




The Innovation Economy




Science and innovation play a key role in maintaining industry competitiveness, economic growth and meeting the challenges of globalisation. By building stronger connections between science and industry, providing a responsive business framework and encouraging the growth of innovative, knowledge-intensive industries, Australia is developing an innovation economy with the diversity and strength to thrive in the future.

The private sector is fast realising the benefits of investing in research and development and commercialising scientific and technological advances. Business expenditure on research and development rose by more than one quarter between 2004-05 and 2006-07 to AUD\$12 billion, which is the highest investment from the private sector ever recorded.

According to World Intellectual Property Organisation (WIPO) statistics, international patents applications originating from Australia under the Patent Cooperation Treaty (PCT) grew by an average of 8.6% annually between 1991 and 2005, ranking Australia 13th in the world. In 2004-05, more than 31,000 patent applications were filed in Australia, the largest numbers in pharmaceuticals and cosmetics, organic fine chemicals and medical engineering.

Linking science and industry



Building the connections between science and industry is a key theme in the Australian Government's approach to science and innovation. Collaboration between researchers is already the dominant pattern for research activities in Australia and this is complemented by a focus on maximising results and improving the commercialisation of new ideas.

The Cooperative Research Centres (CRC) Program, for example, links researchers with industry for faster economic benefits from science and innovation. Since the Program was launched by the Australian Government in 1990, 168 CRCs have been funded with more than AUD\$12 billion in financial commitments from Government, universities, industry and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Currently 49 CRCs operate in six sectors: environment; agriculture and rural-based manufacturing; information and communications technology; mining and energy; medical science; and manufacturing technology. The Program's return to the Australian economy is significant - according to a 2006 study by Insight Economics, Australia's economy gains about AUD\$2.7 billion from this investment.



Launched on 21 May 2008, the \$251 million Enterprise Connect network is a central plank of the government's Innovation Future for Australian Industry policy platform. Enterprise Connect is providing Australia's small and medium-sized enterprises (SMEs) with access to the best advice, technology and research, and link firms to resources in their immediate region and around the country.

Ten Enterprise Connect centres around the nation will help businesses succeed and help create high wage, high skilled jobs now and for the future, adding significant new capacity to the national innovation system. This will include a national network of Manufacturing Centres, a Clean Energy Innovation Centre, a Creative Industries Innovation Centre and a Remote Enterprise Centre.

Science and technology research parks and incubators can also be found at many universities around Australia. These parks and centres encourage commercialisation of Australian research by promoting technology transfer, innovation and entrepreneurial growth, and give emerging research companies resources to expand, through the provision of facilities and advice.

Growing young companies

The University of Queensland's (UQ) science and innovation commercialisation company, UniQuest, exports UQ expertise to countries in the Pacific, South-East Asia, the Indian subcontinent and Africa. In 2003, Uniquest won the Queensland Premier's Export Award for its achievements.

UniQuest has also acted as a technology incubator providing facilities to assist the commercialisation of new technologies. One company that took advantage of the incubator was QRxPharma. Launched in 2002, the bio-pharmaceuticals development company attracted an AUD\$10 million dollar investment and operated from the incubator for a number of years.

<http://www.uniquest.com.au/>

Responsive business framework

Australia's stability, growth, intellectual property protection, open and multicultural society, proximity to Asia, and skilled researchers make it an attractive destination for research and development investment. According to OECD data, Australia's annual economic growth rate between 1991 and 2004 averaged 3.45%, exceeding the OECD average of 2.7%.

Australia ranked sixth in the world in the overall competitiveness of its economy by the IMD World Competitiveness Yearbook 2006. Analysis by the Economist Intelligence Unit in 2005 ranked Australia against the US, UK, Germany, Japan, Singapore and India across a range of biotechnology industry indicators. In this study, Australia ranked first as a location to conduct clinical trials.

The R&D Tax Concession enables eligible companies to claim a tax deduction for their eligible research and development expenditure. In 2004-05, 5,973 companies were registered for the concession and their reported research and development expenditure was more than AUD\$8.24 billion, an increase in expenditure of 16% over 2003-04. The number of registrations was a record, increasing by 5.6% over the previous year and an average of 12% a year over the previous five years.

Capitalising on Australian biodiversity

In 1993 a partnership was formed between AstraZeneca and Griffith University which resulted in the development of the Natural Product Discovery (NPD) unit.

NPD leads the way in bio-discovery, screening thousands of plants from Queensland's rainforests and marine organisms from the Great Barrier Reef for chemical compounds that may provide tomorrow's medical cures. Since the NPD Unit began they have found approximately 700 bio-active compounds from over 35,000 specimens collected. About 40% of these are new to science.

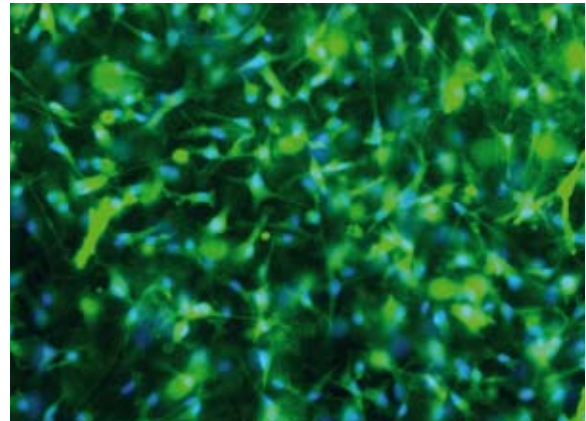
This collaboration represents a commitment from AstraZeneca of more than AUD\$100 million.

<http://www.griffith.edu.au/>

Innovative industries

Australian industries are increasingly knowledge-intensive and innovative. Researchers are developing and embracing new technologies, which will ensure the nation remains at the leading edge of science and innovation.

Up to AUD\$100 million is being invested each year by the public and private sectors for research and commercialisation of Australian nanotechnology. Australia is also at the forefront of biotechnology research and development, with more than 400 biotechnology companies.



Courtesy of The Australian Stem Cell Centre

Knowledge-intensive mining

A widespread interest in Australia's mineral resources was sparked by the 19th century gold rush. This early need for research and development in geology and minerals science has resulted in a world-class mining and processing sector now worth about \$60 billion a year.

Australia's mining industry now leads the world in the development and provision of knowledge-intensive products and services - these alone have become the fifth largest export of the mineral industry, worth \$3 billion a year.

Australian companies develop about 60 per cent of the world's mining software and lead in mineral processing technologies, mining equipment, and scientific analysis technologies. Advances include the development of clean coal technologies such as coal gasification and liquefaction, the use of advanced technologies for making and analysing new mineral finds, and leading mine safety technologies.

Developed by researchers at CSIRO, Ultra Clean Coal (UCC) is coal from which virtually all mineral impurities have been chemically removed. The purification process involves converting the minerals to soluble forms then removing them to a point where the total remaining ash content is less than 0.2%. UCC Energy Pty Ltd, a subsidiary of White Mining Ltd is investing AUD\$45 million in the further development of the technology, with great potential for the reduction of greenhouse gases in power generation.

http://www.det.csiro.au/science/lee_cc/ultra_clean_coal.htm

Information and communications technology (ICT) is another fast-emerging field of research and development in Australia. For example, National ICT Australia (NICTA) and CSIRO's IT arm, CSIRO ICT Centre, are involved in research and development in partnership with industry. NICTA has five research laboratories and is focused on the areas of: biomedical and life sciences; intelligent transport systems; safety and security, environmental management; mobile systems; and services and software Infrastructure. CSIRO's ICT Centre has four research laboratories which focus on wireless technologies, information engineering, networking technologies and autonomous systems.

Australia is moving beyond the standard applications of technology with the Australian Research Council (ARC) Centre of Excellence for Creative Industries and Innovation established in 2005 with AUD\$7 million in funding over five years. The Centre will work on a number of projects which include artists, designers, and information and communications technology experts whose products include electronic gaming and animation. The projects include the formalising of education in the creative industries.

Digital Songlines

The Australasian CRC for Interaction Design has received a prestigious award for the development of Digital Songlines – an immersive 3D tool that records the arts, culture and country of Australian Indigenous communities.

Digital Songlines earned an Award of Merit for Innovation and Excellence at the 2006 Information Industry Association iAwards. Based on digital and simulation technologies, Digital Songlines is perfectly suited to capturing narrative-based and richly layered Indigenous heritage.

As an engaging tool for educating people in their own culture and language, Digital Songlines has also gained the interest of other Indigenous communities around the world.

www.acid.net.au



Students at Mitchell State School explore the Digital Songlines virtual presentation of country around Mitchell in South-West Queensland.

Contacts

The Department of Innovation, Industry, Science and Research

www.innovation.gov.au

Austrade

www.austrade.gov.au

Cooperative Research Centres

www.crc.gov.au

Commonwealth Scientific and Industrial Research Organisation

www.csiro.au

National ICT Australia

<http://nicta.com.au>

Australian Research Council Nanotechnology Network

www.ausnano.net

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