

Greenpeace Australia Pacific

SUBMISSION TO THE URANIUM MINING, PROCESSING AND NUCLEAR ENERGY REVIEW

Executive Summary

The Terms of Reference for the Uranium Mining, Processing and Nuclear Energy Review were announced by the Prime Minister on 6th June 2006. In his media statement John Howard identified that the Review was charged with investigating the potential role of nuclear energy in Australia against a backdrop of concern about increasing global greenhouse emissions and energy security.

However, Greenpeace believes the Terms of Reference announced by the Prime Minister are biased toward the promotion of nuclear energy as a solution to climate change. If the Inquiry Taskforce was genuinely being charged with the responsibility of investigating how Australia will meet future energy demands while significantly reducing greenhouse gas emissions, the Terms of Reference would have allowed for the investigation and analysis of other potential energy sources. As such, it is difficult to not interpret the Review process as merely a platform to expand Australia's uranium exports, develop uranium enrichment capacity, and position Australia as a player in the global nuclear club.

To this end, Greenpeace has re-drafted the Terms of Reference to reflect the debate that Australia should be having about how to solve the climate crisis and move towards genuinely clean energy solutions.

To tackle climate change, immediate and top priority must be deep cuts in emissions. These can only be achieved by developing Australia's renewable energy industry, energy efficiency and by reducing energy demand. These can all be achieved without jeopardising Australia's economy and without the added risks and costs undeniably associated with nuclear power.

Australia has huge potential for renewable energy. Twenty-three renewable energy technologies presently operate under the Federal Government's limited Mandatory Renewable Energy Target (MRET) initiative yet Australia's vast renewable energy potential is untapped and unsupported. The industry requires new market incentives and significant policy changes in order to flourish. Yet the Federal Government's Mandatory Renewable Energy Target (MRET) has remained at less than 2% since its inception, resulting in a loss of \$13 billion in wind investment alone. Investment by the Federal Government in renewable energy is paltry in comparison to other resource industries. Australia could be a leader in renewable energy, yet is lagging behind the 50 countries abroad which have taken the lead in promoting renewable energy.

As compared to nuclear energy, renewable energy does not involve the risks and significant costs associated with fuel enrichment, fabrication and reprocessing of nuclear power. Renewable energy generation has zero emissions and few waste disposal issues. Renewable energy does not contribute to the proliferation of weapons of mass destruction, nor does it pose a risk to national security. Renewable energy will not take years to establish, the technologies are ready and proven. Renewable energy can provide cheaper electricity than that provided by nuclear power.

To make the deep cuts that are not only necessary but essential to tackle climate change, Greenpeace recommends the Australian Government sets targets to reduce greenhouse gas emissions, increases the Mandatory Renewable Energy Target, and directs public research funding to renewable energy, distributed energy and energy efficiency. In addition research and development into areas favoured by fossil fuel industries should be funded by those industries and subject to independent scientific evaluation.

The Real Terms of Reference

1. Economic issues

1.1 Australia's capacity to increase renewable energy domestically and for the export market in response to growing global demand

Australia has an innovative renewable energy industry with world class expertise in a range of areas. Over the past decade, solar PV and wind capacity in particular have grown rapidly. But the continuous development and deployment of the renewable energy sector in Australia is still faced with significant challenges to overcome. Over the last 8 years the actual percentage of electricity generated by renewable energy technologies has progressively decreased, from around 11.5% in 1998 to 8% today. In the absence of new policy measures in Australia, investment in renewable energy will peak by 2007 and fall off sharply thereafter. By 2010, investment in renewable energy in Australia could dry to a trickle, opposite to the overall global growth trend.^{1 2}

Australia's potential to generate power through renewable energy technology is far beyond what is presently being realised,. In particular the potential for wind energy generation in Australia is enormous. Compared to Germany, the world leader, Australia has forty times less installed capacity, yet is twenty times larger in size with one of the strongest and most abundant wind resources on the planet. Furthermore, due to Australia's political stability, its well-developed infrastructure and its well- situated location for export throughout the Asia-Pacific

¹ Renewable Energy Generators Australia, *Renewable energy: A contribution to Australia's environmental and economic sustainability*, June 2006.

² With the exception of the state of Victoria where the state government has introduced its own legislated renewable energy target.

region, the development of a local manufacturing industry has great potential to attract international investors.³

A growing demand for energy and an increasing concern about climate change is leading to a strong push for investment in renewable energy worldwide. US President Bush recently confirmed his confidence in renewable energy as a major energy source for the US in the future and stated that “areas with good wind resources have the potential to supply up to 20% of the electricity consumption of the United States”⁴. At present the U.S. Department of Energy is collaborating with the American Wind Energy Association and the National Renewable Energy Laboratory to develop an action plan focused on providing up to 20 % of the nation's electricity from wind energy.⁵

Renewable energy technologies also offer a significant opportunity for Australia to increase its exports of both technology and services. There is enormous potential for renewable energy development in the Asia-Pacific region, especially in China and India. As these countries have abundant renewable resources and are characterised by widely dispersed agricultural village communities, the Australian renewable energy industry is looking at increasing business opportunities with the potential to increase its market share on a global scale. Experts predict the growth in the renewable energy industry by 2020 to be almost four-fold, mainly driven by wind and solar technologies.⁶ China, one of the largest coal producers worldwide, announced it will spend US\$200 billion (almost AUS\$266 billion) on renewable energy over the next 15 years with the aim of generating one tenth of its energy from environmentally friendly sources by 2010. Credit Suisse puts the compound annual growth rate of China's wind power capacity at 39 per cent in 2004 to 2010 and at 20 per cent in 2010 to 2020, which represents a significant growth potential for wind turbine manufacturers.⁷

Potential technologies for manufacturing export are solar photovoltaic panels, solar water heaters and wind energy components (blades, nacelles and pylons). Australian technical expertise provides significant opportunities for exports in services and consulting for the hydro-electric, wind and solar PV sectors. In the past, Australian manufacturing exports in the renewable energy sector have - in contrast to an overall manufacturing export decline - been growing.⁸

However, in order to take advantage of these opportunities, the Australian renewable energy sector requires new market incentives and significant policy

³ Global Wind Energy Council, *Wind Force 12*, June 2005

⁴ American Wind Energy Association, *Annual industry rankings demonstrate continued growth of wind energy in the United States*, Press Release 20 March 2006b, http://www.awea.org/news/Annual_Industry_Rankings_Continued_Growth_031506.html.

⁵ American Wind Energy Association, *Energy department, wind industry join to create action plan to realize national vision of 20% electricity from wind*, Press Release 5 June 2006, http://www.awea.org/newsroom/releases/Energy_Dept_Wind_Industry_Action_Plan_060506.html.

⁶ Renewable Energy Generators Australia 2006

⁷ A Leung, *Analysis - Cashing in on China's Renewable Energy Boom*, Reuters News Service 17 July 2006 / Planet Ark, <http://www.planetark.org/dailynewsstory.cfm?newsid=37280&newsdate=17-Jul-2006>.

⁸ Renewable Energy Generators Australia 2006

changes. International experience shows that renewable energy must be deployed by a number of long-term policy interventions.

Putting a price on carbon dioxide emissions has proven to be efficient in reducing greenhouse gas emissions in the short term and provides strong incentives for investment in renewable energy technology over the longer term. The Federal Government's Mandatory Renewable Energy Target (MRET) was the first step in building a domestic renewable energy industry. However, the failure to increase the target has led many companies and investors to turn their back on Australia and relocate to one of the 50 countries abroad that have taken the lead in promoting renewable energy. To date, Government funding allocated for the development of new renewable energy has not been enough to sustain a viable renewable energy industry. Without an increase in the MRET and the further development of market entry incentives, Australia risks lagging behind other nations in the global challenge to produce enough energy with less greenhouse gas emissions.

1.2 Australia's potential, costs and benefits for establishing other steps in renewable energy development in Australia, which does not include fuel enrichment, fabrication and reprocessing, along with the costs and benefits associated with each step

The beauty of renewable energy is that it does not involve the risks and significant costs of dealing with fuel enrichment, fabrication and reprocessing of nuclear power.

As outlined above, all Federal government policies and initiatives to date have either been too small to support significant investment in renewable energy or are about to be withdrawn.⁹ As a consequence, incentives for continuous growth and investment have been exhausted (with the exception of Victoria) and the ongoing expansion of the domestic renewable energy sector has effectively been killed off. For instance, the failure to increase the MRET has resulted in a AUS\$13 billion loss in additional wind energy investment for Australia.¹⁰

This has compounding employment impacts. In Australia, wind power has been shown to create more than six times as many manufacturing and installation jobs as equivalent coal generation.¹¹ There are 1.7 million jobs in the renewable energy sector worldwide: 400,000 jobs alone in the ethanol sector in Brazil and 250,000 jobs in the Chinese solar hot water industry.¹² In Germany, the

⁹ Renewable Energy Generators Australia 2006

¹⁰ The Climate Institute, *Top ten tipping points on climate change: An analysis of how the fundamental trends of climate change have shifted and why Australia is adrift*, The Climate Institute Australia, Sydney, 2006.

¹¹ R Passey, *Driving investment, generating jobs: Wind energy as a powerhouse for rural and regional development in Australia*, Australian Wind Energy Association, Melbourne, 2004.

¹² The Climate Institute 2006

renewable sector created 150,000 jobs by 2005 and now provides more electricity than does nuclear power.¹³

In contrast, employment in the Australian coal mining industry has declined by 45 percent since the mid 1980s, while the amount of coal mined has increased steadily over the same period of time. Since the 1990s employment in electricity generation has fallen by 50 percent while the amount of electricity produced has significantly risen.¹⁴

Renewable energy delivers greater local control over technologies and more local job creation potential, and can often be financed or partly manufactured locally. Furthermore, benefits immediately flow to the regions where these technologies are manufactured or installed. At present wind farms built in Australia have a 50 percent Australian content (in dollars) which may rise to 80 percent in the future if the MRET is increased and a domestic manufacturing industry is established. Coal electricity only has an Australian content (in dollars) of about 26 percent. Even if wind power created only the same number of global jobs per MWh as compared to coal electricity, the smaller scale of wind power would ensure that smaller economies like Australia will gain more local employment.¹⁵

1.3 The extent and circumstances in which renewable energy could in the longer term be economically competitive in Australia with other existing electricity generation technologies, including any implications this would have for the national electricity market

In Australia results of several recent studies emphasise that “existing renewable energy resources are capable of substituting for coal-fired power stations, in spite of claims to the contrary. Further, they show that combinations of energy efficiency, renewable energy, and gas as an interim bridging fuel, may be less expensive than continuing to build coal-fired plants, even without considering the environmental and health costs of burning coal”¹⁶. Renewable energy technologies are proven, safe, already in widespread commercial use, but also likely to become cheaper over time. In addition, more efficient energy use is much more cost-effective than any electricity supply technology, having negative costs with shorter payback times.

Since the 1970s the cost of electricity from wind has fallen globally by 75% and it is estimated that the costs of wind energy in Australia could be competitive with fossil fuels within the next decade, even without the additional costs of emission

¹³ Bundesverband Wind Energie (eds) (2005), ‘Energy news: German renewables producing more power than nukes’, *New Energy*, No. 5, October 2005, p. 10.

¹⁴ M Diesendorf, ‘Can geosequestration save the coal industry?’, in J Byrne, L Glvoer & N Toly (eds), *Transforming power: Energy as a social project*, Energy and Environmental Policy Series vol. 9, 2006, p.14

¹⁵ Diesendorf 2006, pp. 9-10

¹⁶ CSIRO Sustainability, *Sustainability Network Update No. 54E*, 2005, p.1.

reduction measures fossil fuels are facing.¹⁷ Furthermore, if local, regional and global environmental and social damage costs resulting from the combustion of fossil fuels were internalised into the electricity tariff a number of renewable energy technologies would immediately be competitive with coal-fired electricity generation. The appropriate pricing of fossil fuels and electricity produced from burning fossil fuels plus the removal of both direct and indirect subsidies to power-generation technologies are therefore essential policy strategies for stimulating the development of renewable energy technologies.¹⁸

Additionally, opinion polls continuously demonstrate high levels of public support for clean energy technologies such as wind or solar, even if they require an increase in electricity tariffs. A poll by the Australian Research Group shows that 95% of respondents support the use of wind power, while 50% support the use of gas and only 21% support new coal plants. 76% of respondents were willing to pay 5% more on their electricity bill if it meant that they would be purchasing 10% more clean energy. A separate poll by Newspoll found that 83% of Australians would agree to pay AUS\$3.50 more for monthly energy expenses if it meant that 10% of Australia's electricity would be produced from new renewable sources by 2010.¹⁹

1.4 Current state of renewable energy research and development in Australia and the Australian capacity for a significantly greater contribution to international renewable energy science

Australia's renewable energy researchers have been successful in developing some of the world's leading technologies. Australian research and development expertise is presently concentrated on thin film and silicon sliver PV, hydrogen research, photovoltaic concentrator technology, services to the wind industry and hot dry rocks (HDR) geothermal technology.²⁰

However, due to our small population the commercialisation of domestically developed technologies has proven to be relatively difficult. In order to compete with existing market technologies and entrenched subsidies to the fossil fuel sector, new technologies, including renewable energy technologies, have to be produced in large quantities in order to achieve prices that enable market entry.

Despite these general problems, there have been some renewable energy manufacturing successes. They include BP Solar and Origin Energy's solar PV manufacturing plants, the Vestas blades and nacelle manufacturing, Keppel Prince and Air-ride Technologies pylon manufacturing facilities as well as the ten significant manufacturers of solar water heaters. Additionally, several successful

¹⁷ Global Wind Energy Council 2005

¹⁸ A D Owen, 'Renewable energy: Externality costs as market barriers', *Energy Policy*, no. 34, 2006, pp. 632–642.

¹⁹ Australian Wind Energy Association, *Wind power myths and facts*, viewed August 2006c, <http://www.auswea.com.au/auswea/index.html>

²⁰ Renewable Energy Generators Australia 2006

consulting and project development companies work in the renewable energy services sector in Australia and abroad.²¹

Despite these successes, under current policy the renewable energy industry is under serious constraints with investors and researchers going offshore or abandoning investments and research in Australia. “Australia has already lost solar thermal technology to China because there were no funds for its commercialisation”, says University Professor Dr Phillip Jennings, “It would have created an industry worth at least \$1billion, but that’s gone now”.²²

*It is deeply concerning that while Australia has several publicly funded cooperative research centres for fossil fuels there are now none for renewable energy technology.*²³

2. Environment issues

2.1 Contribution of renewable energy to the reduction of global greenhouse gas emissions

Present calculations of Australia’s greenhouse gas emission increases are drawing a distorted picture of reality. Meeting the Kyoto obligation of increasing greenhouse gas emissions to “only” 108 percent of 1990 levels by 2010 is largely the result of significant reductions in land clearing and the forestry sector, while actual emissions from all other sectors, particularly electricity and transport, have risen enormously. After 2012, there is little opportunity for emission reductions through land clearing, and it must be expected that the electricity sector will be compelled to take on greater responsibility for emission reductions.²⁴

At present the electricity sector is responsible for around one third of Australia’s total greenhouse gas emissions. With an emissions increase of 41 percent since 1990, it is also the fastest growing source of greenhouse gas pollution.²⁵ Without further action, emissions from electricity generation are estimated to grow by 70 percent over the period to 2020.²⁶ Under present conditions, annual emissions from electricity generation over the period to 2050 are predicted to rise by 250% compared to 1990 levels. Should we use even the most efficient fossil fuel technologies there would be a 220% increase in emissions compared to 1990 levels.²⁷

²¹ Renewable Energy Generators Australia 2006

²² The Climate Institute 2006, p. 56

²³ Diesendorf 2006, p. 13

²⁴ The Climate Institute 2006

²⁵ Renewable Energy Generators Australia 2006

²⁶ The Climate Institute 2006

²⁷ Renewable Energy Generators Australia 2006

Claims that nuclear power is “emissions free” are false. Mining, extracting, processing and transporting nuclear fuel produces emissions at every point. Even decommissioning mothballed reactors generates greenhouse emissions due to heavy machinery and transportation..

2.2 Contribution of renewable energy to the mix of emerging energy technologies in Australia

A target of 60 percent greenhouse gas emission reductions by 2050 combined with rising demand for power requires a significant increase in the installation and uptake of renewable energy as part of a low-emission energy generation mix on the supply side. Additionally, it requires decreased consumption through increased energy efficiency on the demand side.

While wind energy is at present the fastest growing form of clean energy in Australia, it is only one of 23 renewable energy technologies that presently operate under the Federal Government’s MRET initiative. Combined with other forms of clean energy technologies, wind energy is capable to meet base-load and peak energy demand with very low pollution. The abundance of zero cost renewable resources such as wind, sun wave and biomass in Australia and the massive potential for increased energy efficiency guarantees that Australia's future power needs can be met in a cost effective and sustainable manner through an intelligent mix of different energy generation technologies.²⁸

3. Health, safety and proliferation issues

3.1 Potential of renewable energy technologies to meet safety, waste and proliferation concerns.

Renewable energy is an effective weapon in the fight against climate change and increases local, regional and global energy security. Unlike nuclear power, renewable energy produces little waste and requires no waste storage and maintenance. Proliferation issues related to renewable energy technologies for developed and developing countries are therefore not an issue.

3.2 Waste processing and storage issues associated with renewable energy and current world's best practice.

Unlike nuclear power, renewable energy does not produce nuclear waste and requires no waste storage and maintenance.

3.3 Security implications relating to renewable energy

²⁸ Australian Wind Energy Association 2006c

Renewable energy impacts Australia's security in multiple ways: First, renewable energy technologies are zero-emission technologies which makes them an effective means for decreasing greenhouse gas emissions and mitigating the significant security consequences associated with climate change. Secondly, energy generation from renewable energies promotes a mix of energy sources which improves Australian energy security by making it independent from increasingly constrained fossil fuels as the single energy source. Third, renewable energy technologies are distributed and decentralised, increasing Australia's energy supply security in case of the failure of a single generator. And finally, renewable energy are low-waste technologies which makes them the safest energy technology currently available.

In contrast, nuclear technology is inherently linked to nuclear weapons production, and therefore a proliferation risk. After the September 11 terrorist attacks, the nuclear industry itself acknowledged that nuclear power plants, nuclear waste, spent fuel and waste facilities should be regarded as potential targets.

3.4 Health and safety implications relating to renewable energy

Burning fossil fuels and using nuclear technology for energy generation can result in a range of adverse health effects and safety challenges, from respiratory diseases to cancer, and the obvious dangers associated with accidents. In contrast, renewable energy technologies have not been found to have negative impacts on the health or safety of people. In fact, as renewable energy technologies help ameliorate climate change, by definition they actually improve human health and safety.

A recent assessment by the World Health Organisation found that more than two million people die prematurely each year due to air pollution from the burning of solid fuels such as coal. A similar WHO study also found that global climate change, caused primarily by burning fossil fuels, is directly tied to increased rates of malaria, malnutrition, and diarrhoea. It estimated that climate change contributes to 150,000 deaths and five million illnesses each year. A recent US study looked at the impact of a terrorist attack on a nuclear reactor in the US. It estimated there would be at least 44,000 fatalities immediately with over 500,000 deaths from long-term effects, including cancers.

RECOMMENDATIONS:

- Australia must give immediate and top priority to rapidly expanding renewable energy, energy efficiency and reducing energy demand to achieve the deep cuts in emissions that are required to prevent dangerous climate change.
- The Government should set a target to reduce the nation's greenhouse emissions by 60-80 percent below 1990 levels by 2050 with a target of at

least 20 percent by 2020. A roadmap needs to be developed to set out the measures necessary for these targets to be achieved.

- The current Mandatory Renewable Energy Target (MRET) should be increased so that 10 percent of electricity is supplied by renewable energy by 2010 and 25 percent by 2020, with increasing targets beyond 2020.
- Australia's public research funding should be directed towards renewable energy, distributed energy and energy efficiency. Recognising the polluter pays principle, research in areas advocated by the fossil fuel industry, including geosequestration, should be funded by the fossil fuel industry and should be subject to independent scientific evaluation.

References

American Wind Energy Association, *Annual industry rankings demonstrate continued growth of wind energy in the United States*, Press Release 20 March 2006b, http://www.awea.org/news/Annual_Industry_Rankings_Continued_Growth_031506.html.

American Wind Energy Association, *Energy department, wind industry join to create action plan to realize national vision of 20% electricity from wind*, Press Release 5 June 2006, http://www.awea.org/newsroom/releases/Energy_Dept_Wind_Industry_Action_Plan_060506.html

Australian Wind Energy Association, *Wind power myths and facts*, viewed August 2006c, <http://www.auswea.com.au/auswea/index.html>

Bundesverband Wind Energie (eds), 'Energy news: German renewables producing more power than nukes', *New Energy*, No. 5, October 2005.

CSIRO Sustainability, *Sustainability Network Update No. 54E*, 2005.

Diesendorf M, 'Can geosequestration save the coal industry?', in J Byrne, L Glover & N Toly (eds), *Transforming power: Energy as a social project*, Energy and Environmental Policy Series vol. 9, 2006.

Global Wind Energy Council, *Wind Force 12*, June 2005.

Owen AD, 'Renewable energy: Externality costs as market barriers', *Energy Policy*, no. 34, 2006, pp. 632–642.

Passey R, *Driving investment, generating jobs: Wind energy as a powerhouse for rural and regional development in Australia*, Australian Wind Energy Association, Melbourne, 2004.

Renewable Energy Generators Australia, *Renewable energy: A contribution to Australia's environmental and economic sustainability*, June 2006.

The Climate Institute, *Top ten tipping points on climate change: An analysis of how the fundamental trends of climate change have shifted and why Australia is adrift*, The Climate Institute Australia, Sydney, 2006.