



# House of Representatives Standing Committee on Industry and Resource Enquiry

## Development of the Non-fossil Fuel Energy Industry in Australia

Babcock & Brown Wind Partners Submission  
July 2007



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## Executive Summary

- Babcock & Brown Wind Partners is among the world's top 5 global wind energy producers with 34 wind farms in Australia, the USA, and Europe. As an Australian based owner and operator of a global wind energy business with installed capacity of approximately 1,450MW, BBW is uniquely placed to comment on the future "economically viable" development of Australia's non-fossil fuel energy industry. In establishing and managing its portfolio of wind farms BBW has direct exposure to numerous regulatory regimes and countries supportive of renewable energy.
- The future development of the Australian non-fossil fuel energy industry is dependent on the ability to generate efficient sources of renewable energy of sufficient scale and cost competitiveness. BBW believes that wind energy can make a meaningful contribution to the generation of electricity in Australia as wind provides relatively cheap, reliable, emission and waste free form of electricity.
- The benefits of wind energy have been recognised on a global basis, with wind energy now a mainstream generation technology. Many European countries, the UK, the USA, Canada, Korea, India and China have implemented progressive renewable energy targets and strong incentive mechanisms that recognise their respective drivers to secure a sustainable energy future. Statistics released by the Global Wind Energy Council (GWEA) illustrate that wind energy has grown from 4,800MW in 1995 to just over 74,200 MW at the end of 2006, an increase of 25% from 2005 to 2006 alone.
- Wind energy is playing a significant role in achieving a reduction in emissions through the generation of clean, zero emission energy and is widely accepted as the most competitive large scale renewable energy technology for reducing dependence on non-renewable fuel sources. These credentials are demonstrated by investment in the wind energy industry growing at an average rate of 28% over the last 10 years and generating €18bn worth of new generation in 2006<sup>1</sup>.
- The natural variability of wind should not impose a limit for the use of wind energy in Australia. Offshore experience has demonstrated that wind energy penetration of up to 20% of capacity (or 20% of average load in the case of Denmark) can be achieved without threatening grid security or reliability. Given the dynamic nature of the supply and demand balance of Australia's energy network, electricity storage is no more an issue for wind energy than it is for any other technology.
- BBW believes emissions' trading is only one element of an effective emissions policy and that other market mechanisms should also be implemented, particularly in the context of a late start, slow ramp up scheme as recommended by the recent "Report Of The Task Group On Emissions Trading". A number of countries have recognised the environmental cost of electricity generated by fossil fuels and in response have introduced a number of policy mechanisms including tax credits, renewable energy and / or low emission targets, and feed in tariffs.
- BBW recognises that traditional fossil fuels will continue to be a major source of energy in Australia for the foreseeable future and supports initiatives including emissions targets and the development of clean coal technologies. However, technologies such as clean coal are at best, 10-20 years away, with the cost of clean coal technology likely to substantially exceed the cost of wind energy. Wind energy can make an immediate impact in contributing to the generation of zero emission energy and is best encouraged through a renewable energy target such as the Mandatory Renewable Energy Target (MRET).

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<sup>1</sup> Global Wind Energy Council, "Global Wind 2006 Report", May 2007

## **Overview of BBW**

Babcock & Brown Wind Partners is a specialist global business focused on the wind energy sector and is among the world's top 5 wind farm owners & operators on an installed capacity basis. BBW commenced operations in Australia in June 2003 and has since grown to include interests in 34 wind farms on 3 continents and 5 countries (Australia, France, Germany, Spain and the United States) that have a total installed capacity of approximately 1,450MW. BBW's business is exposed to a wide range of regulatory regimes and policy mechanisms which include tax credits, renewable energy targets and feed in tariffs.

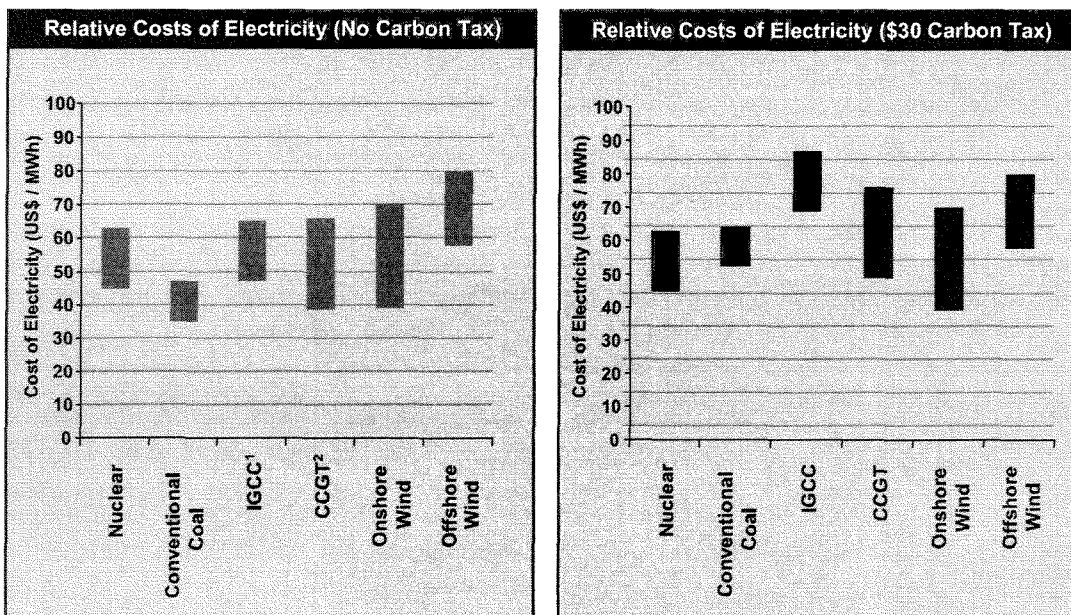
BBW is currently constructing the second stage of the Lake Bonney Wind Farm in South Australia. On completion this wind farm will have a totalled installed capacity of 159MW. Together, the Lake Bonney Stage 1 & 2 wind farms will represent the largest wind farm in the southern hemisphere with a total installed capacity of 239MW. BBW also owns and operates the 90MW Alinta wind farm near Geraldton in Western Australia. These wind farms also offer local employment opportunities and attractive rental income streams supporting rural communities.

BBW's operating wind farms have a forecast long term mean energy production of over 3,000 GWh per annum and save approximately 3.6 million tonnes of greenhouse gas (CO<sub>2</sub>) emissions each year.

## Industry Overview: The Rationale for Wind Energy

The global wind energy industry grew by 25% in terms of cumulative installed capacity over the 12 months to March 2006. Several factors have been identified as driving the global growth in wind energy, and today the momentum behind these factors continues to strengthen as follows:-

- Wind generation costs have fallen by 50% over the last 15 years, moving towards the cost of conventional energy sources in many markets. Furthermore, wind continues to become more price competitive as traditional fossil fuel resources are depleted and prices escalate. The cost of wind energy production is currently cheaper than the cost of producing electricity from a new gas power station in most countries where BBW has wind farms. It is also competitive with coal fired generation plant in some countries and is competitive with coal in all countries if the cost of carbon dioxide emissions is taken into account. The following table produced by Emerging Market Energy highlights the relative cost of wind energy.



- Fossil fuels are increasingly concentrated in geopolitical sensitive regions; therefore the security of supply in many countries is becoming an important driver for the deployment of domestic energy resources such as wind energy.
- There are deepening concerns about global warming and climate change at a time when wind energy has become the most competitive large scale energy technology for reducing dependence on non-renewable fuel sources.
- The global demand for electricity is forecast to double between 2002 and 2030, and according to the International Energy Agency one third of the current installed generation capacity will need to be replaced during this period.

The Australian Conservation foundation has estimated that increasing the energy efficiency and increasing the renewable energy to 25% of Australia electricity generation would only cost the average house \$1.25 per week.<sup>2</sup>

### **Wind Energy: An International Perspective**

Wind power is now established as an energy source in over 50 countries worldwide. In 2006, 15,197MW of new installed generation capacity was installed worldwide and 10 countries added over 500MW each.<sup>3</sup> As at the end of 2006, the top 5 global wind energy markets accounted for almost three quarters of the world's total installed capacity. Germany continues to be the largest wind market in the world, accounting for 27.8% of global installed capacity. The next largest markets were Spain, the US, India and Denmark which collectively account for 43.8% of global installed capacity.<sup>4</sup>

In Europe, strong government support has aided the development of a significant wind energy market. As a result, wind energy is already a mainstream contributor to the generation mix of many European countries. Europe currently accounts for two thirds of the global wind energy generation capacity. Wind energy has reached 15-20% of total generation capacity in countries including Germany and Spain, and 20% of average load in Denmark.

Significantly the US is the world's fastest growing wind energy market, accounting for 2,454MW or 16.1% of new global installation in 2006. The growth in this market has been driven by the extension of the Production Tax Credit (PTC) system, which is the primary Federal Government incentive for wind energy development to 2008. In addition, there are State based incentives and targets providing further impetus for growth of the US wind energy market. There are currently 26 states and one district in the US with mandated renewable energy usage targets, which include specific renewable portfolio standards policies. Recently, the US states of Minnesota, Virginia and Oregon have all introduced renewable energy usage targets. Minnesota for example, has introduced a target of 25% by 2025.

The strong growth in wind energy is predicted to continue. Emerging Energy Research estimates average growth rates for cumulative installations through to 2010 and 2015 of 34.2% and 15.2% per annum respectively. Wind energy is expected to account for approximately 3% of global electricity generation by 2015 as forecast by Emerging Energy Research. In addition, GWEC expects international wind markets to grow by an average of 19% per year up to 2010.

The Global Wind Energy Council reports that the value of new operating plant installed by the global wind energy industry was €18.0 billion in 2006.

Wind energy is now well recognised and established around the globe as a mainstream generation technology.

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<sup>2</sup> A Bright future – 25% Renewable Energy by 2020 April 2007, ACF and others.

<sup>3</sup> Global Wind Energy Council, "Global Wind 2006 Report", May 2007.

<sup>4</sup> Global Wind Energy Council, "Global Wind 2006 Report", May 2007.

## **Wind Energy: Global Policy Mechanisms**

BBW's wind farms all operate under a variety of regulatory frameworks all focussed on promoting renewable energy generation. Policy mechanisms vary depending on the priority of each specific country and are far too extensive and detailed to schedule in this submission, however a common theme is their response to key policy objectives of:-

- Energy independence
- Reduction of emissions (from stationary energy)
- Need for sustainable energy sources to meet ongoing demand

In Australia, MRET successfully encouraged the development of the Australian wind energy industry allowing BBW to develop 3 very successful (and non-controversial) wind farms, but MRET is now fully subscribed and only the state based renewable target schemes provide hope for further development of the industry in this country.

BBW is of the view that a federal renewables target is the missing piece of current government policy, particularly during the period from now to 2014 when the currently proposed emissions trading scheme will not provide sufficient incentive for renewable energy development to be restarted in this country. A single Federal scheme has significant administrative advantages over the mix of state based schemes likely to be implemented to fill the vacuum created by the lack of an effective federal renewable energy policy.

*A national market is more efficient/ less costly than state markets due to:*

- Projects can be optimally located at the best wind/transmission location without regard to state boundaries;
- A deeper national market will provide for more liquid spot and forward markets and be more transparent for developers, providing clearer signals on the opportunities for new renewable capacity;
- At present developers are beholden to large state based retailers for the sale of green certificates. A national market does much to increase the pool of available customers thereby reducing project risk;

The following table highlights the global policy mechanisms for countries where BBW owns and operates wind farms.

REGULATORY MECHANISM	EXAMPLES	KEY CHARACTERISTICS	COUNTRIES	LEGISLATION	CHARACTERISTICS
Direct Tariff	Renewable energy feed in tariffs	<p>Provides certainty to revenue stream and potential return on investment, thus encouraging investment.</p> <p>Does not guarantee investment and growth levels, however is largely responsible for creating the 2 largest wind energy markets in the world being Germany &amp; Spain.</p>	Germany	Renewable Energy Sources Act (EEG) 2004.	<ul style="list-style-type: none"> <li>• Fixed rate for 20 years.</li> <li>• For the first five years this rate is Euro 87 per MWh reduced by 2% for each year after 2004.</li> <li>• The rate from years 5 to 20 will be a minimum of Euro 55 per MWh.</li> </ul>
			Spain	Spain Electricity Act 1997 & Associated Royal Decrees.	<ul style="list-style-type: none"> <li>• In principle Fixed or Market Option tariff.</li> <li>Market Option consists of: <ul style="list-style-type: none"> <li>(+) Marginal Pool Price</li> <li>(+) Premium</li> <li>(-) Imbalance costs</li> </ul> </li> </ul>
			France	Electricity Law 2000 & subsequent Decrees.	<ul style="list-style-type: none"> <li>• Fixed rate for 15 years.</li> <li>• For the first 10 years this rate is Euro 82/MWh.</li> <li>• The rate from years 5 to 15 ranges from Euro 28/MWh to 82/MWh depending on site productivity.</li> </ul>
Tax Credits	Tax Incentives	<p>Minimises direct market impact, perceived as market friendly and no cost to business/ consumers.</p> <p>Policy can target specific technologies.</p>	USA	USA Energy Policy Act of 2005, Production Tax Credit incentives	<ul style="list-style-type: none"> <li>• 19 US cents per Kwh.</li> <li>• Provides tax credits for 10 years.</li> </ul>
Quota Systems	<p>Renewable Energy Targets</p> <p>Green Certificate Market</p>	<p>Ensures investment and growth levels.</p> <p>Perceived as more market friendly as it encourages the market to deliver the most effective renewable energy.</p> <p>Mandates business and requires monitoring and tracking initiatives.</p>	Australia	Renewable Energy (Electricity) Act 2000 and Mandatory Renewable Energy Target	<ul style="list-style-type: none"> <li>• Penalty for non-compliance is A\$40/mwh.</li> <li>• Quota already filled.</li> </ul>



## **Natural Variability of Wind Energy**

It is often asserted that renewable energy including wind will always be fringe technologies. This is no longer true: 30% of all power generation capacity installed in Europe in the five years to 2006 was in the form of wind energy generation; providing further evidence of wind being successfully integrated into the generation mix in many European countries. In any event BBW believes that the choice of generation technologies need not be a case of either/or and that going forward wind can play an increasing role in contributing to the overall generation mix in Australia. Wind energy already contributes significantly to the overall energy generation mix in many industrialised countries.

Significant variability currently exists in the supply and demand of the electricity system in Australia. The demand for electricity varies on an hourly and daily basis. The variations in demand are managed by scheduling a mix of electricity into the grid including base load, intermediate load and peak-load power stations. As a result of this variability, the reliability of the whole generating system can never be predicted with complete certainty.

Accordingly, given the dynamic nature of the supply and demand balance of Australia's energy network, electricity storage is no more an issue for wind energy than it is for any other technology. Traditional fossil fuel generation has necessitated the integration of base, shoulder and peaking plants to efficiently manage variability in demand. This has achieved a more economic use of fossil fuels where ramping down is not always quick or easy. Further, traditional centralised generation units are 100's of MW's and require an extensive radial distribution network subject to significant losses. The incorporation of distributed generation units will assist in reducing these losses.

The cost of wind variability is already taken account in the transactions for wind energy that occur in Australia and similar markets (eg USA). Customers are large sophisticated energy retailers and utilities with technical, trading and broad commercial expertise. The technical/commercial characteristics of wind are appraised taking account of limitations on load following capability but also of advantageous attributes such as:

- Peak enhancing diurnal production patterns;
- Reduced line losses from being "closer" to the customer; and
- Modular nature of wind reducing calamitous force majeure type risks from exposure to single massive energy production centres.

BBW acknowledges that the introduction of wind energy into the grid introduces another source of variability. However wind energy can be added to the grid in manageable quantities such that its variability is absorbed among other fluctuations in demand and supply. This has been clearly demonstrated in countries including Germany, Spain and Denmark.

The latest statistics indicate that wind energy capacity for Australia is currently 817MW and that wind farms currently produce around 0.5% of Australia's electricity<sup>5</sup>. Auswind has estimated that there are no technical barriers to installing up to 8,000MW of wind energy in Australia.<sup>6</sup> In addition, a geographic spread of wind turbines contributes to the stability of supply and reduces line losses as a distributed generation source.

Since 2003, Denmark has generated approximately 20% of its electricity from wind energy. Whilst the Danish electricity system is linked to a larger European system, the European Wind Energy Association (EWEA) has reported that the Danish experience indicates that regional and local level penetration levels of up to 25% of load are manageable. For example, in west-Denmark around 25% of electricity is derived from wind and the system has not confronted any major problems (EWEA 2005).

Numerous studies, as well as the experience of several European countries, have demonstrated that wind can be reliability accommodated within the electricity grid without the need for significant back up until at least 20% market penetration is achieved. The issue of backup generation is irrelevant in Australia given that wind only generates 0.5% of electricity.

The UK Sustainable Development Commission examined the capacity value of wind energy relative to penetration levels. The Commission noted that at low penetration levels, of say 6% of generation, wind energy has the capacity value of 35%, and that the capacity value of wind energy only decreases to 20% at penetration levels of 20%.<sup>7</sup> These figures were accepted by the House of Lords Science and Technology Select Committee in 2004.

Based on overseas experience and given the current low level of penetration, the introduction of wind energy into the generation mix for Australia in far greater quantities can be accommodated.

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<sup>5</sup> Global Wind Energy Council, "Global Wind 2006 Report", May 2006.

<sup>6</sup> Auswind, "Driving investment in Australia's wind energy industry".

<sup>7</sup> Sustainable Development Commission, "Wind Power in the UK", May 2005.

## Key Policy Observations and Recommendations

- BBW is of the view that a renewables target is the missing piece of current government policy and that a single Federal scheme would be better than the state by state scheme that is currently being established. A single Federal scheme would provide industry participants with significant administrative advantages over the mix of state based schemes.
  - A single Federal scheme will result in wind farms being located optimally in Australia, resulting in a lower cost to the entire country
  - A national scheme will result in more liquid and transparent spot and forward markets
  - A national market will be more encouraging to developers who will not be beholden to a limited pool of state dominant retailers, acting again to reduce overall costs to the community
- Given that the stationary energy sector is the single largest contributor to greenhouse gas emissions the absence of a federal mandated renewable energy target is considered to be a major deficiency of government policy in the context of global initiatives which see the great majority of developed nations having significant mandated renewable energy targets in place.
- The late start date and slow ramp up of the government's proposed emissions trading scheme has the consequence that renewable energy will receive no federal government mandated market support for a period of at least 6-8 years from now.
- The natural variability of wind does not impose a limit of the use of wind energy in Australia and storage is no more an issue for wind energy than it is for any other generation technology.
- BBW is of the view that the choice of generation technologies need not be a case of either / or, and that wind energy can play an increasing role in the generation mix. Wind energy already contributes significantly to the generation mix in many European countries with penetration levels of 15% to 20% of capacity being very manageable.
- The development of Australia's non-fossil fuel energy Industry is a means of reducing Australia's risk from an extreme reliance on fossil fuels for both internal energy requirements and export income, to a less dangerous/more balanced position should the graver global warming scenarios be realised.

Committee Secretary  
Standing Committee of Industry and Resources  
House of Representatives  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600  
AUSTRALIA

Dear Sir / Madam,

Babcock & Brown Wind Partners (BBW) is pleased to provide a submission to the House of Representatives Standing Committee Inquiry into the development of the non-fossil fuel energy industry in Australia.

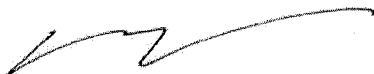
BBW believes that the promotion and development of renewable energy generation in Australia is capable of delivering substantial social, environmental as well as economic benefits to Australia. This is an opportunity that should not be missed.

BBW is of the firm belief that it should not be a case of either / or when evaluating the benefits of energy generated from traditional fuels with those from alternative renewable fuels. Securing Australia's sustainable energy future will best be served by a diversified portfolio of energy generation technologies that provide complimentary benefits.

BBW is committed to engaging with Government and other stakeholders about the most efficient way to promote the development of renewable energy generation in Australia and in particular the wind energy sector. We would be pleased to provide further detail with respect to any aspect of our submission.

Please find enclosed BBW's submission. Should you require further information, please contact Rosalie Duff, Investor Relations Manager on (02) 9261 1362 or by email at [rosalie.duff@babcockbrown.com](mailto:rosalie.duff@babcockbrown.com).

Yours sincerely,



Miles George  
Chief Executive Officer.  
Babcock & Brown Wind Partners