

*The*  
**ENVIRONMENTAL  
ENGINEER**



Journal of the Society for Sustainability and Environmental Engineering, Institution of Engineers, Australia

Price: Free to members Non-members - \$7.95

Vol 6 No 2 Winter 2005



**Sustainability**  
*Special Edition*

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**SOCIETY FOR SUSTAINABILITY  
AND ENVIRONMENTAL  
ENGINEERING,  
INSTITUTION OF  
ENGINEERS, AUSTRALIA**



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## **THE ENVIRONMENTAL ENGINEER**

*The Environmental Engineer* is published  
by Hallmark Editions on behalf of the  
Society for Sustainability and  
Environmental Engineering. For  
advertising enquiries, please contact:

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is also available via subscription.

# CHAIRMAN & EDITOR'S MESSAGE

This is the second edition of *The Environmental Engineer* for 2005. I have previously mentioned a possible change of name for the Environmental Engineering Society, and it has finally happened.

Ours is one of the most dynamic and energetic technical societies within Engineers Australia - The Environmental Engineering Society (EES). The EES, which interestingly has roots going as far back as the 1970s, is over 1000-member strong, and has dedicated chapters in six states. The Society (<http://ees.ieaust.org.au>) conducts and coordinates over fifty seminars and technical meetings throughout Australia on matters relating to environmental engineering, science and sustainability. We have happily noted that our activities, reflecting the changing working landscape of our members, has shifted over the past decade towards from environmental to broader sustainability. What were previously corporate and government environment policies, which was the basis of our work, are now sustainability policies. With this paradigm shift has come the need for our Society to acknowledge its contribution as well as its continuing mandate to not only embrace, but to play a strategic and central role in engineering sustainability.

With this in mind, the National Board of the Society has spent the past six months consulting its State Chapters and members about changing its name to reflect this notion. And, I am now proud to announce that, with the continuing support of Engineers Australia, the Society will be re-named as the Society for Sustainability and Environmental Engineering (SSEE). This is formally being launched at our biennial national conference, *Creating Sustainable Engineering Solutions*, on the 18th and 19th of July 2005 at the Powerhouse Museum in Sydney.



This edition has been designed as a special sustainability edition to both reflect the change of name of the society, as well as the 2005 national conference, the theme of which is sustainability. Accordingly, this edition contains several papers on sustainability, and a state-of-sustainability report from each of the state committees.

With this edition, it is more than likely, that I will finally (after four years as Editor), retire from this post as managing editor of *The Environmental Engineer*. Watch this space as we are still finalising matters with the possible new editor in charge. I thank you for your contributions and support over the past four years to not only make this half-yearly publication into a quarterly, but also incorporate some quality material, which has helped increase the growth in readership.

Finally, please help the society keep in touch with you by e-mailing our Secretary Julie Armstrong at [JArmstrong@engineersaustralia.org.au](mailto:JArmstrong@engineersaustralia.org.au) with your contact details, particularly if you have not been receiving e-mails about society activities.

We continue to search for articles for the Journal. Good articles will ensure the continuing success of the Journal, particularly external to the society. It is our intention that the distribution goes beyond the EES to include an external subscriber base. Your contributions are therefore most welcome. The next deadline for contribution towards the

Spring Edition of the 2005 journal is Friday 16th September 2005. Please e-mail contributions to [terence\\_jeyaretnam@urscorp.com](mailto:terence_jeyaretnam@urscorp.com) or contact me directly at URS on (03) 8699 7587. You are also welcome to e-mail me regarding your thoughts on content matter for future editions.

**Terence Jeyaretnam**

**Chair - SSEE**

**Editor - *The Environmental Engineer***

Journal Committee: Julia Lamborn (Assistant Editor), Lindsay Smith (NT), David Gamble (NSW), Rajendra Kurup (WA), Emma Parsons (SA), Katie Mayall (Vic), Michael Clarke (QLD), Andrew Barton (Tas).

## THE ENVIRONMENTAL ENGINEER

### CONTRIBUTIONS WANTED NOW FOR SPRING EDITION

*The Environmental Engineer* is seeking contributions for the remaining two editions in 2005 in the form of articles, papers, technical notes and news items. Contributions need to be kept to below 4000 words, but there is no requirement on the minimum size required. Topics may range from any part of the environmental and sustainable development areas. Papers may also be published as a peer reviewed contribution and accordingly a panel of experts has been established.

The next contribution deadline is Friday 16th September 2005 for publication in October 2005. In the first instance, your contributions should be e-mailed to the Managing Editor, Terence Jeyaretnam on [terence\\_jeyaretnam@urscorp.com](mailto:terence_jeyaretnam@urscorp.com). Terence can be contacted at URS on (03) 8699 7587 or 0439 073 332 for any enquires regarding contributions to the Journal. Following assessment of suitability the article will be edited by either Terence or one of the Journal Committee members.

**Refereed Papers:** Papers provided for peer review and publication will once again be assessed for suitability and then passed on to the peer review committee for review and comment. Their comments will be passed back to the principal author. The finalised paper will then be published.

## THE ENVIRONMENTAL ENGINEER

### ADVERTISING SPACE NOW AVAILABLE FOR SPRING EDITION 2005

The Journal is mailed out to more than 1200 environmental professionals throughout Australia. As such it represents an excellent advertising opportunity for environmental services, technologies, events and employment opportunities. We encourage the environmental engineering community to consider the Journal as a marketing vehicle for your companies.

The prices for advertising are as follows:

- Full page four colour is \$1250
- Half page four colour is \$750
- Full page mono is \$875
- Half page mono is \$525
- One-third page mono: \$400
- One-quarter page mono: \$325
- One-sixth page mono: \$250

Add 25% to mono for two colour ads.

# NEWS AND VIEWS

Compiled by Ms. ChinChin Lim.

## WATER INDUSTRY ROADMAP RELEASED

Market incentives that drive water-efficient buildings, improved pricing arrangements and fast-tracking of the water reform agenda are key recommendations in the Australian Water Industry Roadmap, released by the Barton Group.

The report presents a roadmap of sustainable solutions for Australia's water users and water custodians to affect change in the systems used for allocation, financing and pricing as well as managing demand and supply infrastructure arrangements.

The roadmap draws on examples of best practice management from Australia and overseas in the areas of policy, reuse, integrated water cycle management, demand management, new supply sources and innovative partnerships.

Key elements of the AWI Roadmap include:

- Expansion of water trading and investment opportunities with more engagement of the private sector.
- Robust definition of water entitlements, the establishment of guaranteed registers and rigorous accounting systems.
- Improved pricing arrangements that reflect the seasonal opportunity costs of water use, including environmental impacts.
- Thorough evaluation of opportunities to reconfigure water supply and sewage infrastructure to expedite the building of new water-efficient cities.
- The coupling of high standards and market incentives that drive water efficient construction and retrofit of buildings.
- Development of innovative accounting, measurement and benchmarking systems and new competitive institutional arrangements.

The report can be found at [http://www.bartongroup.org.au/AWIR\\_FINALV10.pdf](http://www.bartongroup.org.au/AWIR_FINALV10.pdf)

Source: *EnviroInfo*, 23 June 2005

## WORLD FIRST CARBON CREDIT TRADING SCHEME

An Australian Forest Corporation (AFC) scheme that allows landowners to trade carbon credits with greenhouse gas emitting industry groups has been

officially endorsed in New South Wales.

The Ecotech Group Pty Ltd subsidiary was granted accreditation by the Independent Pricing and Regulatory Tribunal (IPART), under the carbon sequestration rule of the State Greenhouse Abatement Scheme.

IPART believe the move may represent the first such endorsement of a, 'sustainable forest' model for carbon sequestration anywhere in the world.

AFC's scheme enables landowners to trade credits gained through the planting of non-stand specific trees, and includes templated modules designed to help landowners fulfill the carbon sequestration program's certification criteria. Carbon credits are calculated on the amount of carbon stored in trees and plantations.

Introduction of the trading scheme will enable gas-emitting industries to purchase carbon credits from relevant landowners to counterbalance environmental impacts related to their operation.

The aim of the scheme is to raise industry and agricultural sector awareness of their environment affects, while affording a viable means of complying with antipollution legislation. In addition, the financial element of the scheme is expected to act as a positive incentive to contributing landowners to reforest previously unproductive or damaged land in the region.

The AFC trading scheme falls in line with New South Wales Government policy, which parallels basic Kyoto protocol guidelines to cut green house gas emissions.

Source: *EnviroInfo*, 12 May 2005

## WORLD-FIRST REPORT ANALYSES THE TBL OF THE AUSTRALIAN ECONOMY

A world-first report, providing a detailed 'triple bottom line' overview of the 135 industry sectors of the Australian economy using a set of ten environmental, social, and financial indicators, has been released.

The report, undertaken by CSIRO Sustainable Ecosystems and the University of Sydney, uses the indicators of water use, land disturbance, greenhouse gas emission and energy use, profits, exports and imports, employment, income and government revenue to provide a snapshot of the

triple bottom line performance of the Australian economy in the mid 1990s (the most recent data available to the researchers).

The report highlights sustainability challenges for different industries and pinpoints areas in the production chain where a focussed effort would make a significant difference.

All effects are referenced back to a consumption dollar - roughly the dollar spent by a consumer in everyday life. It also shows that each consumption dollar is quite different - some dollars are positive and create employment, or suck in imports or generate government revenue. Other consumption dollars are less positive through their high use of water or production of greenhouse gas emissions.

One of the major insights emerging from the analysis is that the prices consumers pay for primary production items does not reflect the full value of the natural resources embodied in their production chains. This issue is reflected in the current debate on national water resources reform with calls for consumption-based pricing, full cost recovery pricing for water services, and the implementation of pricing that, where feasible, includes externalities (CoAG 2004).

The analysis seeks to underpin broader societal calls for industry, government and institutions to make decisions on a broader basis than just the financial bottom line.

The report, *Balancing Act*, can be downloaded at <http://www.cse.csiro.au/research/balancingact/aboutreport>

Source: *EnviroInfo*, 26 May 2005

## LAUNCH OF VICTORIA'S ENVIRONMENTAL SUSTAINABILITY FRAMEWORK

Victoria's Environmental Sustainability Framework was launched by the Minister for Environment, the Hon John Thwaites MP, on 20 April 2005. The Framework provides direction for government, business and the community on building environmental considerations into the way Victorians work and live, and will be a key driver of the Government's commitment to make Victoria a world leader in environmental sustainability.

The Framework:

- Outlines the key environmental challenges faced by Victoria;

# NEWS AND VIEWS

- Explains 'environmental sustainability' and its importance;
- Identifies the strategic objectives to be pursued to become environmentally sustainable;
- Sets out objectives to be achieved and interim targets for measuring progress towards the objectives; and
- Identifies some important steps for putting the Framework into action.

The Department of Sustainability and Environment will work with State and local government, business and the community to implement the Framework.

The Framework is available at <http://www.dse.vic.gov.au/dse/>

Source: *Department of Sustainability and Environment*

## AUSTRALIA RELEASES GHG EMISSIONS INVENTORY

The Australian Greenhouse Office (AGO) has released its 2003 National Greenhouse Gas Inventory. Highlights of the inventory include:

- Australia's net GHG emissions were around 550 million tonnes of CO<sub>2</sub> equivalent in 2003, which is a 1.4% decrease on 2002 net emissions;
- The decrease in emissions was sourced from the land use, land use change and forestry sector and from waste;
- Australia's 2003 GHG emissions were 1.1% above 1990 levels; and
- The largest source of net national GHG emissions was the combined energy subsectors, comprising stationary energy, transport and fugitive emissions from fossil fuel extraction and distribution, which accounted for 68% of total GHG emissions in Australia.

The National Greenhouse Gas Inventory 2003 is available at <http://www.greenhouse.gov.au/inventory/2003/index.html>

Source: *E3Monitor (Australian Greenhouse Office)*

## REPORT OUTLINES ACTIVITY IN THE CARBON MARKET OVER 2004/05

The World Bank has released its annual State of the Carbon Market report for 2005. The report is based on data from transactions involving credits from Clean Development Mechanism (CDM)

and Joint Implementation (JI) projects under the Kyoto Protocol, as well as EU allowances under the EU ETS and allowances under other GHG emissions trading systems. Highlights of the report include:

- The regulatory framework of the carbon market has been reinforced considerably by the commencement of the EU ETS on 1 January 2005 and the Kyoto Protocol's entry into force on 16 February 2005;
- 107 million tonnes of CO<sub>2</sub> equivalents were traded through project-based emission reductions in 2004, compared to 78 million tonnes in 2003;
- The estimated volume of project-based credits traded so far in 2005 is 43 million tonnes of CO<sub>2</sub> equivalents;
- The prices of project-based emission reductions have varied considerably, with Verified Emission Reductions

(emission reductions that have been validated by an independent third party) trading between US\$3.6 and US\$5 per tonne of CO<sub>2</sub> equivalents from January 2004 to April 2005, and Certified Emission Reductions (generated by Clean Development Mechanism projects) trading between US\$3 and US\$7.15 per tonne of CO<sub>2</sub> over the same period.

- There are currently four operating markets for GHG allowances: the EU ETS, the UK ETS, the NSW Scheme and the Chicago Climate Exchange. The combined total volume of emissions exchanged in these markets from January 2004 to March 2005 is around 56 million tonnes of CO<sub>2</sub> equivalents.
- EU allowance prices varied between €7 and €9 in 2004; however, in May 2005, their price reached €20.

The report is available at <http://www.ieta.org/ieta/www/pages/getfile.php?docID=899>

Source: *E3Monitor (International Emissions Trading Association)*

## GLOBAL WIND POWER CAPACITY MAY MEET WORLD ENERGY DEMAND

A new study by researchers at Stanford University in the US has indicated that the world's potential wind energy capacity has been underestimated in the past.

The researchers studied wind speed measurements from around 7,500 surface stations and 500 balloon-launch stations. 13% of the locations studied experienced average annual wind speeds sufficient for power generation and the researchers claim that, on a global scale, an even larger proportion of locations are likely to experience sufficient speeds to ensure the economic feasibility of wind power.

The study also indicates that converting as little as 20% of the world's wind energy to electricity would satisfy the world's total energy demands; however, a number of practical barriers are preventing such a scenario. The most prominent of these barriers is the difficulty involved in creating and maintaining a dense array of modern turbines that would be required to harness the energy, the researchers said.

Source: *E3Monitor (American Geophysical Union)*

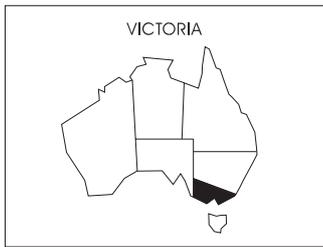
## WORLD ENVIRONMENT DAY DINNER



To celebrate World Environment Day 2005 in North Queensland, the Society of Sustainability and Environmental Engineering, Engineers Australia, the Australian Institute of Geoscientists and Australasian Institute of Mining & Metallurgy joined forces to sponsor a three course formal dinner in Townsville. Mick Roche, Manager Product Stewardship, BHP Billiton presented a keynote address on the principles of Product Stewardship and representatives from the Townsville and Thuringowa Councils provided an update on local activities aimed at greening the Twin Cities and adopting sustainable practices. Over 120 people, including dignitaries from three surrounding councils attended the event held at Riverbend Restaurant and Bar. Organisers hailed the night a huge success with offers for corporate sponsorship of future events being made.

# CHAPTER REPORTS

## VICTORIAN CHAPTER



### June 2005

The first half of the year has flown by! We have held some successful seminars in the past few months including

- Who's looking after the health of Port Phillip Bay? on 20 April
- Student industry night on 27 April
- Dual pipe water recycling guidelines on 24 May

We have some interesting events coming up:

- a seminar on hazardous waste
- green buildings breakfast forum
- involvement in engineering week with a site visit to the 'green' commonwealth games village in Parkville
- 'enviro eng' networking drinks (similar to enviro drinks)
- a seminar on nuclear waste - can we handle it?

The SSEE conference is coming up very soon. The Victorian delegates, including myself, will look forward to meeting some of the interstate members and affiliates there.

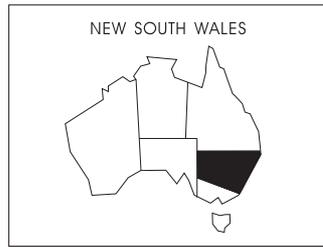
We are currently seeking enthusiastic individuals to join the Victoria committee of SSEE. If you are interested in finding out more about what is involved, please do not hesitate to contact me.

**Deborah Woods**  
Chair, Victorian Chapter



Debbie Woods  
Chair, Victoria

## SYDNEY CHAPTER



Since I wrote my last report, many months have passed. Planning for the SSEE 2005 Environmental Engineering and Sustainability National Conference, which is to be held at the Powerhouse Museum in Sydney between **18-19 July 2005**, is in its final stages.

All indications are that we will have around 250 attendees at the event, which is more than we initially expected. We have a full technical program over two days, with some extremely interesting papers being presented, on just about every aspect of sustainability that you could think of. There are eminent speakers, such as Peter Newman and Ian Lowe, who will give us their view on how sustainability should be applied. And of course we have social events such as dinners and drinks, that will provide delegates with opportunities to network and make contacts that can assist them in their professional lives.

By attending this conference, people will gain a broad understanding of how to apply sustainability principles in areas other than their own specialist fields - and cross fertilisation of ideas is what the engineering profession needs in order to be able to implement sustainable engineering solutions.

If you want further information about what is planned, please visit the conference website at <http://www.iceaustralia.com/ees2005/index.html>. I look forward to seeing you there.

### Past events

Due to the time commitments associated with the conference, we haven't organised many events on our own over the past few months. What we have been doing instead is to co-host events with other societies that have already planned technical sessions on topics that we feel would be of interest to our members. These include stormwater management, groundwater cleanup, wind energy and other environmental engineering areas.



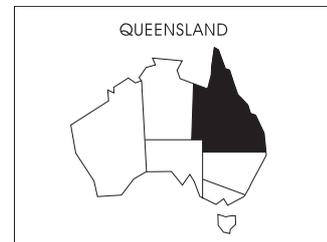
David Gamble,  
Chair, NSW

### Future events

Our next event is a student presentation night on 29 June 2005. Two students will be presenting on their final year projects. Kate Maunder from Newcastle University is presenting on Urban Water Resource Management - Economics of On-Site and Decentralised Systems, and Mitchell Harley from the University of NSW is presenting on Algal Blooms in the Hawkesbury River. We intend to get participants from other NSW universities next year, and make this an annual event.

**David Gamble**  
Sydney Chair SSEE

## QUEENSLAND CHAPTER



### Functions

The last quarter has seen three more very interesting technical seminars and a networking session. The seminars were all closely aligned with our sustainability theme and included:

- **EcoEfficiency - How it can work for you (19 April)**. Wynne Henderson from Total Energy Solutions showed examples of how industrial or commercial facilities could save energy through a combination of Energy Performance Contracting and on-site generation while also providing security of energy supply. Tim Powe from the Sustainable Industries Division EPA then outlined the ecoBiz program and showed how it is helping Queensland companies adopt new resource efficient practices that are great for the financial bottom line as well as the environment.

# CHAPTER REPORTS

• **The Gladstone Synergies Project (May 17).** Dr Glen Corder from the Sustainable Minerals Institute at The University of Queensland presented a summary of the current synergies in this major industrial region of Queensland, the key factors that have enabled these synergies to be realised and the potential opportunities for new regional industrial synergies in both the short and long term.

• **The Qld Environmental Protection Act - Recent changes impacting on anyone undertaking an Environmentally Relevant Activity (June 21).** This forum was held at Engineering House and co-hosted by the Australian Industry Group, Environment Institute of Australia and New Zealand South East Queensland Division and the Environmental Engineering Society, Queensland Chapter. Rebecca Hoare, from Deacons presented an overview of the amendments and what they mean from a legal point of view. Elisa Nichols from the Environmental Protection Agency discussed the reasons for the changes and the resulting changes to the EPA's role as the regulatory agency. David Stevenson from the Australian Industry Group then discussed how the legislative changes have the potential to impact on industry and included a review of how the changes have already impacted on some AIG members. The forum was attended by about 130 people and as you can imagine the range of presentations led to some interesting questions and lively debate. In fact, it is the first time that we have ever run out of red wine at a function.



David Stevenson, Elisa Nichols and Rebecca Hoare.

On 3 June a **World Environment Day "Eco-drinks" function** was held jointly with the Environment Institute of Australia and New Zealand and the Queensland Environmental Law Association. The Honorable Stephen Robertson MP Minister for Natural



Andrew King,  
Chair, SSEEQ

Resources and Mines outlined a number of important Queensland environmental initiatives as well as welcoming the current and continued presence of our environmental organisations in Queensland. Again the function was well attended and discussions continued late into the night - luckily we were in a pub and we didn't run out of red wine.



Anna West, Donnell Davis and Sandy Stewart.

## Future functions

Technical seminars are held on the third Tuesday of each month and details of up-and-coming events are posted on the SSEE website and emailed to members. A wide range of topics is planned for the next quarter including a seminar on July 19 (for those not able to attend the National Conference):

- 19 July Forensic Science: A Cornerstone to the Effective Implementation of Legislation and Regulation (John Thorogood FRC Environmental)
- 16 August North-South Bypass Tunnel Brisbane-Air Quality (CAS of A&NZ)
- 20 September Energy from Waste (Pat Glymes, CSIRO & Bill Brazier, EDL)

In addition, Thiess has agreed to run a follow up of last year's very successful site visit to the Newstead Remediation site. Details will be finalised in the coming months.

## People

Lara Harland has now taken on the role of Vice Chair of the Queensland Chapter and due to his interest in sustainability Michael O'Brien has joined the

committee. We thank Scott Moffett for his help in setting up catering for our functions and wish him well for his new job in Ballina. All members are welcome to attend committee meetings, they are held in Engineering House on first Wednesday evening of each month.

We will shortly be calling for nominations for the Eric Brier Memorial Award. This award is for a Queensland based Engineers Australia member who has made a significant contribution to advancing the public status of the profession of engineering, particularly in the field of sustainable development.

**Andrew King**  
Chair SSEEQ

## WA CHAPTER



## Technical Seminars

Environmental professionals rarely work in isolation, but are usually contributing to environmental and sustainability related elements of far wider projects. The WA Chapter is therefore seeking to establish and strengthen links with other technical panels and societies, both within and beyond Engineers Australia. Following on from very successful events jointly sponsored with the Centre for Water Research and the Clean Air Society, we are looking to jointly sponsor more of our technical seminars.

## Sustainable Water Resource Management in WA

In May the SSEE and the Hydrology and Water Resources Panel jointly sponsored a technical seminar on Sustainable Water Resource Management in Western Australia. The speaker, Jos Mensink, is Director of the WA State Water Strategy and uniquely placed to present the audience with a comprehensive summary of the current and emerging issues related to water resource management in WA, including the recent changes to the water resources portfolio, which is now the responsibility of the Premier, and the on-going review of proposals to transfer water from the Kimberley to Perth. The

# CHAPTER REPORTS



Rajendra Kurup  
Chair, Western Australia

topic attracted a full house (nearly 100 attended) and discussion carried on for over an hour.

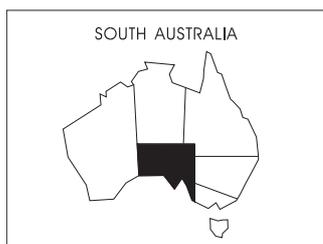
## **WAGOOS - Western Australia's contribution to the Global Ocean Observing System**

The June seminar was jointly sponsored by EES and the Coastal and Ocean Engineering Panel and discussed WAGOOS - Western Australia's contribution to the Global Ocean Observing System. The seminar was presented by WAGOOS Chairman, Dr Ray Steedman, who gave a summary of the UN sponsored project's objectives and some preliminary results. WAGOOS is an alliance of government, academic and corporate organizations that contribute data and expertise.

## **Advanced Sustainability for Professionals**

Engineers Australia, through the College of Environmental Engineering and the Society for Sustainability and Environmental Engineering, has sponsored the development of a series of three new Continuing Professional Development short courses called Advanced Sustainability for Professionals. The short courses are being prepared by Professor Peter Newman and his colleagues at Murdoch University and cover topics including sustainability assessment, sustainable procurement and implementing sustainability in organizations. Members of the WA Chapter Committee have been working with members of the National Board to review the course outlines and material, which is targeted at practicing professionals. The courses will be available for enrolment in the second half of this year, initially in Western Australia but it is planned to make them available throughout Australia in future years.

## **SA CHAPTER**



Nadine Kelly  
Chair, South Australia

## **Overview**

By the time you receive this journal, the South Australian Chapter will have held three technical seminars this year on a diverse range of topics. A summary of the first two are provided below. The third was a joint meeting "South Australia - The State of Sustainability?" was held on July 6th with EIANZ, with support from the CSIRO Sustainability Network. A summary of this meeting will be provided in the next chapter report.

As well as technical events, this year we are also looking to foster closer links with other organisations; both environmental and other engineering disciplines, with the idea of holding joint meetings in the future.

The inaugural *Student Sustainability Prize* was also awarded at the end of 2004.

## **TECHNICAL SEMINAR: Radioactive Waste: The Facts (16th March 2005)**

### **Background**

Over the years there has been much debate, and conflicting information in the public arena on the issue on uranium and radioactive waste in South Australia. The amount of debate on this issues has recently heightened due to: the proposed National Low Level Radioactive Waste Repository in South Australia; the increased interest in nuclear energy as a solution for greenhouse gas production; and the proposed expansion of the Olympic Dam uranium mine, the largest known source of uranium.

Our society uses and benefits from radioactive sources on a daily basis, including in the fields of medicine, industrial measurement and engineering. In addition, South Australia's economy benefits from the export of uranium to other countries for use in nuclear power plants. These activities produce radioactive waste. In

South Australia, historic mining and refining activities at Radium Hill and Port Pirie has also produced radioactive waste. Therefore, long-term solutions for the disposal and storage of radioactive waste are required.

Much of the public debate on radioactive waste has been based on perceptions and emotions. In light of this, we held a seminar on nuclear waste within South Australia focusing on the technical facts.

## **Radioactive Waste Storage Audit by EPA**

The first speaker, Mr Graeme Palmer from the EPA presented a summary of the radioactive waste storage audit for South Australia conducted by the EPA during 2003. Key points included:

- There are 134 sites within South Australia where radioactive material is stored - 80 of which store radioactive waste.
- The radioactive materials are, in general, stored safely and securely.
- Radioactive material and waste varies from very low level waste (such as hospital gloves), sealed sources (such as radiation gauges, moisture density gauges), miscellaneous sources (such as smoke detectors), and mining sources (including tailings from uranium mines)
- Mining produces the most radioactive waste with a volume 35,400,000 m<sup>3</sup>, and a corresponding activity of ~5,000 TBq; the sum of the rest of the known sources (sealed sources, very low level and miscellaneous) has a volume of only <38 m<sup>3</sup>, with a corresponding activity of ~6.8 TBq.
- As yet, there is no central repository for radioactive waste of any level in South Australia - owners of the waste must store the waste.

# CHAPTER REPORTS

## **EIS for National Low Level Radioactive Waste Repository**

Dr David Cruickshanks-Boyd & Dr Peter Woods from Parsons Brinckerhoff provided an overview of PB's approach to the Environmental Impact Statement (EIS) and the political background to the project. They also provided a more detailed description of the assessment process for a critical aspect of the EIS - the protection of the groundwater. Key points included:

- The project was initiated by the lack of a national repository within Australia for low-level radioactive waste.
- The motto for the project was 'A safer future for all Australians'
- The basic design for the project was an engineered near-surface facility (~100 m x 100 m), with an operating life of ~50 years, and a management life of ~250 years, by which time the radioactivity of the low-level waste would be negligible.
- The EIS was used to select between three proposed sites, all of which were located in northern South Australia.
- Criteria for the site selection included the site's hydrology, geology, hydrogeology, ecology, security, social impacts and transportation.
- There were no technical reasons for the project not to go ahead.
- The project was abandoned for political reasons and a solution for this waste has not been provided.

## **TECHNICAL SEMINAR: Project Sustainability Management (19th April 2005)**

FIDIC, the International Federation of Consulting Engineers (FIDIC) have developed guidelines for Project Sustainability Management (PSM) (refer [www.fidic.org/psm](http://www.fidic.org/psm)). John Boyd, co-author of the FIDIC PSM guidelines presented an overview of the development and application of PSM. In his talk, John emphasised the following:

- Engineers, more than any other profession, are the people who can most influence sustainability - as they are involved in all new developments.
- There has to be a common, transparent, repeatable and

defendable definition of sustainability - and FIDIC has adopted the definition from the 1992 Earth Summit.

- Sustainability must include social and economic, as well as environmental and legislative, indicators.
- Project indicators are a moving target that need to be re-assessed continually as technology and best-in-class goals develops.
- The sustainability of projects are site and project-specific; a project that is sustainable in one area will not necessarily be sustainable in another.

The guidelines provide a transparent framework for developing and assessing the sustainability of projects, however, they rely on the cooperation of the project developer to have the aim of sustainability. The next step for engineers is to influence clients and developers of the benefits of sustainability on their projects.

## **Student Sustainability Prize**

We were pleased to have entries from both the University of Adelaide and the University of South Australia, from disciplines including Chemical, Electrical and Civil/Environmental. The prize was awarded to Katherine Daniell, Ashley Kingsborough, David Malovka and Heath Sommerville from The University of Adelaide, School of Civil and Environmental Engineering for their excellent thesis entitled "Assessment of the Sustainability of Housing Developments".

## **Upcoming Program**

Looking forward, we have the following events proposed:

**August:** The Annual Debate: always entertaining and informative!

**September:** Technical Seminar: possibly on development of alternative energy.

**November:** Field Trip: possibly to winery - what more could you want?!

As always, if you have any ideas or questions, please feel free to contact me, or any of the committee.

**Nadine Kelly**  
Chair, SA Chapter

## **ACT CHAPTER**



Peter Liston delivered a presentation on the draft ACT Environmental Flow guidelines that have recently been released for comment. The presentation was held on the 28th of June at Engineering House.

This presentation covered:

- objectives of the environmental flows
- monitoring results
- balancing trade-offs
- communicating the science
- larger basin implications

Based on the presentation, SSEE Canberra will assess whether or not to make a submission in the consultation process. Over the coming months, the ACT Chapter will begin planning the National Engineering Week (NEW) visit to the Woodlawn mine site (proposed). A presentation on the impact of Climate Change on the insurance industry is also planned for June/July.

**Pete Dickinson**  
ACT SSEE Chair



Peter Dickinson  
Chair, ACT

# WHAT IS ENVIRONMENTAL SUSTAINABILITY?

*Philip Sutton, Director-Strategy of Green Innovations*

*This article explores the important concepts of environmental sustainability, sustainable development and triple bottom line, including similarities and differences in the terms, and their collective significance to today's society.*

*The article is an edited extract from a 30 page paper written for the Commissioner for Environmental Sustainability Victoria. We would like to thank the Commissioner for permission to print this extract.*

*The complete paper is available at: [www.ces.vic.gov.au](http://www.ces.vic.gov.au). Click on the menu option "What is environmental sustainability?" and then click on the PDF file symbol at the end of the page.*

## **What is Environmental Sustainability?**

**Environmental sustainability** is the ability to maintain the things or qualities that are valued in the physical environment.

For example, most people want to sustain (maintain):

- human life
- the capabilities that the natural environment has to maintain the living conditions for people and other species (eg. clean water and air, a suitable climate)
- the aspects of the environment that produce renewable resources such as water, timber, fish, solar energy
- the functioning of society, despite non-renewable resource depletion
- the quality of life for all people, the livability and beauty of the environment

Threats to these aspects of the environment mean that there is a risk that these things will not be maintained. For example, the large-scale extraction of non-renewable resources (such as minerals, coal and oil) or damage done to the natural environment can create threats of serious decline in quality or destruction or extinction.

Traditionally, when environmental problems arise environmental managers work out how to reduce the damage or wastage. But it is not always easy to work out exactly when and where threats will have their effects and often the impacts are hard to reverse. So increasingly environmental managers adopt strategies aimed to prevent damage being done in the first place. A full sustainability program needs to include



Philip Sutton

actions to prevent threats and impacts from arising, actions to protect the environment from threats and damage, and restoration to reverse damage already done.

Sustainability issues arise wherever there is a risk of difficult or irreversible loss of the things or qualities of the environment that people value. And whenever there are such risks there is a degree of urgency to take action.

Environmental sustainability programs include actions to reduce the use of physical resources, the adoption of a 'recycle everything/buy recycled' approach, the use of renewable rather than depletable resources, the redesign of production processes and products to eliminate the production of toxic materials, and the protection and restoration of natural habitats and environments valued for their livability or beauty.

These sustainability programs need to operate on an adequate scale and need to continue operating reliably for as long as the threats continue.

Some of the issues that pose major environmental sustainability problems include:

- destruction of the living environments (habitats) of native species
- discharge of polluting chemicals and other materials into the environment
- emission of greenhouses gases into the atmosphere than can cause climate change
- depletion of low cost oil and other fossil fuels

Some environmental issues are largely of local significance while others have regional or even global relevance.

At the personal or household level, there are a host of actions that people can take to contribute to environmental sustainability at home, when travelling/accessing people or services or goods, at work, in other places or when acting as a community member or

citizen or as an investor of personal funds.

Some useful examples include living close to work where it's possible and walking, using a bike or using public transport are good options to save energy and reduce greenhouse gases. If these options are not possible then using an ultra-efficient hybrid petrol/electric vehicle can cut greenhouse gases and petrol consumption by about 50% and cut other toxic pollutants by about 90%.

Buying products made of recycled materials will generally save materials and energy, cut greenhouse gases and toxic pollution, and reduce impacts on living things in the wild. Installing a water tank and low flow shower can save water.

Building or renovating a house using environmental sound design and lower impact materials and 5+ star appliances can make a big impact on all environmental issues.

Using food in season or from local sources and organically grown can cut impacts from chemicals, save energy and reduce greenhouse gases.

Involvement in or donations to community environmental groups can help with practical projects like revegetation or by building support for effective government policies. And investing savings in ethical investments can help accelerate the creation of an environmentally-sustainable economy.

This is the simplest and most fundamental way to express the concept. But people using the term *environmental sustainability* can specify or elaborate the term further to add extra meaning or to apply the concept to more specialised contexts.

## **What Makes an Issue a Sustainability Issue?**

A sustainability issue arises whenever a valued system, object, process or attribute is under threat. The *existence* of the valued system, object, process or attribute could be threatened or its *quality* could be threatened with serious decline. In other words there is a sustainability issue whenever there is something that is valued that faces the risk of not being maintained.

Whenever there is a strong sense of urgency, there is always a sustainability issue involved. This urgency could relate

to something that *already exists* or to an understood *potential*. For example biodiversity might be threatened with extinction or the chance to realise the potential of a human being might be threatened, for example, if they remain in poverty or their lives are threatened by violence or disease. (The latter would usually be thought of as being *social* sustainability issues.)

## Sustainable Development

Sustainability is about *continuity* and development is about *change*. There are many things about life that we want to sustain (maintain) and many that we want to change. So it makes sense to create the notion of '*sustainable development*' that combines desired change and desired continuity - for example we might change exploitation, unhappiness, poverty, destructiveness, etc. and sustain the rest of nature, trust, tolerance, honesty, happiness, health, etc. Treated in this way *sustainable development* doesn't have to be an oxymoron (a combination of conflicting terms).

While theory says that sustainable development does not have to be an oxymoron, it can sometimes take quite a bit of negotiation before a whole society can be comfortable with a shared definition of what should be maintained and what should be changed.

The Brundtland definition is a widely used definition of sustainable development. (It is often misquoted as a definition of 'sustainability' - in situations where people (incorrectly) treat 'sustainability' and 'sustainable development' as synonyms.)

The text usually quoted is:

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

In fact this text is a paraphrasing of what the Brundtland Commission actually said in 1987 in its report "Our Common Future". What they originally said was: "Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." (definition quoted from p.8 of the Brundtland Report).

Thus it is clear that the Brundtland 'definition' of sustainable development is not a normal dictionary-style definition. Instead it is a outcomes-style statement which associates sustainable development with one of its important outcomes (ie. meeting the needs of the present without compromising the ability of future generations to meet their own needs) without actually saying what sustainable development itself is.

## The Triple Bottom Line

The Triple Bottom Line framework has been popularised globally since the mid-1990s by SustainAbility Plc., the UK consultancy company. The triple bottom line concept has been anticipated by others eg. in the late 1980s the Victorian State government promoted its economic, social justice and conservation policies as the centre pieces of its policy framework and in fact talked about having a triple bottom line.

The triple bottom line concept is often (but not always) associated with concerns about sustainability, but its core role is to broaden the issues-perspective of organisations. It extends the idea of the financial 'bottom line' (ie. the summarised, final outcome) to include an environmental and a social bottom line. A triple bottom line approach is often introduced into organisations that are almost exclusively financially focused to broaden their perspective. But, it can also be used to broaden organisations that are tightly focused on any other single bottom line (eg. environmental or social).

There are two quite distinct reasons for having a triple bottom line approach, one pragmatic and one ethical. The pragmatic argument is that because we live in a complex interlinked world, outcomes in one area of interest often cannot be delivered without paying attention to what's happening in the rest of the system eg. good financial results, in the longer term, may depend at least in part on the health of the society and the environment too; good social outcomes may depend to some extent on the environmental and economic parts of the system; and environmental protection may depend to a degree on the social and economic parts of the

system. The ethical argument for a triple bottom line (or broad-based) sustainability approach is that a narrowly focused ethical concern doesn't make much sense - if we care for people and other species at all, surely we should pay attention to their welfare as it is impacted by all aspects of the 'system' we live in - the environmental and the social and the economic spheres.

The triple bottom line concept is frequently associated with accounting and reporting. This is an historical or pragmatic<sup>1</sup> association, but is not essential. Many organisations are now beginning to migrate their triple bottom line focus from accounting and reporting to the *strategy setting* aspects of management, including into the spheres of business and product development<sup>2</sup>.

It is often easier to take a triple bottom line approach (ie. a broadly inclusive approach) if organisations are open to input from their full range of stakeholders. This can compensate to some degree for any narrowness of perspective of an organisation's management.

However, the simple act of adopting a triple bottom line approach does not mean that an organisation is actively tackling sustainability issues, nor does it make clear what is being sustained, even if there is an intended connection to sustainability.

Some organisations try to capture the spirit of the triple bottom line concept using alternative language that doesn't sound so 'corporate' eg. "People, planet, prosperity<sup>3</sup>" or Truly Better Living (ie. TBL). When applied broadly to social, environmental and economic issues, corporate social responsibility (CSR) programs are essentially the same as a triple bottom line programs.

A comprehensive treatment of the triple bottom line should involve consideration of:

- sustainability (continuity for things that matter)
- genuine progress (change to make things better for the first time)
- change that arises from the 'journey of life' (change that makes things different, but neither better nor worse).

1. Some practitioners find that it is easier to start with a focus on indicators and the accounting or reporting functions as this is less challenging for timid managements than immediately trying to change what the organisation actually does.

2. SustainAbility Plc., the populariser of the triple bottom line concept, is now developing what it calls the Trimaran program to help companies to make triple-bottom-line-orientated change and to position themselves to achieve triple bottom line performance, that is, it is moving at last into triple bottom line strategy making.

3. Another variation is "people, planet, profit", but the limitation of this slogan is that the economic element for society is not picked up, 'profit' for individual firms being only of interest to the firm and some of its stakeholders.

The fact that the triple bottom line approach directs attention to environmental, social and economic issues does not in itself mean that it is 'about' sustainability<sup>4</sup>. And even where there is an intended connection to sustainability, the adoption of a triple bottom line approach does of itself make it clear what is being sustained. This needs to be spelled out explicitly in each triple bottom line program.

While the general triple bottom line practice is to treat the triplet of environment, society and economy as a 'universal set' that covers all issues, some people feel that they cannot shoehorn everything under one of these headings. Some people feel that 'culture' is a separate category from 'society'. Others feel that 'governance' needs to be highlighted as a distinct category - using a 'triple bottom line + one' formula.

Other related concepts are:

- Triple Bottom Line reporting/accounting (sometimes misnamed as 'sustainability' reporting)<sup>5</sup>
- Triple Bottom Line strategic management
- Corporate social responsibility
- Global Reporting Initiative

### End Comment

Important concepts, ranging from environmental sustainability to triple bottom line, have emerged over the last thirty years. These concepts need to be further explored and better understood if government and business are to be able to use them for a sustainable future.

### References

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[http://dms003.dpc.vic.gov.au/l2d/C/ACT03151/0\\_1.pdf](http://dms003.dpc.vic.gov.au/l2d/C/ACT03151/0_1.pdf)

National Strategy for Ecologically Sustainable Development - source definition of ecologically sustainable development used in *CES Act 2003*, <http://www.deh.gov.au/esd/national/nsesd/index.html>

Natural Step: [www.naturalstep.org](http://www.naturalstep.org) (international hub), <http://www.au.naturalstep.org/> (Australia), <http://www.naturalstep.org.nz/> (New Zealand)

Susan Murcott's list of definitions of sustainable development, <http://www.sustainableliving.org/appen-a.htm>

Weaver, P., Jansen, L., van Grootveld, G., van Spiegel, E. & Vergragt, P. (2000). *Sustainable technology development*. Greenleaf Publishing: Sheffield, UK.

4. It is sometime held, inappropriately, that sustainability means "the integration of environmental, social and economic issues". However the core meaning of sustainability is the maintenance of something over time. The integration of issues is often needed pragmatically to get results but it is not what sustainability is 'about'. Trying to define sustainability in terms of integration involves a confusion of between 'means' and 'ends'.

5. Many people incorrectly think that 'sustainability' means 'the integration of environmental, social and economic issues', so 'sustainability accounting and reporting' is sometimes considered to be a synonym for 'triple bottom line accounting and reporting'.

# SUSTAINABILITY PRINCIPLES FOR ENGINEERS

*Terence Jeyaretnam, Chair, Society for Sustainability & Environmental Engineering*

Engineers, because of their professional role in society, have a particular obligation towards the integration of development and the environment, leading towards sustainable development. The Environmental Principles for Engineers (down-loadable from <http://ees.ieaust.org.au>) are Principles for the Engineering Profession for the Planning, Implementation and Management of Engineering Works that are Socially, Ecologically and Economically Sustainable.

The Environmental Principles were prepared in 1992 by the National Committee on Environmental Engineering (predecessor to the Environmental Engineering Society, the now Society for Sustainability and Environmental Engineering). The purpose of this document was to define a set of environmental principles for engineering practice. These principles complement the Engineers Australia Code of Ethics and incorporate the concept of ecologically sustainable development, and the practice generally of environmentally responsible engineering.

Background to the Environmental Principles is provided in the various chapters of the document. Topics include ethics, sustainable development,

environmental impact assessment, environmental economics, community participation and considerations for the practice of engineering internationally.

Given the change of name of the society, recognising the growing need for engineers to embrace more widely the broader concept of sustainability, and the wide acceptance and support to the concept by Engineers Australia, the society has been mandated with the re-writing of The Environmental Principles for Engineers to The Sustainability Principles for Engineers. It is expected that a draft document would be prepared in the fourth quarter of 2005, and a wide consultation process adopted before finalisation in early 2006.

The Sustainability Principles for Engineers will not only embrace emerging tools such as Project Sustainability Management guidelines by FIDIC, but look to truly step beyond rhetoric to reach both strategy and ground-level actions focussing on sustainable engineering practice.

Sustainable development, as phrased by the Brundtland Commission, is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". What is the role of engineers in achieving this?

In many instances engineering skills and knowledge are inherent in the solutions to the challenge of sustainable development. Renewable energy sources rely on engineering solutions to capture energy and convert to power; greenhouse gas reduction initiatives often require engineering input; and many of the solutions to our dry land salinity problems may prove to be engineered. Through such innovative solutions engineers are contributing to our mission to enhance future generation's ability to achieve their needs.

The next fifty years, to me, represent the fifty years in which we will do the most to protect, and restore the environment, and facilitate sustainability. We will do so because it will increasingly be more economically unfeasible, and socially unacceptable not to do so. Accordingly, engineers will have the significant task of re-engineering thought processes, challenging accepted wisdom, changing corporate thinking, accounting for the natural environment and remaining resources, increasing eco-efficiency, managing growth, and integrating the triple bottom line. The Sustainability Principles for Engineers will no doubt be one more yellow brick on the path to sustainability. Watch this space!

# SUSTAINABILITY: WHERE DO ENGINEERS STAND? A DISCUSSION PAPER

*Terence Jeyaretnam, Chair, Society for Sustainability and Environmental Engineering, and  
David Hood, Deputy Chair, College of Environmental Engineers*

## Introduction

Since the establishment of the National Committee on Environmental Engineering some 35 years ago, Engineers Australia has taken a number of steps to embed sustainability into the culture of engineering, and has achieved some successes. However, this leadership, demonstrated through policies and public announcements, needs to find ways of better integrating sustainability issues into our organisation's core business and its day-to-day management. Without a clearly articulated action and implementation plan, sustainability will be seen as a rather ad-hoc and disjointed activity within Engineers Australia.

Some issues and lessons learnt from activities to date include:

- The development and delivery of sustainability activities have tended to rely upon the efforts of a member or small group of members, often placing unrealistic demands upon volunteers;
- They tend to have been created randomly as one-off projects, relying on volunteer initiatives, often with inadequate support or funding;
- Lines of responsibility to coordinate and carry initiatives forward into other areas of Engineers Australia's activities need to be clear and prioritised;
- There is an increasing urgency for informed engineering input (eg. Greenhouse abatement and climate change adaptation, energy reform, building and construction, transport and land use planning, education), however we seem to be missing significant opportunities to contribute on a number of fronts; and
- While there is considerable interest in, and concern about sustainability issues, this concern is not yet reflected as a strategic priority of Engineers Australia.

While the Society for Sustainability and Environmental Engineering and the College of Environmental Engineers (SSEE and EEC), continue to support initiatives such as *The Natural Edge Project*, and are developing education and training modules on sustainability,



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David  
Hood

the call by Immediate Past National President Doug Jones to make sustainability one of Engineers Australia's priority areas needs to be implemented. The formation of a President's Task Force, or National Board on Sustainability to better understand, and respond to the growing sustainability debate, and define the role for engineers in driving the necessary paradigm changes, needs more momentum.

This paper has been prepared to provide background on matters surrounding sustainability in Australia for Engineers Australia.

## The Australian Government Position

During the 2004 Elections, the coalition government released its policy on sustainability through *A Sustainable Australia*. The following is a summary of some of the key relevant commitments outlined:

- developing a *more effective* response to climate change through 'Beyond Kyoto', including working alongside the Framework Convention on Climate Change, APEC, developing country partners, National Carbon Accounting System, and establish an Asia Pacific Climate Change Exchange;
- establish a \$2 billion Australian Water Fund for practical, on the ground water solutions;
- invest \$200 million of the Australian Water Fund to restore the Health of the River Murray;
- add 170,000 hectares of old growth forest to the existing reserve;
- provide a package of over \$50 million over four years to support sustainable forest management practice, to audit river catchment water quality;
- invest \$75 million over ten years in a Solar Cities demonstration program,

and continue supporting the Perth trial with the purchase of 90 hydrogen buses;

- provide research funding to Commonwealth Environment Research Facilities programme;
- fund the development of a national recycling telephone hotline for the general public; and
- continue the support of the Natural Heritage Trust.

## The Federal Opposition Position

The opposition takes a more global perspective:

*International environmental concerns have become ever more acute. Many of the most serious environmental problems extend far beyond the boundaries of nation states. Climate change, ozone depletion, over-population, over-consumption, deforestation and loss of biodiversity threaten the future of the planet and its inhabitants. Environmental degradation contributes to social and political conflict. It undermines regional and international security. Protecting the environment will support Australia's national interests and security.*

## The Community Position

On reflection, the 2004 election results seem to indicate that the community wants more, and continuing support for economic development and financial prosperity, rather than environmental stewardship, and sustainability from the Australian government. In this short-sighted outcome, the environmental agenda, and sustainability were the losers, clearly highlighted by Tasmanian voters.

What's more relevant, is that both major political parties failed to capture the essence of sustainability - that is to "*Meet the needs of the present generation without compromising the ability of future generations to meet their own needs*".

Their policy documents do not look at social aspects, nor do they covet a framework to consider intergenerational equity, or the achievement of balance between the current economic, social, and environmental accounts of society.

Despite this, the Australian media is focusing increasingly on energy and

environmental issues, particularly climate change and its impact on water and the intensity of adverse weather events. Recent reports from the World Wildlife Fund (WWF) and the United Nations Millennium Eco-assessment Board paint depressing scenarios of a future severely damaged and dramatically changed from today as a result of pollution and climate change. The consensus is that we have run out of time to stop climate change, and must now address adaptation to new climate patterns as well as mitigation to prevent even worse scenarios.

### A Picture of the Australian Sustainability Movement

Sustainability is probably one of the most over-used, but poorly-understood words in Australian industry, government, non-government and media. Seemingly, and increasingly, it is a word that is coupled along with every other word (eg. sustainable road project, sustainable business, sustainable donation or contribution, sustainable economy, sustainable design, and so on), and thus tends to lose meaning and credibility. There are no 'standards' or 'quantifiable means' by which to confirm, or measure sustainability, or what is 'sustainable'.

There is also much confusion between being 'ecologically sustainable', and 'environmentally, socially and economically sustainable'. These are quite different ideals, yet often appropriated for each other.

Yet, notwithstanding the limited understanding, the application of the concept of sustainability, and general principles are extensive, with some ground-breaking and pioneering work being done. Some of the perspectives are discussed below.

### Industry Associations

The **Business Council of Australia** has a sustainable growth policy, which is summarised as follows. The BCA has the Charter of the World Business Council for Sustainable Development (WBCSD) in Australia.

*The BCA recognises the importance of Australia's capital base (infrastructure, environment, people) in sustaining growth in a rapidly globalising world. While our physical, environmental and social capital provide the foundations for growth, recent work has raised the prospect that future growth within Australia could be constrained if long-term investment in these areas is not coordinated and sustained. The Sustainable Growth Task Force is developing a more comprehensive approach to delivering the*

*conditions required for sustainable growth in Australia. In the first phase of its work, the Task Force will describe an aspirational scenario for a sustainable future and characterise the gap between what is required to deliver this scenario and the outlook for Australia on its current trajectory.*

**Australian Business Limited** suggests the following:

*Sustainability is one of the latest catchcries in business. It can mean many things to many people. Some see sustainability as reducing risk and avoiding litigation. Others see greater social, environmental and ethical responsibility as smarter ways of doing business. Recent history documents organisations that have failed miserably in this respect and prove that the days are gone where a business could survive on profit or shareholder return alone.*

*Society, communities and governments are now expecting an outstanding reputation of business on several fronts. Modern business must meet this challenge and to do this it:*

- *must be a consistent performer of outstanding service and product delivery*
- *should be deploying sound and truthful reporting that ensures it is adding value in financial and non-financial terms*
- *should have systems in place that guarantee it can sustain itself and add value to society*

## CAREER OPPORTUNITIES IN ENVIRONMENTAL ENGINEERING

A seminar targeted at undergraduate environmental engineering students was held at the Melbourne Town Hall on Wednesday 27th April 2005. The seminar was organised by the Victorian Chapter of EES in conjunction with Melbourne University, RMIT University and Monash University Environmental Engineering Students Associations with over 100 students in attendance.

The Victorian Chapter of EES has for several years organised a successful 'careers in environmental engineering' event, however for the second year in a row now a wider focus was applied to the seminar in order to meet the following aims:

- expose students to the broad range of employment opportunities in environmental engineering
- encourage students from various universities across Melbourne to meet and develop a wider student network
- to minimise the number of industry/employment seminars that students and industry representatives organise and attend throughout the year, thus maximising the effort and the rewards through one forum

The seminar commenced with networking and drinks, followed by formal presentations. Terence Jeyaretnam, National Chair of EES opened the proceedings by outlining the benefits of EES membership. Five speakers from government and private consulting then presented their experience of working as an environmental engineer. The speakers were:

- Danielle Roche, City West Water
- Amanda Smith, EPA
- Sharon MacDonnel & Kate Wheeler, VicRoads
- Warwick Bishop, Water Technology
- Kelly Dauberman, URS

Following the formal presentations, students had the opportunity to network with over 50 industry representatives from over 25 organisations. Fifteen companies had displays of promotional material to encourage students to learn more about their organisation.

Incentives for becoming a member of the Society for Sustainability and Environmental Engineering were incorporated into the seminar. Students were offered the opportunity to win a day of vacation work with the seminar

sponsors for becoming an EES member on the night. A stress ball in the shape of a frog bearing the EES logo plus a copy of the EES journal were also provided to new members, and 39 new members signed up on the night.

To keep the entry costs for the event to a minimum for the students, sponsors provided financial assistance, and the Victorian Chapter of EES are grateful for their support. The sponsors of the event were: VicRoads, City West Water, EPA Victoria, URS, Water Technology, Golder Associates, Lane Consulting, GHD, Maunsell, Earth Tech and WBM Oceanics.

A relaxed atmosphere facilitated discussion between industry representatives and students. Thanks to all the students and industry representatives for attending the seminar and making it a success. A special thanks to the students who helped to organise the seminar, (Chloe Weisenfeld - Melb uni, Christian Beasley - RMIT and Matt Drysdale - Monash) and others who helped make the night run smoothly.

**Jon Crosbie, Student Liaison Representative, EES Vic Chapter**

**Australian Industry Group**, has an environmental policy and information to members is comprehensive. AIGroup has a dedicated national manager with responsibility for sustainability policy and environmental issues.

The **Environment Business Australia** is a membership organisation for environmental businesses. The organisation regularly hosts seminars and conferences on themes relating to sustainability and makes policy submissions to the government on a regular basis, but does not have a formal policy position on sustainability on its web site.

Other industry associations with sustainability agendas are:

- **Australian Business Council for Sustainable Energy** - focuses on renewable energy, energy efficiency, and alternative sources of energy;
- **Australian Green Development Forum** - an industry association focusing on partnerships, and the business case for more sustainable urban development;
- **Buy Recycled Business Alliance** - has a membership of companies that support supplier environmental stewardship.
- **Committee for Economic Development of Australia** - organises regular seminars on sustainability;
- **Electricity Suppliers Association of Australia** - does not address sustainability as much it does environmental and safety issues;
- **Green Building Council of Australia** - has a membership of property and service groups focussing on more environmentally friendly buildings;
- **Minerals Council of Australia** - has a commitment to sustainability through its 'Enduring Value Code' in partnership with the International Council for Minerals and Metals;
- **Property Council of Australia** - has a strong policy on sustainability and organises regular seminars on sustainability in the property business;

### Professional Member Associations

The **CPA Australia** has a number of articles on corporate governance and sustainability, sustainability reporting, corporate social responsibility and CPA's research in to sustainability reporting. There is no formal policy position outlined.

The **Association of Chartered Certified Accountants (ACCA)**, has set up awards programs for environmental and sustainability reporting in several

countries across Europe, North America, Asia and Australia. These are regarded as the most recognised awards for public reporting on sustainability. The ACCA has also conducted extensive research on several sustainability and related topics, publishing regular features on its web site.

The **Environment Institute of Australia and New Zealand** is very active on environmental issues, and is beginning to discuss sustainability - with an upcoming conference in New Zealand in particular. There are no formal policy positions on sustainability made on the EIANZ web site.

The **Planning Institute of Australia** has a forthcoming national congress on 'creative and sustainable communities'. It mentions 'sustainable places' in its vision, but does not have a formal policy position on sustainability.

The **Royal Australian Institute of Architects** is one of the few member organisations that has announced a firm commitment to sustainability. The following is an excerpt from its web site:

*"To mark the 10th anniversary of its adherence to the International Union of Architects' Declaration of Independence for a Sustainable Future, the Royal Australian Institute of Architects has reaffirmed the responsibility of the architecture profession to embrace an integrated approach to ecological, social and economic sustainability. .... Since 1993 when the declaration was first signed, there have been many changes and achievements in delivering sustainable buildings. The green Olympics were one example of the implementation by architects of sustainability issues in their designs, with many of the buildings constructed at Homebush incorporating innovative new solutions focusing on sustainability."*

The **Australian Council of Building Professions (BDP)** which is a peak body comprising Engineers Australia, ACEA, RAI, ACAA, AILA, AIQS, and PIA produces the BDP Environment Design Guide, combining the sustainability policies and resources for the built environment of all its members. Since its launch in 1997, BDP EDG has grown into a substantial body of knowledge with a total of close to 200 practice notes and 50 case studies. BDP EDG is revised and added to on a quarterly basis, with the College of Environmental Engineers represented on its Steering Committee, and input from many members.

Other individual member based organisations that actively work in the sustainability space include:

- **Australian Water Association** - features regularly on discussions that deal with sustainable water consumption and conservation;
- **Facilities Management Association of Australia** - recently compiled an industry action agenda with a high priority on sustainability;
- **Municipal Association of Australia** - has not tackled sustainability to any great depth;
- **National Environmental Law Association** - organises regular seminars on sustainability.

### Role of Governments

The **Australian Government** deals with sustainability primarily through the Department of Environment and Heritage, and to a lesser extent through the Department of Industry, Tourism and Resources. While all Australian Government Departments are required to report on energy efficiency and environmental matters, the Government's overarching focus remains firmly on economic development. The Department of Family and Community Services has progressed some interesting social initiatives.

The **Western Australian Government** has shown leadership on sustainability through the development of its state sustainability strategy. The author of this strategy, Prof. Peter Newman is currently developing sustainability modules for the SSEE, and will also be a key note speaker at the society's biennial national conference. It also has appointed an Advisory Body to the Premier.

The **South Australian Government** has set up an Office of Sustainability and has crafted a State Sustainability Plan as its strategic way forward.

The **Victorian Government** has renamed the former Department of Natural Resources and Environment to the Department of Sustainability and Environment, and has also set up an Office of the Commissioner for Environmental sustainability. A business leaders forum is also set up to advise the premier. The EPA has a 'sustainability covenant' program in place, which is a voluntary commitment regime for industry to become more sustainable.

The **Tasmanian Government** has no formal processes that capture overall sustainability, but has a detailed process around forestry.

The **New South Wales Government** has set up a Sustainability Commission and the premier has openly supported the Kyoto Protocol and Carbon Trading.

The **Queensland Government's** sustainability program is led by its Environmental Protection Authority, which has shown leadership in drawing global thought-leaders to input into local programs.

The **ACT Government** has set up an Office of Sustainability, and established a Sustainability Expert Reference Group, but has yet to show any ground breaking initiatives for the National Capital.

In summary, the various state strategies appear inconsistent with the federal approach, as well as being adequately different to question the extent of communication between the states on a national and global level. The lack of consistency in government does not assist industry in articulating a forward strategy on sustainability.

Well-known government agencies include the Sustainable Energy Authority of Victoria and EcoRecycle Victoria (both now collectively known as Sustainability Victoria), and the Australian Greenhouse Office (recently absorbed into the Federal Department of Environment and Heritage, but maintaining its identity) amongst others.

### **Non-Government Agencies**

The most active non-government agencies in the sustainability debate are the environmental NGOs. These include **Greenpeace, Australian Conservation Foundation, EarthWatch, Landcare, Greening Australia, World Wildlife Fund for Nature and Clean Up Australia**. The only social NGO that comments on sustainability, from time to time, is the **Australian Council of Social Service**. Other groups of interest include **International Council of Local Environment Initiatives, Triple Bottom Line Australia** and the **Australia Institute** (which has published significant research on economic development, growth, and sustainability and other associated topics).

Reflecting a concern that sustainability was not progressing fast enough within the building and construction sector, industry and professional associations, and the green movement recently established the **Australian Sustainable Built Environment Council (ASBEC)**, a peak council with a mission:

*"For Australia to be a leader in reducing ecological impacts, improving economic returns and extending community amenity of the built environment"*

ASBEC, with over 30 member associations, aims to develop a National

Sustainability Framework for the built environment, and will seek to influence government policy and deliver a regulatory framework that encourages sustainability in urban development, buildings and infrastructure.

### **Service Groups**

A large number of consulting and advisory groups operate in the space of sustainability. Some of these are listed below:

- Consulting firms: URS, KBR, ERM, Ernst & Young, PWC, Allens Consulting, GHD, SKM, Arup, Maunsell, Environ, EcoSteps, ECOS, EcoFutures, KPMG
- Universities: Monash Sustainability Enterprises, RMIT Global Sustainability, UTS Institute of Sustainable Futures, and Deakin Corporate Citizenship Unit;
- Research Groups: CSIRO, CRC for Construction Innovation, Sustainable Asset Management, Sustainable Investment Research Institute, Innovest Australia, Centre for Australian Ethical Research, Corporate Monitor
- Legal Firms: Freehills, Mallesons, Phillips Fox

### **Special Interest Groups**

There are several special interest groups that have been brought together to help deliver particular sustainability outcomes. These include:

- UNEP Financial Initiative - a signatory organisation for financial institutions committed to sustainable outcomes, based out of EPA Victoria.
- Banksia Environment Awards - recognised nationally as the most prestigious environmental awards, administered by the Banksia Foundation.
- Company Directors - has published a document on sustainability reporting.

### **The Global Influence**

Globally, the sustainability movement has had a phenomenal growth. The United Nations is one of the carrier pigeons of sustainability. The other main influences have been the Rio and Johannesburg World Summits. Others include the World Business Council for Sustainable Development, Davos, SustainAbility Ltd, Global Reporting Initiative, International Labour Organisation, the Coalition for Environmentally Responsible Economies and AccountAbility UK. On the professional engineering front the following are relevant:

**World Federation of Engineering Organisations (WFEO):** Since co-hosting a major international conference setting the agenda for Engineering Education and Training for Sustainable Development in the late 90s, WFEO has driven the UN to adopt engineering and technology as a major contributor to the alleviation of poverty and sustainable development in the world's evolving regions.

**American Society of Civil Engineers (ASCE):** ASCE has a policy that recognises the need for new leadership roles in engineering,

*"The nature of development in the future will demand a new role for engineers — not just their traditional problem solving role — but as leaders of the interdisciplinary teams involved in the decision-making process itself and as agents for change. In this role, engineers must become "facilitators of sustainable development" through the information we provide, the decisions we make and those we influence. Sustainable development requires broadening the education of engineers and finding new ways to do business".*

To implement this policy, ASCE has appointed a Manager Sustainable Development in the Built Environment. This is a senior position in the ASCE National Office. Recently ASCE published a comprehensive guide for its members on sustainability and sustainable development.

**American Association of Engineering Societies (AAES):** represents over 1,000,000 engineers and has Public Policies and Objectives which explicitly and independently address both the Environment and Sustainable Development. These policies commit the Association and its member organisations to education and information dissemination on sustainable technologies and processes that promote the use of recyclable materials, reduce energy consumption and consumption of non-renewable resources and also reduce waste.

**FIDIC.** FIDIC is the international organisation representing consulting engineers (ACEA is the Australian member). FIDIC Past President William D Lewis made the FIDIC position very clear when he stated in his policy message to members in 1999:

*"On Securing the Future. Let us step forward out of the shadows of anonymity and exercise leadership in the challenges facing the world in the 21st century. We must become authoritative voices to plead the case for sustainability and prudent resource utilisation...."*

Putting teeth to this policy, FIDIC has recently published Project Sustainability

Management (PSM), a guide for all consulting engineers worldwide on sustainability assessment for project work. FIDIC policy is that members should not accept commissions from clients who do not wish to adhere to the guidelines detailed in PSM.

### Sustainability Resources

From this rapid scan, it would seem that there are now sufficient standards and guidelines that have arisen overseas, and that can and should influence the sustainability movement in Australia. So, what about Engineers Australia?

### The Challenges for Engineers Australia

The College of Environmental Engineers and the Society for Sustainability and Environmental Engineering each have significant separate, but complimentary roles. The following roles and objectives are proposed for adoption by Engineers Australia, and represent only slight variations on the current situation.

Having established a sufficient constituency of practitioners, the **College** is primarily the “keeper” of the specific body of knowledge for environmental engineering, and more generally the “advisor” on sustainability as it applies to the practice of engineering. Flowing from this “primary” role is a set of objectives, whereby the College:

1. Promotes the knowledge, practice and profession of Environmental Engineering.
2. Formulates policy, and sets and maintains the standards for the accreditation of undergraduate courses, the competencies required for professional practice, and the assessment of practitioners for Chartered Status and Registration in the fields of environmental engineering.
3. Coordinates the activities of all units of Engineers Australia affiliated with the College, and encourages and facilitates discussion and debate on matters of sustainability and environmental impact for the whole of the engineering team.
4. Facilitates linkages at the international and national level to further the profession of environmental engineering in Australia.
5. Actively contributes to the Engineers Australia Accreditation process for undergraduate education through the identification and training of College Members for participation in the accreditation process.

6. Provides inputs to the Council and Congress of Engineers Australia on all matters related to the practice and profession of environmental engineering in particular, and more generally on sustainability as it relates to the whole of the engineering team.

7. Provides public comment and expert opinion on behalf of Council and Congress, as required on matters related to environmental engineering and sustainability.

8. Manages the annual budgeting phase and monitors expenditure on behalf of the College and all its affiliated units, and

9. Coordinates the provision of Continuing Professional Development (CPD) for EA in the fields of environmental engineering and provides guidance and leadership in sustainability as it applies to the whole of the engineering team.

On the other hand, the **Society** is more activity based, and relates more directly with practitioners, industry and the community on matters of sustainability and environmental engineering. Through membership of the society both engineers and others come together to network and share work experiences. Thus, the Society’s roles are to:

1. Promote professional ethics through adherence to Engineers Australia’s Sustainability Principles for Engineers;
2. Promote national excellence in the practice of environmental engineering and the infusion of sustainability in all engineering endeavour;
3. Promote participation in, and contribution to, activities of the Society;
4. Provide, at the national level, the focus and co-ordination mechanism for professional society matters, policy formation, and communications;
5. Bring to Engineers Australia expertise and input on sustainability and environmental engineering matters from both within and outside the engineering profession;
6. Provide activities that facilitate business networking for Society Members;
7. Facilitate linkages at the international level, enabling members to benefit from international exchange on matters concerning sustainability and environmental engineering;
8. Provide seminars, CPD events, and other resources that show case best environmental practice, Society Members’ achievements and innovation in sustainability and environmental engineering;

9. Provide a focus and coordinating mechanism for research into, and information dissemination on sustainability and environmental engineering;

10. Facilitate participation by other professions in project teams involved with sustainability and environmental engineering matters;

11. Provide expert advice to Government, industry and the community on sustainability and environmental issues;

12. Provide advice on sustainability principles for engineering education and professional practice; and

13. Influence community, educational, corporate and regulatory attitudes and practices in relation to sustainability.

Given these roles, the College and the Society then have a significant responsibility to inform leadership within Engineers Australia in driving a high priority dual agenda that:

- Inculcates a culture of sustainability across education and practice in all fields of engineering; and
- Develops a clear definition, and set of standards for education and practice in the specific fields of environmental engineering.

Supporting this agenda is the pressing need to reposition Engineers Australia as a National leader, and first point of reference on sustainability. To achieve this Engineers Australia needs to:

- Clearly define sustainability, and its engineering dimensions;
- Develop a formal policy and strategy for sustainability across all activities of Engineers Australia;
- Unify and coordinate the various sustainability initiatives of all Engineers Australia units across Australia;
- Develop formal mechanisms for responding to government policies, industry initiatives and community concerns;
- Establish and progress the work of a National Sustainability Board further develop and oversee policy, strategy, and implementation; and
- Lift the priorities of, and invest in the development of tools, guidance material, programs, and projects on sustainability for engineers, and in environmental engineering.

# THE STATE OF SUSTAINABILITY - A STATE ROUND-UP OF SUSTAINABILITY ISSUES

## VICTORIA

Some of the key challenges that Victoria faces as it progresses towards sustainability include declining land health and productivity, stressed water resources, threatened biodiversity, a changing climate, population and urban growth and increasing waste. Environmental sustainability will not be achieved in our life time, but must be pursued with vigour to reverse the trends in ecological decline that are currently observed.

The Victorian Department of Sustainability and Environment was established in December 2002 to bring together the state's responsibilities for sustainability of the natural and built environment. The department is responsible for looking after Victoria's built environment (including planning, heritage protection and land titles), coordinating strategic policies and projects particularly in the area of waste and greenhouse gas, providing policy direction and reform for Victoria's water resources including participating in intergovernmental agreements such as the Snowy Project and the Living Murray Initiative, and being stewards of public land and the biodiversity it contains including parks, forests and coastal management.

Recent strategies the department has produced include Melbourne 2030, Our Forests Our Future, Our Water Our Future, Towards Zero Waste, the Victorian Greenhouse Strategy and the Victorian River Health Strategy. These and other strategies form the basis for current projects to proceed toward an increasingly sustainable state. For example, the Our Water Our Future strategy identified that many of Victoria's rivers are stressed and has initiated a cap on all river basins, similar to the Murray Darling Basin Cap, which limits extraction to levels seen in 1993/94, with further development available where water is saved from increased efficiency or water is traded from one use to another.

In 2003, the Parliament of Victoria established the role of Commissioner for Environmental Sustainability. The Commissioner acts as an independent voice that advocates, audits and reports on environmental sustainability in Victoria. The Commissioner is mandated to raise the profile of environmental sustainability in Victoria by 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, and encouraging sound environmental practices and procedures to be adopted by the Government of Victoria and local governments as a basis for ecologically sustainable development. Four major tasks provide an avenue to achieve these objectives:

- completing the State of the Environment Report for Victoria
- carrying out the Environmental Management Systems Strategic Audit of state government agencies and public authorities
- carrying out the Public Education Audit, relating to ecologically sustainable development
- advising the Minister for Environment in relation to any matter referred to the Commissioner by the Minister.

The Victorian Environmental Sustainability Framework was launched in April 2005 as a key driver for making environmental sustainability a fundamental consideration in decisions that are made across the whole of Government. The Department of Sustainability and Environment will lead the implementation of the framework and work with other parts of State government, local government, business and the community to build environmental sustainability into decision making. The challenge will be to see how the implementation of this ambitious Framework progresses.

Some activities leading Victoria towards environmental sustainability in the private and non-government sector include the green building called "60L" in Carlton used to promote sustainability in the commercial building sector, the City of Melbourne and other municipal councils' commitment to sustainability through waste management and reduction, stormwater reduction, climate change and environmental education programs, and research into the many areas of sustainability in Victoria's academic institutions.

**Deborah Woods, Chair,  
Victorian Chapter**

## TASMANIA

Tasmania leads the debate on many environmental issues in Australia, with sustainability at the heart of present

issues, some of which are briefly discussed below.

Forestry dominates the sustainability debate in Tasmania. The most recent issues have been old growth logging in the Styx valley, the Tarkine wilderness area and the proposal for a \$1 billion pulp mill. The mill issues revolve around the emissions from the mill into both water and air, and the sourcing of wood chips that would otherwise be exported overseas. The recent Tasmanian community forest agreement between Federal and State Governments have preserved further tracts of forest for future generations, now putting the area in the state under some form of protection at over 40%.

Water is an issue across Australia, with Tasmania being no exception. For example there have been gradual improvements in the Derwent River estuary water quality due to greater public awareness of stormwater connectivity with downstream receiving waters, better monitoring, and uptake of new technologies such as water sensitive urban design. However, there is still a way to go in 'sharing' water resources between hydropower and environmental needs of Tasmanian rivers.

Energy sustainability is intimately related to water in Tasmania due to dependence on hydropower. Increasing energy demands within Tasmania combined with current low water storage levels for hydropower generation is continuing to provide the momentum to supplement existing electricity generation with wind power and to complete the Bass Link project, which will connect Tasmania to the national electricity grid. When Bass Link is brought on-line there will be benefits to both Victoria and Tasmania with the greater utilisation of renewable energy.

Launceston has been identified as having some of the poorest air quality of any city in Australia due to the large per capita usage of wood heaters and associated gases and fine particulates. This has been identified as a major health concern and not a sustainable practice for long term heating needs for a city with a population approaching 70,000. The rollout of gas in Tasmania is hoped to help in this regard.

State government responsibilities for maintaining progress towards sustainability are held principally with the Department of Primary Industries, Water and Environment, and the

Department of Infrastructure, Energy and Resources.

**Andrew Barton, University of Tasmania**

## NEW SOUTH WALES

This is a very simplified overview of some of the initiatives that have been undertaken by the NSW Government and its agencies to improve sustainability in a number of key areas. It does not necessarily mention all such measures.

In NSW the responsibility for implementing sustainability policy is vested not in a single government department, but shared across a number of key departments.

### NSW Dept of Environment and Conservation (DEC)

The NSW Department of Environment and Conservation (DEC) plays the most significant role in trying to modify the behaviour of individuals and organizations (both public and private) in terms of improving their environmental performance, and thereby the sustainability of their activities. The DEC is a super department, which has jurisdiction over environmental policy and licensing in a few key areas:

- The natural environment (air, water, land, ecology);
- The built environment/construction activities;
- Operational facilities; and
- Waste and resource recovery.

The NSW Environment Protection Authority (EPA), which is a key part of the DEC, administers most of the key environmental legislation in NSW. It also has been preparing and publishing a State of the Environment (SoE) Report for NSW for a number of years. This is an extremely thorough coverage of sustainability issues in all areas of the natural environment. The last such report was published in 2003.

Rather than paraphrasing what it says about implementing sustainability, here is a direct quote from the 2003 SoE report.

*“In NSW an extensive array of programs is being developed or implemented to make progress toward sustainability including:*

- *Catchment Blueprints to prioritise government funding and other actions for improved catchment management*
- *water-sharing plans to allocate water for environmental flows and human use*
- *the NSW Biodiversity Strategy to improve the scientific knowledge and involve landholders and the community*

*in conserving biodiversity on public and private land*

- *commissioning of the Wentworth Group of Concerned Scientists to develop a new model for native vegetation management (Wentworth Group 2002) and a mechanism to end broadscale clearing of remnant vegetation*
- *a comprehensive NSW Coastal Protection Package to balance continuing coastal development and environment protection*
- *compulsory greenhouse gas emission reductions by electricity retailers using an innovative market-based benchmark approach*
- *the Action for Air and Action for Transport 2010 strategic plans for improving air quality and increasing public transport alternatives and the Cleaner Vehicles package to reduce emissions from private vehicles*
- *the NSW Waste Avoidance and Resource Recovery Strategy which creates a framework and targets to reduce waste and make better use of resources, including proposals for extended producer responsibility mechanisms*
- *supporting community interest in the environment with a three-year State environmental education plan, Learning for Sustainability (NSW Council on Environmental Education 2002), which is being overseen by the NSW Council on Environmental Education who will prepare the first performance report on the plan for government in early 2004*
- *the statewide education campaign Our Environment - It's a Living Thing, which promotes awareness of sustainable living behaviours*
- *the use of economic incentives and market-based approaches to reduce pollution, such as the Hunter River Salinity Trading Scheme, load-based licensing for major emitters, and trial of an approach to managing the impacts of new development known as 'green offsets' in western Sydney and three regional centres*
- *implementation of an Environmental Services Scheme to model new land management practices that combine conventional production with improved soil and vegetation retention, salinity control, water quality and biodiversity.*

*Local councils, communities, businesses, industries and individuals are also taking action to help create a more sustainable NSW.”*

Another significant part of the DEC is the Sustainability Programs Division, formerly known as Resource NSW. This organization does not have a regulatory compliance role, but is a policy maker and implementer of sustainability programs.

The NSW Waste Avoidance and Resource Recovery Strategy 2003,

which was developed by the then Resource NSW provides a framework in NSW for reducing waste and making better use of resources.

When it was called Resource NSW, its main focus was on maximizing solid waste recycling and recovery through working with local government, state government and private organizations. Its focus has now broadened to include cleaner production, litter prevention and other programs.

The National Parks and Wildlife Service (NPWS) is also part of the Department of Environment and Conservation. It is the main government conservation agency in New South Wales, Australia, which protects the flora and fauna in the National Parks and elsewhere, as well as cultural heritage ie indigenous and non-indigenous heritage.

Further, the Sydney Catchment Authority (SCA), which is a separate organization, has strong links to the DEC. The SCA manages all the catchment areas where Sydney's drinking water is collected, and thereby has a key role in sustainability.

### Department of Infrastructure, Planning and Natural Resources (DIPNR)

The Department of Infrastructure, Planning and Natural Resources (DIPNR) is the agency responsible for environmental and land use planning across the whole of NSW. It therefore has a key role in sustainable development.

The NSW Government wants DIPNR to be the sole department that makes integrated decisions about natural resource management and land use planning and brings the social, economic and environmental agendas together to promote sustainability.

One of the significant initiatives that DIPNR has introduced is called BASIX. “BASIX (the Building Sustainability Index), is a web-based planning tool, introduced as part of the NSW planning system, that measures the potential performance of new residential dwellings against sustainability indices. **BASIX** ensures each dwelling design meets the NSW Government's targets of:

- 40% reduction in water consumption and
- 25% reduction in greenhouse gas emissions, compared with the average home.

BASIX will also apply to all residential alterations and additions throughout NSW from October 1 2005, and the

greenhouse target will increase to 40% from July 2006.

## Shaping Our Cities Report

The NSW Government has decided to prepare a Metropolitan Strategy for the Greater Metropolitan Region. The report, known as "Shaping Our Cities" is the key planning strategy for the Greater Metropolitan Region of Sydney, Newcastle, Wollongong and the Central Coast. Shaping Our Cities identifies the overall planning priorities for this area, and will guide the decisions of local councils and state government agencies. The strategic planning framework enables

- community wellbeing through housing choice, more recreational opportunities and a healthy environment
- attractive, safe and affordable neighbourhoods
- a strong economy that can provide employment and lifestyle equity.
- transport systems and urban structures with equitable access to jobs, services and leisure.

The future vision for Sydney and the Greater Metropolitan Region is that there will be:

- effective use of existing land and infrastructure
- socially equitable communities through the provision of affordable housing
- increased use of public transport and better air quality
- reduced demand for new urban land and less development in environmentally sensitive areas.

## Metropolitan Water Plan

The Metropolitan Water Plan - covering the next 25 years - outlines a \$1.4 billion strategy to ensure Sydney's water future through optimising water supplies from the existing system, as well as ensuring that Government, industry and households reduce their water use to sustainable levels.

The Plan has been developed to address:

- future population growth - Sydney's population is expected to grow by one million people in the next 25 years or so
- climate change - the amount of rain that falls is expected to decrease. This means that long droughts could become more common and our water supplies need to be able to outlast lengthy droughts
- the environment - as more water is stored in dams, less water is flowing down our rivers. This is resulting in

algal blooms and water weeds choking rivers. The Plan balances Sydneysiders' use of water with the needs of a healthy environment.

## The Department of Energy, Utilities and Sustainability (DEUS)

The Department of Energy, Utilities and Sustainability (DEUS) was formed on 1 January 2004. It promotes the sustainable, safe, reliable and affordable supply and use of energy and urban water in NSW.

The Greenhouse Gas Abatement Scheme was implemented from 1 January 2003, and is administered by the Independent Pricing and Regulatory Tribunal (IPART). DEUS was responsible for the development of this Mandatory Scheme and has an ongoing role in further policy development.

In January 2002, the NSW Government released a Benchmarks Position Paper that set the aims and methodology for the scheme. The scheme came into effect from 1 January 2003. Now NSW electricity retailers and some other parties ("benchmark participants") must meet mandatory targets for abating the emission of greenhouse gases from electricity production and use up until 2012.

The State-wide benchmark is to reduce greenhouse gas emissions to 7.27 tonnes of carbon dioxide equivalent per capita by 2007, which is 5 per cent below the baseline year of 1989-90. The targets for abatement is higher each year from 2003 to 2007, and then the benchmark level must be maintained until 2012.

To reduce the average emissions of greenhouse gases benchmark participants, they will purchase and surrender abatement certificates to IPART. Abatement certificates can be created from the following activities:

- reduction in the greenhouse intensity of electricity generation
- activities that result in reduced consumption of electricity ("demand side abatement")
- the capture of carbon from the atmosphere in forests, referred to as carbon sequestration
- activities carried out by elective participants that reduce on-site emissions not directly related to electricity consumption.

## Other sustainability initiatives

In Feb 2004, NSW Minister for Infrastructure, Planning & Natural Resources, Craig Knowles, announced that new communities in the North-West and South-West of Sydney would be

some of the most 'water friendly' in the country.

## Conclusions

There is significant government activity in NSW in regard to implementing sustainability and in changing the behaviour of individuals, government and the private sector.

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**David Gamble, Chair, Sydney Chapter**

## QUEENSLAND

### Queensland, beautiful one day, smart the next and working towards becoming sustainable

In the Smart State the journey along the road to sustainability is underway. State and local governments, developers, businesses, industry, and advocacy groups and community groups are all recognising the benefits of sustainability. This short paper presents an overview of some of the sustainability initiatives undertaken in Queensland.

The Queensland Government has made an explicit commitment to sustainable development through its legislation and its planning processes. It recognises that a 'healthy and sustainable environment is essential to our future'. Since 1994 sustainable development principles have been included in a range of legislative instruments and government business practices.

By articulating a commitment to the guiding principles of sustainability, Queensland has taken the first steps in the complex and challenging transition to a sustainable society. The *Environmental Protection Act 1994* (EP Act) was a significant milestone for Queensland on its journey towards sustainability. The object of the Act is to protect Queensland's environment while allowing for 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 ('ecologically sustainable development').

The Queensland Government's sustainability program is one of the EPA's top five priorities and sustainability programs are also performed by a range of other State Government departments:

- Through its Sustainable Industries Division, the EPA offers help and

advice, a consumer information service and training support services. These are delivered largely through industry associations. Programs include the Solar Schools program, the Queensland Sustainable Energy Innovation Fund (QSEIF), the Queensland Water Recycling Strategy, the resource efficiency programs WaterWise, WasteWise and EnergyWise Queensland, and ecoBiz.

- ecoBiz is an EPA partnership program that helps Queensland businesses adopt resource-efficient practices that are good for the financial bottom line as well as for the environment. It provides a range of tools and guides to help Queensland businesses invest, compete and profit sustainably. Participants in the ecoBiz program include Buderim Ginger, Maryborough's PAC Foundry and North Queensland's Baramundi Blue.
- The Charter of Social and Fiscal Responsibility (Qld Treasury 2001) ensures that the contribution of the government is not assessed purely against economic and financial criteria, but that the social and environmental consequences are also considered.
- The aim of the Cleaner Energy Strategy (2000) was to encourage the energy sector towards greater use of gas and renewables. It included \$50 million allocated over five years to a range of initiatives targeting renewables and energy efficiency.
- The Queensland Greenhouse Strategy (2004) highlights Government initiatives that will reduce greenhouse gas emissions including: the phase-out of broadscale clearing of remnant vegetation by December 2006; the 13% Gas Scheme and the Townsville Power Station and Gas Delivery Project and the Centre for Low Emission Technology.
- The Department of Housing is the lead agency for implementing 'Smart Housing' in QLD. Smart Housing promotes simple, common sense housing design that aims to help Queenslanders to plan and build homes that are more sustainable over time.
- The Office of Urban Management developed the Draft South East Queensland Regional Plan (2005). This plan is the proposed statutory regional planning strategy that will guide growth and development in South East Queensland. Importantly, it incorporates the broad principles of sustainable urban development, supported by twenty-four

Sustainability Indicators that will be used to measure the implementation of sustainability across the region.

- Other State Government environment and conservation related initiatives cover a wide range of sustainability issues, for example buying strategic parcels of land of high conservation value to add to protected estate; introducing stand-alone legislation to protect wild rivers and developing a natural and cultural heritage tourism strategy for Cape York Peninsula.

Many local governments are also developing sustainability programs. For example:

- Townsville City Council has an active and growing sustainability program called Sustainable Townsville. Under this program, the Council is trialing hybrid cars and a biodiesel trial was also recently completed. Sustainable Townsville also considers energy efficiency and renewable energy - the City Hall administration building is now 100% powered by clean energy. Council undertakes sustainability training for staff and extends the program throughout all levels of Council and into business and the community. The flagship of Sustainable Townsville is an ornate 8-metre high grid-connect vertical axis wind turbine that has been constructed on Townsville's waterfront - the Strand. The Strand Wind Project is a popular educational and tourism resource. The coffee shop across the road proudly distributes brochures to its customers and forms part of Townsville's renewable energy 'learnscape'.
- Environs Australia is a network of members interested in promoting sustainable development through local action, primarily in the local government sector. The strength of the network lies in its members sharing their knowledge, learning and success to build sustainability at the local scale. Thirteen Queensland Councils are currently part of this program and The Natural Edge Project is working with a number of them on their sustainability initiatives. An example is Logan City Council's SmartTIP, which is one of the most advanced, user friendly and innovative waste facilities in Queensland. The SmartTIP provides a variety of options when it comes to waste disposal, reuse, recycle, and landfill. The SmartTIP also includes one of Queensland's most successful recycling markets.

The development industry has embraced sustainability, example projects include:

- The Housing Industry Association has built *GreenSmart* Villages at Northlakes near Brisbane and three *GreenSmart* display homes at Springfield Lakes near Ipswich. These homes showcase examples of smart, sustainable housing within the existing urban framework, with a focus on incorporating sustainability into new residential development.
- The Kelvin Grove Urban Village: The Queensland Government and the Queensland University of Technology are working in partnership to revitalise the 16 hectares of land at Kelvin Grove, just two kilometres from Brisbane's Central Business District. The plans provide a blueprint for sustainable inner urban living bringing together education, residential, health, retail, recreational and business opportunities.
- The Brisbane Housing Company (BHC) is an independent, not-for-profit organisation that provides affordable housing in Brisbane. BHC's properties are primarily in the inner and middle suburbs in locations that promote the use of public transport.

Sustainability research is carried out in a number of institutes across Queensland, for example:

- The Centre for Subtropical Design is located at QUT, Gardens Point, Brisbane, in the Faculty of Built Environment and Engineering. It supports high quality planning, design and development that complements the collective view of the subtropical lifestyle.
- The Griffith University EcoCentre has been designed as a showcase/education centre in the area of sustainable development. The sustainable building design of the EcoCentre involved a total life cycle approach, with attention paid to the potential environmental impacts during the construction and ultimate demolition of a building, as well as the ongoing impacts of daily operations.
- The Sustainable Minerals Institute located at the university of Queensland supports sustainability within the mining industry.

There are a number of sustainability advocacy groups across Queensland, examples include:

- The Urban Development Institute of Australia, Queensland. In 2002 UDIA and the EPA launched The Sustainable

Urban Development Program to encourage and promote sustainable development practices. Twenty-five projects are being supported. These projects include the Rockcote Design Centre, the Coomera Waters Village and Resort and the Pacific Harbour Golf Course Precinct.

- The Australian Green Development Forum is a non-profit coalition of members from development industries, government organisations and community groups. Based in Brisbane, its mission is to accelerate the adoption of sustainable practices in the Australian building and development industry.
- The Environment Institute of Australia and New Zealand (SEQ Branch) and SSEE Qld Chapter work closely to provide a range of sustainability related technical seminars and social functions. Engineers Australia (Queensland Division) now has a sustainability web page.

*In the true spirit of sustainability this paper was produced collaboratively. Contributors included Karlson 'Charlie' Hargroves, Guy Lane, Michael O'Brien and Andrew King.*

**Andrew King, Chair, Qld Chapter**

## TOWNSVILLE

### Sustainable Townsville getting to the future first

Sustainability calls upon individuals, organisations, cities and towns to align today's practices with the social and environmental requirements of the future in a manner that is consistent with good economic practice. While it can start in one City it needs to be practiced globally.

In theory, implementing sustainability is easy. Quickly replace the fossil fuels with photons (solar energy), close all the loops by recycling and integrating industry with ecology, provide a just and equitable economy based on rights and values. Then export and multiply this model over and over again until all six thousand four hundred million humans are doing the same. And hey-presto! - a sustainable global civilisation initiated by a single city. The first city to get it right can be the global leaders of a new industrial revolution and reap the wealth that this brings.

In practice, paradigm shifting to a sustainable future requires a little more thought. This is because shifting from an energy intensive paradigm affected by economic and political myopia into a new paradigm that is efficient, long-term and flexible requires co-operation

across many levels of government and industry. Difficult this may be, one city on the eastern seaboard of Australia is making it happen.

Townsville and neighbouring Local Government Area, Thuringowa, is a regional City that has a mainly urban population of about 150,000 people. The economy is diverse and includes army and airforce bases, a deep-water port, international airport, and three metals processing plants (nickel, copper and zinc). Townsville is the regional administrative centre for Commonwealth and State Government Departments. The City has a University plus a myriad of research and environmental management organisations, chief of which are the Great Barrier Reef Marine Park Authority and the Australian Institute of Marine Science.

Furthermore, Townsville is growing rapidly. The City is undergoing a residential building boom as well as a large expansion of military and industrial facilities.

Townsville is powered mainly by coal, generated nearly a thousand kilometres south. A recently introduced gas pipeline now allows for the offset of small proportion of new demand for coal to be provided by coal seam methane gas. The continuing development of Townsville's residential building stock and industrial facilities means that the town that is gasping for much more cheap energy than the gas pipe can provide. A 400 - 800 MW coal plant is being discussed and planned for.

From this angle Townsville perhaps does not seem like a sustainable city that could spark a global revolution. Indeed to extrapolate this trend for even just one hundred years would be to condemn the city to the unsustainable future that is the fate of nearly every city in the world. Increasing greenhouse emissions and air pollution, depleted aquifers, vulnerability to peak oil, dry dams and so on.

However, on closer examination there are some powerful and positive trends beginning to emerge in Townsville.

Because Townsville borders the Great Barrier Reef World Heritage Area, the environmental licenses for the metals plants are very strict and are thus some of the most eco-efficient metals plants in the world. Following this argument, if there is a global demand for metals, best that they are produced in a town with strict environmental safeguards as this provides a lower ecological cost for the planet. Queensland Nickel Yabulu refinery, for example, has developed an

industrial scale water recycling program.

However, not just industry is stepping up to the mark. The Local Authority, Townsville City Council has an active and growing sustainability program called Sustainable Townsville. Under this program, the Council is trialing hybrid cars - with a Toyota Prius and a Honda Civic hybrid on fleet. The significance of this trial is that hybrids use about half as much fuel as an equivalent sized car. Greenhouse emissions are similarly halved. A biodiesel trial was also recently completed. Sustainable Townsville also considers energy efficiency and renewable energy - the City Hall administration building is now 100% powered by clean energy. Council undertakes sustainability training for staff and extends the program through out all levels of Council and into business and community too. Council's Citiwater utility is also the driver of the Carbon Neutral Water Recycling project, a plan to recycle 20 ML per day of treated wastewater. The tender documents call on the successful private parties to include the use of renewable energy in powering the recycling facility.

The flagship of Sustainable Townsville is an ornate Italian designed 8-metre high grid-connect vertical axis wind turbine that has been constructed on Townsville's waterfront - the Strand. The Strand Wind Project is a popular educational and tourism resource. The coffee shop across the road proudly distributes brochures to its customers and forms part of Townsville's renewable energy 'learnscape'.

There are other renewable energy initiatives in this town. For example, local manufacturers Gough Plastics, have developed an innovative domestic solar hot water system called Hot Harry. A local High School has a Centre of Excellence in Technology Maths and Science. The Townsville State High School Renewable Energy Program includes a sophisticated grid connect photovoltaics project. This project compares 1 kW polycrystalline PV system with 1 kW amorphous PV and records the energy data as well as weather data. A small wind turbine is soon to be connected into this program to run the lights in the library.

Townsville is in the running for the Commonwealth Solar Cities program with initiatives to promote grid-connect photovoltaics, energy efficiency. This is driven by extensive liaison between Local Authorities, energy utilities and

other levels of State and Commonwealth Government.

Integration between local and state governmental bodies continues in Townsville via the Centre for Excellence in Tropical Design. The CETD is becoming the focal point for a significant number of initiatives for which there is no other natural forum.

Something is happening in Townsville. And this 'thing' has a growing international significance. A recent visit to the City by Hunter Lovins has helped to give clarity of purpose to the City and take word of Townsville's initiatives to a wider, global audience.

On the surface Townsville looks just like any other unsustainable city in an unsustainable global economy. But look out for sustainable Townsville initiatives and the successes that they are providing and you will see the seeds of a sustainable human civilisation taking root.

**Guy Lane, SEA O2 Sustainable Development, Sustainability Management and Consulting**  
**Chair Society Sustainability and Environmental Engineering**

## WESTERN AUSTRALIA

### State Sustainability Strategy

In September 2003, the Western Australian Government released the State Sustainability Strategy (Government of Western Australia, 2003), Australia's first comprehensive sustainability strategy at the State level. The State Sustainability Strategy included a ten-year action plan across all areas of government that government agencies are now implementing. Progress has been variable across areas of Government, but there have been some notable achievements.

### Draft Sustainability Bill

One of the first actions for government in the State Sustainability Strategy was the development of a Sustainability Act. A draft Sustainability Bill has been prepared and was released for public comment in 2004. The Bill defines sustainability as "meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity" and describes a number of foundation and process principles. The Bill commits government agencies to a range of measures including the preparation of Sustainability Reports, compliance with a Sustainability Code of Practice and the development of Sustainability Action

Plans. It is understood that the Bill will be introduced to Parliament towards the end of 2005.

### Sustainability Roundtable

The key vehicle for supporting the implementation of the State Sustainability Strategy is the Sustainability Roundtable. Established in March 2004 and Chaired by Prof. Peter Newman, the Sustainability Roundtable consists of people who are drawn from State Government, Local Government, Industry and Community who are individually recognised as having significant experience in progressing sustainability within their own fields of endeavour. It provides advice to government and facilitates initiatives that need collaborative approaches involving government, industry and the community. In addition, the Sustainability Roundtable is charged with reviewing the State Sustainability Strategy every two years. The functions and membership of the Sustainability Roundtable are included in the draft Sustainability Bill.

### Regional and Local Planning

The State Sustainability Strategy formalised the inclusion of sustainability in the planning system. In accordance with the strategy, the Western Australian Planning Commission has established a Standing Committee on sustainability and a Sustainability Directorate within the Department for Planning and Infrastructure.

Sustainability principles are being applied to regional planning through the development of regional sustainability strategies such as the Pilbara Regional Sustainability Strategy and others for the Peel Region and the Shire of Augusta-Margaret River. The geographical diversity of the State makes the role of regional sustainability particularly important for Western Australia.

### Major projects

Sustainability assessment has not just been a task for government; the corporate sector has undertaken some of the most challenging sustainability assessments, particularly for large resource development projects. Amongst the most significant has been the Gorgon gas development. The State Government required the developers of the Gorgon gas field, Chevron-Texaco, to examine the projects environmental, social and economic impacts. The Gorgon example has been followed by other assessments of major resource development projects by most major resource companies.

### Engineering Involvement

The Environmental Engineering Society in association with Engineers Australia, Western Australian Division sponsored a landmark address in April 2004 by Hunter Lovins, prior to the launch of the State Sustainability Strategy. Dr Lovins is an acknowledged leader in the development of sustainability and so it was gratifying to hear her complimentary remarks on the leading position sustainability has reached in the government and professional spheres in WA. Dr Lovins commented that she saw real opportunities for WA and Australian engineers to play a leading role in the practical implementation of sustainability principles internationally, leading by example and by practical achievement.

### References

Government of Western Australia (2003). *Hope for the Future: The Western Australian State Sustainability Strategy*, Department of the Premier and Cabinet, Perth.

**David Horn and Patrick Coffee, WA Chapter**

## SOUTH AUSTRALIA

This brief report provides a summary of the status of sustainability in South Australia, including: an overview of State Government initiatives for sustainability (legislation, policies, agencies, etc); examples of projects with a sustainability focus; local research being conducted into sustainability; and, a summary including the challenges associated with developing and implementing sustainability across the State.

### Government Agencies and Policies

There are a number of State Government initiatives that relate to sustainability. These include:

- The establishment of the **Office of Sustainability** (OS) within the Department of Environment and Heritage in 2002. The OS was set up to assist the government take social, economic and environmental factors into account at all levels of decision-making, and to develop sustainability frameworks and tools. In 2003 the OS produced the 'Greening of Government Operations' (GoGO) Framework, with the aim to achieve, by 2005, *'Greening of the South Australian Government's operations as a demonstration of a commitment to sustainability and eco-efficiency on a whole of Government basis'*.
- The **2004 State Strategic Plan** has as one of the six key objectives 'Attaining Sustainability', that is, to *'...make*

*South Australia world-renowned for being clean, green and sustainable.'* The SA Greenhouse Strategy, which will look at how to tackle climate change, will be the next major sustainability-related strategy to be released. It is anticipated that a draft strategy will be available by early 2006, although issues papers are already available.

- The establishment of the **Premier's Round Table on Sustainability** in November 2003, which is chaired by Professor Tim Flannery. The aim of the Round Table is to supply the Premier and Minister for Environment and Conservation with high-quality, independent advice on issues related to sustainability. The Round Table has produced a report relating to the implementation the 2004 State Strategic Plan with a focus on sustainability.
- The **Adelaide Green City** project is a collaboration between the South Australian Government and Adelaide City Council through the Capital City Committee partnership. The aim of the project is for Adelaide to become an internationally acclaimed green and sustainable city centre by 2010.
- The establishment of **Adelaide's Thinkers-in-Residence** program in 2003, where prominent international and national experts come to Adelaide to live for a while and give their advice on the development of Adelaide. Herbert Girardet had a significant influence on the development of the Green City idea, while Peter Cullen has provided expert opinions on issues relating to water.
- The establishment of **Zero Waste SA** in 2004 as a State Government Authority with the aim of reducing waste. As well as holding 'Zero Waste' events, such as the international world music festival WOMAD, SA recently introduced a new policy on single use HDPE plastic shopping bags - they will be banned in SA by 2008. At present, almost 65% of recyclable waste is recycled (in 2003 more than 2.1 million tonnes was recycled). A draft waste strategy for public consultation was released in November 2004.
- The establishment of **Energy SA** to assist the 'government to provide competitive, sustainable, safe and reliable use and supply of energy for the benefit of the South Australian community'. Energy SA sits within the Department of Transport, Energy and Infrastructure, and provides information on energy auditing and

energy conservation. In June 2005, the premier announced that electric hot water storage systems will be banned in all new houses from 1 July 2006.

- New housing is required to have a minimum four-star energy performance rating, with plans to mandate **five-star energy rating** from May 2006. The Department on Administrative and Information Services coordinates the building ratings.
- The submission to Parliament, in April 2005, of the **Sustainable Development Amendment Bill** to the *Development Act 1993* (yet to be passed).
- The introduction of Transport SA's **TravelSmart SA** program, which is designed to reduce transport-related greenhouse gas emissions.

As well as these specific sustainability-related initiatives, other government agencies involved in sustainability include: The Department of Trade and Economic Development, which supports sustainable practices and technological development; the Department of Education and Children's Services, which established an Ecologically Sustainable Development Team in 1996; and SA Water and the 'Waterproofing Adelaide' Initiative, promote water conservation, water reuse schemes, and rainwater tank installation.

The Local Government Association of SA does not have any specific sustainability policies, they are developing a common framework of sustainability themes and indicators, to be used by local governments.

### Projects

A number of recent developments and projects within South Australia have adopted some aspects of sustainability, including the following:

#### Energy Generation

**Wind:** South Australia now has a number of wind farms, with an installed capacity of 400 to 500 MW - about 10% of South Australia's energy use.

**Solar:** In June 2005 Origin Energy announced the start of manufacturing of the new photovoltaic SLIVER cell (a solar cell that use 80-90% less silicon than standard photovoltaic cells) in Adelaide. The State Government has recently installed solar cells on the museum, Parliament House and about 80 public schools.

**Geothermal Energy:** The development of this renewable energy is underway in South Australia.

### Energy Consumption

The first building that is likely to get a 5-star energy rating is the office tower proposed for the mixed development on News Limited's Advertiser site, which is presently under construction.

As part of the Green City program, 10 buildings in the city centre have been selected to participate in the Adelaide Building Tune Ups Project, to undergo energy efficiency assessment and upgrades. The Government's goal is to reduce energy consumption in government buildings by 25% by 2014.

### Waste

SA's Container Deposit Legislation (the 5c deposit scheme) was first introduced in 1975, and expanded in 2003 to include aluminium, glass, PET and milk cartons. Although figures are uncertain, the return rate of drinking containers is well over 80%, and over 95% of South Australians think the legislation is a 'good idea'. The legislation is administered by the Environment Protection Authority.

### Transport

Earlier this year the metropolitan diesel buses and trains began running on a B5 biodiesel blend (5% biodiesel), with the aim to increase this to a B20 (20% biodiesel) blend over time. While 535 buses of the 810 fleet run on diesel, the rest of the fleet run on natural gas. There is also a number of commercial biodiesel users, such as Torrens Transit buses, wool processors G H Michells, Buses R Us and Mt Gambier loggers G&R.

### Water

South Australia has the highest per capita level of wastewater reuse in Australia - currently almost 22% of Adelaide's wastewater is reused for irrigation. The Virginia Pipeline, which pumps water from Bolivar Treatment Plant to Virginia (north of Adelaide), is believed to be the largest of its type in the Southern Hemisphere - pumping 12,750 ML in 2002/03.

A number of residential developments have incorporated stormwater capture and reuse for irrigation in their designs. Examples include the new suburbs of Mawson Lakes, Regent Gardens, Andrew's Farm, Aldinga EcoArts Village and Northgate. A number of these developments, and others (such as the City of Salisbury), have used the aquifer storage and recovery (ASR) technique - where water is treated (often in wetlands) and pumped into the aquifer for storage before use.

The Adelaide Building Tune Ups Project is also assessing and upgrading water efficiency.

## **Residential**

Some private developers have taken a more integrated approach to sustainable development. The Christies Walk Townhouse development in the city, and the Aldinga Eco Arts Village both incorporated environmental, as well as social and economic, sustainability factors in to their development.

## **Research**

Research into sustainability is being conducted on a multitude of levels on a number of areas, including water resources, alternative energy (solar power) and urban design. Many of these research projects are a collaborative effort between universities and industry or CSIRO.

## **Challenges**

The primary challenge for the state to become more sustainable will be to turn ambitious policies and strategies into reality. This might be aided by the consolidation of existing strategies into a centralised, general department, such as the Department of Premier and Cabinet, where whole-of-government sustainability reporting is possible.

## **Further Information**

[www.adelaidegreencity.com](http://www.adelaidegreencity.com)  
[www.zerowaste.sa.gov.au](http://www.zerowaste.sa.gov.au)  
[www.waterproofingadelaide.sa.gov.au](http://www.waterproofingadelaide.sa.gov.au)  
[www.deh.sa.gov.au](http://www.deh.sa.gov.au)  
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[www.lga.sa.gov.au](http://www.lga.sa.gov.au)  
[www.decs.sa.gov.au](http://www.decs.sa.gov.au)

**Nadine Kelly, Chair, SA Chapter**

## **AUSTRALIAN CAPITAL TERRITORY**

### **New Dam for ACT**

ACTEW provided its report Future Water Options Implementation Plan to the ACT Government on the 15 April 2005. This report assessed options for additional supply and provided recommendations to the Government. The main recommendation of the report was to construct a pipeline to transfer water from the Murrumbidgee River near the southern border of the ACT to Googong Dam via Burra Creek. In addition to this ACTEW has already

commenced work to increase the efficiency of its existing supply sources by transferring excess water from the Cotter catchment in the west via the existing network of pipes and delivering it into Googong Dam in the east, currently only 1/3 full (124 GL total capacity). With these two options in place, ACTEW expects that a reliable water supply can be provided out to 2023 for an investment in the order of \$60 million dollars. The Government has indicated that it will make a decision by the end of the year.

These recommendations were founded after 9 months of investigations which looked at environmental, social, economical and technical issues to evaluate the options. The project was also supported by a comprehensive consultation and communications program to engage stakeholders and the general community.

### **Environmental Flows**

Environmental flows releases from ACT water supply storages were first introduced in 1999. To inform this new initiative, a comprehensive scientific monitoring program has been undertaken. These results have now been considered and a revised set of Draft Environmental Flow Guidelines were released for comment recently, with comments closing on the 17 July 2005. As part of this review, there will be consideration of the social and economical implications of environmental flow requirements. The review will be completed by the end of the year, and a new set of Environmental Flow Guidelines will be introduced.

### **Conservation Council**

The Conservation Council of the South East Region and Canberra (CCSERAC) has had funding removed despite having been assured of its funding. This has left the council with a budget shortfall in the order of \$50,000.

CCSERAC has also lobbied for the banning of cats in some of Canberra's newest suburbs in the hope of protecting native fauna.

### **Transport**

'Save The Ridge' has so far been successful in its efforts to delay the construction of the Gungahlin Drive Extension - a road that will ease traffic burdens for commuters in the new suburbs to Canberra's North at the expense of bush land. The matter is still in front of the courts and is subject to continuing, fiery debate.

In a more sustainable move, the ACT Government is looking to construct a

'busway' linking the Belconnen Town Centre with the City. The ACT SSEE chapter will be monitoring this, and will look to secure a speaker on the subject as the project evolves.

### **AGDF**

The Australian Green Development Forum (AGDF) is now well established in the ACT and Southern NSW Region with some 25 members, and growing. AGDF is a balanced, non-profit coalition of members from development industries, government organisations and community groups. SSEE is an endorsing body of AGDF, and both organisations are closely linked and work together to ensure that members of both benefit from each other's CPD program. AGDF is in partnership with ANSI to facilitate the project development of the ANSI complex as an iconic "green" development for Canberra.

### **Australian National Sustainability Initiative**

This initiative launched by Hunter Lovins last year, and supported by Engineers Australia, includes the development of an iconic sustainable complex on a prominent site in the National Capital area of Canberra. ANSI will offer a national resource that continually introduces new perspectives, facilitates partnerships and promotes diverse approaches in working towards sustainability. This initiative is the result of a three-year nation-wide collaborative and consultative process that identified a need for a cross-sectoral network of individuals, groups and organisations working for sustainability, and the establishment of a national support centre.

Around 300 groups and individuals have already registered to participate in the proposed centre and Network. The National Capital Authority and the ACT Government have made strong commitments of support to the Centre. ANSI aims to accelerate progress towards a just, healthy and ecologically sustainable Australia. Both AGDF and SSEE Canberra Chapters are working with ANSI to progress the business case for the development of the physical ANSI complex.

### **Wind Farms**

The proposed construction of Wind Farms in the ACT region are also a matter of fiery debate as authorities seek to install sustainable power generation at the expense of local land owner's amenity.

**Peter Dickinson, Chair, ACT Chapter**

# SOCIETY FOR SUSTAINABILITY AND ENVIRONMENTAL ENGINEERING MEMBERSHIP

## MEMBERSHIP AND WHAT IT MEANS

The Society for Sustainability and Environmental Engineering (SSEE) relies substantially on the active support and involvement of our members in order to achieve our goals and objectives and to be able to provide technical and professional development support for our members. The SSEE is an inclusive industry association that is keen to see its members not only from the environmental engineering profession but also from other fields of engineering and earth and natural sciences. Indeed, a significant number of the events and technical sessions organised by the SSEE is aimed at sustainability and environmental issues generally.

You are able to join the SSEE regardless of whether you are a member of the Engineers Australia or have any other professional affiliation. Membership has the following benefits:

- Being up dated on technical sessions, seminars and conferences organised by the local Chapter. Whilst most events are free, some are fee payable and members receive member discounts. Each local Chapter coordinates up to a dozen sessions during the course of a year.
- Receiving four Journals a year with articles and news items on sustainability, environmental engineering and related issues.
- The SSEE collaborates with a number of sister organisations in coordinating events so that overlap is minimised and increased value is created for members.
- The National Conference, organised every two years, is an event not to be missed by sustainability and environmental professionals.
- Other value adding initiatives such as development of guidelines, manuals, student initiatives, prizes and submissions to the government are made by the society.
- Provides various opportunities for networking with your fellow sustainability and environmental professionals.

## COSTS

Member (Eng Aust)	\$60
Member (Non Eng Aust)	\$85
Student (Eng Aust)	\$11
Student (Non Eng Aust)	\$16.50

*These fees include 10% GST*

## CONTACT US

For more information on membership, please contact:

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