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**THE AUSTRALIAN
INSTITUTE OF ENERGY**

**ENERGY
NEWS**

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Editor's Message

A Fresh New Look



Joy Claridge, Editor,
Australian Institute of Energy

AIE President Murray Meaton is overseas enjoying a well-earned break from the frenetic pace of the energy and resources boom in Western Australia. In his absence, he has asked me to put together a message for this issue.

I am thrilled to be writing this message for the first full-colour issue of **ENERGYNEWS**. When the board decided to trial full-colour presentation, we took the opportunity to change the layout and update other design elements. The main change to the layout is the placement of all member-related material together. These pages are easy to find because we have added a vertical orange band to each page. I hope you like the fresh new look. We wish to thank the staff at Research Publications for their excellent creative input. If you want to give us some feedback, send an email to editor@aie.org.au.

As you would expect, full-colour is a bit more expensive to print than the two-colour version. To justify the additional expense we need more advertising. You can see from this issue how great advertisements look in the new design. If you want to place an advert in the next (December 2007) issue or in 2008, or to find out more, please contact me

on 03 9596 3608 or email editor@aie.org.au. In the December issue, there will be details about a new industry directory for members which will offer an affordable option for all members. Advertising with **ENERGYNEWS** supports your journal and ongoing enhancements.

The special feature in this issue is *Emissions Trading* and, although we received only two contributions following the Prime Minister's key announcement in June, I think you will agree they address two very important questions: Who gets the permits? What do energy professionals need to consider? We are now calling for contributions to the December special feature, *Energy Efficiency and Demand Management* (see note below). If this is your field of expertise please consider submitting material and sharing your knowledge and views with fellow members of the Australian Institute of Energy.

Enjoy!

Call for Contributions

The special feature section was introduced to give members the opportunity to communicate with each other at some depth on important energy topics. The topic for December issue is *Energy Efficiency and Demand Management*. This is timely following the APEC leaders' Sydney Declaration on Climate Change, Energy Security and Clean Development, which committed regional economies to improving energy efficiency as a policy that supports economic growth while reducing greenhouse gas emissions. The leaders agreed to work towards an APEC-wide regional aspirational goal of a reduction in energy intensity of at least 25% by 2030 (with 2005 as the base year).

We wish to include at least two articles, and not more than four, that will give readers a better understanding of the topic. Ideally, we would like to present the different

aspects of the topic and the different viewpoints in the relevant debate. Articles should be approximately 1,500 words in length; in 'Word' or compatible format; and may include illustrations (original format) and photographs (jpegs of minimum 300 dpi resolution preferred).

Please send contributions before 2 November 2007 to Joy Claridge at editor@aie.org.au or call (03) 9596 3608.

Topics for 2008 are:

March 2008	Energy and Water
June 2008	Developments in Oil & Gas
September 2008	Hydrogen
December 2008	TBA (suggestions welcome)

2006 in review

The Australian Institute of Energy welcomed BP's Group Chief Economist, Christof Rühl, when he visited Australia in June 2007 to present the BP Statistical Review of World Energy.

Mr Rühl is based in London, England, where he analyses global economic developments and energy economics to provide input into BP's strategy. He has a distinguished track record as an economist in academia as well as in economic development and policy advice. Prior to joining BP in May 2005, he served as a Senior Economist at the World Bank in Washington (1998-2000) before becoming the World Bank's Chief Economist in Russia (2001-04) and Brazil (2004-05). An abridged version of his presentation is presented here. The review, including an interactive energy charting tool, with data back to 1965, is available online at www.bp.com.



Christof Rühl in Melbourne

The five-year period 2001-06 has been a period of strong global economic growth and exceptionally high prices for all forms of commercially traded energy.

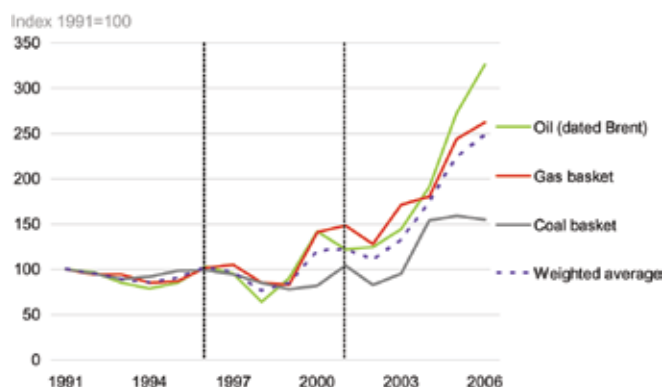


Figure 1: Energy Prices

The consumption of all fuels except nuclear accelerated in the period compared to the previous five years. World primary energy consumption growth accelerated from 1.2% pa in the 1996-2001 period to 3% pa during the period

2001-06. China alone generated almost half of the world's energy growth over the past five years and thus dominated the global aggregate data. Nevertheless this acceleration also occurred in the world outside China – from 1.2% to 1.9% pa. Importantly, this was a non-OECD phenomenon. Energy consumption growth in the OECD slowed, but accelerated in the Asia-Pacific, Africa, the Middle East, the FSU and in South and Central America.

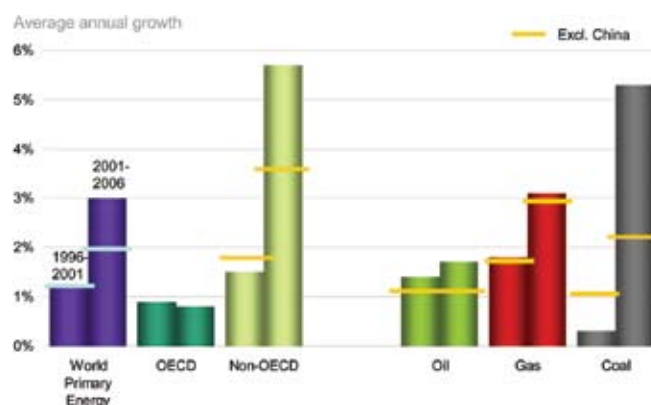


Figure 2: World Energy Consumption Growth

How can we reconcile rapid increases in energy prices with accelerating consumption growth? The first part of the answer is economic growth. Over the past five years the world economy has grown strongly, averaging 4.4% – the strongest five-year growth since the 1960s. The acceleration of growth was concentrated outside the OECD, most notably in China, and it occurred despite rising energy prices. The second part of the answer is energy elasticities (the ratio of energy growth to GDP growth). Even with higher average energy prices, energy consumption grew faster relative to GDP growth from 2001 through 2006 than in the previous period. And this conclusion holds even if China is excluded from the calculation. Oil stands out as the only fuel where income elasticities remained constant in the period, most likely because oil prices rose more than those of other fuels. On a global basis, coal has regained market share and become the fastest growing fuel. This is a result of the surge in Chinese coal use and the end of the backing out of coal in the rest of the world as the change in relative prices improved coal economics. Outside China, coal's share stabilised. Gas's share of total energy has stabilised globally. Gas is still the fastest growing fuel in the world outside China. But the surge in Chinese coal use has been so large, that it has more than offset the strength of gas. Oil meanwhile has begun to lose global share. This reflects the fact that oil prices have risen

the most – and also the strength of electricity and other static sector energy demand, as against transportation. Electricity consistently grows faster than primary energy consumption everywhere, and faster outside, than inside, the OECD.

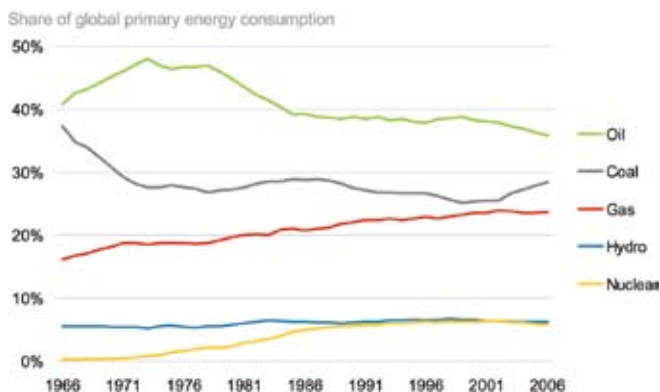


Figure 3: World Fuel Shares

All of this has implications for carbon trends. The growth in world carbon emissions from hydrocarbon consumption has increased to 3.4% pa since 2001, three times the rate in the previous five-year period. North America was the only region or grouping where emissions growth slowed. Energy consumption has also become more carbon intensive; that is, carbon emissions have risen more rapidly than energy consumption. The world remains squarely on a trajectory of rising CO₂ concentrations despite the growing international consensus that action is required.

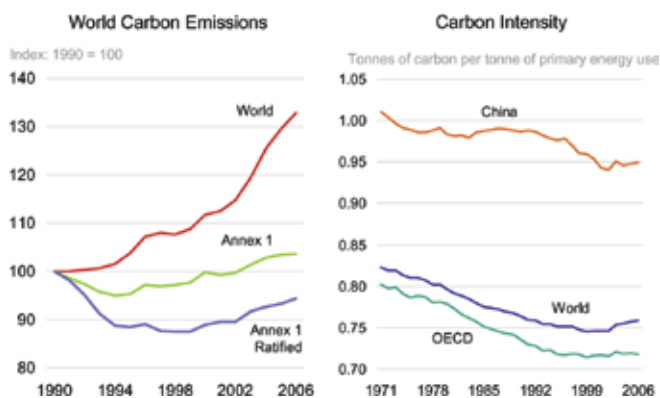


Figure 4: Carbon Emissions

There is an ongoing realignment of both energy demand and supply and, as a result, of energy trade. It has been driven predominantly by the process of economic development, especially outside the OECD, and by the maturing of the hydrocarbon resource base, mainly within the OECD. A complex set of forces has the effect of changing energy trade flows.

These trends have served to raise, rather than reduce, concerns about climate change and energy security. Yet energy consumers have benefited from a continued availability of and access to energy, albeit at much higher prices than in the past. Energy producers have benefited from higher prices and incomes. Energy security has been delivered to consumers and producers through well-

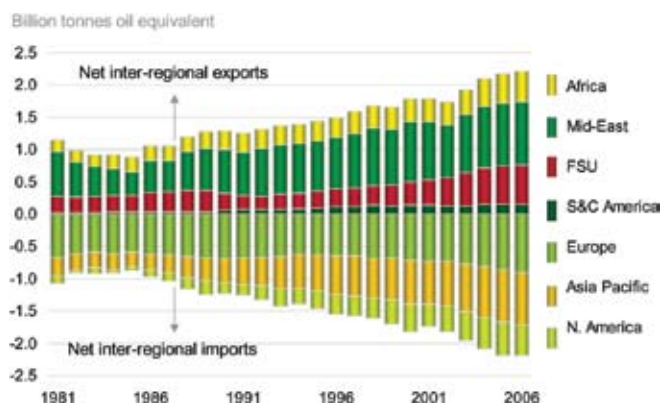


Figure 5: Energy Trade

functioning markets. The flexibility of the world economy and sound macroeconomic policies have cushioned the world economy from rising energy prices. However the five-year experience has been broadly counter to the longer term energy policy objectives of many countries.

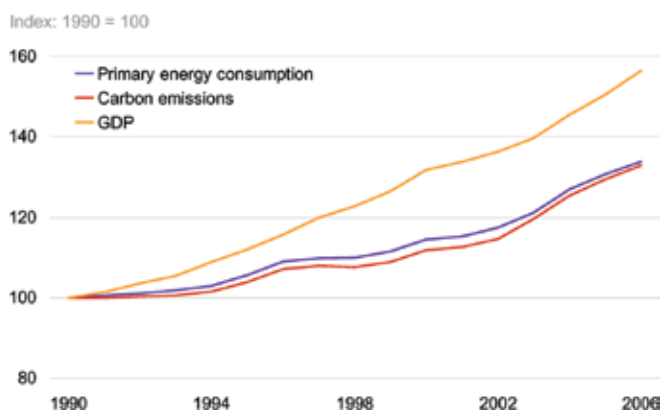


Figure 6: GDP, Primary Energy and Carbon Emissions

The outcome for 2006 indicates just how strong the weight of countries with high GDP growth and high carbon energy is. Despite the fact that energy intensity has declined for all regions, carbon intensity has not. The weight of coal in carbon intensive non-OECD economies has been growing so fast that their addition to global carbon emissions outpaces the increased energy efficiency. Thus 2006 continued the same trend that we have seen for the past five years.

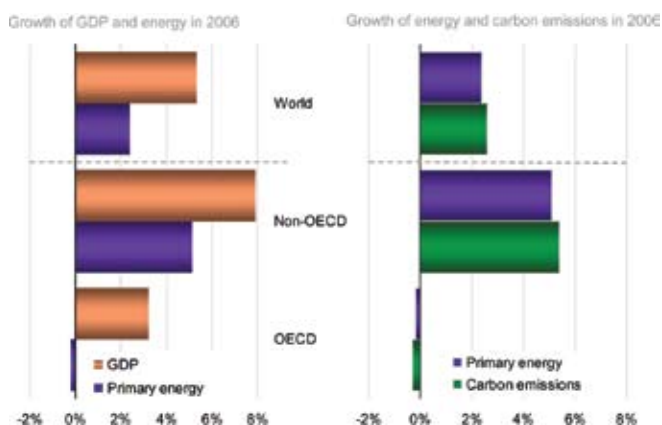


Figure 7: GDP, Energy and Carbon Emissions

Climate Change Symposium

Climate change challenges and opportunities: Industry responds

Leaders in science, government and industry addressed the energy challenges, and explored the energy opportunities, created by climate change at a symposium hosted by Sydney Branch on 21 July 2007.

Sponsored by EnergyAustralia, The Nous Group and the NSW Department of Environment and Climate Change, the symposium covered the science and policy framework, then industry response. The NSW Government's view was presented by the Hon Phil Koperberg, MP, NSW Minister for Climate Change, Environment and Water. Kevin Hennessey, Principal Research Scientist, CSIRO, provided an update on climate change science, including the latest evidence and projections. Prof Ian Lowe, President, Australian Conservation Foundation, talked about the energy options for a sustainable future. Industry's response was articulated by Dr Nicole Williams, Chief Executive Officer NSW Minerals Council; Susan Jeanes, Chief Executive Officer, Renewable Energy Generators of Australia; Dr Andrew Harris, Director of the Laboratory for Sustainable Technology, University of Sydney, and Dr Ian Woods, Senior Research Analyst, AMP Capital.

Here, **ENERGYNEWS** presents a summary prepared by AIE student member, Eleanor Wood, who is studying renewable energy engineering at the University of New South Wales School of Photovoltaic and Renewable Energy Engineering.

The seven speakers at the symposium made presentations which demonstrated that the issue of climate change is a political dilemma, a scientific phenomenon, a technological challenge, an economic opportunity and a moral issue facing society today.

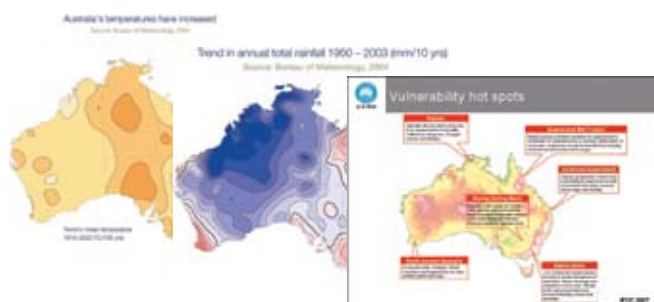
In his presentation on sustainable energy, Prof Ian Lowe highlighted the instrumental role energy plays in shaping human lives around the world. The contrasting social conditions in the developed and developing worlds can be attributed to energy availability. Bearing this in mind, it is no surprise that strategies for addressing and combating global warming by changing, and in some cases restricting, energy markets are highly controversial. The symposium

demonstrated how governments, scientists, industry and investors are all in the process of developing strategies to address the effects of long-term climate change in Australia and around the world.

Phil Koperberg outlined the NSW Government's policy framework for climate change and energy. The Greenhouse Gas Abatement Scheme (GGAS) is the carbon trading scheme which has been operational in NSW since 2003. It was designed to contribute to the NSW economy-wide target of reducing greenhouse gas emissions to 60% of 2000 levels by 2050. Mr Koperberg described the target as ambitious, but realistic and necessary. The relative success of GGAS, so far, demonstrates industry's ability and willingness to adapt to a new carbon market. The increasing body of evidence for global warming, including coastal erosion in NSW, demonstrates the need for bold action now, according to Minister Koperberg. He regards the Australian Government's plan to introduce a national carbon trading scheme after 2012 as irresponsible, and failing to grasp the imperatives surrounding this issue.

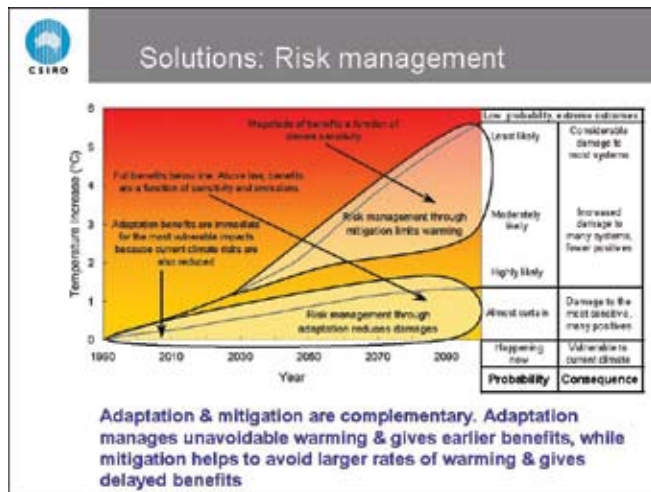


The media were keen to interview Phil Koperberg



Kevin Hennessey is with CSIRO's Marine and Atmospheric Research Division, and is a coordinating lead author of one of the chapters in a forthcoming IPCC (Intergovernmental Panel on Climate Change) report. He presented evidence to suggest that an increase in greenhouse gas emissions is responsible for most of the warming of the planet since 1950. He explained how regional climate changes have already occurred in Australia, resulting in stresses on water supply

and agriculture, changed natural ecosystems and reduced snow cover. The potential impacts of climate change in Australia in the coming century include water security problems which would impact directly on the energy sector. Most of Australia's power stations require large amounts of water. Similar implications would also have to be considered in the development of a nuclear energy industry in the future. Changing climatic conditions would also affect the electricity grid, with an increase in peak energy demand for air-conditioning likely.



Prof Lowe presented possible responses to the climate dilemma, identifying energy as the key consideration in creating a sustainable future. He noted that tackling climate change requires drastic intervention now, suggesting that the linear modeling used in IPCC reports understates the future impact of human activity on the climate. Prof Lowe explored the possibility of reaching a 50% reduction in 2000 greenhouse gas emissions levels by 2050. This figure was presented by the IPCC as the level required to limit warming to 2°C this century. In order to achieve this global target, Prof Lowe argued that developed nations such as Australia will have to make deeper cuts in order to allow continued expansion of energy availability in developing countries. He sees this as achievable, but requiring serious changes in attitudes towards energy use. The capacity to make deep cuts to our energy consumption was demonstrated by the example of the modern motor car, which uses 20–30 times as much energy moving one person from A to B, than is necessary. The scale of action required now cannot be underestimated, since most of the transport and electricity infrastructure which will be used in 2050 is not yet built.

The science and policy frameworks identified in the first session of the seminar established a complex and challenging platform for the industry responses presented in the afternoon of the symposium.

Dr. Nicole Williams told us that “miners care about climate change too”, and the coal industry in NSW is serious about climate change and committed to developing practical solutions to reduce greenhouse gas emissions to ensure the viability of the industry into the future. According to Dr Williams, the Australian coal industry has made a substantial

financial commitment to the rapid development of low or zero emissions technology for coal-fired power plants. As far as policy responses to the issue are concerned, she sees it as vital that Australia uses the phenomenon of China's rapid development and economic growth as the basis for the global reality within which to address climate change here. Dr Williams proposes that practical technological solutions which can be exported to the developing world are preferable to policy measures which hinder the local industry without producing meaningful cuts in greenhouse gases. The strength of such an argument is hard to deny when it is revealed that globally there are around 800 coal-fired power plants either under construction, or planned for the coming years.

The issue of economic growth in developing nations was explored. Questions of whether unbridled development necessarily leads to improved lives or even better outcomes for health and education in developing nations were raised after Dr Williams' formal presentation. The deregulated markets which have delivered global economic growth are intimately related to increasing energy demands, but not necessarily associated with increasing standards of living in the countries involved. In the coming decades the sustainability of such growth may be challenged or ignored, but whether China has the economic capacity to adopt low emissions technology for their new coal-fired power stations will be irrelevant if the technologies themselves are not available yet.

Dr Williams' claim that coal will remain the central ingredient in Australia's energy mix was challenged in the presentation by Susan Jeanes, who believes that an expanded MRET (Mandatory Renewable Energy Target) as well as an effective emissions trading scheme (or carbon tax) would facilitate huge expansion of the renewable energy industry in Australia, and a gradual phasing out of high emissions technology between now and 2050. Ms Jeanes used examples from Australia as well as countries where renewables constitute a large proportion of national power supplies, diversify power grids, and provide increased flexibility and energy security. Mature, intermediate and emerging technologies were outlined, including solar, wind, bioenergy and hydropower.



Solar concentrators

Technological breakthroughs in areas such as geothermal power were described as exciting developments which present huge commercial opportunities for investment. Furthermore, it was predicted that over the next 50 years renewable prices, which are already competitive with other clean technologies, would approach current electricity prices.



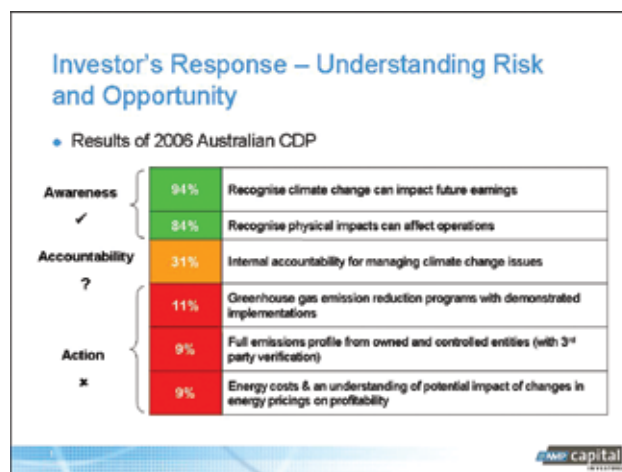
Geodynamics Habanero 2

Dr Andrew Harris is the foundation director of the Laboratory for Sustainable Technology, a multidisciplinary research group at the University of Sydney, whose goal is to create products that maximise resource and energy efficiency, eliminate waste and cause no harm to the environment. He presented a range of exciting technologies which have huge potential to mitigate greenhouse gas emissions. Several of his PhD students are investigating low impact methods of producing hydrogen as a fuel, and simple ways of mitigating greenhouse gas emissions from coal mines. Central to the technologies contained in his presentation, including the BioRegional MiniMill – an acclaimed sustainable pulp and paper mill in Britain – is the principle of sustainability. Achieving sustainability in the energy industry will rely on long-term investment and an integrated approach which ensures the incorporation of new technologies in future infrastructure planning.

AMP Capital Investors Sustainable Funds which manages investments of nearly A\$3 billion. Senior Research Analyst Dr Ian Woods presented the investment opportunities and challenges associated with climate change. The investment risks for a venture which relates to climate change may be related to weather, regulation or emerging opportunities. Regulatory risk is associated with the development of emissions trading schemes. Dr Woods authored a submission to the Australian Government's Task Group on Emissions Trading, outlining the desirable attributes for an emissions trading scheme. An effective scheme would result in extensive, low-cost abatement of greenhouse gases with minimal impact on the economy and minimal unnecessary wealth transfer, as has been seen in the European Union scheme. The 'what, when and how' of the emissions trading scheme will determine which industries are most affected, and what will be the future of those industries. The investment sector responds to these risks by assessing the policy options being

explored. Dr Woods presented survey data from the Carbon Disclosure Project, which represents over A\$50 trillion of investment globally. As far as the private sector is concerned, the question of whether climate change is occurring, or if it is a significant problem, is well and truly answered. The data showed that while 94% of the companies acknowledge that climate change can impact their future earnings, only 31% have a company policy of accountability for managing climate change issues, and only 11% have greenhouse gas reduction programs with demonstrated implementation.

Industry and investors now need strong indications from governments as to how this issue will be addressed, and to what degree.



The Future of Energy in Australia

Energy Futures Forum Report

Paul Graham, manager of the CSIRO Energy Transformed Flagship's energy futures research program, presented the results of recent research at a lunch hosted by Melbourne Branch on 26 June 2007.

From 2004 to 2006, Paul Graham led the Energy Futures Forum which brought together a diverse group of energy sector stakeholders to develop and examine energy futures for Australia. Mr Graham developed a number of economic models designed to examine the likely technological development paths in Australia's electricity generation and transport industries. His models are used to determine the economic and physical implications of different energy paths and the expected level of market penetration of new technologies. The major output of the Forum was a comprehensive report – *The Heat is on: The Future of Energy in Australia* – which was published earlier this year. Copies of the report are available at www.csiro.au. Mr Graham's presentation summarized the forum's modeling approach and results.

By inviting all stakeholders, including community groups that participated free-of-charge, and applying a broad range of assessment tools – economic, social & environmental – the forum produced a public report to inform decision making by the energy sector and governments.

Participants identified climate change as the most important issue that will change the future of energy in Australia. Therefore, the modellers designed five climate change scenarios that differ in whether nuclear power and CO₂ capture and sequestration technologies are available and in the amount of global participation in emission reduction targets. One scenario was constructed to explore the impact of oil prices peaking at \$100/bbl in the next decade.

All of the greenhouse gas abatement scenarios explore global emission paths that are consistent with stabilising the global CO₂ concentration at between 550 and 575 ppm (parts per million) by 2100. This is similar to the Intergovernmental Panel on Climate Change's A1T scenario. The forum recognised that this concentration level is less stringent than might be considered desirable to avoid many climate change environmental impacts, but was constrained by the ability of models to explore deeper emission cuts.

In parallel with forum participant meetings, panels of around 20 members of the public were convened in each of Perth, Newcastle and Melbourne. These meetings provided a useful check on the plausibility of the forum's scenarios from a public perspective. The forum discovered that a broad range of views exist, and that those views and opinions were susceptible to change when provided with new information and exposed to group discussion. Of particular interest was the general acceptance of the trade-off between factors such as reliability, environmental impacts and costs.

The economic modelling framework was designed to provide a broad range of outputs at different scales consisting of Australian Bureau of Agricultural and Resource Economic's

global and national economy models and a detailed Australian energy sector model developed jointly with CSIRO. With this framework the forum could project global economic growth and carbon prices and at the same time look at state GDP impacts and changes in energy technology use in Australia.

The modelling found that globally addressing climate change has very little overall impact on economic growth. The impacts in Australia are greater but still modest. Overall average Australian economic growth over the period is reduced from 2.46% to 2.23% in the worst case. Australia's economy is reasonably robust to the introduction of carbon taxes because carbon prices have little impact on costs in the services sector which represents over 70% of the economy. However, there are some other impacts that need close examination.

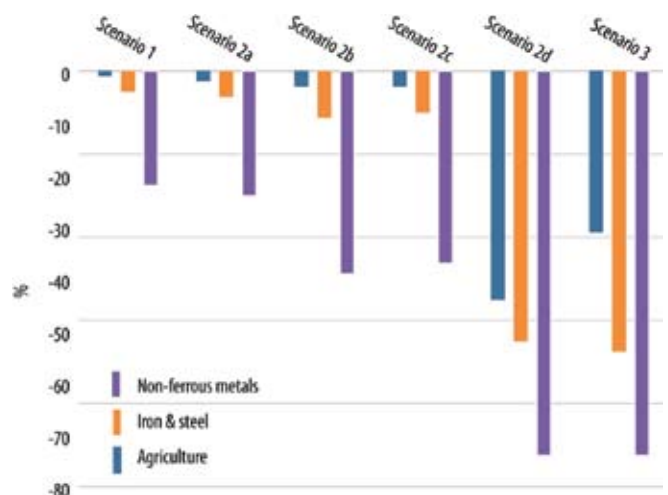


Figure 1: Industry impacts: Changes in output in 2050 across mitigation scenarios

Energy- and greenhouse-intensive sectors (and by implication the regions that depend on them) will be disproportionately impacted by the introduction of a carbon price. However, these results assume no protection is given to export exposed industries. Proposals from both sides of politics have been seeking to offer some protection in that regard. If protection were offered for a period until other competing countries also introduced carbon prices then some of the more extreme impacts projected would not occur.

Wholesale electricity prices are projected to increase around 50% to accommodate low emission technologies such as clean coal, renewables and nuclear which are generally more expensive than current technologies. Surprisingly the affordability of electricity improves – even when more expensive technologies are used – because while residential electricity prices increase between 7% and 20%, real per capita income increases by 100%. CSIRO has recently re-examined electricity prices under emissions trading and

These results are based on the following assumptions:

	Reference case	High oil price	Mitigation scenarios						
			1	2a	2b	2c	2d	3	
Targeted global abatement of CO ₂ at 2050	NA	NA	35%	40%	40%	40%	40%	40%	
Introduction of climate change policy action	NA	NA	Late action: global participation commencing in 2030	Early action: global participation commencing in 2010	Early action: global participation commencing in 2010	Early action: global participation commencing in 2010	Early action: global participation commencing in 2010	Early action: global participation commencing in 2010	Early action: for developed countries 2010; delayed action for developing countries 2020
Differentiated abatement target for Australia	NA	NA	No	No	No	No	Yes: 50% below 1990 levels of CO _{2e} emissions by 2050	No	
Availability of CCS, globally	NA	NA	Yes	Yes	No	No	Yes	Yes	
Nuclear power in Australia	NA	NA	No	No	No	Yes	Yes	No	
Temporary oil price peak (\$100/bbl)	No	Yes	No	No	No	No	No	No	

found a higher wholesale electricity price profile. On the one hand the result still holds that, in the long term, electricity will be more affordable than today. However, in the short term it is possible that prices may rise faster than per capita income. Whether this actually occurs will depend very much on how the government of the day designs the emissions trading scheme or other compensating policies.

The technology mix in 2050 depends on whether carbon capture and storage and nuclear power are available.

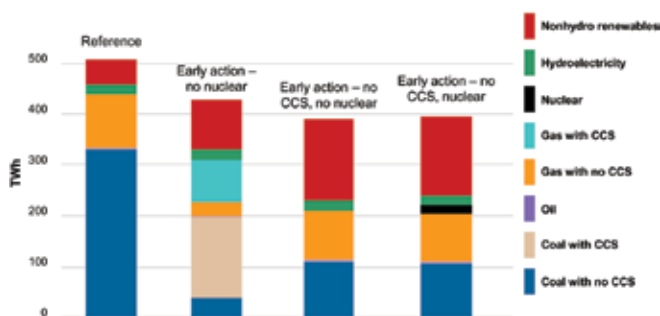


Figure 2: Technology Mixes (3) 2050

Nuclear power is likely to be economic in the long term if Australia chooses to go down that path. It was assumed in the modelling that only two medium-sized nuclear plants would be built. There was a variety of opinion in the forum about whether this was too conservative or too optimistic. Ultimately the uptake of nuclear power in Australia will be a decision for Australian society rather than market economics and therefore cannot be reliably predicted by modelling. The transport sector responds to carbon constraints and oil price volatility with greater uptake of more efficient engine technology and uptake of gas and biomass related fuels as well as hydrogen.

The forum also modelled the economic and biophysical impacts of climate change. Although estimates are uncertain and based on sensitivity analysis, doing nothing results in at least a 4% reduction in GDP, but potentially much higher. Reducing CO₂ concentrations reduces the impact on GDP to less than 3%. For biophysical impacts the forum considered sensitive systems that humans can do very little to save. The carbon mitigation scenarios provide significant benefits to reduction of species at risk of extinction. More substantial global emission reductions will be required to protect coral reefs and prevent substantial melting of Greenland icesheet.

The Energy Futures Forum concluded:

- On the basis of risk assessment, it is likely that the global benefits of avoiding climate change will outweigh the global costs of mitigation. However, Australia’s energy-intensive and trade-exposed industries and the regions they are based in may be disproportionately impacted.
- The Australian and World economies will continue to grow when carrying out greenhouse gas mitigation. Furthermore, electricity can be expected to remain affordable for households (with some shorter-term concerns).
- The cost of addressing climate change is lowest for Australia when global participation is high, and Australia can choose from all available low emission technologies in partnership with energy efficiency improvements and demand management.
- Uncertainty regarding climate change policy in Australia increases investment risk, particularly in electricity generation.
- There are a wide variety of emission reduction policies which could be brought to bear in Australia at different times.

Emissions Trading

This special feature was held over from June 2007 issue of ENERGYNEWS to allow contributors to comment on the important developments then anticipated for July and August. ENERGYNEWS received two contributions which help us better understand the ramifications of recent policy announcements.

Global Carbon Exchange (GCX) – a commercial enterprise in the development of carbon emission reduction projects – looks at lessons from Europe and concludes with a list of important considerations for energy professionals. The second article is an updated and edited version of a presentation to Canberra Branch on 29 June 2007 by Dr Frank Jotzo, Research Fellow with the Australian National University, on the topic *Emissions trading: who will get the permits?*.

On 3 June 2007, the Prime Minister, the Hon John Howard, announced that the Australian Government would introduce a ‘cap and trade’ emissions trading scheme. Trading under the scheme will commence no later than 2012, and in 2008 the government will announce a long-term aspirational goal

to set the context for Australia’s overall abatement effort. On 17 July 2007, the Prime Minister launched the policy statement, *Australia’s Climate Change Policy: our economy, our environment, our future*. This statement endorsed the key features of the emissions trading system outlined in the report of the Prime Ministerial Task Group on Emissions Trading (see <http://www.pmc.gov.au>).

On 15 August 2007, the government introduced into Parliament the National Greenhouse and Energy Reporting Bill 2007, which establishes a single, national framework for reporting Greenhouse Gas (GHG) emissions, abatement actions and energy consumption and production by corporations from 1 July 2008. Data reported through this system will underpin the Australian Emissions Trading

Key features of the Australian Emissions Trading Scheme

The AETS will be based on a ‘cap and trade’ model, with the following features:

maximum practical coverage of all sources and sinks, and of all greenhouse gases:

- with permit liability placed on direct emissions from large facilities and on upstream fuel suppliers for other energy emissions
- initial exclusion of emissions from agriculture and land use from the scheme though these emissions should be brought into the scheme as practical issues are resolved; and
- with those sectors initially excluded from the emissions trading scheme subject to other policies designed to deliver abatement.

a mixture of free allocation and auctioning of single-year dated emissions permits that:

- provides an up-front, once-and-for-all, free allocation of permits as compensation to existing businesses identified as likely to suffer a disproportionate loss of value due to the introduction of a carbon price
- ameliorates, through free allocation, the carbon-

related exposures of existing and new investments in trade-exposed, emissions-intensive industries while key international competitors do not face similar carbon constraints, but which also provides ongoing incentives for abatement and adoption of industry best practice; and

- allows for the periodic auctioning of remaining permits

a ‘safety valve’ emissions fee designed to limit unanticipated costs to the economy and to business, particularly in the early years of the scheme, while ensuring an ongoing incentive to abate

recognition of a wide range of credible carbon offsets, domestically and internationally

capacity, over time, to link to other comparable national and regional schemes

incentives for firms to undertake abatement in the lead-up to the commencement of the scheme, including through the purchase of offset credits from carbon plantations, and potentially from other accredited activities.

Source: Australia’s Climate Change Policy: our economy, our environment, our future, page 32

System (ETS). Registration and reporting obligations will be progressively phased in over three years, with first reports due in October 2009. For more information on greenhouse and energy reporting, see <http://www.greenhouse.gov.au>. The date – 3 June 2007 – has been set as the asset valuation date to avoid windfall gains for investments made in full knowledge of an impending price for carbon.

In July, the Leader of the Opposition, Kevin Rudd, affirmed the Labor Party's policy to set a carbon target – a 60% reduction in carbon emissions for Australia by 2050 – the minimum required to avoid dangerous levels of climate change. Earlier, in May, the Labor Party had put forward its

five tests for an effective emissions trading scheme:

1. a cap and trade scheme (to be internationally consistent)
2. effectively reduce emissions
3. economically responsible
4. fair
5. recognise the need to act now.

Mr Rudd added that work should progress on developing a national emissions trading scheme starting no later than 2010 with the detailed design finalised by the end of 2008.

EN

What is emissions trading?

Emissions trading (or cap and trade) is an administrative approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants. In such a plan, a central authority (usually a government agency) sets a limit or cap on the amount of a pollutant that can be emitted. Companies or other groups that emit the pollutant are given credits or allowances which represent the right to emit a specific amount. The total amount of credits cannot exceed the cap, limiting total emissions to that level. Companies that pollute beyond their allowances must buy credits from those who pollute less than their allowances or face heavy penalties. This transfer is referred to as a trade. In effect, the buyer is being fined for polluting, while the seller is being rewarded for having reduced emissions. Thus companies that can easily reduce emissions will do so and those for which it is harder will buy credits which reduces greenhouse gasses at the lowest possible cost to society.

There are currently several trading systems in place with the largest being the European Union's. The carbon market makes up the bulk of these and is growing in popularity. Many businesses have welcomed emissions trading as the best way to mitigate climate change. Enforcement of the caps is a problem, but unlike traditional regulation, emissions trading markets can be easier to enforce because the government overseeing the market does not need to regulate specific practices of each pollution source. However, monitoring (or estimating) and verifying of actual emissions is still required, which can be costly. Critics doubt whether these trading schemes can work as there may be too many credits given by the government, such as in the first phase of the European Union's scheme. Once a large surplus was discovered the price for credits bottomed out and effectively collapsed, with no noticeable reduction of emissions.

Source: Wikipedia (<http://www.wikipedia.org>)

Carbon trading: What to expect, what to learn?

By Kevin Sher, Director Voluntary Markets, Global Carbon Exchange

Comment on the Australian ETS

The Australian Government's trading scheme proposes a 'cap and trade' system with aspirational emissions reduction goals and emission reduction pathways which begin below business as usual levels to support an initial low price for carbon, which progressively stabilises over time. The system would be recalibrated by the government for changing international and domestic circumstance and a structure that provides business with a forward price path for carbon. The scheme is aiming for the largest coverage of emission sources compared with other schemes, with a permit system where permit liability is placed on direct emissions from large facilities and on upstream fuel suppliers for other

energy emissions. While the details are yet to be defined, the scheme:

- provides an up-front, once-and-for-all, free allocation of permits as compensation to existing businesses.
- ameliorates, through free allocation, the carbon related exposures of existing and new investments in trade exposed, emission-intensive industries, with periodic auction of remaining permits.
- imposes an 'emissions fee' for those emitters exceeding the agreed level.
- recognises credible domestic and international carbon offsets.

- links to other national and regional schemes (as a more unified emissions trading system evolves)
- enforces mandatory emissions and energy reporting using standardised tools.

For an emissions trading scheme to be successful, the focus needs to be placed on the energy and mining sectors as they are by far the biggest contributors to Australian GHG emissions. They also have the potential to deliver the most returns from an investment in GHG emissions reduction and energy efficiency measures. These companies can be considered the low hanging fruit for GHG emissions reduction in Australia.

As Australia begins its journey towards an ETS we have an opportunity to learn from the experience of the European Union (EU).

ETS lessons from Europe

In 2006, the World Bank reported more than US\$30 billion in GHG allowances were traded worldwide, the majority within the EU ETS. It can be argued that this ETS has in principle been successful and innovative by implementing a market-based system to encourage emissions reductions linked directly to achieving the Kyoto target. It covers energy-intensive industries and nearly half of the EU's emissions. However a paradox has emerged. While the scheme has built a huge market for carbon credits, actual emissions reductions have been hard to validate so far. In fact, emissions rose for a number of member countries. Further, the goal of generating investment in renewable energy and energy efficiency has not materialised – only 2% of credits issued so far originate from renewable energy¹. As Australia begins its journey towards an ETS we can reflect and learn from the EU experience. The main source of these lessons is *Europe's Dirty Secret – Why the EU Emissions Scheme Isn't Working*, August 2007, Open Europe (<http://www.openeurope.org.uk/research/etsp2.pdf>).

Lesson 1

The ETS should offer the capacity to link to other national and regional systems, especially the EU scheme and its associated mechanisms. Doing this encourages the development of a free market mechanism within the Australian ETS that builds efficiency into the program. For example, under Phase 2 (2008–12) of the EU ETS, member states are able to import Kyoto credits from non-EU states.

Lesson 2

Use auctions to enable greatest emitters to access permits to meet emissions requirements. The limited use of auctions in Phase 1 of the EU ETS has been criticised. Phase 2, with lower emission targets and up to 10% of allowances being auctioned

rather than given as free allowances, is anticipated to be a smoother process, using auctions to stabilise prices.

Lesson 3

A long-term price signal is needed so that industry can confidently invest in alternative energy technologies and their associated application, because typically these projects take time to develop and deliver results. Just how the Australian ETS can deliver longer-term pricing stability is still an open issue that warrants continued discussion and resolution. In the EU ETS experience, a low carbon price has offered limited encouragement for investment in alternatives energy sources. This will continue to be a weakness of EU ETS Phase 2.

Lesson 4

A balance is needed between the government's desire for shorter trading cycles, to enable adjustment of the cap, and longer-term trading cycles to support investment decisions. The Australian ETS does aim to incorporate a forward carbon price path to support investment. If this forward price meets industry expectations investment should follow. In Europe, short-term trading cycles in Phase I and 2 limited long-term investment certainty.

Lesson 5

Ensure all major sectors are covered, including mining and energy. Positively, the proposed Australian ETS will cover 70% of emissions, and will also include GHG emissions from transport. The EU ETS covers energy-intensive industries; however its coverage is not comprehensive and some large industries including coal mining, are omitted.

Lesson 6

The reporting system needs to ensure all major sectors and emissions are included, while keeping reporting costs in check. *Open Europe* reported that inclusion of smaller installations in the EU ETS system imposed a high cost of reporting relative to the emissions reductions attainable from larger installations.

These lessons must be incorporated for a national or global regime to deliver economic benefits and the key objective of reduced emissions. However, as an isolated program an ETS will not achieve the ultimate goal of immediate and deep cuts needed to support a sustainable future. To deliver on such a vision, companies will need to accept and support a strong ETS and, at the same time, develop a deep understanding of their GHG emissions and how to improve energy efficiency. The natural partners of an ETS are energy efficiency regulations, renewable energy investment programs and separate initiatives to support carbon sequestration technology development. GCX recommends that businesses approach this complex issue from both sides and take immediate action to measure their GHG emissions, improve energy efficiency and understand the impact the ETS will have on their cost structures, supply chains and long-term profitability.

1 Europe's Dirty Secret – Why the EU Emissions Scheme Isn't Working, August 2007, Open Europe, <http://www.openeurope.org.uk/research/etsp2.pdf> p 7

What do energy professionals need to consider?

1. Registries: Understand the registry process and the ability to better manage GHG emissions.
2. Reporting: Identify whether your organisation will be required to report under the defined threshold, now or over the next three years.
3. Carbon offset validation and verification: Companies need to understand accreditation standards and carbon offset options available, and their position until trading commences.
4. Energy efficiency opportunities: Measure and recognise opportunities for emission reductions that also bring economic benefit and competitive advantage.
5. Trading arrangements: Accumulate experience – a number of large energy players are already participating in global emissions trading schemes, either through the EU ETS or the Chicago Climate Exchange; others have built experience through the New South Wales scheme.
6. Permit and auction arrangements: As details of the system become available, develop an understanding of the auction arrangements and permit allowances and how these will be allocated.
7. Regional coverage: Prepare for the emerging emissions trading scheme and Australia's part in a regional scheme and a post 2012 framework.

GCX is involved in activities that support the development of projects that reduce and eliminate GHG emissions caused by anthropogenic activity, including offering brokerage and

trading of carbon credits in mandatory and voluntary carbon emissions markets. For more information, see <http://www.globalclimateexchange.com>. **EN**

Emissions trading: Who will get the permits?

By Dr Frank Jotzo, Research Fellow, Australian National University

This article discusses permit allocation under emissions trading and how to deal with concerns about trade competitiveness. It discusses these issues with reference to the government's proposed ETS.

The pitfalls of grandfathering

Imposing a greenhouse gas emissions constraint through emissions trading creates a new commodity – emissions permits. The total value of these permits is likely to be very large. To illustrate, if permits were issued for 400 million tonnes of CO₂-equivalent per year (roughly the current level of emissions proposed to be covered), and permits were traded at say A\$25/tonne (EU 2012 permits were traded at around 20 euros/tonne in July 2007), then the total value of Australian permits would be A\$10 billion per year (around 1% of GDP). Emissions trading could therefore be one of the single largest redistributive policies.

With so much new wealth to be created, there is intense lobbying over how permits will be distributed. Users of energy and energy-intensive goods and services ultimately face the bill in the form of higher prices. Existing high-emissions capital equipment such as coal-fired power plants will lose value, and producers of traded energy-intensive goods such as aluminium and steel will find themselves at a disadvantage vis-à-vis competitors in countries where there is no carbon pricing. Who should get compensated and by how much can have implications for efficiency, but to a large measure it is

a question of equity. The efficiency consideration is to avoid diluting abatement incentives or creating perverse incentives that would increase emissions, or decrease emissions in one place only to increase them elsewhere. Equity considerations are determined predominantly by political economy, though notions of fairness can matter as well.

'Grandfathering', whereby governments hand out permits for free to existing emitters in proportion to their past emissions, has been the dominant approach in the large emissions trading schemes so far, including in the EU ETS. Grandfathering is popular with emitters because it can give emitters large windfall profits. That happens because most emitters pass on some of their emissions costs to their customers in the form of higher prices. For example, electricity prices go up as a result of emissions constraints, and higher prices will offset much of the cost of permits (or abatement measures) to fossil fuel-based electricity generators. If power plants get their permits for free, then their operating costs remain roughly the same, but with the price fetched in the market going up, profits rise. In the EU, where over 90% of permits are grandfathered, such windfall profits are estimated at several billion euros per year for fossil fuel-based power generators alone. What share of permits needs to be given away freely in order to keep companies profit neutral depends on cost and market structures, but would rarely exceed 50%, based on recent empirical studies.

Giving free permits to current emitters can create perverse incentives, as permit allocation is usually tied to the level of emissions and higher emissions mean more wealth transferred. The way around this is to use emissions levels of some past period to determine allocation, but that works only where reliable data is available. In Australia, emissions monitoring for many installations may not yet be reliable enough. Where there is an expectation that permit allocation may be based on emissions now or in years ahead, the best strategy in the interim may be to delay measures to reduce emissions, or even to increase them. In a broader sense, grandfathering of carbon permits sends a signal that governments are prepared to bail out business from the risk of future environmental costs, which may not be efficient from a societal point of view.

Auctioning

The preferred allocation method from an economic viewpoint is auctioning. If no permits are given away freely, there is no costly lobbying for free permits, and auctioning is transparent and efficient. Full auctioning also generates more auction revenues which enter general government revenue, and can be used in whatever way deemed appropriate. Using permit revenue to lower existing taxes like income taxes could help improve the efficiency of overall resource allocation in the economy.

From an equity viewpoint, the argument against grandfathering is that policy changes are a business risk that is already factored into the required returns to capital and share prices. Regulatory changes are not usually accompanied by financial transfers to businesses. In any event, the writing has been on the wall for many years that some form of carbon pricing would be introduced. Developments in the United States show that permit allocation by auctioning can be politically feasible. Under the United States Regional Greenhouse Gas Initiative (RGGI), several states have now committed to auction 100% of permits.

The task group approach: Compensation

The Prime Ministerial Task Group on Emissions Trading acknowledged the theoretical superiority of auctioning, but recommended a mixed system of giving free permits to some emitters, and auctioning the rest. The proposal, accepted in principle in the government's climate change policy of July 2007, is that emitters that face a 'disproportionate burden' in the loss in value of their assets will be compensated, and to compensate them once and for all. For example, if a power station faced a 10% reduction in its expected discounted future net income stream, and the economy-wide impact was 2%, then the power station owners would get free permits to the tune of 8% of the value of their expected future income stream. These free permits would comprise permits of different vintages, perhaps including permits dated decades ahead. Only emitters who face losses larger by some margin than the economy-wide average would receive compensation.

This compensatory approach has obvious political attraction in that it would buy out industry interests in a one-off fashion using future permits, so the distributive battles would need to be fought only once. However, it would base huge financial transfers on contestable modelling. The computation of free permits would require estimating economy-wide costs and firm-level changes in costs and revenues, decades into the future. Highly debatable assumptions about future energy prices, production technologies, emissions targets, permit prices and so forth would directly influence the amount of permits to be handed out. Firm-level estimation of asset value losses would be especially difficult, because of asymmetry in information between firms and the government. Given these complexities and uncertainties, and the vast scope for lobbying, a more robust way of determining permit allocation might be by industry-level benchmarking. In this way, permits could be allocated to firms on the basis of a small number of verifiable indicators, say past or current production of electricity by each generation technology.

Carbon leakage

The fear of 'carbon leakage' – namely that producers of energy-intensive traded goods such as aluminium and other metals might be pushed out of Australia – has been a political impediment to emissions pricing for many years. The argument in a nutshell is that if the next aluminium smelter is built in a developing country rather than Australia because of carbon costs, then jobs and investment are lost to Australia while emissions simply increase elsewhere. It is questionable whether the extent and economic importance of carbon leakage would be as large as has often been made out, yet the political reality is that the issue has to be dealt with in a world where emissions are priced in some countries but not in others.

Preserving Australia's "competitive advantage through the possession of large reserves of fossil fuels" figured prominently in the terms of reference for the task group. Possible approaches to minimize carbon leakage are to simply exempt trade-exposed, emissions-intensive sectors from the trading scheme; to make border tax adjustments; or to keep producers competitive by compensating them for carbon-related costs. Exemptions are the worst option, as they mean losing out on abatement options in these industries, and more has to be done at higher cost in other parts of the economy. With border tax adjustments, production for export would be exempted from the carbon price, while imports would be taxed for their carbon content to achieve parity with non-exempt domestic production sold in Australia. It has been argued that border taxes would be difficult to implement, particularly for imports; then again they would apply only to a small number of industries where trade consists mainly of exports.

The task group's proposed approach, accepted in the government's policy, is (again) compensation. Firms that are emissions-intensive and trade-exposed would receive free permits to cover the full carbon costs they face, at

regular intervals. Compensation would be made for both the costs of permits needed to cover direct emissions (for example from coal combustion in steel production or process emissions in aluminium smelting), as well as cost increases in intermediates (such as higher prices for electricity used in aluminium smelting).

The compensation approach would leave the bottom line of the relevant businesses more or less unchanged compared to the situation without carbon pricing. Yet they would face the cost of carbon in their operations and so have an incentive to introduce more efficient technology. However, the prices of traded, emissions-intensive products in Australia would not reflect the carbon price, as they would be on par with the world price. Consequently, there would be no price incentives to substitute high-emissions for low-emissions materials, for example opting for timber rather than steel in construction. The task group proposed over time to move to allocating free permits 'as if' firms were using best practice technology, and emphasized that trade-related compensation is to be a transitional arrangement and periodically reviewed. Free permits would be conditional on continued production in Australia.

Similar to the case of compensation for asset value losses, a compensation scheme will be subject to lobbying. Estimates of costs and compensation to be claimed can and inevitably will be disputed. Definitions of who qualifies for status as trade-exposed and emissions-intensive (and is therefore eligible for compensation) are debatable, as are definitions of best practice. Large amounts of money hinge on the distinction. The best solution to the problem of carbon leakage would be emissions pricing in key competing countries. In the discussions toward a post 2012 United Nations climate agreement, the option of sectoral agreements

covering commodities such as aluminium, steel and cement is being explored. Sectoral deals might be easier to negotiate than national emissions targets, as a starting point.

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Congratulations

The Australian Institute of Energy is delighted to announce that the 2007 AIE/ECS Scholarship was awarded to Deborah (Debbie) Marsh.

Debbie is nearing completion of a PhD with the University of Technology Sydney's Institute for Water and Environmental Resource Management in the Faculty of Engineering. Her work focusses on understanding the interface between energy policy and water policy reforms, in particular issues such as the effect of water shortages on electricity generation and the implications of climate change for water availability.

The award of \$5,900 will assist Debbie in attending the International Conference on Adaptive and Integrated

Water Management (CAIWA 2007) in Switzerland, where she will present a peer-reviewed paper. While in Europe, she will also visit the Centre for Energy Policy and Economics at the Swiss Federal Institute of Technology, and the United Nations Environment Program Energy Branch in Paris to learn more about their programs to assist the delivery of energy services in developing countries.

The AIE looks forward to hearing from Debbie on her return when she will make a presentation at a branch meeting and/or submit an article to **ENERGYNEWS**.

Congratulations Debbie!

District Energy in Australia

By Gina Kelly, freelance journalist and corporate affairs advisor, on behalf of GridX Power

GridX Power is an Australian energy utility that has successfully introduced district energy systems into the residential housing market in Australia. It also provides sustainable energy solutions for the commercial and industrial sectors, increasing ABGR scores, BASIX and Energy Star ratings. The company generates NSW Greenhouse Abatement Certificates (NGACs) that also benefit partner utilities. In July 2007, GridX won the 2007 Banksia Climate Award.

Unlike Europe and the United States of America where district energy systems have been well established, acceptance of district and distributed energy in Australia has been hard won. District energy systems have made a rare appearance in commercial buildings, such as university campuses. Some GridX projects are initially driven by the power constraints within the networks that support Australia's major cities, not sustainability. Developers can have economic and time imperatives that need to be met, so the GridX solution shortens the development cycle in areas where infrastructure is constrained.

Commercial and industrial applications are also in the pipeline, but it has been the launch of trigeneration in the residential sector that has showcased the capability of district energy supply.



In April 2007, Australia's first residential housing estate powered by natural gas was launched in Sydney using trigeneration – a technology that generates three forms of energy from a single source. The GridX system uses natural gas-powered generators situated on site to supply electricity and capture byproduct hot and cold water for heating and cooling purposes. In partnership with Mirvac, Vision Estate is the first in the world to use trigeneration in a large housing estate. There are 16 homes currently using the system, with another 200 under construction, and more in the planning stages.

The environmental benefits include an immediate 33% reduction in greenhouse gas emissions compared to coal-



Vision Estate

fired generation, and increased efficiency in transmission and in thermal energy use. The system provides higher reliability, lower energy bills and more sustainable energy at no extra cost to consumers and developers. Residents also use specially designed dishwashers and clothes dryers that maximise the heating capacity of the system. Hot water from the process of generating electricity is used in these domestic appliances to deliver around 75% greater energy efficiency than a standard appliance. Electricity, gas and home services are all included on one bill and customers can access their accounts online via the website.

The air-conditioning system at Vision Estate has no exterior compressor contributing to visual impact on the streetscape nor is it a load on the main electricity grid. There are multiple systems on site for generating electricity and chilling. These are spread out across the estate in order to maximise the heating and chilling components of the system and to build in robust redundancy. Vision Estate is also connected to the main electricity grid. This enables GridX to export excess energy at times of peak network demand.

While the system can be established in remote areas away from electricity infrastructure, the technology currently relies on access to natural gas. The technology is also adaptive to other energy sources, so in future it is envisaged that renewable sources such as solar and wind could be used.

For further information on district energy and GridX Power, visit www.gridxpower.com. **EN**

Having fun with the future

By Joy Claridge, Editor, AIE

Your editor has been having fun trying out the latest in alternative vehicles around the streets of Melbourne. More accustomed to a motorcycle than a car, I found the new Saab 9-5 BioPower running on E85 (a blend of 85% bioethanol, 15% petrol) to be sumptuously boring. This is no insult – it means there is little perceptible difference to driving a luxury car running on 100% petroleum fuel. Ethanol burns hotter and faster than petrol, delivering a bit more oomph to the already sporty 2.3 litre turbo engine.



The ingenuity of this flexible fuel vehicle is its capacity to run on any petrol blend from zero to 85% ethanol. The parts modifications needed to accommodate fuel flexibility are minimal – a plastic fuel tank and different seals and valves. The key enabling technology is the advanced engine management system. Sensors detect the fuel mix going to the engine and the management system adjusts the air flow to the engine accordingly. Built in Sweden, initially for the European market, the Saab 9-5 is the best-selling environmentally-friendly car in Sweden, with 10,000 new BioPower cars sold in 2006.

“In 2002, there was very little E85 fuel available; now 25% of filling stations in Sweden sell E85,” said Parveen Batish, Director, SAAB Australia and New Zealand.

There, the government is subsidising fuel companies to sell E85, and it is more than 30% cheaper. It needs to be because with ethanol you get less kilometres to the litres – up to 25% less.

“I drove a BioPower car from Sweden to the United Kingdom about 18 months ago,” said Mr Batish.

“Once I left Sweden it was harder to find E85, so having the flexibility to use any petrol made it an easy journey. Even environmentally-aware people are looking for an easy life.”

European governments, through the European Commission, are promoting the use of biofuels in transport. As well as subsidising the price of fuel, governments are offering rebates and tax concessions on vehicles; free parking, and exemptions from congestion charges. The Australian Government has a target of at least 350 million litres of biofuels in the national transport fuel supply by 2010, and the New South Wales Government has introduced 2% ethanol mandate from 1 October 2007. Although the 2% is based on network (not individual site) volume, most suppliers have opted for the widespread introduction of E10 to achieve compliance. The Australian Academy of Technological Sciences and Engineering is currently assessing the ongoing role of biofuels in the Australian transport sector.

I was excited to be one of the first to ride the prototype model of Vectrix Australia’s maxi-scooter. This is more familiar territory for me as I usually get around on a 10-year old 250 cc Yamaha. The Vectrix electric motorcycle is a far cry from the small underpowered electric scooters of the past. Its rapid acceleration (0 to 80 kph in 6.8 seconds) and respectable top speed (100 kph) make it fun to ride. It took a little bit of getting used to, but the throttle was a revelation. Like all motorcycles, forward throttle adds power and speed. Unlike other motorcycles, reverse throttle slows the bike and, once at a standstill, reverses it. Reverse throttle also recharges the battery through regenerative braking, and you can watch it happen on the instrument panel.

Basically a big battery pack, an electric motor and a gearbox, the key enabling technologies are the nickel metal hydride batteries and, more importantly, the electronics that control them.

“The main issue for electric vehicles is cooling,” said Charles Mann, Sales Manager, Vectrix Australia.

“The Vectrix has a sophisticated thermal management system, with cooling fans and an air plenum at the top. Every battery cell is monitored for its condition including temperature. It is a very sophisticated piece of mobile battery technology.”



The batteries need to be recharged about every 100 kilometres and use as little as \$45 of electricity per year (assuming 40 kilometres per day, 6 days per week, and 13 cents per kW). Carbon emissions are 90% lower than for a 250 cc petrol-powered motorcycle. The maxi-scooter can be recharged through any three-point power plug. It takes three hours to recharge but can be topped up, delivering 15 kilometres from a half-hour recharge.

The batteries – 125 V with 3.75 kWh capacity – are attached to a brushless, DC radial air-gap motor with peak power of 20.2 kW. Maximum continuous power is 7 kW. The Vectrix maxi-scooter has the acceleration of a 650 cc motorcycle, but the continuous power and top speed of a 125 cc vehicle. It is regarded as such for registration purposes and is learner-approved. However, it would not look out of place trackside at the Phillip Island Moto GP. **EN**

The Inbox

Thank you for the positive feedback on The Inbox. This issue, I only have a page to work with, so will keep the items short to accommodate as many as possible.

OIL SUPPLY CRUNCH: IEA medium-term outlook

WORLD oil demand will rise faster than expected to 2012 while production lags, leading to a supply crunch, the International Energy Agency (IEA) said in its July 2007 *Medium-Term Oil Market Report*. The adviser to 26 industrialized countries said demand will rise by an average 2.2% a year between 2007 and 2012, up from a previous medium-term forecast growth rate of 2%. The outlook, which updates the IEA forecast last issued in February 2007, coincided with a jump in oil prices to more than US\$75 a barrel, closing in on a record high near US\$79, on concerns of a tightening market. Despite four years of high oil prices, this report sees increasing market tightness beyond 2010. "It is possible that the supply crunch could be deferred — but not by much," the IEA said. The IEA now expects global demand to reach 95.8 million barrels per day (bpd) from 86.1 million bpd in 2007. The forecast assumes annual average global GDP growth of 4.5%. To order a copy of the report, see <http://omrpublic.iea.org/mtomr.htm> **EN**

BIG DEAL: NWS gas to China

Resource Minister Ian Macfarlane announced Australia's largest single export deal on 6 September 2007. The agreement between Woodside Energy and PetroChina for the supply of 2–3 million tonnes of Liquefied Natural Gas (LNG) to China per year for up to 20 years is worth up to A\$45 billion in export revenue. Along with the announcement by Shell to supply LNG from Gorgon to PetroChina, it marks a turning point in China's approach to securing long-term energy supplies. PetroChina is one of China's leading energy companies, responsible for nearly 70% of China's domestic gas production and marketing. China is already Australia's second largest market for LNG. For more information, see <http://www.woodside.com.au/> and <http://www.shell.com/home/content/shellgasandpower-en> **EN**

SOLAR: Cloudy Germany turns to the sun

It rains year round in Germany. Clouds cover the skies for about two-thirds of all daylight hours. However, the country has managed to become the world's leading solar power generator. More than half of the world's photovoltaic power comes from solar panels set up between the Baltic Sea and the Black Forest. Around 3% of Germany's electricity is generated by solar power, and the government wants to increase the share of solar and other renewable energy sources from 13% to 27% by 2020. For more information, see <http://www.ises.org/> **EN**

GEOSEQUESTRATION: Between a rock and a hard place

The House of Representatives Standing Committee on Science and Innovation published its report *Between a Rock*

and a Hard Place: The science of geosequestration in August 2007. For a copy of the report, go to <http://www.aph.gov.au/house/committee/scin/geosequestration/report.htm> **EN**

CO₂ ROCKS: UK carbon capture and storage research

Cutting-edge technology which captures polluting carbon dioxide and stores it permanently inside rocks, has been developed at a new research centre at Nottingham University in England. Opening in October 2007, the Centre for Innovation in Carbon Capture and Storage (CICCS) will develop new technologies to trap and store greenhouse gases permanently and safely. There are also commercial prospects for the end product, such as road-building materials and brick construction. For more information, see <http://www.nottingham.ac.uk/carbonmanagement/> **EN**

LIGHT UP THE FUTURE: Energy-saving technology

A scenario-based study by the Siemens subsidiary Osram found that the global trend toward sustainability is having a tremendous impact on the development of new light sources such as organic light-emitting diodes (OLEDs). Electric lighting accounts for 19% of power consumption worldwide, and electricity consumption in Asia could well double within the next decade. Energy-saving bulbs reduce power consumption to a minimum while providing the same amount of light, in addition to lasting many times longer than conventional bulbs. According to the study, light-emitting diodes (LEDs) will be in widespread use for everyday lighting needs.

The lighting technologies of tomorrow will include hair-thin OLEDs. If all of the world's bulbs were replaced by energy-saving bulbs or LEDs, this would correspond to a reduction of 450 million tons of CO₂ per year with the current global power mix, equivalent to almost half of Germany's greenhouse gas emissions. **EN**

In the Turning Torso building, 14,000 Osram light diodes illuminate the floor corridors inside the building. Energy-saving bulbs and LEDs provide the same level of lighting while reducing the power consumption by around 80%.

Source: Siemens press picture



Membership Matters



Welcome to the new members' section of ENERGYNEWS

As part of the redesign of the journal, membership material is now gathered together in one section, with membership pages all sporting the vertical colour band on the outside edge. ENERGYNEWS welcomes contributions to Membership Matters, included member profiles, company member profiles, anecdotes, and advertising. Send ideas and contributions to editor@aie.org.au

Changes to Membership

New Members

Name	Grade	Branch	Name	Grade	Branch
Jeffery Bye	Member	Sydney	Trevor Plumridge	Associate	Melbourne
Shameni Nitchingham	Member	Adelaide	David Lyne	Member	Adelaide
Jim Vaux	Fellow	Melbourne	Dr Raymond Thomas Wills	Fellow	Perth
Charles Percy	Graduate	Sydney	Aaron Fyke	Member	Melbourne
Barry Yardley	Member	Sydney	Clive Cachia	Associate	Sydney
Tamara Kirk-Burnnand	Fellow	Sydney	Chris McGrath	Student	Sydney
Jessica Beck	Fellow	Sydney	Zaida Milena Contreras Castro	Student	Sydney
Ruud T M Kempener	Member	Sydney	Andrew Gadd	Student	Sydney
Dr Yun Tian	Member	Perth	Tien Minh Do	Student	Sydney
Nick Gilson	Student	Melbourne	Fook Choon Choi	Student	Sydney
Christopher Ouizeman	Student	Melbourne	Chris Gerber	Student	Sydney
Noelle Leonard	Member	Perth	Mary Llewelyn Whyte	Graduate	Sydney
Damon Honnery	Fellow	Melbourne	Angus Robert Gentle	Student	Sydney
Shona Guilfoyle	Member	Perth	Vernie Allan Everett	Fellow	Canberra
Peter Kenneth Campbell	Member	Melbourne	Garth De Visser	Student	Sydney
Ian Edmonds	Associate	Brisbane	Peter Laurence Downie	Fellow	Melbourne
Bede Edward Boyle	Member	Newcastle	Gerard Wilson	Member	Melbourne
Brett Connor	Member	Melbourne	Andrew Maddocks	Student	Sydney
Wana Yang	Member	Perth	Ming (Simon) Zhao	Student	Sydney
Maurice John Kezilas	Member	Melbourne	Wei Zhang	Student	Sydney
Warren Kalinko	Associate	Sydney	Prof Michael Bruce Dureau	Fellow	Sydney
Peter Rigney	Member	Sydney	Jillian Los	Graduate	Sydney
Julie Marks	Graduate	Sydney	Jagen Park-Ross	Student	Sydney

New Company Members

Company Name	Representatives	Branch
Finlaysons	Fraser Bell & Jeremy Schultz	Adelaide
Victoria Coal Resources P/L	Russell Rolls & Jeff Martin	Melbourne
Macquarie Generation	Darren Armitage & Wal Shepherd	Newcastle

Members Resigned

Name	Branch	Name	Branch
Michael Durrant	Adelaide	John Feenan	Sydney
Dr Peter A Watterson	Sydney	Ross K Druitt	Sydney
Sir Eric Neal	Adelaide	Maxwell B Noy	Melbourne
James Sterling	Brisbane	Leyton M Richards	Brisbane
Trevor Nichols	Melbourne	Edward Kong	Brisbane
Robert B Brayshaw	Perth	Capt Dick Den Brinker	Sydney
Nick Mccready	Perth	Leonard E Munchenberg	Adelaide
Ashley Renney	Perth	Catherine Sampson	Brisbane
Dominic Lamanna	Melbourne	Eric N Rowlands	Perth
Dr. Frank Harman	Melbourne		
Craig W Tupper	Sydney		
Michael W Mcdonald	Adelaide		

Company Members Resigned

Pearlstreet Energy Services	Perth
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Around the Branches

Canberra

- Martin Parkinson from the Task Group on Emissions Trading, and Frank Jotzo, Research Fellow with ANU spoke at a seminar on greenhouse gas emissions on 29 June 2007.

Melbourne

- Jeff Marvin, Managing Director, CBM Resources Pty Ltd, presented “Coal Bed Methane A Significant New Source of Gas in Australia” at a joint meeting with the Royal Society of Victoria on 26 April 2007.
- Dave Holland, Managing Director, Solar Systems Pty Ltd, presented “Developing Large-Scale Solar Projects” on Friday 18 May 2007.
- Site visit to the Iona and Minerva Natural Gas Processing Plants, Port Campbell on 24 May 2007.
- Paul Graham, Manager of the CSIRO Energy Transformed Flagship’s energy futures research program, presented “The Future of Energy” on 26 June 2007.

Perth

- Martin Thomas, a member Of The Prime Minister’s Uranium Mining, Processing And Nuclear Energy Review Taskforce addressed the role of nuclear in Australian energy on 2 May 2007.
- Lyndon Rowe, Chairman, Economic Regulation Authority, spoke on regulation in Western Australia on 13 June 2007.
- Tim Bult, Managing Director, Wesfarmers Energy Ltd, presented “Wesfarmers Energy – LNG Horizon” on 27 June 2007.

South Australia

- Martin Thomas also spoke in Adelaide on 26 April 2007.
- David Swift, Chief Executive Officer, Electricity Supply Industry Planning Council, presented “Outcomes of Energy Reform Implementation Review” on 24 May 2007.
- Prof John Kaldi, Australian School of Petroleum, University of Adelaide, and Program Manager, CRC for Greenhouse Gas Technologies delivered an address on 21 June 2007.

Sydney

- The Australian Greenhouse Office, BP Solar and other members of the consortium presented “Blacktown Solar City” on 7 May 2007.
- Liesl Baumgartner, Deputy Director-General, DEUS, and Simon Kelley, Analyst, IPART, presented “Energy Policy in NSW” to the Young Energy Professionals Working Group on 10 May 2007.
- Nicola Rothmann, The Nous Group, presented “Understanding Personality to Develop Better Working Relationships” to the Young Energy Professionals Working Group on 5 June 2007.
- Also on 5 June 2007, Richard Hunwick addressed the question, “Plug-in hybrid-electric vehicles – an energy policy silver bullet?”
- Christof Rühl, Group Chief Economist, BP, presented “BP Statistical Review of World Energy” on 30 June 2007.

Young Energy Professionals

Third quarter was a busy and exciting time in the calendar of the young energy professionals (YEPs)

By Deborah Marsh and Ruud Kempener

In early June, Murray Meaton, President of the Institute, met with Sydney-based YEPs to discuss his vision for the AIE, and lend his support to the YEP Program. Murray also participated in a YEP workshop on “Understanding Personality to Develop Better Working Relationships”, which was superbly facilitated by Nicola Rothmann from the Nous

Group. During this workshop, participants formed ‘colour teams’ and were given the task of completing a painting activity in the most efficient manner possible. The activity tested our negotiation, team-building and communication skills, and uncovered a few budding artists! Using the painting activity, Nicola revealed insights into differences



Young (and not so young) energy professionals developing better working relationships

in learning preferences and working styles, and how these insights may assist in working with colleagues. Sydney YEP group thanks Nicola, Felicity, and others from the Nous Group, for their generous support of the YEP program.

In July, YEPs – along with the Australian Water Association’s Young Water Professionals (YWPs) – were put through ‘financial fitness exercises’ by representatives of Fiducian Financial Services and Mercer Wealth Solutions at a seminar titled “Personal Financial Planning”. The presenters provided useful information on financial management and wealth creation strategies for younger professionals to consider, including building an investment portfolio, buying property and, yes, even contributing to superannuation! A special mention must go to YWPs Samantha Phillips and Michael Galloway, who were instrumental in organising the event.

Also in July, was the inaugural YEP forum on Australia’s energy future, which facilitated informative and interactive discussion between the keynote speakers and participants (see below). The forum reaffirmed the opportunities and challenges ahead for young energy professionals and the importance of dialogue in the industry. Along these lines, I encourage all interested YEPs around Australia to contact their branch committee about establishing a YEP network in their area. It is certainly a great way to meet other younger professionals and senior leaders in the industry, and to contribute to issues of contemporary importance. As always, feel free to email Sydney Branch YEP Convenor, Deborah Marsh, at yepsyd@aie.org.au for further information or to discuss ideas that would benefit the YEP Program. In Melbourne, the YEP contact is Jose Luis Valenzuela at joseluis.valenzuela@gmail.com

Young professionals debate Australia’s energy future

The challenges for Australia’s energy future, in particular in the context of global warming, have become pressing issues. Newspapers bring out fact sheets, documentaries are followed by TV debates, and the Prime Minister is asked weekly for his

vision on Australia’s energy future. For young professionals working in the energy sector, the debate is not only of personal interest but unavoidably interlinked with their current professional activities. Furthermore, as their professional careers progress, their decisions will become more and more important in shaping Australia’s energy future.

However, it is unlikely that these decisions will be easy to make; the question of how to shape Australia’s energy future is becoming extremely complex. The number of stakeholders and different perspectives is large, surrounded by high levels of uncertainty. International and national political dynamics, structural changes in Australia’s energy sector, technological developments and household demands constantly change and reshape the challenges of Australia’s energy future.

Sydney YEPs hosted a forum on Australia’s energy future, including the role of the Asia-Pacific Partnership on Clean Development and Climate (AP6), on Tuesday 3 July. The AP6, launched in January 2006, brings together Australia, China, India, Japan, South Korea and the US to address the challenges of climate change, energy security and air pollution in ways that encourage economic development. At the forum, experts in their fields publicly debated – for the first time in Australia – the role the AP6 will play in shaping a sustainable energy future for Australia.

Despite the Australian Government committing \$100 million over five years to the partnership, concerns have been raised regarding the role of technology and its ability to deliver on the stated objectives of AP6. Indeed, the issue of whether technology is sufficient to address future energy challenges is central to many strategic questions that YEPs face now and into the future. The intention of the forum therefore was to address the role of technology in the Australian context and how government incentives and instruments can contribute to a more sustainable energy future.

The forum commenced with perspectives from three keynote speakers. Robert Pritchard (Managing Director of Resources International) provided an overview of AP6 and discussed Australia’s international energy position. Dr. Iain Macgill, (Research Director of CEEM at the University of NSW), discussed the role of technology in addressing



Bob Pritchard delivering an overview of AP6

climate change in both national and international contexts, and offered some early lessons on the effectiveness of governmental instruments and AP6 in particular. Thirdly, Julian Turecek (National Manager, Policy & Government Affairs at Origin Energy) provided an industry perspective on how Australia's energy industry can and should respond to the problem of climate change, the current trends and future predictions of energy use and the potential role that AP6 can play in this context.

The core of the evening consisted of discussions between the YEP participants from different backgrounds in industry, government, consultancy and academia. In two rounds with alternating groups, the following questions were addressed:

- What are the key opportunities and challenges for Australia's energy future?
- How can technology development address these opportunities and challenges?

From the discussions, it became clear that Australia has a unique position within the international community as one of the largest energy exporters in the world, especially of coal. Simultaneously, Australia has some unique national features in terms of its land availability, low population and geological characteristics (abundance of uranium and coal, but lack of water). These features are often unrecognised in the current public debate, but also provide ground for the development of some competitive national and international strategies. However, the political willingness to transform Australia's current reliance on large-scale coal based power stations is cumbersome. The lack of diversity and associated with that, the lack of water, are challenges from the production side. Simultaneously, growing energy demands, relatively low energy prices and strong public opinions on particular energy technologies make market transformations difficult.

The debate on technology development was dominated by two dimensions: short-term versus long-term and market-pull versus technology-push. Technological

options were discussed in terms of their potential within the current constraints of the energy sector versus those that can transform the sector along more sustainable paths. Furthermore, the role of market signals in informing technological choices was discussed.

Whilst this discussion took place, the keynote panel collected the exchange of ideas that had been documented on paper by the working groups. In their replies, they commented on the role attributed to coal, the narrowness of the discussion on energy rather than 'clean development' and the complex role of market forces and public perception on technology development. On the basis of these comments, the plenary debate commenced. Questions addressed the role of AP6 as a political tool only informed by a selected number of industry partners, the usefulness of the AP6 budget in terms of technology development and the way in which projects are selected and executed. Ideas and suggestions were developed on how Australia can use its unique competitive position to develop more coherent strategies for technology development, both globally and nationally. Eventually, two-and-a-half hours of discussions and presentations did not prove to be sufficient to develop a set of decisive solutions for Australia's energy future. However, the intention of the evening was achieved. YEPs had an opportunity to express their views, get to know each other better and learn from each other's perspectives.

In conclusion, the forum provided a platform for a diverse group of YEPs to discuss differences, exchange ideas, work on solutions and create a mutual understanding of the underlying assumptions of the different stakeholders involved. It contributed to a more open discussion on the role of technology development than the narrow "for versus against" discussions dominating public debate. Furthermore, the interaction between participants and keynote speakers created a stimulating environment for discussion and development of new ideas. Finally, the forum provided some valuable experience for YEP participants, which hopefully improves their professional activities as well as the important decisions they will have to make in their future careers.

Progress in hydrogen energy both within Australia and internationally moves onwards with increasing vigour and interest. In this issue we highlight two significant milestones.

By Dr Andrew Dicks, Senior Research Fellow, ARC Centre for Functional Nanomaterials, University of Queensland, and Chairman, WHEC 2008

National Hydrogen Roadmap for Australia

In July, the Department of Industry, Tourism and Resources (DITR) invited tenders for the development of a National Hydrogen Roadmap for Australia. The roadmap's objectives are:

- to assess the areas of hydrogen technology in which Australia currently has research capabilities and strengths, compared to research overseas; and
- to identify the actions Australia should take to prepare for the possible emergence of a hydrogen economy, and the economic case for each of these actions.

The roadmap will cover research, development and demonstration of hydrogen technologies, and will be used as a planning tool for hydrogen researchers and Australian governments. Critically, the developed roadmap will also identify if there are any areas of hydrogen and fuel cell technologies where Australia has developed, or could develop, a competitive advantage. The roadmap will play a role in Australia's move towards the adoption of future renewable and low emission energy technologies.

To be completed between August 2007 and March 2008, it is expected that the outcome will be presented and discussed at the World Hydrogen Energy Conference 2008 next June.

Funding for hydrogen projects

The University of Melbourne and industry collaborators, Ford Australia and Haskel Australia, secured a major grant for hydrogen projects in March 2007. The Victorian State Government grant of \$1.2 million from the Energy Technology Investment Scheme in the Department of Primary Industries will partly fund the \$3 million construction cost for a highly efficient low cost hydrogen-fuelled engine and storage system. For well over a decade the University of Melbourne has been undertaking research into advanced hydrogen combustion engines under the leadership of Prof Harry Watson in the Department of Mechanical & Manufacturing Engineering. For the past five years, it has become a cross-faculty project incorporating the expertise of Dr Michael Brear and

Dr. Chris Manzie, also from the Department of Mechanical & Manufacturing Engineering; Prof Will Ducker of Chemical & Biomolecular Engineering; and Prof Dragan Nesic, Electrical & Electronic Engineering.

One goal of the project is to convert a Victorian-manufactured engine to achieve the world's highest efficiency for a hydrogen-fuelled internal combustion engine. The researchers will also investigate a novel approach to high density hydrogen storage at pressures that allow use of conventional storage equipment. The combination of efficient hydrogen storage and engine is expected to produce a practical option for a zero emission vehicle in the short- to medium-term. Over the next three years, much of the research will be conducted in the recently-formed Advanced Centre for Automotive Research and Testing.

For more information contact Dr Michael Brear on (03) 8344 6722.

WHEC 2008

DITR will be hosting a meeting of the International Association for the Hydrogen Economy (IPHE) in conjunction with the World Hydrogen Energy Conference (WHEC 2008) in Brisbane next June. The Technical Standards Committee for Hydrogen (TC 197) of the International Standards Organisation (ISO) will also meet in Brisbane before WHEC 2008.

Major sponsors for WHEC 2008 are now being engaged and readers are reminded to make the opportunity known to others who may be interested in supporting the event, either as a sponsor or an exhibitor. Expressions of interest should be sent to the conference organisers by emailing whec2008@icms.com.au. There are several international conferences over the coming months where the WHEC 2008 will be targeting potential delegates, exhibitors and sponsors, and these are listed in the calendar. If any members of the Australian Institute of Energy are planning to attend these or other hydrogen or fuel cell events, please contact the WHEC 2008 organisers to find out how to promote the conference on behalf of the Institute.



Dr Peter John Jackson (FAIE) **Research Engineer, Orienteer 27/10/1950 – 11/7/2007**

Peter Jackson was held in the highest regard by a wide group of engineers and scientists in the Australian research community, particularly those involved with natural gas, brown coal and power generation.

After graduating from Monash University with a Bachelor of Engineering (Hons) in 1971 and a PhD in 1977, Peter joined ICI Australia for several years, before joining BHP's Melbourne Research Laboratories, where he remained until 1994. This period culminated in leadership of a large research team involved in conversion of natural gas to liquid fuels. In 1994, Peter was seconded to BHP Corporate Planning exploring new business opportunities for BHP, specifically in technology evaluation and supervision of trials.

Peter joined the predecessor of the CRC for Clean Power from Lignite in 1995 as Manager Research and shortly afterwards became Deputy CEO. He worked closely with the CRC's PhD students and post-doctoral researchers. In any year he would oversee 40 to 50 diverse projects at seven research laboratories in Victoria and South Australia, involving close relationships with three universities and CSIRO.

His style was always inclusive and cooperative. He encouraged initiative and welcomed the intellectual inputs and initiatives of his researchers. These students and researchers drew strength from his management style, welcomed his leadership and saw him as a mentor and confidante.

Peter was appointed CEO in early 2004, a position he held until the CRC wound up in 2006. As CEO, he drove the last stages of the establishment of MTE Research Pty Ltd, the company constructing the A\$6 million experimental MTE brown coal dewatering pilot plant in the Latrobe Valley. Peter played a key role in the spin-off CRC technology which was commercialized by Laser Plasma Technologies Pty Ltd. As a director of the company, he contributed strongly to the commercialization of the laser plasma spectrometer instrument, now merged into the recently floated XRF Scientific Limited.

Peter also made a significant contribution to the Victorian State Government's Brown Coal R&D Advisory Group. It caused

him some anguish that the accumulated experience of 13 years of the CRC was not utilized to form the basis of an ongoing organization to ensure the continued exploitation of the state's brown coal resource on a sustainable basis. Peter gave his best efforts to drive a third life of the CRC. He contributed his strong intellectual and presentation skills. But the rules of the game had changed and the bid failed. Today, given greater awareness of the impact of climate change, he may well have succeeded.

Following the winding up of the CRC, Peter's value to the research community was evidenced by the number of senior job offers he received. He chose to take up a key role with CSIRO, and earlier this year Peter was the principal contributor to a comprehensive submission to a Victorian Government review related to future uses of brown coal in the Latrobe Valley. CSIRO had intended that Peter would lead a major new pilot plant program at Loy Yang Power, but the scourge of terminal illness cut this short.

Peter John Jackson was born on October 27, 1950, in Ballarat, the first child of Eileen and Harry Jackson. His sister Brenda was born in 1952 and the family returned to Melbourne the following year. Peter matriculated as dux of Ashwood High School, just after his 17th birthday. Orienteering was Peter's sporting passion and it was through this sport that he met his wife, Carolyn Hooper, an elite orienteer. Peter's involvement in orienteering included mapping, course setting, and serving on various committees including a term as the Victorian association president. Peter's technical expertise in mapping was widely regarded, and his most recent role of state map registrar was a labour of love. His proudest moment was when he won the Australian Championships in M35 in WA, an area which suited his incredible technical ability.

Peter's battle with melanoma ended on 11 July 2007 when he passed away peacefully with his family by his side. Peter is survived by his wife Carolyn, his children Adrian, Melinda and Timothy, his mother Eileen and his sister Brenda.

Howard Mitchell and David Brockway (colleagues and friends) and Brenda Wardlaw (Peter's sister)

The AIE was saddened to hear of the recent passing of AIE Fellow and friend Peter Jackson. Peter was a regular attendee and strong supporter of Institute activities as well as a respected member of the energy community. He was for many years the AIE corporate representative for the CRC for Clean Power from Lignite and its predecessor. Peter frequently arranged for the CRC to sponsor AIE activities, such as conferences and seminars on energy technology and, in particular, the Postgraduate Student Energy Awards. Peter was a passionate supporter of these awards and a willing judge, including most recently for the first National Postgraduate Student Energy Awards held in Melbourne last November. Peter will be greatly

missed by his friends in the AIE, and our heartfelt sympathies go to his wife Carolyn, and family and friends.

*Dr David Allardice (FAIE)
(colleague and friend)*

Dr Peter Jackson (right) presenting the CSIRO award for best coal & combustion project to George Szego at the AIE National Postgraduate Student Awards in November 2006



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New Coordinator for Perth Branch



AIE Perth Branch welcomes new registrations coordinator, Kristy Harris. Kristy is the first point of contact for function registrations, and is responsible for processing payments, managing attendance lists, and preparing name badges for all AIE Perth Branch events. She will also assist with table reservations to ensure organisations are well represented at branch functions. Kristy has extensive experience in administrative services in both the private and public sectors. In addition to providing a seamless, professional service to Institute members and guests, Kristy is a young mother (with a son at primary school and a toddler at home) and a passionate Carlton Football club supporter. Kristy's contact details for events are (08) 08 9332 6698 and registrationswa@aie.org.au

Kristy Harris

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Forthcoming AIE Events

9 October	SYDNEY Nicole Rothmann, The Nous Group "Communication and influencing skills" University of Technology Sydney	28 November	MELBOURNE BRANCH AGM John Franklin, Monash Energy "Experiences in China"
16 October	SYDNEY Half-day symposium, jointly with CSIRO "Distributed Generation – Ready, Willing & Able" 12 noon, Sydney Masonic Centre, 279 Castlereagh Street	29 November	SYDNEY Young Energy Professionals' end of year meeting
5 November	SYDNEY BRANCH AGM AIE Hydrogen Division presentation "Hydrogen – is it really a fuel for the future?"	3 December	SYDNEY Speaker to be advised. "Ethanol from sugar cane, and biodiesel – Are these real alternatives in the mix for our future fuel needs?"
9 November	MELBOURNE Hon Peter Batchelor MP, Victorian Minister for Energy & Resources "Roadmap to Victoria's Energy Future – A 2020 Vision"	MARK YOU DIARY NOW!	

If your branch is organising an event for 2008 send details to editor@aie.org.au to promote the event in forthcoming issues of **ENERGYNEWS**.

Other Events — October 2007 to June 2008

2 October in Sydney	Going Carbon Neutral and Beyond	www.ethicalinvestor.com.au
4 October in Melbourne	Going Carbon Neutral and Beyond	www.ethicalinvestor.com.au
2–6 October in Alice Springs	SOLAR07 (45th Annual ANZSES Conference)	http://www.solar07.org
15–19 October in Texas, USA	2007 Fuel Cell Seminar	http://www.fuelcellseminar.com
15–17 October in Granada, Spain	Hydro 2007	http://www.hydropower-dams.com
17–18 October in Gold Coast	Australian Energy User 2007	http://www.euaa.com.au
19–21 October in Melbourne	Save Water, Save Energy Expo	http://www.savewatersaveenergyexpo.com.au/
30 Oct – 1 Nov in Beijing, China	Methane to Markets Partnership Expo	http://www.methanetomarkets.org/expo/
2 November in Sydney	Climate Risk Management Summit	http://www.informa.com.au/climaterisk
4–7 November in Montecatini Terme, Italy	World Hydrogen Technologies Convention 2007	http://www.whtc2007.com/
11–14 November in Sydney	Energy 21C, 9th International Transmission & Distribution Conference	http://www.energy21c.com.au/
11–15 November in Rome, Italy	20th World Energy Congress	http://www.rome2007.it
12–13 November in Brisbane	8th Annual Australian Gas Turbines Conference	http://www.informa.com.au/gasturbines
12–15 November in Richmond, USA	Materials Issues in a Hydrogen Economy	http://www.has.vcu.edu/phy/ishe/
12–15 November in Basel, Switzerland	CAIWA 2007, International Conference on Adaptive & Integrated Water Management	http://www.newater.uos.de/caiwa/
14–16 November in Miami, USA	Fuel Cells Durability & Performance 2007-08-25	www.knowledgefoundation.com
19–21 November in Bonn, Germany	The case of energy autonomy: Storing Renewable Energies (ISES II)	http://www.eurosolar.org
2–5 December in Anaheim, USA	23rd International Electric Vehicle Symposium and Exposition	www.evs23.org/
7–9 December in Ahmedabad, India	Energy Expo 2007	www.energyexpo.biz
17–21 February 2008 in Adelaide	3rd International Solar Cities Congress	http://www.solarcitiescongress.com.au/
4–6 March in Mumbai, India	SPE Indian Oil & Gas Technical Conference & Exhibition	http://www.indianoilgas.org/
11–14 March in Berlin, Germany	2nd International Renewable Energy Storage Conference (IRES II)	http://www.eurosolar.de/
15–18 May in Surfers Paradise	Fuel for Thought, PICA Qld Conference	email: russellbrandon@bacchus.com.au
15–19 June in Brisbane	WHEC 2008	http://whec2008.com
23–25 June in Newcastle	International Symposium on Advanced Gas Cleaning Technology (GCHT-7)	http://livesite.newcastle.edu.au/gcht/

Please note that the events listed here are based on information sent to the Institute by event organisers. The AIE does not necessarily endorse the views of the speakers. The events are brought to the attention of members as potentially contributing to discussion on relevant energy issues. If you know of any conferences or other major events that would be of interest to AIE members and will be held from January to December 2008 please email details and web link to editor@aie.org.au