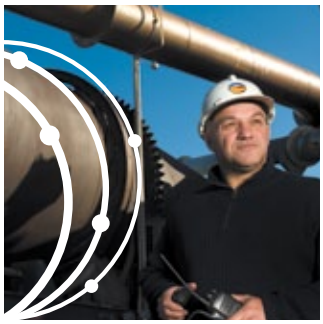
THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA



WORLD-CLASS RESEARCH
INDUSTRY COLLABORATION
INNOVATIVE SOLUTIONS

nier

NEWCASTLE INSTITUTE FOR
ENERGY AND RESOURCES

FROM THE DIRECTOR

Newcastle is a national hub for energy research with an international reputation for delivering innovative solutions to global challenges.

The Newcastle Institute for Energy and Resources (NIER) is bringing together the University of Newcastle's leading energy and resources researchers in a unique facility with unrivalled opportunities to advance energy and minerals research. Funded with the assistance of a $30 million Australian Government grant, NIER will include specialist laboratory space for large scale test bed and pilot plant operations.

Through the collaboration of industry and academia, we aim to deliver solutions that contribute to the sustainability of resources and the environment. Some of our key areas of focus include reducing energy and water consumption, decreasing carbon emissions and developing alternative energy sources, with the ultimate goal of driving long term social change.

We have reached a pivotal time for the energy and resources sector and NIER is perfectly positioned to work with industry and government to meet sustainability targets and, at the same time, improve production. I look forward to sharing our successes with you.

Dr Alan Broadfoot
Director

RESEARCH AREAS OF FOCUS

Supporting best practice industry and academic collaboration, NIER's research focuses on next generation technologies to lower carbon emissions and minimise energy use in the minerals and resources sector. Key areas include:

- Reducing energy and water consumption in industries of national significance
- Lowering carbon emissions through next generation clean coal and carbon capture and storage technologies
- Developing alternative energy sources including geothermal, biomass, wind and polymer solar cells
- Creating smarter and more efficient electricity and water networks
- Promoting social change and the sustainability of resources and the environment.

AREAS OF EXPERTISE

NIER houses the University of Newcastle's Priority Research Centres (PRCs) in the energy, resources and science fields. PRCs are the University's major research groupings around areas of strength including energy and the environment, science and engineering.

With an international reputation for their research activities, each PRC is making significant advances in its field.

PRC for Advanced Particle Processing and Transport
The PRC for Advanced Particle Processing and Transport develops innovative processes that maximise the separation of products from waste material and reduce water and energy use. Through improvements to production and efficiency, the PRC's research saves industry millions of dollars each year.

PRC for Energy
The PRC for Energy is leading research in clean coal technologies, renewable energy systems, transportation fuels and energy conversion, and energy and the environment. One of the PRC's latest developments is GRANEX, a 100 kilowatt pilot plant that delivers higher thermal efficiencies than conventional power plants and increases the amount of electricity that can be generated from low-grade heat sources.

PRC for Organic Electronics
The PRC for Organic Electronics focuses on organic photovoltaics, which have significant potential to be the next generation of environmentally friendly energy sources, photonics and biosensors. Affordable solar paint that generates enough electricity to power the average home is one of the innovations from this PRC that is expected to be commercially available in the coming years.

More information about the University's energy and resources Priority Research Centres at NIER can be found at www.newcastle.edu.au/nier

INDUSTRY PARTNERSHIPS

Collaboration between the University and industry partners is key to the cross-fertilisation of ideas and approaches, and has the potential to make a substantial contribution to sustainable energy research nationally and internationally.

Examples of successful industry interactions and collaborations include:

TUNRA Bulk Solids
TUNRA Bulk Solids (TBS) researches energy reduction and sustainability for particulate material handling systems. TBS designs and researches systems that are used throughout the Australian and international mining and minerals industries, and provides technical services to support the resulting technology. TBS is part of the commercial arm of the University of Newcastle – Newcastle Innovation – and is a successful model for working with industry.

Centre for Ironmaking Materials Research
The Centre for Ironmaking Materials Research is a partnership with BHP-Billiton and specialises in understanding the behaviour of iron ores and metallurgical coals. The Centre's fundamental and applied research identifies how these minerals can be used more effectively.

Centre for Intelligent Electricity Networks
The Centre for Intelligent Electricity Networks is a key partner of Ausgrid in electrical power engineering, smart grid and renewable energy research. The Centre focuses on reliability, data analysis, voltage control, intermittent renewable energy grid connectivity, remote monitoring and control, virtual power plants, electrical vehicles and other smart grid technologies.

NSW Institute for Frontier Geosciences
The NSW Institute for Frontier Geosciences is a partnership with the NSW Department of Trade and Investment, Regional Infrastructure and Services and Doyles Creek Mining and is focused on research and teaching in Earth sciences. The Institute leverages the strengths of the University in minerals processing and exploration, sequestration, geology, geophysics and geochemistry.

"MINIMISING ENERGY USAGE IN THE RESOURCES SECTOR WILL BE AT THE HEART OF THE INSTITUTE'S WORK, SUPPORTING OUR RESOURCES INDUSTRY TO BECOME CLEANER AND GREENER."

Senator Kim Carr, Australian Government Minister for Innovation, Industry, Science and Research

FACILITIES

NIER is located at the former BHP-Billiton Newcastle Technology Centre, a 3.8 hectare industrial scale research facility adjoining the University of Newcastle's Callaghan campus. The facility comprises 15,000 square metres of offices, extensive laboratories and industrial-scale pilot plant workshops unmatched by any Australian university. Development of the facility is made possible with the support of the Australian Government's Education Investment Fund.

WORK WITH US

New partners are taking advantage of working with NIER. For the latest index of our industry partners visit www.newcastle.edu.au/nier

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