AUSTRALIAN R&D REVIEW

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Linking Australian Science, Technology and Business

INSIDE

A climate-led R&D recovery

By Jenifer North

Climate change seems to have brought an extreme event to the Australian R&D community, in the form of floods of cash.

Among the latest initiatives are:

- the **Federal** and **Victorian governments** have contributed $100 million towards a clean-coal project;
- the **NSW Government** will spend $22 million on two pilot clean-coal projects;
- Victoria has started work on a permanent underground carbon-storage project near Warrnambool;
- SA is spending $800,000 on a wind tunnel to improve wind turbine performance, and $200,000 on projects on solar electrical boosting, biodiesel and refrigerated transport;
- Queensland has invested $9 million in a **Climate Centre of Excellence**;
- the **University of NSW** has announced a new $6 million national climate-change research centre;
- the **ANU** has created the **Fenner School for Environment and Society** for research into areas including climate change and water;
- **Griffith University** has signed an agreement with Indonesia to study the regional effect of climate change;
- the **University of Ballarat** has launched a project on community-owned renewable energy;
- **Adelaide University** has launched a **Research Institute for Climate Change and Sustainability**; and
- **Allco Wind Energy** has announced it will acquire wind-energy projects in Germany and France with a total capacity of 112MW, for completion in 2007 and 2008.

Federal Industry Minister ***Ian Macfarlane*** and Environment Minister ***Malcolm Turnbull*** have announced **HRL Ltd** will receive a $100 million grant for a $750 million clean-coal technology project. The project, funded under the Australian Government's Low Emissions Technology Demonstration Fund, involves building a 400-megawatt integrated drying gasification combined-cycle (IDGCC) power generation plant at the Loy Yang coal mine in Victoria's Latrobe Valley.

IDGCC combines pressurised drying and gasification of brown coal with gas turbine combined-cycle power generation. The technology is capable of reducing CO_2 emissions from power generation from brown coal by 30%, compared with the current most efficient brown coal generation in the Latrobe Valley, and by about 50% when compared with the older power stations in the valley.

The technology also reduces water use by 50% compared to current use by Latrobe Valley power stations. It is also suitable for carbon capture and geosequestration.

HRL is an Australian-owned energy technology company that has been developing IDGCC technology over the past 15 years at an investment of more than $140 million.

The proposed 400MW demonstration power station will be developed through a joint-venture agreement with **Harbin Power Engineering Company Ltd**, a subsidiary of China's largest power equipment and power station developer **Harbin Power Equipment Group Corporation**.

HRL expects to commit to construction of the power station in mid-2007, with the plant expected to be operational by late 2009.

▶ **More information: Claire Wilkinson, 02 6277 7580, Maria Brejcha, 0409 380 381**

...and a water cashflow

The **Australian Government** is increasing its investment in R&D to help ease the country's water shortage. The Minister for the Environment and Water Resources, ***Malcolm Turnbull***, announced a $5.6 million investment in three major water projects through the Raising National Water Standards program.

The centrepiece is $5 million to develop a $10 million national water accounting model. "A national water accounting model will enhance public and investor confidence in the amount of water being delivered and traded, extracted for consumptive use and managed for environmental and other public benefit outcomes," Mr Turnbull says.

The effect of trading on various water users and other parties will also be monitored.

A further $2.475 million will support six water recycling and

Continued page 2

urban water-management projects across Australia, worth $3.2 million. Funds to be provided include:

- a total of $1 million under the Raising National Water Standards program for the Water Utilities and Performance Reporting project – a national benchmarking framework will be developed and regional and rural water utilities will have more capacity to report on required performance indicators;
- up to $850,165 from the Raising National Water Standards program for tools to assess the viability of recycling stormwater and reclaimed water via aquifers;
- up to $250,000 to develop a detailed methodology to assess the implementation of national water recycling guidelines – industry focused, this will help build community confidence in the management of recycled water;
- up to $200,000 to develop information materials to increase public awareness of the use of recycled water for drinking;
- up to $120,000 to develop pricing policies encouraging the efficient use of recycled water and stormwater; and
- $100,000 to support two initiatives that will further contribute to water-sensitive cities' activities and support implementation of the National Water Initiative.

▶ **More information: www.nwc.gov.au**

Innovation injection

The Minister for Industry, Tourism and Resources, ***Ian Macfarlane***, has launched a $4 million pilot program to improve access to innovation for small and medium enterprises (SMEs).

The Intermediary Access Program will reduce the cost of SMEs engaging in innovative activity by helping businesses to adapt knowledge and technology and collaborate with industry partners. The pilot will see **InnovationXchange** and the **Australian Institute for Commercialisation** work with SMEs to find experts to solve their technology problems. More than 50 eligible companies will be assisted by the scheme over the next nine months.

▶ **More information: www.ausindustry.gov.au**

Defence R&D boost

A new defence industry policy provides a critical framework to guide investment by the private sector and government in industrial capabilities critical to the long-term support of the **Australian Defence Forces** (ADF). It sets outs the **Australian Government**'s response to the challenge of ensuring the cost-effective delivery of equipment and support to the ADF. Included in its various strategies are "driving innovation in defence technology, maintaining priority local industry capabilities and encouraging small and medium enterprises".

A range of initiatives will bring defence and industry closer together through higher levels of government support for R&D by Australian defence companies, a reinvigoration of efforts to expand defence industry exports and a broadening of the government's already successful Skilling Australia's Defence Industry program.

▶ **More information: www.defenceindustrypolicyreview.com.au**

Changing farm climates

The **Australian Government** is to provide up to $5 million to help farmers prepare for the risks associated with climate change. The Minister for Agriculture, Fisheries and Forestry, ***Peter McGauran***, says climate variability poses an enormous challenge to Australia's farm sector.

The funding will go to a number of projects identified at a round table of 50 representatives from industry, research organisations and state and federal governments, which focused on the *National Agriculture and Climate Change Action Plan 2006–09*, released in August 2006. The Action Plan provides a framework for coordinated action relating to climate change, further reducing greenhouse gas emissions and R&D.

▶ **More information: Ben Houston, 02 6277 7520**

Tsunami alert

The **Bureau of Meteorology** (BoM) and the US **National Oceanic and Atmospheric Administration** (NOAA) are joining forces to promote cooperative technical partnerships in tsunami early-warning systems. The Tsunami Science Implementing Arrangement will create a structure and network of scientists in both countries to share data and provide technical capabilities. The agreement fosters a mutual exchange of scientific and technical expertise to the benefit of both countries.

The partnership will:

- strengthen national and regional capacity for tsunami detection, forecast, warning, communication, preparedness and other aspects of an end-to-end tsunami warning system;
- increase the number of in situ and deep-ocean sea-level observations available in the Pacific and Indian oceans;
- reduce development, deployment, operations and maintenance costs for tsunami detection systems that protect Australia, the US and the Pacific and Indian Ocean regions; and
- help to build capacity among Australian and US regional partners.

With **Australian Government** funding of $68.9 million over four years and a 2009 completion date, Australia has committed to developing its own Australian Tsunami Warning System. NOAA and the BoM will launch a new deep-ocean assessment and reporting buoy station in April to further strengthen the region's capacity for tsunami warning.

▶ **More information: Valentina Lazarevska, 03 9669 4158**

BCA backs climate R&D

The **Business Council of Australia** has outlined a series of principles around a 'cap and trade' scheme to tackle greenhouse emissions as part

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of a framework which it believes can provide the foundation for an integrated global solution to emissions reduction.

The Business Council's submission to the Prime Minister's Emissions Trading Task Group calls for a multifaceted approach to tackling emissions, involving not only a market response but continued investment in research and development of low-emission technologies, increasing the use of existing and emerging low-emission and renewable energy sources, and ensuring greater energy efficiency across all sections of the economy.

▶ **More information: Scott Thompson, 03 8664 2664, 0403 241 128**

Cash for excellence

The **Australian Government** has committed an additional $67.6 million over three years to 14 Australian Research Council (ARC) Centres funded under the Centres of Excellence scheme. A review committee chaired by former **BHP Billiton** chief scientist ***Dr Bob Watts*** assessed the performance over the past three years and the research plans of ARC Centres of Excellence and ARC Centres first funded in 2003, and made recommendations on further investment.

Centres receiving funds are: **Quantum Computer Technology**, **Ultrahigh-bandwidth Devices for Optical Systems**, **Advanced Silicon Photovoltaics and Photonics**, **Integrative Legume Research**, **Biotechnology and Development**, **Quantum-Atom Optics**, **Complex Dynamic Systems and Control**, **Autonomous Systems**, **Functional Nanomaterials**, **Bioinformatics**, **Kangaroo Genomics**, **Complex Systems**, **Mathematical and Statistical Modelling of Complex Systems** and **Solar Energy Systems**.

▶ **More information: Fiona Skivington, 0412 623 057**

Cancer team

Two peak cancer groups are joining with the **Australian Government** to coordinate research resources and expertise. The founding partners of the Collaborative Cancer Research Scheme are the Australian Government's new cancer agency **Cancer Australia**, the **National Breast Cancer Foundation**, the **Prostate Cancer Foundation of Australia** and the **Department of Health and Ageing**. It is hoped that other cancer groups will join the scheme in 2008.

In 2007 the scheme will provide up to $10 million in research grants for projects focusing on collaborative research, increased consumer involvement and on populations with poorer health, such as people in rural and regional areas or Aboriginal and Torres Strait Islander people. The funding, provided by the government and non-government organisations, will be administered by Cancer Australia. Assessment and registration of research applications will be managed by the **National Health and Medical Research Council**.

▶ **More information: 02 6277 7220**

Overseas networking

The Minister for Education, Science and Training, ***Julie Bishop***, has announced government funding of $801,300 over three years to support 252 postgraduate and postdoctoral researchers in the final round of **Australian Research Council** Linkage International Awards for 2006.

"This brings total funding for the Awards scheme for 51 collaborative research projects beginning in 2006 and 2007 to more than $1.6 million," Ms Bishop says. "Thirteen Australian universities have been awarded Linkage International Awards Round 3 funding to enable some of our most promising new researchers to tap into international networks."

The funding is for collaborative research projects such as:

- improving the strength and durability of magnesium alloys for the production of lighter, more fuel-efficient and environmentally friendly cars (**Deakin University** with **Free University of Brussels**, Belgium and **McGill University**, Canada);
- examining the commercial and diplomatic alliances between China and Latin America and the economic and political challenges they pose for resource-exporting countries such as Australia (**University of Technology, Sydney** with **Tecnologico de Monterrey** and the **University of Guadalajara**, both in Mexico);
- enabling Australian participation in a network of the seven European nations coordinating development of the first observing facilities in the Australian Antarctic Territory (**University of NSW** with the **University of Nice**, France); and
- developing new approaches to drug design to combat antibiotic resistance and treat a range of pathogenic bacteria, including 'golden staph' (**University of Melbourne** with New Zealand's **University of Canterbury** and **Massey University**).

▶ **More information: Fiona Skivington, 0412 623 057**

Synroc hits back

The **Australian Nuclear Science and Technology Organisation** (ANSTO) says it is wrong to conclude that research recently published in *Nature*, which showed the extent of radiation damage in zircon, casts doubt over the ability of ceramic materials such as synroc to safely immobilise radioactive waste.

According to ***Dr Bruce Begg***, manager of the synroc project at ANSTO, the research has no practical impact on the use of synroc or other ceramic waste forms for a number of reasons. "First, zircon, which is totally unrelated to the similarly named synroc material 'zirconolite', is more susceptible to radiation damage than the minerals that make up synroc," Dr Begg says. "Second, the work only focused on the impact of radioactivity on the structure of the material. It did not determine whether the observed changes in the structure had any impact on its ability to lock up radioactive waste. Ultimately what is important is not whether a waste form has an ordered or irregular structure, but how well it imprisons high-level waste."

Dr Begg says that several international studies have shown that the structural changes that radioactivity induces in the synroc phases zirconolite and pyrochlore have no detrimental effect on their ability to retain the radioactive material when subject to accelerated leaching tests. "Based on the extensive R&D carried out at ANSTO and around the world, we are satisfied that the family of synroc phases designed to lock up radioactive waste can withstand the test of time while the radioactive waste that it is designed to store decays away."

▶ **More information: Sharon Kelly, 02 9717 9575, 0400 395 085**

Tropical R&D a goer

Representatives of regional business and industry, research organisations, indigenous and community groups have come together to advise the **Australian Government** on its $40 million marine and tropical science research program.

John McIntyre, project director of the Great Tropical Drive for **Tropical Tourism North Queensland** and board member of the **Australian Rainforest Foundation**, is to chair the Advisory Council for the **Marine and Tropical Sciences Research Facility** (MTSRF)

program. MTSRF is a multi-disciplinary approach to pursuing big-picture environmental research aimed at protecting North Queensland's unique reefs and rainforests, such as the Great Barrier Reef and its catchments, tropical rainforests, including the Wet Tropics World Heritage Area and the Torres Strait.

▶ **More information: www.environment.gov.au/programs/cerf**

Ag science is in trouble

Agricultural science in Australian universities is in trouble as interest in career agriculture wanes, universities chase external funding and industry complains that the supply of suitable graduates is drying up. A workshop held by the **Australian Institute of Agricultural Science and Technology** (AIAST) discussed the problem and possible remedies. Information collected by the **Department of Education, Science and Training** (DEST) shows that domestic demand for undergraduate places in agriculture has been declining. Enrolments have dropped by more than 2000 in the past five years.

For those who begin university study in agriculture, drop-out rates are slightly higher and completion rates are slightly lower than average. Ag graduates are much less likely than other graduates to work full-time in a field related to their training. In 2005, about a quarter of agricultural graduates (26%) were working full-time as agricultural or environmental scientists four months after completing their university study.

A discussion paper prepared by the education committee of the South Australian division of the AIAST states there is widespread concern that ag education is not meeting the needs of industry. The AIAST authors comment: "The fact remains that agriculture does not have the wide political clout that it once had. This is being reflected in the priorities of government at most levels, and by managements of tertiary institutions. Governments are more interested in promoting the 'vote grabbers' such as health, education and law and order, at the expense of those areas which create the real wealth on which all other depends, these being agriculture, mining and innovation."

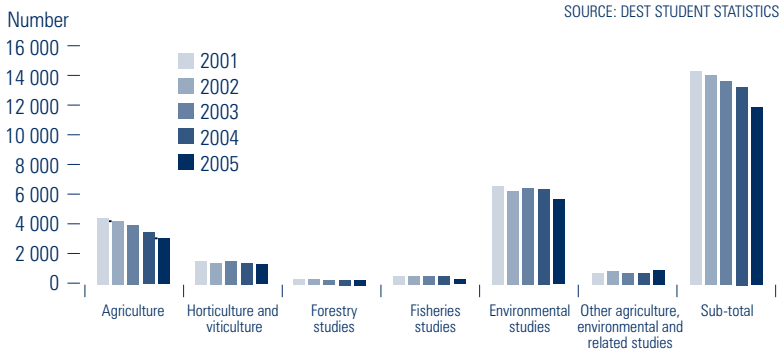
They note that state and Commonwealth governments have reduced budgets to agriculture departments. Research and extension capabilities have been slashed and those that remain rely increasingly on outside funds or fee for service. The funding balance in agricultural research and extension has therefore been shifting from the public-sector agencies to the R&D corporations.

Research strategies of R&D corporations understandably tend to concentrate on more immediate gains for farmers at the expense of pursuing longer-term, often more innovative but higher-risk activities that were once undertaken by universities or **CSIRO**. Inefficiency and instability have developed, brought about by time spent in negotiating funding and the short-term (often three-year) approach to the staffing and funding of projects.

Poor communication is another cause of some of the problems, says the report. Student demand is influenced by negative community perceptions about agriculture, fostered by the media, conservation interests, and inadvertently by farm organisations themselves. Frequent changes are made to tertiary courses. Communicating effectively to prospective students the nature of these changes and how they will improve the prospects of meaningful employment is complex and frequently not well addressed.

The report says universities have caused some of the problems. For many years they have taken a supply-driven approach to course content, based on a mix of inadequate understanding of demand, what might attract students and what they can provide. Federal government policy also has a big effect, as it determines student intake and funding.

TRENDS IN UNDERGRADUATE ENROLMENTS BY SUB-FIELD



Agricultural courses have become part of a broader set of science offerings. There has been a strong shift from the generalist to the specialist, which some say has reduced the capacity of graduates to analyse and synthesise situations, problems and opportunities.

▶ **More information: www.aiast.com.au**

On the pulse

A joint venture to deliver superior pulse varieties for the Australian grains industry has been formed to coordinate Australia's pulse breeding efforts and create a world-class breeding and germplasm enhancement program.

"The aim of PBA is to coordinate a cost-effective pulse breeding program that develops new, superior varieties more quickly for our farmers," says inaugural **Pulse Breeding Australia** (PBA) chairman ***Peter Reading***. "Its focus will be on monitoring reliable market signals, accessing elite germplasm for breeding efforts and rapid adoption by Australian growers of new lentil, faba bean, chickpea and field pea varieties developed for, and field-tested in, local conditions".

PBA is an unincorporated joint venture between the **Grains Research and Development Corporation**, **Pulse Australia**, the **University of Adelaide**, the **SA Research and Development Institute**, the **Victorian** and **NSW Departments of Primary Industries**, the **Queensland Department of Primary Industries and Fisheries** and the **Department of Agriculture and Food, Western Australia**.

▶ **More information: www.grdc.com.au/whats_on/mr/mr150307.htm**

By Geoff Wilson
FOUNDER AND PRESIDENT, GREEN ROOFS FOR HEALTHY AUSTRALIAN CITIES

Terraforming the new economy

Australian cities can be 'terraformed' so that they become part of a climate-change response, rather then being a cause of it. Terraforming is 'Earth shaping' of a planet, moon or other body. It is the hypothetical process of deliberately modifying atmosphere, temperature or ecology to resemble those of Earth in order to make it habitable by humans.

In this context, the term describes the transformation of a city's built environment by sowing its wasted space – its roofs and walls – with growing plants, so that it more closely resembles a rural countryside in terms of environmental advantages. Terraforming is a convenient term for a most convenient truth.

Terraforming is not entirely new. The practice of 'sod roofing' – using slabs of growing turf to build a roof for one's house – has been going on in Europe for thousands of years. What is new is the dramatic upsurge in interest in developing it to suit the urban landscape of the 21st century and in the sophistication of the techniques now being used.

North America and Europe now have 15 national green roof infrastructure associations. They consist of urban planners, built-environment educators, engineers, architects, horticulturalists, developers, specialist builders and municipal government. Their international organisation is the World Green Roof Infrastructure Network (WGRIN), which next meets early in May 2007 in Minneapolis to launch a worldwide campaign that aims to lead a global trend to terraform much of the world's built environment.

Terraforming is demonstrably good for the economy. Australian built-environment professionals can team with Australian primary producers for new business opportunities. Both can specialise in the nascent urban greenery market.

Australia has formed a member organisation of WGRIN – Green Roofs for Healthy Australian Cities. WGRIN plans to include many Asian, African and South American countries in its work, notably China and India. This has significance for our credibility as a part of the new terraforming world economy that is emerging as a response to climate change.

Green roofs and walls of terraforming can be retrofitted or designed in new construction. Design varies according to roof load and slope, solar aspect and budget. Two types of green roofs are favoured: extensive (low profile) and intensive (high profile). A combination of both is also possible.

Australia made a serious start in green roof development with the construction of the new Parliament House in Canberra in the 1980s. Its three hectares of lawns on a concrete structure should have triggered much more interest among urban designers than they in fact did.

A quarter of a century elapsed before Australia began serious green roof development. In February 2007, a group met to develop guidelines and regulations for green roof and green wall structures. These have four important criteria:

- buildings for green roof and wall terraforming must be made water-tight, with no root penetration;
- appropriate species of hardy plants must be chosen and established on well-designed substrates;
- each green roof and green wall plan must have a sound integration of professional expertise in water-proofing and horticulture – plant selection, substrate choice, plant establishment and plant maintenance; and
- each building approval for green roofs and walls must have a long-term maintenance plan for the waterproofing and the greenery.

The major benefits of green roofs and green walls in terms of climate change are:

- lower city temperatures and energy savings of at least seven to eight per cent; and
- storm-water management – reduced runoff of rainfall at peak times enables drainage infrastructure to cope with extreme events without massive and costly upgrades.

Urban heat-island effects can sometimes be 5 to 10°C above nearby rural temperatures. The city of Toronto estimates that having eight per cent of its buildings green-roofed would lower its heat-island effect by up to 2°C.

In Australia, lower rooftop temperatures from vegetated roofs and walls mean that air entering air conditioners will be up to 5°C colder than air from a traditional roof, saving large amounts of energy now used for cooling.

Other benefits of green roof and wall terraforming include air and water cleaning, longer roof life and lower maintenance costs, noise and electromagnetic insulation, visual beauty, bird habitat, fire resistance, food production, a new source of income from the building and a more valuable building. The plants, being permanent, also contribute by locking up carbon dioxide.

Many Australian plants from coastal and inland areas are well suited to planting on green roofs and green walls because they are tolerant of heat, cold, drought and wind. These native plants represent a new regional business opportunity as green roof retrofits and new designs expand. A global export market is expected to develop as terraforming catches on worldwide.

The prospect of an entirely new horticulture-based industry in Australia deserves consideration by all levels of government as an economic offset to the inevitable costs of countering climate change, as well as a way to cool and beautify the urban landscape.

This will create new careers and new business for urban planners, architects, landscape architects, horticultural and landscape contractors, builders, roofers, developers and building owners, as well built-environment regulators, researchers and academics.

Green roofs and walls are a wide-ranging convenient truth worth grasping in a federal election year.

Links: www.urbanag.info
www.greenroofs.org.au
www.nettworx.info
www.greenroofs.org (Canada)
www.greenroofs.com (US)

Geoff Wilson: "Terraforming is a convenient term for a most convenient truth."

Termite food vibes

Researchers from **CSIRO** and **UNSW@ADFA** (the University of NSW at the Australian Defence Force Academy) have found that termites can tell what their food is made of, purely from the 'vibes' it gives off. The findings, published in the *Journal of the Royal Society Interface*, may lead to improvements in termite control.

By offering them a choice of normal wooden blocks and specially designed blocks made of wood and other materials, researchers found that the termites always preferred the blocks containing the most wood, even though they could not touch or see the other materials. ***Ra Inta***, from UNSW@ADFA and CSIRO Entomology, says the ability to differentiate between food sources is based on the vibrations of the food, although the exact mechanism for this ability is yet to be explored.

"Scientists have known for some time that termites are receptive to vibrations," Mr Inta says. "But these results demonstrate that termites' methods of food assessment are much more sophisticated than previously thought."

The researchers are designing further experiments to test termites' assessment methods in an attempt to determine precisely what aspect of the vibrations termites are responding to in assessing food. "If we understand how they use vibrations to assess their food, we might be able to exploit this to manipulate their feeding habits, and address the very significant problem of termite damage in buildings and other structures," Mr Inta says.

▶ **More information: www.csiro.au/news/ps2wf.html**

Bacterial fashion statement

It smells like red wine and feels like sludge when wet, but the cotton-like cellulose dress 'grown' at the Institute of Agriculture, **University of Western Australia** (UWA), fits snugly as a second skin. The unique bacterial-fermented dress, made from wine, could mark the start of fabrics fermented by living microbes entering the $229.5 billion-a-year Australian fabric manufacturing industry.

The Institute of Agriculture, in collaboration with SymbioticA: the Art and Science Collaborative Research Laboratory, is in a unique position to link university faculties by integrating science and the arts.

UWA researchers ***Gary Cass***, ***Donna Franklin*** and ***Alan Mullett*** authored Micro'be' – an arts project using science to convert wine into a cellulose product. "Micro'be' examines the practical and cultural biosynthesis of microbiology, using biological specimens in art pieces," Mr Cass says.

Inspiration for the cellulose garments came when Mr Cass noticed a skin-like layer covering a vat of wine that had been contaminated with bacteria and gone 'off'. Mr Cass says the ultimate goal was to produce a wearable seamless garment that formed itself without a single stitch. "The product is very delicate, comprising micro-fibrils of cellulose, the material that forms green plants' cell walls. A non-hazardous, non-pathogenic bacterium, five microns in size, produces this material, which is more like tissue paper than cotton."

The researchers are using other forms of alcohol, including growing the bacteria on beer, to produce a translucent material.

▶ **More information: www.symbiotica.uwa.edu.au**

Wombat fires up

Following the OPAL reactor's successful return to full power, **ANSTO**'s second state-of-the-art neutron beam instrument – Wombat – went online for the first time. In honour of the reactor, scientists selected an opal gem as a test material for neutrons to penetrate and determine its atomic structure.

The $5 million High Intensity Powder Diffractometer has the power to detect a million neutrons a second and to produce data on the structure of materials in milliseconds.

"The instrument is called Wombat because it's the only one in the world with this kind of grunt," says ***Dr Shane Kennedy***, head of ANSTO's Neutron Beam Instrument Project. "Australia is exceptionally lucky to have Wombat, as it means we can now drive research to help us develop new materials, as well as better understand materials production processes, how the earth is structured and what materials do in extreme environments.

"Wombat will let us run in situ experiments in real time," Dr Kennedy says. "For example, if you want to know at the atomic level how a metal will respond if rapidly heated to 900°C, put in an electric field or chilled to hundreds of degrees below zero, Wombat will show you. This type of information is crucial for refining manufacturing processes or knowing how to better extract minerals from rock, because we can see what is happening atomically during the production process.

"The refining of some manufacturing processes tends to be a little hit or miss, as what happens to materials at the atomic level during manufacturing has not been accurately measured before. In Australia, this is about to change, thanks to this technology."

▶ **More information: Sharon Kelly, 02 9717 9575**

Mountain building

A research team led by an **Australian National University** scientist has solved the mystery behind the formation of the Andes by discovering how the jostling of tectonic plate boundaries affects geological formations.

It has been known for some time that the Andes mountain range in South America sits above a subduction zone, where one

tectonic plate is sinking below its neighbouring plate. But until now, it has not been clear how such a movement could result in the upward thrust that created the Andes.

"It's commonly understood that large mountain ranges occur when one continent collides with another," says team leader ***Dr Wouter Schellart*** from the Research School of Earth Sciences. "But there's no continent butting up against South America, so we needed to find a different explanation for the Andes."

Using the modelling power of supercomputers, Dr Schellart and his colleagues at ANU and **Monash University** discovered that as tectonic plates move, so do the boundaries between them. As a subducting plate is drawn downward by gravity, it forces the boundary between the subducting plate and overriding plate to move. This means the boundaries between tectonic plates are constantly changing shape.

Researchers found that the width of the tectonic boundary determines the speed and direction of its migration, which will affect whether a mountain range or an ocean basin forms above the activity. They also found that the width determines the shape of subduction zones, which explains the curvature of deep ocean trenches that mark the surface expression of these subduction zones. The researchers' findings were published in *Nature*.

▶ **More information: info.anu.edu.au**

Vintage find

A **CSIRO** research team has pinpointed the genetic difference between red (or black) and white grapes: a discovery that could lead to the production of new varieties of grapes and ultimately new wines. While white wine has ancient origins – its residue was found in the tomb of the Egyptian king Tutankhamun – researchers know that the ancestors of modern grapes were all red. What they did not know was how the change from red to white berries came about.

CSIRO researchers, working in the **CRC for Viticulture**, have found the genetic mutations that occurred thousands of years ago to give us white grapes. "Researchers in Japan have shown that one particular gene, which controls production of anthocyanin, the red pigment in grape skins, was mutated in white varieties," says team leader ***Dr Mandy Walker*** from CSIRO Plant Industry's Adelaide laboratory. "By closely studying part of a red grapevine chromosome carrying the genes for red colour and comparing it to a white variety chromosome, we found a second similar gene involved in the grape colour pathway that was also different in white varieties.

"Our research suggests that extremely rare and independent mutations in two genes produced a single white grapevine that was the parent of almost all of the world's white grape varieties. If only one gene had been mutated, most grapes would still be red and we would not have the more than 3000 white grape cultivars available today."

▶ **More information: www.csiro.au/news/ps2u5.html**

Oral success

Fluoride in water and toothpaste provides important dental benefits into adulthood, with a marked drop in dental decay levels over the past 17 years, a new national survey of oral health shows.

A 300-page report prepared by the **Australian Institute of Health and Welfare**'s Dental Statistics and Research Unit at the **University of Adelaide**, shows that Australians born after 1970 – the 'fluoride generation' – have, on average, half the level of decay of their parents' generation. "These results provide the first evidence within the Australian population that drinking fluoridated water during childhood translates into significantly better dental health in adulthood," says ***Professor Gary Slade***, one of the report's authors.

Australia's dental generations: the national survey of adult oral health 2004-06 surveyed more than 14,500 Australians aged 15 to 98 years and shows that only 6% of people have lost all their natural teeth, compared with 14% in the first national oral health survey conducted in 1987-88.

Despite improvements in oral health, most Australians are susceptible to dental disease, the authors say. "A total of 25% of Australians have cavities, one in five has gum disease and another 15% have experienced toothaches in the last 12 months," Professor Slade says. Aboriginal people and other disadvantaged groups, including people eligible for public dental care, are also more likely to have dental health problems. The survey reveals that only 44% of Australians visit the same dentist for an annual check-up, and there is a direct correlation between dental attendance and levels of oral disease.

▶ **More information: www.adelaide.edu.au/news/?mode=search2002**

Good copper

A **Deakin University** study has unlocked one of the many mysteries of pregnancy – how the trace element copper is transported across the placenta. The findings offer a lead to the possible cause, treatment and prevention of a number of potentially fatal conditions. ***Belinda Hardman*** completed the study for her PhD with Deakin's Centre for Cellular and Molecular Biology under the supervision of ***Dr Leigh Ackland***.

Ms Hardman is the first to find that copper is delivered to the developing foetus via specific transporters in the placenta that are regulated by the mother's oestrogen and insulin levels. These findings have implications for better understanding pre-eclampsia, intrauterine growth retardation, the development of babies born to mothers with gestational diabetes and some genetic disorders.

"For the most part, people get enough copper in their diet so we do not believe that severe copper deficiency is a problem in the general population," Dr Ackland says. "However, in pregnancy, when the needs of the mother change and there are the demands of the foetus, this is a critical time to understand copper metabolism. The foetus can face a range of problems without enough copper such as aneurysms, connective tissue disorders and mental retardation."

▶ **More information: www.deakin.edu.au/news/index.php**

Memory booster

A research team at the **WA Centre for Health and Ageing** (WACHA) is investigating the effect of vitamin D and mental exercise on memory. ***Professor Nicola Lautenschlager***, deputy head of the School of Psychiatry and Clinical Neurosciences at the **University of Western Australia**, says the team was trying to develop strategies to reduce the risk of cognitive decline and dementia, such as Alzheimer's disease, in later life.

"We have good evidence that vitamin D deficiency increases

frailty and that mental activity can reduce memory decline," Professor Lautenschlager says. "We now want to test this in a systematic way to find out whether people with mild cognitive impairment benefit from these treatments. People with mild cognitive impairment show evidence of memory decline that is not sufficiently severe to meet diagnostic criteria for dementia."

Professor Lautenschlager says it has long been known that vitamin D is important for healthy bones and muscle function in older people. Sunlight is the body's main source of vitamin D and it is believed that as people age, they are less likely to be exposed, especially if they live in residential care facilities.

The mental activity trial will compare a cognitive activity program focusing on cognitive training and rehabilitation techniques with an educational program providing information on healthy ageing and retirement.

▶ **More information: Cheryl Ackoy, 08 9224 2855**

Hot croc

Sydney University researchers have identified how crocodiles and other reptiles detect temperature, shedding new light on their adaptation to environmental changes and pointing to new pain treatments for humans.

Dr Frank Seebacher and ***Dr Shauna A Murray*** from the university's School of Biological Sciences, have shown that reptiles possess a family of genes that code for proteins which act as external heat sensors as well as providing an internal thermometer. These proteins, 'transient receptor potential ion channels', are closely linked with sensory nerves at the animal's surface as well as in their liver, heart and muscles. Information about internal temperatures and environmental conditions is fed back to the brain via these receptors. The brain is then able to direct the behaviour of the animal, depending on how warm or cold it is relative to the environment.

"Until now it was unknown exactly how cold-blooded animals sensed heat in their environment, which is an important step in our understanding of the biological functions governing an animal's ability to regulate their body temperature," Dr Seebacher says. "This capacity to sense environmental and internal temperatures is a prerequisite for the evolution of the kind of thermal regulation we find in warm-bodied animals, such as ourselves. Interestingly, similar proteins exist in mammals where, among other things, they are responsible for 'tasting' the heat in chillies. Hence, the detection of environmental heat and 'hot' chillies depends on the same mechanism, and both are closely linked to perception of pain. Transient receptor potential ion channels are therefore of enormous interest to medicine because they could be the target for new pain-relieving drugs."

▶ **More information: www.usyd.edu.au/news**

Blood 'n guts

Graphic images on cigarette packets, similar to those introduced in Australia last March, have been found in a recently published international study to be the most effective way to get across to smokers the range and severity of the health risks they face.

The study, published in the *American Journal of Preventive Medicine*, analysed data from 15,000 adult smokers in Australia, Canada, Britain and the US. It found that larger and more vivid warnings were more likely to retain their impact over time than less prominent warnings. The findings add to a growing body of evidence that graphic warnings are more effective than text warnings. In addition, the study highlighted the 'novelty' effect of health communications and the importance of periodically revising the warnings on cigarette packages to avoid 'wear-out'.

Over the past 12 months, seven graphic colour picture warnings have replaced text-only health warnings on tobacco products. From 1 March, the **Australian Government** requires the second set of pictorial warnings to be printed on Australian-manufactured and imported tobacco products. To keep the messages fresh, the two sets will rotate every 12 months.

Since the introduction of the graphic warnings in 2006, the number of calls to Quitline from smokers doubled.

▶ **More information: www.health.gov.au**

Plant forebear

A team at **Sydney's Royal Botanic Gardens**, working with researchers in Canada, Britain and Switzerland, found that the miniature grass-like aquatic plants *Hydatellaceae* are actually relatives of waterlilies rather than grasses. *Hydatellaceae*, which are mostly native to Australia, are tiny plants that grow to less than three centimetres and can flower and set seed under water.

The new research, through DNA sequencing, reveals that *Hydatellaceae* are 'basal Angiosperms', belonging to an ancient lineage that evolved before the major groups of flowering plants became separated. This makes this new grouping one of the branches at the very bottom of the flowering-plant evolutionary tree. "This does not tell us that the first flowering plants were aquatic or looked like the *Hydatellaceae*," says ***Dr Tim Entwisle***, executive director of the **Botanic Gardens Trust**. "But it does mean this group is very ancient."

▶ **More information: www.rbgsyd.nsw.gov.au**

Ocean eye

Australian scientists will have access to the most detailed measurements of ocean circulation and global sea level variations following the launch next year of Jason-2, a multinational ocean-observing satellite. The satellite's data will be used to study ocean dynamics, with many applications including global warming and climate prediction, monitoring of mean sea level, El Niño and La Niña events, ocean circulation and tides and waves.

"The success of next year's launch will be critical for the maintenance of the global ocean-observing system," says oceanographer ***Dr David Griffin*** of the **Wealth from Oceans Research Flagship**. "The continuation of the Jason observations is vital to gaining a better understanding of, and having the ability to predict, changes in the climate system."

Jason-2 will be the third ocean-observing satellite to be launched by an international partnership involving **NASA**, France's **Centre National d'Etudes Spatiale** and the US **National Oceanic and Atmospheric Administration**, since TOPEX-Poseidon in 1992. **CSIRO** has been on the satellite altimetry science project team for nearly 20 years. Access to data from the first two satellites has revolutionised scientists' understanding of the Australasian marine environment and has led to a warning that the present-generation climate models may be underestimating the true rate of change.

▶ **More information: www.csiro.au/news/ps2vd.html**

By Dr Adrian Burton
LEADER, AUSTRALIAN PARTNERSHIP FOR SUSTAINABLE REPOSITORIES

Avoiding a digital Dark Age

Advances in information and telecommunications technology present opportunities and risks for research and research data. These advances are propelling us into a new age of research. The question is: is this a golden age or a dark age for research information?

Researchers now use ever-increasing volumes of data about our world. Ever more common and powerful digital instruments and sensors churn out more data in a single session than a human being could deal with in a whole lifetime. By some projections, in 2010, "there will be more data being generated [annually] than has ever been generated in human history up to 2006".[1]

Fortunately, the same ICT revolution has helped to deal with this tsunami of research data by empowering researchers to analyse, assemble and share research data. This is largely due to the emergence of data management systems, high-performance computing to manipulate large volumes of information, and infrastructure and protocols to network or federate information.

If all works out nicely, this will be a golden age for researchers: unlimited new online collections of data and research information with powerful tools for aggregating, analysing and accessing that information. But what are the risks?

Being able to preserve digital data is a must for a golden age of research information, and a major risk is therefore the rapid obsolescence of digital objects. File formats, software and hardware are constantly being superseded, so the curation of digital objects involves regularly migrating files into currently supported formats. Who will do this for important research information long after the original research group has been disbanded? Memory institutions such as libraries and archives will have a role, but research disciplines must also assist in identifying the intrinsic qualities that need to be preserved during migration.

Important research collections need to be under the stewardship of a sustainable body committed to – and able to ensure – the continuity of access to these digital research assets. Otherwise, these online research collections and data sets will never last long enough to revolutionise the way we do research. At worst, a new digital dark age will follow, where access to the previous generations' information is severely compromised.

New research builds on previous research. In the new golden age, references to previous research or supporting data can include the actual digital objects or a link to the referenced digital object. Other scholars, in turn, refer to this research or include it in their digital works, and the new golden age builds on itself.

However, the mesh of information needs to be reliably persistent for future scholars to retrace these cross-collection workflows. The risk of a dark age occurs if the whole information infrastructure for scholarly communications is not permanent enough. The simple URL 'address' of the World Wide Web is insufficient. We need to use better systems of persistent identification to cope with changes of address; otherwise broken links will usher in another dark age for information.

The new model of scholarly information is decentralised with an unlimited number of online research collections hosted in various types of repositories, data centres and custom web applications. The beauty of this internet model is the organic growth of content by authors distributed all over the world. Combining this information into international grids is potentially part of the new golden age of research data and scholarly information.

The risk involved with this decentralised, distributed production model is the necessary diversity of systems and formats for storing the research data. Attempts to combine atmospheric data from around the globe can be stymied if the underlying data models are not compatible, so the tantalising possibility of aggregating our data remains elusive.

The patient development and disciplined application of community standards is the key to ensuring the golden age of mutual intelligibility does not turn into a dark age of tribal confusion.

Adrian Burton: the ICT revolution can be a golden age for researchers.

The promised golden age includes sophisticated public services for search, discovery, access, analysis, visualisation, fusion, submission and presentation of research. For this to work we need intelligent data; the raw data needs to be structured, described, and 'marked up' with meta-information.This applies to scholarly literature as much as to data sets, because even text files need to be structured and marked up with discipline-specific meta-tags to participate in sophisticated bibliographic, data-mining and discovery services.

In the dark age of information we bequeath to our sons and daughters an unending sea of ones and zeros with no standard structure, description or provenance data. Extracting useful information from this 'dumb data' will be a time-consuming process. The golden age is predicated on openness, a willingness to grant access to scholarly outputs and research data. With the advent of the World Wide Web as a core part of popular culture, there is a new expectation that everything should be findable and accessible online. And commonly available software empowers authors and data scientists to self-publish their work.

Copyright and digital rights management are not necessarily risks to this openness. The risks lie rather with the general ignorance of the rights and responsibilities in this area or with the lack (or non-adoption) of clear protocols for expressing these rights.

Openness of research data has social barriers in some disciplines where primacy and sole use of data is important to academic reputation. Other disciplines have adopted, at a community level, a greater expectation of immediate open access to research data.

Advances in ICT technology are enabling the prospect of a golden age of research information. However, the barbarians are massing outside the empire and unless we invest to secure digital longevity, persistent identification, interoperability, richness of data and open access, a regression into a digital dark age is also possible.

1. From data to wisdom*, the Prime Minister's Science Engineering and Innovation Council 'Data for Science' working group report, available at www.dest.gov.au/sectors/science_innovation/publications_resources/profiles/Presentation_Data_for_Science.htm*

Broaderband

The adoption of broadband services in Australia has passed the 3.5 million mark, according to the latest **Australian Competition and Consumer Commission** (ACCC) 'Snapshot of broadband deployment'.

"The September quarter showed an increase of more than one million customers, or 51.2 per cent, over the preceding 12-month period," ACCC Commissioner ***Ed Willett*** says. "This growth continues a trend observed since June 2005.

"Since the entry of a number of new competitors and lower retail prices for broadband services in early 2004, there has been a notable increase in broadband take-up. However, as we would expect, in annual terms the percentage growth of take-up has declined given the increase of the total subscriber base in absolute terms."

DSL-based services remain Australia's most popular type, accounting for about three-quarters of all broadband service connections. However, take-up of all other forms of broadband (including cable, satellite and wireless) continues to increase.

▶ **More information: www.accc.gov.au**

Wireless in China

The **CSIRO ICT Centre** has signed a landmark contract to commercialise its advanced technologies in China. The agreement, one of the first of its kind, was signed between CSIRO and the **China Electronic Technology Corporation** for technology transfer in the area of antennas for wireless communications.

"With its booming economy and large consumer base, China is fast becoming a significant early adopter of new technologies," says ***Dr Y Jay Guo***, director of the **CSIRO Wireless Technologies Laboratory**. "CSIRO is confident that the deal will allow the opportunity for a closer collaboration between China and Australia to extend research cooperation and develop markets for CSIRO's research.

▶ **More information: www.csiro.au/news/mediacentre.html**

Doctors in cyberspace

The **Australian Government** has enabled all stages of the prescribing and supply of medicine to be completed electronically, providing an alternative to the current paper-based prescription system.

Prescribers will be able to create prescriptions electronically, authenticate them via an electronic signature and transmit them securely to a pharmacy for dispensing. The pharmacy can then make claims electronically to **Medicare Australia**.

Commonwealth legislative barriers to electronic prescribing and dispensing of PBS medicines have been removed by changes to the *National Health (Pharmaceutical Benefits) Amendment Regulations 2006*, which took effect on 1 March. The initial focus will be on small-scale implementations in controlled settings.

Proposals from interested parties will be assessed against principles and guidelines being prepared by the **Department of Health and Ageing** and Medicare Australia.

▶ **More information: www.health.gov.au/internet/wcms/publishing.nsf/Content/eprescribing**

Game of life

A new computer program developed by **Deakin University** is allowing students from nursing, business and law to experience real-world situations from their personal computers. Based on games technology, Deakin LiveSim was developed by a team led by ***Associate Professor Jacob Cybulski***, ***Stephen Segrave*** from the Institute of Teaching and Learning and ***David O'Brien*** from the Knowledge Media Division.

"Computerised simulations have been used by business faculties for a number of years," Professor Cybulski says. "In information systems they have a shorter history, but even then very few examples use virtual reality, such as embedded video or the 'real-life' characters seen in the gaming industry. Deakin's LiveSim program embraces all these characteristics and more.

The next step is to link the simulations to Deakin Studies Online, which will allow lecturers to track students' progress.

▶ **More information: Jacob Cybulski, 03 9244 6847**

Wool tops

Australian Wool Innovation's (AWI) Merino Innovation website has received the **Australian Interactive Media Industry Association** (AIMIA) Award for the Best Corporate or Business-to-Business site.

The site was developed by Sydney-based creative brand development business **Devotion**. The AIMIA Awards are the peak awards for the interactive media and digital content sectors in Australia.

AWI's general manager of corporate affairs, ***Matthew Flügge***, says: "To have our website recognised with such a prestigious award is a great achievement for AWI. It confirms that we are presenting a unique, innovative and impressive communications tool for retailers, manufacturers, and designers looking to source information on Australian Merino wool."

▶ **More information: www.merinoinnovation.com**

Message e-stick

Indigenous communities have been invited to apply for funding under the **Australian Government**'s $36.6 million Backing Indigenous Ability telecommunications program. About 400 of Australia's (approximately) 1200 remote indigenous communities are thought to lack access to telecommunications services.

"Backing Indigenous Ability will extend essential telecommunications services such as robust public phones, internet access and videoconferencing facilities, to people living in remote indigenous communities," the Minister for Communications, Information Technology and the Arts, ***Senator Helen Coonan***, says. "An important element of the program will be providing funding to develop indigenous online content.

"[This program] will provide up to 150 communities with internet services, enabling communities to access health, education, legal, employment and welfare services more easily," she says. "It will also enable entrepreneurial indigenous communities to set up micro-businesses and commercial activities such as tourism and selling art and music."

Applications for the first round of funding close on 20 April.

▶ **More information: www.dcita.gov.au/bia, 1800 355 014**

By Dr Andrew Davies*
PROGRAM DIRECTOR FOR OPERATIONS AND CAPABILITY, AUSTRALIAN STRATEGY POLICY INSTITUTE

No easy solutions to greenhouse

Nuclear power will not solve the problem of greenhouse gas emission. There are a number of reasons why this is true. But before we start looking at uranium supplies and the scope for nuclear power generation, we need to understand precisely what we are dealing with. The scale of energy use by human beings is staggering. Total world energy consumption is about 500 million trillion kilojoules per year. That is a tremendous amount of energy, and the only way it can be produced in a cost-effective way at the moment is through the exploitation of 'once only' fossil fuels.

In the well-publicised report of the Stern review on the economics of climate change, the conclusion was that we need to make substantial cuts to our greenhouse gas emissions. To stabilise atmospheric greenhouse concentrations at levels consistent with 'manageable' climate change, we need to be producing somewhere between 30 and 75 per cent of current levels by 2050. And if economic growth is not to be sacrificed, we need to do that in a world economy three to four times larger than that of today.

If we are to succeed, we need to dramatically reduce the output of greenhouse gases per unit of GDP. We could do that by finding efficient new ways of generating energy – but that is very unlikely, barring a dramatic (and unexpected) breakthrough in something like fusion technology, for example.

Nuclear-fission power plants cannot do that job for us. First, they are capital intensive to set up and require long lead times. Stern suggests that action in the next decade will be the most effective, with even more dramatic steps being required if we wait longer. This suggests that an energy source that is a decade in the making is not likely to help much.

Second, the current cost of nuclear energy is relatively high. The Switkowski taskforce found that the median cost for coal-powered electricity generation in Australia is about $35 per megawatt hour, while the corresponding figure for nuclear power is about $52, about 50% higher.

Of course, that gap could be closed by the imposition of a carbon tax. Making the emission of carbon more expensive is one way to capture the true cost of fossil fuels, which hitherto has been based only on the cost of mining, refining and transporting them. But even if that were to happen – and given the reluctance of major greenhouse gas emitters to even agree on a timetable to discuss the issue, we shouldn't hold our breath – there is limited scope for uranium supplies to be ramped up to meet the demand.

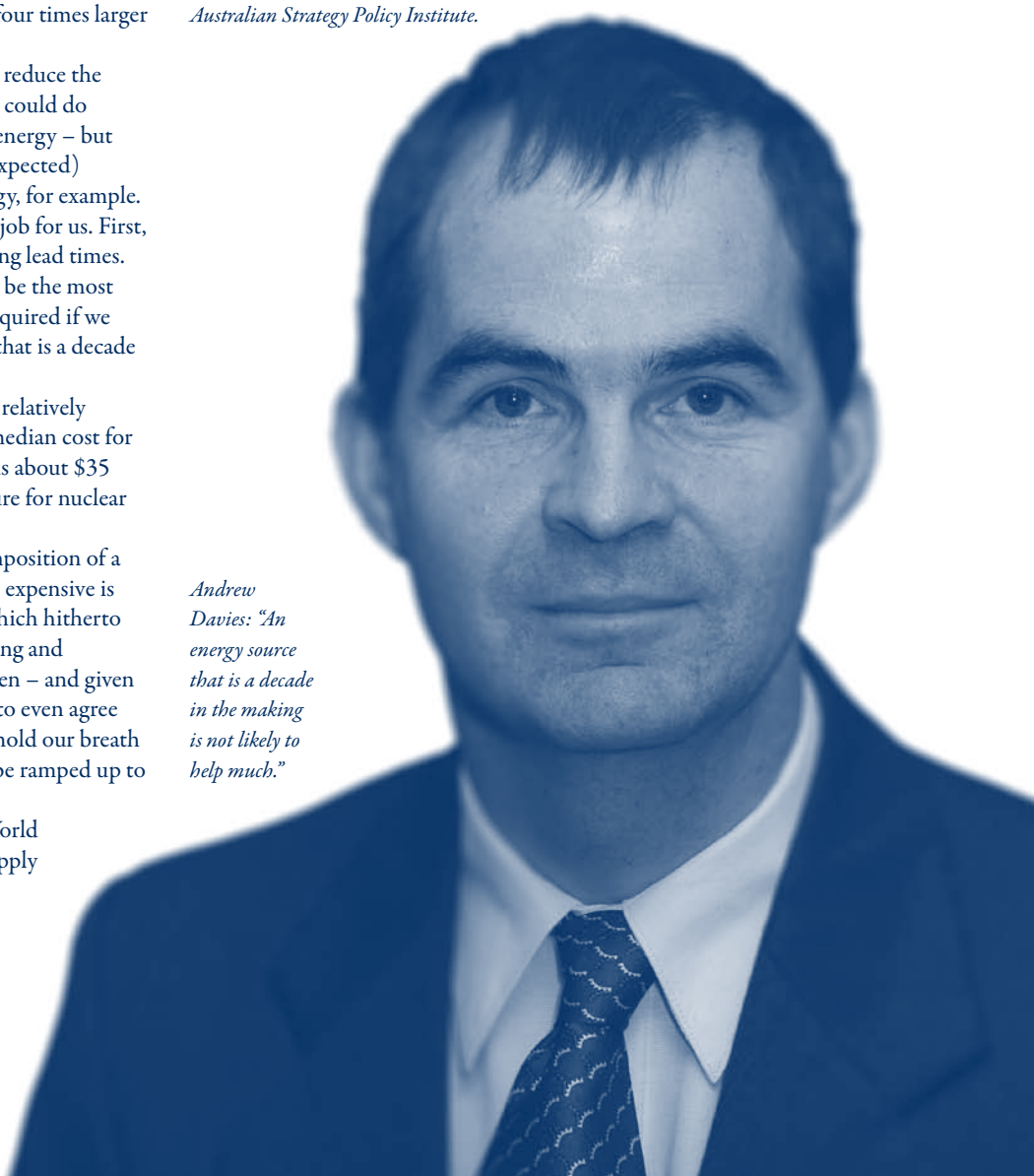
The most optimistic projections from the World Nuclear Association show the world uranium supply doubling by 2030. Even in that scenario, the contribution to world power generation (taking into account increased demand) is about 18 per cent, compared to today's 16 per cent. When the Stern figures are considered, we clearly have a considerable shortfall here. If the demand for energy for transport is included, the potential contribution of uranium falls even lower.

There are no easy ways to bridge the gap between the projected demands for energy in our economy and the levels we need to achieve. Greater exploitation of uranium is, at best, going to buy us a very small extra amount of time. It seems likely that we will have to accept that economic loss is an inevitable consequence of the necessary steps to reduce greenhouse gases. That would most likely look like a dramatic reduction in energy use in the developed world, accompanied by a modest increase in the developing world.

Recently, I took part in a forum to discuss the future of nuclear power in Australia. One of my fellow panellists drew a round of applause by suggesting that we could avoid any need for nuclear power by the simple expedient of switching off the light when we leave the room. If only it were that easy. I wonder how large a round of applause would be drawn by telling the audience that they would have to stop driving their cars, flying overseas or heating and cooling their houses?

Alas, a much more likely scenario is that we will simply default to a position where we continue to burn fossil fuels with our fingers metaphorically crossed that nothing too bad will result. That is not a sensible approach, but it is the default one.

** The views expressed here are those of Andrew Davies, not of the Australian Strategy Policy Institute.*



Andrew Davies: "An energy source that is a decade in the making is not likely to help much."

Greenhouse focus

A new climate change research centre is to be established at the **University of NSW**, with a $6 million funding boost. The **Centre for Climate Change Research** will bring together some 60 academics across the university in an integrated research program addressing all aspects of climate change, from its causes to its effect on communities, public health, the law, the built environment and the economy. It will also be the focal point for a diverse national network of researchers from universities and major government research groups – including **ANSTO**, **CSIRO**, the **Bureau of Meteorology** and **Australian Antarctic Division** – known as the **ARC Research Network for Earth System Science**. ***Professor Matthew England*** and ***Professor Andy Pitman*** will be the centre's joint directors.

▶ **More information: Judy Brookman, 0421 061 251**

Eco School

The new **Fenner School of Environment and Society** at the **ANU** will tackle issues such as climate change, water management and biodiversity loss. The Fenner School will combine the resources of the former Centre for Resource and Environmental Studies (CRES) and the School for Resources, Environment and Society. It will be headed by ***Professor Will Steffen***, a former CRES director and pro vice-chancellor (research). The school is named in honour of ***Professor Frank Fenner*** who was instrumental in establishing environmental and resource research at ANU as the foundation director of CRES in 1973.

▶ **More information: Jane Dwyer, 02 6125 5001, 0416 249 231**

Healthy image

Macquarie University is collaborating with **GE Healthcare** in a project aimed at staying at the forefront of technical innovation in the field of neuroscience imaging and oncology. GE will support collaborative R&D projects with Macquarie, beginning from December 2007 in the following areas:

- hypertension – brain and circulation;
- arteriovenous malformation (AVM) – impact of circulation on the brain, early health to treatment;
- Parkinson's disease; and
- explore education/training plans related to the above projects.

▶ **More information: Kathy Vozella, 02 9850 7456**

Indonesian impact

The **Government of Indonesia** has signed an agreement with **Griffith University** to study the effects of climate change and environmental degradation in the region. The **Centre of Excellence in Sustainable Development for Indonesia**, to be based at the Griffith's Brisbane campus, will provide a range of initiatives to help the nation develop sustainability and mitigate the impact of climate change on the region. Programs include:

- education in environmental science, resource management, pollution and environmental degradation, and urban planning education for Environment Ministry staff;
- a range of PhD projects to enable graduates to provide sustainable-development education in Indonesia;
- specific research programs on regional climate change threats such as coastal erosion, wildfire, hurricane-driven flooding, sea level rise, drought and environmental degradation;
- setting up emergency technical consultancies on specific issues; and
- conducting joint climate change research and collaborating to deliver the UN Climate Conference in Bali in December.

▶ **More information: Jeannette Langan, 07 5552 8654, 0419 649 516**

eResearch lab

A $2.7 million international eResearch centre that will help scientists measure climate change and assess the health of ecosystems has opened at **Queensland University of Technology** (QUT). The **Microsoft QUT eResearch Centre**, which is the first of its kind in Australia and one of only a handful in the world, aims to give scientists more time for discovery and invention by automating the data processes that are necessary to their research. The virtual lab is jointly funded by Microsoft, QUT and the **Queensland Government**. QUT ***Professor Paul Roe*** says the centre will allow scientists to research climate change by providing the IT tools necessary to collate, manage and analyse vast amounts of information.

▶ **More information: Sandra Hutchinson, 07 3138 2130**

Renewed energy

The Hopetoun community and the **University of Ballarat**'s **National Centre for Sustainability** have started a project to assess the Hopetoun area's potential to produce community-owned, renewable energy. The Hopetoun Community Sustainable Energy Initiative, funded by the **Victorian Government**'s Sustainability Fund, will:

- gather data on the amount of electricity that can be generated in Hopetoun from renewable sources, such as wind, solar and biomass (from organic waste);
- determine the cost of producing this renewable energy;
- explore financial models for community ownership of such renewable energy generators;
- assess the town's electricity consumption and raise awareness of sustainable energy options; and
- develop a research template for other communities to follow.

This initiative is being conducted with the support and cooperation of the **Yarriambiack Shire Council**, **Gateway BEET**, **Corrong Development Cooperative**, **Hopetoun Progress Association** and **Hopetoun Secondary College**.

▶ **More information: Matthew Freeman 03 5327 9510, 0408 519 674**

Youth disorders

NSW Premier ***Morris Iemma*** has announced $10 million to fund the construction of the **Youth Mental Health Clinical Research Facility** at the **University of Sydney**'s **Brain and Mind Reach Institute** (BMRI). The new facility will have 10 psychiatrists with a youth focus and 20 clinical psychologists. Welcoming the government's commitment to mental health research and treatment, BMRI's executive director ***Professor Ian Hickie*** said: "Emotional and behavioural disorders currently account for more than 60% of disability costs in those aged 15 to 34 years, with 75% of major mental illnesses starting before the age of 25."

▶ **More information: Jake Shaughnessy, 02 9351 4312**

Healthier dogs

Genetic Technologies (GTG) has granted a research licence to **Merlogen**, a US company based at **Texas A&M University** that specialises in researching canine genetic disorders. GTG has also secured an exclusive commercial licence from Merlogen to offer a genetic test in the Asia-Pacific region for Alport's Syndrome (characterised by progressive renal disease) in canines.

"Our genetic testing laboratory in Melbourne now offers a wide range of genetic tests for humans, animals and plants," says ***Geoff Newing***, chief operating officer of GTG. "Our canine business has experienced substantial growth in the past six months, primarily as a result of our ability to secure and offer genetic tests relevant to the Asia-Pacific canine community."

▶ **More information: Geoff Newing, 03 9415 1135**

Heart beat

Sunshine Heart has announced that ***Dr William Abraham*** of Ohio State University and ***Dr Patrick McCarthy*** of Northwestern University will be the co-principal investigators for the C-Pulse™ feasibility trial in the US. Dr Abraham, who has participated in more than 100 drug and device clinical trials and has been international principal or co-principal investigator for several of Medtronic's heart failure pacemaker trials (Miracle, Miracle ICD), says "the C-Pulse™ has great potential in the treatment of patients with moderately severe heart failure".

▶ **More information: www.sunshineheart.com.au**

Life strategy

Life Therapeutics has appointed **Citigroup** as a financial adviser and to evaluate the strategic opportunities available to Life Therapeutics. In response to numerous queries from shareholders, Life Therapeutics has confirmed that it is in negotiations with interested parties to vertically integrate its plasma collection centres with a fractionation business. The company has confirmed that the discussions are advanced.

▶ **More information: www.life-therapeutics.com**

Kinder cut

Peptech has announced that its wholly-owned subsidiary **Peptech Animal Health** (PAH) has received a recommendation to grant approval in Europe for Suprelorin®, a veterinary contraceptive that renders male dogs temporarily infertile for six months.

The **Committee for Medicinal Products for Veterinary Use** (CVMP) of the **European Medicines Agency** has recommended the grant of a European Marketing Authorisation for Suprelorin®. **Cyton Biosciences**, PAH's regulatory partner in Europe for Suprelorin®, says that a positive opinion from the CVMP makes it almost certain that a European Marketing Authorisation will follow in the next three months.

Suprelorin® is expected to become commercially available in Europe during the second half of 2007. It has been successfully marketed in Australia since December 2004 and in New Zealand since September 2005. PAH is pursuing a registration application with regulatory authorities in the US.

▶ **More information: www.promics.com**

Super Band-Aid

Tissue Therapies has signed a joint development agreement with **Novozymes A/S** for the development of advanced wound dressing products combining proprietary Novozymes technology with Tissue Therapies' VitroGro® technology. Based in Denmark, Novozymes is a world market leader in enzymes and other biological protein production and innovation, with sales in 2006 of more than $1.5 billion and a market capitalisation of about $7 billion.

The collaboration will involve scientific work in Brisbane and Denmark.

▶ **More information: www.tissuetherapies.com/news/index.html**

Military image

Wavefront imaging company **Iatia** has successfully completed the sixth milestone under its capability and technology demonstrator contract with the **Defence Science and Technology Organisation** (DSTO). The milestone involved the continued development and optimisation of Iatia's unique algorithm for defence applications and the development of the software interface to the prototype camera test bed. This work is in preparation for Iatia's first military field trial of its unique imaging technology at the Puckapunyal army base.

Iatia's field trial has attracted the attention of international defence contractor **Saab Barracuda**, who have asked to participate in the trial. Saab Barracuda specialise in signature management, camouflage and deception technologies. Saab's participation has been welcomed by the DSTO.

▶ **More information: www.iatia.com.au**

Light guard

Clinuvel Pharmaceuticals has identified a new oncology application for CUV1647, which stimulates an increase in the production of the body's natural photoprotective pigment, melanin. It is expected that CUV1647 will be shown to prevent the phototoxicity associated with photodynamic therapy (PDT) in cancer therapy. Clinuvel has filed patent applications for the use of CUV1647, and any related compounds, in this way. Applications to begin clinical trials in this new indication will soon be filed.

▶ **More information: www.epitan.com.au**

French connection

Virax Holdings has entered into a licence agreement with French biopharmaceutical company **Transgene SA**, granting Transgene exclusive access to Virax's Co-X-Gene™ technology patents for use in two of Transgene's immunotherapeutic products, TG4010 and TG4001. These products are in phase IIb clinical trials for treating non-small-cell lung cancer and in preparation for phase III trials against human papilloma virus-associated pathologies respectively.

Virax could receive up to US$12 million under the agreement (US$9 million for TG4010 and US$3 million for TG4001). In addition, Virax will receive a royalty on net sales of the licensed products in North America.

▶ **More information: www.virax.com.au**

Pick your flu

Brisbane-based **BioChip Innovations** is close to releasing a new product to identify different strains of bird flu, including H5N1, quicker and cheaper than products currently available.

BioChip Innovations CEO ***Dr Graeme Barnett*** says the current genetic tests used to detect and subtype influenza A viruses have several deficiencies, including "an inability of a single test to detect any of the 144 known subtypes, all of which infect wild birds". Comprehensive analysis of an influenza virus takes up to 21 days and requires complex and expensive tests. Consequently only a small percentage of influenza viruses can be thoroughly analysed.

"We have developed a set of unique reagents, commonly called primers, that will allow scientists to quickly detect and analyse selected parts of the genetic code of any influenza A virus." Influenza PrimRset will do a battery of tests within three days on a virus that currently requires at least three weeks and many thousands of dollars to test.

Over the next two years, BioChip expects to develop a fully automated hand-held device to genetically detect and identify an influenza virus in 30 minutes.

▶ **More information: Graeme Barnett, 07 3318 9540**

Ovarian therapy

Four patients have responded positively to treatment of a new personalised medicine for ovarian cancer, exceeding the expectations of the Australian clinical study. Melbourne-based **Prima BioMed** is driving development of this new technology and has announced plans to conduct a larger and more extensive clinical trial in Australia and New Zealand, which will offer CVac™ to more women battling ovarian cancer and at an earlier stage of their disease.

In the trial, all of the 21 women treated with CVac™ had advanced late-stage ovarian cancer for which there were no more curative options available. Trial participants had had surgery and extensive chemotherapy in an attempt to treat and control their cancer; at the time of entering the trial their disease was progressing.

Of the four patients who responded positively to therapy, two showed tumour regression as measured by a decrease of more than 50% in the blood marker that indicates tumour growth. One patient experienced a 25% reduction and one patient had no progression of the tumour. Upon completion of treatment, the disease was stable in all four patients.

▶ **More information: www.primabiomed.com.au**

Beating drug-resistant HIV

Avexa has announced successful results from its phase IIb trial for apricitabine (ATC). ATC is Avexa's novel nucleoside reverse transcriptase inhibitor (NRTI) being developed for the treatment of HIV infection in patients with drug-resistant HIV.

The phase IIb trial compared the effectiveness of ATC in reducing the viral load of patients with drug-resistant HIV with the effectiveness of lamivudine (3TC), a leading NRTI in widespread use. A total of 47 patients completed 21-day dosing.

The results for patients in both ATC cohorts exceeded the phase IIb trial primary endpoint by a substantial margin. Patients with the highest degree of drug resistance still achieved a substantial benefit from treatment with ATC. The demonstration of superior activity in this study indicates that ATC will be an effective antiviral drug for the treatment of many drug-resistant patients.

ATC continues to be very well tolerated – there were no serious adverse events related to ATC during the study, and no patients withdrew because of side effects – and some patients have received more than 12 months treatment to date.

▶ **More information: www.avexa.com.au**

Perfectly synhuman

Peptech has implemented a proprietary antibody-based therapeutic technology platform – 'Synhumanisation' – which provides a competitive advantage by enabling therapeutic drugs to be developed against multiple medical targets.

Synhumanisation is centred on the use of human-like antibody sequences, instead of mouse sequences, in order to avoid potentially harmful immune responses in humans. It will result in increased discovery of patentable new antibody products.

"The successful application of this technology will add to Peptech's pipeline by enabling us to discover new products against additional (medical) targets, particularly those which have proven successful through human trials undertaken by other pharmaceutical and biotech companies," says Peptech CEO ***Dr John Chiplin.*** "This technology was developed to provide Peptech with a competitive advantage by providing the means to access high-value targets without being blocked by patents held by others. In other words, it gives Peptech the freedom to develop drugs without falling under the scope of other companies' patents."

▶ **More information: www.promics.com**

Won't hurt a bit

Norwood Abbey has announced progress in its needle-free injection system project being undertaken at the BioInstrumentation Laboratory at **Massachusetts Institute of Technology** (MIT) under the direction of ***Professor Ian Hunter***.

MIT reports that it has successfully completed laboratory trials using the latest prototype, which clearly demonstrate the ability of the Norwood needle-free mechanism to deliver compounds in a controlled manner into a human skin substitute.

The MIT program involved testing delivery using the unique patented drive force actuator that forms part of the technology. MIT used a state-of-the-art video system to record the trial processes at the speed of 30,000 frames per second. Extracts of the video recording of the tests can be viewed on the company's website.

The viewer is able to see how, with a simple adjustment to the prototype device, the target depth can be varied to a pre-determined setting.

MIT also reports that further refinement of the technology has resulted in a reduction in the device's size and weight, which will lower the projected end cost of the re-usable actuator. The actuator has the potential for more than a million procedures, making it economically very attractive.

▶ **More information: www.norwoodabbey.com/indexnews.htm**

Painless patching

Phosphagenics has extended its transdermal technology by successfully incorporating its patented TPM/Morphine formulation into an occlusive patch system. Phosphagenics will restart its clinical phase II trials in the first half of 2007, examining its application in the management of chronic pain.

The clinical study, investigating the absorption, metabolism and efficacy of morphine administered using Phosphagenics' novel transdermal carrier TPM via a patch, will include an additional treatment group to assess the transdermal delivery of oxycodone.

Dr Esra Ogru, executive director of R&D at Phosphagenics, says this trial follows on from the successful completion of large-scale chronic toxicology studies on its patented transdermal morphine formulation and its carrier platform technology.

"With the success of our recent morphine clinical trials, we have now started to explore alternative application methods. Using an occlusive patch is a logical and appropriate next step as it is non-invasive and minimises the need for any human handling, which is clinician and patient preferred," Dr Ogru says.

Harry Rosen, managing director of Phosphagenics, adds: "In these studies, and in response to commercial interest, we will also examine the transdermal delivery of oxycodone, thereby extending our commercial opportunities. Oxycodone is a commercially successful product with worldwide sales exceeding US$1 billion annually and is currently delivered either in tablet or intravenous form.

"Phosphagenics will apply its novel technology in the pain area to the treatment of chronic pain, which is the largest market segment."

▶ **More information: www.phosphagenics.com**

Deep breath

Pharmaceutical company **Pharmaxis** has announced the results from its phase II trial for Aridol in subjects with chronic obstructive pulmonary disease (COPD), a respiratory disease affecting more than 30 million people worldwide. The trial was conducted in 79 diagnosed COPD patients at 12 centres in Australia.

The primary objective of the trial was to determine if subjects that were positive to an Aridol challenge test would demonstrate an improvement in lung function, as measured by spirometry, following a three-month course of inhaled corticosteroids. A secondary objective was to determine the effect of inhaled corticosteroids on hyper-responsive airways as measured by a positive Aridol test. In this group, with predominantly mild to moderate COPD, Aridol response was positive in 76.5% of cases.

There were no related serious adverse events and Aridol was shown to have an acceptable safety profile.

The presence of hyper-responsive airways is becoming accepted as an important measure in determining the prognosis of patients with COPD and a simple test such as Aridol to identify hyper-responsiveness and monitor the effects of treatment is needed.

To further enhance the role of Aridol in COPD management, Pharmaxis is supporting an additional, and larger, study in subjects with COPD to be run in Switzerland. The first patient is expected to be enrolled in this study in April 2007 and the study should conclude during the first half of 2008.

▶ **More information: www.pharmaxis.com.au**

Free drug data

Wiley-Blackwell has launched *Archives of Drug Information* (*ADI*), an open-access, peer-reviewed journal dedicated to publishing results of drug studies. The journal will help to address requests for the disclosure of clinical trial information by practitioners, patients, media and government.

ADI will publish not only results of clinical trials and drug studies, but also articles on inconclusive and/or negative clinical trials, early drug development, routine drug interaction, pharmacokinetic studies and other low-profile areas that are often overlooked. *ADI* will publish a broad range of research including cellular, animal and human studies The first articles will be published online in April 2007.

"*ADI* will provide an unbiased, scientific home for high-quality information that should be in the public domain but currently resides on file somewhere," says *ADI* editor ***Dr C. Michael Stein***. "It will also help prevent scientists in drug development from repeating mistakes or following the same blind alleys others have explored."

▶ **More information: www.blackwellpublishing.com**

Crash detector

Four out of five corporate collapses can be predicted up to four years ahead using a new method created by ***Dr Gus Hossari*** from **Deakin University**.

Dr Hossari applied an innovative method for predicting corporate collapse as part of his PhD studies. He analysed the financial health of a company by looking at key items in financial statements: cashflow, net income, total assets and total liabilities. These were then weighted to account for their effect on the final forecast. For instance, net income and total assets affect the outcome most, while cashflow and total liabilities affect it least. At the end of processing company data, a probability of collapse is calculated. "Using data from financial statements for **HIH**, probabilities of collapse were calculated up to four years prior to the event," Dr Hossari says.

He says the method could be useful to CEOs or corporate watchdogs to identify companies in danger of collapse.

Models for predicting corporate collapse were developed in the 1960s and have a success rate of predicting three out of five collapses.

▶ **More information: Gus Hossari, 03 9244 5106**

Watch your assets

As international business becomes increasingly competitive and corporate governance requirements more stringent, the management, protection and commercialisation of intellectual property has become a crucial issue for business managers and an area for oversight by boards, according to the **Licensing Executives Society of Australia and New Zealand** (LESANZ).

"Intellectual property assets typically represent a disproportionate amount of a company's value, often outstripping the tangible asset valuation of a business by five

times or more," LESANZ president ***Rob McInnes*** says. "Effective management, protection and commercialisation of intellectual property assets are therefore key drivers of sustainable value creation. Directors and managers who do not actively manage these important intangible assets risk breaching their professional duties.

"For companies exporting out of Australia and New Zealand, or offshoring back-office functions, it's vital to understand how to keep intellectual assets intact."

▶ **More information: lesanz.org.au/events/annualconference.html**

Spray-on infertility

Drug-delivery company **Acrux** has signed an agreement with **Organon**, the human health-care business unit of **Akzo Nobel**, to develop and commercialise contraceptives delivered through the skin using Acrux's unique spray technology.

Under the agreement, Organon has licensed Acrux's technology for use with selected contraceptive compounds. Acrux will be responsible for developing formulations of such contraceptive compounds and upon successful completion of this program, Organon will undertake and fund all clinical trials, regulatory submissions, manufacturing and marketing.

For each contraceptive compound that Organon selects to develop, Acrux may receive payments totalling between US$12 million and US$16 million as development and regulatory milestones are achieved. Acrux will also earn royalties on worldwide sales of each product.

Acrux is free to develop and commercialise sprays containing other contraceptive compounds, including Nestorone®, which it is advancing through clinical trials. Worldwide sales of hormonal contraceptive products in 2006 were about US$6.7 billion.

▶ **More information: www.acrux.com.au/IRM/content/default.html**

Little footprints

Origin Energy has launched a carbon reduction scheme offering Australian businesses a way to reduce their carbon footprint.

Origin, a founding member of the **Business Roundtable on Climate Change**, says the scheme is a way to help companies focus on and effectively manage the reduction and offset of greenhouse gas emissions.

"There is a heightened awareness that companies need to take action now to universally reduce our greenhouse gas impact," says Origin's managing director ***Grant King***. "The carbon reduction scheme design is based on five key principles: credibility, transparency, affordability, flexibility and effectiveness.

"It draws on and extends existing mandatory and voluntary frameworks to ensure that participants can use one framework and apply it to national and international operations. Importantly, the scheme is cost-effective, transparent and externally verified.

"The scheme also allows business to purchase carbon offsets that are sourced from abatement activities overseas. This is particularly attractive to companies with international operations."

The carbon reduction scheme specifically allows for businesses to participate on both sides of the carbon market, and offset emissions from electricity, natural gas and LPG consumption, fleet emissions and air travel.

Origin's scheme recognises a range of carbon-reduction activities, such as energy efficiency projects, renewable energy or low-emission generation, carbon sequestration and industrial abatement, for example fuel substitution.

It also provides customers with the certainty that all products on offer meet published and verified standards, particularly in ensuring that carbon credits are retired and cannot be used again.

▶ **More information: www.originenergy.com.au**

Wind of change 1

Allco Wind Energy has announced its entry into the large European wind energy market, entering into partnership arrangements with two leading German developers, **WPD AG** and **JUWI GmbH**. Allco will acquire a total of 112MW of wind energy in Germany and France, with completion in 2007 and 2008.

With a total installed capacity of 60MW, three wind farms in Germany have been acquired from WPD, with the acquisition of a fourth project, to be completed later in 2007, taking the overall installed capacity to 64MW. Wind turbine generators are supplied by **Vestas** and **Siemens**.

An agreement has been entered into with JUWI whereby Allco will acquire eight wind-energy projects in Germany and France totalling 48.5MW. The first acquisition of the 6MW Ober Kostenz project in Germany (6.0MW, 3 x Vestas V90 – 2.0MW) has been completed. Wind turbine generators are supplied by Vestas and **Enercon**.

▶ **More information: www.allco.com.au/home.aspx?m=2**

Wind of change 2

TrustPower, which generates all of its electricity from sustainable resources, has added impetus to carbon trading in New Zealand by selling carbon credits to **Meridian Energy**.

TrustPower, which owns and operates 34 hydro generators and the Tararua Wind Farm, has been awarded carbon credits for a number of its sustainable generation development and enhancement projects. The largest completed so far has been the Stage 2 development of the Tararua Wind Farm.

Chief executive ***Keith Tempest*** says TrustPower's decision to focus on renewable energy sources has proven to be a sound one, for the company and the environment. "We are pleased that our efforts to concentrate on sustainable generation have put us in a position where we are now able to trade our surplus carbon credits to assist others to gain carbon neutrality or offset their own greenhouse gas emissions. We welcome approaches from any New Zealand businesses that require assistance to gain carbon-neutral status."

In addition to its existing 100% sustainable generation portfolio, TrustPower is on target to complete its Tararua Stage 3 Wind Farm expansion in July and its Deep Stream Hydro project later in the year. It is in the resource consenting phase for a new 72MW hydro project in Marlborough, a 42MW hydro scheme on the west coast of the South Island, and a new 200MW wind farm at Mahinerangi in Otago, adjacent to one of its existing hydro schemes.

It has also begun construction of a new 88MW wind farm at Snowtown in South Australia.

▶ **More information: www.trustpower.co.nz**

Platypus plague

Tasmanian Minister for Primary Industries and Water ***David Llewellyn*** has announced a collaborative conservation program to understand the threat the mucor fungus poses to Tasmanian platypuses.

The disease, which causes ulcers leading to death, was first observed in platypuses in 1982 in the Elizabeth River, near Campbell Town in Tasmania's north. It is now known to occur throughout the Tamar River catchment, as well as in the Emu and Mersey River catchments. So far, the disease seems confined to these northern catchments but anecdotal reports indicate the disease may be spreading. The mucor fungus affects platypuses only in Tasmania and not on the Australian mainland, where the same pathogen infects frogs.

The Tasmanian Department of Primary Industries and Water is working to map healthy and diseased platypus populations.

"To help raise community awareness and assist our understanding of the disease distribution, detailed information has been produced as part of the awareness program," Mr Llewellyn says. "Trialling is also under way of a specific monitoring program at two sites."

▶ **More information: 03 6233 6573**

Burying carbon and…

Victorian Minister for Energy and Resources ***Peter Batchelor*** has announced the start of work on a carbon storage project in south-west Victoria that could offer a pathway to deep cuts in greenhouse gas emissions. Mr Batchelor said the drilling of a research well at Nirranda South, near Warrnambool, marked the start of Australia's first trial project to store greenhouse gases underground. The Bracks Government has contributed $4 million to the trial, which is being run by the **CRC for Greenhouse Gas Technologies**.

The project will involve the extraction of naturally occurring carbon dioxide gas from a nearby gas well (Buttress-1) followed by its injection, in compressed form, into the CRC-1 well at Nirranda where it will be stored 2000 metres underground in a depleted natural gas field.

▶ **More information: Peter Cook, 0419 490 044, www.co2crc.com.au**

…cleaning coal

The **New South Wales Government** will spend $22 million on two pilot clean-coal projects to reduce greenhouse emissions from power stations in NSW.

The first project will capture greenhouse gas emissions from power stations and pump them into deep underground rock formations for permanent disposal. The initial stage of the project will identify potential CO_2 storage sites in NSW and this will be followed by a pilot project. The total cost of the geosequestration project will top the $60 million mark.

There will also be an Ultra Clean Coal project, which will produce a high-purity cleaned coal that can be burnt directly in gas turbines to generate electricity. To assist the project, the NSW Government will grant freehold land title, valued at $1.9 million, and a long-term lease to **UCC Energy Pty Ltd** for the construction of a demonstration plant at Cessnock.

Ultra clean coal fired turbines can potentially reduce greenhouse gas emissions from the generator by 20 to 30% and make it easier to capture greenhouse gas emissions. The Ultra Clean Coal project is based on wholly Australian-owned technology.

▶ **More information: Jenny Ward, 02 8289 3925**

Power degrees

Australia's first university program for power generation professionals has been launched in Brisbane by Mines and Energy Minister ***Geoff Wilson***. The Power Generation Skills Development program was forged between the three government-owned generators and three leading Queensland universities

Developed in partnership with **Tarong Energy Corporation**, **CS Energy** and **Stanwell Corporation**, the postgraduate program will be offered concurrently through the **University of Queensland**, **Queensland University of Technology** and **Central Queensland University**. Students can enrol in a Masters Program, Graduate Diploma or Graduate Certificate, depending on their professional experience and academic qualifications. The programs are structured to allow professionals to undertake intensive learning sessions on campus or at generation sites.

▶ **More information: Ellen McIntyre, 07 3225 1819**

Premier projects

The **South Australian Government** recently announced projects to be funded in the 2006-07 round of the Premier's Science and Research Fund, which supports local development and innovation and encourages partnerships between researchers and people involved in using the research outcomes.

Winning projects are:

- $533,745 for development of wine yeast strains to add to Australian wine, led by ***Professor Sakkie Pretorius***, managing director, **Australian Wine Research Institute**;
- $376,956 for a materials research and engineering facility for conducting polymers, led by ***Dr Peter Murphy*** of the Ian Wark Research Institute, **University of South Australia**;
- $750,000 for a visual technologies laboratory, led by ***Dr Anton van den Hengel***, director of the Australian Centre for Visual Technologies at **Adelaide University**; and
- $800,000 for the establishment of a large-scale, world-class wind tunnel to support SA's defence aerospace and wind turbine sectors, led by ***Associate Professor Gus Nathan***, **Adelaide University**.

SA Government investment of $2.46 million over three years for these projects is expected to result in South Australian research projects worth $11.3 million. In addition, the fund continues to support a number of successful projects from previous rounds.

▶ **More information: www.ministers.sa.gov.au/news.php?id=1273**

Biosecuring Queensland

Biosecurity Queensland is now the new central point of contact for invasive species and diseases across the state. The new agency has been formed by combining the experience and expertise of nearly 700 staff from **Queensland's Departments of Primary Industries and Fisheries**, and **Natural Resources and Water**.

Biosecurity Queensland brings together land protection capabilities, plant, animal and marine biosecurity, chemical use and food safety, animal welfare and will shortly include some key areas of the **Environmental Protection Agency**. ***Kareena Arthy*** has been appointed chief executive for a period of six months while the full-time position is advertised. ***Dr Ron Glanville*** has been appointed chief biosecurity officer, chief veterinary officer and deputy CEO.

▶ **More information: www.dpi.qld.gov.au**

NT marine parks

The **NT Government** is one step closer to creating a larger world-class parks system with the development of a strategy to establish a system of marine parks in the NT. Environment Minister ***Marion Scrymgour*** says the draft strategy would recognise the important social, ecological, fishing and economic benefits of establishing Marine Protected Areas.

The NT Marine Protected Areas (MPA) Advisory Committee has been established to provide input on the development of the strategy. The new committee comprises a wide range of stakeholders, including indigenous interests, recreational fishing, commercial fishing, fishing tourism, aquaculture, mining, conservation, sailing and SCUBA diving, as well as the NT and Australian governments. The committee is chaired by ***Professor Bob Wasson*** of **Charles Darwin University**.

▶ **More information: Maria Billias, 0401 119 746**

Green energy

Four projects have won almost $200,000 in research and development grants from the **South Australian Government** for competitive sustainable energy projects:

- **Rinnai Australia** has won $43,650 along with their project partner, **CSIRO Technology**. The project aims to convert solar energy into electricity to power appliances such as air conditioners and heaters, and offset grid loads during peak periods;
- **University of South Australia**'s (UniSA) **Sustainable Energy Centre** has won $41,558 for the development of a residential solar thermal system for Adelaide conditions that combines hot water generation, heating, cooling and dehumidification, to maximise efficiency and minimise cost.
- UniSA's Sustainable Energy Centre has won an additional $34,130 to move into the next phase of its project designed to reduce the costs of transported refrigerated goods and reduce their greenhouse gas emissions; and
- **Adelaide University**'s **School of Mechanical Engineering** has won $75,000 to develop breakthrough injection technology for biodiesel-powered engines with low emissions, high fuel economy and high performance.

▶ **More information: www.ministers.sa.gov.au**

Somatic moves

Victoria aims to become the first state to allow somatic cell nuclear transfer (SCNT) for medical research, following the **Bracks Government**'s introduction of amendments to the *Infertility Treatment Act* in Parliament. Premier ***Steve Bracks*** has said the vote to ease current restrictions on SCNT, otherwise known as 'therapeutic cloning', will be a conscience vote. Health Minister ***Bronwyn Pike*** says adopting the proposed changes would bring Victorian legislation into line with new Commonwealth legislation and enable Victorian scientists to apply for federal licences to undertake SCNT research.

The amendments aim to:

- maintain the ban on human reproductive cloning;
- update the legislation to allow for somatic cell nuclear transfer (therapeutic cloning) to enable the creation of disease-specific stem cells and patient-tailored stem cell therapies; and
- uphold the open and transparent national regulatory regime.

▶ **More information: www.dpc.vic.gov.au**

Child cancer facility

New South Wales Premier ***Morris Iemma*** has announced a $15 million grant for the **Children's Cancer Institute Australia for Medical Research** (CCIA) for the construction of a new building to house the institute's research activities. The new building will be at the **University of New South Wales** as the first stage of a planned multi-stage development of the university's biomedical campus that will accommodate the CCIA's projected growth to a total of 500 staff.

CCIA is the only independent medical research institute in Australia devoted to research into the causes, prevention, better treatment and cure of childhood cancer. It has produced advances in the understanding and treatment of childhood cancers, including the first paediatric trial in Australia that uses genetic testing to tailor chemotherapy regimes for children with leukaemia.

▶ **More information: Miriam Pollak, 02 9382 0641, 0419 697 673**

Island ecofunds

A fund to support environmental projects on Kangaroo Island will be set up in a joint initiative by the **SA Government** and the developers of **Southern Ocean Lodge**, a nature-based tourism venture to be built near Hanson Bay, adjacent to the Flinders Chase National Park.

The Southern Ocean Lodge Development Fund, to be partly funded by visitor tariffs, is expected to generate between $20,000 and $50,000 annually for local environment projects. A board made up of representatives of developers **Baillie Lodges**, the **Native Vegetation Council** and the **Department for Environment and Heritage** will administer the fund.

Projects could include ongoing restoration and management of the glossy black cockatoo habitat, further research into the 15 threatened plant species on the island or a range of monitoring and management programs for threatened fauna.

▶ **More information: www.ministers.sa.gov.au/news.php?id=1381**

Adelaide accelerates

An ultra-high-speed, high-volume broadband network – SABRENet – has been launched to deliver ultra-high-speed connectivity between Adelaide's key research and education precincts, initially up to 10GB per second. It will allow large quantities of data to be transferred between locations through some 90 kilometres of bundled fibre.

In addition to universities, research precincts to be linked into the network include the Thebarton Bioscience precinct, two **SARDI/PIRSA** research institutions and the **Defence, Science and Technology Organisation**. The **State Government Computing Centre** at Glenside will be connected to support hospital, school and TAFE use.

Major projects already being funded by the government include:

- $1 million to establish a very high speed connection to Melbourne that in turn connects SABRENet to the national research network and, internationally, with the US and the Europe;
- $400,000 to connect marine research sites in locations where SABRENet will not initially be available, including an optical fibre connection to the future Marine Innovation SA; and
- more than $1 million to purchase high-performance computing equipment.

▶ **More information: www.ministers.sa.gov.au**

Barry Brook

Cathy Foley

Bruce Stillman

Michael Braber

Nick Smale

Geoffrey Smithers

Rod McClure

Curtin gong

Professor Bruce Stillman has been awarded the Curtin Medal for Excellence in Medical Research for his work on DNA replication in cells. The medal is awarded by the John Curtin School of Medical Research at the Australian National University.

Nuclear chair

Dr Ziggy Switkowski has been appointed as the new chairman of the board of the Australian Nuclear Science and Technology Organisation (ANSTO). Dr Switkowski chaired the Uranium Mining, Processing and Nuclear Energy Review Taskforce, which reported to the government in December last year, and is a former member of the ANSTO board.

Food fanfare

Food Science Australia's **Dr Geoffrey Smithers** and his team have won the Sir Ian McLennan Achievement for Industry Award for developing technology and ingredients worth nearly $60 million annually in foreign exchange to Australia. An oral healthcare ingredient, Recaldent, developed by Dr Smithers' team, in partnership with Melbourne University and Bonlac Foods, is the active component in the Trident range of functional chewing gums marketed in Japan and the US by Cadbury–Adams. The team, in partnership with Murray Goulburn Cooperative Co Ltd, also developed and adapted technology for manufacturing whey protein that is now central to Murray Goulburn's export program. A whey extract, isolated using processing technology developed by Dr Smithers' team in partnership with GroPep Ltd, is also undergoing clinical trials for use against oral mucositis, a gastrointestinal side-effect of chemotherapy and radiation therapy that can prevent cancer patients eating and drinking.

Climate accolades

Professor Barry Brook has received the Edgeworth David Medal from the Royal Society of New South Wales. The medal is awarded for distinguished contributions by a scientist under the age of 35 in any discipline, for work in Australia or which assists the advancement of Australian science. Professor Brook has just taken up the Sir Hubert Wilkins Chair of Climate Change at the University of Adelaide. He will head the new Research Institute for Climate Change and Sustainability.

Barber for Flinders

Dr Michael Barber, group executive for CSIRO's Information, Manufacturing & Minerals group, is to become vice-chancellor of Flinders University. Dr Barber will take up his position in January 2008 after the retirement of the present vice-chancellor, **Professor Anne Edwards**.

Accident head

Professor Rod McClure has been appointed to lead the Monash University Accident Research Centre. He is currently Professor of Community Care and Epidemiology at Griffith University and chief executive officer and research director of Injury Prevention and Control (Australia) Ltd.

Cool winner

Food Science Australia's **Dr Nick Smale** has been awarded this year's James Harrison International Institute of Refrigeration Young Researchers Award for his research into improving the quality of fresh produce exports by developing mathematical models of air movement in refrigerated transport systems.

Good fellows all

Seven new CSIRO Fellows have been announced. They are: **Dr Trevor Bird** (CSIRO Information and Communication Technologies Centre) for his contributions to reflector antennas, multiple beam antennas and arrays; **Dr Greg Constable** (CSIRO Plant Industry) for his work in cotton research, including plant physiology, crop agronomy, farming systems and plant breeding; **Dr Ron Ekers** (Australian Telescope National Facility) for his work in the field of extragalactic astronomy, galactic nuclei and the techniques of radio astronomy; **Dr Dick Manchester** (Australian Telescope National Facility) for his study of pulsars and supernova remnants; **Dr Trevor McDougall** (CSIRO Marine and Atmospheric Research) for his work in oceanography, particularly on fundamental issues in the field of ocean mixing; **Dr Steve Rintoul** (CSIRO Marine and Atmospheric Research) for his work in physical oceanography with a keen interest in the role of the ocean in the earth's climate system, particularly the Southern Ocean; and **Dr David Trimm** (CSIRO Petroleum Resources) for his work in heterogeneous catalysis and its applications.

Euro-pals

Australian researchers working in the areas of malaria, gene mapping, musculoskeletal disorders and microbiology have been awarded $1.8 million by the National Health and Medical Research Council to join forces with leading research teams from the European Union. They are: **Associate Professor Nicholas Hayward**, Queensland Institute of Medical Research, who will map the genes responsible for causing melanoma; **Professor Peter Le Souef**, University of Western Australia, whose team will research immunity to malaria in infants; **Professor John Bateman**, Murdoch Children's Research Institute, who will research diseases of the musculoskeletal system; **Professor Nicholas Hunt**, University of Sydney, who will join a project investigating complications of malaria in the brain and lungs; and **Dr Peter Lewis**, University of Newcastle, who will research the genetic regulation of bacteria.

Through to the Keeper

Dr Suzanne Miller is the new director of the South Australian Museum. She was previously Keeper of Natural Sciences at the National Museums of Scotland, and has more than 20 years experience in geology and earth sciences.

Natural winner

Professor Margaret Brimble, head of medicinal chemistry at Neuren Pharmaceuticals and researcher at the University of Auckland, is the first New Zealander to receive a Laureate award for scientific excellence from the L'Oréal–United Nations Educational, Scientific and Cultural Organisation (UNESCO) for Women in Science Awards for her research on the synthesis of biologically active natural products that provide new lead compounds in the development of drugs.

Physics chief

Well-known CSIRO scientist **Dr Cathy Foley** has been elected president of the Australian Institute of Physics (AIP). She is the AIP's first female president and will serve a two-year term.

Medi-dean

The Australian National University has appointed **Professor Nicholas Glasgow**, a leading authority on primary health care, as the new Dean of the ANU Medical School. Professor Glasgow will take over the reins from Foundation Dean, **Professor Paul Gatenby**, who completes his six-year term.

Swinburne PVC

Professor Andrew Flitman has been appointed pro vice-chancellor (research) at Swinburne University of Technology. He will officially join the university in July. Currently the dean of the Faculty of Science and Technology at Deakin University, Professor Flitman has played a major leadership role in advancing the faculty's research and teaching performance.

Resourceful

Irrigation scientist **Professor Wayne Meyer** has been appointed as the University of Adelaide's new chair of Natural Resources Science. Professor Meyer comes to the university after a long career in CSIRO where he was the founding chief executive officer of the Cooperative Research Centre (CRC) for Irrigation Futures and, for the past three years, has been the CRC's chief research scientist.

Cancer stars

Cure Cancer Australia has announced the winners of its National Young Researcher of the Year Awards 2007, which aims to recognise brilliant cancer researchers in the early stages of their careers. National Young Researcher of the Year Award 2007 goes to **Dr Megan Fabbro**, Children's Medical Research Institute, Sydney. Young Researcher – Clinical Award winner is **Dr Belinda Thewes**, Eurobodalla Cancer Services, Moruya, NSW. Young Brillance Award (Research Student) goes to **Jill Larsen**, Prince Charles Hospital, Brisbane.

Eco-lauded

A marine scientist from the University of Newcastle, **Dr Bill Gladstone**, has received an EnergyAustralia National Trust Heritage Award award for his work in environmental education.

Eyes Prize

Professor Roger Truscott from the University of Sydney's Discipline of Clinical Ophthalmology has been awarded the Cataract Research Award by the National Foundation for Eye Research in the US. He is the first Australian to be awarded the prize.

Uranium mining

The economic and environmental sustainability of uranium mining has been analysed by **Monash University** researcher ***Dr Gavin Mudd*** in a paper that challenges the perception that uranium mining is an "infinite quality source" that provides solutions to the world's demand for energy.

Dr Mudd says information on the uranium industry touted by politicians and mining companies is not necessarily inaccurate, but it does not tell the whole story, being often just an average snapshot of the costs of uranium mining today without reflecting the escalating costs associated with the process in years to come. "From a sustainability perspective, it is critical to evaluate accurately the true lifecycle costs of all forms of electricity production, especially with respect to greenhouse emissions," he says. "For nuclear power, a significant proportion of greenhouse emissions are derived from the fuel supply, including uranium mining, milling, enrichment and fuel manufacture."

Dr Mudd found that financial and environmental costs escalate dramatically as the uranium ore is used. The deeper the mining process required to extract the ore, the higher the cost for mining companies, the greater the impact on the environment and the more resources needed to obtain the product.

"It is clear that there is a strong sensitivity of energy and water consumption and greenhouse emissions to ore grade, and that ore grades are likely to continue to decline gradually in the medium to long term. These issues are critical to the current debate over nuclear power and greenhouse emissions, especially with respect to ascribing sustainability to such activities as uranium mining and milling. For example, mining at Roxby Downs is responsible for the emission of over one million tonnes of greenhouse gases per year and this could increase to four million tonnes if the mine is expanded."

▶ **More information: Samantha Blair, 03 9905 9315**

Rain drift

Australia's rainfall distribution is moving north, according to maps compiled by the **Bureau of Meteorology**'s National Climate Centre using data from the past decade. The shift is said to expose a need for an urgent rethink of existing big city and rural water supply policies, infrastructure and consumption patterns in the populous south of the continent. The rainfall deficiencies are further exacerbated by record high temperatures in the drought-stricken southern half of the continent. The maps are part of a body of evidence that a climate shift of major national strategic significance is under way in Australia.

▶ **More information: uninews.unimelb.edu.au**

Climate impacts online

The **Murray-Darling Basin Commission** (MDBC) has produced a website that carries comprehensive information on the operations, research projects and aims of the $7 million South Eastern Australian Climate Initiative (SEACI). The MDBC is the managing agency for SEACI, which was launched early in 2006. The new website includes an overview of the initiative as well as fact sheets, background papers, reports and other documents on various aspects of its operations and plans.

"The new site will help stakeholders and members of the public understand how climate change is affecting the south-eastern part of our continent," says ***Dr Wendy Craik***, MDBC chief executive. "It will also create more awareness of how the SEACI investment will help us tackle these important issues by providing us with better knowledge of the causes and impacts of climate change and climate variability."

Other SEACI partners are the **Australian Greenhouse Office**, the **Managing Climate Variability Program**, the **Victorian Department of Sustainability and Environment**, **CSIRO** and the **Bureau of Meteorology**.

▶ **More information: www.mdbc.gov.au/seaci**

Sceptical

The former chairman of **Western Mining**, ***Sir Arvi Parbo***, has launched an attack on the "unbalanced debate" on man-made climate change while at Parliament House launching the book by former mining executive Ray Evans, *Nine facts about climate change*. He said the question is not whether the climate is changing, but whether CO_2 emissions from human activities, unless checked, will cause disastrous global warming. "This has not been proved," says Sir Arvi, who especially criticised the reliance on computer modelling. "What started out as a scientific assessment has gradually become something quite different. Politics, social agendas, ideology and even a semi-religious fervour now overshadow the science."

▶ **More information: www.lavoisier.com.au**

Uniwater

On World Water Day, Victorian Minister for Water ***John Thwaites*** launched **Uniwater**, a research-driven response to the water crisis, spearheaded by the **University of Melbourne** and **Monash University**, which contributed $1 million each to the project. Uniwater has four strategic objectives:

- maximising environmental return on investment in repair of rivers, groundwater and catchments;
- realising the potential of irrigated and dryland agriculture using less water;
- providing a reliable and sustainable water supply to Australia's growing cities; and
- developing water policies and institutions within a federation framework.

Professor John Langford is director of Uniwater, and a research development manager will be located at Monash.

▶ **More information: Tim Winkler, 0409 551 743**

Recycled claims

University of Melbourne researchers are to embark on a three-year project that will put the risks of drinking recycled water under the microscope. The study will examine scientific opinion about the possible risks of ingesting trace amounts of micro-contaminants such as pharmaceuticals that may be contained in drinking water that has been recycled from sewage.

Project leader ***Dr Louisa Flander***, from the School of Population Health, says the study will examine the processes and methods scientists go through to make their assessments of a range of risks, from whether a contaminant is likely to cause few health problems to whether cancer or reproductive

problems may be a danger. Also involved in the research are University of Melbourne experts ***Professor John Langford*** (**Uniwater**), ***Professor Mark Burgman*** (**Australian Centre for Excellence in Risk Analysis**), ***Professor Markus Reuter*** (**Civil and Environmental Engineering**) and ***Professor John Hopper*** (**Centre for Molecular, Environmental, Genetic and Analytical Epidemiology**). The study recently received a $282,000 grant from the **Australian Research Council**.

▶ **More information: uninews.unimelb.edu.au**

GM food fears

A French study on GM food has been cited by WA's Agriculture and Food Minister ***Kim Chance*** as further support for WA's moratorium on the commercial production of GM crops.

Mr Chance pointed to an independent study, conducted by researchers from the **University of Caen** and **University of Rouen**, which found that rats fed on **Monsanto**'s MON863 genetically modified corn had significant reductions in growth and adverse effects on liver and kidney function after 90 days. The minister said that the GM corn under scrutiny was not grown in Australia, but Australians may have consumed it in imported foods such as corn chips, tacos and products made from corn meal and syrup.

"Until we know more about GM crops, especially GM food crops, I believe it is a wise move to continue with the moratorium," he says. "We want to take some time to understand the effect of GM crops and leave our options open. Advocates for adopting the technology now perhaps do not realise it, but by doing so we would close those options. This is because GM technology is effectively irreversible."

Mr Chance urged **Food Standards Australia and New Zealand** (FSANZ) to undertake thorough testing of GM foods before they are approved. "FSANZ should stop relying on the data supplied by the GM companies and conduct their own independent feeding trials and stringent analysis of the GM products that are proposed for human consumption."

He added that the lack of independent data is the reason the **WA Government** has funded its own independent long-term animal feeding trial to gain data on the safety or otherwise of GM food crops. The government is working through the full range of issues associated with GM technology with industry through its GMO Industry Reference Group.

▶ **More information: Alicia Miriklis, 08 9213 6700**

Biofuel study

The environmental, social and economic benefits of biofuels produced from renewable organic material will be the subject of a pilot study conducted by the **Wimmera Development Association**. The Federal Minister for Agriculture, Fisheries and Forestry, ***Peter McGauran***, announced a $60,000 grant for the study, which will focus on the possibility of developing a biofuels processing industry in the Wimmera, in western Victoria.

"Biofuels remain in the early stages of development and are costly to produce," Mr McGauran says. "However, there are opportunities for growth and the government is keen to help the Wimmera business community investigate ways to diversify and create a regional industry and associated employment. I look forward to seeing whether a business case can be made to justify the industry and the communities taking the project further."

The study, which has strong community backing, will assess the region's capacity and preparedness to support a biofuels industry and will consider various sites across the six Wimmera shires where processing plants could be located.

▶ **More information: Ben Houston, 02 6277 7520**

Rural R&D praised

The importance of R&D to the future productivity of Australia's agriculture, fisheries and forestry industries is more likely to increase than decrease in coming years, says Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry ***Sussan Ley***. Addressing the **Council of Rural Research and Development Corporations**, Ms Ley congratulated the R&D corporations on their cooperative and coordinated approaches to investment: "The government's policy is to encourage our industries to be self-reliant and self-directing, and we know that this brings new challenges for R&D stakeholders – especially with the compounding effects of prolonged drought and the need for adaptation to climate change."

In 2005-06 the combined expenditure on R&D by the rural R&D corporations was more than $540 million.

▶ **More information: Verity Williams, 02 6277 4503**

Trans-Tasman deal

CSIRO Livestock Industries and **AgResearch**, New Zealand's largest Crown Research Institute (CRI), have formalised a close working relationship with the signing of a Heads of Agreement document that extends working relationships and collaborative research projects. CRI chief scientist ***Dr Peter Willadsen*** says collaboration is essential so that both organisations can compete effectively in the international agricultural biotechnology arena. "We are highly experienced in working on the major scientific challenges that confront animal industries around the globe and our unique partnership has given us a competitive advantage and greatly strengthened our animal bioscience capability." The relationship has already produced impressive results such as sequencing the bovine genome, done in collaboration with several organisations in the US and Europe.

▶ **More information: Lisa Ru, 07 3214 2960**

Early vigour

Wheat with early vigour traits can produce more roots and use nitrogen more effectively, say researchers at **CSIRO Plant Industry**. ***Dr Jairo Palta*** in WA compared how quickly roots grow in a commercial wheat variety and two breeding lines developed by CSIRO.

The vigorous wheats produced more prolific root branching that increased root length density, the number of roots, and the capacity to capture nitrogen. While conditions in controlled growth boxes are clearly different to field conditions, there is good evidence from the work of CSIRO Plant Industry scientists in Canberra that the same benefits of increased nitrogen uptake in wheat varieties with early vigour would be the same in the field. Incorporating early vigour traits into wheat varieties could reduce input costs and improve yield.

▶ **More information: Dr Jairo Ra, 08 9333 6611**

Postdoctoral Research Fellow – Human Factors
Centre for Sleep Research, University of South Australia 10 April

Postdoctoral Research Fellow – Sleep and Fatigue
Centre for Sleep Research, University of South Australia 10 April

Group Leader – Geophysics
Geoscience Australia, Onshore Energy and Minerals Division 10 April

Postdoctoral Fellow in SPH Modelling of Fluid-structure Interaction
CSIRO Mathematical and Information Sciences, Melbourne 10 April

Postdoctoral Fellow in Multiscale Modelling
CSIRO Mathematical and Information Sciences, Melbourne 10 April

Professor of Psychology
Health and Human Sciences, Southern Cross University, Coffs Harbour 11 April

Professor of Linguistics
ANU College of Asia & the Pacific 12 April

Senior Project Manager
Australian Nuclear Science and Technology Organisation (ANSTO) 13 April

Senior Lecturer – Paediatric Cardiology
Department of Paediatrics, University of Auckland 13 April

Sypkes Research Fellowship – Junior Research Fellow/ Research Fellow
University of Tasmania 13 April

Research Leader – Science into Natural Resource Planning
CSIRO Sustainable Ecosystems, St. Lucia, Queensland 13 April

Senior Research Engineer (two positions)
CSIRO Energy Technology 15 April

Lecturer/Senior Lecturer Pharmacy Practice
School of Pharmacy, University of Auckland 16 April

Lecturer/ Senior Lecturer in Clinical Pharmacy
School of Pharmacy, University of Auckland 16 April

IT Administrator
Bioengineering Institute, University of Auckland 16 April

Lecturer/Senior Lecturer Pharmaceutics
School of Pharmacy, University of Auckland 16 April

Lecturer/Senior Lecturer in Food Microbiology
Institute of Food, Nutrition & Human Health, Massey University, New Zealand 17 April

Lecturer/Senior Lecturer/Associate Professor (two positions)
School of Forestry, University of Canterbury 19 April

Associate Professor in Physiology
University of Auckland 20 April

Synchrotron Beamline Scientist
Australian Nuclear Science and Technology Organisation (ANSTO) 20 April

Director of Wireless Research Centre, UCi3
College of Engineering, University of Canterbury 20 April

Scientist or Senior Scientist (Genetics)
AgResearch, Invermay, New Zealand 20 April

Visiting Academic in Environmental Engineering (Fixed Term)
Civil Engineering, University of Canterbury 21 April

Research Manager Cancer Trials New Zealand
Department of Oncology, University of Auckland 23 April

Lecturer/Senior Lecturer in Algebra and Combinatorics
Department of Mathematics, University of Auckland 23 April

Lecturer/Senior Lecturer in Pathophysiology
Institute of Food, Nutrition & Human Health, Massey University, New Zealand 29 April

Lectureship – Food & Bioprocessing
Department of Chemical & Materials Engineering, University of Auckland 30 April

Senior Lecturer/Associate Professor (Pavements)
Department of Civil & Environmental Engineering, University of Auckland 30 April

OCE Postdoctoral Fellowship 2007 – Deep Radio Imaging Techniques
CSIRO Australia Telescope National Facility 1 May

Lecturer/Senior Lecturer/Associate Professor in Civil Engineering
Department of Civil & Environmental Engineering, University of Auckland 31 May

The importance of biofuels

By Melissa Branagh

For South Australian grain grower Caroline Brown, a Nuffield Scholarship meant an opportunity to research a topic that stands to increase rural wealth while improving environmental sustainability. Sponsored by the Grains Research and Development Corporation, she scoured three continents seeking out best-practice biofuel technology.

The seed processor and dryland grain producer conducted research in Europe, North America, Japan and India, but any ambition to implement what she learnt was challenged by what she saw as shortcomings in Australian government policies.

Ms Brown realised that, in contrast to other countries, Australia has some distance to go in catching up with policies that are conducive to renewable energy advancements.

"Global warming, increasing dependence on dwindling oil supplies and political turmoil caused by competition to secure resources have set the stage for renewable energy development around the world," she says. "But while Europe and the US have introduced legislation favourable to private investment and are benefiting from early R&D, the support in Australia for technology based on non-renewable resources leaves us standing alone."

While local companies have launched breeding programs to develop oilseed crops for biodiesel production – something Ms Brown, before her tour, believed signified Australia was ready for a biofuels industry – she now says she recognises the use of 'first generation' feedstocks based on traditional food crops as a stepping stone, not the start of a viable new industry.

"Efficient energy production is imperative, therefore the future of biofuels lies with new second-generation technologies, such as biomass-to-liquid (BTL) and cellulosic ethanol," she says. "Overseas research indicates this is where Australian farmers will enjoy longer-term security."

Biomass comes from purpose-grown crops, agricultural waste and wood byproducts that can be gasified and reconstituted into liquid fuel (diesel) or converted into fuel using chemical or enzymatic processes (ethanol).

"This practice allows farmers to maximise the grain harvest residue from food crops (such as wheat), providing value-adding opportunities and reducing land-use competition. Second-generation technologies are cheaper than conventional biofuels in terms of energy balance and carbon saving, but production requires huge investment beyond the reach of most farming entities."

While current production costs are prohibitive in Australia, global investment is well advanced, with a second-generation biodiesel plant coming online in Germany and new technologies being developed in Europe and the US to produce biofuels from a wider range of biomass feedstocks. "These moves are largely testament to political strategies that have been effective in subsidising energy production overseas," says Ms Brown.

In Europe, support for market creation is part of a broader vision for biofuels to constitute one quarter of the EU's transport fuels by 2030. This has been bolstered by the introduction of a biofuels directive demanding a 5.75 per cent biofuel inclusion in all transport fuel by the end of 2010.

In the US, the Bush administration aims to replace 75 per cent of oil imports from the Middle East with renewables by 2025, and has set a mandate for 7.5 billion litres of biofuel by 2012, supported by federal tax incentives.

Conversely, the Australian Government has set a non-mandatory target of 350 million litres of biofuel by 2010 – less than 0.01 per cent of transport fuels. Ms Brown says this is a concern given that Australia's declining oil supply offers only 42 per cent self-sufficiency.

"Australian policies do not foster the industry or set goals for future levels of biofuel consumption compared with many other developed nations, where policies are creating automatic biofuel markets through mandates and strict environmental emission standards.

"Australian farmers are in an excellent position to capitalise on ownership of biomass feedstock opportunities, provided they can work cooperatively to negotiate with big processing companies. But development of a viable and successful biofuels industry in Australia is dependent on policy that will stimulate demand and encourage investment in infrastructure."

Caroline Brown: Australian policies do not set goals for future levels of biofuel consumption.

In addition to lobbying government for equitable industry support and tougher emission standards, Ms Brown recommends research into biomass production, including a study of suitable environmental and soil conditions, development of cooperative structures to help farmers negotiate biomass product value and education to promote the benefits of biofuels.

CALENDAR

For more events or to list an event go to
www.sciencealert.com.au/events

Drug Delivery 2007
9 to 11 April, San Francisco

International Conference on Research and Education on Mathematics
10 to 12 April, Kuala Lumpur

25th Meeting of the Society of Crystallographers in Australia and New Zealand
10 to 14 April, Pokolbin, Hunter Valley

A Crisis of Meaning, Challenges Facing Science and Religion in the 21st Century
11 to 14 April, Brisbane

17th Annual Conference of Australasian Society for Biomaterials
11 to 13 April, Melbourne

Climate Law in Australia
12 to 13 April, Canberra

Young Statisticians Conference 2007
13 to 14 April, Canberra

18th Congress of the World Association for Sexual Health
15 to 19 April, Sydney

The Australian Petroleum Production and Exploration Association Conference and Exhibition
15 to 18 April, Adelaide

5th World Conference of Science Journalists
17 to 20 April, Melbourne, Australia

Accelerating the Development and Deployment of Clean Technologies in the Asia Pacific
17 to 18 April, Melbourne

REACH 2007
17 to 19 April, Brussels

European Bio Fuel Summit
17 to 18 April, Madrid

Somatachnics Conference 2007
19 to 21 April, Sydney

XII International Symposium on Biological Control of Weeds
22 to 27 April, Montpellier, France

International Conference on Modelling, Monitoring and Management of Air Pollution
23 to 25 April, Algarve

RNAi World Congress
24 to 25 April, Philadelphia

33rd International Symposium on the Application of Computers and Operations Research in the Minerals Industry
24 to 27 April, Santiago

Cancer Proteomics World Congress
26 to 27 April, Philadelphia

Molecular Diagnostics World Congress
26 to 27 April, Philadelphia

37th Annual Scientific Meeting of the Australian and New Zealand Society of Nuclear Medicine
28 April to 1 May, Adelaide

The International Agrichar Initiative Conference 2007
29 April to 2 May, Terrigal

Mining – The Big Picture
2 to 3 May, Brisbane

Accelerating now! Local Action: Sustainability: ICLEI Oceania
2 to 5 May, Melbourne

International Conference on Plant Vascular Biology
7 to 11 May, Taipei

15th European Biomass Conference
7 to 11 May, Berlin

International Conference on Biotechnology Engineering
8 to 10 May, Kuala Lumpur

II International Giardia and Cryptosporidium Conference
13 to 18 May, Morelia-Michoacán, México

Australia's Uranium Conference
15 to 16 May, Adelaide

Spatial Sciences Institute International Biennial Conference 2007
14 to 18 May, Hobart

EPOBIO International Workshop – Products From Plants: From Crops and Forests to Zero-Waste Biorefine
15 to 17 May, Athens

CRCs Association Conference
16 to 18 May, Perth

MinNd International Forum on Children 2007
18 to 21 May, Sydney

5th Australian Stream Management Conference
21 to 25 May, Albury

Nickel/Cobalt, Copper and Uranium International Conference
21 to 25 May, Perth

2nd UrbanSalt Conference: Dealing with Salinity in Urban Environments
22 to 23 May, Sydney

Blowing Agents and Foaming Processes 2007
22 to 23 May, Frankfurt

Cleantech 2007
23 to 24 May, California

The Australian and New Zealand Association of Neurologists Annual Scientific Meeting 2007
24 to 25 May, Alice Springs

WasteTech 2007
29 May to 1 June, Moscow

International Green Build and Renewable Energy Exhibition and Conference
1 to 3 June, Sydney

World Environment Day
5 June, Worldwide

Urban Water Policy
6 to 7 June, Brisbane

Industry to Industry Showcase of Rail CRC Research Implementation
7 June, Brisbane

Seed Ecology II 2007
9 to 13 June, Perth

Nanopolymers 2007
12 to 13 June, Berlin

Annual meeting of the International Behavioral Neuroscience Society
12 to 16 June, Rio de Janeiro

21st Pacific Science Congress
12 to 18 June, Okinawa, Japan

10th International Conference Biodetection Technologies 2007 – Technological Responses to Biological Threats
14 to 15 June, Atlanta

23rd International Applied Geochemistry Symposium
14 to 19 June, Oviedo, Spain

World Hydrogen Energy Conference
15 to 19 June, Brisbane

14th Annual Meeting of the Organization for Human Brain Mapping
15 to 19 June, Melbourne

Genomics in Business 2007
17 to 19 June, Amsterdam

Oceans 07 Europe
18 to 21 June, Aberdeen

International Conference on Engineering and City Development
18 to 19 June, Gaza, Israel

Contamination CleanUp 07
24 to 28 June, Adelaide

COIN/ACOFT 2007: The 6th International Conference on the Optical Internet
24 to 27 June, Melbourne

32nd Australian Conference on Optical Fibre Technology
24 to 27 June, Melbourne

4th International Conference on Geotechnical Earthquake Engineering
25 to 28 June, Thessaloniki

32nd International Symposium on Remote Sensing of the Environment
25 to 29 June, San José, Costa Rica

Breccias Symposium
26 to 27 June, Townsville

Sustainable Development in the Coatings Industry
26 June, Hampton, UK

European Science Museum Tour 2007
30 June to 21 July, Europe

CHEMED 2007
1 to 4 July, Auckland

8th Biennial Engineering Mathematics and Applications Conference
1 to 4 July, Hobart

3rd International Energy, Exergy and Environment Symposium
1 to 5 July, Évora, Portugal

Astronomical Society of Australia Annual Scientific Meeting
1 to 5 July, Sydney

ESF-EMBO Symposium Biological Surfaces and Interfaces
1 to 6 July, Costa Brava

23rd International Conference on Yeast Genetics and Molecular Biology
2 to 6 July, Melbourne

International Conference of Applied and Engineering Mathematics
2 to 4 July, London

Annual Conference of the Australian Association of Mathematics Teachers
2 to 6 July, Hobart

European Sustainable Energy Forum
2 to 6 July, Lucerne

Materials and Ceramics Conference
4 to 6 July, Sydney