Australian Government

Research and Development.

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Science and Innovation
A GUIDE FOR INVESTORS

Australia is a leading provider of geoscientific services, information and technology for exploration, assessment, extraction, beneficiation, environmental management and further processing of mineral and petroleum products.

Australia possesses world class expertise and facilities in mineral and petroleum Research and Development (R&D). Government and industry recognise that industrial R&D and support for science and innovation are vital to Australia's competitive advantage in resources.

Powering Ideas – the Australian Government's Innovation Agenda

On 12 May 2009, Australia's Innovation Agenda, *Powering Ideas: An Innovation Agenda for the 21st Century*, was released. *Powering Ideas* sets a 10–year reform agenda to make Australia more productive and more competitive and is supported by a $3.1 billion boost in funding over the next four years. It outlines how the Australian Government will: improve skills and expand research capacity; increase incentives for innovation in business, government and the community sector; and boost collaboration – domestic and international.

Powering Ideas outlines actions that the Australian Government has already taken to boost Australia's innovation system, as well as new proposals to improve innovation within the research, business and public sectors including reforms to the governance of the system.

For further information on *Powering Ideas* see the website **www.innovation.gov.au/poweringideas.**

Commercialisation Australia

The Australian Government has committed $196 million over four years to 2013 to the *Commercialisation Australia* initiative.

Commercialisation Australia will assist Australia's talented researchers, entrepreneurs and innovative companies to turn ideas into internationally competitive products, processes and services, and create new high skills, high wage jobs. Depending on their stage of commercialisation, applicants can apply for assistance under four components:

- **Skills and Knowledge** – up to $50,000 to access specialist advice and services.
- **Experienced Executives** – funding of up to $200,000 over two years (up to $100,000 per year) to engage an experienced Chief Executive Officer or other executives. Only companies are eligible for this assistance.
- **Proof of Concept** – grants between $50,000 and $250,000 to assist with testing the commercial viability of the business model or idea for a product, process or service.
- **Early Stage Commercialisation** – repayable grants from $250,000 to $2 million to undertake activities focusing on enabling a new product, process or service to be developed to the stage where it can be taken to market. Only companies are eligible for this assistance.

Successful applicants will work with a case manager who will guide them through the commercialisation process and link them to volunteer business mentors who will share their business insights and experience. Applications are processed on a continuous basis.

For further information see the *Commercialisation Australia* website **www.commercialisationaustralia.gov.au**.

R&D Tax Credit

The Australian Government provides tax benefits to companies that perform R&D activities. Leaflet 18 provides further details of tax concessions for research and development activities.

On 12 May 2009, the Government announced it will replace the existing R&D Tax Concession with a new R&D Tax Credit. The R&D Tax Credit will come into effect from 1 July 2010.

The R&D Tax Credit program will be the Australian Government's principal initiative to enhance and increase the amount of research and development undertaken by Australian businesses. The new R&D Tax Credit is a broad-based and market driven incentive package. The two core components of the package are:

- a 45% refundable tax credit (the equivalent to a 150% concession) for companies with an aggregated turnover of less than $20 million per annum;
- a 40% standard tax credit (the equivalent of a 133% deduction).

The new tax credit is decoupled from the corporate tax rate and thereby creates certainty in the level of assistance to be provided.

The R&D Tax Credit comes into effect from 1 July 2010.

Information on the R&D Tax Credit is available at the Department of Innovation, Industry, Science and Research website **www.innovation.gov.au**.

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Geoscience Australia (GA)

GA is Australia's national agency for geoscience research and geospatial information and is located within the Resources, Energy and Tourism portfolio. It operates at the interface between science and policy by providing scientific advice for the sustainable development of Australia's minerals and energy resource industries. GA's corporate objective is to provide enhanced potential for the Australian community to obtain economic, social and environmental benefits through the application of first class geoscientific research and information.

It undertakes geoscience research and provides geospatial information to enhance the global attractiveness of Australia's offshore and onshore exploration and investment opportunities, and to underpin improved resource management and environmental protection. GA acquires a wide range of geoscientific information, maintains national mineral and petroleum databases, and undertakes geoscientific and resource analyses, multidisciplinary assessment and research for the benefit of government and the private sector.

For further information see **www.ga.gov.au**.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The Commonwealth's commitment to industrial R&D is through the activities of CSIRO which provides R&D assistance and services to industry by offering access to a multi-disciplinary pool of talent and facilities at the leading edge of international research. CSIRO works with industry and other potential research users to exploit opportunities created by R&D.

Types of commercial arrangements include:

- collaborative research,
- contract research,
- commercial licensing agreements, and
- consulting and technical services.

For the minerals and petroleum sector, CSIRO research areas are divided into:

- Sustainability
- Mineral exploration
- Mining
- Mineral processing
  - Advanced processing technologies
  - Carbon steel materials
  - Online analysis
- Metal production
  - Base metals
  - Precious metals
  - Light metals
- Coal and energy
  - Coal production
  - Coal utilisation
  - Carbon dioxide capture and geological storage
- Petroleum and geothermal
  - Petroleum exploration and production
  - Gas and geothermal.

National Research Flagships Program

In April 2003 CSIRO initiated the National Research Flagships Program, one of the largest scientific research programs ever undertaken in Australia, with total investments to 2010–2011 estimated to be about $2 billion.

The Flagships are a new approach to national challenges and opportunities emphasising long term, large scale collaborations with a focus on widespread adoption of practical solutions. They bring together the best and brightest from across the Australian innovation system. Working across organisational and disciplinary boundaries, Flagships operate at the scale and duration needed to have impact for the nation.

There are currently ten Flagships within the program of which four relate to the minerals and petroleum industries. They are:

- Minerals Down Under (www.csiro.au/org/Minerals-Down-Under-Overview.html),
- Light Metals (www.csiro.au/org/LightMetals.html),
- Energy Transformed (www.csiro.au/org/EnergyTransformedFlagship.html) , and
- Wealth from Oceans (www.csiro.au/org/WealthOceansFlagship.html).

For further information on CSIRO's research see **www.csiro.au**.

Cooperative Research Centres (CRC) Program

The CRC Program was established in 1990 as a demand pull, collaborative, medium to long-term research program. Its objective is to deliver significant economic, environmental and social benefits to Australia by supporting end-user driven research partnerships between publicly funded researchers and end-users to address clearly articulated, major challenges that require medium to long-term collaborative efforts.

There are currently 48 CRCs operating in Australia across all industry sectors: agriculture, mining, manufacturing, and services.

CRCs that benefit minerals and petroleum R&D are:

- **CRC Mining** – increasing the productivity, safety, and reducing the operating costs associated with mining shovels, trucks and electric power, improving the availability, performance and safety of major equipment used in the coal extraction process, developing smart mining systems, developing geoengineering technologies and facilitating technology implementation. The CRC is currently funded until June 2014. Further information can be found at **www.crcmining.com.au**.

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- **CRC for Sustainable Resource Processing** – developing science and technology platforms and finding innovative ways for making major advances towards sustainable mineral resource processing. The CRC's objectives include finding economically viable ways of eliminating waste and emissions by lifting the eco-efficiency of existing operations, capturing regional synergies in resource processing intense areas and streamlining complex metallurgical supply chains. The CRC is currently funded until June 2010. Further information can be found at **www.csrp.com.au**.
- **CRC for Infrastructure and Engineering Asset Management (CIEAM)** – delivers capabilities and technologies for integrated and sustainable asset management in the defence, utilities, transportation and processing sectors. CIEAM works to optimise asset management systems, seek out and develop innovative technologies, processes and programmes, enhance infrastructure cost-effectiveness, productivity and longevity, and build Australian capability in research, postgraduate education, and training and service provision. The CRC is currently funded until June 2013. Further information can be found at **www.cieam.com**.
- **Deep Exploration Technologies CRC** – The Deep Exploration Technologies CRC is being established in 2010 to address a significant challenge to the future of the Australian minerals industry – the reduction in the mineral resources inventory due to high production and low mineral exploration success. The CRC's research will focus on developing new technologies to explore to greater depths and under terrain cover in the vast areas of Australia that are known to be prospective for minerals. The CRC is currently funded until June 2018. The Deep Exploration Technologies CRC website is currently under development.
- **Energy Pipelines CRC (EPCRC)** – The EPCRC is being established in 2010 to provide research to enable Australia to meet the increased demand for gas transportation arising from the need to decrease greenhouse gas emissions. The safe and cost efficient maintenance and expansion of the energy pipeline infrastructure requires some major technological challenges to be addressed. Research will focus on welding, pipeline manufacture, corrosion control and public safety. The CRC is currently funded until June 2019. The EPCRC website is currently under development.
- **Parker CRC for Integrated Hydrometallurgy Solutions** – improving hydrometallurgical processes for the extraction of metallic compounds such as alumina and metals such as gold, nickel, copper and zinc from minerals using aqueous solutions. The CRC's research spans two broad areas: Breakthrough Technologies and Process Fundamentals. The Process Fundamentals work is directed at achieving the fundamental understanding of the science behind current extraction processes that is needed to optimise existing hydrometallurgical plants, for example by increasing efficiency and yield, improving product quality and minimising operating costs. The Breakthrough Technologies research aims to develop innovative processing technologies to exploit low-grade ores or currently uneconomic, untapped mineral deposits. The CRC is currently funded until June 2012. Further information can be found at **www.parkercentre.com.au**.
- **CRC for Greenhouse Gas Technologies** – one of the world's leading collaborative research organisations focused on geosequestration and carbon dioxide mitigation technologies. Through the CRC, more than 100 researchers work on the capture of carbon dioxide from stationary industrial sources, its compression, transport and storage in deep geological reservoirs. The CRC is currently funded until June 2014. Further information can be found at **www.co2crc.com.au**.
- **CRC for Spatial Information (CRCSI)** – developing spatial information applications that are affordable, usable and readily available. Examples of these applications include digital maps and land titles, thematic maps and satellite imagery, 3D landform models, computer visualisations, or outputs from Geographic Information Systems (GIS). CRCSI's research programs focus on application systems, demonstrator projects, quality and standards. The programs cover positioning, metric imaging, spatial information systems, remote sensing, and visualisation. The CRC is currently funded until June 2018. Further information can be found at **www.crcsi.com.au**.

In December 2009 it was announced that seven CRCs were successful in receiving funding from the 12th CRC Selection Round. The successful CRCs include a CRC for Optimising Resource Extraction (COREx), which will transform mineral deposit evaluation and extraction, to significantly enlarge Australia's mineral resource and generate a more sustainable mining industry. It is expected that this CRC will commence operations on 1 July 2010 and it will be funded until June 2015.

Detailed information on the CRC Program can be found at **www.crc.gov.au**.

Universities: Mining Research and Education

Australia's universities are internationally renowned for the high quality of their research in geology, geoscience and mining engineering. Universities that undertake research and offer undergraduate and postgraduate training in these fields include:

The Australian National University

Curtin University of Technology

James Cook University

Macquarie University

Monash University

The University of Adelaide

The University of Melbourne

The University of Queensland

The University of Sydney

The University of Western Australia

University of New South Wales

University of Tasmania

University of Wollongong

AuScope

AuScope Limited is a non-profit company formed to facilitate the implementation of a world-class infrastructure system for earth science through the delivery of a range of technologies and capabilities in data acquisition, management, modeling and simulation across the geospatial and geoscience spectrum.

AuScope is funded by the Australian Government under the National Collaborative Research Infrastructure Strategy (NCRIS), and through co-investment by its participants, which include CSIRO, Geoscience Australia, universities and state government agencies.

Most of the universities identified above are members of AuScope.

See **www.auscope.org.au** for further information.

Australian Research Council (ARC) Centre of Excellence

The University of Tasmania hosts the ARC Centre of Excellence in Ore Deposits, which undertakes multidisciplinary research in close association with industry on ore deposit location, formation, discovery and recovery including: igneous petrology, geochemistry, melt/fluid inclusions and magma genesis, hydrothermal systems, volcanology, structure, tectonics geophysics, and geometallurgy.

See **www.fcms.its.utas.edu.au/scieng/codes** for further information.

Mining Education Australia (MEA)

MEA delivers world-class undergraduate education in mining engineering, and is a national education joint venture between Australia's major mining education providers, Curtin University of Technology, The University of New South Wales, The University of Queensland, and The University of Adelaide. The mining industry supports MEA and provides excellent opportunities for post graduate research in mining engineering.

See **www.mea.edu.au** for further information.

AMIRA International

AMIRA International is an industry-funded research body. It manages jointly sponsored R&D for the minerals industry. AMIRA members are drawn from the mineral and petroleum industries, ranging from small exploration companies to large mining houses. The AMIRA initiates and coordinates jointly sponsored R&D contracts on behalf of its members. GA, CSIRO, CRCs, universities, consultants, suppliers and member companies carry out research as contractors to AMIRA.

See **www.amira.com.au** for further information.

SMI Knowledge Transfer (SMI KT)

SMI Knowledge Transfer is a unique professional development unit, offering the global resources sector life-of-mine professional development activities, including training courses, workshops, and small conferences in which current and future industry issues are considered by both internationally and nationally recognised specialists from industry, academic/research institutions and government.

As the training and education unit of JKTech Pty Ltd, the technology transfer company for the Sustainable Minerals Institute (SMI) at The University of Queensland, SMI Knowledge Transfer aims to build on the already strong brands of the six SMI Centres, JKTech and ACMER. This combination of leading industry expertise and positive reputation with industry and government, allows us to deliver a comprehensive range of quality, targeted courses and workshops with a national and global reach.

SMI KT staff members were involved with the Steering Committee that manages the *Leading Practice Sustainable Development for the Mining Industry* program and has contributed to the development of various handbooks under the program. For more information on the program see **www.industry.gov.au/sdmining**.

In summary, SMI Knowledge Transfer can deliver courses appropriate to corporate managers, site managers, site based specialists (e.g. metallurgists, mine planners, geologists, HSE managers, environmental officers, community and stakeholder advisers) and operators/technicians.

See **www.acmer.uq.edu.au** or **www.jktech.com.au** for further information.

These fact sheets have been produced as a collaborative project between the Australian Trade Commission, Department of Resources, Energy and Tourism and Geoscience Australia.