

## The Natural Edge Project

The Natural Edge Project (TNEP) is an 'Engineering for Sustainable Development and Climate Change' working group based at Griffith University and the Australian National University. Driven by a team of early career Australians, the Project receives mentoring and support from a range of experts and leading organisations in Australia and internationally through a generational exchange model.

TNEP's mission is to contribute to and succinctly communicate leading research, case studies, tools and strategies for achieving sustainable development across government, business and civil society. Established in November 2002 with in-kind hosting from The Institution of Engineers Australia, the project is now hosted by Griffith University, Australia and lead by a Secretariat team of Charlie Hargroves (Project Director), Cheryl Desha (Deputy Project Director), Michael Smith (Research Fellow), Peter Stasinopoulos (Research Fellow) and Stacey Hargroves (Professional Copy Editor).

TNEP's initiatives are not-for-profit. Our main activities involve research, creating training material and producing publications, which are supported by grants, sponsorship (both in-kind and financial) and donations. Our other activities involve delivering short courses, workshops, and working with our consulting associates as we seek to test and improve the material, and to supplement the funds required to run the project. All support and revenue raised is invested directly into existing project work and the development of future initiatives.

### Project Focus

In line with the United Nations Decade of Education for Sustainable Development (2005 – 2014), we are focused on making sustainability relevant to this and future generations as we undertake the following actions:

- Engaging in and facilitating discussion on best practice in engineering for sustainable development and climate change.
- Engendering cooperation and collaboration across sectors, disciplines and qualifications to accelerate the transition to a sustainable future.
- Identifying knowledge gaps and undertaking original research on how to operationalise sustainable development.
- Communicating existing and emerging concepts to a contemporary audience, raising awareness and understanding about sustainability issues.

### Project Deliverables

The Natural Edge Project seeks to achieve its mission through a range of initiatives that will deliver:

- Peer reviewed and endorsed material (including books, education modules, study guides, online resources) with leaders in the field.
- Short courses and training programs in partnership with professional bodies, vocational and higher education institutions, and organisations.
- Consulting services, research and advice to organisations, helping them to achieve a profitable transition towards sustainable practice.
- Opportunities for generational exchange and mentoring through keynote lectures, seminars, forums and interactive sessions with national and international leaders and experts.



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## The Natural Edge Project – Team Member Biographies

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**Charlie Hargroves – Project Director/Research Fellow:** Charlie is a co-author and co-editor of *The Natural Advantage of Nations* (Earthscan 2005). Charlie graduated in Civil Engineering from the University of Adelaide, Australia in 2000. After practicing as a Civil/Structural Engineer for two years he committed to a career focused on sustainable development and co-founded TNEP in September 2002. Charlie's main area of interest is developing initiatives on sustainable policy design, and in 2006, began his PhD part time on this subject, at Murdoch University, Australia with Professor Peter Newman.



**Cheryl Desha – Deputy Project Director/Research Fellow:** Cheryl is a co-author of *The Natural Advantage of Nations* (Earthscan, 2005). Cheryl graduated in Environmental Engineering (First Class Honours) with the University Medal from Griffith University. Cheryl worked in an international consulting engineering firm for four years. In 2005 Cheryl was selected as the Engineers Australia Young Professional Engineer of the Year. In 2005 Cheryl began her PhD at Griffith University, Australia. She is supervised by Professor David Thiel (Griffith School of Engineering), Professor Neil Dempster (Griffith School of Education) and Professor John Fien (RMIT Professor of Sustainability). Cheryl also co-founded the Queensland node of the *Sustainable Living Challenge* at Griffith University.



**Dr Michael H. Smith – Research Fellow:** Michael is a co-author and co-editor of *The Natural Advantage of Nations* (Earthscan 2005). Michael completed a double major Science degree in Chemistry and Mathematics from the University of Melbourne gaining 1<sup>st</sup> class honours in his honours year at the University of Sydney. He then moved to Canberra to research atmospheric chemistry with Professor Michael Collins at the Australian National University. After co-founding TNEP, Michael changed Ph.D topic and recently submitted to ANU on "Advancing and Resolving the Great Sustainability Debates" co supervised by ANU's Professor Steve Dovers. With TNEP, Michael has since undertaken numerous sustainability projects.



**Peter Stasinopoulos – Research Fellow:** Peter is a graduate of the University of Adelaide, holding a Bachelor of Mathematical and Computer Science, and Bachelor of Mechatronic Engineering with First Class Honours. At the University of South Australia Peter is undertaking a Masters degree by research in the field of Sustainable Manufacturing with a focus on Whole Systems Design Engineering. Since starting with The Natural Edge Project in September 2005, Peter has worked on a variety of projects across TNEP's Education and Industry Consultation portfolios.



**Stacey Hargroves – Professional Copy Editor:** Stacey is a graduate of the University of Canberra, holding a Bachelor of Applied Science specialising in the Conservation of Cultural Materials. Stacey is currently undertaking a Masters in Editing and Publishing by coursework with the University of South Queensland, majoring in the field of web publishing. Stacey started with The Natural Edge Project in 2002 working as a copyeditor on their first book *The Natural Advantage of Nations*, and has since worked on nearly all major publications and deliverables produced by the project.

### Support Staff:

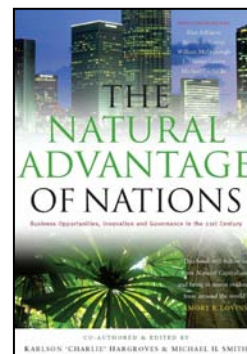


**Fatima Pinto – Office Manager:** Fatima joined The Natural Edge Project in April 2007 as the Office Manager. Fatima brought to the team sixteen years of experience working within Griffith University, as the Administrative Officer for the Student Representative Council. Fatima's roles include managing administrative duties and providing support to the team.

## TNEP Achievements – Flagship Publications

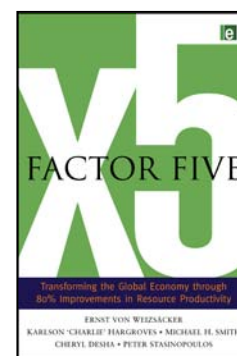
### The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century, Earthscan, London - 2005

Pulling together the work of over 30 of the world's leaders in sustainable development the lead authors and editors, Hargroves and Smith, this 500-page reference text demonstrates that far from being in conflict with economics and business practice, it is possible to improve the well being of society and at the same time drive innovation for sustainability in an increasingly competitive world. This publication was winner of the 2005 *Banksia Award for Environmental Leadership, Education and Training*, and is used by a number of universities in Australia and internationally as a recommended text. 9 of the 22 chapters are freely available and fully referenced (hyperlinked) online, and all chapters containing a free online companion with links to further references.



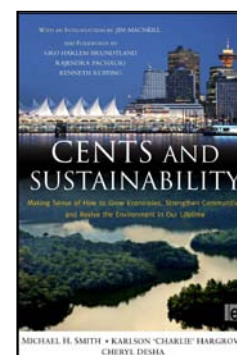
### Factor 5: Transforming the Global Economy through 80% Improvements in Resource Productivity, the update of the 1997 publication 'Factor 4: Doubling Wealth, Halving Resource Usage'. (Earthscan 2009)

This publication will mark the 10 year anniversary of the publication of '*Factor Four*' to update the case studies, policy mechanisms and technical innovations to provide a significant sustainability educational resource. *Factor Four* is widely regarded as one of the most significant books on sustainable development. *Factor 4*, has been an international success, translated into 12 languages, and remaining on the Earthscan/James&James's bestsellers list for 8 years after publication. Ten years on, the resource efficiency solutions outlined in *Factor 4* are more relevant than ever. Also in the last ten years significant advances in technology, design and policy innovation have occurred. This leads us to the conviction that in updating and overhauling *Factor 4*, we should rather aim at a higher factor of resource productivity gains. Hence the new book will be called *Factor 5: A Convenient Truth*. This project is being led by Ernst Von Weizsäcker and TNEP.



### Cents and Sustainability: Securing Our Common Future by Decoupling Economic Growth from Environmental pressures (Earthscan 2010) - A 20 Year Response to 'Our Common Future'

*Cents & Sustainability* (OCF20+) is a response from the next generation to key themes developed in the 1987 publication *Our Common Future* (also known as The Brundtland Report). This new publication will also commemorate and celebrate Our Common Future's 20 year anniversary. Our Common Future is one of the most important books written on sustainable development - a landmark publication in many ways. In 1987, it was one of the first publications to suggest that the twin goals of economic growth and sustainable development could be reconciled. *Cents & Sustainability* (OCF20+) provides a response to the call by Gro Brundtland in the Foreword to Our Common Future when she stated, '*What is needed now is a new era of economic growth – growth that is forceful and at the same time socially and environmentally sustainable.*' *Cents and Sustainability* (OCF20+) will further explore, in a modern global context, the conditions under which society can achieve a form of economic growth that is both socially and environmentally sustainable. The book will include forewords by Gro Brundtland, and Kenneth Ruffing, former Deputy Director and Chief Economist of the OECD Environment Directorate. In addition to Gro, the other key contributor to Our Common Future, Jim McNeill, Former Secretary General to the United Nations Brundtland Commission, and former Director OECD Environment Directorate, is also a mentor and advisor.



## TNEP & Partners Achievements - Publications for Industry Groups and Business

### The Plastics and Chemical Industries Association: Sustainability Discussion Paper – 2007

TNEP is working with the Plastics and Chemicals Industry Association (PACIA) to assist in the development of a discussion paper for its members to consider the issues and opportunities related to the sustainability of the industry. Potential outcomes of the discussion paper include industry workshops and the potential to develop a Sustainability Framework in consultation with PACIA members for the Plastics and Chemicals Industry in Australia.



### Australian Plantation Products & Paper Industry Council: Sustainability Action Plan 2006

The Australian Plantation Products and Paper (A3P) Industry Council recently launched its 'Performance, People and Prosperity' sustainability action plan at the 7<sup>th</sup> National Business Leaders Forum on Sustainable Development in Brisbane, May 2006. The plan includes targets, measures of performance and a commitment to public reporting for Australia's plantation products and paper industry, which creates and sells more than A\$5 billion of product each year. A3P have acknowledged the extensive contribution of Mr Phillip Toyne from EcoFutures Pty Ltd, and Mr Michael Smith and Mr Karlson Hargroves from The Natural Edge Project.



### Australian Industry Group: Environmental Management Handbook, Lead Article - 2006

This Handbook provides practical information on approaches to environmental management as well as discussion of the key environmental issues facing business today. TNEP's Mike Smith and Karlson Hargroves' contribution to this publication was titled 'How Does Australian business reconcile environmental obligations with competitive advantage?' *'In 2006 Australia's manufacturers face increasingly tough global competition. Since the fall of the iron and bamboo curtains, hundreds of millions of low-paid workers have been added to the world's workforce. Hence, competing on low wages is a race that no Australian company can win. This together with a growing number of directives and regulations associated with minimising environmental impact are becoming leading proponents to drive industry to innovate creative solutions.'* The 2006 Environmental Management Handbook is distributed to more than 5,000 Australian Industry Group member companies and TAFE college libraries across Australia.



### Australian Council of Infrastructure Development (AusCID): Sustainability Framework for the Future of Australia's Infrastructure Handbook – 2003

This publication was released by the Australian Council for Infrastructure Development to outline their framework for the future of Australia's infrastructure, and presents a strong case for Sustainable Development in Infrastructure as a driver of innovation. This Handbook was produced by Phillip Toyne of Eco Futures Pty Ltd with invaluable contributions from Alan Tate and Justin Sherrard of Cambiar Pty Ltd and Julian Crawford of Eco Steps Pty Ltd. Charlie Hargroves and Mike Smith from the Natural Edge Project and Ralph Evans provided excellent, additional material.



### Queensland EPA (State Government) (2004-7) - EcoBiz Training Package

TNEP worked with the Sustainable Industries Division of the Queensland EPA to assist the division to further develop their capacity building programs and assist the division to embed sustainability thinking, methodologies and tools into the organisations behaviour and practice. TNEP is now working with the Qld EPA Sustainable Industries division to assist their planning of their 2007 October Eco-Efficiency conference where TNEP's work for Qld EPA will be launched.





## TNEP Achievements - Engineering Education for Sustainable Development

### Engineering Sustainable Solutions Program: Critical Literacies Portfolio (ESSP-CLP) [www.naturaledgeproject.net/ESSP.aspx](http://www.naturaledgeproject.net/ESSP.aspx)

ESSP-CLP comprises 12 university-level, semester-equivalent course content, designed to present key information relating to sustainability for use in engineering and built environment curricula. The courses begin by addressing the Role of Engineering in Sustainable Development. They then overview major tools that allow engineers to achieve sustainable development: Eco-efficiency and Cleaner Production, Whole System Design, Bio-mimetic Engineering, Green Chemical Engineering and appropriate technology. Each course addresses six major sectors within which engineers can make a difference on sustainability: Energy, Industry, Built Environment, Transport, Water and Waste. The structure of the content includes clear educational aims, key learning points, background information pieces, best practice case studies, checklists approved by Engineering bodies, further reading, online resources, comprehension quiz and break-out activities. This portfolio was developed with the support of Engineers Australia, The Society of Sustainability and Environmental Engineering and UNESCO. Content from various parts of the program has been trialled and reviewed by 15 universities in Australia. There is also now significant interest in this package form leading engineering schools internationally. Following extensive peer review, TNEP is currently uploading the content packages for free dissemination online: (Total over 400 pages). <http://www.naturaledgeproject.net/ESSP.aspx>



### Engineering Sustainable Solutions Program: Design Principles Portfolio (ESSP-DPP) [www.naturaledgeproject.net/Whole\\_Systems\\_Design\\_Suite.aspx](http://www.naturaledgeproject.net/Whole_Systems_Design_Suite.aspx)

ESSP-DPP aims to produce 12 university-level, semester-equivalent course content packages which present a series of design calculations to facilitate incorporating sustainability design principles into engineering and built environment university curricula. This includes introductory technical design calculations to demonstrate how advances in energy and materials efficiency can be achieved through applying the concept of 'Whole System Design'. The portfolio focuses on the theme of 'Achieving Energy, Water and Materials Efficiency', responding to requests from engineering educators for more examples of worked technical calculations. The first of five stages of ESSP-DPP (Whole Systems Design) has been completed with the support of the Australian Department of Environment and Heritage. This includes six units freely available from the TNEP web site (approx 100 pages). TNEP is seeking additional funding to continue program development: email [info@tnep.net](mailto:info@tnep.net). <http://www.naturaledgeproject.net/ESSP.aspx>



### Engineering Sustainable Solutions Program – Industry Practice Portfolio (ESSP-IPP) - E-Waste Education and Training Package (2006-07)

There is now a disturbing trend towards the minimum re-use or recycling of electronic goods ('e-products') such as computers, MP3 players, mobile telephones, entertainment systems and gaming systems. Disposal of 'e-waste' receives minimal or no evaluation of social or environmental consequences. To address the information gap in knowledge about e-products, e-waste and opportunities for improving the situation, TNEP in partnership Griffith University have developed two courses available online, introducing and discussing the challenges of e-waste in our society: <http://www.naturaledgeproject.net/EWasteHome.aspx>. These courses engage with youth, through both a high school and an undergraduate package. The project was supported with funding from DELL.



## TNEP Achievements - Engineering Education for Sustainable Development

### Engineering Sustainable Energy Solutions Program - ESESP (2006/07)

TNEP is part of a collaboration with Griffith University (Centre for Environmental Systems Research) and the Australian National University (Institute for Environment), supported by the Institution of Engineers Australia, to develop education and training material funded by the CSIRO Energy Transformed Flagship. The project aims to deliver an effective toolkit for capacity-building engineers and other key technical professions, in the skill of finding cost-effective low-carbon energy approaches and energy efficiency options. The capacity-building training program will empower engineers to address these issues through the course of their professional life. In the first year it will deliver three advanced training programs (for university and practitioner level) focusing on the following themes:

1. Identifying, quantifying and implementing energy efficiency opportunities for Industrial/Commercial users – by Technology.
2. Integrated systems based approaches to realising energy efficiency opportunities for Industrial/Commercial users – by Industry Sector.
3. Integrated approaches to energy efficiency and low emissions electricity, transport and distributed energy.

Additional funding to enhance to the project has been received from the National Framework for Energy Efficiency to support a survey of universities, additional academic review of the modules and end user engagement activities.



### ***State of Engineering Education for Sustainable Development- Engineering Solutions for Sustainable Cities"* (SedSD) - An initiative inspired by the 'UNESCO International Workshop on Engineering Education for Sustainable Development', Beijing 2006**

In November 2006, the inaugural 'UNESCO International Workshop on Engineering Education for Sustainable Development (EESD)' was held in Beijing, China. The event, attended by a representative of TNEP, brought together delegates from 48 universities and 10 engineering institutions and academies to focus on the 'new requirements to engineering education brought by sustainable development'. Engineering educators from around the world used the opportunity to share their experiences.

Given the success of the knowledge sharing experience at the Beijing Workshop and a number of other such forums, this project will engage with the growing network of engineering educators and researchers internationally to develop and publish a report on the 'State of Engineering Education for Sustainable Development' (SedSD – pronounced 'Said-SD') specifically focused on 'Engineering Solutions for Sustainable Cities' around the globe. Engineering educators and researchers in different countries will form Focus groups each contributing a report on the state of engineering education for sustainable development in their country.

A summary of the main outcomes of the process along with a selection of supporting papers will be published as a special edition of the 'International Journal of Sustainability in Higher Education' in May 2008. The complete outcomes of the process will be considered for publication as a book in late 2008. The process of developing the SedSD Report will be facilitated by The Natural Edge Project (hosted by Griffith University). Accelerating teaching and research about the challenge and opportunity of achieving sustainable cities is one of the most urgent issues of our time. This project aims to provide a structure and mechanism for focusing on a range of ways to achieve this acceleration and build a coalition for action within Engineering Education as a demonstration to other disciplines. The Focus Groups' production of country-specific collections of research, analysis, review and critique under a common global documentation structure, will provide a significant shared body of materials and experience, on which the network can build significant future collaborations for action.

## TNEP Achievements – Practice Partners In Education and Research

### Engineers Australia – Foundation Administrative Host

In 2002 the Institution of Engineers Australia accepted TNEP as a special project and provided the structure, administration, governance and transparency to undertake its research, allowing the team to focus on the development of *The Natural Advantage of Nations* and open source online companion, and providing corporate service on-costs in-kind.



### Griffith University Centre for Environmental Systems Research (CESR)

After several years administrative hosting by Engineers Australia, TNEP's next phase of development in content and research was considered best suited an academic institution. With the support of Professor Bofu Yu and Professor Roger Braddock, TNEP officially joined the Centre for Environmental Systems Research in January 2007 for an initial two year period. The team is now focused on undertaking targeted research to assist in accelerating society towards more sustainable outcomes. With this goal in mind the team endeavours to ensure that all outcomes of projects are accessible the public and in many cases open source.



### ANU School of Engineering

TNEP's Research Director Michael Smith accepted an invitation to become a departmental visitor at ANU CRES in 2006, with the support of Professor Stephen Dovers. In 2007 he joined the ANU Department of Engineering for 12 months to develop an engineering sustainable energy solutions educational package, under funding from the CSIRO Energy Transformed Flagship project grants, in collaboration with Griffith University, TNEP and Engineers Australia.



### University of South Australia - Louis Laybourne Smith School of Architecture and Design (2006/07)

TNEP is working with the University of South Australia's School of Architecture and Design on the development of coursework units for the Master of Sustainable Design drawing from and building on from the ESSP. The first two courses 'Sustainability and Society' and 'Sustainable Design Principles' and have been scheduled for first delivery in the second semester of 2007.



### Queensland University of Technology – Faculty of Built Environment and Engineering (QUT) (2005/06)

TNEP collaborated with the Faculty of Built Environment and Engineering at QUT to develop a Faculty-wide 'Introducing Sustainability' unit. TNEP assisted by facilitating preparatory workshops, delivering base lecture material and assisting in tutor training and support. The base unit material for the unit is based on the Introductory Module of the ESSP. The text for the course is *TNEP's Natural Advantage of Nations*.



### RMIT Master of Sustainable Practice (2005/06)

TNEP is working with RMIT on the development of coursework units for the Master of Sustainable Practice. Currently two units from the Introductory Module of the ESSP have been approved by the RMIT engineering department. To date, TNEP has undertaken two short courses at Griffith University. Learnings from the short courses are being used to inform the content for ESSP-CLP.



### Monash University (2006/7)

TNEP is working with Monash University's Faculty of Engineering to assess ways in which sustainability content could be holistically embedded within existing undergraduate and masters programs. This collaboration includes trialing of part of TNEP's Draft Rapid Transition Strategy for mainstreaming sustainability into engineering curricula.



## TNEP Achievements – Practice Partners in Research & Education

### Practice Partners

#### **Townsville City Council – Solar Cities Program (2006 – 2011):**

TNEP is assisting Townsville City Council to implement the A\$30 million Solar Cities Program as a lead consultant for the provision of technical advice, education and training services. The initiative will involve: installing solar panels in 500 homes and businesses; the rollout of 2500 smart meters and 1700 in-house energy display meters; and the provision of consumer energy efficiency advice.



#### **KBR (Infrastructure/Water) (2006/07)**

TNEP is assisting multinational engineering company Kellogg Brown & Root (KBR) in the development of training material and capacity focused on sustainability critical literacy skills, with a focus on water issues.



#### **Hatch (Minerals Processing) (2006/07)**

TNEP is working with Hatch to assist in the development of training material focused on sustainability critical literacy skills, relevant to the minerals processing industry. The training materials strongly align with the leading sustainability tools within Hatch.



#### **Hewlett Packard (Information & Communications Technology) (2006/07)**

TNEP is working with Hewlett Packard to develop the business case for IT customers to shift to a product service model for the provision of IT services. TNEP's package to HP includes a Literature Review, a public White Paper, an Annotated Bibliography and a Presentation Kit for HP staff to deliver Customer Workshops. TNEP anticipate partnering with HP to deliver a series of Customer Workshops.



#### **Santos (Oil and Gas) (2006)**

TNEP supported consulting associate, Sustainable Business Practices, to provide a range of services to Santos including; sustainability indicators selection, prioritisation and data collection; development of the 2005 Santos Sustainability Report and research to enhance the sustainability content of the Santos website.



#### **VicUrban (Urban Development) (2006)**

TNEP is working with VicUrban to assist in the development of a suite of Environmental and Urban Design Performance Measures and Indicators for Industrial and Business Park Developments. TNEP is collaborating with our partners Janis Birkeland (research) and Hatch (review) to develop the Indicators.



#### **Sustainable Living Challenge (Secondary Schools) (2005/06)**

The Natural Edge Project is assisting in the development of teacher capacity building material and the provision of base teaching resources to expand teacher's curriculum toolkit on sustainability issues aligned with the Sustainable Living Challenge (hosted by the University of New South Wales).



#### **Sudanese Virtual Engineering Library (2004)**

TNEP assisted in the creation of this project to establish a website on 'Virtual Library on Engineering for Sustainable Development' as a pilot project. SudVEL now contains 1000 records in full text and 700 records in bibliographic databases. It provides access to engineering information in the industrial field, students, researchers and academic staff in all the Sudanese universities.





## TNEP Achievements – Further Contributions to Publications and Web Site Databases - Best Practice Case Studies of Sustainability

### Australian Conservation Foundation (ACF): Natural Advantage: A Blueprint for a Sustainable Australia, Best Practice Case Studies

In 2000 Sir William Deane, then Governor General of Australia, launched the blueprint that outlined ACF's vision for a sustainable Australia and set out inspirational and long-term solutions to environmental and social problems. TNEP's Michael Smith assisted over a two year period in identifying and developing an extensive and comprehensive case study database, highlighting best practice case studies to support of the ACF policy Blueprint. ACF is updating this case study folder as we speak and it will be re-uploaded both on the ACF and the TNEP web site by October 2007. (50 pages featuring over 100 Australian sustainability case studies of best practice)



### CL Creations: Australian Innovation - Towards a Sustainable Future

This newly launched book and website demonstrates through case studies the range of Australian activities, initiatives, leadership and innovative approaches being implemented by business, government and industry groups in Australia on their journey to sustainability. This is an important and credible editorial-based resource reviewing innovation-driven sustainable products, services, technologies and partnerships around the issues faced in the environment, workplace, community and marketplace. TNEP has provided a chapter on innovations in water and a commentary piece on Australian Bio-mimetic Innovation.



### Good Business: South Australian Industry Leadership in Environmental Sustainability, Case Study Development - 2006

This publication, launched by SA Premier, the Hon. Mike Rann, MP at the Second Australia New Zealand Climate Change and Business Conference in Adelaide, February 2006 highlights nine examples of sustainability practices in corporate South Australia. The publication was produced by the Premier's Round Table on Sustainability, with content and case study development undertaken by TNEP and Sustainable Business Practices. With an introduction from Tim Flannery. The case studies in this booklet were drawn from work commissioned by the Department of Trade and Economic Development, and the Department for Environment and Heritage's Office of Sustainability on South Australian businesses' attitudes to sustainability opportunities.



### Focus Publishing: Australia Worldwide Solutions for a Sustainable Future, Chapter - 2005

This publication showcases the Australian expertise, products and services in sustainable

<http://www.focus.com.au/ProductDetails.asp?ProdID=39> development, and place Australian-based companies on the world stage as business partners of choice. Edited by Alan Tate, with chapters written by leading industry journalists Susan Brown and Phil Dickie, and the team from The Natural Edge Project, Nick Palousis, Karlson 'Charlie' Hargroves, Michael H. Smith and Cheryl Desha; Solutions for a Sustainable Future describes how Australia's expertise has been applied to manage the vitally important issues of water, waste, land, energy and air. TNEP contributed to the development of the case studies and the chapter 'Tomorrow's Technologies'.



### Environs Australia (Local Government) (2004/05)

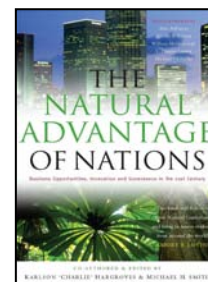
TNEP worked with Environs Australia to develop a database of best practice in local government sustainability. Environs Australia was formed in 1989 and is a network of members interested in promoting sustainable development through local action, primarily in the local government sector.



## TNEP Sector Programs - Climate Change and Energy

### How can Government and Business Achieve Deep Cuts in Greenhouse Gas Emissions?

- TNEP's The Natural Advantage of Nations (Vol I): Business Opportunities, Innovation and Governance in the 21st Century. Earthscan, London - 2005 Chapter 17 Profitable Greenhouse Solutions is now completely online. ([www.naturaledgeproject.net/NAON\\_ch17.aspx](http://www.naturaledgeproject.net/NAON_ch17.aspx)).
- TNEP 2007 report 'Action on Climate Change can Help Business Competitiveness and Economic Growth' - launched at the 2007 National Business Leaders Forum for Sustainable Development. ([www.naturaledgeproject.net/60by2050.aspx](http://www.naturaledgeproject.net/60by2050.aspx))



### CSIRO ECOS magazine series on Deep Cuts

CSIRO ECOS magazine is featuring a series of articles by The Natural Edge Project on how to achieve deep cuts to greenhouse gas emissions. The following short articles provide new insights into some of the most exciting and effective ways to profitably reduce greenhouse gas emissions. (<http://www.naturaledgeproject.net/TNEPArticles.aspx>)



### Engineering Sustainable Solutions Engineering Education and Training

All of TNEP and partners Engineering Sustainability Education and Research Programs outlined above address climate change and energy issues for engineers.

### Emissions Trading Schemes – Prospering in a Carbon Constrained World

How can business best profit when operating in an emissions trading scheme? This key question is addressed in detail in a detailed report for the Chicago and European Climate Exchanges. This report was developed by Natural Capitalism Solutions (NCS) and The Natural Edge Project for the Chicago Climate Exchange (CCX) and the European Climate Exchange (ECX). The report was researched and prepared by Karlson 'Charlie' Hargroves and Michael H. Smith of The Natural Edge Project, supervised, reviewed and edited by Hunter Lovins and Christopher Juniper. (<http://www.naturaledgeproject.net/KeyAchievements.aspx>)



### The Nuclear Energy Debate.

Over the last two years there has been renewed debate about nuclear energy. To help you make up your mind on this complex issue firstly we present the key points of both the Pro-Nuclear Case and the Anti-Nuclear Case (<http://www.naturaledgeproject.net/TheGreatSustainabilityDebates-NuclearPower.aspx>)



### Stay Informed – Subscribe to ECarbon News.

Since Al Gore's An Inconvenient Truth many more people have been wondering how they can stay up to date easily with the latest climate change news. Here is an answer – eCarbon News. eCarbon News is a free monthly emailed digest of news from around the world relevant to climate change. eCarbon News is hosted on a new Australian Climate Forum web site (<http://www.australianclimateforum.com/>). ECarbon news has chosen TNEP to partner with to help promote this significant resource.



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**TNEP Academic Contributions – Papers & Articles**

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**Selected Journal & Conference Papers**

- Desha, C., and Hargroves, K. (2009) 'Surveying the State of Higher Education in Energy Efficiency, in Australian Engineering Curriculum', *Journal of Cleaner Production*, Elsevier, doi:10.1016/j.jclepro.2009.07.004.
- Desha, C., Hargroves, K., and Smith, M. (2009) 'Addressing the Time Lag Dilemma in Curriculum Renewal Towards Engineering Education for Sustainable Development', *International Journal of Sustainability in Higher Education*, Volume 10 Number 2, 2009.
- Desha, C., and Hargroves, K. (2008) 'Mainstreaming EESD: Elements of Rapid Curriculum Renewal', in Proceedings of the 2008 Engineering Education for Sustainable Development Conference, 22-24 September (Graz, Austria), EESD 2008, Graz, Austria.
- Desha, C., and Hargroves, K. (2008) 'Education for Sustainable Development Curriculum Audit (E4SD Audit): A Curriculum Diagnostic Tool for Quantifying Requirements to Embed SD into Higher Education - Demonstrated through a Focus on Engineering Education', UNESCO International Centre for Engineering Education, *World Transactions on Engineering and Technology Education*, Vol. 6(2), pp. 365-372.
- Desha, C., Hargroves, K., and Smith, M. (2007) 'A Summary of the 'Engineering Education for Sustainable Development - Toolkit of Information & Teaching Material', *Pathways to our common future: Proceedings of AGS Annual Meeting 2007*, Barcelona, Spain.
- Stephens, R., Desha, C, and Hargroves, K. (2007) 'The Philosophy and Practice of Water Sensitive Urban Design – is it Consistent with a Whole System Approach?', *BEDP Environment Design Guide*.
- Desha, C., Hargroves, K. (2007) 'Education for Sustainable Development: Elements of Rapid Curriculum Renewal in Engineering', Paper presented to the Griffith University School of Engineering Research Conference, 29-30 October 2007, Logan.
- Palousis, N., Hargroves, K., Smith, M. and Paten, C. (2006) 'Re-thinking Sustainable Solutions – Innovation Inspired by Nature'. Submitted to the Australian Rangelands Society: 14<sup>th</sup> Biennial Conference (Renmark, Australia), 5–7 September 2006.
- Smith, M., Hargroves, K., Palousis, P. and Paten, C. (2006) 'Pros and Cons of the Nuclear Energy Debate', The Natural Edge Project.
- Hargroves, K., Paten, C., Palousis, N. and Smith, M.H. (2005) 'Making the Profitable Transition Towards Sustainable Business Practice.' Submitted to the ASEE/AAEE 4th Global Colloquium on Engineering Education (Sydney, Australia), 26-29 September 2005.
- Smith, M.H., Hargroves, K., Palousis, N. and Paten, C. (2005) 'A Taste of Best Practice in Engineering Sustainable Solutions'. Submitted to the 2005 Environmental Engineering Society National Conference, 18-19 July 2005.
- Paten, C., Palousis, N., Hargroves, K. Smith, M.H. (2005) 'How Do You 'Teach' Sustainability to Engineers? Introducing the Engineering Sustainable Solutions Program'. Submitted to the 2005 Environmental Engineering Society National Conference, 18-19 July 2005.
- Paten, C., Palousis, N., Hargroves, K. and Smith, M. (2005) 'Engineering Sustainable Solutions Program - Critical Literacies for Engineers Portfolio: Putting Sustainability as a 'Critical Literacy' into Mainstream Engineering Curricula', *International Journal of Sustainability in Higher Education*, Volume 6 Number 3, pp. 265-277.
- Paten, C., Vance, P., Hargroves, K., Smith, M., and Palousis, N. (2004) *Inventory of Resource and Energy Usage Efficiency for Priority Industry Sectors in Queensland*, Queensland Environmental Protection Agency.
- Smith, M. and Hargroves, K. (2002) 'Harnessing External and Internal Drivers for Change, Partnerships for Sustainability to Facilitate Permanent, Change in the University Sector'.

Submitted and Presented to The 2nd National Conference of Sustainable Universities, co-organised by The University of Melbourne, RMIT and Monash University.

### **Book Publications:**

- Smith, M., Hargroves, K., Stasinopoulos, P., Desha, C., and Reeves, A. (2011) Water Transformed: Sustainable Water Solutions for Climate Change Adaptation, TNEP, (In Development)
- Smith, M., and Hargroves, K. (2010) Cents and Sustainability: Decoupling Economic Growth from Environmental Pressures, TNEP, Earthscan, London (In Development)
- Desha, C. and Hargroves, K. (2010) Engineering Education for Sustainable Development: A Guide to Rapid Curriculum Renewal, TNEP, Earthscan, London (In Development)
- Von Weizsäcker, E., Hargroves, K., and Smith, M (2009) Factor Five: A Convenient Truth: Increasing Wealth and Reducing Resource Use, TNEP, Earthscan, London. (An update of 'Factor Four')
- Stasinopoulos, P., Smith, M., Hargroves, K. and Desha, C. (2008) Whole System Design - An Integrated Approach to Sustainable Engineering, TNEP, Earthscan, London. (Published in partnership with UNESCO and the World Federation of Engineering Organisations)
- Smith, M., Hargroves, K., Stasinopoulos, P., Stephens, R., Desha, C. and Hargroves, S. (2007) Energy Transformed: Sustainable Energy Solutions for Climate Change Mitigation, The Natural Edge Project (TNEP), Australia. (Available Online)
- Hargroves, K. and Smith, M. (eds) (2006) The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century, Earthscan, London. (9 Chapters available Online)

### **Selected Articles & Position Papers**

**CSIRO ECOS Magazine – A Selection:** TNEP regularly contributes to CSIRO's *ECOS Magazine* with articles on a range of topics:

- Smith, M., Hargroves, K (2007) Carbon Leaders – The New Corporate Standards p27-29 ECOS Issue 136 April – May 2007
- Smith, M., Hargroves, K (2007) Smart Approaches to Electricity Use p12-13 ECOS Issue 135 February - March 2007
- Smith, M., Hargroves, K (2007) The Gore Factor - Reviewing the impact of An Inconvenient Truth pp. 16-17 (Cover Article) - ECOS Issue 134 December - January 2007
- Smith, M. and Hargroves, K (2006) Inquiry encourages broader corporate reporting accountability, CSIRO ECOS, Issue 131, pp 4.
- Hargroves, K., and Smith, M. (2006) Innovation inspired by nature: Biomimicry, CSIRO ECOS, Issue 129, pp 27-29.
- Smith, M. and Hargroves, K (2006) Wood - another low carbon footprint solution, CSIRO ECOS, Issue 129, pp 12-13.
- Smith, M. and Hargroves, K (2006) The First Cuts Must be the Deepest. CSIRO ECOS, Issue 128, pp 8-11.
- Smith, M. Hargroves, K, and Toyne, P (2004) 'The Role of Infrastructure in Sustainability'. Published in Engineering World, October Edition.
- Smith, M and Hargroves. K. and Toyne, P (2004) 'Heavy Duty: The crucial role of infrastructure planning in Australia's move toward sustainability', CSIRO ECOS, Issue 121, pp 10-13.
- Smith, M and Hargroves. K. (2004) Encouraging more sustainable practices - the easy way, CSIRO ECOS, Issue 121, pp 24-25.



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