



State of the Future



Dr Nat Lenzo from Oceanic Medical Imaging and Minister Bill Marmion inspecting the Positron Emission Tomography (PET) machine.

New study to tackle early detection of Alzheimer's disease

The State Government has provided more than \$2 million towards research into the early detection of Alzheimer's disease.

Minister for Commerce; Science and Innovation Bill Marmion said the funding would help researchers at the McCusker Foundation identify specific markers in the

brain that could lead to the early detection of the disease.

"Dementia and Alzheimer's disease currently affect more than 245,000 Australians or one in three people aged 85 and over," Mr Marmion said.

"This study aims to develop an early diagnostic test leading to the accelerated discovery of effective treatments against Alzheimer's disease and dementia.

"Early diagnosis will enable people at risk of developing the disease to make

informed decisions to modify their lifestyle and improve their situation, while better treatments and medications are being developed."

McCusker Foundation's Director of Research and Professor of Alzheimer's and Ageing at Edith Cowan University, Ralph Martins, said the funding would allow the foundation to test 1,600 patients with a predisposition to developing the crippling disease.

"This funding will enable the testing of a big cross section of patients to further understand Alzheimer's," Professor Martins said.

"Once patients are injected with a special tracer agent, their brain will be imaged using a PET (Positron Emission Tomography) scan to identify brain activity in certain brain regions.

"This enables our clinicians and researchers

...continued on page 3



Minister's foreword

It has been a busy and very exciting time across the science, innovation and industry portfolio.

I had the opportunity to attend an event hosted by the Hon Barry House, President of the Legislative Council, to meet all current and past Nobel Laureates and Western Australian Research Fellows.

The Western Australian Research Fellowship Program seeks to attract outstanding researchers to the State, to conduct internationally competitive scientific research. It is estimated that the WA Government's \$8.5 million investment in the program has created benefits to the State worth more than \$80 million.

August saw the launch of the 2010 National Science Week. The week encourages community interest in science and highlights its importance in our everyday lives.

Science is critical for the delivery of economic benefits and social development outcomes for our state. It underpins many vital sectors in Western Australia including mining, radio astronomy, environment, water conservation and health.

For example, the science used to deliver the Square Kilometre Array (SKA) will not only benefit the project itself, it will have wider societal applications and drive innovation in other areas. These areas include micro-electronics and telecommunications systems, medical imaging, supercomputing, green power generation facilities as well as education and employment.

I recently visited the Murchison Radio-astronomy Observatory to view the impressive infrastructure developed for our bid to secure the SKA in Western Australia. This includes



Minister Bill Marmion and students releasing fauna into the new Wetlands pond at the Perth Cultural Centre during the launch of National Science Week.

the Australian SKA Pathfinder antenna, Murchison Widefield Array installations and new accommodation facilities at Boolardy Station.

In August I also hosted an SKA function for all Members of Parliament at Parliament House. During a presentation Professor Brian Boyle, Chair of the Australia-New

Zealand SKA Coordination Committee, suggested that the State's nominated SKA site would deliver the best science outcomes at the most affordable cost over the project's operating life.

In addition to the SKA, Western Australia has developed strengths in the field of desalination and I am

pleased to announce that Australia's first desalination research centre has opened its doors at Murdoch University's Rockingham campus.

The State Government contributed \$3 million towards the National Centre of Excellence in Desalination to research technologies that would directly benefit Western Australia's two desalination facilities and others throughout the world. This investment will help WA lead the way in world class desalination research, secure our water future and lift our global research profile.

The Australian Marine Complex's newest piece of infrastructure, the floating dock, lifted the first Collins Class Submarine in June.

This achievement is a significant milestone for the State Government funded floating dock. It officially marks the beginning of a 25 year relationship between ASC, the prime contractor of the Collins Class submarines, the Royal Australian Navy and the Australian Marine Complex.

**The Hon Bill Marmion MLA
Minister for Commerce;
Science and Innovation**



Minister Bill Marmion, Chief Scientist Professor Lyn Beazley, President of the Legislative Council Barry House, Parliamentary Secretary Helen Morton, Member for South Metropolitan Region Kate Doust and all the WA Research Fellows, Nobel Laureates and their partners.

Scitech turns global with travelling exhibits

Did you know Scitech designs and manufactures its own interactive science exhibitions at its workshop in West Perth?

As one of Australia's top interactive science centres, Scitech is leading the way in science communication to increase interest, participation and awareness of science, maths and technology among all Western Australians.

Scitech is currently designing and building its latest exhibition, *Playing with Light*, which will

open on 6 November 2010. Scitech's Exhibition Design and Project Manager Murray Dare said the *Playing with Light* exhibition would enable visitors to learn more about lasers, draw on their own 'frozen' shadows using special pens and even become part of a giant kaleidoscope.

"The *Playing with Light* exhibition will feature some 25 exhibits, many newly created and unique. For example, the *Robotic Mirror* can actually bend at certain points by being programmed through a control panel by the user," Mr Dare said.

"Through our team of experts ranging from software

developers and graphic designers to electricians and welders, we are able to design and develop these exhibits in-house."

Scitech's exhibitions take 12 months to complete and are on display for a period of six months. Exhibitions are then sold or hired by other organisations throughout the world.

"We sometimes exchange our exhibitions with Questacon, a national science and technology centre in Canberra which also builds its own exhibitions," Mr Dare said.

"The exhibitions also travel to regional areas in Western Australia through the Scitech

outreach program and around the world to places such as Norway, Portugal, Finland, Estonia, the Netherlands and Hong Kong.

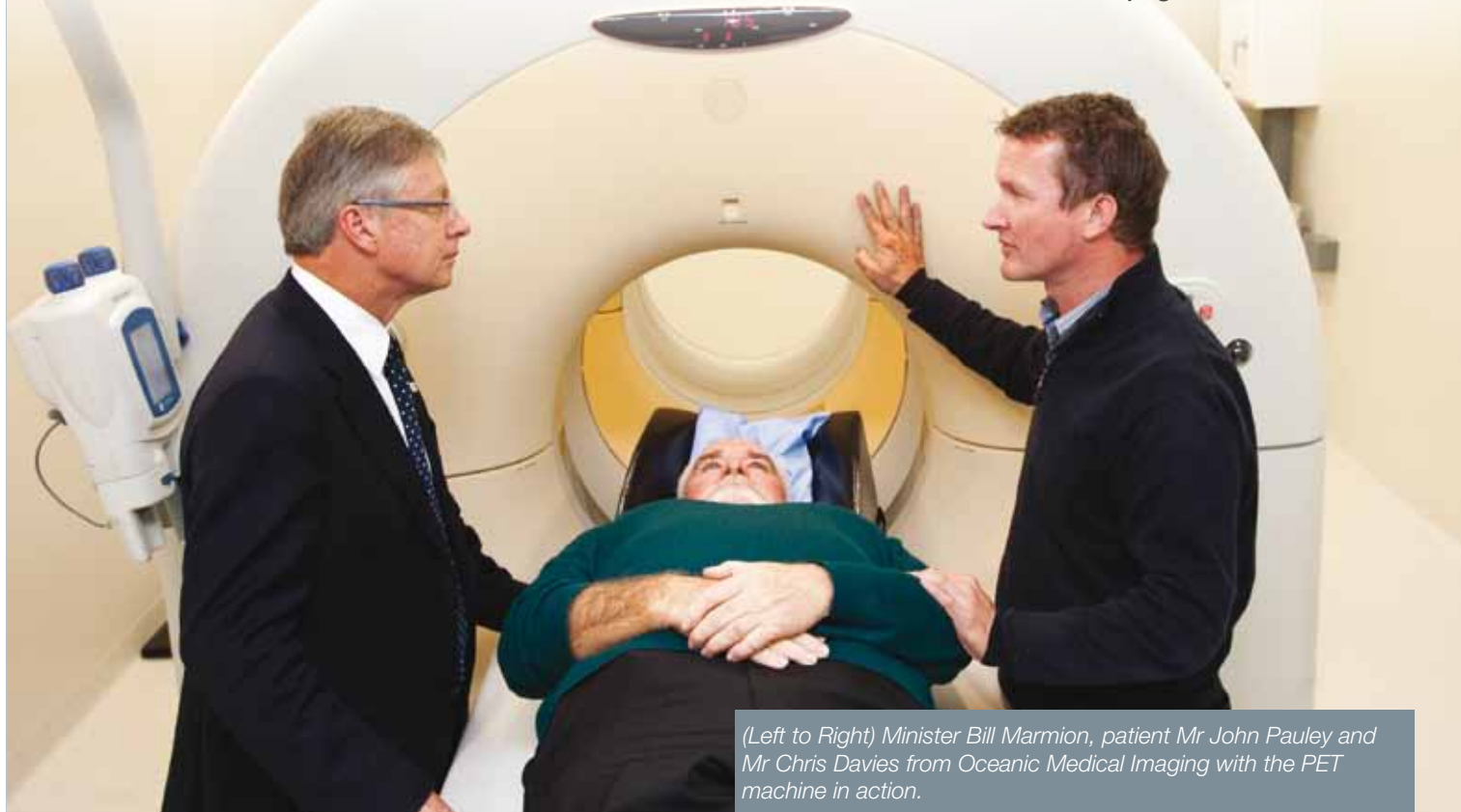
"Our exhibitions are popular because they cater for all age groups ranging from young kids to adults.

"Information panels and touch screens are available for those requiring more information on a certain exhibit. The information is available in multiple languages."

Scitech is part funded by the WA Government through the Department of Commerce.

For more information on the *Playing with Light* exhibition at Scitech visit www.scitech.org.au.

New study to tackle early detection of Alzheimer's disease ...continued from page 1



(Left to Right) Minister Bill Marmion, patient Mr John Pauley and Mr Chris Davies from Oceanic Medical Imaging with the PET machine in action.

to compare the results against other more conventional scans of the patient's brain and try to determine if Alzheimer's disease is present.

"The early detection of Alzheimer's means medications which may help delay the progression of the disease can be started earlier – when they

have the greatest effect." The State Government's funding will also enable the McCusker Foundation to purchase a High Performance

Mass Spectrometer to undertake research for the development of a diagnostic blood test for Alzheimer's disease.

Western Australian Science A

Since 2002, the Western Australian Science Awards have recognised the outstanding and groundbreaking achievements of the State's best scientists, science educators and facilitators of science outreach initiatives. Previous winners share their achievements.

Professor Cheryl Praeger

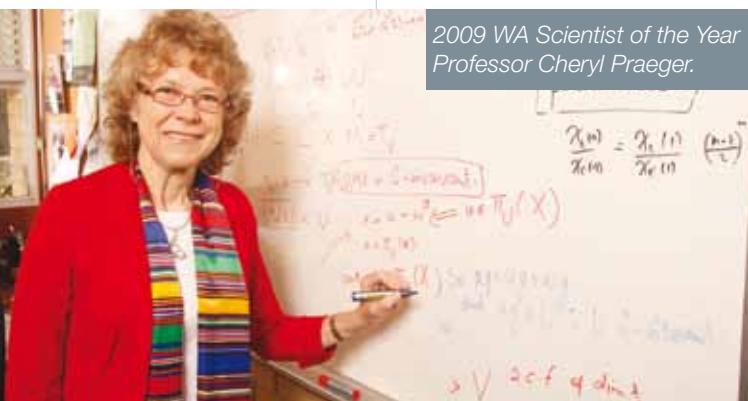
Professor Cheryl Praeger was awarded Western Australian Scientist of the Year in 2009. Professor Praeger is Australia's most highly cited pure mathematician and a leading international researcher in algebra and combinatorics.

What is your current role?

I am currently an Australian Research Council Federation Fellow and Director of the Centre for the Mathematics of Symmetry and Computation at The University of Western Australia.

What is your current research?

I am working on my Federation Fellowship project and two Australian Research Council Discovery Grant projects.



2009 WA Scientist of the Year Professor Cheryl Praeger.

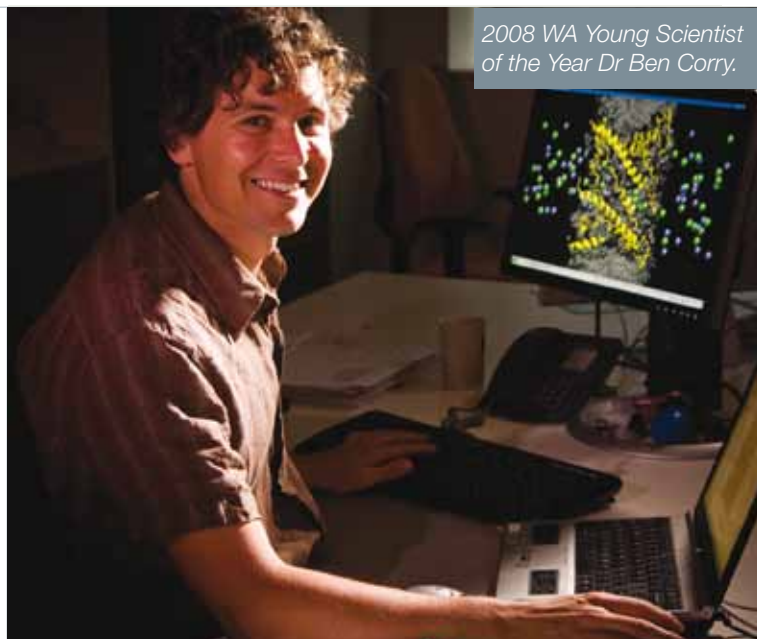
All of these focus on highly symmetrical geometries, networks and algebraic structures. They also include algorithm design and analysis for computing with arbitrarily large groups – the mathematical systems used to measure symmetry.

One significant outcome of my research has been the first global analysis of a family of finite flag-transitive geometries. This has identified a family of fundamental geometries that includes, as a sub-class, the famous theories of Jacques Tits, critical for understanding the finite simple groups.

What have been some significant achievements since winning the award in 2009?

I have recently been elected for a second four-year term to the Executive Committee of the International Mathematical Union (IMU). The IMU is the premier international mathematical body, of which Australia is one of around 70 member countries. I am the first Australian-based mathematician to serve on the Executive Committee.

Earlier this year, the Centre for the Mathematics of Symmetry and Computation was established at The University of Western Australia. I am the Director of the centre which aims to promote mathematics within Western Australia and strengthen our international mathematical linkages. It will undertake fundamental mathematical research and provide training for students.



2008 WA Young Scientist of the Year Dr Ben Corry.

Dr Ben Corry

Dr Ben Corry won the Western Australian Young Scientist of the Year Award in 2008 for his research in the field of molecular biophysics. Dr Corry has significantly advanced the understanding of biological ion channels – the proteins that regulate electrical signaling between cells.

What is your current role?

I am currently Associate Professor at the School of Biomedical, Biomolecular and Chemical Sciences at The University of Western Australia.

What have been some significant achievements since winning the award in 2008?

Since winning the 2008 Young Scientist of the Year, I have continued my research into the understanding of the 'ion channel' proteins responsible for regulating electrical activity in the body.

In particular, my team and I have spent a lot of time examining the way salts move through channels at the nerve-muscle junction as well as studying channels found only in bacteria that can be targeted by new classes of antibiotics. Part of this involved developing innovative new methods for

finding out how these channels change shape by combining experimental measurements with simulation studies. Often this kind of fundamental research is not valued in the same way as research with targeted application, yet it is only by improving our basic understanding of the phenomena that new applications can be developed.

For example, at the time of winning the award I proposed a way to make the desalination of sea water more cost effective by utilising the fundamental knowledge gained by studying biological channels. This is important as many parts of the world, including most of Australia's major cities, are facing water shortages due to an increasing population and climate change. Since then I have continued this research with the aim of creating a demonstration of the technology and developing collaborations within Australia and the UK.

What are your future plans?

I am nearing the end of a five year research fellowship and I am looking for opportunities to further our basic understanding of the way biological molecules operate and their application.

Awards – Where are they now?

Lorraine Ellis

Lorraine Ellis received the Excellence in Science Teaching: Secondary award in 2008 for her dedication to science teaching at Newton Moore Senior High School. Lorraine established two significant science programs at the school – Science Horizons and the Wetlands Project.

What is your current role?

I am the Head of Science at Newton Moore Senior High School (NMSH) and a Microsoft Innovative Schools Facilitator.

What have been some significant achievements since winning the award in 2008?

I was very excited to win the 2009 Australian Museum

Eureka Science Teacher of the Year award for developing the Science Specialist Program and environmental initiatives to inspire students at Newton Moore Senior High School.

I have also received the 2009 Schools First Impact Award, including \$50,000 for our science partnership of more than 10 years with the City of Bunbury. The money will be used for a number of science initiatives including the purchase of scientific equipment to establish a secure breeding program for threatened native fish species and a school nursery to propagate native plants. In addition to this, the school received a Department of Environment and Conservation licence to breed threatened native fish in partnership with Murdoch University.

In 2009, Newton Moore Senior High School was one of 23 schools across Australia and

the only high school in WA to become a Microsoft Innovative School. I am the facilitator of this program at NMSH which helps students achieve their full potential in science.

I developed the curriculum for the regional Year 7 PEAC science program, which won the 2010 Australian Rural Education Award. I also implemented a new Robotic Engineering subject which focuses on using programmable robots in the classroom.

In 2010, I successfully involved the school in the Science and Technology Education Leveraging Relevance program, a national science education initiative of the Australian Academy of Technological Sciences and Engineering. All Year 10 students at NMSH are currently participating in this physics program, encouraging them to continue their studies in science and mathematics.



Mrs Lorraine Ellis, winner of the 2008 Excellence in Science Teaching: Secondary award.

ECOCEAN

ECOCEAN was awarded Western Australian Science Outreach Program of the Year in 2009. The WA-based not-for-profit organisation is the driving force behind the global campaign to protect the world's declining population of whale sharks.

What have been some significant achievements since winning the award in 2009?

Since winning the award in 2009, ECOCEAN has continued its whale shark research and protection program in Ningaloo and engaged the global community to monitor whale sharks using its internet site, www.whaleshark.org.

This year during the whale shark season in Ningaloo, ECOCEAN was able to record more whale sharks than ever before and engaged operators

and tourists to educate them about whale sharks and their conservation.

ECOCEAN is also a finalist in The Banksia Awards 2010, which recognises valuable Australians who have made a positive difference to our environment.

What is ECOCEAN's current research?

ECOCEAN has begun behavioural studies on whale sharks in Ningaloo to identify whether there have been any variations in behaviour. The results will enable ECOCEAN to implement appropriate strategies to ensure the long term sustainability and conservation of whale sharks.

People from 45 different countries are currently contributing photos of whale sharks through the website, enabling ECOCEAN to understand whale sharks' movement and distribution around the world.

Founder of ECOCEAN Brad Norman, winner of the 2009 Science Outreach Program of the Year.



Through this international collaboration, ECOCEAN was able to monitor the journey of some whale sharks in Belize and Honduras in Central America, which were later sighted in Mexico and then the

gulf coast of America. These sightings showed that the whale sharks traversed over the recent oil spill, enabling the team at ECOCEAN to better understand how many whale sharks were affected by the disaster.

WA clinical trials facility to test new cancer treatment

Western Australia's new world-class clinical trials facility has begun its first trial to test a new cancer treatment.

The facility, operated by Linear Clinical Research Limited, will be used to run early phase clinical trials to determine the suitability of potential new drugs and treatments prior to market entry.

Linear General Manager Cameron Johnson said the oncology trial was being conducted in collaboration with WA cancer researchers.

"This research will see up to 20 patients in Western Australia help test the effectiveness of a new drug that could help reduce solid cancerous tumours," Mr Johnson said.

Trial volunteers would be approached by their doctors to take part in the research.

"We also have a number of other clinical trials awaiting final approval in a variety of therapeutic areas that will commence in the coming months. These trials will



Mr Cameron Johnson in the clinical trials facility ward.

be conducted on behalf of Australian biotechnology companies, as well as international pharmaceutical companies," he said.

Western Australian Institute for Medical Research (WAIMR) Acting Director Professor Peter Leedman congratulated Linear on the developments.

"To have world first trials taking place here in WA is a real achievement. Not only are local patients getting early access to new medications, but the facility is helping draw in dollars that would otherwise have been spent outside of the State," he said.

The Western Australian Government has provided

funding of more than \$9.4 million to establish the facility at WAIMR's Nedlands campus.

A number of clinical trials are planned to commence by the end of the year.

For more information on the clinical trials facility visit www.linear.org.au

WA's innovative universities join forces at Univation

Univation will bring together Curtin University, The University of Western Australia, Murdoch University and Edith Cowan University.

Univation provides a perfect opportunity to build relationships between academia, industry and investors to develop new and exciting products and services. It will also explore the latest commercial opportunities from WA universities in the resources, life sciences, green-tech and information and communication technologies sectors.

Member of the investment team at Charles River

Ventures, Bill Tai, will deliver the keynote speech. Mr Tai is a global leader in the field of venture investing and has overseen numerous successful investments. Robyn Williams from the Radio National Science Show will compere.

The Department of Commerce, which facilitates industry development in the innovation sector, is supporting Univation by offering mentoring and pitching training to participants. Univation participants will have

the opportunity to attend the department's WA Innovator of the Year Awards presentation.

Other event sponsors include Rio Tinto, Griffith Hack and Co, AusIndustry, Wrays, Chevron, Pfizer, Sungrid, Perth Convention Bureau and KCA.

For more information on Univation visit www.univation.com.au.

The event will be held at the Burswood Entertainment Complex on 3 and 4 November.

IBM chooses Perth to establish new research centre

IBM has chosen Perth as the location to establish a new research centre to explore innovative solutions for the mining and oil and gas sectors.

The IBM Natural Resources Solution Centre will be one of just six global research centres run by the company and the only one focused on creating solutions for the mining industry, in addition to the oil and gas industry.

Minister for Commerce; Science and Innovation Bill Marmion said IBM's decision to invest in WA clearly demonstrated the abundant opportunities that exist in the State and our strong reputation in innovative technology development.

"Western Australia currently mines more than 50 different minerals and operates 64 oil and gas fields, but there is potential to tap into even more of these natural resources," Minister Marmion said.

"The centre will help to drive this potential in the coming years and address the need for more research into ground breaking, high-end solutions for

some of the most complex and challenging questions facing the mining and petroleum industries."

Managing Director of IBM Australia and New Zealand Glen Boreham said the idea behind the centre was to create a hothouse environment for accelerating the development of smart solutions that would solve industry specific problems.

"The centre will bring together global IBM expertise, local clients, academic researchers and strategic business partners," Mr Boreham said.

"Working with the resources sector, the centre will aim to optimise operational efficiency,

reduce operational costs and improve environmental, health and safety performance."

IBM has started talks with the Western Australian research and development community including the Western Australian Energy Research Alliance (WAERA) on collaborative opportunities.

WAERA works with industry to develop new knowledge and novel technologies to deliver research outcomes that will exploit Western Australia's large reserves of natural gas.

In 2004, the State Government invested \$20 million towards a five year program to establish WAERA as a research hub for the oil and gas industry.

Western Australia strengthens radio astronomy links with China

Astronomers from the International Centre for Radio Astronomy Research (ICRAR) joined a historic Australia-China Commonwealth Roundtable on astronomy at the Shanghai Expo in August.

Leading ICRAR scientists, Professor Steven Tingay and Professor Lister Staveley-Smith, formed part of the Australian delegation of astronomers who met with Chinese colleagues to cultivate productive, long-term relationships between Australian and Chinese astronomers, institutions and academies.

The meeting was chaired by Chief Scientist of Australia Professor Penny Sackett.



Australian and Chinese representatives at the Australia-China Commonwealth Roundtable on astronomy.

ICRAR researchers attended the meeting to promote links with Chinese colleagues in the areas of radio astronomy and high performance computing.

Themes discussed included the Square Kilometre Array (SKA) and SKA Pathfinders, current and future collaborations in Very Long Baseline Interferometry (VLBI), Antarctic astronomy and large optical spectroscopic surveys. An

overarching discussion included developments in technologies that support astronomy and a call for policy discussion on information sharing regarding infrastructure, data collection and archiving.

Professor Madam Ye, former Director of the Shanghai Observatory, called for greater cooperation and for Australian astronomers to continue to visit China to strengthen the good

will, collaboration and build on current partnerships.

An equal joint venture between Curtin University and The University of Western Australia, ICRAR is engaging with the global science community and industry to ensure the successful delivery of the SKA.

Written by Pete Wheeler, International Centre for Radio Astronomy Research.

Rio Tinto supports local industry



The Iron Ore group at Rio Tinto continues to demonstrate strong support for local industry through its resource development projects in the Pilbara region.

Rio Tinto is a leading global supplier of iron ore to the steel industry internationally. Since January 2007, the company has spent a total

of \$5.3 billion for project expansion work across the Pilbara region. Eighty-eight per cent of this work was awarded to Western Australian and Australian industry.

In the 2009/10 financial year, the company invested a total of \$634 million to expand its Pilbara operations. Eighty-six per cent of this work was awarded to businesses located in Western Australia, 10 per cent to businesses located in the Eastern States and only 4 per cent was awarded to overseas businesses.

General Manager of the Industry Participation Branch at the Department of Commerce, Stephen Grocott said in recent

times there have been differing trends in the levels of local content in major resource projects.

"A decline has been experienced in a few projects due to a number of factors such as globalisation, enhanced technologies and changes in procurement practices," Mr Grocott said.

"Local content results achieved by Rio Tinto demonstrate a strong commitment by the company to retain work in Australia and this is very good news for Australian and particularly Western Australian industry."

The Department of Commerce

plays a key role in maximising local industry opportunities in both the private and public sectors by administering the State Government's Building Local Industry Policy. The policy is based on the expectation that Western Australian and Australian industry is provided with full, fair and reasonable opportunity to participate in major capital projects in Western Australia.

For copies of the Building Local Industry Policy visit

www.commerce.wa.gov.au.

More information on Rio Tinto's operations is available at

www.riotintoironore.com.

Contact details

State of the Future is received by more than 3500 key industry representatives, local councils, media and other organisations. The newsletter is a great way to promote your business. In each issue we profile different companies within the science, technology, innovation, industry and enterprise fields.

If you have some news or a story to tell about what your company is up to for State of the Future please contact:

Department of Commerce
Science, Innovation and Business Division
Email: soft@commerce.wa.gov.au
Phone: 08 9263 8279

Various stories have been written in conjunction with ScienceNetwork WA. For more information on Western Australian initiatives please visit www.sciencewa.net.au

Disclaimer – The information contained in this publication is provided in good faith and believed to be reliable and accurate at the time of publication. However, the information is provided on the basis that a reader will be solely responsible for making their own assessment of the information and its veracity and usefulness. The State shall in no way be liable, in negligence or howsoever, for any loss sustained or incurred by anyone relying on the information, even if such information is or turns out to be wrong, incomplete, out of date or misleading.



Government of Western Australia
Department of Commerce

