

Summary of Successful Linkage - Projects Proposals for Funding to Commence in 2010 by State and Organisation

New South Wales

The University of Newcastle

LP100200717 Dr Olivier P Buzzi, Prof Scott W Sloan, A/Prof Stephen G Fityus, Prof Terry F Wall

Approved Project Title **Combined strategies to extinguish underground coal fires and to extract geothermal energy**

2010 \$77,500.00

2011 \$167,500.00

2012 \$152,500.00

2013 \$62,500.00

2014

2015

Primary FoR 0905 CIVIL ENGINEERING

Partner/Collaborating Organisation(s)

Near Surface Geothermal Energy Pty Ltd

Administering Organisation The University of Newcastle

Project Summary

This project addresses two serious environmental issues that occur worldwide. Firstly, it aims to develop strategies to combat underground coal fires which are a serious environmental problem. It has been estimated that underground coal fires in China alone contribute 2 to 3 per cent of the total world output of carbon dioxide (CO₂) from burning fossil fuel. Concentrations of CO₂ and CO (carbon monoxide) of up to 2200 ppm and 1000 ppm, respectively, have been measured in gases produced by underground coal fires. Secondly, the project is a proof of concept to validate the feasibility of production of geothermal energy from burning coal seams. This aspect has the potential to harvest large amounts of geothermal energy which is currently wasted.

LP100200488 A/Prof Kristian Krabbenhoft, Prof Scott W Sloan

Approved Project Title **Remediation of groundwater using permeable reactive barriers**

2010 \$90,000.00

2011 \$185,000.00

2012 \$200,000.00

2013 \$105,000.00

2014

2015

Primary FoR 0905 CIVIL ENGINEERING

Partner/Collaborating Organisation(s)

Hydro Aluminium Kurri Kurri

Administering Organisation The University of Newcastle

Project Summary

Permeable reactive barriers are passive subsurface installations that remove contamination from groundwater as it flows through a reactive substrate. This project will develop new permeable reactive barriers that will benefit the nation by building skills and knowledge in an area of growth in Australian industry, namely the rehabilitation of industrial lands and the protection and remediation of Australia's critical groundwater sources. The project is aimed at remediating an industrially contaminated site in the Hunter Valley, New South Wales, thereby contributing to the environmental improvement of that region. The technology developed will have wide application to other sites, both nationally and internationally.

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LP100200665	Prof George A Kuczera, Dr Dmitri Kavetski, Dr Mark A Thyer, A/Prof Stewart W Franks, Dr Benny Selle, Dr Faith Githui, Dr Thabo Thayalakumaran	
Approved Project Title	An integrated modelling approach for efficient management of irrigated landscapes	
2010		\$32,500.00
2011		\$65,000.00
2012		\$60,000.00
2013		\$27,500.00
2014		
2015		
Primary FoR	0406	PHYSICAL GEOGRAPHY AND ENVIRONMENTAL GEOSCIENCE

Partner/Collaborating Organisation(s)

Department of Primary Industries (Victoria)

Administering Organisation The University of Newcastle

Project Summary

Northern Victoria's irrigators use a substantial portion of water from the Murray-Darling Basin, which is under mounting pressure to satisfy competing economic, social and environmental needs for water in the face of climate change. Up to 20 per cent of this water may be on-farm surface runoff and deep percolation, with poorly known spatial distributions. This project will provide reliable temporally and spatially distributed information on surface runoff and deep percolation for Northern Victoria irrigation regions. This will inform decisions which improve water use efficiency, agricultural productivity and environmental values through optimisation of irrigation infrastructure and by better management of groundwater resources and salinity.

LP100200871	Prof Behdad Moghtaderi, Dr Elham Doroodchi, Mr Ian S Munro	
Approved Project Title	Application of tuneable nanofluids in regenerative supercritical power generation	
2010		\$50,000.00
2011		\$95,000.00
2012		\$95,000.00
2013		\$50,000.00
2014		
2015		
Primary FoR	0915	INTERDISCIPLINARY ENGINEERING

Partner/Collaborating Organisation(s)

Granite Power Ltd

Administering Organisation The University of Newcastle

Project Summary

The proposed project combines the simplicity, flexibility, robustness and thermodynamic effectiveness of GRANEXTM cycle with the advances recently made in nanotechnology. If deployed across Australia to recover even 50 per cent of the 11,000 Gigawatt hour annual bioenergy potential, it will generate a revenue stream of approximately \$550 million per annum while reducing greenhouse emissions by 14 mega tonne, which is about 2.5 per cent of the annual national emissions. The proposed research will place Australia within the forefront of the research and development activities in the field of low grade heat recovery and will clearly contribute the Australian Government's National Research Priority an environmentally sustainable Australia.

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LP100200872	Prof Behdad Moghtaderi	
Approved Project Title	A novel approach for chemical looping gasification of municipal solid waste	
2010		\$62,500.00
2011		\$142,500.00
2012		\$125,000.00
2013		\$45,000.00
2014		
2015		
Primary FoR	0904	CHEMICAL ENGINEERING

Partner/Collaborating Organisation(s)

N Moit and Sons NSW

Administering Organisation The University of Newcastle

Project Summary

Conventional methods of municipal solid waste disposal, such as landfill and incineration, face strong community opposition because of their adverse environmental impacts. The proposed gasification process with its features, such as low energy demand, inexpensive manufacture, and simplicity, will offer an effective and alternative solution to the problem of municipal solid waste disposal. If deployed across the country, the volume reduction of waste will be 5 million tonnes per year. The corresponding reduction in greenhouse gases will be 15 Mega tonnes of carbon dioxide equivalent or 2.7 per cent of the net national emissions. About 9 Terra Watt hours of electricity (3 per cent of the national demand) can also be produced, generating \$700 million per annum.