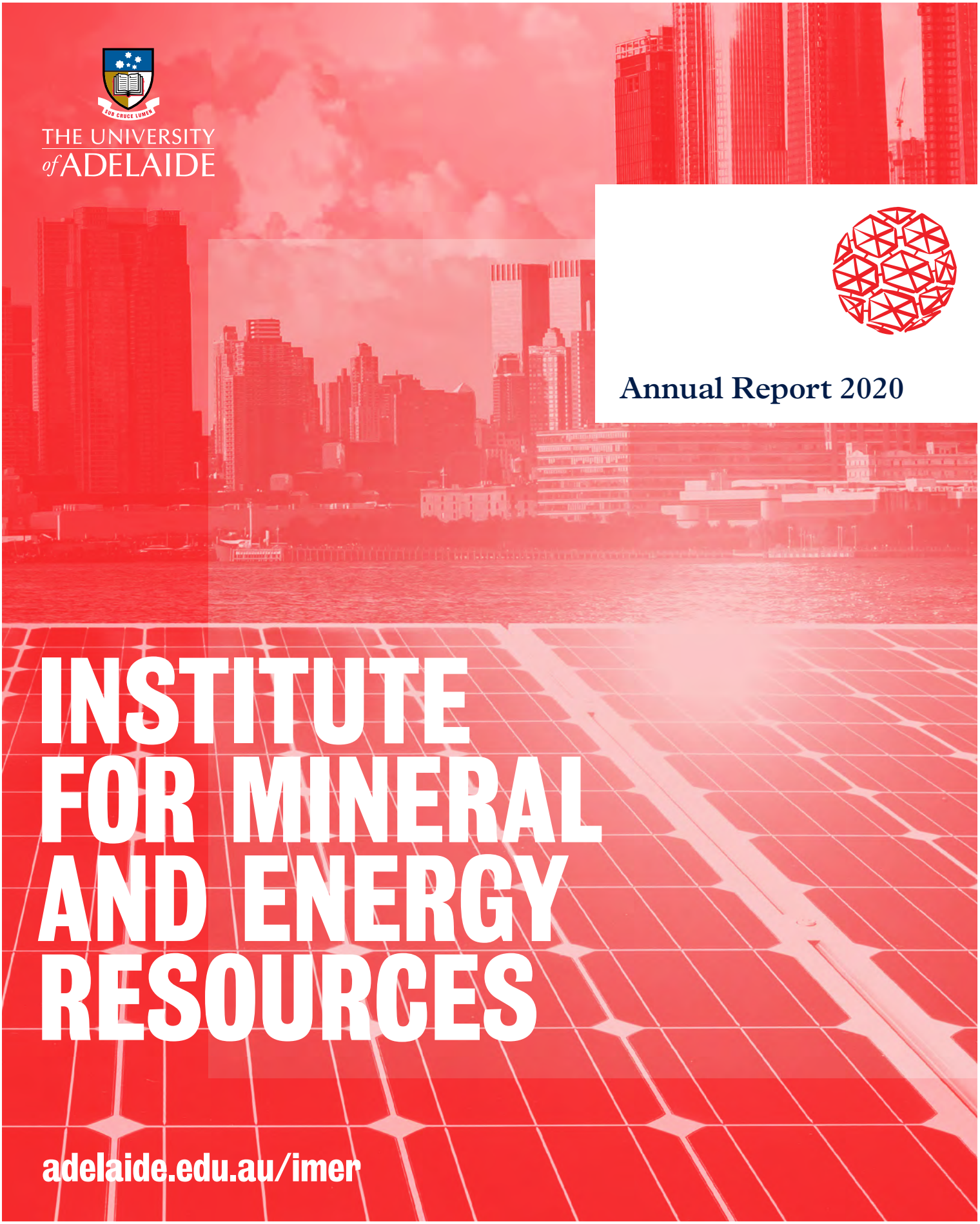
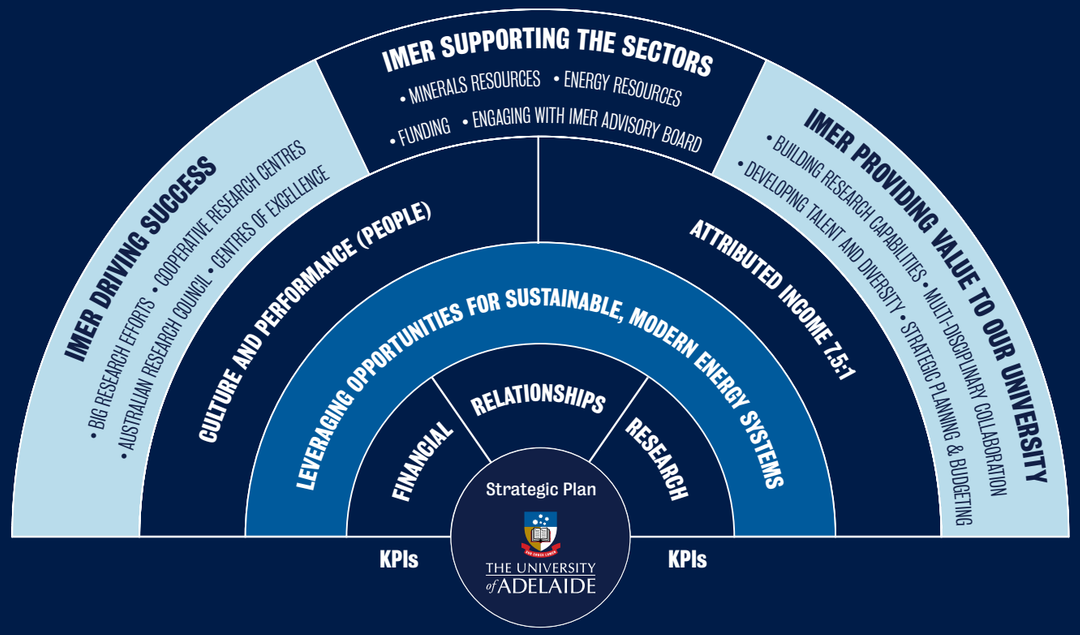


THE UNIVERSITY of ADELAIDE

Annual Report 2020

INSTITUTE FOR MINERAL AND ENERGY RESOURCES

adelaide.edu.au/imer



THE IMER UNIVERSE

IMER operates at the international forefront of the mineral, energy and resource sectors, showcasing our finest talent in large-scale research and innovation outcomes, with the capacity to pursue higher-risk, cutting-edge projects catalysing the modern energy system.

IMER helps create and deliver a vision for a more sustainable world, and reaches out across the globe to collaborate on delivery of this vision.

IMER fulfils the University of Adelaide's strategic plan and is driven by key performance indicators, influenced by its own culture and that of the University. It illustrates here the critical need for a return on investment and the interconnected nature of our business.

What is IMER?

IMER is the Institute for Mineral and Energy Resources, one of seven institutes in 2020 at the University of Adelaide. IMER develops cross-disciplinary programs and teams that transcend school and faculty boundaries to work collaboratively with industry and government, focusing on opportunities critical to sustainability, productivity and global competitiveness for the energy and resources sectors, catalysing research-driving innovation for modern energy systems.

IMER is guided by an industry advisory board and contributes to the University's 'Future Making' strategy. This annual report contains required information and aims to add value for our stakeholders.

Who are IMER's stakeholders?

- The University of Adelaide
- Industry Advisory Board
- Academics and researchers
- Energy and resources sector industry groups
- Energy, resources and mineral companies
- The State Government of South Australia
- The Australian Government and funding bodies

CONTENTS

MISSION

To provide transformative solutions for modern energy systems in a rapidly changing world

VISION

To be the global destination for research and development in modern energy systems

AIM

To win highly competitive funding from government and industry, in the energy, minerals and resources sectors, through:

- national and international research and interdisciplinary initiatives such as cooperative research centres, Australian Research Council Centres of Excellence, training hubs and collaborative research programs with industry for global impact
- strategic cooperative research ventures with state, territory and Australian Government agencies to lever significant social, economic and environmental outcomes
- facilitating smaller-scale pilot programs for longer-term growth.

DEPUTY VICE-CHANCELLOR (RESEARCH) REPORT

Professor Anton Middelberg

The University values each of its institutes as a unique and critical interface between academia and industry and/or government – for social benefits that affect us all.

IMER's goal of transforming the ways we, as a State, a country and a world, create and use energy is now more important than ever. The year that has been – 2020 – has taught us greater resilience.

During 2020, despite the challenges of other sectors, energy and resources remained strong and IMER worked successfully with industry to society's advantage. This has great strategic importance to the University, and we appreciate the feedback from valued advisors across industry and government.

The institutes, which comprise a research community of some 1200 staff and students, bring together world-leading researchers who are supported by the University's infrastructure and innovative culture to tackle State and national research priorities.

In the case of IMER, this institute is vitally important to enable our country to achieve sustainable energy targets, capacity and security in a new, 'greener' world.

With its focus on the fields of earth sciences, energy technology and resource engineering, IMER as an interdisciplinary research institute works hard to address the scientific, technological, environmental and social challenges that we all face in the 21st Century.

FIVE PILLARS TO EXCELLENCE

Five pillars define our Strategic Plan and will shape the trajectory of the University of Adelaide. These connect our research and teaching capabilities, manifest in our Faculties and Research Institutes, with the key challenges faced by our evolving world.

1. CONNECTED TO THE GLOBAL WORLD OF IDEAS
2. A MAGNET FOR TALENT
3. RESEARCH THAT SHAPES THE FUTURE
4. A 21ST CENTURY EDUCATION FOR A GROWING COMMUNITY OF LEARNERS
5. THE BEATING HEART OF ADELAIDE

DIRECTOR REPORT

Professor Michael Goodsite

Professor Michael Goodsite

John Anderson

Once again, IMER has exceeded all key performance indicators for 2020. See page 4 for more details. Our primary KPI is to deliver a 7.5:1 'leverage', which is the income in 2020 attributed to efforts from IMER compared with its 2020 budget.

This means that to meet our KPI, in any given year, IMER needs to have approximately $7.5 million in research income attributed to our efforts, as our annual budget is just under $1m.

This funding covers both efforts for the Institute, and the 'industry engagement priority' in mining, energy and resources.

We are delighted to have sponsored and managed the landmark 2020 HILT CRC (Heavy Industry Low-Carbon Transition) bid. We were only one of five bids nationally in the final round – the first time for a University of Adelaide-led CRC bid in over a decade. We are extremely grateful for our bid partners.

IMER Advisory Board advice also helped us to meet post-Covid-19 budget savings and yet still deliver excellent outcomes. We also addressed internal stakeholder feedback – one example is our commitment to improve diversity. The appointment of Dr Kathryn Amos as our first female deputy director, and a new mentorship program for early career women, both demonstrate a more inclusive management system for IMER.

Through strategic alliances with industry and government to deliver least-cost, reliable and sustainable energy and resources systems, we streamlined focus areas towards continually evolving modern energy systems.

This year's annual report continues our aim to deliver meaningful, short and concise information to our stakeholders.

I thank my team of talented, committed colleagues both within IMER and across the University. We are also grateful for the companies who have supported our ongoing challenge to modernise our energy systems.

IMER ADVISORY BOARD CHAIR REPORT *John Anderson*

Once again IMER deployed its limited discretionary resources to meet KPIs, despite the Covid-19 pandemic and other challenges. We were pleased to see Professor Goodsite fully appointed in the role as IMER's Director.

We revised IMER's vision, mission and goal to reflect the key benefit of the IMER model, which is the Institute's ability to combine international research and development expertise with strategic know-how.

Add to that, IMER's enthusiasm for developing a pipeline for major future efforts, collaborating with industry partners to best secure research outcomes to benefit these sectors. (See the inside back cover for a full list of our valued industry collaborators.)

IMER makes the most of its limited resources by applying a portfolio-management style of programs to balance risk and reward on value-generating activities, tested with internal and external stakeholders. This assures co-ownership of outcomes.

In 2020, the IMER Board provided strategic input and advice and is pleased to see IMER continue its growth as a respected voice in Australia's minerals, mining, energy and resources industries.

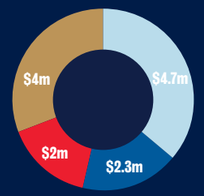
ACHIEVEMENTS IN 2020

ATTRIBUTED INCOME
$13m:$1m
(exceeded KPI of 7.5)

190 IMER ACADEMIC MEMBERS

80 STUDENT MEMBERS

TOTAL FUNDING $13m



Category 1 Category 2
Category 3 Category 4

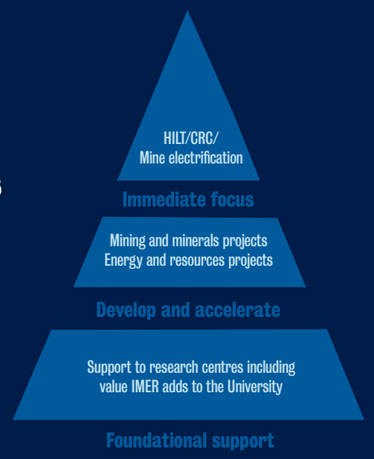
See page 6 for a definition of what each category means. (The amount will likely be adjusted downward later in the year once a more precise audit is conducted. We are confident that IMER will still exceed its KPI.)

Attributed Income – the ratio of IMER's attributed research funding delivered in 2020, to its 2020 budget.

IMER focuses the University's capabilities on large research efforts for best outcomes towards modern energy systems.

DEVELOPING MODERN ENERGY SYSTEMS

2020 ACTIVITY



COMPLETIONS IN 2020

70 PhDs
8 Masters

PUBLICATIONS IN 2020

3 Books
28 Book chapters
117 Conference papers
888 Journal articles

* South Australian Government Sector Growth Plan for Energy and Mining

AWARDS IN 2020

IMER Director first academic to be elected to SACOME Council

In December 2020, IMER's Director, Professor Michael Goodsite, was voted onto the South Australian Chamber of Mines and Energy council, along with nine South Australian industry leaders. Professor Goodsite is the first councillor from a background in resources academia.

SACOME Exceptional Woman in Resources Award 2020

Awarded to Dr Kathryn Amos, Head of the Australian School of Petroleum and Energy Resources (ASPER).

The award recognises the exceptional achievement of a woman in the South Australian resources sector. It also recognises the recipient's work to promote a positive perception of the mining and energy industry, through commitment to community engagement and development, contribution to gender diversity within the sector, or other sustainability initiatives.

Geological Society award winners

2020 Walter Howchin Medal

Awarded to Dr Morgan Blades, postdoctoral researcher in the Department of Earth Sciences.

This annual award is presented by the Geological Society of Australia (SA division) to a researcher in the early stage of their career, who is distinguished by their significant published research work within the earth sciences in South Australia. The medal also commemorates the pioneering contribution of Walter Howchin (1845-1937), who worked for more than 50 years documenting our State's geology in more than 80 papers and teaching at the University of Adelaide.

Dr Blades has published numerous papers on the formation of Gondwana, the evolution of Proterozoic Australia, and in the evolution and water chemistry of basins. She is also the out-going Chair of the SA Division of the Geological Society and has been on the executive for more than five years, a testament to her commitment to scientific service and outreach.

2020 Bruce Webb Medal

Awarded to Dr Steve Hill, former lecturer with the Department of Earth Sciences.

This prestigious award acknowledges leadership that has advanced earth sciences and/or contributions to the advance of knowledge within the earth sciences in South Australia. In addition to his work teaching students at the University of Adelaide, Dr Hill spent eight years as Director of the SA Geological Survey, before moving on to become the Chief Scientist in Geoscience Australia.

Young Tall Poppy Science Award

Awarded to Dr Yan Jiao, one of four University of Adelaide researchers to receive a 2020 Australian Young Tall Poppy Science Award.

The Tall Poppy Awards, an initiative of the Australian Institute of Policy and Science, recognises achievement in the sciences and helps to communicate the passion and purpose of Australia's finest scientists.

Dr Jiao is a Senior Lecturer in the School of Chemical Engineering and Advanced Materials.

Peter Dowd elected President of the IAMG

Professor Peter Dowd, Director of the ARC Industrial Transformation Training Centre for Integrated Operations for Complex Resources, was elected President of the International Association for the Mathematical Geosciences (IAMG) for a four-year term, commencing September 2020.

The IAMG promotes international cooperation in the application and use of mathematics in geological research and technology. It publishes four journals (Mathematical Geosciences, Computers and Geosciences, Natural Resources Research, and Applied Computing and Geosciences) exploring topics that align strongly to Professor Dowd's research and the projects of the ARC Training Centre, and the PRIF Integrated Mining Consortium.

2020 IEEE Power Engineering Society – Prabha S. Kundar Power System Dynamics and Control Award

Awarded to Dr Michael Gibbard for his extraordinary contributions to theory and software tools for small-signal stability analysis and power system control.

The award was made in honour of Dr Kundur, who worked in power system dynamics and control for nearly four decades. It recognises Dr Gibbard's work spanning almost four decades in the field of power system dynamics and control at the University of Adelaide. Since retiring, Mike has continued his association with the University as an honorary visiting research fellow with the School of Electrical and Electronic Engineering.

HOW IMER HAS DRIVEN SUCCESS AND SUPPORTED THE SECTORS

We use the phrase 'Modern Energy Systems' to encompass the infrastructure and strategic know-how required for decarbonisation and the transition to a net-zero emissions energy future, including:

- the raw (as well as critical) materials needed to generate and transmit renewable electricity
- renewable energy generated, and grid requirements, such as storage
- decarbonising transition fuels, such as gas (compared with coal) and carbon sequestration.

IMER exists due to support from the University, the State Government and Australian Government and industry partners that operate in the minerals and mining, and energy resources sectors. Our combined future – indeed the future of the world as we know it – depends on transforming to a low-carbon approach.

KEY AREAS OF IMPACT – main areas of research

The backdrop to our work is informed by essential strategies, including federal and state hydrogen plans, 2030 emissions reduction targets, industry growth models and the Australian Government's Technology Innovation Roadmap.

All strategies intersect with University of Adelaide strengths and opportunities.

We are pleased that the University was successful in 2020 in recruiting Associate Professor, Carl Spandler, consolidating Australia's greatest critical mass in the field.

See the table for a summary of our main projects that completed and started in 2020. See our website for the full details of all current projects, at www.adelaide.edu.au/imer.

SOUTH AUSTRALIAN BENEFITS

Our State, in the context of modern energy systems, is already considered a leading centre in the world of renewables. We may have fewer resources than Queensland or Western Australia, but through the Moomba gas fields for example, we punch well above our weight, supplying gas to much of the eastern seaboard, in addition to South Australia.

But we need energy to extract those precious resources that are becoming harder to find and more complex to extract or refine. This is why the synergy between cost-effectiveness, sustainability and productivity in energy and minerals/resources is so critical.

CATEGORIES OF FUNDING EXPLAINED

Category 1

IMER teams are experts in how to attract funding, helping researchers play to their strengths. Income is primarily from Australian competitive grants, which meet the conditions of a self-assessment system. IMER helps researchers submit and win this most prestigious and highly competitive level of funding.

Category 2

Includes research income received from government, and other public sector research income, eg state governments, such as the PRIF Research Consortium Industry Fund.

Category 3

For industry and other research income and includes contract research.

Category 4

Refers to Cooperative Research Centre (CRC) research income.

Projects highlighted with blue were completed in 2020. Projects with no highlight began in 2020

Project	Details	Sponsor	Duration	Funding
RESOURCE EXTRACTION				
Research Hub for Australian Copper-Uranium	Completed in 2020, see further details on page 8. Hub researchers developed and tested new, cost-effective ways to remove non-target metals from copper concentrates from ores in our State and beyond. More info: https://www.adelaide.edu.au/copper-uranium-research/	Australian Research Council, Industrial Transformation Research Hub	June 2015 to June 2020	$4.8m over 5 years
ARC Training Centre for Integrated Operations in Mining	By bringing together end-users, translation partners and researchers, this project will drive productivity in mining, grow competitiveness in the METS sector and build skills and capacity for research focused on the needs of end-uses. More info: https://iocr.com.au/	Australian Research Council – Training Centre	2020 to 2024	$5.6m over 4 years
Single-atom anchored photocatalysts for solar ammonia production	This project aims to develop single-atom anchored two-dimensional photocatalysts with outstanding activity, selectivity and stability for sunlight-driven photocatalytic nitrogen reduction to produce ammonia. High-performance, cost-effective solar ammonia production will not only reduce Australia's demand for non-renewable fossil fuels, but also alleviate the environmental contamination, greenhouse effect and climate change.	Australian Research Council – Discovery Early Career Researcher Award	2020 to 2022	$450k over 2 years
MINERAL RESOURCES				
Fox Project – Trace elements in iron oxides: deportment, distribution & application in ore genesis, geochronology, exploration & mineral processing	Completed in 2020. Studying iron oxides helps to develop novel exploration models by defining the signatures of different deposit types. This project contributed more than 50 research papers and to our State's globally recognised excellence for minerals research. Relationships developed have created successful collaborations between researchers and the minerals industry. This approach, with its emphasis on training and teamwork, and challenging research students to enter into areas outside their comfort zones, represents a model for future collaborative projects. This project has demonstrated the necessity of access to state-of-the-art microanalytical techniques and the value of dedicated micron-to-nanoscale expertise in contemporary ore deposit research. For outcomes see page 9.	Government of South Australia's Mining and Petroleum Services Centre of Excellence and BHP	June 2015 to June 2020	$1.9m over 5 years
Intelligent vision, sensing and data fusion for mining and exploration GeoVision CRCp	Completed in 2020. The project successfully developed tools and methods of data collection, automation, fusion, processing, and visualisation, to generate new datasets and extract valuable – yet often lost – information from existing data. Using Cloud computing and machine learning, lithology, alteration, structural orientation, and texture techniques will allow more timely, well-informed decision making to occur at exploration and mine sites from anywhere in the world. For outcomes see page 9.	Department of Industry, Innovation & Science, Australian Government Cooperative Research Centre Project	2017 to 2020	$800k over 3 years
ENERGY				
Tectonic Geography of the World's Oldest Petroleum Play, the McArthur Basin	Completed in 2020. This project examined effective ways of increasing the success of extracting McArthur Basin hydrocarbon deposits (plays), which cover northern Australia, estimated to be more than 1 billion years old. It created a 'roadmap' for techniques to understand ancient petroleum systems and trained 13 Honours students and 3 PhD students over the course of the project. The project team published 15 journal papers and presented 43 papers at national and international conferences. See page 9.	Australian Research Council Linkage Project	2017 to 2020	$1.75m over 3 years
Innovative coal burst system to investigate the influence of confinement loss and pre-conditioning	This project aims to investigate 'coal burst' by using state-of-the-art hollow cylinder loading/unloading systems to replicate the process of underground coal mining. It will create reliable, cost effective data for use in mine design and geotechnical monitoring. There are only a few experimental systems for investigating bursting mechanisms worldwide, most in Chinese institutions and none in Australia.	Australian Coal Association Research Program	2020 to 2022	$329k over 3 years
In-situ stress measurements using cored coal/rocks for coal burst management	This project aims to analyse the results of Acoustic Emission (AE) and Deformation Rate Analysis (DRA) to calculate in-situ stresses from cored rocks obtained from coal mines. We will apply this method to not only rocks but also coal itself. This will build knowledge about field stress distribution and result in more realistic in-situ stress measurements in coal mines.	Australian Coal Association Research Program	2020–2022	$228k over 2 years

HOW IMER PROVIDES VALUE TO THE UNIVERSITY

IMER's main value is as a commercial conduit to the University of Adelaide's full spectrum of world-class, mining-related expertise. We operate at the sector's international forefront, focusing our University's finest, multidisciplinary talent.

The Institute adds value by its coordinated and focused success, looking at every aspect of the minerals value chain. The ratio of IMER's attributed research funding delivered in 2020, to its 2020 budget, was achieved on target.

By focusing the University's capabilities on large research efforts for best outcomes, IMER always has modern energy systems in its sights.

KEY AREAS OF RESEARCH IMPACT INCLUDING NEWLY ESTABLISHED RESEARCH CENTRES

- Centre for Energy Technology – seeks to accelerate the transition of Australia's heavy industrial sector to carbon neutrality from its present high CO_2 intensity. The Centre brings together researchers from 11 schools and four faculties across the University.
- Heavy Industry Low-carbon Transition CRC (HILT CRC) bid submitted in CRC Round 22 – HILT CRC will enable our heavy industry sector to compete in the low-carbon global economy for carbon-neutral materials such as 'green' iron, alumina, cement and other processed minerals.
- ARC Training Centre for Integrated Mining Operations – see page 9.
- Australian Critical Minerals Research Centre – ongoing, secure supply of critical minerals is essential to the transition to a high-tech and clean energy world. This centre will conduct multidisciplinary research in the discovery and extraction of critical minerals to benefit society.
- Andy Thomas Centre for Space Resources – this centre brings together the University's collective exploration, mining, manufacturing and engineering research strengths to address the challenges faced by long-term planetary exploration, while ensuring the near-term application here on Earth.
- Future Battery Industries CRC Project: Battery Supported Mine Electrification – a holistic systems approach to mine electrification with batteries deployed in stationary and mobile applications. This project was under development in 2020 and opened for expressions of interest from companies, state governments and FBICRC research participants.

RESEARCH HUB FOR AUSTRALIAN COPPER-URANIUM

This five-year program addressed the development and testing of new, cost-effective ways of removing radionuclides in copper concentrate produced from complex South Australian ores.

The Hub's work has directly given the Australian mineral industry a technological advantage. Clean copper concentrates are a core requirement for the minerals industry to increase efficiency and maximise revenue. See our website for the full story at www.adelaide.edu.au/imer.

Over duration of project from 2015 to 2020

$11.5m	Project budget
1	Commendation, Premier's Mineral and Energy Awards
4	Australian universities involved to solve challenges of national importance
4	Industry partners involved
85	Total number of publications in international peer-review journals
45	Presentations at national and international conferences
12	Graduated PhD or masters students, all now employed
8	Early career researchers involved
$11.6m	Additional funding leveraged

MINING ARC RESEARCH TRAINING CENTRE LAUNCHED IN 2020

The commitment to the new ARC Training Centre for Integrated Operations in Mining to be based at the University of Adelaide was a major win in 2019 for the PRIF Consortium (South Australian Premier's Research and Industry Fund Research Consortia Program). The PRIF's goal is to unlock complex resources through lean processing.

The Training Centre opened in July 2020 and caters for some 16 higher-degree students, plus eight post-doctoral scientists. Like so much of IMER's work, the Consortium and the ARC Training Centre both focus on uniting multiple disciplines to solve a common problem, then integrating results.

This doctoral training centre is a pioneering win in our sector, involving industry interaction and mutual collaboration, deliberately seeking to avoid silo-type comfort zones. It's bringing together professionals in an exciting, different way of working.

OTHER PROJECTS THAT FINISHED IN 2020

Contact us for details of all IMER projects. www.adelaide.edu.au/imer

Research Hub for Australian Copper-Uranium

Project outcomes:

- Performed ground-breaking mineralogical-geochemical research to diagnose the location, form and behaviour of radionuclides in copper ores down to the nanoscale
- Developed innovative tools for measurement of radionuclides at ultra-trace concentrations in solid and liquid media
- Developed new hydrometallurgy techniques for reducing radionuclide content in copper concentrate down to <1 Bq/g per radionuclide
- Provided long-term economic benefits for the South Australian copper industry
- Led to creation of the Centre for Radiation Research, Education and Innovation at the University, which employs three former hub members.

Fox Project (studying iron oxides to develop novel exploration models)

Project outcomes:

- Contributed more than 50 research papers and to our State's globally recognised excellence for minerals research
- Relationships developed have created successful collaborations between researchers and the minerals industry
- Developed an approach emphasising training and teamwork as a model for future collaborative projects
- Demonstrated the necessity of access to state-of-the-art microanalytical techniques and the value of dedicated micron-to-nanoscale expertise in contemporary ore deposit research.

GeoVision CRCp

Project outcomes:

- Examined trace elements in iron oxides, the deportment, distribution and application in ore genesis, geochronology, exploration and mineral processing
- Developed tools and methods of data collection, automation, fusion, processing, and visualisation, to generate new datasets and extract valuable – yet often lost – information from existing data
- Used Cloud computing and machine learning, lithology, alteration, structural orientation techniques to allow for more timely, well-informed decision making at exploration and mine sites from anywhere in the world.

Tectonic Geography of the World's Oldest Petroleum Play, the McArthur Basin

Project outcomes:

- Collected over 2500 U-Pb detrital zircon data to unravel the depositional architecture of the greater McArthur Basin and demonstrated the depositional connectivity between the Birrindudu, McArthur, Beetaloo and South Nicholson Basins
- Demonstrated the significance of the Daly Waters Fault Zone in bathymetrically subdividing the greater McArthur Basin
- Developed elemental and isotopic proxies for water and atmosphere redox, salinity and productivity, including chromium and nitrogen isotopes as well as trace element geochemistry. Collected spatial and temporal datasets of these proxies through the greater McArthur Basin
- Collected detrital zircon and rutile U-Pb, REE and Hf elemental and isotopic data from >5000 zircons from over 1 billion years of stratigraphy, spatially across the greater McArthur Basin to unravel the four main depositional packages, constrain their ages, investigate their correlations and examine their provenance
- Developed Phanerozoic thermal models for the northern Beetaloo Sub-basin and the surrounding basement exposed in the Pine Creek Orogen, the Murphy Inlier and the Tennant Creek region.

ADVISORY BOARD 2020

Mr John Anderson (Chair)
Managing Director,
Austrike Resources Pty Ltd

Mr Joe Cucuzza
Director, *industry*C21

Mr Andrew Freeman
Manager, Business Support, Santos Ltd

Dr Paul Heithersay
Chief Executive, Department for Energy and Mining, Government of South Australia

Professor Richard Hillis
Pro Vice-Chancellor (Research Performance)
University of Adelaide

Ms Katie Hulmes
General Manager Transformation and Readiness, OZ Minerals Ltd

Dr Damien Leclercq
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Mr Simon Ridgway
Engineering Manager,
Gas & Renewables Division, AGL Torrens

Mr Matthew Reed
Chief Executive, Mining, SIMEC Mining

Adjunct Professor Peter Williams
Centre for Exploration Targeting,
University of Western Australia

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Professor Michael Goodsite
Director

Dr Kathryn Amos
Professor Nigel Cook
Professor Graham Heinson
Professor Gus Nathan
Deputy Directors

Dr Chris Matthews
Manager

Mrs Louise Beazley
Senior Administrator

Ms Jen Thomas
Administrator

UNIVERSITY OF IMER 2020 – ACADEMIC MEMBERS

27	School of Physical Sciences
26	School of Mechanical Engineering
25	School of Computer Science
21	School of Chemical Engineering & Advanced Materials
21	School of Civil, Environmental and Mining Engineering
20	Australian School of Petroleum and Energy Resources
17	Professional staff
10	School of Electrical and Electronic Engineering
8	School of Biological Sciences
4	School of Economics
3	School of Mathematical Sciences
2	Centre for Global Food and Resources
2	Adelaide Business School
2	School of Agriculture, Food & Wine
2	Adelaide Law School

CENTRES THAT OPERATED WITH IMER IN 2020

- Centre for Energy Technology
- Centre for Radiation Research, Education and Innovation
- Andy Thomas Centre for Space Resources
- Centre for Materials in Energy and Catalysis
- Mawson Centre for Geoscience
- Australian Critical Minerals Research Centre

OUR 2020 PARTNERS

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SOUTH AUSTRALIA