

## Background

On 12 September 2005 the House of Representatives Standing Committee tabled the *Sustainable Cities* report. The committee called for the development of a Sustainability Charter based on measurable outcomes, over a certain period, with intermediate milestones.

The Committee is now inquiring into and will report on key elements of a sustainability charter and identify the most important and achievable targets, particularly in relation to:

1. The built environment;
2. Water;
3. Energy;
4. Transport; and,
5. Ecological footprint.

The following submission has been prepared by Graham Harris (University of Tasmania; former Chief, CSIRO Land and Water), Manfred Lenzen (University of Sydney, leading Ecological Footprint researcher and practitioner) and Richard Sanders (ecological economist, Queensland public service).

The authors welcome the opportunity to make a submission on this vital matter. In addition to the issues and questions raised in the discussion paper, this submission addresses the following:

- A proposed National System of Biophysical Accounts aligned with the Australian System of National Accounts (SNA),
- A proposed system of Specific Biophysical targets.

## Securing the Future for Australia

Sustainability is about balancing the scale of the economy with the scale of supporting ecosystems globally to locally. We strongly support using the concept of the Ecological Footprint as an overarching indicator of progress towards sustainability. The Ecological Footprint measures the area of land and aquatic ecosystems required to produce the resources used, and to assimilate the wastes produced, by a defined population at a specified material standard of living.

Ecological Footprint analysis shows the physical scale of the global economy is now 1.2 times the planet's bio-productive capacity. Wealthy countries like Australia, the USA and the UK are 'three planet' economies which means they would need three planet Earth's to sustain their current levels of material consumption. Clearly this is unsustainable.

We propose that Australia adopts the sustainability challenge with the vision of achieving a "One Planet Economy" as the UK has. Living within environmental limits lies at the heart of the UK Government's Sustainable Development Strategy *Securing the Future* (2005).

Achieving the goal of a “one planet economy” requires that the economy operate within a biophysical budget (more specifically a set of biophysical budgets that represent each form of critical natural capital) that is within the bio-productive capacity of the planet. Sustainability demands that at least these physical budgets are met, and further that using the bio-productive capacity proceed in a manner that does not lead to future reductions of bio-capacity.

## **National System of Biophysical Accounts**

In operational terms this requires a comprehensive and integrated National System of Biophysical Accounts comprising Ecological Footprint and Material/Energy Flow/Emissions accounts with particular emphasis on each form of critical natural capital (CNC). This system of accounts would underpin the full suite of proposed indicators/targets. By calculating the ecological footprint of each form of CNC on a sectoral basis it is possible to identify the ‘low hanging fruit’ whereby large reductions of ecological footprint can be achieved at minimal cost. Application of such an analysis on a bioregional (catchment) basis can assist in targeting action to improve/restore the ecological health of bioregions.

## **Sustainability Commission and Commissioner**

We welcome and support the concept of an independent Sustainability Commission and Commissioner. This is timely as the world enters the ‘era of sustainability’.

Given the enormity of the challenge of transitioning to a ‘One Planet Economy’ the National Sustainability Commission will require a significant guaranteed line of budget to ensure funding for public education initiatives, the establishment of a National System of Biophysical Accounts (particularly the data capture and modeling of Australia), and for the payments incentive scheme. This National System should be aligned with the Australian System of National Accounts (SNA) that governs Australia’s financial accounts.

Consideration should be given to a system of ecological and natural capital taxation to fund the Commission.

## **Charter Content and Structure**

*This section addresses the following issues and questions raised in the discussion paper:*

- **Sustainability Objectives and their measurement/General Questions/Should a sustainability charter consist of aspirational statements, set targets (such as measurable water quality) or both? YES**
- *Is National Competition Policy a good template for consideration of incentive payments for sustainable outcomes? YES*

We endorse the idea of a Sustainability Charter.

The Charter should be a brief document. Its structure should consist of an aspirational vision, a commitment to educate and engage the Australian people in the challenge of creating a Sustainable Australia, sets of measurable milestones to transition Australia toward a ‘One Planet Economy’ as rapidly as possible, supported by an incentive payments scheme for meeting of sustainability targets along the lines of the National Competition Council (NCC) model.

The Aspirational Vision should be brief – perhaps a slogan such as ‘a **One Planet Economy**’ and a paragraph on Australia’s aspiration to take on a world leadership role in the drive for sustainability. It should include the NSESD definition and core objectives.

The Charter should include a commitment to educate and engage the Australian people in the challenge of creating a Sustainable Australia. This should include an ethos of strengthening our communities by participating together in this greatest of challenges. At the heart of this could lie an ongoing national conversation process to explore and envision the kind of society Australians aspire to in the context of having to live within ecological and material constraints. This would be central to gaining public ownership of, and enthusiasm for, the sustainability challenge.

The milestones section should be equally brief referring to a comprehensive and integrated National System of Biophysical Accounts comprising Ecological Footprint, Material/Energy Flow, and Emissions accounts with particular emphasis on each form of critical natural capital (CNC). A proposal for the detail of such a set of accounts, standards and indicators is included in this submission. These accounts would underpin a schedule of targets with milestones including 1, 5, 10, and 20-year timelines depending on the target in question.

The final paragraph would spell out a COAG agreement for the Commonwealth to make payments to the States and Territories involving an incentive payments scheme for meeting of sustainability targets along the lines of the NCC model to be administered by the National Sustainability Commission.

## **Proposed System of Specific Targets**

This submission proposes a new conceptual framework (see above) to underpin a set of indicators/targets from the macro to micro scale. Currently there is a plethora of indicators and standards that have proved problematic due primarily to inconsistencies of method and the sheer number of indicators. The proposed framework is much more streamlined and conceptually rigorous. Once established, the Commission should engage in a process of selecting which indicators (including method, etc) should be included in the sustainability accounting framework.

As a matter of principle, all indicator targets should be in the direction of improvement. Note: Imports/exports need to be accounted for.

- Ecological Footprint (target – 20% reduction by 2015; 50% reduction by 2025)
  - Ecological Debt day (awareness raising – used in UK)
- Genuine Progress Indicator (full cost accounting of the economy to maximize economic efficiency) (target – benefit account increasing, cost account decreasing)
- Critical Natural Capital (A state indicator describes the minimum quantity of natural capital necessary for continued functioning, while a pressure indicator explains the maximum pressure that the natural capital stock can tolerate and still maintain its functions. The difference between the actual and sustainable levels is termed the “Sustainability Gap” (SGAP), and provides targets for policy. These are macro targets to be set for national and state economies and include imported natural capital)
- Specific Landscape physical indicators/targets (these should be tracked for each bioregion)
  - Bioregional (i.e. catchment) health indicators
    - Increase/decrease ecological infrastructure (is investment needed?) Is there an appropriate proportion of the landscape as ecological infrastructure? (based on idea that there must be balance between the ecological and that for intensive human use (eg. agricultural/urban/industrial) at the (bio)regional scale
    - Ecological rehabilitation (investing in Green Infrastructure). Generally, each bioregion will need to establish a balance between land devoted to green infrastructure and land devoted to intensive human use with a proportion of both categories being devoted to multiple use. Specific details will vary with bioregion.
  - Agricultural land:
    - Nutrient balance (target – input/output balance maintained)
    - Salinity (target – improving)
    - Acidity (target – improving)
    - Erosion (target – improving)
    - Structure (target – improving)
  - Water (surface, wetland, subsurface)
    - Percentage extracted from environment (target – 50% max?) A slowly tightening cap towards 50%? is recommended)
    - Water quality in watercourses (good indicator of landscape health within a bioregion) (monitoring points at all major confluences to trace back to problem areas) (target – continuous improvement)
    - Soil moisture/evapotranspiration (drought?)
    - Water storage capacity (siltation)
  - Biodiversity (or ecological infrastructure)
    - Vegetation cover (target - % appropriate to the bioregion in question)
    - Vegetation and species diversity (target – movement towards ‘ideal’ for the bioregion in question)
    - Landcover disturbance as defined by the CSIRO.
  - Assimilative capacity for wastes

- Specific Human Settlement physical indicators/targets
  - Mandatory building codes
    - % water heating from solar (domestic/industrial) mandatory solar hot water in new homes (target – 60% by 2010, 100% by 2015) (Commonwealth incentive payments may fund rebates scheme)
    - % domestic water sourced from rainwater tanks
    - domestic air-conditioning offset by solar panels or other domestic renewable capacity (as in SA?)
    - Lifecycle assessments of household and building products
  - Transport
    - Ratio public/private (target increasing)
    - Footprint/1000person/km by mode)
- Specific sectoral indicators/targets
  - Water embodied in product (agricultural and industrial) (target – low hanging fruit, then progressive improvement)
  - Energy (by type, i.e. renewable, non-renewable) embodied in product (agricultural and industrial) (target – low hanging fruit, then progressive improvement; increase proportion of renewable)
  - Sectoral ecological footprinting (target – low hanging fruit, then progressive improvement)

## Questions for consideration (raised in Discussion Paper)

### Sustainability Objectives and their measurement

#### General Questions

*Should a sustainability charter consist of aspirational statements, set targets (such as measurable water quality) or both?*

#### Response

The Sustainability Charter should consist of aspirational statements and set targets (as well as the additional features suggested above)

*What research will be needed to develop and support the Sustainability Charter?*

#### Response

The primary research required will be in the National System of Biophysical accounts and into appropriate methods to measure and monitor the cultural and social aspects of transitioning to sustainability. For example, biophysical accounts need to be aligned with financial accounts in order to integrate sustainability assessments across the Triple Bottom Line. The Ecological Footprint methodology needs to be formulated in a more robust and scientific way.

*Can existing standards (such as the Water Efficiency Labelling and Standards (WELS) Scheme) be applied to the Sustainability Charter? What are they?*

**Response**

This submission proposes a new conceptual framework (see above) to underpin a set of indicators/targets from the macro to micro scale. Currently there are a plethora of indicators and standards that have proved problematic due primarily to inconsistencies of method and the sheer number of indicators. The proposed framework is much more streamlined and conceptually rigorous. Once established, the Commission should engage in a process of selecting which indicators (including method, etc) should be included in the sustainability accounting framework.

*Can the charter be framed in such a way to ensure that it can be integrated into all level of government decision-making?*

**Response**

If the Charter can lead to a nationally agreed set of targets supported by incentive payments ranging from macro targets such as ecological footprint reduction to local waterways targets then it will ensure integration into all levels of government decision-making.

*Will there be a cost/gain to the economy by introducing the target(s)?*

**Response (Costs/Benefits of Charter)**

As a matter of principle, prevention is much less costly than cure. The costs of delaying action to restore an economy-ecology balance will be many orders of magnitude greater than acting now. Most of the costs of current economic activity are either invisible or externalised. GDP while being a useful measure of the level of economic activity adds benefits to costs. The true picture of economic health can only be gauged through a benefit/cost analysis. Genuine Progress indicators (GPI) provide such an analysis and show that the costs of economic activity as currently conducted are of roughly the same magnitude as the benefits.

The application of a National System of Biophysical Accounts as described above will enable economic activity to be tailored to reduce costs, which, together with targeting investment at natural capital restoration, will increase the benefits account of the GPI while significantly reducing the cost account, giving a high benefit/cost ratio. This is sound economic logic that makes good sense. In real terms (full cost accounting) this will result in very significant economic gain. Conversely, failure to act may impose costs that become beyond the capacity of the economy to sustain in future.

*Could a sustainability charter be incorporated into national State of the Environment reporting?*

**Response**

State of Environment reporting is the ideal framework to deliver effective monitoring and evaluation of sustainability indicators. It is important the charter develops agreed mechanisms for consistent reporting through Commonwealth, State, Regional and Local Government processes. The sustainability charter would further develop the targets and measures required for achieving the transition to living sustainably.

Perhaps most importantly the SoE reporting only records the regional and national state indicators – and these may well be supported by unsustainable energy, water and material subsidies from neighbouring and distant regions. Combining SoE with a Footprint analysis provides more rigour and guarantee of sustainability.

*Is National Competition Policy a good template for consideration of incentive payments for sustainable outcomes?*

**Response**

We believe NCP is a good framework for incentive payments for reaching sustainability targets

*How should payments be awarded under the Sustainability Charter?*

**Response**

In a similar way to current NCP payments.

*Is it possible to measure cultural and social values in relation to a Sustainability Charter?*

**Response**

This is a matter for further research and could be commissioned by the Sustainability Commission.

**Built Environment**

*What objectives are applicable to the built environment? How would these be measured?*

**Response**

These have been addressed above. The focus should be on designing for climate, recognising and integrating potential changes to the climate from the enhanced greenhouse effect. In summary, objectives are to set targets maximize use of renewable energy (eg. mandatory solar water heating), solar passive design, achieving increased use of rainwater, and required use of low impact (ecological footprint) building products.

*How should we rate the sustainability of existing building infrastructure?*

- *Could a measurement of level of retro-fitting achieve this?*
- *How would we measure levels of retr –fitting?*

**Response**

A great deal could be achieved through retro-fitting. An incentive scheme for retro-fitting could require a statement of what was done enabling statistics to be collated.

*Do we need to protect heritage buildings as part of the sustainability charter?*

**Response**

Yes.

*Can existing building standards, such as the 5 star rating system, be incorporated into the Sustainability Charter?*

**Response**

Such a system should be incorporated. Further investigation by the Commission once established could determine if modifications to this system was required.

**Water**

*How should water quality be measured?*

**Response**

Water quality is measured for a range of reasons and the way in which measurements are carried out will depend on the objective of the measurement program. One of the most common reasons for measuring water quality is to determine whether quality meets defined standards (i.e. guidelines or water quality objectives). In this situation, measurements are based on indicators that reflect the issues of concern e.g. salinity in salt affected areas or benthic macroinvertebrates if the main issue is impacts on ecosystems. While chemical water quality (e.g. nutrient concentrations) is not widely regarded as useful because of apparent “noise”, recent research indicates that is much more information in these data than has hitherto been realized. Such measurements are therefore useful indicators of linkages between land use, flow regimes and the health of aquatic ecosystems. Measurements must be long term in order to detect trends of worsening quality before any non-reversible effects occur. There is much scope for better sampling designs and the introduction of new technologies to obtain better and more cost-effective information. International advances in this area should be more rapidly adopted in Australia.

*Should targets be focused on reducing water consumption, increasing water re-use or both?*

**Response**

Both are important. Increasing reuse contributes to reduced consumption anyway. Demand management and reuse of water needs to have a strong focus considering the likely decrease in rainfall that is projected to occur over many parts of Australia in future (as a result of climate change).

*How can we measure the health of water catchment areas?*

**Response**

There is a wide range of recognised catchment health indicators e.g. percent land clearance, percent grass cover, presence of riparian zones and so on. Many of these can now be measured using remote sensing technology, which is a very cost effective approach of assessing broad scale catchment health. As with any other measurement program, indicators should reflect the major issues of concern. New technologies (e.g. in situ on-line sensors and real time data reporting over the Web) are rapidly coming on stream and can be adopted in Australia. Some of these technologies will be trialed by the newly established CERF Hub “Landscape Logic” based in Hobart. There is an urgent need to make such data – especially when merged with remotely sensed data of various kinds – more readily available to regional groups, Catchment Management

Authorities, regional NHT and NAP committees and the like so that they may guide investment decisions. The CERF Hub will also address this.

### **Energy**

*How should we measure the use of renewable energy?*

### **Response**

Proportion of renewable to non renewable.

*How do we encourage an increase in renewable energy use?*

### **Response**

The focus needs to be on diversifying the energy sector to reduce its greenhouse intensity. A broader focus than renewable energy and energy efficiency is needed. Making improvements in the fossil fuel industry is also vital, and recognises Australia's heavy reliance on these energy sources both now and in the future.

Some recommendations from a previous inquiry (*Employment in the Environment Sector: Methods, Measurements and Messages*) which examined the Mandatory Renewable Energy Target (MRET) were not adopted by the Australian Government. This included a recommendation to substantially increase the MRET. If the Australian Government is going to lead the sustainability agenda, recommendations such as these need to be supported.

*Can we measure the awareness of the environmental, economic and social benefits of energy efficiency and renewable energy?*

### **Response**

A significant part of the Sustainability Commission's brief should be educative. The Commission should examine the most appropriate ways to measure these things.

### **Transport**

*How do we judge the efficiency of transport systems?*

### **Response**

Ratio public/private (target increasing) is one useful measure. Another drawing on ecological footprint methodology (which we believe should lie at the heart of sustainability targets) is ecological footprint/1000person/km by mode.

*What transport infrastructure measures will reduce private transport needs?  
How do we measure these?*

### **Response**

Addressing transport requires a combination of approaches, including:

- infrastructure and planning improvements
- awareness raising and improving access to information
- behaviour change initiatives
- economic reforms e.g. incentives, disincentives, pricing reforms
- technology improvements e.g. fuels, cars, real time traffic systems

- encouraging innovation e.g. car sharing/car pooling programs

#### Water

Targets for the MDB given that climate change is likely to reduce water inputs to the Basin – see article <http://www.theage.com.au/news/national/murray-needs-faster-flow-just-to-tread-water/2006/05/14/1147545209341.html>