Western Australia – a world leader in natural gas

As the world is challenged to reduce carbon emissions to save our environment – governments, scientists, industry and the community are working together to find clean energy supplies for the world’s transition to a reduced carbon economy.

LNG is one of the most valuable resources in Western Australia and is increasingly in demand as a lower emission alternative to more traditional fossil fuels, such as coal and oil.

Nearly all of Australia’s conventional gas resources are located in North Western Australia, in three main basins: Carnarvon, Browse and Bonaparte. Based on current known conventional reserves, Australia’s gas resources can provide it a secure energy supply for the next half-century.

The Australian Government reports gas ‘is projected to be the fastest growing fossil fuel over the period to 2030’. Currently there is more than $200 billion invested in natural gas developments with more projects waiting in the pipeline, just over the horizon.

Western Australia’s LNG export capacity will almost treble to 44.5 million tonnes per annum by 2016 to meet Asia’s growing demand – mainly from Japan, South Korea and China, with India an emerging market. As Western Australia is in such close proximity to LNG markets, it is increasingly positioning itself as a world leader in the supply of clean, high-quality natural gas.

Western Australia is the largest gas producing state in Australia and currently has two operating LNG facilities – the North West Shelf Venture and Pluto. Across Australia there are seven more projects under construction – four draw from gas fields off the north coast of WA (Gorgon, Prelude, Wheatstone and Ichthys) and three are in Queensland (Queensland Curtis LNG, Gladstone LNG and Australia Pacific LNG). Gorgon is due to begin production in mid-2015 with startup at Prelude scheduled for 2016.

Energy users the world over see that natural gas is relatively inexpensive, provided it can be transported efficiently. The International Energy Agency (IEA) predicts that the world is entering a ‘golden age of gas’, where affordable energy will be provided to millions of people who lack access to it now.
The golden age of gas

The IEA’s World Energy Outlook predicts global energy demand increasing by 37% to 2040, with this demand driven by non-OECD countries. The power sector represents over half of the increase in global primary energy use over the period 2012-2040. Gas-fired power generation almost doubles during this period.

The IEA reports global gas use is continuing to grow with gas now drawing level with coal as the second-largest fuel in the global energy mix, after oil. The main regions driving this increased demand are China (which will consume more gas than the European Union by 2030), and the Middle East. Gas is on its way to becoming the first fuel and the role of LNG is on the rise. The increased supply of LNG supports more integrated and secure gas markets.

Global energy demand by fuel type (Quadrillion BTUs)

[Graph showing energy demand by fuel type with bars for Oil, Gas, Coal, Nuclear, Biomass/Other, Wind/Solar/Biofuels, Hydro/Geo for 2010 and 2040]

Industry’s partner of choice

Western Australia’s energy and minerals industries are high-tech, knowledge-rich and sophisticated. The University of Western Australia is repeatedly selected to partner with industry based on strengths in science, engineering, law, environmental science, agriculture, medicine and other disciplines. Together industry and UWA are consistently developing innovative solutions for the resources sector.

UWA – member of the Group of Eight
The University is a member of the Group of Eight, a coalition of research-intensive, comprehensive Australian universities, and is a member of the Worldwide Universities Network of 19 member universities across four continents.

In August 2014, Shanghai Jiao Tong University’s internationally recognised Academic Ranking of World Universities ranked UWA 88th in the world. The Academic Ranking of World Universities places UWA 24th in the world for Life and Agricultural Sciences, the highest ranking in Australia. Psychology, Education & Earth and Marine Sciences at UWA have been ranked in the world’s top 40 institutions in 2014 according to the QS World University Rankings by Subject.

Global Partners
Recognised by industry for its outstanding research capability, UWA has been selected to join the global programs of both Rio Tinto and Chevron. Rio Tinto announced a $3 million investment in UWA as the first partner in its Global Education Partnerships Programme. This Programme will establish a worldwide network of leading universities to generate and foster an appropriate expertise base for the resources industries.

In 2011 Chevron invested $5.7 million in Gas Process Engineering at UWA. This is part of an ongoing commitment to the company’s prestigious global University Partnership Program, which also includes Stanford University, Massachusetts Institute of Technology and Texas A&M University.

Professorial Chairs
Several University Chairs are funded by industry. For example, the Chevron Chair in Gas Process Engineering, Winthrop Professor Eric May; UWA Chair in Geophysics, Winthrop Professor David Lumley; Woodside Professor in Leadership and Management, Winthrop Professor David Day and BHP Billiton Chair in the Business of Resources at UWA’s Business School, Winthrop Professor Peter Hartley.

Harnessing the talent in UWA’s Centre for Offshore Foundation Systems and greater Faculty of Engineering, Computing and Mathematics – Shell and The University of Western Australia entered into an agreement in 2011 to assist with research on the effects of the ocean environment on offshore gas operations.

The agreement involved the appointment of the Shell EMI Chair, Winthrop Professor David White, two (UWA) research assistant professors – Dr Hugh Wolgamot and Dr Wenhua Zhao - and PhD students to conduct the studies. The Shell EMI collaboration also supports Winthrop Professor Mike Efthymiou, the part-time Shell EMI Professor of Offshore Structures, who came to UWA after a career leading the Offshore Structures Group within Shell.

The Shell EMI Chair has grown the breadth of UWA’s expertise across geotechnics and floating structures and is already triggering collaboration between UWA and Shell’s global engineering teams.

Linkage Project Success
UWA is in the top tier of Australian universities in terms of number and success rate in Linkage Project grants. The University attracts funding from the Australian Research Council for projects that support research and development, which are collaborative between academics and partners from outside the University.
Energy and Minerals Institute
UWA’s Energy and Minerals Institute (EMI) connects UWA’s talent and capability across the energy and minerals value chain, builds multidisciplinary networks and strengthens partnerships with industry and external stakeholders. Guided by a Board of Trustees of key industry leaders, EMI provides strategic business development, governance, engagement and consultancy services across UWA.

EMI also leads UWA’s engagement in key collaborations including:

- NRSP (National Resource Sciences Precinct) - a UWA, CSIRO and Curtin University collaboration connecting some of the world’s best researchers with industry and government to tackle some of the most complex challenges facing the resources industry. Between its foundation partners the NRSP hosts more than 400 FTE research staff all addressing the future needs of the global resources industry and is supported by millions of dollars of advanced research infrastructure.

- WA:ERA (WA Energy Research Alliance), a partnership between UWA, CSIRO and Curtin University which aims to build research capability on opportunities relating to the oil and gas industry.

Education and Training

- For details about the University’s undergraduate and postgraduate study options that could lead to a career in the LNG industry, go to http://www.studyat.uwa.edu.au/

- The Energy and Minerals Institute supports professional development opportunities delivered by the University of Western Australia. Experts in their respective fields deliver a wide range of short courses, designed for professionals in the workplace who want to enhance their skills in the resources sector. Further information is available at http://www.emi.uwa.edu.au/training
The value of Australia’s energy resources is now recognised on a global scale and Australia is leading the innovation drive to safe, sustainable energy for the world. Leading the state, The University of Western Australia has a dedicated team of inter-disciplinary researchers who are developing powerful new technologies to drive global change in the widespread use of LNG.

UWA’s scientists collaborate with industry and government providing invaluable insights into current practice and industry needs, triggering new technical developments.
UWA’s LNG Expertise

Key scientists at UWA are making valuable breakthroughs across the entire LNG value-chain by leading research using high tech, world-class UWA infrastructure. The following pages highlight a selection of the UWA team leading research that delivers safe and significant value from our energy resources.

Winthrop Professor Dongke Zhang FTSE
Energy Conversion Technologies
He has conducted extensive research into fuel processing and conversion and combustion science and technology, with a specific focus on coal, petroleum, natural gas and bio-fuels.

- UWA Centre for Energy – Director
- Australia’s Top 100 Most Influential Engineers (2011)
- 1000 Chinese Talents Fellowship (2010)
- CEO’s Award for Excellent Environmental Services, BHP Billiton (2008)
- John Curtin Distinguished Professor (2007)
- John A. Brodie Medal for Excellence in Chemical Engineering, Engineers Australia and Institute of Chemical Engineers (2007)

dongke.zhang@uwa.edu.au

Winthrop Professor Mike Johns
Water Management in Oil and Gas
Along with his team he works on the characterisation, separation and discharge of water inevitably produced during oil and gas production. A key feature is the application of magnetic resonance characterisation techniques. These have been commercialised for oilfield emulsions and are currently being used to develop cheap emulsion breaking technology employing CO₂.

The current focus is also on sub-sea processing and water discharge, specifically the development of radiation-free multi-phase flow measurement devices and non-optical detection of trace oil contamination.

- Chair of Chemical and Process Engineering
- Co-director of the Fluid Science and Resources Division

michael.johns@uwa.edu.au

Winthrop Professor Eric May
Gas Process Engineering
His research has developed breakthrough techniques for measuring gas properties under extreme conditions – providing critical data to advance the computer models used to design and optimise gas processing plants.

- Chevron Chair in Gas Processing
- Research Theme Leader (Natural Gas)
- Young Scientist of the Year (2010)
- Australian Prime Minister’s Award for Physical Scientist of the Year (2012)
- Co-director of the Fluid Science and Resources Division

eric.may@uwa.edu.au

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- Co-director of the Fluid Science and Resources Division

eric.may@uwa.edu.au
Assistant Professor Zachary Aman
Gas Hydrates and Flow Assurance
His research focuses on experimental investigations of high-risk behaviour in subsea oil and gas systems, with specific emphasis on hydrocarbon-based solids that lead to pipeline blockage formation. Through laboratory and flowloop studies, his group is developing new strategies to predict and prevent the formation and buildup of gas hydrates and asphaltenes, with a goal of improving design margins on subsea infrastructure and reducing the risk of flowline failure.

Associate Professor Paul Stanwix
Measurement Science
With applications in fundamental and applied science, his research contributions range from testing Einstein’s Special Theory of Relativity with world-record precision, to developing techniques for nanoscale magnetic sensing using diamonds and low-cost methods for water monitoring using magnetic resonance.

Professor Melinda Hodkiewicz
Engineering Asset Management
She manages research projects in the areas of prognostics, asset data quality and life cycle costing with infrastructure, local government and the resources sector.

Associate Professor Jeffrey Shragge
Computational Geoscience
He leads the alliance between UWA and Perth-based oil and gas company Woodside to develop new computational geoscience research toward improved understanding of WA’s vital North West Shelf energy resources. He is an expert in seismic imaging.

Professor Winthrop Professor David Lumley
Energy Geoscience
An international expert in 3-D seismic imaging and 4-D time-lapse monitoring of the sub-surface, including hydrocarbon recovery, and environmental processes such as CO2 injection and storage.

Assistant Professor Zachary Aman
Gas Hydrates and Flow Assurance
His research focuses on experimental investigations of high-risk behaviour in subsea oil and gas systems, with specific emphasis on hydrocarbon-based solids that lead to pipeline blockage formation. Through laboratory and flowloop studies, his group is developing new strategies to predict and prevent the formation and buildup of gas hydrates and asphaltenes, with a goal of improving design margins on subsea infrastructure and reducing the risk of flowline failure.

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Associate Professor Ed Cripps
Statistics
His research is directed mainly towards statistical theory and applications. In particular, Bayesian methods, change point detection, computational statistics, model uncertainty and mixture models. He also provides statistical consulting to industry and to the scientific community.

> Member of the School of Mathematics and Statistics
> Member of the Centre of Applied Statistics
> Complex Data Modelling Research Group – Co-director

edward.cripps@uwa.edu.au

Associate Professor Conleth O’Loughlin
Offshore Anchoring
An expert in offshore geotechnics focusing on anchoring of floating systems, his research on the high speed penetration of objects in soil has direct application to dynamically installed ‘torpedo’ anchors and free-fall tools for measuring the strength of the seabed. This expertise has led to the development of a new anchor system, which has been sold under licence to industry.

> Centre for Offshore Foundation Systems – Centrifuge Manager

conleth.oloughlin@uwa.edu.au

Winthrop Professor Hui Tong Chua
Geothermal Energy and Waste Heat Utilisation
His research includes catalytic cracking of methane and downstream application of graphite carbon, utilisation of process waste/geothermal energy for desalination and coal seam gas water treatment and absorption of natural gas for safe onshore vehicle usage. His research into catalytic cracking led to a UWA spin off company, Hazer Pty Ltd, in 2010 which has since successfully demonstrated the upscale potential of the catalytic cracking process.

> School of Mechanical and Chemical Engineering

huitong.chua@uwa.edu.au

Associate Professor Rachel Cardell-Oliver
Big Data
As a computer scientist, she manages research projects on sensor networks and data mining. She has worked on applications in natural environments and infrastructure monitoring including rammed earth houses, smart water meters and pipeline networks.

> School of Computer Science and Software Engineering
> Project Leader on Intelligent Urban Water Systems for the CRC for Water Sensitive Cities

rachel.cardell-oliver@uwa.edu.au
Professor Michael Small  
*Complex Systems Modelling*  
His research is focused on Complex Systems Modelling and Data Science – combining complex data and computer model to reliably simulate and predict reality. His work has covered a broad range of applications – from infant respiration, epidemic diseases and predicting cardiac arrhythmia to granular mechanics, financial markets and social dynamics.

- School and Mathematics and Statistics  
- Complex Data Modelling Research Group – Co-director  
- Australian Research Council Future Fellow

michael.small@uwa.edu.au

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Winthrop Professor Mark Randolph  
*Offshore Geotechnics*  
His research team has contributed significantly to our knowledge of North West Shelf seabed conditions, with particular insights gained from using the innovative world-class centrifuge facility – unique in Australia. Internationally renowned for his contributions in the field of soil mechanics and geotechnics, he has advanced the analysis and design of piled foundations, led major discoveries into soil penetration using plasticity solutions and finite-element analysis and developed novel techniques for offshore site foundations, anchoring systems and pipelines.

- Centre for Offshore Foundation Systems  
- Academic Staff (Civil and Resource Engineering)  
- Royal Society Fellow  
- Fugro Chair in Geotechnics

mark.randolph@uwa.edu.au

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Associate Professor Britta Bienen  
*Geotechnical Engineering Applications*  
Her research spans geotechnical engineering applications from shallow to deep water and relates to both oil and gas and renewable energy industries. She is actively involved in the development of international guidelines and was part of the inSafeJIP team that developed the ‘Improved guidelines for the prediction of geotechnical performance of spudcan foundations during installation and removal of jack-up units’.

- Australian Research Council Postdoctoral Fellow  
- Member of the International Standards Organisation (ISO) Committee since 2009

britta.bienen@uwa.edu.au

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Winthrop Professor Liang Cheng  
*Pipeline Stability and Offshore Hydrodynamics*  
His research is focussed on fluid-structure interactions with particular interests in pipelines, risers and multi-body floating interactions. His projects involve close collaboration with industry and he is a Thomson’s Highly Cited researcher.

- Academic Staff, Civil, Environmental and Mining Engineering

liang.cheng@uwa.edu.au
Professor David White
Offshore Engineering
He leads experimental and numerical studies into geotechnical mechanisms at micro- and macro-scale, which have been used to understand the behaviour of piles, foundations, pipelines and submarine slides, as well as leading to new types of site investigation tools. His work is widely referred to in engineering practice, and has been recognised through several industry awards.

Shell EMI Professorial Chair in Offshore Engineering
Early Career Scientist of Year (2011)
david.white@uwa.edu.au

Assistant Professor Hugh Wolgamot
Ocean Wave Interaction with FLNG Systems
His research focuses on aspects of wave-structure interaction related to FLNG operations in Australia, supported by the Shell EMI Chair in Offshore Engineering. He is based jointly in the School of Civil, Environmental and Mining Engineering and COFS.

Part of the Offshore Hydrodynamics Group
Member of the Offshore Hydrodynamics Group
hugh.wolgamot@uwa.edu.au
Assistant Professor Scott Draper
Marine Renewable Energy
(Offshore Structures)
His research is focused equally on three aspects of offshore hydromechanics and engineering: marine renewable energy, sediment transport and scour and (most recently) wave statistics.

- Member of the Offshore Hydrodynamics Group
- Lloyd’s Register Foundation Assistant Professor (since 2011)

scott.draper@uwa.edu.au

Assistant Professor Wenhua Zhao
Hydrodynamics
(Offshore Structures)
He is working on the hydrodynamics of multi-body systems in side-by-side offloading configurations, in particular at developing a reliable model to predict the hydrodynamic performance of a FLNG facility and an FLNG carrier during side-by-side offloading. He is based jointly in the School of Civil, Environmental and Mining Engineering and COFS.

- Academic Scholarship for Excellent Doctoral Candidates from the China Ministry of Education (2012)
- Member of the Offshore Hydrodynamics Group

wenhua.zhao@uwa.edu.au

Winthrop Professor Mike Efthymiou
Offshore Structures and Development (FLNG)
His experience in the design and delivery of offshore structures is second-to-none and he has made award-winning contributions to the industry in a career which spans more than 30 years. His appointment at UWA has deepened the partnership between UWA and Shell, where he has been a key player in the development of FLNG technology as the company’s Lead Technical Authority for the turret, mooring, production rises, water intake risers and topsides structural design. He holds several patents on aspects of the design.

- Shell EMI Chair of Offshore Structures

mike.efthymiou@uwa.edu.au
Winthrop Professor Greg Ivey  
Ocean Dynamics  
His research is in the area of physical oceanography focusing on ocean mixing, internal waves and currents in both the coastal and open ocean environments. He uses the combination of field measurements and numerical circulation modelling to quantify ocean dynamics in support of engineering development and sustainable management of the ocean.

- Deputy Dean and Deputy Dean (Research) in the Faculty of Engineering, Computing and Mathematics  
- Winthrop Professor of Geophysical Fluid Dynamics in the School of Environmental Systems Engineering and the UWA Oceans Institute  
- Node leader of the Western Australia Marine Science Institution (WAMSI)

greg.ivey@uwa.edu.au

Professor Jessica Meeuwig  
Marine Science  
Her main expertise is in marine and fisheries conservation and quantitative modelling. Her work includes investigating how marine sanctuaries generate ecological and economic benefits.

- UWA Oceans Institute – Research Professor  
- School of Animal Biology – Research Professor  
- Centre for Marine Futures – Director, Research Professor  
- Conservation fellow of the Zoological Society of London

jessica.meeuwig@uwa.edu.au

Professor Susan Gourvenec  
Seabed Engineering  
She specialises in seabed engineering and leads a team which develops seabed engineering solutions for offshore hydrocarbon developments. Her research focuses on seabed soil mechanics and translating research outcomes to design frameworks for use in engineering practice. A number of design tools from Susan’s research are widely used in industry.

- ISO/API Geotechnical Resource Group – Task Group Leader  
- Vice Chancellor’s Mid-Careers Resource Award (2014)  
- Author of Offshore Geotechnical Engineering

susan.gourvenec@uwa.edu.au

Assistant Professor Hongwei An  
Seabed Interactions  
His main research areas include stability of pipelines and subsea structures, sediment transport and numerical simulation of flow via computational fluid dynamics (CFD).

- Large O-tube Facility Manager  
- Academic staff, Civil, Environmental and Mining Engineering

hongwei.an@uwa.edu.au

Winthrop Professor Charitha Pattiaratchi  
Coastal Oceanography  
His research is assisting industry to monitor and manage environmental and safety risks through UWA’s Australian National Facility for Ocean Gliders. The gliders are capable of collecting data and monitoring the health of coastal ecosystems.

- Head of School of Environmental Systems Engineering  
- Professor of Coastal Oceanography, UWA Oceans Institute

chari.pattiaratchi@uwa.edu.au

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- Head of School of Environmental Systems Engineering  
- Professor of Coastal Oceanography, UWA Oceans Institute

chari.pattiaratchi@uwa.edu.au

The University of Western Australia | 11
Winthrop Professor John Chandler

Energy and Minerals Law

A practising lawyer for over 30 years, specialising in mining and petroleum development, he has advised parties to large mining projects including major Chinese and Japanese companies. He co-leads a team working on collaborative projects, conferences, seminars and workshops conducted in cooperation with the public and private sectors. The Centre stimulates education and research issues around governance, safety and regulation.

Centre for Mining, Energy and Natural Resources Law – Co-director
Co-author of Petroleum Law in Australia (2013)

john.chandler@uwa.edu.au

Winthrop Professor Peter Eastwood

Sleep Science

He is the inaugural Director of UWA’s Centre for Sleep Science, with a research focus on the pathophysiology and upper airway dysfunction in individuals with sleep-disordered breathing. Research in sleep science can help optimise shift scheduling, improve sleep quality when off-shift and support the development of best practice in safety and productivity for the workforce.

Centre of Sleep Science – Director
School of Anatomy, Physiology and Human Biology
peter.eastwood@uwa.edu.au

Winthrop Professor Mark Griffin

Leadership and Safety

His research seeks to understand how organisational contexts shape, and are shaped by, individual performance and well-being. Current projects investigate leadership, safety, performance management and work stress. He has extensive experience managing large leadership and safety projects across Australia and overseas.

UWA Safety Centre – Director
Accelerated Learning Laboratory – Co-director
Australian Research Council Future Fellow
Academy of Management Research Methods Division – Program Chair

mark.griffin@uwa.edu.au

Winthrop Professor Paul Flatau

Social Impact

His research responds to the rapidly evolving needs of business, government, the third sector and the emerging framework of social investment and the developing challenges of corporate responsibility and sustainability. Recent work has involved close contact with the resources sector but also with not-for profit organisations and government partners.

Centre for Social Impact – Director
Chair of Social Investment and Impact

paul.flatau@uwa.edu.au

Winthrop Professor Tim Ackland

Occupational Biomechanics and Ergonomics

His leading research in occupational biomechanics and ergonomics supports workplace injury prevention and optimisation of human performance in industry.

UWA Health and Rehabilitation Program – Director
School of Sport Science, Exercise and Health – Head of School
tim.ackland@uwa.edu.au

Winthrop Professor Peter Hartley

Resource Economics

As a leading economist he provides leadership and fosters excellence in the UWA Business School’s teaching and research activities and community engagement with the resources sector. He is widely acknowledged as a world renowned expert in natural resource economics, particularly in the energy sector.

BHP Billiton Chair in the Business of Resources (UWA Business School)
US Association for Energy Economics – President
George and Cynthia Mitchell Professor at Rice University in Texas
James A. Baker III Institute for Public Policy Scholar

peter.hartley@uwa.edu.au
Winthrop Professor Sharon Parker
Organisational Behaviour and Work Psychology
She is a Winthrop Professor of Management and Organisations at the UWA Business School. Her research interests include proactivity at work, job and work design and employee perspective taking. She also works with the Centre for Safety and with oil and gas companies to identify factors promoting safety in the workplace.

¬ Future Fellow of the Australian Research Council
sharon.parker@uwa.edu.au

Associate Professor Paul Bourke
Supercomputing and Visualisation
UWA's high-performance supercomputing and visualisation capabilities support leading edge research across a range of disciplines, particularly geosciences. His research interests include visualisation, computer graphics, geometric algorithms and digital image processing.

¬ iVEC@UWA – Associate Director and Head of Visualisation Team
paul.bourke@uwa.edu.au

Professor Matthew Tonts
Regional Development
His research expertise lies in the analysis of how local and regional economic and social systems adjust to external pressures like the growth of infrastructure in rapidly growing areas. This includes quantitative and qualitative analyses of the economic, demographic and social structures and dynamics of localities and regions, as well as considerations of policy and planning frameworks.

¬ Centre for Regional Development – Director/Professorial Fellow
¬ School of Earth and Environment – Head of School
matthew.tonts@uwa.edu.au

Winthrop Professor Brian Dawson
Exercise Physiology and Biochemistry
He works on the simulation of environmental conditions and measuring and assessing the effects of heat and cold stress on individuals, which provides the science that underpins OHS policy decisions and practices.

¬ Community and Public Programs – Director
¬ Exercise Physiology and Biochemistry
¬ Centre for Athletic Testing – Director
brian.dawson@uwa.edu.au
Deputy Director, Energy and Minerals Institute, Mark Stickells
Joint Venture Governance, Business Development
He plays a central role at UWA’s Energy and Minerals Institute in liaising with multidisciplinary networks across UWA, nationally and internationally, to create opportunities for collaboration and valuable partnerships. He has extensive experience in joint-venture R&D management, major infrastructure and collaborative research programs. He was the former CEO of the WA Energy Research Alliance and is a Board member of the Australian Centre for Natural Gas Management. He is enthusiastic about developing new ways of engaging UWA’s unique expertise and facilities with stakeholders in industry and the community in order to tackle the major energy, resource and environmental challenges of our time.
mark.stickells@uwa.edu.au

Associate Director, Energy and Minerals Institute, Jill Stajduhar
Business Development, Social Impact
Her primary role is focused on identifying and developing local, national and international strategic initiatives for research collaboration and business partnerships, and she is currently company relationship manager for the top eight oil and gas majors. As the former general manager of the International Association of Teachers of English as a Foreign Language and Deputy Director of the International Mining for Development Centre, her management of local and international associations and Board experience in not-for-profit organisations has provided a deep understanding of impact investing in organisations and the value or cooperation and collaboration. She is a member of the Australian Institute of Company Directors.
jill.stajduhar@uwa.edu.au

Director, Energy and Minerals Institute, Tim Shanahan
As Director he builds EMI's collaborative structures and networks with business, governments and other universities – locally, nationally and internationally. His experience, leadership and knowledge in the energy and minerals sector is extensive. Prior to his appointment as Director of EMI, he was the Chief Executive of the Western Australian Chamber of Minerals and Energy (CME). CME is the peak advocacy group for the resources sector in WA, representing companies that contribute more than 90 per cent of the State’s mining production and exploration expenditure. His role at UWA is a culmination of his depth of experience and networks within the resources, business and government sectors in Western Australia. In his role at EMI he has been appointed to the Boards of the Planning and Transport Research Centre (PATREC) and the WA Energy Research Alliance (WA:ERA). In 2007 he was the recipient of the WA Gas Industry Development Award.
emi@uwa.edu.au

Associate Director, Energy and Minerals Institute, Jill Stajduhar
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Crawley WA 6009
Email: emi@uwa.edu.au
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