

## CURRICULUM VITAE

**Name:** Chris Greig

**Present Position:** Dow Chair in Sustainable Engineering Innovation

**Academic training:** BE(Hons), Chemical Eng., University of Queensland (1982)  
ME St., Chemical Eng., University of Queensland (1984)  
PhD Chemical Eng., University of Queensland (1995)



### Awards:

Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE), 2012;  
Fluor Chemeca Award for Excellence in Engineering Management, 2001;  
Engineers Australia (Queensland Division), Engineering Awards - Product Design 1996;  
Engineers Australia (Queensland Division), Engineering Awards - Project Management 1996;  
Premier's New Queensland Exporter Award 1996;  
President's Medal, Australian Society of Sugarcane Technologists, 1990.

### Overview:

Chris is a professional executive / director with extensive experience in general management, technology commercialisation and the development and management of complex industrial projects. His professional career began during his PhD, as founder of a successful start-up company which grew under his leadership, into a globally recognised supplier of specialised sugar equipment and turnkey process plants focused in developing countries. Following the sale and exit from that venture after 14 years as CEO, Chris went on to hold senior corporate and project roles with privately owned and listed companies in the resource, engineering and construction sectors for a further 12 years. During his career, Chris worked extensively throughout Asia, the Americas, Europe and Africa. High level technical qualifications coupled with broad commercial and interdisciplinary experience and strong interpersonal skills provide a sound platform for leadership roles in the energy, industrial and resource sectors.

In late 2010, Chris took a break from work to be the full time carer of his terminally ill wife. In late 2011 he made a decision to join UQ and took up an academic position which is focused on strategic energy and sustainability research, industry and government engagement, as well as teaching business and professional practice for engineers. He also continues as a non-executive director for a small number of ASX listed companies and Government owned corporations.

### Referees:

Emeritus Professor Paul Greenfield – (retired President and Vice Chancellor, The University of Queensland), Brisbane. [vspgreen@me.com](mailto:vspgreen@me.com) +61 418 733 866

Professor Max Lu – President and Vice Chancellor, University of Surrey, Surrey, Guildford, Surrey, UK. [vice-chancellor@surrey.ac.uk](mailto:vice-chancellor@surrey.ac.uk) (EA [h.staveley@surrey.ac.uk](mailto:h.staveley@surrey.ac.uk))

Mr Robert Pritchard – Executive Director, Energy Policy Institute of Australia, Sydney. [robert.pritchard@resourceslaw.net](mailto:robert.pritchard@resourceslaw.net) Mobile: +61 413 755 616

Professor Robert Socolow - Director, Princeton Environmental Institute, Princeton University, NJ, USA [socolow@Princeton.edu](mailto:socolow@Princeton.edu) Telephone: +1-609-258-5467 (EA is Caitlin Daley)

## Experience:

September 2011 – Current                      University of Queensland

- Dow Chair in Sustainable Engineering Innovation. Leadership of the Dow Centre for Sustainable Engineering Innovation hosted within the School of Chemical Engineering but which has a UQ-wide mandate to pursue strategies to move the needle in the sustainable production and utilisation of energy and materials.
- Director of the UQ Energy Initiative. Established and led the University-wide initiative to lead the energy research strategy across all faculties and institutes. The role seeks to provide strategic context, techno-economic assessment and engagement with government, industry, NGO's and research funders. The initiative emphasises a whole-of-system, transdisciplinary approach incorporating primary energy extraction to processing, conversion, distribution and utilisation of fossil and renewable energy systems for power, fuel and industrial applications. (Stepped down in 2018)
- Chair or member of Advisory Boards for the UQ Centre for Coal Seam Gas, UQ Geothermal Energy Centre of Excellence and UQ School of Chemical Engineering.
- Established and co-lead of the UQ Energy Poverty research Group – a cross-disciplinary research program looking at energy and livelihoods in the developing world.
- Advising / Co-Advising 3 Graduated PhD scholars and 5 current PhD students.
- Universities nominee on the Advisory Board of the Australian Solar Thermal Research Initiative, a formal research collaboration encompassing the Australian Renewable Energy Agency, CSIRO and six Australian Universities including UQ.
- Developer, Lecturer, and Coordinator of a course for final year and Masters of Engineering, "Professional Engineering Practice in the Business Environment".
- Developer, Lecturer, and Coordinator of a course, "Energy Investment and Finance" in the Masters of Sustainable Energy program.
- Guest lecturer in in various Engineering courses around Energy Policy & Economics, Innovation & Strategic Management.
- Australian Academy of Technology and Engineering – Member of Fellows Selection Committee and Member of the Panel of Judges for the Clunies Ross Awards for Innovation, Commercialisation and Entrepreneurship.
- Member of the Queensland Government 30 year Energy Strategy Reference Panel (now ceased).
- Member of the National Low Emissions Fossil Fuel Technologies Leadership Roundtable, comprising energy sector business leaders and national / state government (now ceased). Chaired committee to develop the 2013 Roadmap for Carbon Capture and Storage.

### Non-Executive Director Roles

- Director (and current Acting Chairman), The Energy Policy Institute of Australia
- Non-Executive Director and Chair of the Nominations & Remuneration Committee, Seymour Whyte Limited Ltd, an ASX listed engineering & construction contractor (Retired in 2017)
- Deputy Chairman and Member of the HR Committee, Gladstone Ports Corporation, a Queensland Government Owned Corporation. (Retired in 2015)

2008 – 2011                      ZeroGen Pty Ltd

- CEO and Project Director for ZeroGen (A\$6 Billion leading edge IGCC power project with carbon capture & sequestration) for Scoping Study and Prefeasibility Study (leadership role in project delivery and contract structures, negotiation with key technology providers, contractors and engineers, capital cost estimates, financial modelling, funding and risk management). Recommended cessation and closure of the project to shareholders and financiers due to lack of financial viability and climate policy uncertainty.

2004 – 2008                      Ensham Resources Pty Ltd

- General Manager Projects responsible for oversight and leadership of all significant capital projects including open cut Expansion (from feasibility to implementation) and Feasibility Study for a underground development, and coal freight rail and port services negotiation.
- Project Director to recover the mine from a catastrophic flood including development of cost estimates in circumstances of enormous uncertainty, interfacing with shareholders and insurers for funding, and scoping, resourcing and project management of recovery capital works and operations.

2000 – 2004 JJ McDonald & Sons Group

- Managing Director and Chairman of family owned group of companies, based in Townsville (North Queensland), with businesses in civil construction, agriculture and quarrying. Appointed at the request of shareholders and banks, a major restructuring and turn around task was successfully accomplished.

1986 – 1999 STG Group & STG-FCB SA

- Founder and Managing Director of process technology and engineering start-up company formed during PhD studies. Developed and successfully commercialised patented technologies in sugar processing, mineral processing and hydrometallurgy (Exited in 1999 following sale to listed French group).
- The company was a global leader in specific sugar processing technologies – selling its proprietary equipment in all cane sugar producing countries of the world;
- It was also responsible for developing several complete sugar projects from concept through feasibility and from financing to construction and operation in South East Asia.

2000 – 2012 Other Ad-hoc Management Consulting and Directorships (Selection only)

- Non-Executive Director of LogiCams Limited an ASX listed, multidisciplinary EPCM company (Retired).
- Non-Executive Chairman of Western Metals Limited, an ASX-listed exploration company headquartered in Perth with active uranium, gold and base metals exploration properties in Australia, Tanzania, Peru, USA and Canada. (Retired).
- Non-Executive Chairman of Australia Texas Energy Pty Ltd which specialises in the provision of power to remote mining operations and communities, under Build-Own-Operate contracts (Retired).
- Project advisor to the Vietnamese government, Xstrata Coal, Sojitz and Kyushu Electric Power Company to scope the development of a 4,400 MW pulverised coal fired power generation complex in southern Vietnam.
- Independent review for BHP Billiton of the Business Case estimates for the Uranium recovery section of the proposed Olympic Dam Expansion project.
- Advisor for Enthalpy Pty Ltd on Capital Investment Systems and Project Delivery for major clients including BHP Billiton, Barrick Gold and Stanwell Corporation.
- Lead negotiator for UniQuest Pty Ltd (the commercialisation vehicle for the University of QLD) in major technology licensing deals with CSR Limited and OneSteel Limited.

**Publications** (since joining UQ in late 2011) Papers and significant reports

- Kefford, B., Ballinger, B., Schmeda-Lopez, D., Greig, C., Smart, (2018). The early retirement challenge for fossil fuel power plants in deep decarbonisation scenarios. Energy Policy. (Submitted)
- Kefford, B., Ballinger, B., Schmeda-Lopez, D., Greig, C., Smart, S., Small, M. & Wong-Parodi, G. (2018). Identifying regionally dependent barriers in the Carbon Capture and Storage industry. Energy Research & Social Science. (Submitted)
- Malakar, Y., Greig, C. & Van de Fliert, E. (2018). Structure, agency and capabilities: Conceptualising inertia in solid fuel-based cooking practices. Energy Research & Social Science. Vol 40.
- Parkinson, B.; Tabatabaei, M.; Upham, D.C.; Ballinger, B.; Greig, C.; Smart, S and McFarland, E.: "Hydrogen production using methane: Techno-economics of decarbonizing fuels and chemicals", International Journal of Hydrogen Energy, Online: 6 January 2018 (IN PRESS). DOI: 10.1016/j.ijhydene.2017.12.081.
- Greig, C.R.: "Contemporary research in energy science and engineering", Engineering, 2017, 3(4): 436-438. <http://engineering.org.cn/EN/Y2017/V3/I4/436>
- Greig, T.G. Kreutz, E.D. Larson, J.C. Meerman, R.H. Williams, "Lignite-plus-Biomass to Synthetic Jet Fuel with CO<sub>2</sub> Capture and Storage: Design, Cost, and Greenhouse Gas Emissions Analysis for a Near-Term First-of-a-Kind Demonstration Project and Prospective Future Commercial Plants," Final report to The National Energy Technology Laboratory, U.S. Department of Energy, 1 September 2017.
- Parkinson, B., Greig, C, McFarland, E. and Smart, S. (2017) Techno-economic analysis of a process for CO<sub>2</sub>-free coproduction of iron and hydrocarbon chemical products, Chemical Engineering Journal, 313 (2017)

- Herington, M., Lant, P., Smart, S., Greig, C. and Van de Fliert, E. (2017). Defection, recruitment and social change in cooking practices: Energy poverty through a social practice lens. *Energy Research & Social Science*. Vol. 34.
- Greig, C., Bongers, G., Stott, C. and Byrom, S. (2016) *Energy Security and Prosperity in Australia: A Roadmap for CCS*, The University of Queensland, Brisbane. ISBN 978-1-74272-175-0
- Greig, C., Baird, J. and Zervos, T. (2016) *Financial Incentives for the Acceleration of CCS Projects*, The University of Queensland, Brisbane. ISBN 978-1-74272-177-4
- Grove, J., Lant, P., Greig, C. and Smart, S. (2016). Can coal-derived DME reduce the dependence on solid cooking fuels in India? *Energy for Sustainable Development*, 546 (2016). *Energy Research & Social Science* 34..
- Herington, M., Van de Fliert, M., Smart, S., Greig, C. and Lant, P. (2016). Rural energy planning remains out-of-step with contemporary paradigms of energy access and development. Accepted by *Renewable & Sustainable Energy Reviews*.
- Larson, E., Baxley, S., Greig, C., Kreutz, T., Meerman, H., & Williams, R., (2015). Design and Commercialization Analysis for Synthetic Jet Fuel Production from Lignite and Woody Biomass at a Mississippi Site with CO<sub>2</sub> Capture and Storage via Enhanced Oil Recovery. 32nd Annual International Pittsburgh Coal Conference, USA.
- Greig, C. (2015). We need to get our energy policy right. Feature article in *FOCUS*. Published by The Australian Academy of Technological Sciences and Engineering (ATSE).
- Lane, J., Smart, S., Lopez, D., Hoegh-Guldberg, O., Garnett, A., Greig, C. and McFarland, E. (2015). Understanding constraints to the transformation rate of global energy infrastructure. *WIREs Energy Environment*. Volume 3, 2015.
- Greig, C., Garnett, A., Oesch, J., Smart, S. (2014). Guidelines for scoping & estimating early mover CCS projects. [http://anlecrd.com.au/wp-content/uploads/2016/08/ANLEC-Project-1-0512-0205\\_Milestone-5\\_Final-Report.pdf](http://anlecrd.com.au/wp-content/uploads/2016/08/ANLEC-Project-1-0512-0205_Milestone-5_Final-Report.pdf)
- Garnett A. and Greig C. (2014). *Cost Reduction and Innovation Strategies for Carbon Storage*. Published by the International Energy Agency.
- Garnett A. and Greig C. (2014). Investing in CCS: Key project gateways. *INSIGHTS 2014: What lies in store for CCS*. International Energy Agency.
- Greig C, et al, (2013). *A Roadmap for the Development and Deployment of Carbon Capture and Storage in Australia*. Report prepared on behalf of the National CCS Council for the Minister for Resources, Environment and Tourism, Australian Commonwealth Government.
- Greig, C., Baird, J. and Zervos, T., (2013). *Mobilising Investment to Accelerate CCS Deployment in Australia*. Report prepared on behalf of the National CCS Council for the Minister for Resources, Environment and Tourism, Australian Commonwealth Government.
- Greig C., (2013). *Energy Innovation Policy and the need for a Portfolio Approach*. Public Policy Paper 4/2013 prepared on behalf of The Energy Policy Institute of Australia.
- Garnett A., Greig C. and Wheeler C. (2011). The ZeroGen project—Managing risk and uncertainty. *Energy Procedia*. Volume 4, Pages 5631–5638.

#### Books

- Garnett A., Greig C. and Oettinger M. (2013) [Eds]. *ZeroGen IGCC with CCS. A case history*. UQ Press. ISBN: 978-0-646-91501-2
- Foster, J., Froome, C., Greig, C., Hoegh-Guldberg, O., Meredith, P., Molyneaux, L., Saha, T., Wagner L. and Ball, B. (2013). *Delivering a Competitive Australian Power System* (3 Part series)

#### Reports to governments

Submissions to the Australian and State Governments made on behalf of the University of Queensland;

- Submission to the Federal Minister for Resources and Energy. Response to the Energy White Paper 2012 “Australia’s Energy Transformation”. 2013.
- Submission to State Minister for Energy and Water Supply. Response to the Queensland Government’s “POWERQ: A 3-year strategy for Queensland’s electricity sector”. 2013.
- Submission to the Senate e Standing Committees on Rural and Regional Affairs and Transport. Response to Senate Enquiry on Australia’s Transport Energy Resilience and Security. 2014.

- Submission to Federal Minister for Resources and Energy. Response to the Energy White Paper 2015 “Australia is an Energy Superpower”. 2015
- Submission to the NSW Department of Environment. “NSW Climate Change Policy Framework: Important considerations for taking the aspirational goal seriously a public interest discussion paper”. 2016
- Submission in response to the Commonwealth Chief Scientist’s Report. “Independent Review of the Future Security of the National Electricity Market” 2017.

Submissions co-authored on behalf of the Australian Academy of Technology & Engineering.

- Submission to Federal Minister for Resources and Energy. Response to the Energy White Paper 2015 “Australia is an Energy Superpower”. 2015
- Action and Position Statements intended as advice to government (contributions on behalf of the ASTE Energy Forum)
  - Deep reductions in emissions using CCS (Action Statement) 2017
  - Advancing energy storage for Australia (Action Statement) 2015
  - Enhancing Australia’s solar photovoltaic advantage (Action Statement) 2015
  - Doubling Australia's energy productivity (Action Statement) 2014
  - Intelligent electricity networks for the future (Action Statement) 2014
  - Low emission fuels for transport (Action Statement) 2014
  - Nuclear energy is an option (Action Statement) 2014
  - A sustainable energy future for Australia (Position Statement) 2014

Invited talks/papers at national and international conferences (selected):

- Indian Conference on Advances in Energy Research 2017- Keynote (Mumbai).
- 9<sup>th</sup> Sino-US Joint Conference of Chemical Engineering 2017 (Beijing).
- Australian Engineering Conference 2016. Australia’s Transition away from Fossil Fuels (Brisbane)
- Princeton-BP Carbon Mitigation Initiative 2017 (Princeton) & 2016 (London).
- McDonnell Alliance Global Energy & Environment Partnership 2016 (Brisbane), 2014 (St Louis) & 2012 (Mumbai).
- New Frontiers for Energy & Chemicals in a Carbon Constrained World 2015 & 2014 (Santa Barbara).
- EnerAsia 2014 (Ahmedabad, India).
- Energy State of the Nation. 2016 & 2013 (Sydney).
- America Australian Chamber of Commerce Energy Conference in Houston (2014).
- Bio-energy and CCS (BECCS): Options for Brazil – IEA Workshop Sao Paulo (2013).
- EPRI CCS Costs Workshop 2013 (USA).
- Australian Ambassadors Global Leadership Address in Washington DC (2012).
- International Energy Agency – Coal & CCS 2012 (Paris).
- International Conference on Clean Energy 2012 (Xian).
- APEC Expert Committee on Clean Fossil Energy 2012 (Gold Coast).
- IEA Committee on Energy Research & Technology 2012 (Sydney).
- Various Presentations to Engineers Australia.
- Various presentations to Society of Petroleum Engineers.