



Overview

The Australian Technology Network of Universities is a strong and successful alliance of five leading technology based universities in Australia. In addition to excellence in technology, the ATN are academic leaders in exploring the social, intellectual and cultural issues of technology. The five ATN universities comprise Curtin University, University of South Australia, RMIT University, University of Technology, Sydney and Queensland University of Technology. Together, the ATN teaches around 190,000 students, or almost 20 % of Australia's student population. Of these, some 42,000 are at post graduate level.

The ATN's aim is to help secure Australia's reputation as the clever country, and contribute to its social and economic wealth. Our strength is in our demonstrated capacity to work collaboratively across the five universities in a cross disciplinary manner in research and development.

An additional strength of the ATN is its international linkages. The ATN has an agreement with the International Strategic Technology Alliance (ISTA) of China which is an association of 22 technology based universities. Similar agreements are being developed with European universities and other international partners. These linkages are already being exercised in energy related areas and it is expected that they will provide value for the nuclear power sector as these economies are rapidly increasing the amount of nuclear power in their networks. One example of the benefits is an active researcher exchange and collaboration programme.

The ATN group of universities provides a broad and coherent range of educational and research skills of relevance to the Uranium Mining, Processing and Nuclear Energy Review (UMPNER). These extend across mineral exploration, mining and processing, to public policy, environmental sustainability, energy asset management and security, engineering and control systems, fuel processing, business and law.

The ATN is the only national network of universities addressing the current energy debate in a multi university, multi disciplinary manner. It is our strong view that if Australia is to have a nuclear energy platform, then how the community interacts with the development of policy will be critical.

In 2005 the ATN was successful in receiving funding under the Federal Government's Collaboration and Structural Reform (CASR) fund to develop a national R&D program to address the energy R&D priorities outlined in the Federal Government's Energy White Paper, provide industry focussed courses in energy and provide general community education in energy. The initial stage involved an audit and gap analysis of existing capabilities mapped against the current and likely future demands of industry and business. As discussed in the body of this submission, nuclear energy emerged as the dominant issue for most participants, albeit that many stakeholders were coming at it from different sectoral perspectives and interest.

As recently discussed with UMPNER Secretariat, what follows in this report is an outline of the information gathered to date as part of the Commonwealth funded ATeENERGY project.

Industry

In assessing business, community and industry views regarding solutions to Australia's energy demand issues, the Australian Technology Network organised for a series of unofficial interviews to be conducted with corporate management over a three-month period from October 2005 to January 2006.

The decision to conduct the initial round of interviews on an unofficial (no names or companies sourced) basis, was taken to ensure open discussion and candid assessment. The interviews were an initial component of a part CASR-funded energy project.

At no time did the ATN interviewer raise nuclear power as a subject for discussion. This was deliberate. The interviews were to elicit business community views, not to question on specific possible sources of additional power.

In total 67 interviews took place. Twenty eight were face to face. The remainder were by phone.

Without any prompting, 42 individuals at senior levels of management in Australia mentioned the lack of any cohesive energy policy that gave them faith Government understood the country's future energy requirements – especially related to electricity.

Most concerned were organisations headquartered in West Australia, Victoria and South Australia who all said they recognised the potential for generation supply issues related to peak demand scenarios.

Those managers also expressed the view that future electricity supply was a subject that frequently concerned them when developing business plans, and was regularly mentioned in this context at senior management meetings. It was therefore identified as a subject of concern raised within their organisations on a regular basis.

The general view of all those interviewed, was that the Federal Government and State Governments were working too much “on the margins” with wind and solar. These comments were made even by those who strongly supported the wind and solar push. None considered it was “the” solution.

All those who mentioned it as being on the margins were perplexed and concerned by a perception, stress perception, that Government viewed it as a solution. The perception extended to comments that Government was wasting time rather than moving forward to identify and produce a cohesive energy policy framework.

Companies stated they believed Australia must have a solid national energy policy for economic security.

General comments were also - during 29 interviews - that members of the companies’ management teams had expressed levels of frustration with the numerous different energy use/energy efficiency reporting and programs being introduced by both levels of Government.

Most criticism was directed to the time and cost factor involved in such participation, the lack of a bottom line understanding of the specific company requirements, and a view that Federal and State Governments were “tripping over each other” “reinventing the wheel” instead of having one focussed strategy re energy, particularly electricity.

Industry was keen to harness what it termed as sensible energy efficiency policies, in that it would put effort into ensuring it did not waste energy but it saw this as a totally separate issue to seeking a new long-term reliable source of power for their businesses.

It appeared to worry that Government was not separating the two – delaying the identification of solutions to delivering energy, by putting the onus on using less energy back on business, particularly the manufacturing base.

Nuclear power as a subject was raised during 41 of the 67 interviews. It is worth restressing here that the subject was raised without prompting.

In only one of those conversations was the communication on nuclear expressed in the negative. All other comments suggested that:

- The debate was long overdue
- It was ridiculous we (Australia) sent our uranium overseas when gradually each State was experiencing more and more peak load electricity issues without a sensible nation-wide solution in sight.
- That someone had to “bite the bullet” and state nuclear power must be considered as an energy option.
- It should be on the agenda.
- It should surely be part of any progressive nation’s energy policy

Feedback was also sought about how the quality of the existing education courses provided by the higher education sector was perceived by those working within the energy sector. Again, this did not focus on the issue of nuclear energy however it is apparent from our discussions that if Australia is to actively be involved in nuclear energy, there must be a coordinated , multi disciplinary approach to delivering relevant undergraduate and post graduate education in this field.

Across the ATN there are several post graduate courses in the energy sphere but none are specifically related to nuclear education. Offerings include the University of South Australia’s Graduate Certificate in Energy Management and RMIT’s Masters of Engineering in Sustainable Energy and Energy Policy subjects.

Research and Development

The capacity for Australia to embrace a nuclear energy platform will, in a large part, be dependent upon research which will be undertaken within Australia’s university system, in tandem with Government policy makers.

Clearly there is growing interest by industry, government and the community, spurred by current events, in Nuclear power covering the environmental impacts of uranium mining and processing, community attitudes to nuclear power, possible involvement in the fuel cycle, waste disposal, economic studies etc.

A term of reference for this review is to consider the current state of nuclear energy research and development in Australia and the capacity for Australia to make a significantly greater contribution to international nuclear science.

The ATN group has sufficient existing aggregate capability to undertake significant research in this area as outlined below.

In the mineral sector, the Ian Wark Research Centre (UNISA) is the headquarters for the Australian Mineral Science Research Institute (AMSRI) which has been established to strengthen Australian technological and scientific leadership in particle science and engineering. Curtin's Centre of Excellence for Exploration and Production Geophysics is directed at improving the recovery of hydrocarbons and minerals from known locations. Research is carried out jointly with both the petroleum and minerals industries in Australia. To this end, a major thrust of the research is in educating and training future employees for the resource industries. The aim of the Centre for Fuels & Energy (Curtin) is to develop new knowledge and advanced technologies for efficient, effective and environmental-friendly utilisation of fuels and energy in processing industries. The Centre of Excellence for Sustainable Mine Lakes (Curtin) undertakes research and education on the sustainable use of mine lakes.

The Centre for Environmental Management and Compliance (UniSA) provides training and undertakes research in the development and administration of environmental law. The Centre of Excellence in Cleaner Production (Curtin) undertakes training, research and information dissemination of particular interest to business and other organisations in the resource and production sectors.

In the important area of energy sustainability, the Institute for Sustainable Futures (UTS) looks at the economic, environmental and social aspects of national energy and water issues. The Infrastructure Research Theme of the Faculty of the Built Environment and Engineering (QUT) has a primary goal of improving the planning, design, operation and management of vital Australian infrastructure. The Institute for Sustainable Resources (QUT) is integrating multidisciplinary research teams for research across development and infrastructure, energy systems and water systems. The new Institute for

Sustainable Systems and Technologies (UniSA) aims to be the flagship for the University's research capabilities in the areas of built environment and sustainable development.

For research and expertise in the societal aspects of uranium and nuclear power, public policy is strength of the John Curtin Institute of Public Policy (Curtin) where issues of national, state and regional significance are researched and debated. The Centre for Social Change Research (QUT) is looking at the drivers for, and implications of, social change.

In business and management, ATN universities provide education and research expertise in many areas of relevance to the review. For example, environmental economics, global environmental policy, regulation and public policy are areas of speciality in the School of Management (RMIT), while the International Graduate School of Business (UniSA) undertakes research and teaching in areas of sustainability, and adoption and diffusion of new technology, in an international context. The School of Finance and Economics (UTS) has expertise on electricity markets and power production.

In engineering, ATN universities cover many aspects of relevance to the review; the School of Urban Development (QUT) has expertise in structural engineering, disaster mitigation and impact and energy absorbing structures. The Faculty of Engineering (UTS) has specialist expertise in energy policy and planning, including scenario-based energy modelling for Australia, energy environment macro economic modelling, and global perspective on the impact of electricity supply industry reforms. The School of Civil and Chemical Engineering (RMIT) has extensive experience in environmental engineering, waste management, slurry processing and mine rehabilitation. The School of Electrical and Computer Engineering (RMIT) has research strengths in power systems analysis and control system engineering.

In Law, the Faculty of Law (QUT) undertakes research and teaching in environmental and natural resources law, and planning and resources law. Studies and research in radiation health physics and radiation protection and measurement are provided at the School of Physical and Chemical Sciences (QUT).

Conclusion

The ATN welcomes the opportunity to participate in this review. The energy policy spectrum is as wide as it is controversial. Energy is a field which has many powerful and committed players both politically

and from industry. The views are as varied as the options. It also has many – as yet – untapped potential fronts of policy development and opportunities. The many issues surrounding the development of holistic energy policy will only be resolved via sound, impartial research, development and education. The ATN with its strong multidisciplinary, applied research focus is well placed to make a significant contribution to the current debate and subsequent policy deliberations.