

R&D

REVIEW

AUSTRALIAN

INSIDE

- National news roundup 1-5
- Science and technology 6-8
- Opinion/R&D Update 9, 11
- ARDR special 10
- Universities 12
- Technology business 13-16
- State roundup 17-18
- People 19
- Rural and resources 20-21
- Information technology 22
- Industry forum: 23
- On the radar & jobs 24

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*Linking Australian Science,
Technology and Business*

Where has all the water gone?

Commissioned in the wake of the November 2006 Summit of the Southern Murray Darling Basin (MDB), the CSIRO has now released the final report of the **Murray-Darling Basin Sustainable Yields Project**. It provides a dire assessment of the anticipated impacts that climate change, catchment development and increasing groundwater extraction will have on the availability and use of water resources.

The project has developed, for the first time, an integrated modelling capability for the entire MDB linking multiple river systems models together with multiple groundwater models. The most comprehensive modelling of water availability in the MDB to date used 111 years of daily climate data and investigated four scenarios:

1. A historical baseline scenario considering 100 years of historical climate data (mid-1895 to mid-2006) against which other scenarios were compared.
2. A scenario based on recent severe drought conditions in south eastern Australia, which was used as a reference point for climate change scenarios.
3. A climate change scenario considering three global warming scenarios providing a spectrum of possible climates ranging from wet extreme to median (best estimate) to dry extreme.
4. A scenario based on a 2030 climate and likely future development considering effects such as expansions of farm dams and commercial plantation forestry expected under current policy, and changes in groundwater extraction.

Framed around these scenarios the key findings of the study are:

- Water resource development has caused major changes to the MDB. It has changed the flooding regimes that support nationally and internationally important floodplain wetland systems in the MDB



"Where has all the water gone?" – "See? No rain!"

Cartoon: Mark Elliott

and has reduced the total water flow at the Murray Mouth by 61%. It has caused the river to cease flowing through the mouth of the Murray for 40% of the time, compared to 1% of the time at a time before water resource development.

- Severe drought such as experienced in the south of the MDB, and usually occurring only every 300 years, will become increasingly common.
- The impacts of climate change by 2030 are uncertain; however, surface water availability across the entire MDB is more likely to decline than to increase, and a very substantial decline in the south is possible. For the entire basin, the median decline is 11%. If current water sharing arrangements remain in place, this would further reduce the water flow at the Murray mouth by 24%.
- In 2030, under median (best estimate) climate conditions, diversion

The Villa Frescati in Stockholm, seat of the Royal Academy of Science, which hosts the International Geosphere-Biosphere Program, IGBP.



photo: Wikipedia

Metabolomic news

The \$9.5 million Victorian node of **Metabolomics Australia** has been launched at the **University of Melbourne**.

The facility, which is funded through the **National Collaborative Research Infrastructure Strategy** (NCRIS) and \$2.65 million by the **Victorian Government**, will have subsidiary nodes at research institutions in **Western Australia**, **Queensland** and **South Australia**. It will focus on the medical, agricultural and environmental applications of metabolomic research.

Victoria's Innovation Minister **Mr Jennings** also launched **Proteomics and Metabolomics Victoria** – a consortia designed to strengthen and expand the development of proteomics capability in Victoria.

► **More information:** www.premier.vic.gov.au

Bionic news

Bionic Vision Australia is a new national partnership with the goal of developing a high-resolution bionic eye implant capable of restoring reading vision to people suffering from degenerative retinal conditions. The conditions account for 48% of all blindness in Australia.

The partnership is between the **University of Melbourne**, the **University of New South Wales**, the **Victoria Research Laboratory of National ICT Australia** and Melbourne's **Bionic Ear Institute** and **Centre for Eye Research Australia**.

► **More information:** www.premier.vic.gov.au/

Wine research cluster

The **Wine Innovation Cluster** has been launched at the Waite Campus of the **University of Adelaide**. The cluster brings together the resources of the **Australian Wine Research Institute**, **CSIRO Plant Industry**, private research agency **Provisor Pty Ltd**, **South Australian Research & Development Institute** (SARDI) and the University of Adelaide.

Some projects already benefiting from the collaboration include: studies on the effects of climate change on vines; the breeding of new yeasts to enhance fermentation; and research into the remediation of bushfire taint in wine.

► **More information:** **Stuart McNab**, stuart.mcnaab@fostersgroup.com

Sydney medical centres

Three new medical research centres have opened in Sydney:

- The \$99 million Kolling Building at **Royal North Shore Hospital** is jointly funded by the **University of Sydney** and **NSW Health** and provides a purpose-built facility for medical researchers and clinical educators.
- The \$47.5 million School of Medicine building at the **University of Western Sydney** (UWS) in Campbelltown is the home base for the university's current 200 medical students, as well as the school's 60 academics, researchers and support staff.
- The **University of Sydney's Brain and Mind Research Institute** has launched a new Parkinson's Disease research clinic which will be headed by **Dr Simon Lewis**. Previous research by Dr Lewis conducted at the University of Cambridge UK used a novel data-driven approach to identify the existence of sub-groups within a population of PD sufferers.

► **More information:** (RNSH) **Jake O'Shaughnessy** 02 9351 4312; (UWS) **Amanda Whibley** 02 9678 7084; (BMRI) **University of Sydney**, 02 9351 0702

Global climate engagement

The new **Climate Change Institute (CCI)** at **The Australian National University (ANU)** has opened.

Professor Will Steffen, who will lead the CCI, says it will support and promote research in core climate-related capabilities across the ANU. The research will include understanding the climate system and the human dimensions of climate change, its impact on the Asia-Pacific Region and approaches to mitigating and adapting to climate change.

From 2009 ANU will offer an interdisciplinary Masters in Climate Change offered jointly by the **Fenner School of Environment and Society** and the **Crawford School of Economics and Government**.

Globally, the CCI will co-host the international scientific congress on climate change, March 2009 in Copenhagen, which is organised by the **International Alliance of Research Universities (IARU)** and engage with the **Intergovernmental Panel on Climate Change**, the **World Climate Research Programme**, and the **International Geosphere-Biosphere Programme** among others.

► **More information:** **Jane O'Dwyer**, 0416 249 231

Marine gang

The **University of Tasmania (UTAS)** will host the **National Climate Change Adaptation Research Network for Marine Biodiversity and Resources**. The network will work closely with the **National Climate Change Adaptation Research Facility** based at **Griffith University** to foster a collaborative and interdisciplinary research environment to support the development of appropriate climate change adaptation responses by policy-makers and managers.

The network will include the **Australian Maritime College**, the **Australian National University**, **CSIRO Marine and Atmospheric Research**, **CSIRO Sustainable Ecosystems**, **Great Barrier Reef Marine Park Authority**, **James Cook University**, **Northern Territory Government**, **Western Australian Marine Science Institution**, **University of the Sunshine Coast**, **University of New South Wales**, **Charles Darwin University** and **Macquarie University**.

► **More information:** 03 6226 2124.

Planet-friendly plastics

Cheaper energy sources and a reduction in greenhouse gas emissions are among the key benefits of the newly opened **Centre for Organic Photonics and Electronics (COPE)** at the **University of Queensland**. **Professor Paul Burn** will lead the \$7 million purpose-built centre, the first of its kind in **Queensland**, which will bring together almost 40 scientists from the disciplines of chemistry and physics.

The discipline of organic photonics and electronics involves plastics that can function as inorganic semiconductors (such as silicon) and the centre's work will focus on the development of plastics that can be made to manipulate and use light for practical applications, such as more efficient lighting and displays (for example, television or computer screens) and solar cells.

► **More information:** **Paul Burn**, 07 3365 3778



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- **Ken Preshaw**, *Licensing Executive - AP Asset Team, IBM*
- **John Walker**, *Senior Manager - Intellectual Property Portfolio Management, CSIRO*
- **Craig Glazier**, *Senior Counsel, Sun Microsystems Australia*
- **Dr Deborah Rathjen**, *CEO, Bionomics*
- **Rob McInnes**, *Principal, Spruson & Ferguson, IP and Commercialisation Lawyers*
- **Louise Denver**, *Communications Director, Corporate Affairs & Communications, Deloitte*
- **Dr Anthony Coulepis**, *CEO, Cell Sense*
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in driest years would fall more than 10% in NSW regions, around 20% in Murrumbidgee and Murray regions and 35-50% in Victorian regions. But assuming the dry extreme variant, diversions in driest years could fall 80-90% in the major Victorian regions.

- Most of the impact of climate change will be borne by the environment rather than consumptive water users.
- Currently groundwater represents 16% of total water use but under current arrangements this could increase by 2030 to over ¼ of total water use. Already, current groundwater use is unsustainable in seven of the 20 areas in the basin which experience high groundwater use. Predicted expansions in farm dams and commercial plantation forestry are likely to have minor impact on total runoffs reaching rivers across the MDB. However, as expansions of forestry plantations are likely to be concentrated in small areas, mainly in the Eastern Mount Lofty Ranges, Murrumbidgee and Murray regions, local impact on runoff could be significant.

“The major findings are first and foremost the degree to which the river system has been modified by development to date. It’s easy to look past this when we’re in the middle of a severe drought but the fact is that even without the drought we’ve quantified how the flows to a number of key environmental assets around the basin have changed dramatically,” says **CSIRO’s Dr Tom Hatton**, lead author of the report. “The drought has highlighted how far we’ve pushed some of these ecosystems and also the reliability of water as a resource for cities towns and irrigators. But even when the drought breaks there’s going to be an ongoing challenge to provide secure, safe water in a healthy environment unless we make some changes.”

According to **Professor Craig Simmons** at **Flinders University**, “this is the first time that we have ever seen a basin wide assessment of our water resources done. This means for the first time we have been able to start comparing water use, surface water, ground water and so on in a consistent way across the whole of the Murray Darling Basin. This is a crucial step as until you have a consistent framework you really can’t see what the state of affairs is.”

However, as **Dr John William** from the **Wentworth Group of Concerned Scientists** points out, the report also shows “that we’ve got a major reallocation issue to confront, that is we’ve taken too much water out of the river, we’ve done that through a period of high rainfall and

wet periods since 1950 when we had the expansion of our irrigation and that’s led us to over-allocate a river in a time of plenty.”

He says that the two major issues ahead are “to reallocate the water to a condition where we have the droughts that we’re experiencing and our river allocation can actually cope with those droughts, secondly we’ve got to adjust to the climate change future which looks like an 11-15% reduction in water availability across the system.”

► **More information:** www.csiro.au/mdbsy; www.aussmc.org/Murray_Sustainable_Yields.php

Speak out

Charters setting a new framework for research independence and responsibility have been signed for four major public research agencies, the **CSIRO**, the **Australian Institute of Marine Science (AIMS)**, the **Australian Nuclear Science and Technology Organisation (ANSTO)** and the **Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS)**.

While varying slightly to reflect the special circumstances of the agencies, the charters set out General Principles, which are:

- encouragement of open communication and dissemination of research findings;
- encouragement of debate on research issues of public interest;
- recognition of the role of researchers in such communication and debate;
- the contestability of ideas;
- independence and integrity of public research agencies in their research activities;
- government responsibility for policy formulation and implementation.

Professor Ken Baldwin, the president of the **Federation of Australian Scientific and Technological Societies (FASTS)**, says that the charters are an important step forward. However, he says: “The charters would have greater power if – as well as conferring the right for science agencies and scientists to speak freely in their field of expertise – they also articulated an obligation to do so. Public debate is undermined if scientists and researchers breach their responsibilities by omission i.e. by not speaking out against misinformation or misconceptions.”

He points out that only the AIMS charter is explicit in stating the responsibility of the agency to provide regular training and professional advice for scientists and researchers to effectively communicate with the media. “This provision should be articulated in all the charters, to provide for a more complete statement of what is required for scientists to participate in public debate.”

► **More information:** (**DIISR**) minister.innovation.gov.au; (**FASTS**) www.fasts.org/images/news2008/mr-charters-announcement.pdf

Handy hand-out

The Minister for Innovation, Industry, Science and Research, **Senator Kim Carr**, has announced 73 projects that will share in funding of over \$31.6 million under the Linkage Infrastructure, Equipment and Facilities (LIEF) Projects scheme. The **Australian Research Council (ARC)** had received a total of 169 proposals of which 43 % were approved for funding. By comparison, in the previous year 67 projects (43%) were approved for funding totalling over \$33.2 million.

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The LIEF funding will be for Australian institutions to collaborate with a large number of national, international and other government organisations. These organisations will contribute a total of over \$180 million to research infrastructure, equipment and facilities.

The objectives of the LIEF 2009 scheme are to:

- encourage eligible organisations to develop collaborative arrangements in the higher education sector and with other organisations outside the sector in order to develop research infrastructure;
- support large-scale cooperative initiatives thereby allowing expensive infrastructure, equipment and facilities to be shared;
- enhance support for areas of research strength; and
- ensure that researchers in fields of recognised research potential have access to the support necessary to carry out high-quality research.

► **More information:** (DIISR) www.arc.gov.au/media/releases/media_18Nov08.htm; (ARC) www.arc.gov.au/ncgp/lief/LIEF09_Selection_rep.htm

Old & rusty

A new survey on the condition of Australia's university infrastructure indicates that **Group of Eight** (Go8) universities, and possibly most Australian universities, face serious problems with the bulk of their infrastructure from the post World War II period and into the 1980s.

The *Go8 Infrastructure Condition Survey 2007* found that many buildings have reached the end of their economic lives and are beyond maintaining. This supports the case for releasing funds from the \$11 billion Education Investment Fund (EIF) quickly and efficiently, according to the chair of the Go8 universities, **Professor Alan Robson**.

The survey found backlog maintenance liabilities of Go8 universities totalling \$1.75 billion and a funding shortfall for new capital and refurbishment works considered essential of around \$3 billion over the five years 2008-2012.

Professor Robson calls on the **Australian Government** to:

- commit \$8.5 billion of the EIF capital to support capital renewal in the higher education sector;
- release \$800 million a year for ten years to the sector from the EIF;
- allocate higher education EIF funds according to a formula based 50% on student load and 50% on research income; and
- establish an independent process to assess and assure the condition of Australian university infrastructure.

► **More information:** Tim Payne, 02 6239 5488

Health research splurge

A total of \$132 million in **National Health and Medical Research Council** (NHMRC) Program Grants and Fellowships, as well as the NHMRC **European Union** Collaborative Health Research Grants, has been announced by the Minister for Health and Ageing, **Nicola Roxon**.

The eight 2009 Program Grants, funded with \$73 million over a period of five years, include:

- \$10 million for **Professor Patrick McGorry** and colleagues (**University of Melbourne**) to continue studies into mental disorders in young people.
- \$10.6 million for **Professor David James** and colleagues (**Garvan Institute of Medical Research**) to study insulin in Type 2 Diabetes by translating cell and animal research to humans, and improving diagnosis and therapy.



Harnessing Victorian science, technology and innovation capabilities through partnerships

Victoria's Science Agenda Investment Fund Call for Proposals Competitive Grants Program

Victoria's Science Agenda (VSA) Investment Fund is a major program under the Victorian Government's new innovation statement aimed at developing solutions to make Victoria more productive, sustainable and healthy.

The \$41 million VSA Investment Fund will provide competitive grants to business and research organisations for partnerships that strengthen Victoria's science and technology capabilities and translate these to market outcomes.

Applications are invited from technology-based companies, universities, research institutes, Co-operative Research Centres, industry associations and government agencies. Proposals will be considered on merit against selection criteria published in the guidelines and ranked against other proposals. Information sessions on the program will be conducted, see website for details and times.

Guidelines and application forms are available at www.business.vic.gov.au/vsa or contact (03) 9651 9820 for further information.

Applications close 13 February 2009.



- \$7.6 million for **Professor Perry Bartlett** and colleagues (**Queensland Brain Institute**) to determine how neurons are generated and integrate into the existing brain.
 - \$11.1 million for **Professor Roger Daly** and colleagues (**Garvan Institute of Medical Research**) to identify molecular markers that can be used to classify subtypes of particular cancers according to their prognosis and response to therapy.
 - \$8.4 million for **Professor Jeffrey Braithwaite** (UNSW) to investigate patient safety focussing on the roles of teamwork, safe medication use and the application of information technology to support improved decision-making.
 - \$12.1 million for **Professor Stephen MacMahon** and colleagues (USYD) to generate the evidence for new strategies to combat cardiovascular diseases.
 - \$5.7 million for **Professor Adele Green** and colleagues (QIMR) to develop evidence-base for the prevention and control of gynaecological, oesophageal and skin cancer in Australia.
 - \$7.6 million for **Dr Philip Hodkin** (WEHI) to investigate how B immune cells circulating in the blood change into antibody-producing ASC cells, with the aim to improve vaccines and understand autoimmune diseases and leukaemia.
- Fifteen health care professionals have been awarded five-year Practitioner Fellowships to combine their clinical and research careers. Another 80 NHMRC Research Fellowships were awarded to researchers in clinical medicine and science, public health, basic science and health services.
- Five grants totalling \$2.4 million will support health research

The Pyrotron is a 25-metre-long aluminium wind tunnel with a five-metre-long fuel bed and a viewing section.

projects co-funded by the **European Commission**, and carried out within Australian and European research institutions. Study areas include genetic factors in osteoporosis, twin studies in genetics, motorcycle safety, preventing weight gain and cancer gene-environments.

► **More information:** Carolyn Norrie (NHMRC), 0422 008 512

Zusammenarbeit erwünscht

An extra \$1 million to support research collaborations between Australia and Germany has been announced by the **Group of Eight** (Go8) universities and the **German Academic Exchange Service** (DAAD).

The funding will be granted under the second round of applications for the *Go8 Germany Joint Research Co-operation Scheme*, which targets early career researchers and supports collaborative research projects over a wide range of disciplines. This additional funding will allow 27 teams of researchers from Australia and Germany to visit each other in 2009 and 2010 to work in research areas such as energy production, climate change and labour market outcomes of immigrants.

Professor Doug McEachern, chair of the Go8 DVCs Research, expressed the hope that the collaborations will generate economic, social, cultural and environmental benefits for both nations. According to DAAD's spokesperson in Australia, **Dr Andreas Jaeger**, there has long been interest from Australian and German researchers in working together but until now there has been no funding mechanism for such co-operation in Australia. "The Go8 scheme is filling an important funding gap for research collaboration with Germany," he says.

► **More information:** Kerrie Thornton, 02 6239 5488

Big guns (needed)

As one of 11 funding organisations in 8 countries, the **NHMRC** is taking part in an international study to reveal genomic changes in 8 forms of cancer found across the planet. The projects, launched by the **International Cancer Genome Consortium** (ICG), constitute the biggest ever initiative on cancer genetics and one of the most ambitious biomedical research efforts since the Human Genome Project. Each organisation will be coordinating studies of at least one specific type or subtype of cancer, with each project expected to involve specimens from approximately 500 patients and estimated to cost US\$20 million.

Over the next decade, additional nations and organisations are expected to join the ICGC so that up to 50 types of cancer will be thoroughly studied. Ultimately, the project is expected to generate datasets that are 25,000 times larger than the Human Genome Project.

As announced in August, the **Australian Government** will support the ICG with \$27.5 million over five years.

► **More information:** www.icgc.org/news; Carolyn Norrie carolyn.norrie@nhmrc.gov.au; 0422 008 512

Bushfire ready

The now open **CSIRO Pyrotron** in Canberra will improve fire safety and fire-fighting by allowing researchers to conduct controlled experiments that will increase our understanding of bushfire behaviour, says the Minister for Innovation, Industry, Science and Research, **Senator Kim Carr**. The Pyrotron is a 25-metre-long aluminium wind tunnel with a five-metre-long fuel bed and a viewing section for burning bushfire fuel such as grasses, forest litter and small logs. There is only one other facility like this in the world, and none that can match the CSIRO Pyrotron's capabilities, according to Senator Carr.

"This research will help Australian communities coexist with the natural environment in a safe and sustainable way," he says.

The controlled and repeatable experiments made possible by the

Pyrotron will add to the knowledge gained from traditional studies in the field. It will allow researchers to study the combustion and spread of fires in complete safety, even on days of high temperatures and low humidity.

► **More information:** (DIISR) Patrick Pantano, 0417 181 936; (CSIRO) Andrea Wild, 0415 199 434



Public CSIRO

The winner is: Public Good

The new guidelines for the **Cooperative Research Centres** (CRC) **Program** have been released by the Minister for Innovation, Industry, Science and Research, **Senator Kim Carr**, who says the re-instatement of public good as an assessment criterion and the inclusion of the humanities, arts and social sciences will broaden the base of the program.

The guidelines received a positive response from the **Australian Academy of Science** (AAS), particularly in regard to the re-instatement of public good as an assessment criterion. "It is an overdue recognition that 'public good' science is an essential component of building a sustainable future for Australia," says the AAS, also identifying the recognition of the global nature of research in the guidelines as important.

Senator Carr also launched the 11th CRC selection round for which the applications will close on 20 March 2009. "The new program responds to the recommendations of the O'Kane review and takes account of stakeholder feedback," he says adding that he expects that good applications from 2006, deemed uncompetitive at that time because of their focus on public good, will be resubmitted.

Senator Carr says there will be information sessions held nationally.

In 2008, the **Australian Government** will provide more than \$182 million to CRCs.

The **CRC Association** has welcomed the announcement, with chief executive officer **Mr Michael Hartmann** saying: "The Program has been evolved to reflect changing times. Its attributes have been exploited and concerns have been addressed. Importantly the program's inherent flexibility has been reinforced."

► **More information:** (DIISR) Stella Morahan 02 6213 7528; (AAS) Richard Bray, 0416 331 821; (CRCA) Michael Hartmann, 0438 081 968

Intelligent defence

A new **Defence Science and Technology Organisation** (DSTO) program is designed to fast-track successfully demonstrated projects for further capability development.

The **Capability and Technology Demonstrator** (CTD) **Extension Program** builds on work already undertaken by DSTO to encourage Australian industry to innovate through the original CTD program. The CTD provides industry with the opportunity to demonstrate new technology, showing Defence the potential performance and technical risk associated with its implementation.

"The Extension Program is the next step in the process to move

successfully demonstrated CTD technologies closer to operational capability for the **Australian Defence Force**,” says the Minister for Defence Science and Personnel, **Warren Snowden**. “According to Defence priorities, the projects for the Extension Program are currently being short-listed from 33 successful CTD projects.”

The CTD Extension Program will be managed by DSTO in consultation with the **Defence Materiel Organisation and Defence’s Capability Development Group**.

► **More information:** Kate Sieper, 02 6277 7620

Intelligent island

The now open \$30 million Hobart-based node of **CSIRO’s Information and Communication Technologies (ICT) Centre** is jointly funded by CSIRO and the **Australian Government** through the Intelligent Island Program.

According to CSIRO’s chief executive officer, **Dr Geoff Garrett**, the **Tasmanian ICT Centre** is addressing national research priorities in areas such as energy and water use while at the same time building ICT capability in Tasmania.

► **More information:** Stephen Giugni, 03 6232 5550; Stephen.Giugni@csiro.au

Nucleic crime

The Minister for Home Affairs, **Bob Debus**, has released a discussion paper for public consultation about new laws covering DNA theft.

“The rapid development of human genetic technology which allows genetic testing on hair follicles, saliva and cheek cells have made tighter laws necessary,” he says. “However, the proposed new offences don’t interfere with the use of DNA testing by the police or courts or lawful access to private paternity testing by parents and guardians.”

The discussion paper was endorsed by the **Standing Committee of Attorneys-General** and examines the nature of DNA theft and the harms that flow from it, as well as the response of other countries to the problem. The discussion paper proposes the following draft model offences for consideration: obtaining bodily material for genetic testing; the use of bodily material for genetic testing; and the disclosure or use of results from genetic testing.

► **More information:** Samantha Wills, 0448 721 372; [Discussion paper: www.ag.gov.au](http://www.ag.gov.au)

Engineering excellence

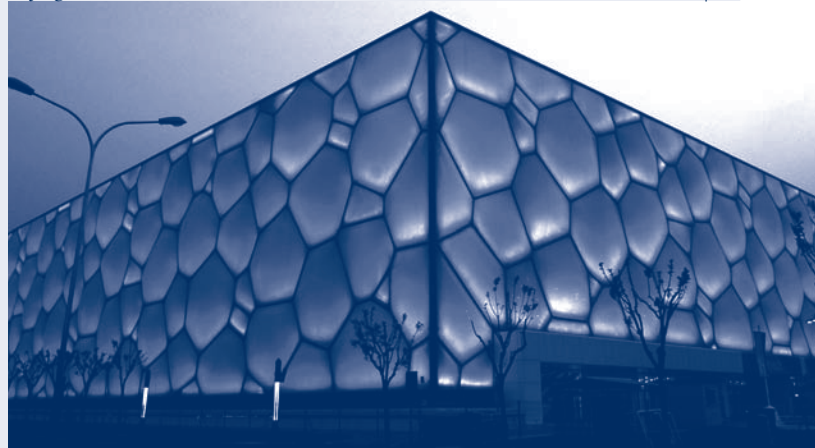
Arup Australasia won top honours at the **2008 Australian Engineering Excellence Awards** (2008 AEEA) ceremony, the Sir William Hudson Award, for engineering the Beijing’s National Aquatics Centre (Water Cube).

Winners of the **Australian Engineering Excellence Award**:

- **Sinclair Knight Merz** – for solutions in the US\$1.4 billion upgrade of the Dampier Port (Western Australia) which enabled increasing port capacity by 90% while exporting record tonnages.
- **Connell Wagner Pty Ltd** – for the structural glass engineering of the Amazon Waterlily Pavilion in Adelaide.
- **Lu Papi & Associates** – for the design of the axle-less, ultralight and multifunctional Freedom Wheelchair.
- **P3- Accord - Maritime Patrol System Program Office, BAE Systems Australia and Australian Aerospace** – for the AP-3C Tactical Common Data Link (TCDL), enabling crews to provide coalition commanders with valuable real time aerial views of their

Beijing Water Cube

photo: DeviantART



surrounding environments.

- **Connell Wagner Pty Ltd** – for the unique toroidally-shaped rectangular roof of the London Wembley Stadium.

Winner of the **AusIndustry Engineering Innovation Award**:

- **Peregrine Semiconductor Australia Pty Ltd** – for the manufacturing of UltraCMOS™ silicon-on-sapphire (SoS) technology, which enables the processing of Ultra-Thin Silicon (UTSi*) circuitry on an insulating dielectric sapphire substrate.

Winner of the **Environmental Engineering Excellence Award**:

- **Thiess Pty Ltd and Black & Veatch** – for the Bundamba Advanced Water Treatment Plan (AWTP) – Stage 1A project in SE Queensland, a part of the \$2.5 billion Western Corridor Recycled Water Project.

► **More information:** Mr Bright, 0407234490; www.engineersaustralia.org.au

Lost in Space

The **Senate Standing Committee on Economics** has submitted a final report on the current state of Australia’s space science and industry sector. The report states that Australia’s involvement in space science and industry “has in recent times drifted and the sense of purpose been lost.” It further says that overseas observers expressed surprise that Australia has no space programme or agency and, other than for communications, is reliant on satellites owned by other countries.

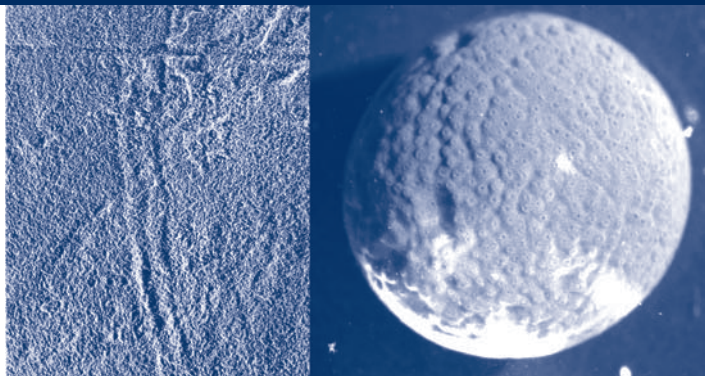
The Australian government should have a space policy and, like most other comparable countries, an agency to implement it. “The global space industry generates global revenues of around US\$250 billion per annum, and Australia should be playing a larger role.”

Recommendations by the committee include:

- the establishment of an Australian government Space Information Website;
- that immediate steps be taken to coordinate Australia’s space activities and reducing its over reliance on other countries in the area of space technology;
- the formation of a government unit to coordinate Australian space activities, including those in the private sector;
- the establishment of a Space Industry Advisory Council comprising industry representatives, government agencies, defence, and academics. The Council would be a precursor to the establishment of a space agency;
- that any Australian Space Agency reassess the case for Australia becoming more closely linked to an international space agency.

► **More information:** www.aph.gov.au/senate/committees/economics_ctte/space_08/report/report.pdf

Left: Tracks left by the giant protist similar to ones found in fossil records dating back 542 million years. Right: A giant rotist, found off the coast of the Bahamas.



Healthy food robot

The CSIRO Food Futures Flagship has developed an automated instrument to accurately predict glycemic index (GI) and resistant starch (RS) in food products *in vitro*. The prototype robotic machine acts as an 'artificial gut' that can process large numbers of food samples for a fraction of the time and cost required by the standard *in vivo* (human) method.

Validated as a rapid and reliable predictor of the food GI and RS content, its principal purpose is to help food manufacturers develop more cheaply and quickly a wider range of healthy food products.

Associate Professor Jonathan Shaw, associate director of the Baker IDI Heart & Diabetes Institute in Melbourne, says the institute's research team has been working with CSIRO to validate results obtained from the device. "With the growing epidemic of obesity, diabetes and cardiovascular disease, both in Australia and around the world, there is increasing demand for low GI and high RS foods. Consumers really need greater access to products with appropriate health benefits, and we believe this new GI and RS predictor will help achieve that goal."

► **More information:** www.csiro.au/news/GI-Predictor.html

Science & maths in the dull

A new report released by the Australian Council for Educational Research (ACER) has confirmed that Australia faces significant challenges in boosting participation in science and mathematics studies in school education, university studies and in the teaching workforce.

The report *Participation in Science, Mathematics and Technology in Australian Education* shows participation in senior secondary school science has declined over the past 30 years, and there is also evidence for every State and Territory that since the mid 1990s participation in the advanced levels of studies in mathematics has declined.

The report's lead author, ACER deputy chief executive officer (Research) Dr John Ainley, says strengthening science curriculum in school is a key to higher levels of participation in science-related studies at university. He says the science curriculum in secondary school needs to relate more strongly to the experience of young people and needs to connect what is studied in schools to the emergent fields of science, such as biotechnology. "Stronger use of curriculum resources at primary school level is also required," he says.

The report suggests that schemes to off-set Higher Education Contribution Scheme (HECS) charges may provide an incentive to attract science graduates to teaching even if that is not always for a life-time career.

► **More information:** www.acer.edu.au/

Tracks to the past

Grape-like balls called 'giant protists', found off the coast of the Bahamas, throw into doubt long-held views about the evolution of multi-cellular organisms. Professor Justin Marshall, from the University of Queensland, was part of an international team that spotted the single-cell organisms and their tracks during a deep sea expedition last year.

It was a chance encounter.

"The tracks they made were like long furrows in the sea floor," Professor Marshall says. "Initially we thought the tracks might have been made by the ocean currents, but we saw them roll themselves along the sea floor, even up hills. We recognized the tracks these animals had made as similar to those known only from the fossil records."

The tracks found in fossil records are believed to have been made by multi-cellular organisms. "This is the first evidence that organisms other than multi-cellular animals can produce such traces. The discovery throws into doubt when people believe multi-cellular life began," Professor Marshall says.

The fossil records of tracks like these date back 1.8 billion years, way before the earliest fossil record of the animals themselves which are found in the early Cambrian period of around 542 million years ago.

"It was just one of those things, as we were not there looking for this at all," Professor Marshall says. "It really just shows the nature of science how we can stumble upon these things."

The deep sea research involved colleagues from America and use of the Harbour Branch Oceanographic Institute in an expedition called "Deep Scope" to the depths off the Bahamas to 1 km. It was for several years significantly funded by the US National Oceanic and Atmospheric Administration's Office of Ocean Exploration and Research.

The research is published in the journal *Current Biology*.

► **More information:** www.uq.edu.au/news/

Energy eater: broadband

The surge for energy caused by an increased uptake of broadband and Internet based services, such as Video demand, web based real-time gaming and social networking, threatens to create an energy bottleneck.

In a world-first model of Internet power consumption, University of Melbourne researchers have been able to identify the major contributors to Internet power consumption as the take-up of broadband services grows in the coming years. The results indicate that, even with the improvements in energy efficiency of electronics, the power consumption of the Internet will increase from 0.5% of today's national electricity consumption to 1% by around 2020. "It has now become clear that the exponential growth of the Internet is not sustainable," says Dr Kerry Hinton from the university's Department of Electrical and Electronic Engineering and the ARC Special Centre for Ultra-Broadband Information Networks (CUBIN). Dr Hinton says IT broadband telecommunications will provide a wide range of new products and services. "To support these new high-bandwidth services, the capacity of the Internet will need to be significantly increased. If Internet capacity is increased, the energy consumption, and consequently the carbon footprint of the Internet will also increase," she says. "Increasing amounts of energy will be needed to power and cool Internet equipment that provides high speed broadband. If service providers don't update their equipment, energy consumption will soar, but then cost of updating may also be prohibitive." (see also 'Energy friendly broadband', p22)

► **More information:** uninews.unimelb.edu.au/

Infective policy

Needle exchange programs need to be considered for Australian prisons to help stop the spread of hepatitis C, according to a Deakin University health researcher.

Dr Emma Miller says the results of her research into hepatitis C infection in South Australian prisoners suggests that needle exchange programs should be considered for all prisons. "Around 42% of all the prisoners taking part in this study, and nearly 60% of female prisoners, had hepatitis C on entering prison. This is a startling statistic given that only 1.5% of the Australian population is infected."

According to the study, inmates who already have hepatitis C on entering prison are significantly more likely to commence injecting drugs during their incarceration, and needle-sharing is common in this group.

Dr Miller says other studies have suggested that one needle in the prison system could be used up to 100 times and by multiple different inmates. "The current zero tolerance in Australian prisons toward the introduction of a needle exchange program increases the danger for people not infected already."

► **More information:** www.deakin.edu.au/news/media.php

Yeast vs Alzheimer's

CSIRO scientists have developed a new system to screen for compounds that can inhibit one of the processes taking place during the progression of Alzheimer's disease.

Alzheimer's disease is believed to be caused by the loss of neurons in the brain due to toxic multimers formed by misfolds of a small protein called A β protein, which tend to aggregate.

Around the world research groups and drug companies are trying to find compounds that could halt or even reverse this process.

The CSIRO researchers have now developed a system to easily screen for such agents. They use live yeast cells to produce an A β protein

linked to a green fluorescent marker protein. The produced A β protein can spontaneously misfold, similar to what is found in Alzheimer's, but in the yeast model this can be easily monitored as the structurally changed A β protein causes the fluorescence signal to dim. The researchers tested the system with folate which, according to lead author **Dr Ian Macreadie**, is well known to have a protective effect against Alzheimer's disease. They found that when folate was present, the fluorescence increased.

Dr Macreadie says: "The significance of this development is that the yeast trial we developed could lead to the discovery of new agents which may prove useful in preventing or delaying the onset of Alzheimer's disease"

The study was published in the *Journal of Alzheimer's Disease*.

► **More information:** www.csiro.au/news/MediaCentre/whatsnew.html

Better fed

A successful intervention program has been established following a study led by **Queensland University of Technology** which had reported almost half of aged care facility residents were malnourished.

In 2005, the initial study found that of 350 residents looked at, 49.5% were malnourished, with 42.1% classified as moderately malnourished and 6.4% severely malnourished.

An intervention study, which has yet to be published, has now demonstrated that nutritional health can be maintained with a co-ordinated nursing and nutrition intervention where nutritional status continued to decline.

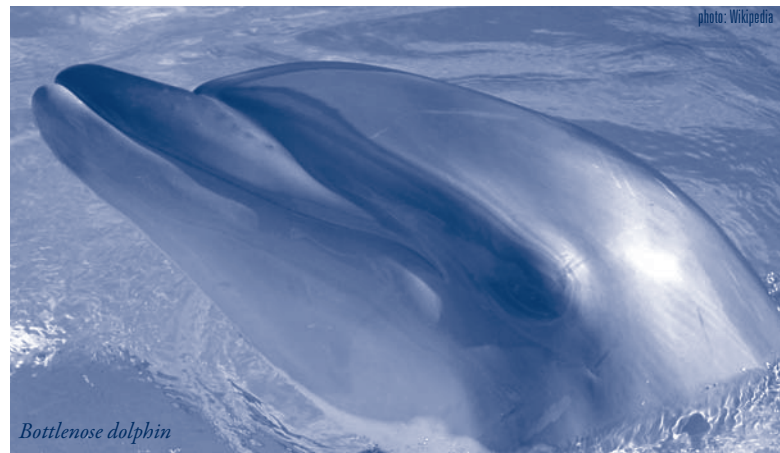
Adjunct Associate Professor Judy Bauer says malnutrition in residential aged care facilities is a big issue and the second component of the study involved helping aged care facilities increase awareness of the nutritional needs of residents, and implement a nutrition action plan. "The facilities should be congratulated because they have made a tremendous effort to improve nutrition care by nominating nutrition champions to increase staff awareness, ensuring residents are weighed regularly and improving overall management of nutrition care."

► **More information:** www.news.qut.edu.au

New Aussie

Marine mammal experts have uncovered a new species of dolphin in Australian waters, challenging existing knowledge about bottlenose dolphin classifications and highlighting the country's marine biodiversity.

Using genetic methods researchers from **Macquarie University** and **Monash University** found that the coastal bottlenose dolphins from southern Australia are a separate species, rather than one of the two currently recognised bottlenose dolphin species. The DNA analysis found that the new species was in fact more closely related to the Fraser's dolphin, which is found mostly in the deep waters of the Pacific Ocean.



Bottlenose dolphin

According to study leader **Dr Luciana Möller**, from Macquarie University's Graduate School of the Environment, it is difficult to distinguish between some species of bottlenose dolphins using only external body features.

The currently recognised species of bottlenose dolphins are both found in Australian waters: the common bottlenose dolphin generally found in Australia's offshore waters, and the Indo-Pacific bottlenose dolphin, found in coastal waters. "This group to which bottlenose dolphins belong includes several species that have differentiated relatively recently in evolutionary time and therefore it is difficult to distinguish or understand relationships between them based on morphology alone," Dr Möller says adding that her research team's findings demonstrated how important DNA studies are to uncovering hidden marine diversity.

The findings are published in *Molecular Phylogenetics and Evolution*

► **More information:** www.pr.mq.edu.au/events/index.asp?TypeID=2

Wildlife returns

Revegetation on farms in Victoria is bringing back wildlife, new research by **Deakin University** has found.

The three-year study into ways to help native wildlife survive and prosper in farmland identified positive trends for various species, but especially for woodland birds. On the flip side, the research has also confirmed, for the first time, that as native bushland declines in farm landscapes the populations of woodland birds decrease. Sixty species of woodland birds were recorded in the study but those farmland areas with little remaining bush often supported fewer than 20 of these species.

Revegetation and restoration of farm landscapes also provided benefits for other studied wildlife, such as frogs, native mammals and butterflies. Many of the detected species were making use of the revegetation, supporting the notion that farm landscapes can provide important habitat opportunities for local wildlife.

Deakin environmental science researchers **Dr Roban Clarke** and **Associate Professor Andrew Bennett** looked at 43 farming areas in the Glenelg Hopkins catchment in western Victoria.

“There is no doubt that birds that specialise in woodland habitats are in trouble, but revegetation is helping turn things around. The total amount of cover is the key driver for the recovery of woodland birds and any increase in the amount is of benefit,” Dr

Clarke says. “When revegetation is undertaken the number of woodland bird species occupying these areas rebounds,” he says. Birds returning to revegetated areas included the Superb Fairy-wren, the Red-capped Robin and the White-throated Treecreeper.

It was also found that the older the revegetation, the better the response of woodland birds.

► **More information:** www.deakin.edu.au/news/media.php

Crops still growing

The well-documented worldwide decline in the number of bees and other pollinators is not, at this stage, limiting global crop yields, according to an international study published in *Current Biology*.

Co-author **Dr Saul Cunningham**, from **CSIRO Entomology**, says, however, that demand for pollinators is still growing and some highly pollinator-dependant crops are suffering.

“The research team scored crops on how much they depend on pollinators for maximum production,” Dr Cunningham says. “Depending on the crop, this dependence ranges from zero to 100%. For example, cereal crops like wheat don’t need to be pollinated but at the other end of the scale, unpollinated almond trees produce no nuts.”

The team found that between 1961 and 2006 the yields of most crops have consistently grown at about 1.5% a year because of improvements in agriculture. There was also no difference in yield growth between crops that require pollinators and those that do not.

“Global summaries can also hide local stories. In some places, local pollinator shortages are affecting local production. While these don’t

threaten overall global food supplies, they can have very significant impacts on local communities and their economies,” Dr Cunningham says. “While this is a positive finding, the interaction between yields and pollination is a hugely complex issue which needs to be teased-out further.”

The researchers were surprised to discover that there has been a global increase in the growing of pollinator-dependent crops, particularly in the developing world. “The fact that, while pollinators are declining in various parts of the world, global agricultural systems are becoming more dependent on pollinators, could create serious problems in the future,” Dr Cunningham says.

► **More information:** www.csiro.au/news/Pollinator-Decline.html

Wind resistant

A new study published in *Nature Geoscience* suggests that currents in the Southern Ocean and its ability to soak up CO₂ have not changed in recent decades, despite a large increase in winds.

The Southern Ocean slows the rate of greenhouse warming by removing CO₂ from the atmosphere and storing it in the ocean but previous studies suggested the Southern Ocean carbon sink could be ‘saturated’ and no longer be able to keep pace with increasing concentrations of CO₂ in the atmosphere.

German and Australian scientists have now compared new ocean measurements from a global network of ocean robots with historical data. **CSIRO’s Dr Steve Rintoul**, co-author of the study, says that while the Southern Ocean was found to have become warmer and fresher since the 1960s – a pattern consistent with the ‘fingerprint’ of climate change, there was no evidence of a change in strength of ocean currents or, importantly, in the upwelling of CO₂ rich deep water to the surface near Antarctica.

He says that small scale motions of ocean eddies act to balance the stronger winds. These are not represented by climate models currently in use, which therefore over-estimate the response of the Southern Ocean to changes in winds.

► **More information:** www.csiro.au/news/MediaCentre.html

Dissolving finding

New research published in the *Proceedings of the National Academy of Sciences* indicates that 450 parts per million (ppm) atmospheric carbon dioxide could well be a tipping point beyond which marine organisms will be severely affected by the increasing acidity of the ocean.

Dr Ben McNeil, from the **University of New South Wales**, and **Dr Richard Matear**, from **CSIRO** and the **Bureau of Meteorology**, show that the widely accepted limit of 450 ppm CO₂ is a tipping point for some of the oceans most important organisms, the microscopic zooplankton with calcium carbonate shells.

The shells of these organisms start to dissolve when sea water becomes too acidic and Dr Neil says that previous estimates suggested that in the Southern Ocean this ‘dissolution point’ would occur after atmospheric CO₂ concentration reached 550 ppm, which is expected for the latter part of the 21st century.

By using a new technique that better quantifies CO₂, the researchers found natural processes amplify the onset of this dissolution point to occur when atmospheric CO₂ reaches 450 ppm or as early as the year 2030. “Earlier Southern ocean acidification has direct consequences on the calcifying organisms, and yet unclear flow-on impacts to the higher trophic organisms like fish or whales which feed on them,” says Dr Neil.

► **More information:** www.aussmc.org

photo: wikimedia



Superb fairy wren (*Malurus cyaneus*)

Fostering Australian University Research

Having just stepped back from heavy managerial responsibilities in the Higher Education sector and leadership roles in international university networks, I feel able to comment dispassionately on the topic. Admittedly it is narrow. A great strength of the Cutler Review, *Venturous Australia*, is its multisectorial approach to enhancing an innovation culture in Australia. Phrases like ‘connectivity’, ‘collaboration for productivity’, ‘virtuous cycle’, ‘information flows’, ‘open innovation’, ‘market facing’ and ‘self transformation’ are markers for a nationwide cooperative leap forward. I believe, however, that in each component of an overall innovation culture the structural context must provide incentives for decision makers, so I feel free to focus on those incentives which apply (or should apply) within universities.

For many years the biggest problem for me has been the lack of any systematic scheme to develop basic research infrastructure. I speak not of researchers nor of their equipment, but rather the buildings to house them. Existing block grants cannot be used in this way so there is severe difficulty in mounting major new initiatives, especially inter – disciplinary ones, and in attracting overseas stars and their teams. Of course the Endowment Fund was established to tackle this – but

For many years the biggest problem for me has been the lack of any systematic scheme to develop basic research infrastructure.



... government policy should not be squeamish about potential leakage of funding to foreign universities or companies.

in areas which can be measured. This has obvious strategic implications for we must have a ticket at the table to access the remaining 98%. It means we must take the risk and fund some areas of high impact basic research (although picking winners is not easy) and that we must encourage our academics to travel. We need schemes to bring more researchers here and we must be part of international alliances. In particular government policy should not be squeamish about

public universities to forge their own destiny with refreshing vigour; on the other hand the Centres of Excellence system of research funding seems to have put at threat perfectly good public universities with less overall strength.

There is a great looming challenge for Australia in fine-tuning a system of compacts and clusters in such a way as to reward leadership initiative throughout the system. In other parts of Asia I have discerned a tendency for university presidents to be hired and fired on the basis of (flawed) international league tables so we have the further challenge of evaluating research performance fairly and making this a rigorous component of funding allocations while nurturing the whole system.

Australia’s research contribution to world productivity is around 2%

potential leakage of funding to foreign universities or companies. We should adopt an investment strategy approach in the international area.

Similarly we would benefit from a climate of more open innovation in the commercialisation of university research. Over the last few years I feel that government agencies have over-estimated the potential returns and written more onerous contracts. The universities have responded by doing the same with an eye to taxpayer audit. If I am correct, this has the danger of missing the main game with the outcome being that none of us can be blamed, but opportunities are lost. Companies should find universities easier to deal with.

All of this requires heightened public awareness of the benefits and risks of science and technology in an overall climate of adventurous innovation. Key decision makers must be kept abreast of the world issues arising from research, not least so that they are less susceptible to emotion-based lobbying, and everyone, especially youth, should gain an appreciation of both the joy and practicality of research.

The universities have an important obligation here. Meanwhile society should help them with infrastructure, full –funding of research grants, encouragement of international engagement and a more entrepreneurial risk-accepting regimen.

**Professor Gavin Brown* was formerly vice-chancellor at the University of Sydney

its small size means it is a solution in principle not in practice.

Close behind comes the frustration of underfunding of research grants. These typically go to individual researchers with the university being required to provide both overheads and partial contribution. As *Venturous Australia* explains, this forces cross-subsidy, usually from overseas student teaching fees and damages both research and teaching viability. As grant success rates are already low, there is little need for further demonstration of institutional commitment and the only solution is more money in the system - a strategy backed by OECD comparisons.

As cross-subsidy is currently necessary, there is incentive for public research universities to develop private for-profit colleges and there are some sociological arguments in favour. However there is fear of brand dilution and of deviation from core purpose. Similarly it would have been logical to retain the funding from domestic full-fee students (and the opportunities provided) but that is deeply controversial.

To save on costs one might tackle those problems by further concentration of research resources to fewer universities. China, Taiwan, Korea, Japan, Germany, Malaysia have all gone down this track to various degrees and so, in a sense, has Australia, where something like 70% is won by Go8 universities and ANU has additional dedicated government funding. Recent observation of Japan suggests great caution. On the one hand relaxation of governance protocols has allowed leading Japanese

Driving green down under

Amid the global financial crisis, an era of dwindling oil reserves, a warming climate and a global car industry on the brink of collapse, the **Australian Government** has put forward a \$6.5 billion plan *A New Car Plan for a Greener Future*, to revitalise the struggling Australian car and manufacturing industry, and to prepare it for challenges ahead.

The plan builds on recommendations by **Steve Brack's** Review of Australia's Automotive Industry and centres on the following cornerstones:

- a new **Automotive Transformation Scheme (ATS)**, running from 2011 to 2020 and providing \$3.4 billion to the industry including:
 - capped assistance of \$1.5 billion over 2011 to 2015 (up from the \$1 billion planned for Automotive Competitiveness and Investment Scheme Stage 3) and
 - new capped assistance of \$1 billion over 2016 to 2020, whereby assistance will be in the form of grants rather than duty credits;
- an expanded **Green Car Innovation Fund** of \$1.3 billion brought forward to 2009 and running over ten years with assistance provided in form of grants;
- changes to the **Automotive Competitiveness and Investment Scheme** in 2010 to smooth the transition to the ATS (\$79.6 million);
- an **Automotive Industry Structural Adjustment Program (AISAP)** of \$116.3 million to promote structural adjustment through mergers and consolidation in the components sector (from 1 January 2009) and facilitate labour market adjustment (from 1 November 2008);
- an **Automotive Supply Chain Development Program** of \$20 million from 2009–10 to help suppliers improve their capacity to integrate into complex national and global supply chains;
- an **Automotive Market Access Program** of \$6.3 million from 2009–10 to boost component suppliers access to global supply chains;
- a new **Automotive Industry Innovation Council**, bringing key decision makers together to drive innovation and reform; and
- a \$10.5 million expansion of the LPG vehicle scheme, to start immediately, that doubles payments to purchasers of new private use vehicles that are factory-fitted with LPG technology.

There will also be a cut of automotive tariffs to 5%.

The total level of assistance detailed in the plan is \$6.2 billion between 2008-09 and 2020-21, of which \$3 billion is already committed, and \$3.2 billion is net new funding. The Government expects business investment of at least \$16 billion in new capacity and technologies resulting from the assistance package, which will have a high level of support at the beginning and eventually tapering out to zero.

Major objectives of the plan are:

- to attract new investment to the industry amid challenges posed by global warming, the emergence of low-cost competitors, and rising fuel prices – a situation compounded by the recent deterioration in the international economy;
- to accelerate the development of fuel-efficient, low-emission vehicles;
- to strengthen the local supply chain and boost skills by providing incentives for firms to upgrade workforce skills and extending their own capabilities, and by specific measures to make suppliers more creative, resilient, competitive and export-focused;
- to increase international engagement building on Australia's already existing strong export position (\$5.6 billion worth of vehicles and components in 2007-2008), with the aim of increasing overseas sales,

contributing to design and development of global vehicle platforms, and improving links to international supply chains.

Heather Ridout, chief executive of the **Australian Industry Group** welcomed the plan saying: "The Government has not only accepted the recommendations of the Bracks Review, but has acted sensibly in bringing forward its implementation and boosting funding for the Green Car Fund and the industry restructuring package." She says the decision to reform the Automotive Competitiveness and Investment Scheme to focus more on local innovation, design, exports and supply chain improvements, will deliver better economic outcomes and inject much needed flexibility into the scheme."

KPMG automotive partner, **David Gelb**, also applauded the plan saying the increase in green funding is the key to creating a sustainable industry. He notes that there will be significant spill-over effects for the rest of the Australian economy with this boost to R&D but, he warns, speed and implementation of the plan were critical to success.

He further says: "Whilst the Government's announcement has sent a positive message that it is firmly committed to supporting innovation, the broader Australian industry is eagerly awaiting the Government's response to the Cutler Report, which recommended much needed enhancements to R&D tax incentives."

► **More information:** DIISR www.innovation.gov.au/automotivereview; AIG Anthony Melville: 02 6233 0700; KPMG Rebecca Cook, 03 9288 5178



image: adapted from www.innovation.gov.au/automotivereview by Etwinmedia

The future of the net: IPv6

Since it went commercial in mid-1990, the Internet has been arguably one of the fastest processes for world-wide adoption of new technology. However, as its global success unfolded, the engineers behind the technology, the Internet Engineering Task Force (IETF), soon realised that the technology, which in its current Internet protocol version 4 (IPv4) allows for only 4.2 billion unique addresses, would be insufficient for global demand. The use of technical fixes such as 'private' addresses and classless interdomain routing (CIDR) allowed continued expansion of the worldwide Internet, but they were only ever stopgap solutions.

If the current rate of allocation continues, the pool of IPv4 addresses is expected to run out by 2010 and further growth of the Internet will require the adoption of a new generation of Internet technology, Internet Protocol version 6 (IPv6).

The IETF developed the Internet Protocol as the standard by which computers all around the world could transfer data. The protocol provides for data to be separated into 'packets' composed of a payload and address information. By increasing the length of the address from 32 bits used in IPv4 to to 128 bits, IPv6 vastly expands the number of original addresses that can be used on the Internet to 3.4×10^{38} unique addresses. By way of analogy, if all the IPv4 addresses occupied a volume the size of a mobile phone, then you would need a phone the size of Planet Earth to contain all IPv6 addresses.

The imperative to adopt IPv6 will affect all major international economies including North America, Asia and Europe, a fact which was highlighted at the recent 2008 Australian IPv6 Summit* in Canberra.

IPv6 vastly increases the scale of networks that can be built using Internet technology. It also includes additional features, which were not originally included in the IPv4 version of Internet technology. IPv6 allows the elimination of network address translation (one of the stopgap solutions mentioned above) so that all addresses used are unique and can be reached from any other part of the Internet, in what is called an end-to-end architecture. Such an approach allows all computers on the Internet to become producers as well as consumers of information. Ultimately, this approach will support a shift from the 'Internet of desktops' to the 'Internet of devices', and support technologies such as large scale sensor networks, which could be used in environmental, energy or security monitoring. IPv6 includes enhancements such as autoconfiguration and mandatory support for the Internet security protocol (IPSEC).

There are, however, major challenges (and opportunities) in the transition for business and policy.

IPv6 is not backward compatible with IPv4. Both can coexist on the same network, and neither protocol will interfere with the other, but they cannot interwork. Therefore, a transition process is required to move all parts of the Internet onto IPv6, in the long term. As an interim step, the IETF has proposed that both protocols continue to operate in all parts of the Internet, under an arrangement called 'dual stack'.

A node of the Internet that uses IPv6 will be invisible to another node which uses IPv4, so one or both nodes must use both protocols, or some translation mechanism must be used. Most translation mechanisms have disadvantages of one sort or another, which is why dual stack is the

transitional method of choice.

In this environment Australia needs to build capacity to develop IPv6 skills and requires services that help to adopt the technology.

As was pointed out at the IPv6 Summit by leading Internet authorities including Vint Cerf, the father of the Internet, and Paul Twomey, chief

...if all the IPv4 addresses occupied a volume the size of a mobile phone, then you would need a phone the size of Planet Earth to contain all IPv6 addresses.



executive of ICANN, there is an urgent need to build skills and processes for adoption of IPv6.

Responding to this challenge a group of people who have been leading Australia's discussion of IPv6 and representing Australia in international forums, founded a start up company in 2007, IPv6Now**, with the aim of providing support services for Australia's transition to IPv6:

- It has developed the skills and infrastructure to support all Australian organisations as they adopt IPv6.
- It has conducted policy analysis for Australian governments, including a policy analysis of the benefits of IPv6 to Victorian industry.
- It has also built its own infrastructure that allows Internet users anywhere to access the IPv6 Internet over their existing IPv4 infrastructure.

IPv6Now is now working with the Australian Industry Group to build an IPv6 testbed network for Victorian industry, in a project funded by Multimedia Victoria. The testbed will allow industry to gain experience with the use of IPv6 prior to implementation in production networks, so as to minimise disruption to industry in a transition to IPv6. The project will initially focus on developing proof of principle demonstrations for three target sectors: health, financial services and automotive manufacturing. Businesses and organisations from these sectors will be able to become members of the testbed project, allowing them to inject design requirements into the project and allowing their staff to gain direct access to the testbed network to carry out trials and develop capabilities, which in turn can be taken back to operate in production networks. The testbed project will support product and process innovation to help industry build greater efficiency and productivity based on adoption of IPv6.

As IPv4 address exhaustion looms, it is now time to implement the necessary steps to a prosperous IPv6 future.

* www.ipv6.org.au/summit; ** www.ipv6now.com.au

Drug partners

Griffith University and **Pfizer** are to collaborate to develop the next generation of anti-infective medicine.

Griffith University's **Eskitis Institute for Cell and Molecular Therapies** investigates novel drug and cell-based therapies for human diseases in the areas of cancer, infection and immunity, neglected diseases, neurological disease and stem cell biology. The Institute's research includes a program to search new compounds from nature that can be developed into drugs.

Eskitis institute director **Professor Ronald Quinn** and his team have spent the past 14 years developing Nature Bank, a library of 200,000 natural product fractions derived from a collection of over 40,000 samples of plants and marine invertebrates collected from diverse areas of tropical Queensland, the Great Barrier Reef, Tasmania, Papua New Guinea and China. Pfizer hopes that this will be the first of several screening campaigns to be run in conjunction with Griffith University to facilitate the drug discovery programs.

► [More information: www3.griffith.edu.au](http://www3.griffith.edu.au)

Try it out in Vic

Australian startup **IPv6Now** has teamed up with **Multimedia Victoria** (MMV) and the **Australian Industry Group** (Ai Group) to build an IPv6 testbed network for Victorian industry. MMV, the ICT arm of the **Victorian Government**, and Ai Group signed an agreement, which will see IPv6Now manage the design and implementation of the testbed, and Ai Group provide the industry connections.

Tony Hill, managing director of IPv6Now says that industry will be able to test equipment and software in a working IPv6-connected network, to gain knowhow and experience that they can apply directly to their own business operations.

The testbed will be open to all Victorian industries, but is initially aimed at the finance, automotive and health sectors. Mr Hill says a main function of the testbed will be for vendors to showcase their latest IPv6 equipment. "This is an ideal and risk-free way for vendors to reach potential customers, and for industry to see what works."

Consultation with industry on the design of the network will begin almost immediately. The first users of the network are expected by March 2009.

(See also "The future of the net: IPv6, p11")

► [More information: www.ipv6now.com.au](http://www.ipv6now.com.au)

Humanised success

According to **Patrys Limited**, preclinical trials have found that several of its lead products – natural human antibodies – were effective in preventing the spread of cancer.

Treated with lead product PAT-LM1 only 35% of 20 animals with colon cancer developed metastases in the liver, which compared to 85% in a control group. PAT-LM1 is scheduled to enter human clinical trials in 2009.

Aggregate results with four additional lead products found that 'recurrence' of gastric cancer to an animal's bone marrow and blood, also referred to as 'minimal residual disease', was reduced to 38% with Patrys lead products, compared to 73% in the control group. The most potent lead product, PAT-SM6, is scheduled to start human clinical trials in 2009.

Anti-cancer benefits of natural human antibodies were also found in a

human clinical trial conducted with PAT-SC1, developed by AstraZeneca using Patrys' human antibody technologies.

According to **Dr H. Peter Vollmers**, head of research at Patrys, effective treatments can be established by identifying and developing antibodies made by the human immune system that attack and kill cancer cells – as a supplement to cancer patients' own natural anticancer immunity.

► [More information: www.patrys.com](http://www.patrys.com)

Vaccine booster

Scientists at **Industrial Research Limited** (IRL) in Wellington anticipate that a new synthetic vaccine adjuvant could work safely in humans and be used in a wide range of vaccines against viruses, bacteria and cancer. Adjuvants are often required to boost the immune response to a vaccine, but they are usually too toxic for human use. Only one adjuvant is currently licensed for use in human vaccines in the US, according to **Richard Furmeaux**, group leader of Carbohydrate Chemistry at IRL.

Freund's adjuvant, usually an extract from TB causing mycobacteria, is commonly used to boost immune responses in animal studies. However, the associated toxic side-effects have prevented the use in humans. IRL's adjuvant is a synthetic glycolipid, a carbohydrate-based molecule derived from the cell wall of mycobacteria. It seems to be similarly effective as Freund's adjuvant but without the dangerous side-effects. IRL has now entered into an agreement with a leading New Zealand research centre, the **Malaghan Institute of Medical Research**, to test their adjuvant with a cancer vaccine.

► [More information: www.irl.cri.nz/newsandevents.aspx](http://www.irl.cri.nz/newsandevents.aspx)

Rheumatic news

Biotechnology company **Arana Therapeutics Limited's** lead anti-inflammatory compound, ART621 has successfully passed review of its rheumatoid arthritis (RA) Investigational New Drug (IND) application by the **US Food and Drug Administration**.

IND status indicates regulatory approval to conduct clinical trials in humans in the US and represents the first review of ART621 data by a major regulatory authority. Arana can now proceed with its planned Phase II study in rheumatoid arthritis.

Arana has also submitted regulatory and ethics approvals for a pilot study of ART621 in RA. The randomised double-blind trial – designated ART621/223 – will compare four different dose regimens of ART621 and is designed to quickly obtain initial safety and efficacy data in this patient population. Interim data from this study will be used to optimise the dosing regimen for ART621/221 – the international multi-centre Phase II dose ranging RA study.

The factorial-design, randomised, double-blind, placebo-controlled study will investigate the safety, efficacy, immunogenicity and pharmacokinetics of different dose regimens of ART621 following multiple dose administration in subjects diagnosed with rheumatoid arthritis concomitantly taking methotrexate. The primary endpoint is safety with secondary endpoints including efficacy measures. The study will be conducted at a single centre in Sri Lanka and will aim to enrol approximately 20 patients.

Arana's acting chief executive officer **Dr Steffen Nock** says: "The two RA studies combine to give us a cost effective and risk managed approach to identifying the optimal dose regimen for ART621 in RA."

► [More information: www.arana.com/news_media.htm](http://www.arana.com/news_media.htm)

Patently helpful

The **United States Patent Office** has allowed **Antisense Therapeutics Limited's** (ANP) US patent application *Modulation of insulin like growth factor I receptor expression* (10/545354) covering the ATL1101 compound until 2024. With this allowance the granting of the US patent is a formality and will take place in the coming months.

The US patent forms part of the company's extensive portfolio of intellectual property protecting ATL1101 and its uses. This includes patent applications in Europe, Japan, Canada and Australia and a granted NZ patent 541637.

Alongside the important allowance of the US patent, ANP has lodged a new US provisional patent application *Modulation of insulin like growth factor I receptor expression in cancer* (61/105,367) based on the preclinical data generated from its successful ATL1101 prostate cancer animal study. The application was filed in order to extend protection for ATL1101 in prostate cancer and other cancers by 5 years to 2029 in the US.

Additional patent protection is also provided internationally for ATL1101 by Isis Pharmaceuticals' antisense technology and manufacturing patents and applications to which ANP has a world-wide license.

► [More information: www.antisense.com.au/_home.asp](http://www.antisense.com.au/_home.asp)

Metabolic progress

Phosphagenics Limited has announced that recruitment of the Phospha E[®] phase 2 clinical trial for the management of metabolic syndrome, which commenced last year, has been completed. Five sites throughout Australia were used to recruit 160 patients, the majority of which are nearing completion. The results from the trial are expected towards the end of the first quarter of 2009.

Two previous pre-clinical dose response trials had confirmed that, when given orally, Phospha E[®] significantly reduces many of the key biomarkers associated with metabolic syndrome, which is characterised by a group of risk factors that increase the threat of diabetes, coronary heart disease and other diseases associated with plaque build up in artery walls.

Phosphagenics has agreed on the principal terms of a commercialisation agreement, which would grant a worldwide exclusive license to its partner, a global nutrition company, for the use of Phospha E[®] in medical foods. Under the terms of the agreement, Phosphagenics would be the exclusive manufacturer and supplier of Phospha E[®]. The decision whether to execute a final commercial agreement will be made once the results of the phase 2 trial have been assessed.

► [More information: www.phosphagenics.com/main/News_Releases.htm](http://www.phosphagenics.com/main/News_Releases.htm)

Retroviral news

Avexa has completed recruitment of the first 160 patients for the two-dose component of its Phase III trial for apricitabine (ATC), with over 300 patients in the screening or dosing stages of the trial.

ATC is a possible first line therapy for HIV-infection. The trial is ongoing with over 130 specialist HIV centres in 15 countries.

Results from this component of the trial are expected in the second quarter of 2009.

The company has also provided an update on the ATC extension study associated with its earlier Phase II b trial. Thirty seven patients remain on ATC, with the longest dosed patients receiving ATC for nearly three years. All patients in the extension study have completed at least 96

weeks of dosing. Thus far, patients have not developed resistance to ATC and there have been no reported Serious Adverse Events related to the drug candidate. According to chief executive officer **Dr Julian Chick**, the length of time that some patients have elected to remain on ATC validates its potential to be a robust, long-term component of any HIV treatment regimen.

Avexa has also provided an update on its antibacterial program with data presented at the *48th Interscience Conference on Antimicrobial Agents and Chemotherapy/ Infectious Diseases Society of America* meeting, held in Washington, DC. The data presented showed potent *in vivo* antibacterial activity of Avexa's lead antibacterial candidate AVX13616, particularly against gram-positive pathogens, such as drug-resistant *Staphylococcus aureus*. AVX13616 was as active as mupirocin in a nasal decolonization model but required only a single application.

The compounds are being developed for topical indications and/or wound infection/catheter-related infections. Dr Chick says that gram-positive pathogens like *Staphylococcus aureus* become increasingly important, particularly in nosocomial infections. "The activity of AVX13616 against drug-resistant bacteria demonstrates its potential as an agent to combat these serious and difficult-to-treat infections."

► [More information: www.avexa.com.au/news/press_releases_2008](http://www.avexa.com.au/news/press_releases_2008)

Attractive stem cells

Mesoblast Limited's adult stem cell technology platform has been awarded the 2008 Frost & Sullivan United States Stem Cell Market Technology Innovation of the Year. The award is recognising the success of Mesoblast's US-based sister company, **Angioblast Systems Inc.**, in developing and introducing new/disruptive technology, formulating a well-designed product family, and making significant technology contributions to the industry.

Frost and Sullivan industry analyst **Katheryn Symank** comments that several attractive attributes set Angioblast's proprietary technology apart from other stem cell products, including very accurate identification and isolation. "Since Angioblast's proprietary technology allows for a very pure, potent and homogenous cell population, we view the recent pharmaceutical partnering activity in the stem cell space as a major validation of Angioblast's approach. This underscores the company's prospects for significant commercial transactions," Ms Symank noted.

► [More information: www.mesoblast.com/](http://www.mesoblast.com/)

Safer transplantation trial

Mesoblast Limited has commenced a Phase I/II clinical trial in the US using the patented allogeneic, or "off-the-shelf", Mesenchymal Precursor Cells (MPCs). The trial will be in up to 30 patients with haematologic malignancies undergoing bone marrow transplantation.

The clinical trial will evaluate the safety and effectiveness of the proprietary MPCs in increasing the rate and speed of bone marrow engraftment following transplantation of haematopoietic stem and progenitor cells. At present, only about 30% of patients with haematologic malignancies who could benefit from transplantation of haematopoietic stem and progenitor cells from the bone marrow of a healthy donor, have a genetically matched sibling. For the rest receiving a bone marrow transplant from an unrelated donor carries a high risk of potentially fatal graft-versus-host disease.

The MPC product used in this trial will be developed under the **FDA** orphan drug designation recently granted to Mesoblast's US-based sister

company **Angioblast Systems Inc.** Orphan drug designation is reserved for therapies being developed for conditions affecting up to 200,000 patients annually in the US. It allows for an accelerated review process by the FDA, seven-year market exclusivity in the US upon obtaining marketing authorisation, tax benefits, and exemption from user fees.

► [More information: www.mesoblast.com/](http://www.mesoblast.com/)

Global launch

LORENZO, a software solution for healthcare organisations, has been launched globally by **IBA Health Group Limited**, Australia's largest listed health information technology company.

Built on a service oriented architecture, LORENZO enables healthcare providers to manage their processes while giving secure authorised access to patient information to those who need it, anywhere and at any time. Designed to adapt to existing healthcare IT systems for all points of need—from hospital to community and clinic settings, LORENZO is being rolled out to manage over 30 million patient records as part of the world's largest civilian IT project—the \$30 billion National Programme for IT for the **UK's National Health Service**.

► [More information: www.ibatech.com/html/](http://www.ibatech.com/html/)

No objections

A European patent (0695361) covering **Stem Cell Sciences plc's** (SCS) IRES technology has been upheld by the **European Patent Office** in Munich, which dismissed objections against the patent raised by Institut Pasteur in April 2007.

SCS' IRES (Internal Ribosome Entry Site) technology enables researchers to monitor the activity of a gene of interest in living cells or tissues without blocking the normal function of the gene. This is important for evaluating the success of gene deletions or insertions in stem cells, crucial in the creation of transgenic mouse and rat disease models.

SCS had recently announced its expansion of out-licensing activities for this technology through an agreement with a leading provider of genetically modified rat and mouse models for pharmaceutical research. Under the terms of this multi-year agreement, which is non-exclusive and retroactive, the undisclosed partner will gain access to the IRES technology for use in its own research and development activities. SCS will receive US\$750,000 over six years plus royalties.

In further developments, the **UK Intellectual Property Office** has granted a new UK patent (2428041) covering methods for obtaining cells, especially stem cells, which are particularly useful for drug screening applications and high-throughput assays examining the effects of genes and molecules on stem cell growth. The key step protected by this patent relates to a process known as 'episomal expression' whereby genes of interest remain as free DNA in the cell (an 'episome') rather than being integrated into the chromosome, and this results in more efficient expression of the genes and molecules under assay.

► [More information: www.stemcellsciences.com/](http://www.stemcellsciences.com/)

Trans-dermal update

Phosphagenics Limited has initiated a phase 1 human clinical trial using its patented drug delivery system, TPM, for the targeted delivery of a leading non steroidal anti-inflammatory drug, Diclofenac. The trial will compare the bioavailability and penetration of the topically applied Voltaren® gel (1% Diclofenac), one of the leading marketed products, and

Phosphagenics' Diclofenac (at 1% and 2% Diclofenac concentrations).

The trial is an open label, single centre bioavailability and penetration trial of dermal and systemic pharmacokinetics in 12 healthy adult volunteers, incorporating secondary endpoints of safety and tolerability. The company expects to obtain and announce the results of this phase 1 trial in the first quarter of 2009.

According to **Dr Esra Ogru**, executive vice president of Research and Development at Phosphagenics, Diclofenac is a well known topical anti-inflammatory drug most commonly used for sprains and strains. He says preclinical studies with TPM/Diclofenac have demonstrated significant increases in skin penetration of diclofenac compared to the market leader (Voltaren®). "The advantage of our formulated Diclofenac is that it increases the amount of anti-inflammatory drug delivered to the site of action," he says.

► [More information: www.phosphagenics.com/main/News_Releases.htm](http://www.phosphagenics.com/main/News_Releases.htm)

Continued ovature

The Independent **Data Monitoring Committee** (IDMC), constituted to oversee the conduct of the Phase III OVArIAn TUmour REsponse (OVATURE) Trial, has recommended continuation of the study, according to **Novogen Limited's** US subsidiary, **Marshall Edwards Inc.** The trial is recruiting ovarian cancer patients whose cancer initially responded to chemotherapy, but has since become resistant or refractory to traditional platinum treatments.

The Phase III clinical trial is to determine safety and effectiveness of orally-administered investigational drug phenoxodiol when used in combination with carboplatin in women with advanced ovarian cancer resistant or refractory to platinum-based drugs. The patients are being recruited at clinical sites across USA, UK, Europe and Australia.

Following the review of recruitment progress, as well as safety and efficacy data, the committee has recommended that the study remains open and continue as planned towards its accrual target of 340 patients.

According to **Professor Husband**, group director of Research, site recruitment was slower than expected in the early stages of the study, but there are now 75 sites involved and the pace of recruitment has increased significantly. He says that at the time of the committee meeting 78 patients had completed on the study.

► [More information: www.novogen.com/](http://www.novogen.com/)

Combined superior

At the *9th International Conference on Membrane Redox Systems* in Wellington, New Zealand, **Dr David Brown** presented data from pre-clinical studies showing that **Novogen Limited's** NV-128, a novel mTOR inhibitor, produces potent synergistic anti-cancer activity against non-small cell lung carcinoma cell lines (NSCLC), when used in combination with the Phase III anti-ovarian cancer drug phenoxodiol from Novogen's US subsidiary **Marshall Edwards Inc.**

In NSCLC targets the two drugs combined were more effective than either drug alone or in combination with current approved anti-cancer cytotoxic drugs. Together with the safety profile of these drugs, this suggests a potential for clinical benefits in lung cancer patients which cannot be achieved with current standard of care drugs.

Phenoxodiol is being developed as a therapy for late-stage, chemoresistant prostate and ovarian cancers. It is a novel-acting drug that, by inhibiting key pro-survival signalling pathways, restores the ability of chemoresistant tumor cells to undergo programmed cell death mediated

by a family of proteases, caspases. Caspase-mediated apoptosis is often non-functional in chemoresistant cancer cells.

In contrast to Phenoxodiol, NV-128 does not induce caspase-mediated apoptosis but uncouples the akt-mTOR-P70S6K signal transduction cascade, which plays a key role in driving protein translation and uncontrolled cancer cell proliferation.

“These data provide direct evidence that while invoking discrete modes of cell death, NV-128 and phenoxodiol can be used synergistically to force the convergence of caspase-mediated and caspase-independent cell death pathways to drive overall cell death,” says Dr Brown.

► [More information: www.novogen.com/](http://www.novogen.com/)

Restricted cancer testing

Genetic Technologies Limited (GTG) has recently made a commercial decision to enforce the rights granted to it under an exclusive license to use patents from **Myriad Genetics Inc.** for diagnostic testing of the BRCA1 and BRCA2 genes in Australia and New Zealand.

Inherited alterations in the BRCA1 and BRCA2 genes (short for breast cancer 1 and breast cancer 2) are involved in many cases of hereditary breast and ovarian cancer.

GTG director **Dr Mervyn Jacobson** has previously stated that he was unhappy with this decision as he believes GTG should continue to allow other laboratories in Australia to freely perform the BRCA testing.

GTG wishes to advise that its new Board of Directors, appointed at the company's Annual General Meeting held on 19th November 2008, is undertaking a formal review of the GTG decision. The review is expected to be completed at the meeting of directors to be held on 1st December 2008.

► [More information: www.gtg.com.au/](http://www.gtg.com.au/)

Flu opportunities

Biota Holdings Limited has announced that the multiple centres involved in the Phase III clinical trial on its long acting neuraminidase inhibitor (LANI) CS-8958 are ready to commence treatment. Patients are expected to enrol into the study progressively throughout the Asian influenza season.

The Phase III multi centre study will be conducted in Japan, Taiwan, Hong Kong and Korea involving adult patients who have confirmed, naturally acquired influenza A or B. The trial will use time to symptom resolution as its primary end point, after a single inhaled dose of CS-8958. The double blind, non-inferiority study uses 75 mg of oseltamivir, twice daily for five days as its control. Safety will be also assessed.

A second Phase II/III paediatric study will be conducted in Japan on children of less than nine years of age. This study will use the same primary end point as the adult study, but a dose of 2 mg/kg of oseltamivir, twice a day for five days, as the control.

The duration of the studies will depend on the availability of patients for the trials and the severity of the Asian influenza season.

► [More information: www.biota.com.au/](http://www.biota.com.au/)

Cracking China

Polartechnics, has signed a distribution agreement for its TruScreen product with Shanghai **Kaidi Medical Equipment Co Ltd** (Kaidi).

Kaidi has entered into a contract with the **Chinese Women's Doctors Association** to supply TruScreen as the Cervical Cancer Screening Test

for over 1 million women over three years. Over this period, Polartechnics forecasts sales for TurScreen of \$88 million.

Kaidi is a subsidiary of the **Unisplendour Group**, which, based in Beijing, has an annual sales revenue in excess of RMB 3 billion (\$650 million). Included in its operations are substantial investments involving medical and pharmaceutical manufacturing and distribution.

Beijing Unisplendour Junchuang Med Co Ltd (BUJM), another Unisplendour Group subsidiary, has placed an initial order for 100,000 of Polartechnics' CerviScreen personal DNA collection devices, to be delivered before 31 March 2009. BUJM is planning to distribute CerviScreen as an Over The Counter consumer product for screening of HPV and Sexually Transmitted Infections (STI's). Mutually agreed forecasts for CerviScreen sales in China are over 10 million units per annum, worth approximately AUD \$46 million in revenue over the next three years. In addition, BUJM has signed an agreement to invest \$2million via a share placement in Polartechnics by 24th February 09, subject to further due diligence.

► [More information: www.polartechnics.com.au/IRM/Content/Index.htm](http://www.polartechnics.com.au/IRM/Content/Index.htm)

Better positioned

For the year ended 30 September 2008, **Arana Therapeutics Limited** has reported revenues of \$39.5 million, an increase of \$4.9 million or 14% over last year. The strong Australian dollar through the 2008 financial year offset a significant increase in underlying US dollar denominated revenues. This included income earned on the major new collaboration with **Kyowa Hakko Kirin**. Revenues for the period also included increased interest income on Arana's significant cash balance due to higher interest rates.

For the period, Arana reported a net loss of \$4.1 million which included the writing off of tax losses, contributing to a \$3.0 million tax expense, and non cash depreciation and amortisation expenses of \$9.6 million. In the previous year the company reported a profit of \$133.4 million, which included a \$136.1 million gain from the sale of shares in Domantis.

Cash at 30 September 2008 was \$181.6 million, an increase of \$12.6 million compared with last year.

Arana's lead inflammatory product ART621, has successfully passed review by the **US Food and Drug Administration** and the planned Phase II study in rheumatoid arthritis can now proceed. Results of the ongoing Phase II psoriasis trial are expected in the first quarter of 2009.

► [More information: www.arana.com/news_media.htm](http://www.arana.com/news_media.htm)

Quarterly results

The drug delivery company **pSivida Corp.** has reported a consolidated net loss of US\$471,000 for the first quarter ended 30 September 2008, which compares to US\$795,000 for the quarter ended 30 September 2007. Revenues for the period were US\$2.8 million and were predominantly related to the company's March 2008 amended collaboration agreement with **Alimera Sciences, Inc.**

pSivida's lead development stage product, MedidurTM FA, is in pivotal Phase III clinical trials for the treatment of diabetic macular edema (DME). Medidur is a tiny injectable device that delivers the drug fluocinolone acetonide (FA), a corticosteroid, for up to three years after being injected into the vitreous of the eye. The Phase III clinical trials were fully enrolled over a year ago and filing for **FDA** approval is planned in early calendar 2010 with two year data.

► [More information: www.psvida.com/news/ASXAnnouncements.asp](http://www.psvida.com/news/ASXAnnouncements.asp)

Connective hope

The **Medical Research Commercialisation Fund** has invested \$3 million to bring the the fibrosis treatment drug FT-11 to a commercial reality. The fund is backed by the **Victorian, NSW and West Australian Governments** with investment funding from the superannuation funds

Statewide and Westscheme.

The **University of Melbourne** shares patent rights for the drug through **Fibrotech Therapeutics**, the company commercialising the drug. The university's commercialisation company **Melbourne Ventures** has also worked closely with Fibrotech on

its commercial and strategic development, under a program supported by the Victorian Government Vicstart initiative. The drug will initially be developed to treat people with kidney disease caused by diabetes.

According to Fibrotech's **Associate Professor Darren Kelly**, FT-11 will be trialled on approximately 30 Victorian patients and, depending on the clinical trial outcomes, could be available within six to eight years.

► **More information:** www.premier.vic.gov.au/

Tropical hub

Queensland's Premier **Anna Bligh** has announced **Q-Tropics**, the **Queensland Tropical Expertise Strategy**, will establish a \$19.45 million **Queensland Tropical Health Alliance** based at **James Cook University (JCU)** in **Townsville** and **Cairns** and a laboratory in **Brisbane**.

The initiative includes:

- \$12 million for new facilities and equipment in **Townsville** and **Cairns JCU** campuses;
- \$5 million fit-out of a new floor in the new **Queensland Institute of Medical Research** building in **Brisbane**;
- \$2.3 million for a new laboratory and equipment at **Griffith University**; and
- \$150,000 for new molecular diagnosis equipment at the **Queensland University of Technology**.

The new strategy will build on Queensland's existing tropical expertise strengths and identify market opportunities with the strategy revolving around four key industry pillars: **Health**; **Environmental Management**; **Tropical Primary Industries**; and **Tropical Living**.

Other measures under the Q-Tropics plan include the establishment of a Q-Tropics Regional Hub to link institutions doing research on tropical expertise, and a new tropical science committee led by chief scientist **Peter Andrews**.

► **More information:** **David Yellowlees, 0438 164 824**

Controversial closure

Seven agricultural research stations in NSW are to be closed over the next three years following the state's recent mini-budget. The closures were prompted by a **NSW Department of Primary Industries** review to determine "the most efficient way of servicing rural communities and to make sure Government priorities, such as climate change, are met."

The department is to move towards a more regional, rather than district-based, extension services model.

The seven stations to be closed are at **Alstonville**, **Berry**, **Condobolin**, **Glen Innes**, **Gosford**, **Griffith** and **Temora**. A decision to also close the trout hatchery at **Jindabyne** has been postponed after strong protests.

► **More information:** www.treasury.nsw.gov.au

Cancer funds

The **Victorian Government** has given the **Victorian Breast Cancer Research Consortium (VBCRC)** a boost of \$12 million to continue its research into breast cancer prevention, diagnosis and treatment.

The VBCRC is a consortium of eight Melbourne medical research institutes and the **Cancer Council**. Outcomes at the VBCRC include the identification two years ago of breast stem cells that originate breast tissue formation.

► **More information:** www.premier.vic.gov.au/

Aquatic partners

The **Victorian Department of Primary Industries** and **South Australian Research Development Institute** will collaborate in joint projects on fisheries biology, assessment and modelling together with aquaculture research and development, marine and freshwater ecological research and environmental assessment.

The new partnership builds on the **Victorian Government's** \$205 million **Future Farming Strategy**, which includes an initiative on adaptation of fishing industries and fisheries management to climate change and an aquaculture futures initiative.

► **More information:** www.premier.vic.gov.au/

Tubular bells

The **Heart Foundation** and the **South Australian Government** are funding a \$5 million program to encourage research into the causes and treatment of strokes and heart and blood vessel diseases. The **South Australian Cardiovascular Research Development Program (SACVRDP)** will support the research over a period of seven years and fund two categories of cardiovascular research awards.

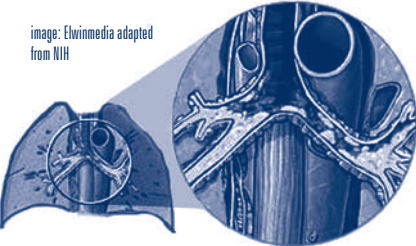
Two development grants will be awarded for tenures of up to four years starting in 2010. These grants will help emerging research leaders to build a track record in research and collaboration. Four research fellowships will also be awarded for tenure of up to three years, with the first two starting next year. The fellowships will support outstanding early career researchers.

► **More information:** www.ministers.sa.gov.au/news.php?id=3965&page=1

Green trees wanted

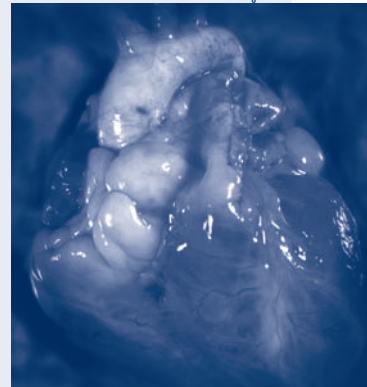
Funding worth \$2.4 million has been allocated for five key research projects to drive a 'green' forest industry in Queensland.

image: Elvinnmedia adapted from NIH



Cystic fibrosis is a hereditary disorder characterised by lung congestion and infection.

image: Vanessa Ruis



Regional Development and Industry Minister **Desley Boyle** says the projects were supported through the Plantation Hardwoods Research Funds, designed to help the State move from native forest harvesting to a plantation-based industry.

The projects include:

- research at the **University of the Sunshine Coast** and the **Department of Primary Industries and Fisheries (DPI&F)** to improve the quality of plantation hardwood trees through better breeding and selection;
- a forest industry research organisation and **CSIRO** examining the pest and disease management in sub-tropical hardwood and develop models for managing potential outbreaks;
- **DPI&F** researchers addressing the gap in knowledge around the natural durability of plantation timber;
- researchers at the **DPI&F** and companies from the plywood manufacturing sector investigating the potential of **Queensland** hardwood plantations for high-value products such as veneer for plywood; and
- a hardwood plantation log sawing firm, a plantation grower and **DPI&F** researchers conducting a trial of a state-of-the-art sawing system suitable for processing plantation material.

► **More information:** 07 3225 1005, 0419 025 326

Q-boost for clinical research

The **Queensland Government** has established a \$20 million senior clinical research fellowship scheme providing six fellowships, each worth up to \$850,000 a year over five years. Fellowship recipients will be required to deliver clinical care in addition to undertaking research.

► **More information:** Martin Philip 07 3225 2680

Vic biodiscovery aid

A new policy introduced by the **Victorian Government** will make it easier for scientists to collect limited material from Victoria's native plants and animals to create new medicines. 'Biodiscovery' is a new framework for managing access to and use of native biological resources. It aims to prevent over-harvesting and exploitation while allowing scientists limited access to Victoria's natural resources to create new drugs, jobs and export income.

The policy includes benefit-sharing agreements, a compliance code and rigorous application assessment system. It meets internationally agreed requirements under the *Convention on Biological Diversity* and is consistent with the **Victorian Biodiversity Strategy**.

► **More information:** www.premier.vic.gov.au/

Solar power project

A new \$10 million state-of-the-art solar plant run by **Solar Systems** at Bridgewater, Victoria, will be used to test and optimise technology, and is a key milestone in the \$420 million large-scale solar power station planned for the Mildura region. The **Victorian Government**

has contributed \$50 million to help deliver the 154MW solar power station, with construction to begin next year once a site in the Mildura region has been finalised.

Solar Systems has also received a grant of up to \$50 million from **Victoria's Energy Technology Innovation Strategy (ETIS)** for their 154 megawatt solar power project.

► **More information:** www.premier.vic.gov.au/

GM stop and go

Western Australia's Government will lift the moratorium on the commercial production of genetically modified cotton at East Kimberley's Ord River Irrigation Area. Agriculture and Food Minister **Terry Redman** says the decision has been taken after extensive GM cotton trials in the Ord River area during the last decade, under the supervision of the **Office of the Gene Technology Regulator, Department of Agriculture and Food** and **CSIRO**.

"The trial crops have been very successful from a production point of view, yielding almost 11.5 bales a hectare," he says. "Over the years, trials of GM cotton in the Ord have frequently out-yielded Australian production by about 10%. These trials have shown that there are no agronomic problems, including the control of insects, in growing GM cotton in the Ord. Importantly, there have been no environmental concerns with the crops."

However, the GMO (genetically modified organism) ban in Tasmania will stay until 2014. Tasmanian Minister for Primary Industries and Water **David Llewellyn** says Tasmania's GMO-free status is a key factor in the Tasmanian brand and is therefore vital to Tasmania's primary producers realising their full potential in international and interstate markets. The Minister says the **Department of Primary Industries and Water** will be actively working with industry to investigate GMO-free seed production and other opportunities.

► **More information:** WA, 08 9213 6700; Tasmania, 03 6233 6573

Research partnerships

Tasmania's Minister for Economic Development, **Michael Aird**, has announced companies **Pitt and Sherry** and **Verdant Tasmania** as the two successful applicants to receive funding from the State Government's 2007-08 Research Partnerships Program. The program offers funding support for businesses to work with researchers who have the expertise to help them develop innovative products, processes or services that have commercialisation potential.

Pitt and Sherry is partnering with the **Antarctic Climate and Ecosystems Cooperative Research Centre** to develop a system that will enable the assessment of the performance of major infrastructure in Tasmania under different climate change scenarios. The project will help develop a risk profile for significant Tasmanian infrastructure assets and aid in the planning and design of new infrastructure.

Verdant Tasmania and the **CSIRO ICT Centre** in Hobart and the **CSIRO Preventative Health Flagship** will develop an interactive weight-management program delivered through mobile phones. **CSIRO** will contribute expertise from their *Total Well Being Diet* program. Verdant Tasmania will develop and test a product range that uses mobile phones to collect health-management information and provide users with feedback and motivation.

► **More information:** 03 6233 6573



photo: EUCAGEN

Weed beater

Charles Sturt University's emeritus professor of agriculture **Jim Pratley** has been honoured with the Molisch Award, which is presented every three years to recognise research excellence and career contributions to the field of allelopathy, the science of using a plant's natural defense system to beat weed infestation. Professor Pratley is a staff member at the E H Graham Centre for Agricultural Innovation in Wagga Wagga, a collaborative alliance between CSU and the NSW Department of Primary Industries.



Jim Pratley

Mining fame

Emeritus Professor John de Laeter from Curtin University of Technology has been inducted into the Australian Prospectors and Miners Hall of Fame, a recognition of his seminal research into mineral exploration technology, which led to improvements in mining exploration practices. Professor de Laeter contributed to geochronological research, the science of dating and determining the time sequence of events in the history of the earth.

Chairman's medal

The team of scientists who developed *The Murray Darling Basin Sustainable Yields Project* has been awarded the 2008 CSIRO Chairman's Medal. The team led by Water for a Health Country Flagship Director, **Dr Tom Hatton**, delivered the most comprehensive and complex whole-of-basin water assessment of the Murray-Darling Basin ever undertaken in Australia.



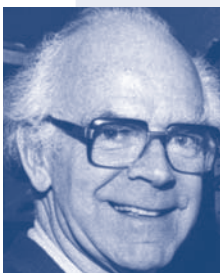
Tom Hatton

Energy director

Curtin University of Technology has appointed **Professor Chun-Zhu Li** as director of its new Curtin Centre for Advanced Energy Science and Engineering. Professor Li brings a wealth of research experience and expertise in energy science and engineering, and is an authoritative expert in coal science and technology. He will commence his role at Curtin in January 2009 and comes to the University after spending the past 12 years at Monash University in coal research.

Physics hero

Associate Professor Colin Keay, from the University of Newcastle, has been awarded the Australian Institute of Physics (AIP) Award for Outstanding Service to Physics in Australia. The award recognises Associate Professor Keay's enduring commitment to science communication, including his longstanding role as Book Review Editor for the AIP's journal. He also received an Unsung Heroes of Australian Science award from



Colin Keay Australian Science Communicators in

2005. Since his retirement from the University in 1993, Associate Professor Keay has engaged in the nuclear energy debate as a speaker and writer on the subject.

Walter Boas Medal

Professor Peter Drummond from Swinburne University's Centre for Atom Optics and Ultrafast Spectroscopy has been awarded the 2008 Walter Boas Medal from the Australian Institute of Physics. Professor Drummond's research in relation to ultra-cold atoms and quantum optics has led to the development of new theoretical calculations in both fields.



Peter Drummond

Pregnant fossil pioneer

The 2008 Australasian Science Prize has been awarded to **Dr John Long** for his discovery of a fossilised embryo from a Devonian fish. The discovery is the first of an embryo inside a mother from the Palaeozoic Era (540–250 million years ago), and provides insights into the breeding behaviour of an entire class of extinct species. Dr Long is Head of Sciences at Museum Victoria.

High flier

CSIRO Entomology scientist, **Dr David Yeates**, has been awarded the Australian Entomological Society's 2008 Mackerras Medal. The award recognises his input into the taxonomy, systematics and evolution of flies as well as his extensive support for Australian taxonomy in general. Dr Yeates is currently president of the Council of the International Congresses of Dipterology, vice president of the Australian Entomological Society and a co-principal investigator on the Taxonomy Research and Information Network (TRIN).



David Yeates

Healthy achiever

The Hunter Medical Research Institute (HMRI) Award for Research Excellence has been awarded to **Professor Rodney Scott**, a co-director of the University of Newcastle's Priority Research Centre for Bioinformatics, Biomarker Discovery and Information Based Medicine and a co-director of the HMRI Information Based Medicine Research Program. Professor Scott is internationally recognised for his research on the genetics of breast and bowel cancer.



Rodney Scott

Science heads

Professor Simon Kaplan has been appointed the first executive dean of the new Faculty of Science and Technology at Queensland University of

Technology. Professor Kaplan has taught in France and America and was head of the School of Information Technology and Electrical Engineering at University of Queensland.

Professor Bruce Milthorpe is the new dean of science at the University of Technology, Sydney. A former head of school of the Graduate School of Biomedical Engineering at the University of NSW and deputy president (Academic) of UNSW Asia, Professor Milthorpe has been involved in biomaterials development and assessment for the past 25 years, most recently developing an adult stem cell model in rabbits for bone and cartilage tissue engineering.



Simon Kaplan

World changer

Dr Peter Dodds, from CSIRO Plant Industry, has been named by an article published in the journal *Nature* as one of five crop researchers who could change the world. The article recognised Dr Dodds' discovery of the rust 'avirulence gene' which could result in the development of new wheat varieties with improved and longer lasting resistance against rust, one of the most significant and devastating crop diseases in the world.



Peter Dodds

Lucky defender

Dr Lindsay Wake is the winner of the 2008 Minister's Award for Achievement in Defence Science. The award is presented annually to a Defence Science and Technology Organisation scientist who has made an outstanding contribution to defence science. Dr Lindsay's specialised research into paints has markedly improved the performance and durability of military aircraft, ships, submarines and land vehicles.



Lindsay Wake

Top tinkerer

Associate Professor Ron Cox, from the University of New South Wales, has been awarded Engineers Australia's Sir John Holland Award for Civil Engineer of the Year in recognition of his outstanding contribution to the profession and the community. Professor Cox has been associated with the university's Water Research Laboratory since 1973, leading research, investigation and design teams for projects in every state and territory of Australia and for many others around the world.

Universities chair

Professor Peter Coaldrake, the vice-chancellor of Queensland University of Technology is the chair-elect of Universities Australia for 2009-2011. Professor Coaldrake was the Universities Australia's deputy chair during 2008, and will assume the responsibilities of chair for a period of two years from 19



Peter Coaldrake

Coral bleaching is one of the first visual signs that corals are stressed. If conditions return to normal, corals often recover but under prolonged stress corals may die.

Drive bio promise

Against the backdrop of the recently announced **Global Carbon Capture and Storage Institute**, the **National Low Emissions Coal Initiative** and the soon-to-be-created **Australian Solar Institute**, a major report on Biofuels released by the **Australian Academy of Technological Sciences and Engineering (ATSE)** now calls for a national **Biofuels Institute** to be established. These models, building on the clustering and industry-creating experiences of a number of Cooperative Research Centres, are expected to be able to go further than CRCs realistically can, ATSE says.

With strong governance, guaranteed funding and appropriately focused international linkages, the 'impressive cadre' of Australian researchers in the bio-industries could come together far more effectively than through the fragmenting, competitive, grant-driven, step-by-step processes that characterise much of Australia's RD&D, ATSE says.

According to the report *Biofuels for Transport: a Roadmap for Development*, Australia could advance strongly in Generation 2 biofuels, where non-food resources dominate, based on the prolific and lower-value resources which it has in abundance. The significant potential for the economic conversion of lignocellulosics (woody plants) to ethanol and specialised algae strains to biodiesel warrant enhanced commitment to focused Australian RD&D in this sector – which should be aligned with the significantly greater RD&D efforts of other nations.

► **More information:** Bill Mackey, 03 9340 1206

Defying the times

The **Australian Government** has granted thirteen new offshore petroleum exploration permits in Commonwealth waters, representing \$500 million of investment in Australia's offshore petroleum sector.

Minister for Resources and Energy **Martin Ferguson** says that, while of

enormous potential, most of Australia's more than 50 offshore basins remain largely unexplored.

The 13 new permits are located in Commonwealth waters off Western Australia and the Northern Territory and include four permits eligible for the Designated

Frontier Area (DFA) tax incentive. They include:

- Four permits in the Browse Basin, off Western Australia, to **Hunt Oil Company, Murphy Australia** and **Nexus Energy Australia NL**;
- Three permits in the Canning Basin, off Western Australia, to **Woodside Energy Ltd**;
- One permit in the Carnarvon Basin, off Western Australia, to **Finder Exploration Pty Ltd**;
- Three permits in the Bonaparte Basin, off Western Australia, to **Goldsborough Energy Pty Ltd**, and **National Oil Corporation Pty Ltd**;
- Two permits in the Bonaparte Basin, off the Northern Territory, to **Essar Exploration and Production Limited**.

A total of twenty four bids were received for thirteen areas of the 2007 release. The new permits will be jointly administered by the Australian Government and the respective State and Territory Governments.

► **More information:** Michael Bradley, 0420 371 744; **Maps of the areas:** www.ret.gov.au/resources/Documents/acreage_releases/2007/index.html



Photo: The Hugh Cutting Centre for Marine Studies, The University of Queensland

Pale forecasts

Computer forecasts with the **Bureau of Meteorology's** seasonal coupled ocean-atmosphere model POAMA are a new tool that could be used to better manage the impacts of coral bleaching caused by climate change, according to a study published in *Coral Reefs*. Coral bleaching is often triggered by high sea surface temperatures (SST) expected to be more frequent with global warming. The study found that POAMA could forecast SSTs over the Great Barrier Reef up to three months ahead – a useful time frame for reef managers.

While forecasts of tropical Pacific SSTs have been routinely produced by forecast models since 2002, this research shows that these same models can also be used for the prediction of regional SSTs over smaller areas such as the Great Barrier Reef, says **Dr Claire Spillman** from the Bureau of Meteorology adding that "...by focussing management efforts on areas of the reef under threat and decreasing other stresses, recovery times and reef resilience to bleaching can be improved."

► **More information:** Claire Spillman, 03 9669 8105

Water excellence

The **Australian Government** will provide \$40 million to establish a **Centre of Excellence in Desalination** in Perth and a **Centre of Excellence in Water Recycling** in Brisbane. The centres are a component of the \$1 billion **National Urban Water and Desalination Plan** and will build expertise required to secure Australia's water supplies, according to Minister for Climate Change and Water, **Senator Penny Wong**. The location of the centres recognises existing skills and experience in Perth and Brisbane but participation in the centres' activities will be encouraged from across the nation.

Separate proposals from prospective administering organisations are required for each centre and must be received by 6 February 2009. Guidelines are available from www.environment.gov.au/water.

► **More information:** www.environment.gov.au/minister/wong/2008

Hot roadmap

The new **Geothermal Industry Development Framework and Technology Roadmap** is a joint effort between industry, researchers, and governments to identify and overcome the challenges facing the geothermal industry.

In releasing it, Minister for Resources and Energy **Martin Ferguson** says the framework is designed to accelerate the development of geothermal energy in Australia and assist in the development of low cost, reliable, and large scale solutions to climate change and energy supply challenges. "The Technology Roadmap explores issues relating to research and development opportunities in areas such as exploration, potential

Bonaparte Basin
Canning Basin
Carnarvon Basin

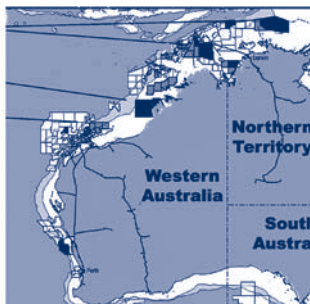


image: adapted from
Department of Resources,
Energy and Tourism

geothermal resources, and reservoir modelling, while technical challenges and possible actions have also been identified.”

Key recommendations to assist the geothermal industry to reach commercialisation relate to: attracting investment; gathering geoscientific data; developing networks and international linkages; progressing research and development; and building human capacity in the field of geothermal.

To accelerate the development of geothermal technology through international cooperation, Australia has recently also formed the **International Partnership for Geothermal Technology** together with the US and Iceland.

► **More information:** Michael Bradley, 0420 371 744

Eco-mining

The Victorian node of the **Australian Mineral Science Research Institute** (AMSRI) has been launched at the **University of Melbourne** by Innovation Minister **Gavin Jennings**. The **Victorian Government** has invested \$1 million to cut energy and water use in the mining and minerals industries and Mr Jennings says: “AMSRI will lead the world in its focus on reducing waste, water and energy consumption, which represent significant challenges to these industries.”

► **More information:** www.premier.vic.gov.au

Powerful investments

Australian Bureau of Agricultural and Resource Economics (ABARE) has released its new six monthly report *Electricity generation: major development projects* which includes electricity projects generated by coal, oil, natural gas, coal seam methane and renewable energy sources (solar, wind, hydro, biomass and wave).

The October 2008 listing details 121 projects, of which 29 are at an advanced stage of ‘under construction or committed’. The advanced projects have a combined generating capacity of 6285 megawatts, equivalent to 12 per cent of Australia’s total generating capacity as at June 2007. Non-renewable electricity generation projects, of which 90% attribute to natural gas and coal seam methane-fired electricity generation, account for around 86% of the total planned additions to capacity.

The projects are widespread, with at least one advanced project in every state and in the Northern Territory, and ABARE acting executive director, **Karen Schneider**, says the estimated capital expenditure of \$8.3 billion by committed projects are a positive investment in the sector.

Wind powered energy make up more than three-quarters of the committed additions to renewable energy capacity. These projects have an average capacity of 100 megawatts and are expected to provide peak load power primarily in Victoria, New South Wales and South Australia.

► **More information:** www.abare.gov.au

Muchas gracias

Spanish firm **Union Fenosa** is investing \$1.9 billion in a portfolio of seven Australian wind farms which, according to Minister for Trade **Simon Crean**, will create 225 jobs in the initial construction phase plus 40 operational positions.

The electricity produced by the first three wind farms on completion of Phase 1 in 2010 will supply the annual consumption of 186 000 households. On completion of Phase 2 in 2013, the total of seven wind farms will represent an additional 850 MW generation capacity to Australia’s existing wind generation capacity of 824MW.

The company forecasts more than \$1.56 billion will be spent in Victoria with the remainder being invested in New South Wales.

Phase 1 will establish wind farms at Hawkesdale and Ryan Corner in Victoria and Crookwell in New South Wales.

Phase 2 will establish wind farms at Tarrone, Berrybank and Darlington in Victoria as well as Paling Yards in NSW.

Facilitation of the investment was supported by the government agency **Austrade**.

► **More information:** Mr Crean’s office, 02 6277 7420

Riches in the sea

A new **Australian Institute of Marine Science** (AIMS) Index of Marine Industry estimates the value of Australian marine industries at \$38 billion a year, based on an analysis commissioned from consulting firm Deloitte.

This analysis provides a conservative estimate and trend data confirms the sector has grown by 42 per cent since 2000-01.

Minister for Innovation, Industries, Science and Research **Senator Kim Carr** says the index provides a framework to consider how marine industry and marine science fit with the national innovation agenda and will be updated annually.

Among the range of values for 2006-07 are:

- Domestic tourism, \$11,611 million;
- Commercial fishing (wild capture), \$1,429 million;
- Marine-based aquaculture, \$666 million;
- Oil exploration, \$1,727 million;
- Oil production, \$9,230 million;

The Index has not yet included some activities with non-tangible benefits such as social and environmental values, says Senator Carr.

► **More information:** Ian Poiner, 0419 702 652, i.poiner@aims.gov.au

Modified benefits

Introduction of genetically modified (GM) insect-resistant cotton has allowed reducing the volume of insecticide sprayed on the crop by up to 85%, according to a new report *Genetically modified crops: tools for insect pest and weed control in cotton and canola* by the **Bureau of Rural Sciences**.

“Access to GM cotton crops has made a significant contribution to the cotton industry’s sustainable management of insect pests and weeds, and to the environment,” says executive director **Karen Schneider**. The report says GM insect-resistant and herbicide-tolerant crops are likely to provide extensive agronomic and environmental benefits to Australian agriculture: they enable farmers to reduce greenhouse gas emissions from cropping by reducing the fuel use associated with pesticide applications and to adapt to impacts of climate change by tailoring crops to suit particular climates.

In Australia, GM organisms are regulated by the **Office of the Gene Technology Regulator**, and are assessed for risks to human health and safety and the environment. The report is available for download from www.brs.gov.au.

► **More information:** Jenny Bibo, 0434 735 465



photo: Nathan Smith

Marine Tourism is a major contributor to the value of Australian marine industries

SmartGate in operation



Photo: Australian Customs Service

Smart customs

The **Australian Government** has launched an information campaign designed to raise public awareness and use of SmartGate – Customs' secure automated border processing system, which uses face recognition technology to verify a person's identity. SmartGate performs the face-to-passport checks that are usually conducted by a Customs officer at the entry point, by comparing an image of the passenger with the stored image of the person encrypted in the ePassport.

According to Minister for Home Affairs **Bob Debus**, SmartGate has been successfully operating in Cairns and Brisbane international airports and is now available at Melbourne airport. "It will be gradually introduced into all major Australian international airports by mid 2009" he says.

An in-flight video explaining the SmartGate option to self-process through passport control will be screened on flights arriving at Melbourne, Brisbane and Cairns international airports. Selfprocessing is available to eligible holders of an Australian or New Zealand ePassport who are aged over 18.

► **More information:** www.ministerhomeaffairs.gov.au

Energy friendly broadband

Researchers from Australia, Canada and the United States have developed a photonic chip capable of low power optical switching. This is based on an improved version of the glass in optical fibre cables that have been the material of choice for telecommunication companies for over 40 years.

Photonic Integrated Circuits (PIC), will not only dramatically increase the speed of the Internet, says team leader **Dr David Moss** from the **Centre for Ultrahigh bandwidth Device Optical Systems (CUDOS)** at the **University of Sydney**. "We've now gone one step further by developing an environmentally friendly all-optical PIC with low energy consumption."

The key behind the discovery is the high refractive index version of the glass used in typical optical fibre which, combined with a novel device design, can perform operations with over a million times less power than previously done in glass circuits. This is a critical breakthrough as the exorbitant energy demands currently placed on electronic information routers are estimated to reach crisis point by 2013 (see also 'Energy eater: broadband', p6). With bandwidth demand growing rapidly the electronic energy used in the ageing routers cannot support the need for instantaneous delivery of information as demanded by mobile phone and Internet users.

► **More information:** www.cudos.org.au/

Smart licences

Australian driver's licences are now set to move into the digital age, with all the nation's transport ministers agreeing on how information will be stored on "smartcard" licences.

The signing of the Smartcard Licence Interoperability Protocol (SLIP) will ensure that when states and territories introduce smartcard

technology the information contained on the card's chips will be accessible by the traffic and law enforcement authorities of other jurisdictions - while safeguarding the privacy of Australians.

Smartcard technology will make it harder to use stolen or fake cards and easier for motorists to change their personal details. Drivers may also be able to store a range of other important information such as donor and health information.

The Protocol was developed by Queensland Transport in consultation with state transport and licensing authorities as well as business groups. Queensland plans to be the first jurisdiction to issue smartcard licences in 2010.

► **More information:** www.minister.infrastructure.gov.au

Trained for relevance

Charles Sturt University (CSU) at Bathurst has developed a new information technology (IT) course to keep pace with industry needs. CSU has joined with international IT services leader **IBM** to develop the Bachelor of Information Technology (Business Services) degree, which will train highly skilled IT professionals for industry clients such as Country Energy and the NSW Department of Lands.

CSU head of the School of Accounting and Computer Science, Associate Professor Ross Wilson, says the mixture of technical and business components of the degree reflects what industry is looking for.

With the start of 2009, the degree will offer a range of contemporary IT skills as well as soft skills associated with interpersonal communication, teamwork and people management, all of which are highly desired by industry.

The course will be taught at CSU's Bathurst Campus by CSU academics and IT leaders, including IBM, to make all subjects highly relevant to current and emerging practices. All 22 students accepted into the new course will be fully supported by scholarships funded by industry partners IBM, Country Energy and the NSW Department of Lands.

► **More information:** <http://news.csu.edu.au/director/latestnews/science.cfm>

Internet privacy dilemma

A **Deakin University** academic has analysed the entire membership list of the **British National Party** (an extreme right wing party) published on the Internet, and has revealed the personal details of 15 Australians.

Professor Matthew Warren, computer ethics expert and head of School of Information Systems, Deakin University urged people to be cautious with their personal information. He says attempts to remove information from the internet are generally unsuccessful. One of the reasons is that the data is mirrored around the Internet on several sites and in several different countries with their own legal systems, posing an intriguing ethical dilemma for Australia's Federal and State Privacy Commissioners.

"If the named BNP Australians requested assistance from the Federal or State Privacy Commissioners, would assistance be given to help remove their data from the Internet or would the fact they are linked to the BNP be an issue?" he says. "The fact that the majority of the Australian members included their email addresses, would seem to indicate that the Internet is being used as means of contact and dissemination."

► **More information:** www.deakin.edu.au/news/media.php

By David Horwood
CONSULTANT FOR THE WOOD NATURALLY BETTER PROGRAM*

Time's favourite: timber

Wood's environmental advantages, especially when produced by sustainable forestry practices, have been well publicised.

The forest and wood products industry is the only sector in Australia that stores more carbon than it releases into the atmosphere. Wood is one of the most sustainable and environmentally sound building materials.

These advantages multiply in a warming world that is starting to apply a cost to carbon dioxide emissions. Under these challenging new conditions, wood may well regain ground it has lost to concrete and steel — if the industry can create new technology and prove its value. Doing that is the primary role of **Forest and Wood Products Australia (FWPA)**, from an annual R&D budget of \$7 million.

Guided by FWPA, the industry is building on the advantages of wood in a variety of ways. It is highlighting well-proven but almost forgotten technology. It is investigating the suitability of technologies already used overseas. And it is researching daring new ideas that could propel wood toward new frontiers.

Prompted by a request from a major house builder, **Andrew Dunn**, chief executive of the **Timber Development Association** of NSW, led an investigation of the timber options for substituting steel beams in houses.

The builder wanted to avoid steel because its costs have risen, and to avoid the need for cranes to lift the beams into position. Moreover, specialist riggers must be employed for the installation.

Mr Dunn's study revealed that plywood box beams, built on site, can do the job just as well for spans of up to 8 m. As a result, many designers and builders have rediscovered box beams, relying on modernised design specifications generated in the project. "One volume builder was typically using a dozen steel beams per house," Mr Dunn said. "That builder has now replaced nine of those with plywood box beams."

A report prepared for FWPA by Karen Bayne, an analyst at the New Zealand forest research organisation **SCION**, evaluated opportunities in prefabricated flooring, specifically modular 'cassette' flooring and 'access' flooring. "There is good potential for such systems to be used in high- to medium-rise residential buildings, and in commercial office developments," Mrs Bayne said. "Prefabricated flooring can improve safety on building sites and simplify materials handling."

Cassette flooring consists of prefabricated lightweight timber modules, ideal for use in the upper levels of one- to three-storey buildings. These flooring systems are well established in the UK, and don't require new factory machinery to manufacture them. "Cassette flooring combines well with engineered wood I-joist box construction, open at the ceiling with either ply or particle board flooring. I-joist systems are already being promoted as a solution to squeaking floors," Mrs Bayne said.

Access floors contain utilities such as heating, ventilation, air conditioning, and power cabling beneath accessible, flexible, modular floors. They have a non-structural infill consisting of easily removable panels that are screwed or clipped to the structural base, allowing flexibility and improved indoor environmental quality for the occupants.

At the **University of Technology Sydney**, **Professor Keith Crews** studies timber-concrete composite flooring. In these systems a thin layer of concrete 60–70 mm thick is poured over formwork or timber flooring supported by timber beams of laminated veneer lumber or glue-laminated timber. Professor Crews has found that in multi-storey buildings these composite floors are structurally suitable for spans of at least 8 m. He is

also working on the connection technology between floor and beam.

"The bottom line for commercial acceptance will be driving down costs," he said. "If we can improve the connectors and so use fewer of them, we will save on fabrication costs."

Professor Crews will continue his research on timber and composite floors for multi-storey buildings in one of three programs set up by a newly created New Zealand and Australian research company: the **Structural Timber Innovation Company**. STIC is a bold alliance between major commercial forest products manufacturers in New Zealand and Australia, and researchers from three universities. STIC is strongly supported by the New Zealand government, which will match industry contributions 'dollar for dollar', leading to a budget of NZ\$10 million over five years. FWPA is the largest provider of industry funding for STIC, with an annual contribution of \$250,000.

From 2009, researchers will study innovative large-span timber buildings built with high quality engineered timber components including glue-laminated timber and laminated veneer lumber. At the **University of Auckland** researchers will investigate single storey roofs and timber

The Dunsborough Residence is a house featuring box beams (Wrightfeldhusen Architects)

photo: Robert Frith, courtesy Timber Design Awards



portal frames with spans of 30–40 m — once the preserve of steel. At the **University of Canterbury** a research team will investigate multi-storey, pre-stressed timber walls and frames.

In Australia, STIC's programs will pave the way for the use of structural timber elements in single storey commercial buildings such as warehouses, and in commercial and residential buildings of up to three storeys, a height limit set for fire and wind protection.

However, under different risk and regulatory regimes, structural timber can take buildings much higher. Andrew Dunn recently inspected a nine storey timber building in London. And he saw a conceptual illustration of a thirty-six storey concrete-framed building with every fourth floor in concrete, infilled with timber between those floors.

"We need more flexibility," he said. "When you use one material exclusively you often don't build optimally. Combining them and using the best features of each gives you the most economical and sustainable option."

* *The Wood Naturally Better campaign is a multi-million dollar industry initiative designed to enable professionals and consumers to understand how they can play a part in tackling climate change by using wood.*

► **More information:** www.naturallybetter.com.au

On the Radar keeps you informed of upcoming reports & funding opportunities. For details of jobs and conferences: www.sciencealert.com.au

Events & Reports

15 December – Carbon Pollution Reduction Scheme - Public release of legislative package (draft). A Bill will be introduced into Parliament in March 2009

More information: www.climatechange.gov.au/emissions/trading/legislation.html

17 December – The World Meteorological Organisation will release their global climate data for 2008.

More information: www.wmo.int

December - Higher Education Review is now due to report in December.

More information: www.dest.gov.au/highereducation/default.htm

Late 2008 - The Government will consider the NIS Review's recommendations and release a White Paper.

More information: www.innovation.gov.au/innovationsreview/

Grants and programs

Australian Laureate Fellowships funding commencing July 2009. Proposals close 10 December 2008.

More information: www.arc.gov.au/media/important_dates.htm

India ICT Partnership Program 2009. Applications close 19 December 2008.

More information: www.austlii.edu.au

The Seventh Framework Programme (FP7) of the European Commission for 'International co-operation', where at least one research entity is from a Mediterranean Partner Country. Applications close 13 February 2009.

More information: <http://ec.europa.eu/info/7thfp/>

Clean Business Australia is to help business and industry to tackle climate change. It has three elements:

- **Climate Ready to develop new technologies and services responding to climate change. Round 2 closes 4 December**

2008, Round 3 closes 12 March 2009 and Round 4 closes 25 June 2009

- **Re-Tooling for Climate Change for improving energy and/or water efficiency of production processes. Round 2 closes 16 February 2009 and Round 3 closes 1 June 2009**

- **Green Building Fund for owners of existing commercial office buildings and relevant industry organisations. Applications close 15 January 2009**

More information: www.austlii.edu.au

Centres of Water excellence in Perth and Brisbane (see story 'Water excellence'). Proposals must be received by 6 February 2009.

More information: www.environment.gov.au/water

Conferences

Drinking Our Own Waste: Change We Can Believe In?
15 December 2008, Canberra, ACT

e-Forensics 2009
19-21 January 2009, Adelaide

Indo-Australian Conference on Biomaterials, Implants, Tissue Engineering & Regenerative Medicine
21 to 23 January 2009, Sydney, NSW

Linux Conference 2009
21 to 24 January 2009, Hobart, TAS

Cycling Medicine Down Under
22 to 25 January 2009, Adelaide SA

Environmental Management in Mining
10 to 12 February 2009, Perth WA

Australian Agricultural and Resource Economics Society (AARES) 53rd Annual Conference
10 to 13 February 2009, Cairns, QLD

Connecting Healthcare
11 to 13 February 2009, Brisbane, QLD

AusTrauma 2009, Critical Care and Emergency Surgery Conference

12 to 14 February 2009, Sydney, NSW

Materials of the future, science of today: radical polymerisation - the next stage
15 to 17 February 2009, Parkville, VIC

29th Symposium on Sea Turtle Biology & Conservation
17 to 19 February 2009, Brisbane, QLD

WA Power & Gas 2009
17 to 19 February 2009, Perth, WA

Healthcare World Australia 2009
17 to 19 February 2009, Sydney, NSW

Health Facilities, Design and Development 2009
17 to 20 February 2009, Brisbane, QLD

Brighter Deeper Greener - Geophysics in a Changing Environment
22 to 26 February 2009, Adelaide, SA

Sustainable Facilities Management
23 to 26 February 2009, Sydney, NSW

Urban Transport World Australia 2009
23 to 25 February 2009, Sydney, NSW

Functional Dairy Foods 2009
24 to 25 February 2009, Melbourne, VIC

Social Media and Cultural Communication
5 to 6 March 2009, Melbourne, VIC

GreenHouse 2009
23 to 26 March 2009, Perth, WA

Coal Seam Methane World Australia 2009
31 March to 1 April 2009, Brisbane, QLD

5th AustralAsian Cleantech Forum
31 March to 2 April, Melbourne, VIC

Waste 2009-Waste Avoidance & Resource Recovery Conference
1 to 2 April 2009, Coifs Harbour, NSW

Chronic Disease Management Australia 2009
6 to 8 April 2009, Sydney, NSW

Macquarie Arc Conference 2009
13 to 21 April 2009, NSW, Australia

GEOFLUIDS VI
15 to 18 April 2009, Adelaide, SA

EcoForum Conference & Exhibition
28 to 30 April 2009, Sydney, NSW

Smart 2009 Conference (Bridging the gap with innovation and new business strategy)
10 to 11 June 2009, Sydney, NSW

Generic Medicines Australia 2009
12 to 14 May 2009, Sydney, NSW

Face THE Facts



R&D REVIEW
AUSTRALIAN

JOBS

	INSTITUTION	CLOSING DATE
Director, School of Biology	Australian National University - Senior Appointment ACT	20 Feb
Director, John Curtin School of Medical Research	Australian National University ACT	20 Feb
Dean Faculty of Law, Business and Arts	Charles Darwin University - Faculty of Law, Business and Arts NT	16 Dec
Research Fellow/Senior Research Fellow in Sustainable Grasslands	University of Sydney - Faculty of Agriculture NSW	----
Scientist - Australian Plague Locust Commission	Department of Agriculture, Fisheries and Forestry Canberra	----
Advanced Nuclear Structural Materials Specialist	ANSTO, Canberra ACT	23 Jan
Associate Professor/Professor in Sport and Exercise Science	James Cook University - School of Public Health, Tropical Med and Rehab QLD	12 Dec
Research Scientist in Geomechanical Modelling	CSIRO Petroleum Resources - Kensington WA	31 Jan
Lecturer/Senior Lecturer	Monash University - Faculty of Pharmacy and Pharmaceutical Science VIC	02 Jan
Lecturer/Senior Lecturer	Monash University - Geochemistry and Petrology VIC	16 Jan
Professor/Associate Professor of Quantitative Fisheries Science	Murdoch University - Centre for Fish and Fisheries Research Perth	15 Dec
Director, John Curtin School of Medical Research	Australian National University ACT	03 Jan

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