

Mr Karlson 'Charlie' Hargroves

Director and Co-Founder, The Natural Edge Project

The Natural Edge Project (TNEP) is an independent Sustainability Think-Tank based in Australia. TNEP operates as a partnership for education, research and policy development on innovation for sustainable development. 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.

Driven by a team of early career Australians, the non-profit Project receives mentoring and support from a range of experts and leading organisations in Australia and internationally, through a generational exchange model. TNEP is administratively hosted in-kind by Griffith University and Australian National University. The project is led by a Secretariat team of Charlie Hargroves, Michael Smith, Cheryl Desha, Peter Stasinopoulos and Stacey Hargroves.

Qualifications

B.E. (Civil/Structural) University of Adelaide, Adelaide 2000.
PhD Candidate, Curtin University, Perth, Professor Peter Newman.

Short Biographical Information

Charlie Hargroves is the co-founder and Executive Director of The Natural Edge Project, an Australian based Sustainability Think-Tank. Charlie and the TNEP team have developed a number of internationally renowned books on sustainable development, including contributions from the likes of Alan AtKisson, Amory Lovins, Ernst von Weizsäcker, Gro Brundtland, Leo Jensen, R. K. Pachauri, and William McDonough.

Charlie is a graduate in Civil and Structural Engineering from the University of Adelaide and is currently completing a PhD in Sustainable Industry Policy with Professor Peter Newman at Curtin University. Charlie spent 12 months on secondment as the CEO of Natural Capitalism Inc, Colorado, and represents the team as an Associate Member of the Club of Rome.

The teams flagship collaborative book, *'The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century'* (Earthscan 2005), was awarded the Australian Banksia Award for Environmental Leadership, Education and Training. Building on from this work the team delivered two online open access books, *'Whole System Design: An Integrated Approach to Sustainable Engineering'* (Earthscan 2008), and *'Energy Transformed: Sustainable Energy Solutions for Climate Change Mitigation'* and is currently working on an update of *'Factor 4'*, co-authored with Ernst von Weizsäcker, and a response to the Brundtland Commission's report *'Our Common Future'*.

Charlie and the team from TNEP have developed a range of projects focused on education, strategy and policy for sustainable development, including working with international partners such as UNESCO, UNEP, Wuppertal Institute, World Federation of Engineering Organisations, Chicago Climate Exchange, World Technopolis Association, Chicago Manufacturing Centre, and Rocky Mountain Institute. The teams Australian partners include Griffith University, ANU, CSIRO, Engineers Australia, Purves Environmental Fund, Townsville City Council, National Framework for Energy Efficiency, HP, UniSA, KBR, VicUrban, Hatch, RMIT, QUT, and the Queensland EPA Sustainable Industries Division.



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Employment History (Related)

Project Director
The Natural Edge Project

Adjunct Senior Lecturer
University of Adelaide

Chief Executive Officer
Natural Capitalism Inc.
Boulder Colorado

Sustainability Research
Officer, Office of
Sustainability,
South Australia

Sustainability Research
Officer, Institution of
Engineers Australia.

Australian Army (Part-
time) Officer Cadet,
Adelaide Universities
Regiment - Honourable
Discharge

Languages

English (fluent)
French (basic)
Mandarin (Beginner)

Academic Achievements

Books:

- 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)

Book Chapters:

- Hargroves, K. and Smith, M. (eds) (2006) 'Waste streams to value streams', in: Marinova, D., Annandale, D., and Phillimore, J. (eds) (2006) *The International Handbook on Environmental Technology Management*, Edward Elgar, Northampton, MA, USA.
- Palousis, N., Hargroves, K., Smith, M. and Paten, C. (2005) 'Tomorrow's Technologies' in Tate, A. (2005) *Towards a Sustainable Future*, Focus Publications, Sydney, pp 88 - 107.
- Desha, C., and Hargroves, K. (In Press) 'Sustainable Development and Engineering Education', 'Environmental engineering' and 'The State of Engineering for Sustainable Development', Marjoram, T. (Ed) *Sustainable Development and Engineering Education*, UNESCO.

Reports and Papers:

- Smith, M., Hargroves, K., Stasinopoulos, P., and Desha, C. (2008) *Analysis of the Costs of Inaction versus the Costs of Action on Climate Change for Australia*, Submission to the Garnaut Climate Change Review, The Natural Edge Project.
- Desha, C., Hargroves, K., Smith, M., Stasinopoulos, P., Stephens, R. & Hargroves, S. (2007) 'State of Education for Energy Efficiency in Australian Engineering Education—Summary of questionnaire results', Report to the National Framework for Energy Efficiency, The Natural Edge Project.
- Smith, M., and Hargroves, K. (2007) *Executive Summary: Action on climate change can help business competitiveness and economic growth*, (Submitted as a call for leadership from the participants of the '8th National Business Leaders Forum on Sustainable Development'), The Natural Edge Project (TNEP).
- Hargroves, K., Stasinopoulos, P. and Smith, M. (2007) 'Sustainable IT' through 'Sustainable Product Service Systems', a case study of Hewlett Packard, The Natural Edge Project (TNEP), Australia.
- Prosser, M., Smith, M., Hargroves, K., and Toyne, P (2006) *Australian Plantation, Products and Paper Industry Council's (A3P) Sustainability Action Plan - Performance, People and Prosperity*, A3P.

- Smith, M. and Hargroves, K. (2006) '*Sustainable Development: How Does Australian business Reconcile Environmental Obligations with Competitive Advantage-Improving Competitiveness Through Effective Environmental Management.*' Australian Industry Group's Environmental Management Handbook.
- Hargroves, K., Smith, M., and Lovins, H (2005) *Prospering in a Carbon Constrained World: Profitable Opportunities for Greenhouse Gas Emissions Reduction*, CCX/EUX Opportunities Report.
- Toyne, P., Tate, A., Hargroves, K., and Smith, M. (2003) *Sustainability Framework for the Future of Australia's Infrastructure Handbook – Australian Council for Infrastructure and Development*, AusCID.

Academic 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: 14th 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.

Articles:

- Smith, M., Hargroves, K., Desha, C., and Stasinopoulos, P. (2009) 'Factor 5 in eco-cement: Zeobond Pty Ltd', *CSIRO ECOS*, Issue 149, p. 21.
- Smith, M., Hargroves, K., Stasinopoulos, P., and Desha, C. (2009) 'Stand-out progress from our corporate first-movers', *CSIRO ECOS*, Issue 148, pp. 14-15.
- Smith, M. and Hargroves, K. (2009) 'Achieving both economic growth and reduced environmental pressures in the current financial climate', *CSIRO ECOS*, Issue 148, pp. 30-31.
- Smith, M. and Hargroves, K. (2009) 'Time to unleash the power of a green economy', *CSIRO ECOS*, Issue 146, pp. 26-27.
- Smith, M. and Hargroves, K. (2008) 'Developing partnerships can help meet Garnaut's 2050 target', *CSIRO ECOS*, Issue 142, pp. 14-15.
- Smith, M. and Hargroves, K. (2008) 'Clever cooperation will step up climate progress', *CSIRO ECOS*, Issue 141, pp. 16-17.
- Smith, M. and Hargroves, K. (2008) 'Seeing the wood for the trees: What to look for when purchasing carbon credits', *CSIRO ECOS*, Issue 140, pp. 12-14.
- Smith, M. and Hargroves, K. (2008) 'Energy superpower – or sustainable energy leader? 2', *CSIRO ECOS*, Issue 140, pp. 22-24.
- Hargroves, K., Smith, M. and Desha, C. (2007) 'Choices, the key to progress', *The Brisbane Courier Mail*, 1 August 2007.
- Berry, M., Smith, M. and Hargroves, K. (2007) 'Energy superpower – or sustainable energy leader?', *CSIRO ECOS*, Issue 139, pp. 20-23.
- Smith, M. and Hargroves, K. (2007) 'Business signs up to support short-term cuts', *CSIRO ECOS*, Issue 138, p 4.
- Smith, M., Hargroves, K. and Desha, C. (2007) 'Tuning into a deeper wisdom', *CSIRO ECOS*, Issue 138, p 18-19.
- Hargroves, K., Smith, M., Stasinopoulos, P. and Hargroves, S. (2007) 'Improving performances in the boardroom', *CSIRO ECOS*, Issue 137, pp. 26-27
- Smith, M. and Hargroves, K. (2007) 'Climate leaders: the new corporate standards', *CSIRO ECOS*, Issue 136, pp 27-29.
- Smith, M. and Hargroves, K. (2007) 'Smart approaches to electricity use', *CSIRO ECOS*, Issue 135, pp 12-13.
- Smith, M. and Hargroves, K. (2007) 'The Gore Factor - Reviewing the impact of An Inconvenient Truth', (Cover Article), *CSIRO ECOS*, Issue 134, pp. 16-17.
- Smith, M. and Hargroves, K. (2006) '\$uper powers - How investment funds could be driving progress in an emerging 'sustainability' economy', (Cover Article), *CSIRO ECOS*, Issue 132, pp 24–28.
- Smith, M. and Hargroves, K. (2006) 'Plantation, paper and milling show how it's done', *CSIRO ECOS*, Issue 132, pp 29.
- Smith, M. and Hargroves, K. (2006) 'Sustainable Development: How Does Australian business Reconcile Environmental Obligations with Competitive Advantage-Improving Competitiveness

Through Effective Environmental Management.' *Australian Industry Group's Environmental Management Handbook*.

- Smith, M. and Hargroves, K. (2006) 'Inquiry encourages broader corporate reporting accountability', *CSIRO ECOS*, Issue 131, p 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', *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.
- Burns, C. and Hargroves, K. (2003) 'Building beautifully', *CSIRO ECOS*, Issue 117, pp 25.
- Hargroves, K. (2003) 'Taking Natural Capitalism to the world', *CSIRO ECOS*, Issue 116, pp 27.
- Page, C., Hargroves, K. and Smith, M. (2003) 'There's money in the air', *CSIRO ECOS*, Issue 116, pp 26.
- Hargroves, K. and Smith, M. (2003) 'A platform for change', *CSIRO ECOS*, Issue 116, pp 15.
- Hargroves, K., Smith, M. and Moody, J. (2003) 'New efficiency from our old systems', *CSIRO ECOS*, Issue 116, pp 13-14.

Prizes & Awards:

- (2005) Member of TNEP team awarded the Banksia Award for Environmental Leadership, Education and Training.
- (2005) Member of TNEP team awarded the 2005 Year of the Young Engineer Award, South Australian Division of The Institution of Engineers Australia.
- (2005) Member of TNEP team awarded a South Australian Engineering Excellence Award - Engineering Education & Skill Formation.
- (2005) Member of TNEP team that was one of three national finalists in the Australian Museum Eureka Awards in the Allen Strom Prize for Education in Sustainability

Keynotes, Lectures and Workshops

Invited Conference Presentations and Keynotes:

- 12 February 2009 – Invited Keynote, Committee for Economic Development of Australia, 'Sustainability: The Next Economic Opportunity?' (Perth, Australia and repeated Adelaide, Australia). On invitation to deliver a keynote lecture to the conference called 'Cents and Sustainability: Securing Our Common Future'.
- 5 – 7 January 2009 – Invited Keynote, Fifth International Conference on Environmental, Cultural, Economic and Social Sustainability (Mauritius) On invitation to deliver a keynote lecture to the conference called 'Cents and Sustainability: Securing Our Common Future'.
- 6 November 2008 – Invited Plenary Speaker and Panellist, Griffith Business School, Sustainability in Business Series 2008, (Brisbane, Australia) Climate change adaptation and mitigation – approaching the costs. On invitation to deliver a presentation on '*The cost of inaction: reducing greenhouse gas emissions*'.
- 30 October 2008 – Invited Speaker, Advanced Manufacturing Australia 2008 International Conference, (Melbourne, Australia). On invitation to deliver presentation called 'The Impact of Climate Change on Advanced Manufacturing in Australia'.
- 16 – 18 October 2008 – Invited Speaker and Facilitator, Asia Pacific Academy of Business in Society Annual Conference. (Singapore) On invitation from APABIS to deliver a presentation called 'Energy Transformed: Responding to the complexity of the challenge of climate change', along with co-facilitating two workshop sessions.
- 8 – 9 October 2008 – Invited Keynote, The Great Energy Debate (Adelaide, Australia). On invitation to deliver presentation on greenhouse gas mitigation and economic growth.
- 22 – 23 May 2008 – Invited Plenary Keynote and Event Master of Ceremonies, Sustainability and Business Growth Summit (Sydney, Australia). On invitation from the event organisers to deliver the opening keynote on 'Sustainability in the Era of Climate Change'.
- 25 - 29 February 2008 - Invited Speaker, 3rd National Water Education Conference (Gold Coast, Australia). On invitation from the Australian Water Association to deliver a speech called 'Education in Water Resource Management and Supply to Respond to Climate Change'.
- 25 - 29 February 2008 - Keynote Speaker, Water Industry Capacity Development (WICD) Conference 2008 (Gold Coast, Australia). On invitation from the Australian Water Association to deliver a speech called 'A strategic approach to embedding sustainable development into engineering education to support the water industry'.
- 25 - 29 February 2008 – Invited Keynote, Cooperation On Health And Biodiversity, COHAB 2 (Galway, Ireland) On invitation from the COHAB Initiative to deliver a speech as part of the 'Business and Ecosystems' workshop on innovation, engineering opportunities and biomimicry.
- 19 October 2007. Gala Dinner Panellist, Environment Institute of Australia and New Zealand (EIANZ) 20th Anniversary Gala Ball (Sydney, Australia). Invited member of dinner panel.
- 6 - 9 September 2007. Invited Speaker, International Urban Design Conference, Gold Coast City Council, (Gold Coast, Australia). On invitation from the Gold Coast City Council to deliver a speech to the conference on 'Engineering Sustainable Solutions for our Urban Cities'.
- 31 - 3 September 2007. Invited Speaker, Asia Pacific Cities Summit (APCS), Brisbane City Council, (Brisbane, Australia). Invited to address the young delegates and contribute to the workshops and discussion as part of the youth program.
- 1 June 2007. Invited Speaker, Greenbuild and Renewable Energy Exhibition - GREX (Sydney, Australia). On invitation from the organisers Charlie and the team from TNEP presented a summary of the flagship projects.
- 15 - 18 April 2007. Invited Speaker, Engineering Sustainability Conference, Mascaro Sustainability Initiative, University of Pittsburgh, (Pennsylvania, USA). On invitation from the University of Pittsburgh to deliver a speech to the conference on sustainable engineering solutions.

- 31—2 November 2006. Invited Keynote, UNESCO International Workshop: Engineering Education for Sustainable Development, (Beijing, China). Invitation from UNESCO to deliver keynote in plenary session.
- 26-28 July 2006. Invited Keynote, Fifth World Technopolis Association (WTA) General Assembly (Brisbane, Australia). Charlie Hargroves was an invited keynote speaker along with Richard Neville in 'The Future Natural Capital of Smart Cities' stream of the assembly.
- 26-29 September 2005. Invited Speaker, ASEE/AAEE 4th Global Colloquium on Engineering Education (Sydney, Australia). A joint presentation by Charlie Hargroves, Cheryl Paten and Nick Palousis on '*Making the Profitable Transition Towards Sustainable Business Practice.*'
- 26-29 September 2005. Invited Speaker, Environmental Engineering Educators' Workshop (Sydney, Australia). A joint presentation by Charlie Hargroves, Cheryl Paten and Nick Palousis on '*Transformational Change in the University Sector.*'
- 18-19 July 2005. Invited Speaker, EES 2005 – Creating Sustainable Engineering Solutions (Sydney, Australia). Charlie Hargroves presented on '*Prospering in a Carbon Constrained World.*'
- 4-5 April 2005. National Business Leaders Forum on Sustainable Development (Melbourne, Australia). Launch of The Natural Advantage of Nations by the Rt. Hon Sir Ninian Stephen, Former Governor-General 1982-89 with the team from TNEP.
- 13-15 April 2005, International Dialogue on '*Providing Leadership for Sustainable Development*', (Beijing, China). TNEP members, Michael Smith and Charlie Hargroves were invited to attend, Michael was unable to attend due to study related commitments however Charlie Hargroves attended along with TNEP mentor Prof. Mark Diesendorf.
- 17-19 March 2005, Invited Speaker, NCIAA 9th Annual Conference (San Diego, USA). The National Collegiate Inventors and Innovators Alliance. Charlie Hargroves attended and presented on the *Engineering Sustainable Solutions Program*.
- 24-25 September 2004, Invited Panellist, '*An International Workshop on the Role of EWB-USA and the Engineer in Capacity Building for the Developing World*', (Denver, Colorado). Discussion panel member Charlie Hargroves.
- 27-29 September 2004, Invited Keynote, Integrating Appropriate-Sustainable Technology and Service-Learning in Engineering Education, (Boulder, Colorado). Keynote presentation by Charlie Hargroves and Nick Palousis.
- 26-28 May 2004, Invited Keynote, ASEAN Australian Engineering Congress 2004, (Kota Kinabalu, Sabah). Keynote presentation by Charlie Hargroves titled '*Transforming Engineering Education and Practice with Whole Systems Engineering Design.*'
- 16–19 November 2003, Invited Speaker, International Conference of the Network of Regional Governments For Sustainable Development (Perth, Western Australia). Session presentation by Charlie Hargroves and Michael Smith, '*Natural Competitive Advantage of Regions: Achieving Regional Competitive Advantage, Attracting Investment, and Encouraging Eco-Innovation through Collaborative Approaches for Sustainable Development.*'
- 29-30 May 2003, Invited Speaker, National Business Leaders Forum on Sustainable Development (Melbourne, Australia). Steering Committee Member/Closing Speaker, Charlie Hargroves.
- 16 August 2002. Invited Speaker, National Science Festival – '*A Whole of Society Approach to Sustainable Development.*' Speakers TNEP's Michael Smith and Karlson Hargroves, TNEP working group member Mia Kelly, Christal George, Dan McKinley and James Moody.
- 2–4 October 2002, Paper Presentation, The 2nd National Conference of Sustainable Universities, co-organised by The University of Melbourne, RMIT and Monash University, (Melbourne, Australia). Presentation by Charlie Hargroves of the paper – Hargroves, C. and Smith. M. (2002) '*Harnessing External and Internal Drivers for Change, Partnerships for Sustainability to Facilitate Permanent, Change in the University Sector.*'

Guest University Lecturers:

- 12 February 2009. Curtin University, Australian Sustainable Development Institute's (ASDI), 'Opening the Curtin Sustainability Dialogue', (Perth, Australia). On invitation to deliver a keynote lecture to the conference called 'Cents and Sustainability: Securing Our Common Future'.
- 6 November 2008. Griffith University School of Business, (Queensland, Australia). On invitation to deliver a keynote lecture to the conference called 'The cost of inaction: reducing greenhouse gas emissions'.
- 13 April 2007. Donald Bren School of Environmental Science and Management, University of California, (Santa Barbara, USA). On invitation from the Dean of the Bren School, Ernst von Weizsäcker, Charlie Hargroves delivered a student lecture on innovation and sustainable development.
- 13 April 2007. Donald Bren School of Environmental Science and Management, University of California, (Santa Barbara, USA). On invitation from the Dean of the Bren School, Ernst von Weizsäcker, Charlie Hargroves delivered a student lecture on innovation and sustainable development.
- 24 January 2007. TERI University, (Delhi, India). On invitation from Associate Professor Arabinda Mishra, Charlie Hargroves delivered a student lecture on innovation and sustainable development.
- 10&17 May 2006. Queensland University of Technology, 'MMB451 Energy Management' (Brisbane, Australia). Cheryl Paten and Charlie Hargroves presented two 3-hour guest lectures on '*Profitable Greenhouse Solutions*'.
- 9-26 May 2005. University of Colorado, Boulder. 'Natural Capitalism for Engineers' Maymester Course (Boulder, Colorado). Charlie Hargroves co-instructed this 3 week course with Hunter Lovins. This course provides an introductory insight into exciting best practice and innovations, as well as the best current research covering key areas of sustainable engineering.
- 20 November 2003. Murdoch University – Institute for Sustainability and Technology Policy (ISTP). '*Overview of The Natural Edge Project – History, Achievements and Goals.*' Presentation with Mike Smith.

Training and Workshops:

- 16 October 2008 – Invited workshops by TNEP, Asia Pacific Academy of Business in Society Annual Conference. (Singapore) On invitation from APABIS Charlie Hargroves and Cheryl Desha facilitated a plenary workshop on MBA Graduate Attributes for Sustainable Business Practices, and an 'APABIS Strategy Symposium: Sustainable Business Practices and Energy Efficiency in the Industrial and Commercial Sectors'.
- 15 February 2008 - Invited Workshop by TNEP. 6th Symposium on Accountability, Governance & Performance (Brisbane, Australia) Charlie Hargroves and Cheryl Desha facilitated a workshop called, 'Developing Effective Strategies and Policies for Organisational Sustainability', focused on the basic tools and processes needed to facilitate constructive debate on policy formulation, direction setting, and effective implementation strategies for sustainable business practices.
- 12 December 2007 - Invited Workshop by TNEP. International Conference on Engineering Education and Research, iCEER 2007 (Melbourne, Australia) On invitation from the host, Victoria University, TNEP delivered a workshop called 'Elements of Curriculum Renewal to Embed Sustainability into Engineering Education'.
- 7 December 2007 - Invited Workshop by TNEP. AaeE 2007: Eighteenth Annual Conference of the Australasian Association for Engineering Education (Melbourne, Australia) On invitation from the AAEE TNEP delivered a called 'Emerging Engineering Education Curriculum for Sustainable Development'. The workshop highlighted the release of the Energy Transformed online textbook, developed in partnership with CSIRO and the National Framework for Energy Efficiency.
- 4-5 August 2006. Sustainability Education & Capacity Building Framework Workshop, KBR. The Natural Edge Project were invited to facilitate a workshop with KBR staff in Brisbane, Australia. The workshop focused on developing the preferred attributes, literacies and competencies to be developed by the proposed 'KBR Sustainability Education and Capacity Building Framework'.

- 19–21 July 2006. Engineering Sustainable Solutions Program Short Course. TNEP Secretariat members Charlie Hargroves, Cheryl Paten and Nick Palousis delivered a three-day intensive short course with the theme '*The Role of Engineers in Sustainable Development 1*' to Griffith University masters students and engineering professionals at the Eco Centre, Griffith University.
- 5-10 March 2006. Engineers Visioning a Sustainable Future Conference, Townsville City Council (Townsville, Australia) Charlie Hargroves and Cheryl Paten co-facilitated a full day seminar for professional engineers on sustainability and two half-day workshops for Year 12 high school students and 1st Year Engineering students (James Cook University) respectively, all based on the Engineering Sustainable Solutions Program.
- 16-19 November 2005. Sustainable Living Tasmania – Annual Sustainability Series, aimed at empowering Tasmanians with a deeper understanding of sustainability.
 - 16 November 2005. *The Role of Engineers in Sustainability* - Charlie and Nick facilitated a 3 hour interactive seminar focused on the opportunities for engineers in sustainable development, including lectures, small group discussion and facilitated group discussion.
 - 17 November 2005. *The Business Case for Sustainability* - Charlie and Nick presented a 2.5 hour interactive seminar focused on the opportunities for business and industry in sustainable development, including lectures, small group discussion and facilitated group discussion.
 - 18 November 2005. *Cultural Change and Sustainability within Universities* - Charlie and Nick presented a 2.5 hour interactive seminar focused on the opportunities to accelerate change within the university towards sustainable development including lectures, a group role play scenario and facilitated group discussion.
 - 19 November 2005. *Sustainability - Being Realistic AND Optimistic* - Charlie and Nick delivered a 45 minute public lecture as part of the *Tasmanian Environmental Home Expo* held in City Hall.
- 8 November 2005. University of South Australia - Formulas for a Thriving Planet Forum (Adelaide, Australia). The Forum provided a relaxed opportunity for young representatives from a number of fields to engage directly with WWF Australia CEO Greg Bourne on topical environmental matters and active solutions. The Session was facilitated by Charlie Hargroves and Nick Palousis.
- 26 September 2005. Young Engineers Australia National Forum (Sydney, Australia). Two hour workshop facilitated by the TNEP team (Charlie Hargroves, Cheryl Paten and Nick Palousis) for 190 young professional engineers at the YEA national forum, focusing on their ability to effect real change in their workplace (around the theme of sustainability).
- October 2004. Charlie Hargroves, Cheryl Paten and Nick Palousis assisted with running a 2 day workshop, Sustainability Intensive, lead by Alan AtKisson, Hunter Lovins and Junko Edahiro at Imperial College (London, UK).

Facilitating Keynote Tours:

- 15 – 26th May, 2006. TNEP co-ordinated the *2006 Innovation Inspired by Nature Australian Tour* with Janine Benyus and Catherine Bragdon from the Biomimicry Guild. The Tour engaged 36 Tour Partners from business, government and the university sector throughout Brisbane, Townsville, Adelaide, Melbourne, Canberra and Sydney.
- 21 March – 6 April, 2005. TNEP co-ordinated the *2005 Sustainable Business Practice Australian Tour* with Hunter Lovins. The Tour was supported by 23 Tour Partners from business, government, professional bodies and university sector throughout Sydney, Brisbane, Byron-Ballina, Townsville, Alice Springs, Melbourne and Canberra.
- 27 March – 25 April, 2004. TNEP co-ordinated the *2004 Natural Advantage of Nations Tour* with Hunter Lovins. The Tour was supported by over 35 Tour Partners from business, government, professional bodies and university sector throughout New Zealand, Sydney, Brisbane, Adelaide, Melbourne, Perth and Canberra.

Education Modules and Curriculum:

- *Introduction to Sustainable Development for the Engineering and Built Environment Professions*
The course is the introductory course in the Critical Literacies Portfolio of the Engineering Sustainable Solutions Program. The course focuses on the context for incorporating sustainable development into the engineering profession, describing the terms, barriers, opportunities and existing tools that define and explain a whole systems approach to Sustainable Development. TNEP received grants from UNESCO (Natural Science Sector) and The Institution of Engineers Australia (College of Environmental Engineering and Society for Sustainability and Environmental Engineering) to develop this course.
- *Principles and Practices in Sustainable Development for the Engineering and Built Environment Professions*
The course is the second, intermediate course in the Critical Literacies Portfolio of the Engineering Sustainable Solutions Program. The course builds on from the introductory course and provides a focus on principles and practices involved in incorporating sustainable development into the engineering profession. TNEP received grants from UNESCO (Natural Science Sector) and The Institution of Engineers Australia (College of Environmental Engineering and Society for Sustainability and Environmental Engineering) to develop this course.
- *Whole Systems Design Suite*
The purpose of the Whole System Design Suite is to provide introductory technical design based teaching material to demonstrate how advances in energy, materials and water efficiency can be achieved through applying a Whole System Approach to Sustainable Design. Whole System Approaches for designing buildings, cars, cities, industry plants, motors, farming and agriculture, and lighting systems are increasingly being seen as the key to the most cost effective reduction in negative environmental impacts. TNEP received a grant from the Australian Federal Department of the Environment and Water Resources under the Education for Sustainable Development Grants Programme.
- *Sustainable Energy Solutions Portfolio*
This portfolio will provide a freely available online education and training package to bring together the knowledge of how Australia can achieve at least 60 percent cuts to greenhouse gas emissions by 2050. This training package provides industry, business and households with the knowledge they need to realise at least 30 percent energy efficiency savings in the short term while providing a strong basis for further improvement. TNEP received grants from CSIRO, as part of the Energy Transformed Flagship, and the National Framework for Energy Efficiency (NREE).

Contributions to Industry Sustainability Action Plans:

- Plastics and Chemicals Industry Association (PACIA) Sustainability Leadership Framework for Industry - Plastics and Chemicals Industry Discussion Paper – 2007. To assist the plastics and chemicals industries on its journey to a sustainable future, PACIA in consultation with its members and stakeholders has developed a "Sustainability Leadership Framework". A Discussion Paper has been developed as the first step in communicating the value of sustainability to the plastic and chemicals industries and its stakeholders, as well as identifying priority areas and tools to assist the industries contribute to sustainability across the social, environmental and financial spheres, both now and into the future. The Natural Edge Project provided research, advice and support in the development of the Discussion Paper.
- White Paper: 'Sustainable IT' through 'Sustainable Product Service Systems - a case study of Hewlett Packard' – 2007. HP commissioned research by TNEP to investigate and outline the benefits of shifting to a product service model for the provision of IT services and the impacts on environmental performance of suppliers and customers. The resulting report provides guidance on a range of questions now facing the industry with a focus on the drivers, benefits and opportunities of a shift towards 'Sustainable Product Service Systems'.
- A3P Sustainability Action Plan – 2006, the Australian Plantation Products and Paper Industry Council (A3P) launched 'performance, people and prosperity', at the 7th National Business Leaders Forum on Sustainable Development in Brisbane, 15 May 2006. The Plan raises 21 issues and lists specific actions for addressing each. It includes targets, measures of performance and a commitment to public reporting. A3P acknowledges Mr Phillip Toyne, from EcoFutures Pty Ltd, and

the extensive contribution from Mr Michael Smith and Mr Karlson Hargroves from The Natural Edge Project. (Prosser, M. Smith, M. Hargroves, K. Toyne. P (2006) *Australian Plantation, Products and Paper Industry Council's (A3P) Sustainability Action Plan - Performance, People and Prosperity.*)

- *Prospering in a Carbon Constrained World - Profitable Opportunities for Greenhouse Gas Emissions Reduction - 2005.* This pre-publication report was developed for Natural Capitalism Solutions (NCS) for use in its engagement with 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 and Chris Juniper of NCS, supervised and reviewed by Hunter Lovins. (Lovins, H. Hargroves, K. Smith, M. Juniper, C (2005) *Prospering in a Carbon Constrained World: Profitable Opportunities for Greenhouse Gas Emissions Reduction, CCX/EUX Opportunities Report*).
- *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. On invitation from the producer (Philip Toyne, Eco Futures Pty Ltd), Charlie and Mike from the TNEP secretariat provided additional material to support the handbook. (Toyne, P., Tate, A., Hargroves, K. and Smith, M. (2003) *Sustainability Framework for the Future of Australia's Infrastructure Handbook*, Australian Council for Infrastructure and Development.)

Experience working with Research Organisations and Universities

- Griffith University. As part of the in-kind hosting of TNEP by Griffith University a number of guest lectures, tutoring and course development activities have been undertaken. Including co-teaching 2335EVE "Sustainability Principles & Practices" in 2007, and teaching into 1001ENG "Engineering Practice & Sustainability" in 2007 and 2009.
- CSIRO Transformed Flagship Program. TNEP is partnering with Griffith University (Centre for Environmental Systems Research) and the Australian National University (Institute for Environment) to develop education and training material as part of the CSIRO Energy Transformed Flagship in 2006/07. The project will seek 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.
- Queensland University of Technology (QUT). TNEP has just completed a collaboration 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 and the textbook for the unit is 'The Natural Advantage of Nations'.
- University of South Australia - Louis Laybourne Smith School of Architecture and Design. TNEP is working with UniSA on the development of coursework units for the Master of Sustainable Design drawing from and building on from the ESSP. The first two courses proposed are 'Sustainable Design Theory - Sustainability and Society' and 'Sustainable Design Theory - Sustainable Design Principles'.
- RMIT Master of Sustainable Practice. 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 under the supervision of Assoc. Prof. Roger Hadgraft, School of Civil and Chemical Engineering. TNEP will be both offering these units in partnership with RMIT to private clients and groups and also to Students of RMIT as short courses.
- Sudanese Virtual Engineering Library. The objective of this project was to prepare and 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.
- Sustainable Living Challenge. 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).

Experience working with Industry

- KBR Government & Infrastructure, "*Selected KBR staff attended workshops, courses and seminars by The Natural Edge Project (TNEP). These resulted in the development of an in-house sustainability program through which we will educate and support our wider staff in the Asia Pacific region as the field of sustainable engineering continues to develop. This program has set the benchmark for our global counterparts in KBR and has provided a robust framework upon which we can build a sustainable future. We will continue to collaborate with TNEP as we progress towards sustainability.*" Bridget Kelly, Sustainability Technical Sector Leader, KBR Government & Infrastructure.
- Townsville City Council, TNEP has an ongoing partnership with the Environmental Management Services team, lead by Greg Bruce, including delivering training sessions, facilitating workshops and organising keynote speakers. In 2007 TNEP began a partnership with TCC around the Solar Cities program, a five year program supported by the Federal Government in partnership with Ergon Energy.
- Hewlett Packard (IT) TNEP worked closely with HP to develop a white paper on sustainable product service systems, researching the benefits of shifting to a product service model for the provision of IT services and the impacts on environmental performance of suppliers and customers.
- CSR Limited (Diversified Manufacturing) TNEP worked with CSR limited to assist in the development of a position paper to the Board. "*Working with the team from TNEP was a pleasure and their professional expertise and operational understanding was evident right from the first meeting. TNEP have added a great deal to our understanding of sustainability and how it can relate to the industry segments with which we are involved. I would highly recommend them to others.*" Martin Jones, General Manager, Government Relations, CSR Ltd.
- Santos (Oil and Gas) TNEP supported our consulting associate, Dan Atkins of 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) TNEP worked 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 collaborated with partners Janis Birkeland (research) and Hatch (review) to develop the Indicators.
- HATCH (Minerals Processing) TNEP worked 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.
- HASSELL (Engineering and Project Management) TNEP was invited to brief the HASSELL sustainability team on issues related to energy and greenhouse gas emissions reductions.
- SKM (Engineering) TNEP was invited to provide a briefing on issues related to energy and greenhouse gas emissions reductions.
- GHD (Engineering) TNEP supported a national survey program to assess the skills gaps and requirements for increasing the capacity of the Australian economy to undertake energy efficiency assessments.
- Queensland Government Environment Protection Agency – Sustainable Industries Division - ecoBiz Program. 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.
- Environs Australia. 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 worked with Environs for over 2 years to assist them to develop a database of best practice in local government sustainability.
- Dell and Griffith University –E-Waste Research and Education Grant. TNEP contributed to research content on emerging trends and activities relating to E-Waste, then to develop educational material for university students in the form of an education module, in collaboration with the Griffith Sustainable Living Challenge team who are developing a high school education module.

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