Submission

No 2

INQUIRY INTO THE ECONOMICS OF ENERGY GENERATION

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SUBMISSION

Greenpeace Australia Pacific's submission to New South Wales' Public Accounts Committee inquiry into the economics of energy generation

Introductory comments

Greenpeace Australia Pacific is pleased to see the New South Wales' (NSW) Public Accounts Committee conduct this inquiry into the economics of energy generation. We are glad to offer this submission into what is an important subject.

While our work on energy, including our Energy [R]evolution report[1], covers the entire energy sector in Australia, we will focus here on power generation (stationary energy), particularly as it accounts for 49% of NSW's energy emissions alone[2]. We would be pleased to discuss the matters raised in this submission with the Committee, should such an opportunity arise.

About Greenpeace

Greenpeace is an independent global organisation campaigning to change attitudes and behaviour, to protect and conserve the environment for future generations. Established in 1971, we now have a presence in more than 40 countries and around 2.8 million supporters worldwide. Greenpeace Australia was founded in 1977 and joined with the Pacific region in 1998. Today, Greenpeace Australia Pacific has over 70,000 supporters.

Measuring up Australia's and NSW's energy mix

Greenpeace's Energy [R]evolution report (2010)[3] demonstrates how coal-fired electricity can be phased out in Australia by 2020 and that by 2024, three-quarters of Australia's power can be sourced from renewable energy. Since the publication of this report, the development of global renewable energy power markets has accelerated, suggesting that not only are there no technical barriers to achieving widespread deployment of renewable energy, but that it could be achieved much faster than previously envisaged. Put simply, renewable energy can meet all of the world's power needs – the only variable that will determine when this is achieved is the political imperative and drivers for growth.

Despite this, in 2011 Australia was powered by only 9.6% renewable energy[4]. For a country such as Australia, with our vast renewable energy resources, expertise, industrial capacity and imperative to avoid carbon polluting sources of power, this is unacceptable. NSW's proportion of electricity

[1] Greenpeace Australia Pacific, *Steps to an Energy [R]evolution*, 2010. http://www.greenpeace.org.au/climate/assets/docs/energyrev2010/energyrev2010-summary.pdf
[2] NSW Office of Environment and Heritage website http://www.environment.nsw.gov.au/climatechange/emissionsoverview.htm Accessed 10 January 2012.
[3] As per footnote #1.
[4] Clean Energy Council, *Clean Energy Australia*, December 2011. http://www.cleanenergycouncil.org.au/dms/cec/reports/2011/Clean-Energy-Australia-Report-2011/Clean%20Energy%20Australia%20Report%202011.pdf

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being sourced from renewables is lower than this already poor national average, with only 6.8% of electricity being generated from renewable sources in 2009-10[5] and hydro power – contributed to largely by the decades-old Snowy Hydro scheme – comprising the vast majority of the renewable electricity generated.

By comparison, renewable energy met 16.8% of power in Germany in 2010, 15.4% in Spain, 21% in Portugal and 22% in Denmark[6], countries whose renewable energy resources pale in comparison to our own.

The barriers to renewable energy deployment in NSW are political. For example, the most substantial drivers of renewable energy growth over the next decade are the 20% mandatory renewable energy target and the deployment of funds raised from the carbon price. Not only is this degree of growth in renewable energy unacceptably low but as the renewable energy target is a market mechanism, accounted for by the issuing and trading of permits rather than actual electricity generated, the policy provides no guarantee of even achieving 20% of Australia's power in the year 2020.

Further, measures such as the recently enacted restrictions on wind farms within 2km of dwellings are arbitrary, contrary to the principles of reducing carbon pollution and the opposite of action that is appropriate to develop renewable energy. They will only serve detract from this state's ability to enjoy the economic, social and environmental benefits of a strong renewable energy industry. NSW is fortunate to host the Snowy Hydro scheme, which is by far Australia's largest renewable energy project and a major employer[7]. However, the capacity for growth in large hydro is extremely limited, not least due to the increasing long-term scarcity of our water resources.

Other power sources such as solar photovoltaics and wind have experienced modest growth in recent years. These technologies have the potential to make a major contribution to NSW's future energy mix but have had their policy support cut off, by either the axing of the solar feed-in tariff or the above-mentioned restrictions on the placement of wind farms.

Renewable energy will be vital to ensuring energy security and breaking the cycle of power price hikes

Electricity prices in NSW increased 43% between 2007 and 2010 and are expected to rise by the same proportion between 2010 and 2013[8]. This is attributed primarily to the maintenance and expansion of the existing power grid, in which billions of dollars of investment is required. Meanwhile, measures to support renewable energy development currently make up one of the smallest parts of a power bill and this is expected to remain the case over at least the coming decade. By 2020, only 4-7% of household electricity bill increases will be due to renewable energy[9].

[5] Australian Government Bureau of Resources and Energy Economics, Australian Energy Statistics - Energy Update 2011, June 2011. Supporting data can be found at http://bree.gov.au/data/energy/AES-2011.html, accessed 27 January 2012
[6] Renewable Energy Policy Network for the 21st Century (REN21), *Renewables 2011 Global Status Report*. http://www.ren21.net/Portals/97/documents/GSR/REN21_GSR2011.pdf
[7] As per footnote #4
[8] NSW Industry and Development, NSW Electricity Network and Prices Inquiry Final Report, December 2010. http://www.dpc.nsw.gov.au/__data/assets/pdf_file/0005/118904/NSW_Electricity_Network_and_Prices_Inquiry_Report.pdf
[9] Clean Energy Council, *Clean Energy Australia*, December 2011. http://www.cleanenergycouncil.org.au/dms/cec/reports/2011/Clean-Energy-Australia-Report-2011/Clean%20Energy%20Australia%20Report%202011.pdf citing J Riesz and J Gilmore, ROAM Consulting, The True Costs and Benefits of the Enhanced RET, 2011, page iii.

A power sector based on fossil fuels and centralised generation is taking us further away from the goals of reducing carbon emissions, achieving energy security and providing affordable power. Alternative to this model is a decentralised structure, whereby a greater number of more diverse and distributed power generation sites feed into the grid at different points, often closer to the end power user.

Greenpeace recommends that NSW switches to a decentralised, renewable energy based, energy efficient model that helps achieve the goals of secure, affordable power in a number of ways as outlined below.

Providing energy security. An energy system that relies on one type of power plant (i.e. coal-fired) to meet 86% of its power (i.e. as NSW does[10]) is insecure in several ways. First, it is economically insecure due to the broader impacts of minor fluctuations in fuel price. Second, it is structurally insecure because of the rigid, centralised network that supports a small number of large-scale power stations. Disruptions to an upstream (or close to power generation site) part of the grid or a single generation facility, such as a fault on a transmission line or substation, will be more impactful if it represents a greater share of electricity generated or transmitted.

Alternatively an electricity supply and demand system that is efficient, decentralised and powered by numerous renewable energy sources enjoys greater security. Concern about disruption to fuel supply is minimal and any fluctuations in supply are predictable, and smaller and more dispersed power stations feeding the grid from different points means that any one interruption in supply is unlikely to affect overall power supply.

Avoiding transmission network maintenance and expansion. The centralised model of sending large amounts of electricity from coal power generation sites (e.g. the Hunter Valley and Newcastle area) to major demand centres such as Sydney requires transmission infrastructure that can cope with times of peak demand. For most of the year, much of this infrastructure is superfluous (Victoria's network, which operates on a similar model of sending large amounts of power from the Latrobe Valley to Melbourne and surrounding areas, uses 25% of its transmission network to supply only 10 days of annual demand[11]) yet it is the expansion of this network that is set to be the primary driver of electricity cost increases. In NSW, $14.6bn in spending on the network over five years is expected to increase the residential electricity price by up to 37.2%[12].

Building smaller, more dispersed power generation sites using renewable energy, and doing so closer to the point of consumption will ease the burden on major transmission routes, avoiding costs of expansion and maintenance and in turn, minimize future electricity price increases. Of particular note are solar photovoltaic systems, the output of which matches the daytime power demand curve, in particular on peak days in summer, and generates power where it is needed, taking pressure of the remainder of the network.

[10] As per footnote #5
[11] Australian Department of Resources, energy and Tourism, Draft Energy White Paper, p172, http://www.ret.gov.au/energy/Documents/ewp/draft-ewp-2011/Draft-EWP.pdf (accessed 24 January)
[12] Australian Industry Group, *Energy Shock: Confronting Higher Prices*, February 2011.Available from http://www.aigroup.com.au/policy/reports Based on the Australian Energy Regulator, *Electricity distribution revenue regulation* (6 December 2010) http://www.aer.gov.au/content/index.phtml/itemId/718205

Breaking the cycle of power price rises. Fossil fuels of all types are increasing in cost whereas for renewable energy power stations, in most cases there is no fuel requirement and so the cost is zero. Fossil fuel-fired power stations, as established technologies, are unlikely to experience significant reductions in cost. However with the exception of hydro-power, renewable energy technologies are still enjoying steep learning rates - meaning costs are dropping fast.

Some renewable energy sources, including hydro and wind power, are already cost competitive or better than fossil fuel-based electricity in Australia. Solar photovoltaics are also approaching grid parity with fossil fuels. While others are yet to reach this mark, one vital trend is clear: the only power sources that are declining in cost use renewable energy.

Renewable energy power plants of all types help reduce the price of wholesale electricity through the merit order effect by providing electricity at the lowest short-run marginal cost. This has been observed in numerous regions where there has been significant development of wind energy[13], including in South Australia, where wind now supplies 20% of energy demand[14].

In short, renewable energy is already reducing the cost of producing power market-wide, and is a reliable and sustainable way of avoiding continual power price hikes long term.

Reduction of greenhouse gas emissions. Climate change is an urgent issue that needs to be taken seriously. This does not mean replacing one highly polluting fuel source with another, nor does it mean switching from coal to gas, which also generates carbon pollution. The extraction of gas is also becoming highly contentious, especially in the eastern states where coal-seam gas extraction is competing with clean water resources and healthy farmland.

Dealing with climate change means that wherever possible and as soon as possible, replacing carbon-polluting power stations such as coal and gas with renewable energy. Greenpeace's Energy [R]evolution report shows that it is possible, due to the carbon pollution reduced in the energy sector, to halve Australia's total carbon footprint over the next decade. It is a goal that all jurisdictions in Australia should be striving to achieve.

[redacted]

[redacted] Pyory / European Wind Energy Agency, Wind Energy and Electricity Prices: Exploring the Merit Order Effect, April 2010, documents this effect in Denmark, Belgium and Germany.
http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/MeritOrder.pdf

[14] Australian Energy Market Operator, South Australian Annual Supply and Demand Outlook, 2011. Draft version available at http://www.aemo.com.au/planning/0400-0031.pdf