and improve our way of life for this generation as well as future generations of Australians, concerted action is required now to lower the impact of our activities on the Australian and global landscape – in other words, we need to reduce our ‘ecological footprint’.*

*This is not ‘someone else’s problem’. It is not something that can be safely ignored. This challenge belongs to all people in Australia. It presents us with an opportunity to improve our quality of life and demonstrate our practical ingenuity to the world.*

*Sustainability is an issue of quality of life. If we all work together it is very likely that we will succeed not only in reducing our ecological footprint, but in creating improvements to human health and well being in general.*

*This Charter sets out the principles and objectives which will define our collective response to the challenge of ecological sustainability.”*

#### *General Principles for the Advancement of Ecological Sustainability*

The preamble should be followed by a set of general principles which provide higher level guidance on the patterns we should follow to achieve the objectives. The principles are based on the strategies for sustainability based on human needs as listed in my previous submission. My aim here is to express the directions that we need to take in terms of everyday human behaviour, rather than in more technocratic terms. I also attempt here to introduce some of the requisite cultural and social values that can drive the achievement of ecological sustainability.

*“In order to reduce our ecological footprint and improve our quality of life, it is necessary to give strong consideration to the following principles:*

- We need to understand and connect ourselves with the ecosystems of our land and water, so we can intelligently assess and reduce our ecological footprint;*
- We need to look closely at all of our daily activities and find ways of getting what we want without creating waste or harming the environment;*
- We need to improve our conditions at work and ensure our working activities make a positive contribution to lowering our ecological footprint;*
- We need to give ourselves the time to get actively involved in our communities;*
- We need to determine limits to growth so that there is always a place for our rural and wilderness land in the future;*
- We need to ensure that all members of our society are valued and taken care of;*
- We need to value our democratic freedoms to maintain a constructive and inclusive approach to reducing our ecological impact.*

**A brief comment on Limits to Growth**

In my submission to the previous inquiry, only a passing mention was made of the need for limits to growth and to plan towards a stable and sustainable end state. However, I have made a point of including this issue above at the general principle level. In my view, there is a need to set a finite limit to growth. This is necessary in order to work towards a stable and sustainable ecological footprint and is reflective of the finite capacity of our country to support human habitation. Such a limit would need to be set with cognisance of our international humanitarian obligations.

The exercise of setting a limit to growth is obviously fraught with difficulties if conducted with a top down approach at the national level. However, some Australian local governments and city regions are already taking a proactive step by setting urban containment boundaries and population caps in consultation with their local communities. I believe that this bottom up approach is the most promising way of reaching a national population cap and could be promoted or coordinated in some way by higher levels of governments. To not set a limit to growth compounds the difficulty of promoting a sustainable ecological footprint by opening the way to unsustainable levels of population growth.

*National Sustainability Objectives and Indicators*

Following the General Principles, the Charter should go on to list National Sustainability Objectives. The operation of the objectives in practice may be quite complex, however for public reporting purposes they will need to remain simple.

At this point, mention must be made of Environment Australia's 'Environmental Indicators for National State of the Environment Reporting – Human Settlements'. Published in 1998, this document contains a range of objectives already used in State of the Environment reporting that are highly relevant to the Charter (as it relates to urban areas). The list of objectives and indicators below is intended to compliment rather than fully duplicate the indicators listed in the above document.

Some of the indicators listed below will appear to be somewhat unconventional. It is my belief that the indicators themselves must be as evolutionary as we wish to be. Progress is generally made in things that are measured closely, hence the indicators themselves drive the objectives. We need indicators to measure the things that will compel us to make the changes required to really lower our ecological footprint, rather than indicators that pay homage to things we already do well.

In a similar fashion to the indicators used and undergoing refinement as part of the State of the Environment reporting, some of the indicators here are not readily measurable at the present time. These indicators provide a springboard for future research that can help inform future policy on matters of sustainability.

Below I have included a table with recommended objectives, indicators and a comment on the purpose or operation of the objective where appropriate. On occasion, there is some overlap between the indicators. The list is not purported to be comprehensive and without doubt there are more objectives and indicators worthy of



inclusion. In addition, there is a need to structure interim targets around the long term objectives listed. This is an important task that I have not attempted here.

Where an indicator is already detailed in the 'SoE Environmental Indicators – Human Settlements' report. This has been noted by placing (SoE) alongside the indicator.

*Table of Objectives and Indicators for National Sustainability Charter*

<b>Category and Objective</b>	<b>Indicator(s)</b>
<b>Energy</b>	
Generate more energy from renewable sources	<ul style="list-style-type: none"> <li>• Non-renewable/renewable energy generation split</li> <li>• Renewable Energy (SoE)</li> </ul>
Reduce overall energy use	<ul style="list-style-type: none"> <li>• Total Energy Use (SoE)</li> <li>• Commercial Energy Use (SoE)</li> <li>• Energy Use in Industry (SoE)</li> <li>• Domestic Energy Use (SoE)</li> </ul>
Increase household energy production	<ul style="list-style-type: none"> <li>• Energy produced by households as percentage of total energy production</li> <li>• Domestic energy use (SoE)</li> </ul>
Promote use of sustainable fuels for public and private transport	<ul style="list-style-type: none"> <li>• Use of low impact or renewable fuels by public and private transport as percentage of total energy used</li> </ul>
<b>Water</b>	
Become more efficient in our use and management of all water	<ul style="list-style-type: none"> <li>• All indicators listed in SoE Environmental Indicators Human Settlements under ‘Water’</li> <li>• Sale or Installation of water sensitive urban design devices by households</li> <li>• River health report cards (South East Queensland Healthy Waterways’ Ecosystem Health Monitoring or equivalent)</li> </ul>
<b>Urban Design/Built Environment</b>	
Maintain and increase green space	<ul style="list-style-type: none"> <li>• Establishment/loss of urban farmland and other green space</li> </ul>

Category and Objective	Indicator(s)
and bushland in urban areas	<ul style="list-style-type: none"> <li>• Number of parks per person by type</li> <li>• Average straight line distance to green space by dwelling type</li> <li>• Public Urban Green Space per Capita (SoE)</li> <li>• Land converted from Non-Urban to Urban Uses (SoE)</li> </ul>
Develop urban infrastructure systems to function as well as systems in nature	<ul style="list-style-type: none"> <li>• Index of environmental performance of infrastructure</li> <li>• Inputs and output analysis of urban infrastructure systems</li> <li>• Sewage Disposed to Water Bodies and Reused (SoE)</li> <li>• Wastewater discharged (SoE)</li> <li>• Stormwater Discharged to Receiving Waters (SoE)</li> <li>• Contaminants in Stormwater Discharges (SoE)</li> <li>• Stormwater Recycled (SoE)</li> <li>• Wastewater Reused by Type of Application (SoE)</li> </ul>
Promote the establishment of sustainable human settlements	<ul style="list-style-type: none"> <li>• Level of incentives provided for establishment of self-proclaimed ‘sustainable communities’</li> </ul>
Promote the establishment of community farms and sustainable urban gardens	<ul style="list-style-type: none"> <li>• Level of incentives provided for establishment of community farms and sustainable urban gardens</li> </ul>
Increase production of fresh produce in (and in close proximity to) urban areas	<ul style="list-style-type: none"> <li>• Agricultural activity in proximity to urban city core</li> <li>• Assessed ability of urban green space to revert to localised food production</li> <li>• Average distance travelled for fresh produce</li> </ul>
<b>Transport</b>	
Increase use of heavy rail for industrial and commercial freight transport	<ul style="list-style-type: none"> <li>• Kilometres travelled for freight by transport mode</li> <li>• Index of environmental impact of freight transport</li> </ul>

Category and Objective	Indicator(s)
Create sustainable transport systems for urban areas	<ul style="list-style-type: none"> <li>• Mode choice by Trip Purpose by Area (SoE)</li> <li>• Average household trips per day by mode</li> <li>• Trip making characteristics by income</li> <li>• Total Time and Distance Travelled (SoE)</li> <li>• Uptake of renewable or low impact fuels for transport</li> <li>• Average straight line distance to line haul public transport stations by dwelling type</li> <li>• Access to Public Transport Stops (SoE)</li> <li>• Car Ownership (SoE)</li> <li>• Economic Costs of Road Accidents (SoE)</li> <li>• Fuel Consumption per Transport Output (SoE)</li> <li>• Costs of Congestion (SoE)</li> <li>• Average Speed by Mode and Distance (SoE)</li> <li>• Fuel Pricing and Taxing (SoE)</li> <li>• Public transport expenditure or subsidy as percentage of total transport expenditure or subsidy</li> <li>• Public transport subsidy per trip v car subsidy per trip (potential area for modelling)</li> </ul>
<b>Population</b>	
Improve the national capacity for self-sufficiency	<ul style="list-style-type: none"> <li>• Balance of Trade</li> <li>• National capacity in market sectors traditionally dominated by imported products or services</li> <li>• Globalisation – economic dependency (SoE)</li> </ul>
Promote sustainability in rural settlements and decrease rural population loss	<ul style="list-style-type: none"> <li>• Index of sustainability for rural areas</li> <li>• Markets/prices for primary products</li> <li>• Rural population balance</li> <li>• Globalisation – economic dependency (SoE)</li> </ul>
Define and work towards a sustainable end state or limit to	<ul style="list-style-type: none"> <li>• Population balance at all levels</li> <li>• International migration to Australia (SoE)</li> </ul>

<b>Category and Objective</b>	<b>Indicator(s)</b>
<p>population growth for Australia consistent with international humanitarian obligations</p>	<ul style="list-style-type: none"> <li>National progress towards development of a plan that sets out limits to growth</li> </ul>
<b>Commerce and Industry</b>	
<p>Promote sustainable commerce and industrial developments</p>	<ul style="list-style-type: none"> <li>Number of self proclaimed ‘sustainable’ commerce and industrial developments</li> <li>Industrial and commercial building star ratings</li> <li>Level of incentives available for development of sustainable commerce and industry developments</li> </ul>
<p>Provide compelling incentives to commerce and industry to adopt sustainable technologies</p>	<ul style="list-style-type: none"> <li>Level of incentives available for introduction of sustainable technologies</li> </ul>
<p>Increase the take up of sustainable technologies in commerce and industry</p>	<ul style="list-style-type: none"> <li>Recognised sustainable technologies - overall market share</li> <li>Recognised sustainable companies – market performance</li> </ul>
<b>Households</b>	
<p>Provide compelling incentives to householders to adopt sustainable technologies</p>	<ul style="list-style-type: none"> <li>Level of incentives available for introduction of sustainable technologies</li> </ul>
<p>Increase the take up of sustainable technologies in households</p>	<ul style="list-style-type: none"> <li>Recognised ‘sustainable’ technologies - overall market share</li> </ul>
<p>Promote affordability of housing</p>	<ul style="list-style-type: none"> <li>House Price to Income Ratio (SoE)</li> </ul>
<p>Promote sustainable housing</p>	<ul style="list-style-type: none"> <li>Uptake of green star sustainable homes and energy efficient homes as percentage of total stock</li> <li>Solar hot water system uptake (as example)</li> <li>Floor Area per Person (SoE)</li> <li>Dwellings Constructed on Greenfield Sites (SoE)</li> </ul>

Category and Objective	Indicator(s)
Promote the use of sustainable building materials	<ul style="list-style-type: none"> <li>• Ranges of Lot Size (SoE)</li> <li>• Balance of materials used in construction (by sale)</li> <li>• Average distance from source to site for materials</li> <li>• Building materials used in Housing/Embodied Energy (SoE)</li> </ul>
Promote greater household efficiency in the use of energy	<ul style="list-style-type: none"> <li>• Average star rating of appliance sold/imported (by appliance type)</li> <li>• Operating Energy Efficiency (SoE)</li> </ul>
<b><i>Environmental and Human Health</i></b>	
Reduce the incidence of preventable diseases and social dislocation	<ul style="list-style-type: none"> <li>• All indicators listed in SoE Environmental Indicators Human Settlements under ‘Environmental Health’</li> <li>• Smoking Patterns in Society by Age and Gender</li> <li>• Alcoholism and Drug Dependence Patterns in Society by Age and Gender</li> <li>• ‘Hits’ on ‘depressionet’ and other health related websites</li> <li>• Life satisfaction survey (‘How happy are you with your life?’)</li> </ul>
Increase workplace sustainability and job satisfaction levels	<ul style="list-style-type: none"> <li>• Time taken in transit to and from work, by income</li> <li>• Job satisfaction</li> <li>• Job security (pattern of permanent/part-time/casual positions)</li> <li>• Workplace mobility</li> <li>• Career mobility</li> <li>• Union membership</li> <li>• Availability of support services</li> <li>• Leisure participation/availability of flexible work arrangements</li> <li>• Reported incidences of workplace related physical or mental illness</li> <li>• Industrial Noise Injuries (SoE)</li> </ul>

Category and Objective	Indicator(s)
Increase the health of flora and fauna populations in urban areas	<ul style="list-style-type: none"> <li>• Index of urban ecosystem health</li> <li>• Known clearance of remnant vegetation in urban areas</li> </ul>
Continue to reduce the impact of urban activities on regional airsheds and the atmosphere	<ul style="list-style-type: none"> <li>• Standard air quality indicators as included in South East Queensland Regional Air Quality Study or similar</li> <li>• Carbon emissions</li> <li>• Carbon trading scheme balance</li> </ul>
Continue to reduce the impact of urban noise	<ul style="list-style-type: none"> <li>• All indicators listed in SoE Environmental Indicators Human Settlements under ‘Noise’ with the exception of ‘Industrial Noise Injuries’</li> </ul>
<b>Waste Outputs</b>	
Reduce waste outputs produced	<ul style="list-style-type: none"> <li>• Total Waste Output Produced</li> <li>• Domestic Solid Waste Generated (SoE)</li> <li>• Domestic Solid Waste Disposed to Landfill (SoE)</li> <li>• Commercial and Industrial Waste Generated (SoE)</li> <li>• Hazardous Waste Generated (SoE)</li> <li>• Domestic Hazardous Waste Collected (SoE)</li> <li>• Contaminated Land (SoE)</li> </ul>
Increase recycling of waste outputs	<ul style="list-style-type: none"> <li>• Waste Recovered – Recycled (SoE)</li> <li>• Energy Recovered from Waste (SoE)</li> <li>• Proportion of Sludge and Bio-solids Reused (SoE)</li> <li>• Recyclables as percentage of refuse</li> <li>• Putrescibles as percentage of refuse</li> <li>• General waste average composition</li> <li>• Number of businesses and government departments operating under cleaner production principles</li> </ul>
Increase demand for recycled	<ul style="list-style-type: none"> <li>• Levels of subsidy for use of target recyclables (i.e. goods difficult to recycle like used tyres)</li> </ul>

Category and Objective	Indicator(s)
goods	<ul style="list-style-type: none"> <li>• Amount of goods by sector made from recycled material</li> </ul>
<i>Education, Culture and Governance</i>	
Provide high levels of dedicated environmental design training to professional planners, engineers and developers	<ul style="list-style-type: none"> <li>• Level of environmental design training possessed by professional planners, engineers and developers</li> <li>• Number of graduates of Permaculture Design Certificate (PDC) and other sustainable design short courses</li> </ul>
Provide compelling incentives for sustainable land use and development projects	<ul style="list-style-type: none"> <li>• Number of new developments which accord with predefined sustainability principles</li> <li>• Number of building retrofits incorporating a range of sustainable technologies</li> </ul>
Increase availability of Australian art, music, film and television programmes	<ul style="list-style-type: none"> <li>• Balance of Australian and imported entertainment available in retail stores and on Australian television, radio, print and other public media</li> </ul>
Construct public buildings and public housing to be an example of sustainable design	<ul style="list-style-type: none"> <li>• Number of new ‘sustainable’ public buildings as percentage of total public buildings constructed</li> </ul>
Increase community partnership with government on sustainability issues	<ul style="list-style-type: none"> <li>• Levels of community response to sustainability issues, by age (inc. over 55’s)</li> </ul>
Increase capacity to provide education in sustainability	<ul style="list-style-type: none"> <li>• Number of qualified teachers/sustainable design courses available</li> <li>• Net export of sustainability education, aid or ecological sustainability-related consulting activities</li> </ul>
Protect pre and post European cultural heritage	<ul style="list-style-type: none"> <li>• Number of heritage sites damaged or destroyed</li> <li>• Funding for protection and enhancement of heritage</li> </ul>



### *Other Indicators*

The list of indicators above are readily augmented by a large range of indicators used in other fields. While other indicators may not directly relate to the achievement of an objective, they can be instructive on the causes and events relating to the achievement of the objective. Examples of such objectives include the following:

- Retail spending;
- Unemployment;
- Local Government Planning Scheme compliance;
- Crime statistics (including robberies and violent crimes);
- Average income and income patterns;
- National, State and Local Budgeting (including share of budget for sustainability works, programmes or education).

### **References**

- Chambers, Simmons and Wackernagel (2000) *Sharing Nature’s Interest*. London: Earthscan
- Rees (2000) ‘Eco-footprint analysis: merits and brickbats’ *Ecological Economics* 32 371-374. Amsterdam: Elsevier
- Van Banzan, N. (2005) *Putting a Foot in it: A critique of the Ecological Footprint concept as a measure of sustainability for policy*. University of Cambridge, UK: Unpublished thesis
- Van den Burgh and Verbruggen, (1999). ‘Spatial sustainability, trade and indicators: an evaluation of the ‘ecological footprint’ . *Ecological Economics* 29 61-72. Amsterdam: Elsevier
- Wackernagel and Rees (1996) *Our Ecological Footprint*. Garbiola Island, B.C.: New Society Publishers