HARNESSING COLLECTIVE CAPACITY TO SOLVE GLOBAL CHALLENGES

GLOBAL IMPACT CLUSTER
ENERGY - RESOURCES - FOOD - WATER

NEWCASTLE.EDU.AU/GICERFW

DELIVERING RESEARCH IMPACT

At the University of Newcastle we are renowned for the quality and breadth of our research, and for our commitment to research translation, innovation and working with industry, business and government partners. We are recognised as a world-class research intensive university with a strong and vibrant research culture, acknowledged for its impact and relevance to the region, the nation and internationally.

From these solid foundations we have developed and built new initiatives under our decadal strategic plan, NeW Futures 2016-2025, which includes the implementation of four Global Impact Clusters (GICs). Through our GICs, teams of researchers work across a variety of disciplines to provide solutions to some of the world's greatest challenges.

Incorporating every functional aspect of research, education and operations, these GICs provide a framework for focused investment in areas where there is potential to build on the University's research strength, promoting innovation and increasing impact. GICs further grow industry cooperation, international collaboration and research translation at a broad level and offer a mechanism to enhance the learning experience through unique postgraduate and doctoral training programs. By their very nature as 'clusters', the GICs are fluid entities that take a multi-layered approach to identified issues and challenges using an interdisciplinary methodology and harnessing the expertise of our researchers.

Building on the existing capacity and research excellence established through the Newcastle Institute for Energy and Resources (NIER) in areas including the transformation of the energy system and sustainability in the energy and resources sector, the GIC for Energy, Resources, Food and Water (GIC ERFW) encompasses additional critical areas such as water and agribusiness to expand our research agenda to tackle important challenges facing these sectors.

We are excited to provide this enabling framework for our research community and to build upon our research excellence, engagement and impact through transformative collaborations.

GLOBAL IMPACT CLUSTERS

Through our Global Impact Clusters, our teams of researchers work across disciplines to provide solutions to some of the world's greatest challenges.

Global Impact Clusters (GICs) are concentrations of research expertise that can be characterised by their flexible, interdisciplinary structures and adaptability in responding to global and national needs. This allows us to efficiently shape our research priorities to align with business, government and industry sector priorities. The University has a major role to play both regionally and nationally in innovation, research translation and working collaboratively with our partners to provide solutions. GICs support research collaborations in the development of ideas, technologies and innovations which provide new market opportunities and contribute to the economic, social and environmental capacity of our communities. Transcending four thematic areas, these GICs are focused on:

- **Energy, Resources, Food and Water**
- Better Health, Healthcare and Treatment
- Future Industries
- Strong Cities and Regions

BUILDING UPON OUR RESEARCH STRENGTH

The University is a research intensive university and contributor to research in Australia and the world, with a long-standing track record in developing research solutions which can be translated regionally, nationally and internationally. Our reputation has been built on high quality performance and outcomes in areas including health and medicine, science and engineering, and energy and the environment. The GIC framework affirms our commitment to research excellence and investment in the future through expansion of research fields and capacity, and outcomes-focused collaborations that push the boundaries of innovation and discovery.

INTERDISCIPLINARY RESEARCH EDUCATION

GICs provide an enhanced learning experience through postgraduate and doctoral training programs which enable our students to expand their skills in leadership, cross-cultural experiences and international awareness. GICs connect students with industry partners and entrepreneurs to improve institutional research capability, with the intention of producing graduates who are highly skilled, globally mobile, creative, socially responsible and suitably employable.

GLOBAL IMPACT CLUSTER
ENERGY, RESOURCES, FOOD AND WATER

The Global Impact Cluster for Energy, Resources, Food and Water builds on the University's energy and resources related research strength harnessed by the Newcastle Institute for Energy and Resources.

Working across disciplines, the GIC ERFW promotes a collaborative approach to engagement within the University's research community, and incorporates cooperation with industry, government and the community.

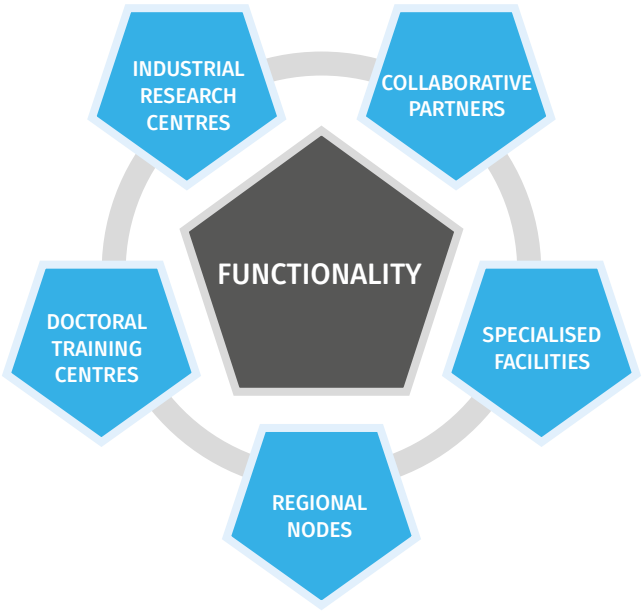
This collaborative and responsive framework allows the GIC ERFW to serve as a catalyst for academia, industry and communities to create, develop and introduce new ideas, technologies and products to stimulate productivity, efficiency and sustainability within the economic sector in focus areas including energy, mining and resources, land use management, and food and agribusiness.

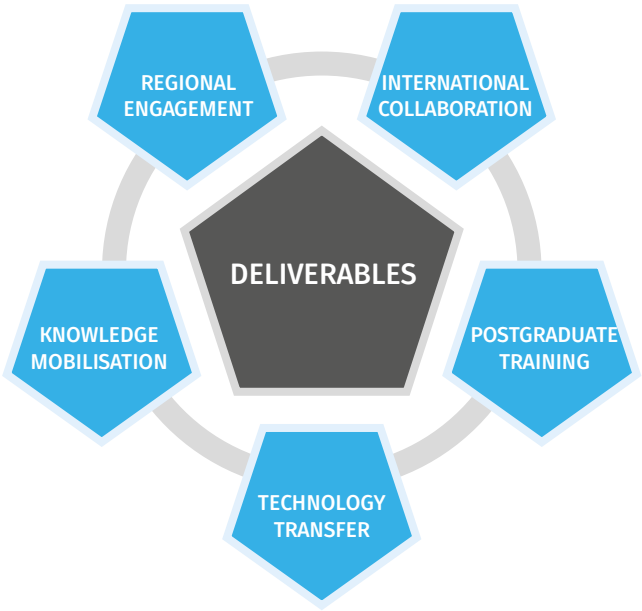
Collectively, the GIC ERFW creates a platform to:

- Tackle global challenges through a collaborative and interdisciplinary approach to developing enabling technologies and solutions;
- Build economic and commercial relevance through the generation of high quality, high impact research that is translatable to new and emerging markets and industries;
- Grow a connective network to foster increased collaboration between our researchers, students, industry partners and other stakeholders in the primary theme areas of energy, resources, food and water; and
- Expose researchers and students to diverse global perspectives to guide the establishment of new models for collaboration within multidisciplinary research initiatives.

GLOBAL IMPACT CLUSTER
ENERGY, RESOURCES, FOOD AND WATER

Activity within the key elements of the GIC ERFW framework





FUNCTIONALITY

Industrial Research Centres

Concentrations of expertise in specific fields and across disciplines, working towards making discoveries, strengthening capacity and delivering holistic solutions.

Collaborative Partners

A partner network supporting research objectives and broader strategic initiatives for the benefit of many.

Specialised Facilities

Extensive research facilities including laboratories, industrial-scale workshops and large-scale demonstration plant enabling industry-ready applications.

Regional Nodes

Strategically positioned nodes for targeted research contributing to sustainability, regional development and economic diversification.

Doctoral Training Centres

Bringing researchers together with industry, business and government partners to inspire new ideas, new ways of working and smarter solutions to industry challenges.

DELIVERABLES

Regional Engagement

Facilitating the transition of resource intensive regions through strategies aimed at economic diversification and the creation of new industries and innovations.

International Collaboration

Contributing to the development of advanced strategies and initiatives aimed at solving universal challenges through international collaborations.

Postgraduate Training

Fostering a cohort of industry-ready graduates through access to specialist research facilities and industry-focused, collaborative research partnerships.

Technology Transfer

The establishment of innovation platforms giving SMEs the resources, knowledge, networks and infrastructure to transform ideas into enterprise.

Knowledge Mobilisation

The delivery of short courses targeted to industry needs to ensure participants are at the cutting edge of their field.

RESEARCH THEMES

ENERGY

- Low emissions technologies
- Renewable energy systems
- Efficiency and process intensification
- CO_2 capture and storage
- Complex dynamic systems and optimisation modelling
- Fuels, material and energy utilistation

FOOD

- Sustainable food supply chain and post-harvest technologies
- Soil productivity
- Supply chain logistics
- Aquaculture and marine
- Health, nutrition and food science
- Plant science
- Novel processing of waste to energy
- Biotechnology
- Intensive agriculture

RESOURCES

- Fine particle beneficiation
- Mineral characterisation
- Raw materials handling
- Iron ore sintering and coke making
- Geotechnical and materials modelling
- Bulk solids handling and particulate technologies
- Precision mechatronics
- Resources health and safety
- Social research in resource-intensive regions

WATER

- Balanced land use
- Land use management and resources sustainability
- Environmental engineering and water resources
- Environmental remediation
- Hydrology, climatology and paleoclimatology
- Water quality and salinity
- Water-energy nexus

Global Impact Cluster for Energy, Resources, Food & Water
The University of Newcastle
Callaghan NSW 2308
T: 4033 9000
E: GICERFW@newcastle.edu.au
W: newcastle.edu.au/GICERFW