

COMPLAINT TO THE AUSTRALIAN COMPETITION AND CONSUMER COMMISSION ABOUT CLAIMS MADE IN SUPPORT OF THE WIND INDUSTRY

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Attachment A – Articles 1 to 52

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To The Australian Competition and Consumer Commission

COMPLAINT AGAINST CLAIMS MADE IN SUPPORT OF THE WIND INDUSTRY

1.0 Introduction

The wind industry occupies a privileged position in that it is assisted by governments and does not compete on the open market with other power producers to sell its product.

This submission seeks an investigation into the claims made by the wind industry and state governments about the benefits of wind farms. Specifically the power they claim wind farms produce, the number of households they will provide electricity for and the amount of greenhouse gas (CO₂) that will be saved. An investigation should determine whether these claims are misleading decision making bodies, local government, investors, consumers and the general public and whether the wind power companies and/or retailers and/or associated individuals are making financial gain from misleading information.

The aim of an ACCC investigation should be to ensure taxpayers, investors and consumers are protected from losses arising from misleading claims.

1.1 Peter McGauran MP Minister for Agriculture, Fisheries and Forestry

In June last year Peter McGauran MP Minister for Agriculture and Fisheries was quoted in the 'Warrnambool Standard' as saying the wind farms were a **"complete fraud"** and that they **"only exist on taxpayer subsidies"**. Mr McGauran also went on to say:

"They devalue the land and to see hardworking individuals have their properties devalued so considerably is immoral."

"They generate next to no electricity, for heaven's sake, when the wind is not blowing," he said. "It can't be stored and their contribution to the electricity grid is so small that it is hard to even measure."

"The wind farms will diminish greenhouse gas emissions by so small an amount I doubt you could calculate it."

"They are simply an excuse for some entrepreneurs to make money at the expense of taxpayers and adjoining landholders."

Other media gave coverage of these statements which were expressed outside parliament and restated on a number of occasions. Attached articles 1, 2, 3, 4 and 5 are some of the coverage.

The statement by a Federal Government Minister that wind farms were a "complete fraud" has a legal context which alone is justification for an investigation by the ACCC into the wind industry.

1.2 The Reasoning for a Wind Industry

The wind industry argues that 'global warming' is of such concern that their industry, because it is to combat 'global warming', needs to be facilitated without delay. Governments generally agree with this view and install mandated schemes and draft 'guidelines' to facilitate its development.

The intention is that wind farms, electrical power generation plants, will reduce 'global warming' because they replace the supply of electricity generated by coal fired, CO₂ producing power plants. Clusters of wind turbines are to be placed in windy locations, generally in rural areas and away from cities, to generate electricity which is transmitted to the grid and distributed for use by industry and households.

The wind does not blow all of the time and its speed varies and to account for this state governments and the industry claim that, over time, an average output of 30-35% of installed, maximum, capacity will be achieved. It is also claimed that a kilowatt of wind generated electricity will displace a kilowatt of coal generated electricity. The reduction of CO₂ is stated as being between 1.0 and 1.4 tonnes of CO₂ saved per Mwh per annum (or kt CO₂ per Gwh per annum). These claims are the basis of calculations as to how many households can be supplied and how much CO₂ can be saved.

1.3 The Need for an Investigation

During the approval process for wind farms objectors have challenged the wind industry and government claims regarding the number of households that could be supplied and the reduction in CO₂ production. Although these concerns have been raised at various hearings the state governments and the industry still give the same figures in support of wind farms. The details in Section 2.1 and attached articles 19 and 45 provide examples.

A number of wind farms have been approved, constructed and operated in Australia for well in excess of one year so it is now possible to assess the validity of the wind industry claims, that is do they:

- produce as much electricity as claimed by proponents preceding and post approval?
- supply the number of households they claim? and
- reduce greenhouse gases as much as claimed?

Wind farm development is being fostered using financial assistance from various quarters.

Taxpayers support government facilitating mechanisms and power consumers ultimately bear the higher cost of power production so the answers to these questions should be available.

Investors fund expansion of the industry. If the industry, with its knowledge of power output figures, is making claims above what could be reasonable expected, investors need to know.

Power industry companies purchase renewable power under mandated schemes so they have a right to know if this additional expense is justified.

Consumers are marketed 'green energy' products at a premium so they should be informed whether or not the product matches expectations.

Property owners surrounding wind farms suffer a reduced standard of living, working conditions and a reduction in property values so they are entitled to know if the claims of benefit are justified.

Natural environment impacts include turbines killing birds and bats so the public needs to know if the wind farm environmental benefits are as claimed.

State and Federal Governments are being asked to support the wind industry and this coupled with the investment from financial institutions make it a multi billion dollar industry. Misdirected and misplaced policies and investment may mean that legitimate stakeholders, as outlined above, will suffer which will ultimately have a negative effect on the Australian economy.

1.4 Information Provided in This Submission

The following sections of this submission examine some of the claims made by the industry and governments.

Attachment A contains 52 reference articles. These are all relevant however where particularly relevant they are noted in the body of the text. The articles come from a variety of sources and provide both technical and general information and in some instances give links to other sources. ACCC will no doubt be able to make its own enquiries.

2.0 Wind Farm Performance Claims

The following examples are those where information was readily available.

2.1 The Wonthaggi Wind Farm Vic (operational for over 12 months)

The Wonthaggi wind farm has six turbines with an installed capacity of 12 Megawatts and has been operational for more than twelve months,

In the proponent's EES it was claimed *"The proposed wind farm comprises six 1.75 MW turbines..... It will have a power generation capacity sufficient to supply 6,040 local households, and will reduce the greenhouse gas emissions by 41,000 tonnes per year."*

The capability of this wind farm is further described on page 76 of the State Government's panel report which recommended approval of the project. *"The panel agrees that the Wonthaggi wind farm proposal is a small development. However, it was advised by Mr Gobbo that it is not so small as to be uneconomical. Furthermore, the wind farm will generate sufficient electricity to power around 6,000 households. The panel agrees with Mr Gobbo, that this is not an insignificant contribution. The power generated would be sufficient to power a town the size of Wonthaggi, and more."*

The 1.75 Megawatt turbines nominated in the EES were replaced by 2.0 Megawatt wind turbines. The claim by Mr Gobbo, legal counsel for the proponent appears, by calculation, to be based on the wind farm delivering 30% of installed capacity.

The following pamphlet, Figure 1, was distributed at the Wonthaggi wind farm site soon after it commenced operation.

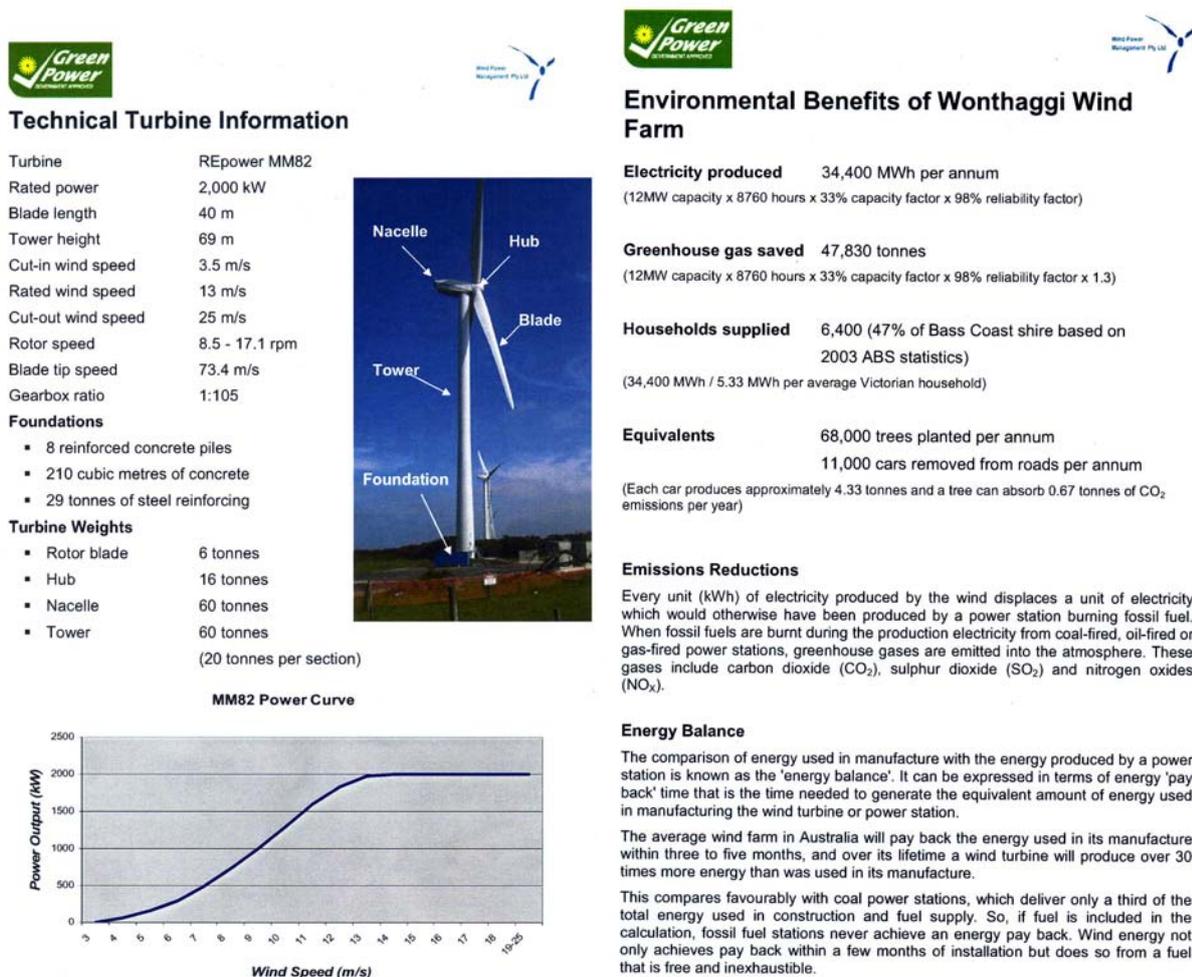


Figure 1 Pamphlet distributed from Wonthaggi wind farm site.

The relevant claims in this pamphlet are that the wind farm comprises six 2.0 MW turbines that have a capacity factor of 33% and a 98% reliability factor. The electricity claimed to be produced is 34,400 Mwh per annum.

The greenhouse gas saved is claimed to be 47,830 tonnes and by their calculation that is based on 1.39 tonnes of CO₂ per Mwh per annum (although 1.3 is stated).

The Wonthaggi wind Farm claims are examined in Section 4.1

2.2 The Bald Hills Wind Farm Vic (approved but not constructed)

The proposed Bald Hills wind farm comprises 52 turbines which have an installed capacity of 104 Megawatts. The proponent claimed in the EES that *"The wind farm will generate sufficient electricity to supply 65,000 households, and reduce greenhouse gas production by 450,000 tonnes per year, through replacing an equivalent amount of fossil-fuel generated electricity."*

During consideration of the Bald Hills wind farm by the Victorian State Government's planning panel, submissions by the government's Sustainability Energy Authority Victoria (SEAV) made claims about the benefits of the proposed wind farm, that is the wind farm would:

- *"generate 320 GWh per annum – enough electricity for 60,000 homes*
- *greenhouse pollution abatement of 440,000 tonnes per annum – same as taking over 100,000 cars off the road each year"*

Following approval of the project in a state government media release dated 25 August 2004, *"Mr Bracks said the Bald Hills wind farm would save up to 435,000 tonnes of carbon dioxide a year - equivalent to taking 75,000 cars off the road."* and also that it *"would supply power for more than 60,000 Victorian homes."*

The Bald Hills wind farm could generate 911 Gwh per annum if it operated at 100% installed capacity all of the time. To achieve the claimed 320 Gwh per annum the wind power company has clearly assumed an output at 35% of installed capacity. The Bald Hills wind farm is likely to be in a similar wind regime to the Wonthaggi wind farm.

The SEAV claim for Bald Hills, similar to the proponent's, suggests 1.38 tonnes of CO₂ saved per Mwh per annum of estimated output.

2.3 Lexton Wind farm Vic (recently approved)

In January 2007, the Lexton wind farm, comprising 19 turbines each of 1.5 Megawatt capacity was approved (Article 19). It was reported that it would provide enough power to supply about 16,000 homes, and will displace about 113,000 tonnes of carbon dioxide or greenhouse gas a year, the equivalent of taking 26,000 cars off the road. Attached article 19.

This is one of the most recent approvals and calculations indicated that it would be operating at about 35% of installed capacity to achieve the stated performance.

The claims outlined for the three wind farms above are typical of those used by the wind industry and governments, for wind farms at various locations, during and after the approval process.

The claim for Lexton suggests 1.37 tonnes of CO₂ saved per Mwh per annum of estimated output.

Wonthaggi, Bald Hills and Lexton are projects of Wind Power Pty Ltd.

2.4 A Report That Gives Support to Some of the Claims

The claims by the wind industry and the Victorian Government are supported by the Victorian State Government's report **'Assessment of Greenhouse Gas Abatement from Wind Farms in Victoria by McLennan Magasanik Associates Pty Ltd, July 2006'**. This report describes the predictive modelling to determine the reduction in greenhouse gases that could be provided by wind farms.

The following are extracts from that report.

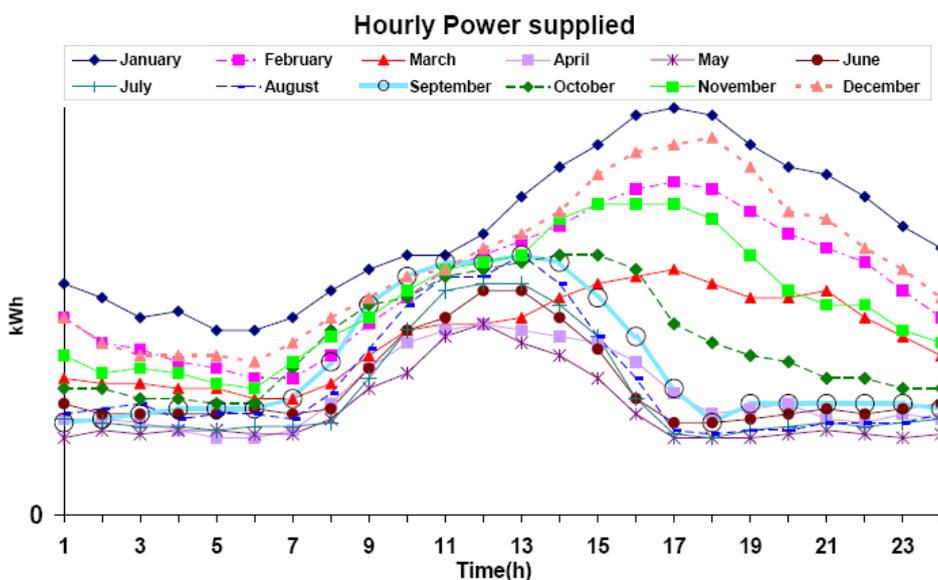
“1 INTRODUCTION

Wind generation is set to expand in Victoria, based on the incentives provided by the MRET Scheme. Encouraging the use of renewable energy is also a key element of the Victorian Government’s Greenhouse Challenge for Energy, with a specific policy to facilitate up to 1000 MW of wind generation in environmentally acceptable locations, and to increase the share of Victoria’s electricity consumption from renewable sources to 10% by 2010. In November 2005, the Victorian Government also announced a commitment to investigate options for a market-based scheme to run in parallel with the MRET scheme to drive investment in renewable energy in Victoria. The Victorian Government said the aim of the Victorian Scheme was to drive investment in renewable energy in Victoria, including in wind generation.”

“2.1.2 Modelling of wind generation

Wind farm generation in the market simulation model is modelled as a typical profile of energy availability. Typical daily generation profiles are used to represent the level of wind generation in each hour of a typical day in each month. Daily generation patterns were modelled using historical load profiles obtained from published data mainly from wind generation data for the Breamelea wind farm. The typical daily generation patterns for each month of the year are shown in Figure2-3. These typical wind generation patterns average wind generation levels for each hour of the day in each month. The profiles are adjusted to obtain an average annual capacity factor of 37% for existing wind capacity to 33% for 1000 MW of wind farms. The decline in capacity factor reflects the fact that less windy sites are likely to be used at higher levels of wind generation.”

Figure2-3: Assumed daily wind generation patterns



In the Strategist simulation model, reliability of wind generation was modelled using the ratio of maximum to minimum capacity. International and domestic data on firm capacity for existing wind generators was applied after adding 100MW and 1000MW. Minimum capacity was set at an estimate of the firm level of wind generation – assumed to be 15% in this exercise. That is, 15% of the total capacity of wind generation was assumed to be firmly available at all times and could be relied upon to provide capacity during peak periods. The intermittency of wind generation was modelled using an availability factor of 33% (that is, the model assumed that the probability of the capacity of wind generation being fully available in any one hour is 33%) for the 1000MW case, 35% for the 100MW case and 37% for the existing capacity case.”

“3.2 LIMITATIONS AND UNCERTAINTIES

The modelling represent a rigorous attempt at obtaining more accurate estimates of the emissions abated from higher levels of wind generation. The estimation method takes into account factors not typically incorporated in previous modelling. These factors include:

- *Realistic representation of the generating plant likely to be displaced by wind generation by taking into account the economic interactions between generating plant in the NEM.*
- *Taking into account the different fuels operated by each generating plant and the differing emission intensities of the fuels.*
- *Taking into account the fact that different operating levels of plant will result in different emission intensities. Thus, the fact that coal-fired plant may be operated at lower capacities as a result of wind generation has been explicitly modelled.*

• Taking into account the full fuel cycle in determining emission intensities by fuel. Nonetheless, there are a number of uncertainties in the method employed. First, a typical pattern of wind generation over the year was employed. The actual pattern of wind generation may differ, which could result in slight differences in the mix of plant displaced. The actual capacity factor may also differ from the levels assumed in the analysis, although it would require large changes in the capacity factor of wind farms to see material changes in emission intensities. Second, more aggressive bidding by brown coal generators will reduce the level of emission saved. Third, there is no account for the fact that a higher cost of electricity as a result of higher levels of renewable generation may result in a small reduction in electricity demand, thus reducing emissions even further.”

“4 CONCLUSIONS

An increase in wind capacity in the Victorian region will certainly reduce greenhouse gas emissions. In the period to 2015, the level of abatement averages between 0.88 kt CO₂e/GWh to 1.12 kt CO₂e/GWh. This results in an annual average abatement of about 0.3 Mtpa for 100 MW of wind generation and 2.6 Mtpa for 1000 MW of wind generation. The results should be treated with some caution. The level of displacement of brown coal in the period up to 2012 reflects in part changes in bidding strategies by brown coal generators in order to support prices with excess generation as a result of 1000 MW of wind. More aggressive bidding (towards marginal cost) would result in slightly less brown coal generation being displaced. Over both the short and long term, the result reflects constraints in the ability of power to be exported into other States through interregional transmission network. Adding more transmission capacity between Victoria and other regions could reduce the displacement of brown coal generation by wind generation (as more brown coal generation would simply be exported interstate).”

The level of greenhouse gas reduction quoted here is “...between 0.88 kt CO₂e/GWh to 1.12 kt CO₂e/GWh.” which is a much lower figure than the used by the industry. Even so there are a number of reasons why actual saving may fall below this range.

- data for the Breamlea single 60 kilowatt turbine was used whereas data for the larger multiple turbine wind farms at Toora, Wonthaggi, Challicum Hills and Codrington was not.
- the capacity factor of 37% of installed energy is higher than what is being achieved.
- the capacity factor of 33% is unlikely to be achieved.
- the firm level of 15% power generation may never occur.
- periods of zero power output were not considered.
- The steep rises and falls in wind power generation were not considered.

This modelling exercise was clearly theoretical and because it was based on a single small turbine and not the performance of a number operating wind farms it is not representative and is overly optimistic. It is not a sound, or correct, basis for estimating CO₂ savings.

2.5 Cullerin Wind Farm NSW (recently approved)

According to the NSW Government's Media Release the Cullerin wind farm comprises 15 turbines and it is claimed it will produce up to 95,000 Mwh of electricity for 30 years, enough to power 12,000 homes. It is also claimed to save 95,000 tonnes of greenhouse gas emissions each year. Attached article 45.

According to these figures the claim for Cullerin suggests 1.00 tonnes of CO₂ saved per Mwh per annum. The CO₂ savings may be different in NSW where black coal is used for power generation however this saving is likely to be higher than can be achieved.

As a result of the ruling of a tribunal in UK against claims made by the British Wind Energy Association (Article 21) the claimed amount of CO₂ savings was reduced from 0.86 tonnes of CO₂ per Mwh per annum to 0.43 tonnes of CO₂ per Mwh per annum. The coal used in UK may be different to that used in Australia with a difference CO₂ output when burnt, however the point is that the amount of CO₂ savings was overstated by the wind industry by a factor of two.

What is being stated in Australia is a CO₂ saving approximately three times the ruling in UK and the difference in coal is unlikely to make this much difference.

The CO₂ savings that result from wind power is considered in detail in article 39 by Dr John Etherington and article 48 by Eric Rosenbloom. Also article 17.

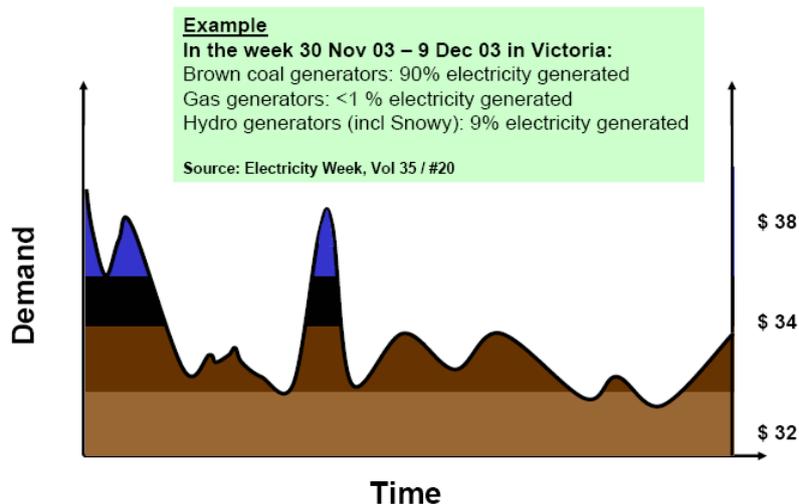
3.0 Integration of Wind Generated Power into the Grid

3.1 The Sustainable Energy Authority Victoria

The SEAV submitted to the panel hearing for the proposed Bald Hills wind farm an explanation of how wind generated power would be accommodated into the grid.

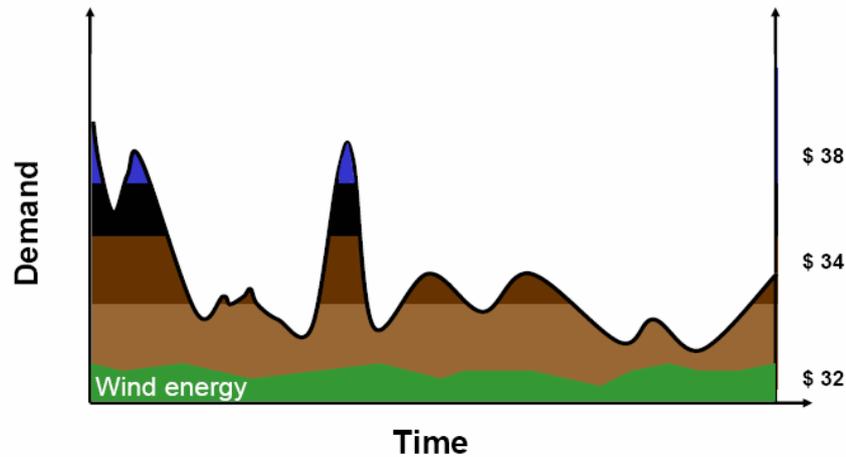
The following graph, page 32 of the SEAV presentation shows how electricity generated from different sources meets demand at a particular time.

Scheduling of generators



The following graph, page 33 of the SEAV presentation, shows how they envisage wind energy would contribute to electricity to the national energy market.

Wind in the NEM



This second graph, using the same demand curve, shows how electricity from wind would contribute toward meeting demand. The contribution to demand by wind power is shown as a fairly flat line with no significant peaks or periods where no electricity is produced. The two graphs can be compared to identify the power generators displaced by wind power. They are hydro, gas and coal generation.

Both SA and Victoria have suffered from electricity shortfalls at peak times in summer and wind farms have at that time provided small to negligible contributions to the grid. Article 10, 13, 17, 18 and 22

Using the optimistic forecasting of SEAV and wind farm proponents, wind generated power does not displace high CO2 emitting electricity producers on a kilowatt for kilowatt basis.

The suggestion that power from a larger number of widely distributed wind farms will even out to produce the fairly flat wind energy line shown above is not based on fact. SEAV admitted at the hearing that it was a freehand drawn line and was not supported by data.

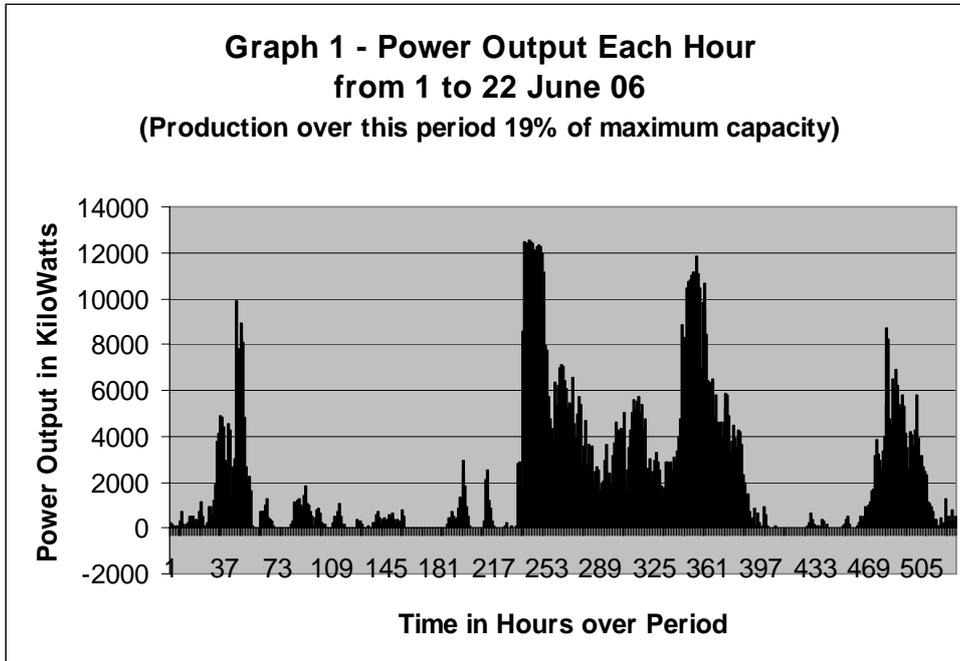
3.2 Origin Energy's Submission to the Victorian Government

Origin Energy provided a submission to the Victorian Government 'Driving Investment in Renewable Energy in Victoria, Options for a Victorian market-based measure, Submission by Origin Energy in response to the Issues Paper released by Department of Infrastructure and Department of Sustainability and Environment, December 2005, 1 February 2006.'

The submission, amongst other things, outlined the difficulties of integrating wind generated power into the grid.

4.1 The Wonthaggi Wind Farm

The following graph has been generated by scanning a hard copy spreadsheet into xl and graphing the power produced by all six turbines each hour over time. Graph 1 reveals what most people observe, that is, the turbines stand still for periods of time not generating any power, start and stop regularly in light winds, move in moderate winds and turn steadily in high winds.



The total output over this period amounts to only 19% of installed capacity, not the 33% stated by the company during the approval process and in promotional material. From Graph 1 it can be clearly seen that the application of a percentage of installed capacity to determine the capacity to supply households is an oversimplification. Furthermore, the SEAV and McLennan Magasanik assumptions are a long way above the actual power production performance of a wind farm.

If the full amount of the power generated by this wind farm is to be used, 19% of installed energy in this instance, supplementary power would be required to ensure a constant overall delivery of power to the grid to meet demand. The amount of additional power required to is contained in Table 1.

Table 1 – Wonthaggi Wind Farm Power Generation and Required Supporting Power Generation to Provide Constant Delivery (based on hourly generation from 1 June to 22 June 06)		
Duration of Portion of Wind Power Generated		Additional Power from Other Generators to Support Wind Farm
Amount of Power Produced	Portion of Time Produced	
Negative – 0%	16%	Greater than 100% for 16% of the time
0 – 5%	31%	95 - 100% for 31% of the time
5 - 10%	9%	90 – 95% for 9% of the time
10 – 30%	18%	70 – 90% for 18% of the time
30 – 50%	15%	50 - 70% for 15% of the time
50 – 75%	6%	25 – 50% for 6% of the time
75 – 100%	5%	0 – 25% for 5% of the time

A closer examination of the data reveals that the wind farm is only able to supply 6,400 households for only 24% of the time. It is also unable to supply more than 1,200 households for 50% of time.

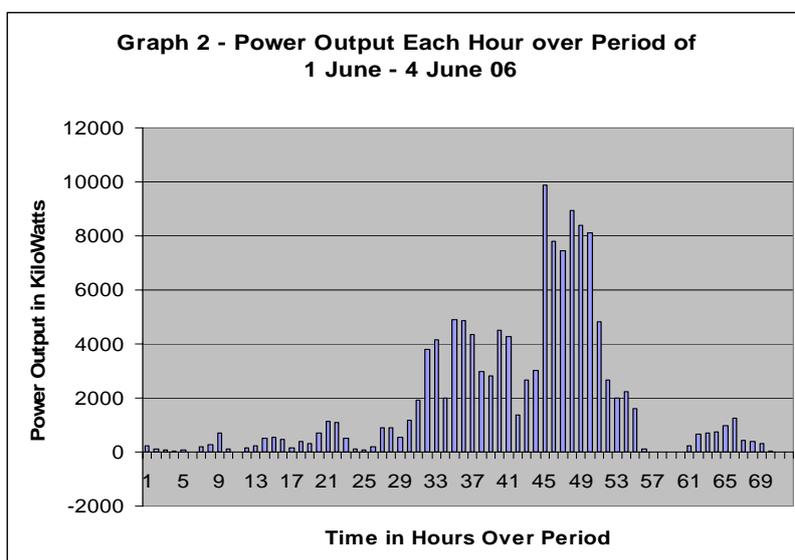
Clearly to maintain a constant supply of electric power to industry and households another form of power generation is required and this is not a small amount. It would amount to a total of 81% of the installed wind farm capacity if that supplementary power could be delivered to the grid with instantaneous adjustment. However, for 16% of the time the wind farm actually draws power from the grid as the operator attempts to start the turbines rotating in light winds so just over 100% of installed capacity is required as 'back up' generation to maintain constant delivery of power to households and industry.

Although the power output data for each turbine gives the amount and duration of power drawn from the grid, the meter records do not give negative values.

If the backup supply power to offset low output from the wind farm is limited to that required to maintain continuous power for 6,400 households, and the excess peak output is surplus to needs, then the wind farm would be providing power at just over 13% of installed capacity.

The various levels of power generation do not occur in the groups as shown in Table 1 but are distributed randomly as shown in Graphs 1 and 2.

The following graph also using data from the Wonthaggi wind farm provides a more detailed examination of the variation of power output from hour to hour.



The standby power supply needs to respond quickly to ensure full utilization of wind generated power.

While the Bureau of Meteorology 'may' be able to forecast weather from day to day, the actual wind speed and wind direction at any location at any point in time cannot be forecast let alone predicted precisely. An examination of the wind speed and direction data for the Wonthaggi wind farm reveals the wind speeds and direction can vary significantly between 10 minute intervals. The power produced by wind turbines is proportional to the cube of the wind speed, therefore variation in wind speed over a short period can produce a sharp variation in power produced as is reflected in Graphs 1 and 2.

It is clear that accurate forecasting to overcome the difficulty with changes in wind speed is not possible so backup power stations would need to be on call at all times. Backup could be in the form of quick start gas fired generation or coal fired generation that cannot be fired up and then stopped at short notice. Coal, the lower cost alternative, would need to be fully operational or in 'spinning reserve' mode while the wind turbines would be generating power. This is not an efficient method of providing backup and would result in a higher CO2 output. Attached articles 39 by Dr John Etherington, 48 by Eric Rosenbloom and article 33.

The pamphlet distributed at the wind farm site claims a 98% reliability factor. What does this mean? It clearly could not mean the level of confidence in the 33% of installed output being met. Does it mean that breakdowns of turbines will only result in a 2% downtime? If so breakdowns at

Wonthaggi may further erode actual output and if the delay in Toora wind farm repairs is any indication then Wonthaggi losses may be significant.

This data covering a limited period of operation of the Wonthaggi wind farm demonstrates a lower than predicted output which would in turn means lower CO2 savings. The erratic production of power is likely to result in higher CO2 production from backup power plants.

4.2 Other Wind Farms in Australia

In NSW, it has been reported that the Crookwell wind farm has only been able to produce 14.7% of its maximum capacity and about 100 kilometre further north along the Great Divide the Blaney wind farm has only produced 22% of its maximum capacity.

Are the Crookwell and Blaney wind farms producing as much power as claimed and are they reducing CO2 as much as claimed?

The 'Adelaide Sunday Mail' in February last year reported that the Lake Bonney wind farm fire automatic shutdown of generation during the heatwave blacked out 63,000 homes. When maximum temperatures exceeded 40C throughout most of the state between 19 and 22 January, creating record demands for electricity, wind farm output averaged only 10 per cent. The total wind farm output in SA plummeted to just 2 per cent of capacity, producing enough power for only 3500 homes compared with the maximum capacity to power 175,000 homes. Later in August last year 'The Australian' reported the owners of Lake Bonney had advised shareholders that performance of the wind farm was below expectations as in May and June there had been unusually wind-less months.

The Lake Bonney wind farm in SA was reported last year to be producing electricity well below expectations. Attached articles 10, 12, 18, 23, 28 and 32.

Babcock and Brown have advised of lower than expected power production from this wind farm. Considering the wind turbine fire and lower than predicted power output just how much CO2 is the Lake Bonney wind farm saving?

And yet in attached article 12 the Financial Review give Babcock and Brown's optimistic views. The article also states "*Wind energy can compete with traditional fossil fuels such as coal.*" This view cannot be supported by evidence and is misleading to people including consumers and potential investors.

The 12 turbine Toora wind farm in South Gippsland was placed in an elevated location where it could generate the most power. Even if it generated 35% of installed capacity with 5 turbines out of action for extended periods because of mechanical and other technical problems the overall output would be significantly reduced. Attached articles 6 and 36.

With five of the twelve turbines broken down and out of action for extended periods how long will it be before the others succumb to technical failures. How much power will this wind farm produce and how much CO2 will it save?

Article 52 contains a response from 'Green Watch' to a genuine query about the sale of 'green energy'. 'Green watch' clearly lacks accountability and is clearly prepared to deceive people.

4.3 Some Examples from Overseas

The UK 'Sunday Telegraph', in January last year reported "The Advertising Standards Authority has just upheld a complaint against Renewable Energy Systems for exaggerating - by no less than 100% - the emissions savings made by its turbines. Yet the formula used by the firm to arrive at these figures is the same used by the British Wind Energy Association and almost every other

company seeking to build wind farms in Britain." A further article in August about the Scroby Sands wind farm off the Yarmouth coast, the region's biggest, was found to be producing less than a third of the electricity it should be. It had been asserted it could produce enough electricity to power 41,000 homes, however during 2005 it powered fewer than 12,000. British Energy, said the findings were not surprising and that wind is only about 25% efficient and that this sort of energy would never be a mass producer. Attached articles 6, 21 and 33.

The Advertising Standards Authority exposed the fraudulent claims of the British wind industry.

The Japanese 'Times' covered a story last July about Tsukuba, the town that prides itself as Japan's most hallowed scientific research centre. It is the site of perhaps the world's worst electricity wind farm. In the first 12 months its windmills consumed 43 times more power than they generated. Amid the embarrassment of Tsukuba's stagnant windmills things have descended into farce. To give the appearance of a functioning alternative energy programme, when dignitaries visited and on parent-teacher evenings, the generators became motors and the rotors were made to turn artificially. Experts in the Ministry of Economy, Trade and Industry were appalled. Shunji Kawamura, the director of its Industrial Technology Research Institute, said: "It should have been perfectly clear the windmills would never work." The Tsukuba City citizens' ombudsman has taken the local authorities to court, demanding that the taxpayers' wasted millions be returned. The academics and industrialists who form the ombudsman's body found what they claim was a network of bid-rigging scams and other corruption associated with the project and police began a criminal investigation. Attached article 8.

With a wind farm consuming more power than it generates it becomes a contributor to CO2 production.

The Canadian 'National Post' reported last November that the showpiece Windshare turbine at Toronto, delivered just 14.7% of its maximum capacity in its first 42 months of operation. In the same article Energy Probe, Ontario's independent power think tank, considered that wind is often utterly out of sync with human activity. Its analysis of hour-to-hour capacity factors at Ontario wind farms showed output declining disconcertingly in the morning, when people were getting out of bed and turning on appliances and lights. On a month-to-month basis, data from last summer showed that wind output remained flattest during the hottest periods and in Alberta's southern wind corridor, the turbines spun like crazy when the Chinook was blowing and little electricity was needed and in the still air of serious cold snaps, when loads were high, the turbines ground to a stop. The overall result was that much of the theoretical environmental benefit from wind power could not be realized, especially since the generators remaining on standby to provide emergency "ramping" tended to produce more pollution per watt than round-the-clock coal and gas facilities. Attached article 22.

This wind farm project would be unlikely to be reducing CO2 by much if any.

5.0 The Variability of Wind Power

The wind blows at different speeds and sometimes it doesn't blow at all so the actual situation would be a lot worse than presented by the wind power companies and governments. The effective output and way in which CO2 would be reduced is not simply a matter of averaging the power output but considering the way in which the wind speeds vary and how this in turn affects supplementary power generation.

The Wonthaggi wind farm's transition from one level of power production to another is not smooth, as shown in Graphs 1 and 2, and this presents the next difficulty. The power grid is a series of cables and wires to conduct electricity. It has no storage capacity to iron out iron out the unpredictable power fluctuations delivered to it. The rise and fall of power generated by a wind farm has to be balanced by reducing and ramping up other power generators to ensure a constant delivery of electricity to meet demand.

Dr John Etherington a scientist in the UK in attached article 39 **Wind Power - 'Variable' or 'Intermittent'? - A Problem Whatever the Word, January 2006** describes how wind turbines are efficient at extracting energy from the air but because wind speed varies the power produced not only varies but is unpredictable. Variations in electricity production can vary significantly over short periods of time. Electricity users need power on tap, not when the wind produces it and a match between these two characteristics rarely occurs. Dr Etherington describes how the variation in wind power causes grid instability which could lead to power distribution failures, or blackouts.

On 5 December 2006 the Environmental Times presented the report **'Europe-wide blackout hints at renewable cause'**. Nearly 12 months after Dr Etherington's predictions a blackout leaving 15 million people without electric power occurred and the cause was traced to power surges from wind farms. South Australia and Victoria have both experienced heavy electricity use in summer at times when wind farm contributions have been negligible.

The Wonthaggi wind farm graphs of power production each hour clearly illustrate the problem of variability described by Dr Etherington which is further supported in other articles.

It is generally claimed by supporters of the wind industry that if wind farms are distributed across the country the variability of wind will be overcome because the wind blows differently at different places. It is however very likely that there will be times when within reasonable transmission distances when the wind does not blow at any point at all. A full back up supply of power will therefore always be required.

In attached article 43 Ted Trainer quotes a study that found reliably available wind only occurred 4.6% of the time. Attached article 15 also criticises the simplistic views of a wind farm supporter.

The variable power output over short periods of time cannot be readily accepted into the grid without risk of power failure. It is difficult enough managing the output of power to match demand without the addition of the highly erratic unpredictable power rises and falls from wind farms. The consequence is low CO2 savings.

6.0 Reduction in CO2

Mr Eric Rosenbloom, a science magazine editor in USA, in attached article 48 **The Low Benefit of Industrial Wind, 20 January 2006** writes about what wind turbines contribute to CO2 reduction. Wind farms are meant to reduce CO2, however Mr Rosenbloom's explains how coal fired electric power generators that operate to support wind power are required to be running on standby to meet the deficiencies in electric power output from wind farms. He clearly explains that wind farms, because of the variation in the amount of electricity produced, need coal fired electricity generators to run in an inefficient manner which results in little net reduction in CO2 emissions. Wind farm electricity production cannot be looked at in isolation, particularly when attempting to determine the amount of CO2 they might reduce.

Expert examination by Mr Eric Rosenbloom puts in doubt the credibility of the CO2 savings of wind farms.

Kent Hawkins Ontario Canada in attached article 35 wrote; I have been researching electrical energy production for 5 years and have lots of documentation from E.ON in Germany, Estonia, Ireland, the UK, Australia, US, Canada and elsewhere. Incidentally, I have come to the conclusion that all the discussion about capacity factor as a measure of wind farm performance within a generation portfolio is irrelevant. It is more a measure of how wind farm operators are paid. Capacity credit is in my opinion the best measure. In Germany this is 8% of installed wind capacity and will diminish to 4% if current German government policies are followed into the 2020s. Backup requirements are 90% of wind capacity which is the flip side of capacity credit. All these statistics are from E.ON Netz.

This examination puts in doubt further the claims of the amount of power that can be provided by wind farms and the CO2 they would save.

7.0 Summary

Local Government around Australia is being persuaded by the arguments of wind farm developers and State Governments to adopt wind farm development policies. The industry and state governments also present compelling arguments stating the number of households that will be supplied and the many tonnes of CO₂ the wind farm will prevent from entering the atmosphere. There is now enough evidence to suggest that the claims presented by them are not based on fact and that the wind industry and state governments know this.

A close examination of the available data for the Wonthaggi wind farm reveals that erratic power output cannot simply be averaged to determine the number of households that could be supplied with electricity. There are significant power output difficulties to be overcome and power production from wind farms cannot be viewed in isolation.

There are environmental downsides for abutting property owners and the natural environment so claims of environmental benefit need to be based on fact and not just asserted.

Articles from a wide variety of sources including Australia, UK, USA, Spain and Japan provide a clear picture of the effectiveness of wind generated electricity to power households and industry and to reduce CO₂ emissions. Wind farms do not live up to the claims made by the wind industry and state governments and action has been taken in the UK to stop misleading claims.

The Minister for Agriculture Peter McGauran clearly articulated the concerns of a minister of the Federal Government, however the claims made by state governments and the industry continue.

Local government, panels and tribunals are being told by the state governments and the wind industry of the benefits of wind farms in order to influence the decision makers. Claims being made to justify costs to taxpayers, property owners, investors and consumers are not correct.

This burgeoning industry is growing on subsidy not market forces and if allowed to continue will be a burden to the Australian economy reducing our competitiveness without producing any environmental benefits.

Industries given preferential treatment under mandated purchasing schemes need to be accountable and the wind industry appears to be exempt.

8.0 Conclusion

The information contained in this complaint is provided as a basis for a detailed examination of the beneficial claims made in support of wind power. An investigation is required to protect the interests of taxpayers, consumers and investors alike. The ACCC could obtain further information by:

- Examining the claims proponents have made to secure project approvals and identify whether or not approvals have been assisted by deception,
- Requesting from wind power operators the power production and operational details of all existing wind farms,
- Obtaining and examining the methods used by governments to determine the claimed benefits of wind farms,
- Determine whether there has been a full disclosure of the potential for below forecast power production.

ATTACHMENT A - REFERENCE ARTICLES

1. AM - Thursday, 29 June, 2006 08:24:00

Reporter: Jennifer Macey

ELIZABETH JACKSON: The Federal Agriculture Minister, Peter McGauran, says wind farms are a fraud and only exist on taxpayer subsidies.

Minister McGauran, the member for Gippsland, made the comments to dairy farmers in south-east Victoria.

The Australian Wind Energy Association says it's disappointed by the comments and is now seeking an urgent meeting with the Minister.

Jennifer Macey reports.

JENNIFER MACEY: In a stinging attack against the wind energy sector, Peter McGauran says claims that wind farms are cleaner alternative to coal fired power plants, are fraudulent.

PETER MCGAURAN: Wind farms don't live up to the hype that they're the environmental saviour and a serious alternative energy source.

And the deleterious effect they can have on their neighbours is so serious it means that they should not be allowed to get away with the exaggerated claims. And their claims are fraudulent in regard to the environmental and energy terms.

JENNIFER MACEY: Mr McGauran says community concerns that wind farms are unsightly and cause property values to decrease should be taken into account.

And he says the energy sector can only survive with taxpayer subsidies.

PETER MCGAURAN: These wind farms are not producing any electricity of any measurable amount and because they're having such an effect on rural communities, they should only be permitted where the community is firstly, engaged, and secondly, accepting of them.

To be sure, there are parts of Australia - and in Victoria there's Ararat and Portland where they are a success - because they are not having a detrimental effect on near neighbours nor on the community at large.

But where a community rejects them because they will push down the value of the properties surrounding or will have an effect on the landscape, they should not be allowed.

JENNIFER MACEY: The Ministers' comments are in contrast to the views expressed by the Federal Environment Minister, Ian Campbell, who supports wind energy and is developing a national code for the sector.

Six hundred wind farms have so far been built or been approved in Australia under the Coalition Government.

Susan Jeanes, the CEO of the Renewable Energy Generators of Australia, says she's disappointed with Mr McGauran's comments.

SUSAN JEANES: Well, I suspect that it's better that we let the Environment Minister comment on matters relating to renewable energy and climate change and let the Agricultural Minister comment on matters relating to agriculture.

JENNIFER MACEY: Can wind energy compete with traditional forms of electricity?

SUSAN JEANES: Any cleaner energy solution, anything that produces less emissions from electricity generation is going to require some form of Government assistance as we head towards the middle of the century.

Scientists around the world have predicted that we need to reduce emissions by up to 60 per cent by 2050; emissions from Australia's electricity sector are predicted to be at 250 per cent above 1990 levels by 2050.

You cannot do nothing and sit back and just wait for a solution because it's not going to come without some form of assistance. The entire national electricity market was built with government money.

ELIZABETH JACKSON: Susan Jeanes, the CEO of the Renewable Energy Generators of Australia, with our reporter, Jennifer Macey.

2. Wind farms are a "complete fraud" that "only exist on taxpayer subsidies", the Warrnambool Standard reports Minister for Agriculture and Fisheries

Peter McGauran as saying yesterday on a visit to Victoria's western districts

<http://the.standard.net.au/articles/2006/06/27/1151174169755.html>

Follow the link. The picture of McGauran and his host, Speaker David Hawker, is worth a thousand words. Not that the Standard's copy isn't bad. Their journo, Madeline Healy, has done a sterling job:

Mr McGauran's comments on wind farms revealed a difference of opinion between himself and fellow Coalition MP, member for Wannon David Hawker, who hosted the minister's visit to the region.

Mr Hawker said he had been supportive of the many wind farm projects that had been proposed for the south-west. "It's bringing jobs and investment to the district," he said.

Mr McGauran said he was speaking as member for Gippsland, another wind farm hot spot, where he said most locals had come to hate wind projects. "They devalue the land and to see hardworking individuals have their properties devalued so considerably is immoral," he said. Mr McGauran said the wind farm industry was driven only by tax subsidies and not by efficiency. "They generate next to no electricity, for heaven's sake, when the wind is not blowing," he said. "It can't be stored and their contribution to the electricity grid is so small that it is hard to even measure."

There are some beautiful subtexts here concerning strife between the Liberals and their country cousins. The Nationals are only just hanging on in Victoria and McGauran has had a go at Hawker for pushing state Liberal candidates over the Nats - particularly after the bitter battle which saw the Liberals take Warrnambool and do their darndest in Wimmera. And as a good party boy, McGauran no doubt recalls Hawker's role pushing for the Nationals to lose their automatic right to front bench slots.

McGauran has shown great dedication to his work. He and his people know that Hawker has happily promoted wind farms in his electorates, despite the objections of a number of locals. A few choice words from the Minister and the issue is back in the headlines of country papers.

No doubt his comments will go down well with RARA voters who see wind farms as a tax scam along the same lines as emu farms and eucalypt plantations. But what will the Nats offer? A nuclear plant?

3. Minister says wind farms just hot air, by MADELINE HEALEY Warrnambool Standard June 27, 2006

WIND farms are a "complete fraud" that "only exist on taxpayer subsidies", Minister for Agriculture and Fisheries Peter McGauran told dairy farmers at Allansford yesterday.

The minister spent the day travelling the south-west talking to farmers about issues including blue gum plantations and supermarket price-fixing.

Mr McGauran's comments on wind farms revealed a difference of opinion between himself and fellow Coalition MP, member for Wannon David Hawker, who hosted the minister's visit to the region.

Mr Hawker said he had been supportive of the many wind farm projects that had been proposed for the south-west.

"It's bringing jobs and investment to the district," he said. Mr McGauran said he was speaking as member for Gippsland, another wind farm hot spot, where he said most locals had come to hate wind projects.

"They devalue the land and to see hardworking individuals have their properties devalued so considerably is immoral," he said.

Mr McGauran said the wind farm industry was driven only by tax subsidies and not by efficiency. "They generate next to no electricity, for heaven's sake, when the wind is not blowing," he said. "It can't be stored and their contribution to the electricity grid is so small that it is hard to even measure."

Mr McGauran said wind farms would have minimal environmental benefits. "The wind farms will diminish greenhouse gas emissions by so small an amount I doubt you could calculate it."

"They are simply an excuse for some entrepreneurs to make money at the expense of taxpayers and adjoining landholders." He said only wind farms on sites that didn't affect adjoining landholders were acceptable.

Roger Learmonth, president of the Hawkesdale Macarthur Landscape Guardians, is opposed to a proposed 183-turbine Macarthur Wind Farm project to which he is a neighbour.

Mr Learmonth said he was "pleasantly surprised" to hear Mr McGauran was also against wind farms and hoped he would actually do something about the issue. "It's easy to say that but can he follow through?" he said.

4. Dear Crikey, Tim Le Roy 31 Lavidge Rd Ashwood VIC 3147

Peter McGauran makes a blunt, but very valid point regarding wind energy being a fraud and it is high time an independent study is made of just how much greenhouse gas is saved by these machines and at what cost. The Institute of Public Affairs has done the numbers of wind energy subsidies and job creation (See: http://www.ipa.org.au/publications/publisting_detail.asp?pubid=506) and estimates each job created will require a subsidy of more than \$600,000. Senator McGauran is also correct about land devaluation. Stanwell

Corporation has paid out six-figure compensation sums to neighbours of their 12-turbine facility at Toora in South Gippsland.

The real fraud however is in claiming emissions reductions. If a public company published such rubbery figures as trotted out by the wind industry there would be a strong case for misleading and deceptive conduct. The wind industry has claimed emissions benefits of between 0.60 and 1.3 tonnes of CO2 equivalent saved for every megawatt hour of wind energy generated. A variation in benefits of some 220%. The 1.3 tonne figure is actually Victorian government policy, yet all requests for the technical evidence to show that when the wind is blowing less coal is being burned in the La Trobe Valley have been studiously avoided by both government and the wind industry. Neither party can explain the variance in their figures.

Andrew Richards of AusWEA also claims that wind energy is not reliant on large taxpayer subsidies. Why then, one can reasonably ask, did his company, Pacific Hydro lobby the Victorian government in February for a \$40/MWh subsidy? This rate exceeds the current wholesale price of electricity (\$30/MWh) by some 135%.

European experience highlights clearly what a useless white elephant energy production source wind can be. On 19 June, of the 10,719 MW of wind energy installed in Spain, a mere 42MW were being produced at 9 am peak demand time. This meant that some \$10.6 billion of wind plant was hanging uselessly, hoping the wind would blow. Meanwhile power had to come from somewhere else.

The Victorian Government is about to announce a very lucrative subsidy for the wind energy industry, paid for by the unknowing Victorian consumer. The question has been asked of the Bracks government as to whether there was any discussion regarding their proposed subsidy scheme with any of the parties bidding for Pacific Hydro last year. Three months have passed and no reply has been forthcoming. A simple yes or no would suffice. Perhaps ASIC should ask the same question?

5. 'The Australian' EDITORIAL, What price virtue? 30 June 06

False premises and promises underlie environmental politics

WHEN federal Agriculture Minister Peter McGauran declared this week that wind farms are a "complete fraud" that "only exist on taxpayer subsidies", he injected the first dose of sanity seen in the renewable energy debate for a long time. Wind power fulfils just 2 per cent of the country's electricity needs, is unreliable even on the gustiest of days and is emblematic of everything wrong with the quest for so-called sustainability. Greens love wind farms for symbolic reasons, as does federal Environment Minister Ian Campbell – so long as no turbines are sited in a marginal Liberal seat within cooee of a protected parrot. But, so far, the only ones who do well off wind farms are the companies that own them – and not even they dispute their poor economics. Wind farmers get huge subsidies and a guaranteed market share and return.

It is not just on wind farms where politics and feelings are allowed to trump economic reality. Senator Campbell and his ilk like to be seen on the "right" side of the environment. Meanwhile, so-called progressives try to shut down debate over global warming even though the science is far from settled. When The Philippines' Mount Pinatubo erupted in 1991, it threw out vast amounts of ozone-depleting greenhouse gases. But the particles it cast skyward also lowered temperatures. Scaremongering polemics such as *The Weather Makers* by Tim Flannery (who is a paleontologist, not a climatologist, by training) have been shown to be riddled with errors. The Kyoto Protocol is far too flawed an instrument to reduce pollution. Australia needs to apply cost-benefit analyses to environmental issues, not sentiment or politics.

Seen in this light, Australia's environmental policy is all over the shop. It is not just wind power that fails the cost-benefit test. Plastic shopping bags are set to be phased out by 2008 at a cost of \$840 million simply because inner-city voters don't like them, despite Productivity Commission data showing the bags to be only a minor threat. Water policy is driven by Greens, farmers and politicians, each with an interest in making city-dwellers feel guilty over every flush. Yet capital city residents consume less than 10 per cent of Australia's water; the real waste occurs in agriculture, particularly in the cultivation of cotton and rice. In Queensland, the Greens are doing their best to hold up a dam that will supply water for the fastest-growing region of the country. Recycling plants dump toxic chemicals and salt into rivers – including the Murray. Nor do "sustainable" policies create sustainable jobs. Victoria spends between \$599,565 and \$999,782 in subsidies per job, per year, in the renewable energy sector. And creating jobs sorting glass is hardly the stuff of a knowledge nation. Even in a world where carbon use is constrained, technologies such as clean coal and geosequestration make more sense for coal-rich Australia than wind power (or nuclear, for that matter). Feelgood environmentalism may win votes. But not only does it fail to pay the bills – it also doesn't save the planet.

6. New doubt over wind power by TOM SMITHARD, 12 August 2006

The future of green energy has been thrown into doubt after a new report revealed that the region's biggest windfarm was producing less than a third of the electricity it should be.

When the 30-turbine Scroby Sands windfarm was built off the Yarmouth coast in 2004 it was hailed as the beginning of a modern, safe, clean and fertile era of energy production.

But the government's first annual report into the £67m development paints a very different picture - with the turbines generating only 28.9pc of the power they were meant to.

Yesterday a spokesman for owners E.ON UK said that the renewable energy sector was in its infancy and that lessons would be learned from the problems at Scroby.

It came as Norfolk County Council released more details of a proposed 70-turbine scheme for Sheringham.

The report from Department of Trade and Industry inspectors shows that the Scroby Sands windfarm was riddled with mechanical problems which significantly lowered production. Between January and December last year 27 intermediate speed and 12 high speed gearbox bearings needed replacing, along with four generators.

The report states that after extensive investigation "work is now at hand to resolve these issues" but that they had "serious implications for resources, costs and downtime". That shows in the amount of time the turbines were not turning: they were projected to turn for 95pc of the time - a figure exceeded only once, reaching 96.77pc in May last year. By September that was 88pc, by October 73pc and by December it was 64pc - figures that were "below expectation". Worse still is the capacity factor percentage, the amount of electricity generated compared with what it would be if the turbines were turning 100pc of the time.

That peak was reached in January, 2005, with 48.9pc capacity but by June it was 20pc and it never again went higher than 30pc, giving an average over the year of 28.9pc.

Given E.ON's assertion that the windfarm could produce enough electricity to power 41,000 homes, the figures show that during 2005 fewer than 12,000 properties were actually powered by Scroby.

But the report was not all bad news - it states that 35,000 people visited the visitors' centre, far more than projected, and that the building of the turbines did not affect native seal or little tern populations, as had been feared.

Jason Scagell, director of E.ON UK, said: "We were very happy with Scroby's performance in the first half of the year, particularly as the operation was in its infancy, but the second half was less satisfactory due to a number of defects with the gearboxes and the generators.

"Scroby Sands was and remains a pioneering project from which lessons will be learned. We're certainly keen to continue working offshore and have four projects in various states of advancement that will allow us to use the lessons from Scroby in larger developments." The report will boost the prospects of a renaissance for the nuclear power industry, already riding high following publication of the government's long-awaited energy review last month. Trade and industry secretary Alistair Darling announced that the government will approve the construction of a new generation of nuclear reactors, giving hope to campaigners for Sizewell C.

Mr Darling said that nuclear power would make a "significant contribution" to meeting the UK's energy needs, particularly as reserves of North Sea oil and gas declined.

Martin Pearce, spokesman for Sizewell owners British Energy, said the findings of the Scroby Sands report were not surprising. "We do not believe that there is one solution to Britain's energy crisis but that nuclear and renewable energy have to work alongside each other," he said. "But it's always been known that wind is only about 25pc efficient and that this sort of energy will never be a mass producer."

John Best, chief executive of the East of England Energy Group, which represents all energy interests in the region, said: "The information in the Scroby Sands report is extremely helpful.

"It is always useful to consider the true value of the contribution which offshore wind can and will make in the future."

The Sheringham Shoal windfarm, which will include 70 turbines, all measuring 172 metres from the tip of their sails to the watermark, is planned over the next few years with towers which will be 97 metres high - standing one metre higher than Norwich Cathedral on a site 17-23km off the coast.

Project backers Scira say the turbines will only be visible on 60pc of days, when the weather is clear, and even then will look like a "line of matchsticks on the horizon". If completed, the development could supply up to 176,000 homes with electricity.

7. Being retired, nobody can fire him for telling it as it is. His paper provides a real education on windpower. Mark Duchamp 16 December 2006

A few quotes:

"This scenario is tantamount to a group of operators of a number of large power stations simultaneously turning the fuel supply to their turbines on and off, the whole year around. When you look at the total of the varying aggregate wind power in Germany (a staggering 7050 MW), you will see that this comparison is in no way exaggerated. In the E.ON region it would take the operators of twelve huge power stations to produce the same effect. The same thing will of course happen in Britain and elsewhere, and will result in exactly the same overwhelming predicament as exists in Germany. In their report, the German E.ON scientists - the engineers responsible for 7000 wind turbines - have stated: 'We

have no solution for these problems." "When a considerable input of wind energy varies more quickly than can be followed by the adaptation of the power stations, the whole system will break down. The result will be a complete national or even an international blackout"

One cannot help but think of the blackout that occurred across Europe on Nov. 4th, which was made to last longer than necessary by Germany's large, uncontrollable windpower generation (see the UCTE report).

"It seems strange that promoters of wind energy - whether official, political or so-called specialists - never mention the significant disadvantage of wind energy: namely, its complete unreliability. One might justifiably suspect that a hidden personal or political agenda is at play here."

I couldn't have said it better myself.

"Most people who have finally begun to realise that things are not as they first thought often do not have the temerity to admit that they were wrong. Many prefer to remain known as 'the specialist' who understands everything about wind turbines and who perseveres in writing or speaking half-truths or outright falsehoods."

Exactly. And then there is their personal interest...

His full paper here: <http://www.iberica2000.org/documents/EOLICA/REPORTS/windfarms - facts and fiction - Dutch engineer.pdf>

8. 'Calm days are a bit of a blow for wind farm' From Leo Lewis in Tsukuba Japan Times 14 June 06

THE air above Yatabe Minami elementary school is heavy with humidity. The playground swelters without the slightest breath of breeze, and on the highest trees the leaves do not flicker. The sails of the Darius-Savonius generator stand still. Tsukuba, the town that prides itself as Japan's most hallowed scientific research centre, is the site of perhaps the world's worst electricity wind farm: in the 12 months it has operated, its windmills have consumed 43 times more power than they have generated. The project to make Tsukuba a self-sufficient showpiece for green energy has failed, bringing scorn upon the government programme to test alternative sources. It is likely to be cited by sceptics elsewhere, including in Britain, where the Government published its energy review this week. Tsukuba is involved in civil litigation, criminal investigations and an assault on the academic reputation of Waseda University, Japan's most respected seat of learning.

Amid the embarrassment of Tsukuba's stagnant windmills things have descended into farce. To give the appearance of a functioning alternative energy programme, when dignitaries visit and on parent-teacher evenings, the generators become motors and the sails are made to turn artificially. For the children of Tsukuba, who watched with fascination as the 10m turbines rose in their grounds, summer science projects are in ruins. They had planned to keep daily registers of how much electricity the windmills were producing but, after a couple of weeks of finding the needles stuck at "0.0kWh", the excitement faded. The three windmills at Yatabe are among 23 installed last July at schools around the high-tech university town of Tsukuba, which had intended to install first dozens, then possibly hundreds more. Home to top-secret industrial laboratories, Japan's space programme and a big robotics institute, Tsukuba has long been pitched as its technology showcase.

Unfortunately it has an average wind-speed of 2.5km/h (1.5mph) — a far cry from the 15-20km/h needed to make a wind farm work. At some schools one or two windmills have occasionally begun spinning in winter gusts. Among them, the 23 windmills have produced one megawatt in 12 months, having been expected to generate more than 200. Experts in the Ministry of Economy, Trade and Industry are appalled. Shunji Kawamura, the director of its Industrial Technology Research Institute, said: "It should have been perfectly clear the windmills would never work." The sails of the model of windmill purchased by Tsukuba are not turning, but nevertheless consume nearly three megawatts a year.

The Tsukuba City citizens' ombudsman has taken the local authorities to court, demanding that the taxpayers' wasted millions be returned. The academics and industrialists who form the ombudsman's body have found what they claim is a network of bid-rigging scams and other corruption associated with the project. Police have begun a criminal investigation. "Tsukuba has the reputation of being the highest-tech city in the world, but it is run by people out of the 19th century," Daijiro Kameyama, the head of the Shisei ombudsman, said.

Tsukuba City is conducting its own civil suit against Waseda University, whose research suggested that the windmills would generate huge amounts of free electricity. The windmills were built by a Waseda University spin-off company.

9. Windpower a major factor in the European blackout of Nov 4th, Mark Duchamp

The UCTE* interim report weighs 2.09 Mb - I shall send it upon request.

*union for the co-ordination of transmission of electricity

Here are some significant quotes:

"In both under-frequency areas (West and South East), sufficient generation reserves allowed restoring the normal frequency in a relatively short time. In the over-frequency area (North East), the lack of control over generation units (quick reduction of schedules and automatic reconnection of wind generation) contributed to deterioration of system condition in this area (long lasting over-frequency with severe transmission lines overloading). Generally, the uncontrolled behavior of generation (mainly wind farms and combined-heat-and-power) during the disturbance complicated the process of reestablishing normal system conditions."

.....

"In spite of the fact that the network was highly loaded at that time, no efficient remedial action was prepared by E.ON Netz in order to keep a minimum safety margin and to prevent a possible increase of the flow due to changes in generation (especially wind power), in consumption and in cross border exchanges for the following hours."

.....

Generation related issues

"During the disturbance, a significant amount of generation units tripped due to the frequency drop in the system which resulted in the increased imbalance. Most of this generation is connected to the distribution grid (especially wind and combined-heat-and-power)."

.....

"However the automatic restarting of a considerable amount of wind generation in the North part of Germany was not immediately compensated by a corresponding amount of decreased generation in thermal or hydro power plants."

.....

"One actual example of changing generation patterns is due to the rapid development of wind generation characterized by a short term predictability: within a few hours, the production of wind farms can change from minimum to maximum and conversely. This can only be mastered with an adequate transmission infrastructure and a more and more complex management of interconnected networks. In reality, many UCTE TSOs face increasing difficulties to build new network infrastructures (lines, substations, etc.) This puts more than ever before pressure on all TSOs to be able to rely on each other via closer co-ordination mechanisms as those stated among UCTE standards."

10. Wind farm fire caused blackout, Sunday Mail SA, 12 February 2006

A \$3 MILLION wind farm turbine caught fire while dozens shut down at the time South Australia most needed them - when a heatwave left 63,000 South Australian homes without power last month.

Adding to the drama, firefighters could not extinguish the blaze because the tower was too high at 67m.

Lack of wind and automatic shutdowns triggered by hot temperatures were to blame for the state's 180 turbines producing just 10 per cent of their maximum power capacity during the January heat wave, according to experts.

The experience proved SA could not rely on wind power to provide electricity when demand was greatest, the Electricity Supply Industry Planning Council (ESIPC) said.

"You never know if the wind will be blowing when you need it to or if wind turbines will shut down," ESIPC spokesman Brad Cowain said.

Operators of the Lake Bonney wind farm, where the turbine fire occurred on Sunday, January 22, said all of its 46 turbines had automatically shut down during the heat wave when temperatures exceeded 40C.

"We want the turbines to operate during peak demand to capture revenue but power output is limited by the automatic shut down to protect electrical instruments," wind farm operator Miles George of Babcock and Brown Wind Partners said.

He said the turbine fire – the first in Australia – had been caused by an electrical fault while maintenance crews were working on it after it had shut down.

Around 3pm, 40 CFS firefighters and six trucks rushed to the wind farm to extinguish the blaze but fire hose water couldn't reach the steel generator at the top of the tower.

Instead, the firefighters watched as fire destroyed the \$3 million turbine – which weighs 75 tonnes – and extinguished spot fires ignited by ashes from the turbine blaze.

According to ESIPC, many of the European manufactured turbines used in SA shut down during extreme temperatures to avoid generator meltdown.

"Most turbines are manufactured in Europe where they don't have to worry about operating at high temperatures," Mr Cowain said.

"We are investigating which individual turbines were not operating because of a shut down or lack of wind."

Between Thursday, January 19 and Sunday, January 22, maximum temperatures exceeded 40C throughout most of the state, creating record demands for electricity while wind farm output averaged only 10 per cent.

But during Saturday's peak power demand wind farm output plummeted to just 2 per cent of capacity, producing enough power for only 3500 homes, according to ESIPC. This compared with the maximum capacity of 318MW to power 175,000 homes. SA leads the nation in wind farm energy with five established sites – Starfish Hill, Canunda, Wattle Point, Cathedral Rocks and Lake Bonney.

There are numerous other approved wind farm developments including an AGL plan for 43 turbines at Hallet in the state's Mid North.

But AGL also plans to more than double the capacity of its nearby gas-fired plant, from 180MW to 430MW, at a cost of more than \$100 million to ensure peak demand during hot weather can be met.

The state's independent energy regulator Pat Walsh declined to comment about the wind farm performance during the heat wave or its implications on the state's overall energy supply.

11. Rethink the role of pricey wind farms by Tim LeRoy Australian Financial Review 7 February 06

As AGL announced the development of another wind farm in South Australia, and its planners and lawyers prepare to do battle with the small Victorian community of Macarthur over a 182-turbine facility, it is worth considering the benefits versus the costs of this kind of energy.

Selling wind energy is a complex task, but it delivers great political capital. Environmentalists view all other forms of electricity generation (excluding solar) as environmental treason, conveniently ignoring the social benefits that cost-effective, reliable energy delivers.

Politicians flock to wind farm openings to display their green credentials, little bothered by the cost imposed on the Australian public.

The Victorian government claims that every megawatt of wind energy will save 1.3tonnes of greenhouse gas. This statement presumes that when the wind blows there is an immediate corresponding reduction in coal-fired generation. Since coal-fired generators take between four and eight hours to ramp up or down their production, the mathematics is intriguing. A detailed South Australian study suggests a lower figure of 0.5tonnes saved.

Wind energy is expensive. To recover construction costs, a price per megawatt (MW) of between \$75 and \$95 must be achieved, compared with the Victorian wholesale average of \$34/MW.

The cost of generating wind energy is supported by subsidies at present, but developers argue that even full cost recovery would have little impact on general energy prices because wind power is such a small proportion of Australia's overall power capacity. However, it may be worth noting that Denmark, which generates 20per cent of its electricity from wind, has moved from being one of the countries with the lowest costs for electricity generation to being one of the most expensive in Europe.

Wind energy is claimed to be very efficient, and the industry uses plant availability to promote this. Yes, the blades are almost always ready to receive a breeze and extract energy.

However, the wind does not blow on command. According to German studies, only 10per cent of the installed capacity of wind generation can be relied upon to deliver when needed. The rest is opportunistic dumping into the grid. The German studies show that the more you install, the less reliable it becomes.

Another study calculates that if 48,000MW of wind energy is installed it will displace only 2000MW of conventional plant.

Finally, there's the question of job creation. The federal government estimates that a mature wind industry will employ about 120people. The Victorian government is proposing an annual consumer levy at an estimated cost of more than \$130million a year over 15 years. This equates to a subsidy per job of about \$1.1 million a year.

Perhaps there is a better way.

- *Tim Le Roy is the spokesman for Coastal Guardians Victoria, a community group opposed to the inappropriate siting of wind farms.*

12. The Australian Financial Review AUSTRALIAN SUSTAINABILITY SPECIAL REPORT 14 November 2006

Fund gets wind of cheaper alternative

Wind is plentiful and cost effective, reckons B&B Wind. Adam Courtenay reports.

Global demand for electricity is expected to double in the next 25 years and about one-third of present energy-producing operations must be replaced. But the question is, which renewable energy sources will be capable of filling the gap?

In Australia, given the announcement by the government that it will invest \$75 million in a massive solar energy undertaking in Mildura, many would think solar energy is the obvious candidate.

But Babcock & Brown Wind Partners, a specialised fund focused on the global wind energy industry, thinks differently. Wind, it says, is extremely cost-effective and Australia has copious supplies of it.

The company says the cost of wind energy production is less than the cost of producing electricity by new gas power stations - at least in Europe, the US and in Australia, its chief areas of investment. It also says wind can compete with traditional fossil fuels such as coal, particularly if you include the cost of carbon itself.

B&B Wind has been nominated for a 2006 Australian corporate sustainability special award for the environment, presented by online magazine *Ethical Investor*.

The company has been nominated for the award of sustainable company of the year among the S&P/ASX 200 companies.

In Australia, the mechanics of organising large scale investment in energy sources such as wind power depend almost entirely on a government scheme, the mandatory renewable energy target.

So far, there are 41 wind farms providing 2200 gigawatt hours of electricity annually, which is about 0.5 per cent of the country's present energy requirements. This is the equivalent of powering 30,000 homes.

European wind farms, led by the large German and Spanish markets, produce about 20 times

Australia's output. Wind farms in the US produce about five times. This may be minuscule compared with other, mostly carbon-related forms of energy, but B&BWP believes strongly in both the investment and environmental rationale for wind power.

'Wind energy can compete with traditional fossil fuels such as coal.'

Globally, the sector grew by 24 per cent in terms of cumulative installed capacity in the year to March 2006.

B&BWP was spun off and floated by investment group Babcock & Brown last year, and reported a net loss of \$16.2 million in the 2005-06 fiscal year, just eight months after listing.

However, the fund remains sanguine about its prospects, recently increasing its projected unit payouts for fiscal year 2007 from 11.2¢ per stapled security to 12.5¢ per stapled security.

This suggests that some of its acquisitions will be reaping returns for shareholders in the near future. In May, it raised about \$119 million from institutional investors for wind farm acquisitions in the United States.

It has grown its portfolio from four wind farms to 19 since listing, with assets spread across Australia, Europe and the US. In all, B&BWP's farms produce over 1300 gigawatts hours a year.

The company believes the investment rationale for wind energy continues to improve as world demand for electricity increases and concerns about global warming deepen.

"We enter a market with a more mature and diverse portfolio and with a balance sheet which is undergeared," chief executive Peter O'Connell said in September.

13. Power by Tim Le Roy, The Age, June 2006

Dear Editor,

Tim Flannery (Opinion 26/6) describes people opposing wind farms as thoughtless NIMBY's. He can now add the following organisations to this broad brush eco-smear. The Australian Conservation Society, Birds Australia, South Gippsland Conservation Society, Bird Observers Club and the National Trust. They all oppose the Bald Hills wind facility.

It is disappointing when supposedly reputable scientists such as Flannery resort to name calling rather than science to prove a point. Even the most basic research will show that intermittent wind will do little or nothing to displace fossil fuel generation. For example: on June 19 2006, the 10,000 megawatts of windmills installed in Spain were producing a mere 42 MW at peak demand, which meant that they made no contribution to reducing emissions from other generators.

Mr Flannery should do more research on energy or spend more time jetting around the world promoting books rather than insulting the people of South Gippsland.

14. Hansard QUESTIONS WITHOUT NOTICE – 8/8/06

Energy: renewable sources

Hon. PHILIP DAVIS (Gippsland) — I direct a question without notice to the Minister for Energy Industries. Will the minister detail for the house the outcomes of the business impact assessment undertaken by the Victorian

Competition and Efficiency Commission regarding the impact on the Victorian economy of the government's proposed Victorian renewable energy target?

Hon. PHILIP DAVIS (Gippsland) — I thank the minister for his expansive answer. I remind him that the question was directed to the business impact assessment undertaken by the Victorian Competition and Efficiency Commission. I therefore ask as a supplementary question: is it a fact that the minister will not release the VCEC impact statement because it shows the significant cost to the Victorian economy and the thousands of jobs that will be lost as a direct consequence of the government's policy?

Hon. T. C. THEOPHANOUS (Minister for Energy Industries) — As I have tried to explain to the honourable member, he continually gets his facts wrong. The economic analysis on which we based the decision to go ahead with the Victorian renewable energy target scheme was done by McLennan Magasanik Associates.

An honourable member interjected.

Hon. T. C. THEOPHANOUS — Members should understand what I am saying — that the economic analysis was not done by VCEC, it was done by McLennan Magasanik and Associates. It did a number of different models, and we decided in the end on a model which will have minimal impact on consumers and which will get the maximum benefit in terms of renewable energy in this state. We are happy to stand by that analysis, and we are very proud to be able to deliver so much renewable energy for this state.

15. Australian Financial Review Wind farm solution needs more research by Tom Quirk 23 August 2006

Lecturer Mark Diesendorf, in Lies and Statistics (August 19-20), joins a long list of theoretical wind farmers who can see no problem with the supply of electricity from wind farms.

One of the most interesting debates has been in the United Kingdom. The government has set an ambitious target of 25,000 megawatts of installed wind farms by 2020. This at face value is some half of peak demand of 50,000 megawatts.

But wind farms rarely perform near their installed capacity and are given a capacity factor for their average power output of about 33 per cent, or about 8000 MW for the UK target. The debate has been about reliability or what is called firm capacity. That is the energy delivered 90 per cent of the time. The Royal Academy of Engineering's Michael Laughton suggests reserves of 30,000 MW while the Oxford Environmental Change Institute's Graham Sinden believes less than 10,000 MW would do.

The issue remains unresolved but it is worth turning to experience with real wind farms.

E.ON Netz, a transmission and network utility in Germany, has the largest installed wind-farm capacity in the world. It noted an example of wind intermittency in its Wind Report 2005. On December 23, 2004 wind power peaked at 6000 MW and in the next 10 hours lost 4000 MW only to rise again by 2000 MW before collapsing to 40 MW on Boxing Day. At its worst, the wind input was falling at a rate of 16 MW a minute and coal-burning reserve power stations had to be brought on and then laid off as the network managers smoothed the energy flow. E.ON quotes a firm capacity figure of 8 per cent.

Denmark, one of the favourite Scandinavian models, has high penetration of wind power because Denmark is stabilised by the connections to Norway, Sweden and Germany. The Danish system is vulnerable to the loss of these interconnectors, as happened on September 23, 2003 causing substantial power cuts in Copenhagen and Zealand.

In Australia, Victoria had an example during a heat wave. On December 9, 2003 when demand was at a peak, all three operating wind farms produced an average 10 per cent compared to their capacity factor of 38 per cent to 40 per cent. Indeed National Electricity Market Management Company uses a firm capacity figure of 7 per cent for wind power.

All this experience says wind development should proceed slowly so facts can be established about Australian operating conditions.

Until then theory should give way to experiment.

16. Critical of NZ energy policies, Radio NZ, 11 May 2006

The International Energy Agency has issued a report critical of the New Zealand government's energy policies. In its 2006 review of New Zealand, the IEA condemns the government's decision not to proceed with a carbon tax, arguing it would have helped combat greenhouse gas emissions.

It says energy efficiency in New Zealand is generally poor, especially in transport and households. The report draws attention to the growing use of wind energy in New Zealand, arguing that unpredictable weather makes electricity generation from wind rise and fall sharply.

It is especially critical of the government's failure to keep oil reserves at internationally required levels of 90 days' use and states that the country's current supply of 60 days is regrettable. It places New Zealand as last on a table ranking the oil security of its 26 member states.

The IEA also condemns the Government-established reserve generation plant at Whirinaki, in Hawke's Bay, which it says comes into force when electricity prices are high and thus undermines the financial incentive to build new electricity generating plant.

The agency says Whirinaki should be activated by hydro lake levels, not electricity prices.

Spot power prices down Meanwhile, spot power prices fell over the past week as storage levels in the hydro-electricity lakes remained steady, further easing concerns over winter power supplies.

Prices at Haywards, north of Wellington, fell 6% to an average \$67 per megawatt hour. There was also a sharp fall in prices the previous week after heavy rainfall replenished lakes.

Water inflows in the South Island were 84% of average over the week to Sunday, falling from 108% last week. Demand rose 1.2% to 103,000 gigawatt hours.

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17. Feathers fly again in battle of the parrots, The Age, August 5, 2006

Air power will only blow hot and cold as state seeks grid boost WHILE a stick-figure army of windmills is set to invade the landscape thanks to the State Government's new renewable energy policy, there is growing evidence that wind power will have little impact on the greenhouse crisis. The problem, according to critics, stems partly from the erratic nature of wind, and partly from the political and economic realities of an energy market ever-hungry for economical power. The result, according to the body responsible for allocating Australia's east-coast electricity, is that wind energy, rather than reducing the state's reliance on coal by adding to the total "green" power in the grid, instead displaces other forms of low-impact energy. A spokesman for the National Electricity Market Management Company has confirmed that greenhouse-friendly power sources such as gas and hydro are likely to be the first to be shut down when wind energy enters the grid. The last to be displaced is brown coal, the worst for the environment but also the cheapest. This and other revelations mean authorities both in Australia and overseas are questioning whether wind power is an effective source of reliable energy or largely environmental spin.

Even if Victoria succeeds in its goal of 10 per cent renewable energy (mainly wind) by 2016, the impact on greenhouse emissions is likely to be less than expectations. Germany, for example, has one of the highest proportions of wind energy in the world and a report last year by grid operator E.ON Netz made the following warning: "Wind energy is only able to replace traditional power stations to a limited extent ... traditional power stations with capacities equal to 90 per cent of the installed wind power must be permanently on line to guarantee power supply at all times." To start with, wind can only be guaranteed to supply 10 per cent of its stated capacity when needed. When a new wind farm is announced, claiming it can provide electricity to 50,000 homes, it only supplies that power in ideal conditions when the wind is neither too weak nor too strong. Overall, it can be relied on to produce power for 5000 homes, while back-up power must be available for the remaining 45,000.

Critics argue that wind's attraction for politicians is its visible presence to a public worried about the environment, but largely ignorant of electricity demand, how it is generated and distributed, and its impact on the economy. The problem is compounded by Australian industry's reliance on cheap power. No one disputes that wind power is currently expensive - about \$75 a megawatt hour - while traditional staple brown coal is at \$35. But it can be reasonably argued that if the true long-term environmental and social costs of coal generation were included in bills, we would be paying two to three times as much as now. But despite the State Government's intentions, several factors diminish wind's ability to deliver its promised greenhouse gas reductions. First, wind farms reliably produce between 20 and 30 per cent of what is called installed capacity, meaning a wind farm capable of producing 100 megawatts will end up pumping out 20 to 30 megawatts over a given time. But it might not be pumping this out when there is much demand. That is why the 90 per cent back-up is needed. Also, because wind is erratic - and because the energy cannot be stored - the Government wants to harness as much as possible when it is available. This means wind power has priority over other electricity generation. During normal to low demand, other generators will be closed down or their power sold cheaper. The first to go will be gas and hydro, they are the next-most-expensive to wind, but they are also relatively greenhouse friendly, so wind displaces generator forms that are already causing lower greenhouse harm. The last to be displaced is likely to be the cheapest but the worst polluter, brown coal. It provides baseload of up to 90 per cent of the state's power. Even the Government's own paper from Sustainability Victoria, released to coincide with its wind farm announcement, admits: "At low levels of wind generation, more aggressive (electricity price) bidding by brown coal generators results in less of this generation being displaced." The National Electricity Market Management Company runs the national grid in the eastern states. When its head of corporate affairs, Paul Price, was asked, he confirmed that wind had priority and, when it was generating would displace the more expensive, lower-polluting forms of power. Because wind is erratic, as the Germans know, back-up is needed to maintain electricity grid stability. This, according to Deputy Premier John Thwaites, is one reason why the Government is trying to place generators across as much of the state as possible - to try to have wind generation coming from at least somewhere at any one time. There are other problems with wind displacing brown coal. Brown coal stations take many hours to increase or decrease output. But there is a potentially more crucial catch. Richard Elkington, general manager for power at the state's biggest generator, Loy Yang Power, admits that as brown coal stations reduce output, they start emitting

more greenhouse gas in proportion to electricity generated. "Brown coal stations are at highest efficiency when they are running flat-out, that is also when they produce their least greenhouse gas. "Our station's output is 2000 megawatts maximum and we can cut it to 1200 megawatts, but we produce more greenhouse gas per megawatt, the lower we go. Anything lower than that and the cost of generation starts to rocket dramatically."

18. Wind farm fire caused blackout, Advertiser Newspapers, 12 Feb 06

A \$3 MILLION wind farm turbine caught fire while dozens shut down at the time South Australia most needed them - when a heatwave left 63,000 South Australian homes without power last month. Adding to the drama, firefighters could not extinguish the blaze because the tower was too high at 67m.

Lack of wind and automatic shutdowns triggered by hot temperatures were to blame for the state's 180 turbines producing just 10 per cent of their maximum power capacity during the January heat wave, according to experts.

The experience proved SA could not rely on wind power to provide electricity when demand was greatest, the Electricity Supply Industry Planning Council (ESIPC) said.

"You never know if the wind will be blowing when you need it to or if wind turbines will shut down," ESIPC spokesman Brad Cowain said.

Operators of the Lake Bonney wind farm, where the turbine fire occurred on Sunday, January 22, said all of its 46 turbines had automatically shut down during the heat wave when temperatures exceeded 40C.

"We want the turbines to operate during peak demand to capture revenue but power output is limited by the automatic shut down to protect electrical instruments," wind farm operator Miles George of Babcock and Brown Wind Partners said.

He said the turbine fire – the first in Australia – had been caused by an electrical fault while maintenance crews were working on it after it had shut down.

Around 3pm, 40 CFS firefighters and six trucks rushed to the wind farm to extinguish the blaze but fire hose water couldn't reach the steel generator at the top of the tower.

Instead, the firefighters watched as fire destroyed the \$3 million turbine – which weighs 75 tonnes – and extinguished spot fires ignited by ashes from the turbine blaze.

According to ESIPC, many of the European manufactured turbines used in SA shut down during extreme temperatures to avoid generator meltdown.

"Most turbines are manufactured in Europe where they don't have to worry about operating at high temperatures," Mr Cowain said.

"We are investigating which individual turbines were not operating because of a shut down or lack of wind."

Between Thursday, January 19 and Sunday, January 22, maximum temperatures exceeded 40C throughout most of the state, creating record demands for electricity while wind farm output averaged only 10 per cent.

But during Saturday's peak power demand wind farm output plummeted to just 2 per cent of capacity, producing enough power for only 3500 homes, according to ESIPC. This compared with the maximum capacity of 318MW to power 175,000 homes. SA leads the nation in wind farm energy with five established sites – Starfish Hill, Canunda, Wattle Point, Cathedral Rocks and Lake Bonney.

There are numerous other approved wind farm developments including an AGL plan for 43 turbines at Hallett in the state's Mid North.

But AGL also plans to more than double the capacity of its nearby gas-fired plant, from 180MW to 430MW, at a cost of more than \$100 million to ensure peak demand during hot weather can be met.

The state's independent energy regulator Pat Walsh declined to comment about the wind farm performance during the heat wave or its implications on the state's overall energy supply.

19. Green light for Lexton wind farm, Ballarat Media, Thursday, 18 January 2007

THE Pyrenees Shire Council has given wind farm company Wind Power the green light for a 19-turbine wind farm at Lexton.

The approval was made at the council's meeting on Tuesday night.

The wind farm will provide enough power to supply about 16,000 homes, and will displace about 113,000 tonnes of carbon dioxide or greenhouse gas a year, the equivalent of taking 26,000 cars off the road.

The project is believed to cost about \$28 million.

The company submitted its application to the council in November, drawing three objections from residents.

However, Mayor Gabriel Horvat said there were no technical issues with the application and felt the council had dealt with all issues fairly well.

He said the council was very supportive of renewable energy projects.

"At the moment, we're in a prime position for the establishment of wind farms as we have all the key factors; hills, wind and major power infrastructure," he said.

"We need to utilise the potential of wind development within the shire."

The development is expected to bring a range of benefits to the shire, including employment, development and extra rate revenue.

Meanwhile, a newly formed group met with the council on Tuesday to discuss their concerns over Wind Power's Stockyard Hill wind farm proposal.

The company is looking into a project of around 70 wind turbines in the area.

Cr Horvat said the group was not against wind farm development, but rather had a lack of information and understanding about wind projects.

Cr Horvat said while the council was in favour of wind developments, it did not mean they were "opening the gate without checks and balances".

"If the community can't be brought on board then we have to change our views."

Wind Power was unavailable for comment yesterday.

20. Twin pillars of Spanish wind market axed — decree removes wind subsidy and price guarantee

Wind Power Monthly, September 2006

The legal basis of the production incentives driving Spain's wind market is now time bombed to disappear in the new year thanks to a new energy law, put together behind the industry's back and passed by government emergency decree. The law will remove the twin pillars supporting the market—a production incentive payment and the safety net of a guaranteed minimum purchase price. Confidence in the Spanish wind market, one of the world's top three, is "shattered" says an industry spokesman. "Projects that should have closed in the past few weeks have been paralysed and others annulled." Read why the government has taken such a drastic step and what the industry is saying about it in the September issue of Windpower Monthly.

21. Carbon Ruling, John Etherington <eth.pbont@virgin.net> wrote on 12/21/05

For many years we have maintained that BWEA and the industry were lying when they claimed wind displaced coal fired generation and saved 0.86 tonne CO2 per MWh (= 860 g CO2 per kWh)

See for example my "Windpower and saving of CO2-emission" posted on wind-farm.org a couple of years ago.

However, it has been necessary to argue the toss about this at every separate application and even Energy Minister O'Brien's letter admitting the 'error' has not been much help.

By now some of you will already have seen an **REF press release** pointing out that Renewable Energy Systems' circular concerning Den Brook in Devon has been adjudicated against by ASA. It claimed a saving based on 860 g CO2 per kWh.

The adjudication may be read at as Complaint 2.

http://www.asa.org.uk/asa/adjudications/non_broadcast/Adjudication+Details.htm?Adjudication_id=40704

This is a milestone

Any application in which the CO2 emission is based on 0.86 tonnes can now be challenged.

It should be 0.43 tonnes - that is half as much!

Please look at any recent hard-copy documentation from developers near you - circulars or newspaper advertising etc.

If this false claim appears please submit a brief complaint to ASA using their own adjudication as 'prosecution' evidence.

1. To assist calculation. Each MW of installed wind generating capacity at 30% load factor will average 0.3 MW and therefore generate $0.3 \times 365 \times 24 = 2628$ MWh per year

This will save $2628 \times 0.43 = 1130$ tonnes CO2 per year

If the developers claim significantly more than this it can be challenged. If they claim 2260 tonnes CO2 per year they are using the false BWEA figure.

2. If you have such documentation, but are in doubt I will be happy to help.

3. I can also give advice on submitting an ASA complaint - if necessary.

We have usually written that the electricity generated by these monsters, and the CO2 emission avoided by it, is next door to worthless.

Now you can say it is: HALF of "next door to worthless"!

John

22. Windmills aren't the answer, Colby Cosh – National Post, November 21, 2006

EDMONTON – It's official: The glorious future of abundant free energy has been put on hold.

In May, the Alberta Electric System Operator (AESO) announced that the province's grid could not safely accommodate more than 900 megawatts of wind-power generation, a target that will be met late next year. Proposals for 3,000 more MW of production have been thrown into indefinite limbo at an estimated cost to producers of \$6-billion; meanwhile, the province is already spending \$1-billion to strengthen the transmission system so that even the 900-MW cap can be reached. In Ontario, meanwhile, the grid operator warned late last month that 5,000 MW -- about one-fifth of the province's current peak consumption -- is probably the absolute technological limit. (A total of 1,280 MW of wind capacity is already in operation or being built.)

It is starting to look as though wind cannot meet more than a fraction of our energy demand even if other issues with the technology, like esthetics and wildlife impacts, are ignored. The problem, as engineers skeptical of wind power have been yelling for decades, is that power usage and production constantly have to be balanced in an electrical grid. Adding too much unstable, unpredictable power to the system creates a risk of failure and cascading blackouts. In fact, the EU is investigating the possible role of Germany's heavy wind-dependence in causing a Nov. 6 blackout that hit 10 million Europeans.

The depressing corollary is that even in reaching the modest limits now being laid down by the grid police, Alberta and Ontario are relying implicitly on the relative sluggishness of their neighbours in adopting wind technology, using interconnections with other provinces and states to off-load excess power and cover shortfalls. So the system operators' warnings aren't just a sign that wind has reached a dead end in their home provinces. They also mean that B.C., Saskatchewan and parts of the U.S. Northeast will never be able to get major wind projects off the ground if they are to continue to serve as an energy release-valve for their wind-harnessing neighbours.

The industry has met the announcements with its usual optimism, pointing out that existing wind installations could be made to co-operate better with the grid if improved region-specific wind forecasting existed. But even assuming such a thing can be wished into existence, predictability is not the same thing as stability. During low-wind, high-demand periods, a drop in output still must be made good by other power sources. Since a nuclear pile can't be switched on and off like a light bulb, Ontario's hydroelectric output is already taxed to the limit and Alberta doesn't have much hydro, guess what technology steps in to fill the void? That's right -- good old Stone Age hydrocarbon burning.

This wouldn't be such a big deal if wind output were naturally synchronized with patterns of maximum power usage. But a report released last Wednesday by Energy Probe, Ontario's independent power think tank, confirms another longstanding taunt of the wind skeptics: Wind is often utterly out of sync with human activity.

Energy Probe's analysis of hour-to-hour capacity factors at Ontario wind farms shows output declining disconcertingly in the morning, just when we greedy energy hogs are getting out of bed, turning on appliances and lights, and going to work. On a month-to-month basis, data from this summer show wind output remaining flattest during the hottest periods. And the AESO has found that in Alberta's southern wind corridor, the turbines spin like crazy when the chinook is blowing and little electricity is needed; in the still air of serious cold snaps, when loads are high, the turbines grind stubbornly to a stop.

The overall result is that much of the theoretical environmental benefit from wind power cannot be realized, especially since the generators that must remain on standby to provide emergency "ramping" tend to produce more pollution per watt than round-the-clock coal and gas facilities.

But at least it's still economically free energy, right? Well, maybe. As an internationally observed rule of thumb, wind farms are expected to deliver, on average, 30% of their theoretical maximum power output. On the basis of partial data, Energy Probe expects the three major farms in its study to come in at 24%-27% over a full 12 months. And that's not even including the showpiece Windshare turbine at Toronto's CNE, which delivered a mean capacity factor of just 14.7% in its first 42 months of operation.

It must be a harrowing time for those who once thought the cool breeze could save us all from the coming ecocide. The expectations of wind advocates have already had to be minimized as they realize there is nothing inherently virtuous about their pet piece of tech. Alas, like recycling fanatics, they are likely to end up praising

wind power as a moral enterprise that "instills good habits" and signals "green consciousness," even if the honest cost-benefit analysis goes against them in the long run.

23. B&B Wind chief sells stake in company, Kate Askew, September 18, 2006

AS BABCOCK & Brown Wind Partners battles lower earnings and poor investor sentiment, it has emerged that chief executive Peter O'Connell has sold his entire stake in the company.

Early last month the specialist wind energy company surprised the sharemarket with a profit warning after what it described as "particularly unusually low wind conditions in May and June". The company's securities slumped to a record low of \$1.25. By August 14, 11 days later, Mr O'Connell presented investors with a detailed explanation of the difficulties besetting the company.

He reiterated the company had also struggled with delays in the acquisition of three Olivo wind farms in Spain, and construction of the Neiderrhein wind farm in Germany.

Only three months earlier the company had gone to institutional investors asking for funds, and had raised \$118.6 million from a book-build.

Mr O'Connell owned 716,000 stapled securities in the company. Because Mr O'Connell is not a director of Babcock & Brown Wind Partners, and is not required to disclose his holdings immediately to the Australian Stock Exchange, it is not clear when he sold his securities.

Depending on when Mr O'Connell sold, and based on the trading range of Babcock & Brown Wind Partners of \$1.25 to \$1.93, his stake could have sold for anything between \$895,000 and \$1.38 million.

Mr O'Connell's decision is at odds with the actions of Babcock & Brown's board. Company chairman Peter Hofbauer, who is also the global head of Babcock & Brown's infrastructure and project finance business, has increased his stake in the company this year.

Between July 10 and July 14, a month before the surprise downgrade was made public, Mr Hofbauer bought 717,166 securities, spending over \$1.1 million.

By September 7, the Babcock & Brown Wind board had sought to offset the impact of a worse than expected performance by upgrading the company's 2007 distribution from 11.2¢ to 12.5¢ when it released the full-year loss.

Having predicted a \$13.5 million full-year profit in its prospectus last year, the company irritated investors with a \$16.2 million loss.

At the time, Mr O'Connell said in a media release that "2006 has been a busy and productive year... Babcock & Brown Wind completed an extensive acquisition program: this saw the portfolio increase from four fully operational wind farms at the IPO, to 16." On a conference call, he said there was no need for more "material" capital raisings in the short term.

Mr O'Connell did not return calls for comment yesterday.

The former lawyer with Minter Ellison and Gilbert & Tobin was an Optus director before he went to PBL as an executive director, and then to Ten Network. Before moving to Babcock & Brown Wind Partners, Mr O'Connell was most recently managing director of Multiplex's infrastructure division.

Babcock & Brown Wind Partners last traded at \$1.42, just above the IPO price last October of \$1.40.

24. Lib win 'will kill the wind industry' by Paul Austin The Age, November 9, 2006

HUNDREDS of people employed in the booming wind energy industry will be thrown out of work if the Opposition wins the state election, one of Victoria's major regional city employers will warn today. In a passionate notice to be distributed to its 450 employees, Portland wind tower manufacturer Keppel Prince says: "Make no mistake about it - if the Liberal Party wins the election on November 25, it will effectively kill the wind industry in this town."

General manager Stephen Garner tells his workers that the Liberals' plan to abolish the Bracks Government's subsidy scheme for renewable energy would sever "the main artery to the heart of Keppel Prince".

Emphasising that he has no political connections, Mr Garner writes: "The choice you make on election day could have a major impact on Portland and our surrounding communities."

His dramatic intervention in the election campaign comes as a left-leaning national think tank nominates Victoria as the best performing state in Australia, based on economic, social and environmental measures.

The Sydney-based Evatt Foundation has put Victoria at the top of its annual "league table" of states for the first time in the survey's 13-year history. It said Victoria was the best performing state in social policy, second best on the environment (after South Australia) and fourth on economic policy (behind the boom states of Western Australia and Queensland and then NSW).

Premier Steve Bracks last night seized on the report's description of Victoria's result as "a clearly superior all-round policy performance".

But Mr Bracks added: "With today's increase in interest rates and the impact of the drought, Labor recognises there is more work to be done to meet these challenges and keep Victoria at the top."

Mr Garner said last night that two weeks ago he had pleaded with Liberal frontbencher and former leader Denis Napthine, whose electorate is based in Portland, to persuade the Opposition to embrace Labor's renewable energy scheme. When Dr Napthine said he stood by the Liberal policy to abolish the scheme, which requires energy retailers to source 10 per cent of their power from renewable energy by 2016, Mr Garner told him he felt compelled to speak out before the election.

"The wind industry can't survive without the subsidies," he said last night. In the notice to his employees, Mr Garner writes: "We employ around 450 people - 120 of whom are directly employed in the manufacture of towers for the rapidly expanding wind energy business. It is a fact that we will be employing an extra 20 people when we expand our operations to include a third shift on the two production lines. "If the Liberals are elected on November 25, not only will this cancel our plans for expansion, but we will be forced to lay off up to 80 of our existing employees." Last night he said the job losses would spread beyond his firm to about 250 people in the wind industry in Portland.

25. Peter Walsh: Labor should ditch greenies, 24 Jan 06

SINCE the 1980s, Australian Labor Party policy has been incrementally hijacked by well-heeled, self-indulgent, morally vain and would-be authoritarian activists, whom the media often misdescribes as the intelligentsia. If language had been less debauched, they would have been more accurately described as secular religious fundamentalists, as contemptuous of the values and aspirations of mainstream Australians as Mao Zedong was of Chinese peasants.

The consequences for Labor have been four successive electoral defeats. Short of a self-destructive Coalition implosion, there is little chance of reversing this electoral trend in the near future.

Some smart Labor people have been long aware of the poisoned chalice handed to Labor by green ideologues and their media cheer squad. Opposition resources spokesman Martin Ferguson is one person to have attacked their holy grail: global warming and the Kyoto Protocol. Writing on this page recently, Ferguson drew attention to the mutual exclusivity of green hostility to economic growth, the greens' self-proclaimed commitment to social justice, their Kyoto-inspired eagerness to export technically efficient Australian industry to Third World countries (thereby increasing greenhouse gas emissions), and their secular religious veto of the only economically feasible alternative to fossil fuel for base load power: nuclear energy.

To secular religious fundamentalists - and others who should know better - global warming, induced by burning fossil fuels, is responsible for all disagreeable or dangerous climatic events: extreme high temperatures, extreme low temperatures, drought, floods, dying coral reefs and rising sea levels. Never mind that one of its high priests, Stephen Schneider, was predicting a catastrophic ice age only 35 years ago. The Kyoto hypothesis, so we are told, must be accepted without reservation.

In several important respects empirical evidence does not confirm the climate model or models on which the Kyoto hypothesis is based. For example:

- * Satellite temperature sensors - the most reliable source of global temperature data - show little if any increase in the lower tropospheric temperature.

- * Precipitation on the Antarctic continent is increasing.

- * Evidence, not yet conclusive, does suggest a small rise in surface temperature since 1970, but to fit the Kyoto models this should have happened 50 years ago. It didn't.

- * Anyone who knows anything - including the authors associated with the Intergovernmental Panel on Climate Change - concedes their models are imprecise, even if they have not been designed to prop up favoured or predetermined conclusions. But Ian Castles and David Henderson's exposure of the fanciful economic statistics incorporated in IPCC models suggests they have been fiddled. If your case is immaculate, why feed lies into it?

- * Authentic history is more reliable than models, doctored or otherwise. The Vikings, who settled Greenland early in the second millennium, grew barley crops for several centuries. To do that, the climate would have to be at least 2C warmer than now, but glaciers did not melt, sea levels did not rise, coral reefs did not disappear and atmospheric carbon dioxide remained stable. How come?

To divert attention from the enormous damage ratification of Kyoto would inflict on the Australian economy, the green cheer squad asserts we are forgoing a golden opportunity to make a fortune from carbon trading. That is another lie. At best, an honest international carbon trading system would reduce, to some extent, the losses of Kyoto compliance.

But who will regulate and audit an international market? Another misbegotten, self serving and corrupt offspring of a corrupt UN? Another IPCC? In the aftermath of the oil-for-food scandal, does anybody really believe the UN would run an honest chook raffle? Asserting that carbon trading will produce windfall gains for all is cargo cultism resurrected: the hoax of the decade, or perhaps century.

Planting forests for carbon sinks has become a fashionable stunt for populist politicians. Western Australia's populist Government announced it will plant enough trees to offset emissions from its proposed desalination plant.

Recent research from Stamford University says that plants, including forests, produce 30per cent of the world's methane emissions. What about that?

Of one thing we can be certain. If rising atmospheric carbon dioxide really is a problem that threatens civilisation, Kyoto is not the answer. Nor is another populist stunt, renewable energy - unless we ignore the social and economic damage inflicted by an enormous increase in energy prices.

Parasitic rent seekers who market windmills and solar panels (and would-be rent-seeking ethanol producers) are beneficiaries of the captive market already delivered to them by mandatory renewable energy targets, so they naturally demand those targets be increased. They may run into a political problem they have not anticipated.

A proposal to establish a wind farm in Denmark, Western Australia, an area much loved and populated by politically correct green nimbies, is being torpedoed by the residents. Consequently, federal Environment Minister Ian Campbell has refused to allocate it any money from the federal renewable energy slush fund, because the green nimbies, including the local Green state parliamentarian, don't want it. Be alert for many repeats of this hypocrisy.

The only economically viable answer to the emissions problem, if indeed it is a problem, is nuclear power, as Ferguson points out. In recent years, Labor has stubbornly truckled for Green preferences, which have helped lower the party's primary vote. But if it wants to remain a major party, Labor should pay more attention to Ferguson and distance itself from a movement that alienates a large body of traditional Labor voters.

Peter Walsh was a senator and finance minister in the Hawke Labor government.

26. Wonthaggi Wind Power Shortfall, Yvonne McRae, 9 April 2006

Remember the fairy tale that 6 Wonthaggi turbines would power 6000 local homes? This was later quietly modified to 4200 homes. Well last week a group of volunteers who man the Information Centres in Inverloch and Wonthaggi were taken by bus to many local 'attractions' so they would know what to tell people about. My friend Paul was among them. The guide at the turbines showed them inside the door at the base of a tower and then informed them 'the turbines will power 1500 local homes!! So how long is this piece of string?

27. A heavy blow for wind power Cap on generation 'stalls the business' by Geoffrey Scotton, Calgary Herald, Wednesday, October 18, 2006

As much as \$6 billion in Alberta wind power proposals are in limbo and could be lost as a result of an arbitrary cap on wind power projects imposed this year, an electricity conference was told Tuesday.

Also, lack of progress in developing a longer-term regime for wind power integration and the transmission lines to carry it is becoming a serious issue, delegates heard.

"It basically has stalled the business of wind in Alberta," Claude Mindorff, president of West WindEau Inc., told a Canadian Energy Research Institute's conference on electricity. West WindEau has plans for a \$400-million windfarm near Medicine Hat, but it and others have been stymied by a cap Mindorff said "came out of nowhere."

In May, citing a potential for reliability problems for the provincial network, the Alberta Electric System Operator (AESO) -- which oversees the electricity market and transmission network in Alberta -- surprised the industry by announcing that wind power generation in Alberta, currently at about 300 megawatts (MW) of capacity, would be capped indefinitely at 900 MW. However, there are proposals for about 3,000 MW of projects above and beyond the ones already lined up and paid up to meet the 900 MW mark.

"This is costing developers a lot of money to sit back and wait. There is over \$6 billion stuck in a nice red box," said Mindorff.

John Kehler, who oversees wind power for the Alberta Electric System Operator, told the conference held in Calgary that the issues are difficult to resolve. Among the challenges are the variability of wind power, which the AESO believes will have an impact on system reliability above a certain threshold.

"Windpower is a very complex issue," said Kehler, the AESO's senior technical specialist. "I've been around for 30 years and it's one of the more challenging issues I've seen. We need to move at the right pace (and) we need to integrate wind power in a fair, balanced and reliable manner."

However, wind power industry players say the AESO is moving too slowly and is understaffed; they argue the solutions to integration issues are both already known and affordable, and they believe billions of dollars in potential generation projects are in danger.

"There is some frustration with the go-slow type of approach," said Kevin Van Koughnett, an executive of TransAlta Corp. unit VisionQuest WindElectric who spoke on behalf of the Canadian Wind Energy Association. He noted Alberta is the only jurisdiction in Canada that has imposed a cap on wind power, and that in the next few months Alberta will lose its title as Canada's leader in wind energy as its pioneering sector is eclipsed by development in Ontario and Quebec.

"If you look at the amount out there potentially in this province, there's probably \$5 billion or more of wind farm development that now is stalled or precluded. We, from an industry point of view, have never understood why you impose a cap, putting up a stop sign, stalling out the industry," said Van Koughnett.

Mindorff said the situation is absurd.

"Some people call it a threshold, some people call it a cap, some people call it a moratorium, and effectively if you're not in the 900-megawatt queue . . . you're out of luck," he said.

"You can't connect no matter how good your wind resources are, no matter whether or not you have a contract to sell energy.

"In this deregulated market, you're not allowed to connect -- and that bothers some of us immensely," he added.

Mindorff also emphasized that even a large number of the projects that are within the 900 MW limit can't get on line because of inadequate transmission infrastructure, particularly in the southeast. The AESO has \$1 billion in transmission projects planned or underway across Alberta, but that will essentially only stabilize the existing system without allowing significant new generation.

"Of those that have actually paid their money under the 900 megawatt queue, 375 megawatts are stranded, waiting for some type of transmission upgrade to allow them to connect," said Mindorff. "So, even though you're allowed to connect under the current threshold, they can't connect."

Kellan Fluckiger, executive director of the electricity division at the Alberta Department of Energy, said he has faith in the AESO and believes solutions will be found before the 900 MW cap is even reached, which could happen as early as late 2007.

"I don't think anyone at the AESO is trying to say, 'Stop wind,' " Fluckiger told the Herald.

"We certainly are not interested in damping the signal for alternative and renewable investment at all. But, at the same time, we have to deal with the fact that each technology brings its challenges. One of the challenges is how do you integrate the variability -- and you have to solve it to keep your electric system stable."

28. Monday, 23 January 2006. Experts try to determine wind farm blaze cause

Engineers from Melbourne will today begin inspecting the scene of a \$3 million fire at the Lake Bonney wind farm.

Yesterday afternoon's blaze began in a turbine located near Tantanoola.

While the flames were initially contained at the top of the structure, falling debris caused the fire to spread to the grass below.

Mike Kemp from the Country Fire Service says it is now up to engineers to determine an exact cause and whether parts of the turbine can be saved.

"We don't know the cause of it at this stage because we can't get at it, but it's probably an electrical fault in the turbine," he said.

29. Europe power outages blamed on Germany, November 5, 2006 Deutsche Presse-Agentur

A chain of power outages that swept through Belgium, France, Spain and even touched Morocco was blamed Sunday on Germany, but experts were divided about the original trigger for the blackout that affected millions of homes.

The government of North Rhine Westphalia state, which was worst hit by the outage, said a load-balancing error after a surge of power from German wind-power turbines had played a role. Too much power entered the German grid and parts of it shut down.

The temporary closure of a 380,000-volt trunk line so that a high ship could pass beneath it along the Ems river also may have played a role, the Eon company, one of Germany's four big utilities, said.

The line was re-activated and the transfer of the 294-metre Norwegian Pearl down the waterway was postponed to Monday or later.

In Germany, 1 million households suffered blackouts of up to 50 minutes at about 10 pm on Saturday night, while millions more noticed lights flicker. In France, 5 million people were left in the dark. Regions of Spain lost power. Even a cable to Morocco was affected.

German government officials immediately slammed the dominance of the big four utilities, which are unpopular because they have raised prices and are turning in excellent profits for shareholders.

Economics Minister Michael Glos demanded Eon put a report on his table 'so that such incidents, as far as possible, do not repeat.'

30. Communication, John Coulter, 9 January 06

Thank you Simon for copying your piece to the ACF Councillors. You urge the Australian Governments and industry to do more to address the Climate Change Problem and note that Australia is probably the world's worst per capita polluter. No-one would disagree. However, I think we need specific targets and a program to achieve these targets and I am doubtful whether merely urging people or governments or telling them that it can be done is sufficient. For example, you mention both the UK and Denmark and the latter is often held out as an example of success. In 2003 Denmark produced wind electricity amounting to 18.5% of its mean electrical system demand. However, this could only satisfy 6% of system demand from wind directly (because of the variability of the wind input). Denmark is in the fortunate position that it has both Sweden and Norway right next door and both these nations have very large hydro schemes that can be turned on and off quickly and, using pumped storage, can store the immediately unusable Danish power until it is needed. Very few nations are in that fortunate position. Denmark imports back again as hydroelectricity most of what it exports as wind electricity. Now one would expect that the avid pursuit of wind electricity by Denmark combined with its fortunate position close to its northern neighbours hydro schemes would show up as improved emissions, but in 2003 (the latest year available), Denmark's carbon dioxide emissions were 10.9 tonnes/capita compared to the UK's 9.5 t/cap and the UK only has 0.5% wind penetration. Finally, its worth noting that Denmark's emissions are also increasing albeit slowly. On a second point, you rightly say that there should be equitable sharing of rights to emit greenhouse gases based on per capita emissions but you fail to mention that the usual reference year for comparison is 1990. If 1990 is to be the reference year for emissions it should also be the reference year for the population which shares the allowable total. Two points arise from this:

1. Ethically, it is no more justifiable for a nation to claim a larger (increased) share in 2005 because it wants more for each of its citizens than it is for another nations to claim a larger increased share of the global total because it has increased the size of its population. If I choose to limit my future share of the global emission total by not having children by what right does another claim an increased share by having six children.

2. If one takes the allowable IPCC limit (say 60% reduction on the global 1990 emissions) it is easy to show that even the most modest increase in per capita emissions by countries with high population growth rates will exceed this limit by a wide margin even if countries like Australia and the US disappeared off the face of the planet. I hasten to add, as I did at the beginning, that this is in no way a defence of our profligate use of fossil fuels. It is to say that any claim that per capita reductions in these profligate countries will allow a modest per capita increase in poor countries while many of those countries have high population growth rates, does not stand up to the simplest mathematical analysis.

I have argued in both the Senate and in ACF Council meetings that Australia needs to cut its emissions by more than 90%. I am not convinced that this can be done while global populations remain so large but I have suggested that we should make a start by setting a reduction of 2% every year starting now - yes - now, that shares in this national limit should be equally shared and we should work hard to see how far we can go using the competitive market (working under this equitable cap). In other words start screwing down on emissions right away.

31. - MP 'lied to' over wind farm proposal, 2006 AAP, October 19, 2006

A Liberal MP says an environment department official lied to him about an unusual wind farm proposal.

Outspoken West Australian MP Wilson Tuckey said he approached the department with a plan to buy electrolysis units to improve the efficiency of wind farms and was told his idea was impossible.

"I said while the wind generator is going around at night-time and there is virtually no demand, why not make hydrogen by electrolysis - a schoolboy experiment - and use the fuel to power a conversion on your diesel motor that backs up the wind tower in times of high demand," he told the House of Representatives.

"To the minister's credit... he said what a good idea and invited me around to have a discussion with one of his officials, who lied to me for half an hour.

"The environmental public servant told me you can't store hydrogen.

"I mean there is enough hydrogen made in the world today to fuel 200 million hydrogen fuel cell motorcars, and I've got an official telling me 'oh, the atoms are too small Mr Tuckey, it would all leak out of the tank'.

"Well running around Perth is three hydrogen fuel cell buses... and of course they have fuel tanks containing hydrogen."

Mr Tuckey said wind farms were "a fraud" and never achieved better than 30 per cent of their rated capacity.

He said because wind was unpredictable, coal power stations had to burn at the same rate to prepare for surges in energy use in case the wind dropped off.

Mr Tuckey made the comments during debate over the government's Environment and Heritage Legislation Amendment Bill, which the government says clarifies its environmental responsibilities.

Labor is using the bill to attack the government over what it says is a failure to act on climate change and halt the decline in Australia's natural environment and best agricultural land.

It wants the government to establish a "climate change trigger" in the act to ensure the federal government has to assess large scale greenhouse polluting projects.

Labor also claims the bill, which gives the environment minister more power to determine sites to become heritage protected, will reduce ministerial accountability and public consultation.

32. Babcock's wind farm ran out of puff in May, Robert Clow, Energy, August 04, 2006

BABCOCK & Brown Wind Partners has found itself becalmed after two unusually windless months in May and June. The wind farm company said it had generated 100 gigawatt hours less than forecast and generated \$10 million less revenue mainly because of the delays in three Spanish wind farm acquisitions, but also because the wind did not blow in May and June.

"Wind speeds across the Spanish, German and Lake Bonney 1 wind farms during May and June have ranged between 58 per cent and 92 per cent of the long-term average," said a BBW release, which came out yesterday after the market had closed.

Earlier, BBW's shares had closed at \$1.45, down 2c.

More seriously, the company suffered from delays of several months in closing the acquisitions of its Olivo wind farms. Those delays are forecast to result in a \$9 million loss.

The company said it would generate revenue of \$67.7 million, compared with the \$77 million forecast at the time of the IPO, while earnings before interest, tax, depreciation and amortisation would fall from a predicted \$62.2 million to \$51.5 million.

The company added, however, that its distribution guidance for 2006 remained unchanged at 10.2c per share.

In the future, the company predicted, wind should not be such a problem. Next financial year BBW should have 19 wind farms operational for the whole period, giving it broad geographical diversification. The wind ought to be blowing somewhere in the world.

On Monday the company announced it had acquired interests in a Texas and a California wind farm for \$72 million.

BBW floated on the Australian Stock Exchange in November last year at \$1.40, just as most infrastructure stocks were going into a profound slump. But since then alternative energy stocks have gained in attraction.

33. Sunderland's spectacular display of 'safe' energy, Sunday Telegraph, 1st January, 2006.

Christopher Booker's Notebook (extract)

"It was like a great flaming Catherine wheel," said a Sunderland resident just before Christmas, when flames engulfed one of the six 180-foot wind turbines recently installed at a cost of £2.3 million to provide just 5 per cent of the energy needs of the Nissan car plant. After a blaze visible for miles, the fibreglass blades crashed down into a field.

It appears that the colossal confidence trick of "safe", "cheap", "environmentally friendly" wind power is finally being exposed. Plans to erect thousands more of these inefficient and expensive contraptions are arousing informed opposition throughout Britain.

Meanwhile, new figures show that Denmark, which derives 20 per cent of its power from wind - the highest percentage in Europe - not only has Europe's highest electricity bills but has also fallen short of its Kyoto and EU targets for savings on carbon emissions by a staggering 25 per cent.

The Advertising Standards Authority has just upheld a complaint against Renewable Energy Systems for exaggerating - by no less than 100 per cent - the emissions savings made by its turbines. Yet the formula used by the firm to arrive at these figures is the same used by the British Wind Energy Association and almost every other company seeking to build wind farms in Britain.

And just as the falsehoods behind the "Great Wind Scam" are being exposed, David Cameron proudly announces that he plans to erect a turbine on his roof, and recruits the charming but hopelessly naïve Zac Goldsmith as a key adviser on energy. Goldsmith is as ardently a booster of wind as he is an opponent of nuclear power - without which, in a few years, we face a complete breakdown of our energy supplies.

34. Greenie alarmists miss target, writes Alan Wood, May 03, 2006

The PM is right to resist renewable energy lobbyists,

THE biggest favour environmentalists could do any of Australia's endangered bird species is relocate them near a proposed wind farm in a swinging federal electorate with a lot of vocal opposition to the project. In Gippsland in Victoria, say.

Actually, the orange-bellied parrot has been smart enough, or lucky enough, to locate itself there already, at least for part of the year. As a result federal Environment Minister Ian Campbell has pulled the plug on a \$220 million wind farm at Bald Hills.

At least he thinks he has; there is a court challenge. If you pay any attention to current affairs, you should already know all of this.

But the issue isn't really the parrot, it is wind farms. Campbell has done the right thing for the wrong reason.

His veto was transparently exercised for political advantage and not because he is opposed to wind farms as an uneconomic, costly gimmick. On the contrary, he thinks they are, to quote from a recent ABC interview, "an incredibly important part of a clean, low-carbon future for the country".

We shouldn't be surprised, I suppose. His feet were hardly on the ministerial carpet before he showed obvious signs of capture by climate change alarmists.

He recently acknowledged Tim "Flim Flam" Flannery and his error-prone book *The Weather Makers* as an admired source on climate change science.

Far from being an incredibly important part of a low-carbon future, the share of global energy demand satisfied by wind power over the next 50 years will be marginal compared with carbon-based energy.

Relying on it would be like hoping a group of greenies peeing into the Murray River could restore its flow.

Campbell got much closer to the real issues involved when he said in the same ABC interview quoted above that wind farms in Australia "rely heavily on the federal Government for support". Indeed they do.

The support is both regulatory - compelling the use of high-cost wind power in the electricity grid - and financial, through subsidies. As governments have no money of their own, this means wind farm developers have their hands in taxpayers' pockets.

To what benefit? Electricity from wind farms costs double or more than that from coal-fired power plants and is unreliable, adding further to power costs. The Victorian Government has admitted that the Green Power scheme to encourage consumers to use more expensive green power has been a less than resounding success. The obvious Labor solution is more government regulatory compulsion, bigger subsidies and increased green power targets. The pay-off is to be a green power industry for Australia, dominated by wind power, with wonderful investment and employment benefits.

It is hardly surprising the big energy companies are keen on investing in wind power when they have taxpayers and governments underwriting their profits and guaranteeing their market share. Nor that they want government targets for wind power generation raised substantially.

As for employment, there are jobs, but at what cost? Alan Moran from the Institute of Public Affairs had a stab at working out the answer in a recent submission to the Victorian Government's issues paper, *Driving Investment in Renewable Energy in Victoria*. He calculated that the government subsidy for long-term employees in the industry was between \$599,565 and \$999,782 per year, per job.

"For decades Australia sought to secure jobs through tariff protection on manufactures, only to see rising unemployment and a mounting need for protection," Moran says. "*The brutal facts are that a subsidy for one job means a tax on existing jobs.* The net outcome is, at best, no effect on employment but a negative effect on competitiveness and overall wage and income levels."

Overseas experience is also instructive. Denmark leads the world in the use of wind power. According to Moran, last year its entire wind generation capacity effectively collapsed when wind speeds caused the automatic shutdown of virtually every wind turbine in the country.

According to Denmark's transmission system operator, Eltra, it has gone from one of the countries with the cheapest electricity in Europe to one of the most expensive.

And why is Australia doing all this? Because of climate change scaremongering and absurd claims it is a leading global emitter of greenhouse gases. According to a fact sheet from the wind farm lobby group, the Australian Wind Energy Association, Australia has the highest per capita greenhouse gas emissions in the developed world.

So what? *The only relevant statistic is its share of global greenhouse gas emissions: about 1 per cent.* As John Howard told a visibly staggered British Prime Minister Tony Blair, if Australia shut down all of its greenhouse emissions tomorrow (causing extensive unemployment and recession), China would make up for our emissions entirely in 10 months. Greenhouse panic is based on alarmist climate change scenarios produced by the UN's Intergovernmental Panel on Climate Change, a body showing increasing signs of being governed by greenhouse politics rather than objective science.

The only good news is that so far the Howard Government has resisted powerful lobbying from companies with a vested interest in renewable energy projects and Labor state governments eager for green votes to bump up its Mandatory Renewable Energy Target.

This target has already been covertly doubled by successful lobbying from the 2 per cent of electricity consumption announced by Howard in 1997 to 4 per cent by 2010.

It shouldn't be allowed to blow out any further unless there is more compelling evidence than we have at present of a looming climate change catastrophe, or renewable energy can stand on its own two feet commercially.

35. Comment by Kent Hawkins, Picton Ontario Canada, on the Institute of Public Affairs Report - 'Regulatory Subsidies to Renewable Energy In Victoria, A submission to the Victorian Government's Issues Paper "Driving Investment in Renewable Energy in Victoria" by Alan Moran Feb 2006

I have read the document, which I found to be fairly good on the whole. Thank you for sending it and it will become part of my library of research material. I have some comments on it that you might be interested in. These comments are not intended as being highly critical of what appears to be a well thought out and presented document but to give you a further perspective. In summary, I believe that the document errs too much in giving wind the maximum benefit of the doubt.

On page 5, the costs of wind power are quoted at \$75-80 per MWh, which I assume to be in Australian dollars (AUD). There are two comments on these rates. They are too low to begin with and are likely based on a capacity factor of 30-35% or more, which is not generally realistic for any appreciable windfarm implementation. The Royal Academy of Engineering (RAE) in the UK puts onshore wind costs at \$93 AUD per MWh (3.7pence per KWh), if I have the correct exchange rate. The RAE calculations exclude backup and use a 35% capacity factor, which they admit to be generous. Notwithstanding any other discussions about capacity factor in the report, I think that you will find, if looked into, that the quoted rates are based on such high capacity factors.

The following analysis will be based on the quoted rates (\$75-80 per MWh), which errs on the side of being generous to wind. Another starting assumption is that these rates are based on a capacity factor of 35%, which is consistent with the RAE analysis. When these costs are adjusted to more realistic capacity factors (15-20%) the costs increase to double this, that is \$150-160 per MWh (the same costs over one-half of the production).

Capacity factor is more a measure of how windfarm operators are paid than how windfarms perform within an total generation portfolio. Capacity *credit* is a measure of this performance. With wind penetrations in the mid-teens, the capacity *credit* for windfarms is less than 10%. On the same page the concept of capacity credit is touched upon as follows "Wind power has a level of firm reliability variously estimated at between 4% and 10% of its capacity". This is capacity credit and is confirmed by E.ON Netz, which has 7,000 MW of windfarms in their distribution system in Germany. E.ON Netz also find that wind requires 90% backup, the flip side of capacity credit.

On the subject of backup, the report then goes on to say that "Such capacity in the form of fast start plant, is estimated to cost some \$10 per MWh". According to the study performed by the RAE, the costs of operating such plant as wind backup is \$43 per MWh (1.7 pence per KWh). This did not take into account a more realistic capacity factor and the inefficient operation of the gas turbine plant acting as backup, which could be 10-15% above that of normal operation for this plant. The increase in backup would be from 65% to 90% of wind capacity resulting in a 38% (90/65) increase in cost, yielding costs of \$59 (1.38 x 43). The fuel consumption as a percentage increase is higher than the increase in inefficiency, so assume 15% for fuel inefficiency. This puts the costs of backup in the range of \$68 per MWh. The stated extra cost of backup of \$10 per MWh is hard to accept in the light of these considerations.

Consider who bears this backup cost. It is not the windfarm operators, but, in the first instance it is the operator of the backup generation plant. Also consider the effect of any addition of a carbon tax on fossil fuel generation. Again the backup generation operator would bear the cost. In addition, analyses rarely consider the cost of grid integration of windfarm output and the increased costs of operations and maintenance of the backup plant, which depends significantly on the number of stop/starts experienced. You also mentioned that under some conditions windfarms are net consumers of electric power (for which they may not pay). In the final analysis these costs are passed on to the rest of us and illustrates a measure of how much the costs of windfarms are hidden.

The inefficiency consideration is like highway versus city driving for a car. For the Honda Civic, one of the most fuel efficient cars, this is 40 miles per gallon versus 30 miles per gallon, or a 25% loss in efficiency.

Incidentally 90% of the wind capacity acting as backup and operating at 15% less efficiency yields the backup acting like an equivalent of 99% of wind capacity. So much for reduced CO2 emissions.

In the case of Michael Laughton's calculations, they are overly generous to wind, suggesting backup in the range of 67% and 75% for penetrations of 10% and 20%, respectively (high capacity factors rear their heads again).

Finally, Laughton's first conclusion on page 9 that plant margin of 20% "...would never be reduced to less than 9 or 10%" is remarkable. My understanding is that this 20% margin is deemed necessary for planned outages, unexpected plant failure, and extreme weather conditions. Wind would almost continuously (that is frequently, not occasionally) compromise the 20% deemed necessary. Additional plant would have to be added to restore the 20% margin. In checking into some of his calculations elsewhere I find that Laughton assumes an overall security of supply of 90% versus what I understand to be a more prudent 99% used by organizations that have responsibility to deliver electricity, like E.ON Netz in Germany, which may explain some of this. Would you travel in an airplane with a 90% chance of not crashing (or even a 99% chance for that matter as far as airplanes are concerned)?

In summary, my calculations show a total cost of wind to be \$150-160 plus \$68 or \$218-228 AUD per MWh. Given that coal generation produces approximately 1 ton of CO2e per MWh gives wind a CO2e mitigation cost of \$218-228 per ton. This compares favourably to studies of CO2e mitigation costs for windfarms done by: the Renewable Energy Foundation (UK) - \$181 USD per tonne (213 AUD per ton); ESB National Grid (Ireland) - 138 euros per tonne (213 AUD per ton); and the University of Victoria (Canada) 140 euros per tonne (216 AUD per ton). These studies took various approaches and treatments of the factors described above.

On a final note, if the net effect of windfarms is no reduction in CO2e emissions, the divisor in the equation approaches 0 tonnes and the cost per tonne approaches infinity.

If you would like more information or references please let me know. Hope this is of interest.

36. The Great Southern Star, Five turbines 'off line', 9 Jan 2007

ALMOST half of the Toora wind farm turbines are out of operation and they won't be back on line at least until the end of the month. Owner/operator, Stanwell Corporation, said

Three turbines were taken "off-line" because of gearbox faults late last year, one in October and two in December.

Another two turbines broke down after the recent bushfires in Victoria's northeast, according to Stanwell, which means only seven turbines are operating. It is not certain when the energy facility will be back to full strength.

"We don't know how long the wind turbines will be out of service, but we anticipate a staged return to operation may be possible starting from the end of January 2007" a Stanwell spokesperson said.

The latest power crashes have been blamed on the heat and fires.

"Power supply interruptions on the high voltage electricity transmission line, which connects to the Toora wind farm, appear to have been a result of hot weather conditions and bushfires," the spokesperson said.

"These power supply interruptions have caused instability to some parts of the Victorian electricity transmission and distribution system."

"During the early hours of Friday, December 22, power supply interruptions on this transmission line occurred, which not only disrupted the power supply in the transmission line, but also appeared to have caused a power surge.

"This power surge resulted in damage to the wind turbine generator transformers on two turbines at the Toora wind farm. These wind turbine generator transformers will require replacement prior to the wind turbines being returned to service."

The company has arranged for two spare transformers and specialist lifting equipment so that repairs can be made this month. The three wind turbines out of order since last year were "taken off-line as a precautionary measure, while a gearbox bearing fault is investigated," the spokesperson said.

"One wind turbine was taken off-line in October, when the company detected a bearing fault in the gear box. A further investigation detected two more faults and the turbines were being taken off-line after showing early signs of a similar issue.

"Stanwell is working with the wind turbine manufacturers and other engineering specialists to determine the cause of this fault. Options have been identified to assist the wind farm in returning to normal operations.

"To expedite the repair, a replacement gearbox for the first turbine has been sourced from the original overseas equipment manufacturer.

"Investigations are also underway to engage a company capable of accessing spare parts and carrying out suitable repairs on the other two wind turbines' gearboxes."

37. European Wind Integration Study, Kent Hawkins

The European Transmission System Operators have just released a report entitled European Wind Integration Study (EWIS): Towards a Successful Integration of Wind Power into European Electricity Grids - Final Report January 15, 2007.

Under their Main Findings on page 2 "Grid congestions - Need for additional/new grid infrastructure", in case you need further evidence of the high backup requirements for wind, note "The variable contributions from wind power must be balanced almost completely with other back-up generation capacity located elsewhere."

In summary the report seems to say that if we have to have [politically mandated] wind here is what must be done, and more study is required.

Here is where you can get the report <http://www.windaction.org/documents/7995> Go to bottom of page and follow the link to a pdf document.

38. Subsidy for green power by Mathew Murphy, The Age, March 30, 2006

VICTORIANS may be forced to pay more for electricity under a Bracks Government plan to boost "green" energy output.

The move comes after the Government conceded it would not meet an election promise on wind farm energy targets.

The Age believes that the Government will introduce legislation into Parliament before the November election which would require energy retailers to generate a higher percentage of their power from renewable sources such as wind, water and solar.

A state-based renewable energy scheme is likely to be announced within months in a bid to ensure continued investment in the renewable energy industry in Victoria.

The Government has also promised that 10 per cent of electricity would be from renewable sources by 2010.

Industry experts yesterday said that promise was more likely to be fulfilled if a state-based scheme went ahead, but the average household electricity bill of \$800 a year could rise by up to 6 per cent, or \$48 per year.

Energy Industries Minister Theo Theophanous told Parliament this week that the Government would not be able to meet its target of 1000 megawatts of installed wind power by the end of this year.

Energy companies have installed about 120 megawatts of wind energy in Victoria. More farms designed to produce a further 500 megawatts have been approved, but are yet to be built and commissioned.

Mr Theophanous said the Federal Government's decision to cap its Mandatory Renewable Energy Target scheme meant it was too easy for energy retailers to meet its requirement of renewable energy. Without a Victorian-based scheme the future of the industry was at risk.

"Without such a scheme and in the current circumstances (the 1000-megawatt target) probably will not occur," he said.

Mr Theophanous said the Government was closely examining the prospects of a state scheme, but warned it "must stack up in economic terms". He said such a scheme would require legislation and the Government was "finalising matters".

"The objective is to double Victoria's renewable energy sources and establish a renewable energy industry to drive technology and place Victoria as the renewable energy hub in the South Pacific," he said.

Some companies such as Origin Energy have criticised the idea of a Victorian-based scheme, saying the narrow geographic base would force a reliance on wind power.

Opposition energy spokesman Philip Davis said the Government would have to substantially subsidise wind energy because of its cost compared with using brown coal.

"It is clear that the Victorian Government promise on wind energy has run out of puff," he said.

"Even if they did set up a Victorian renewable energy scheme it would not be in place in time for this commitment to be met."

He said Victorians would have to prop up the wind industry.

39. Wind Power - 'Variable' or 'Intermittent'? - A Problem Whatever the Word by Dr. John Etherington in iberica2000, January, 2006

A Research Into the Achilles' Heel of the Wind Industry. With a wealth of examples and references, Dr. Etherington enlightens us on the principal weakness of windfarms: their erratic, unpredictable production of electricity. A modern economy cannot afford blackouts, so wind power production must be backed up 24h a day by conventional power, which substantially reduces the CO2 savings

Introduction

A car engine will run without its battery. But stop the engine and you are electrically dead - the engine cannot be started again and if it is dark you have no lights.

That is the problem of intermittency and despite squirming and turning by government, it is the problem of wind power - when the "wind engine" stops, there is no power.

For a few days in a year there is no significant electricity at all from wind turbines in Britain. For the majority of the days in the year they produce far less than half of their potential maximum (1). This is why the average yield (load factor) of wind power in the UK was just 25.4% for the last two reported years (2003-4).

At present there is no economically viable way of storing electricity in quantities sufficient to smooth wind power generation through periods of low generation and for that reason wind stations must be coupled to the conventional electricity system which provides the necessary backup.

The argument which has raged around this requirement concerns need for dedicated backup, stability of electrical supply and the claims for saving of CO2 emission by displacement of fossil fuelled generation.

"Intermittency is a problem"

Twelve years ago I wrote of wind "farms" - "(Because) they fail to generate in windless periods cannot even replace the conventional stations..." (2).

The BWEA has long known this to be the case: - In answer to its FAQ "What happens when the wind stops blowing?" the reply is "... electricity continues to be provided by other forms of generation, such as gas etc. Our electricity system is mostly made up of large power stations, and the system has to be able to cope if one of these large plants goes out of action." (3).

A recent report by the UK Energy Research Council (4) was aimed at answering claims that intermittency is a problem. Despite this, the report admits that "Wind generation does mean that the output of fossil fuel-plant needs to be adjusted more frequently, to cope with fluctuations in output. Some power stations will be operated below their maximum output to facilitate this, and extra system balancing reserves will be needed. Efficiency may be reduced as a result."

The Department of Trade and Industry (DTI) has been warned of the intermittency problem. In a 2003 BBC 2 documentary, Dr Dieter Helm, Energy Economist and Fellow in Economics, New College, Oxford, commented on wind power:

- "What we know, is the wind blows sufficient for these windmills to be producing about 35%, perhaps 40% of the time. So the paradox of building windmills is that you have to build a lot of ordinary power stations to back them up and those are going to be almost certainly gas in the short to medium term and that's what's required. If you ask the question who's making sure that there's enough gas stations out there to back up the windmills the answer is nobody." (5)

Dr Helm has been on the DTI Energy Advisory Panel since 1993 (I think even the industry would now agree Dr Helm's upper limit of 40% was over-optimistic and the lower limit would be nearer 20%).

The most recent and positive statement that there is a problem is in a 2006 report to the Scottish Executive (6) which inter alia concludes: -

"Nevertheless there will be many hours in a year when renewable output from wind, waves and tidal currents falls below demand targets and balancing plant would be needed."

Reports from the wind power generating companies are even more damning. The German company E.ON Netz is operator of the largest assemblage of wind turbines in the world. In 2004 it admitted that every megawatt (MW) of installed wind capacity required 0.8 MW of backup from 'shadow power stations' (7.a), and in 2005 went further: -

"... Dependence on the prevailing wind conditions means that wind power has a limited load factor even when technically available. It is not possible to guarantee its use for the continual cover of electricity consumption. Consequently, traditional power stations with capacities equal to 90% of the installed wind power capacity must be permanently online in order to guarantee power supply at all times." (7.b)

The E.ON area is well away from the Atlantic coast and suggestions have been made that its large requirement for backup is consequent on lower wind speeds and load factor than prevail in the UK (8). However the Irish National Grid (ESB) has reported similar problems in a windier climate than mainland UK: - "As wind contribution increases, the effectiveness of adding additional wind to reduce emissions diminishes (and) the cost will be very substantial because of the back up need" (9).

"Intermittency is not a problem"

The DTI denies this problem. Its web page, Wind power: 10 myths explained tells us that:

"Back-up generation is already in place to cover shut-downs of other forms of generation; little further back-up will be needed up to 2010 to cover periods when wind and other renewables generation is low." (10)

Rather more vehement in denial is a recent report, commissioned by the DTI from the Oxford Environmental Change Institute (11), purporting to demolish the argument for a backup requirement by claiming that the wind always blows somewhere in the UK. This caused Energy Minister, Malcolm Wicks to say "This new research is a nail in the coffin of some of the exaggerated myths peddled by opponents of wind power." (Independent, November 14 2005). However the Oxford report simply compared the incidence of wind speed permitting "no generation" versus wind speed allowing "some generation", however little. Had it compared incidence of generation above a sensible threshold (say 20%) with incidence of maximum generation it would have been apparent that in anticyclonic weather there are many occasions per year when the whole UK wind fleet would be contributing very little.

This was indeed realised by the House of Lords Science and Technology Committee in Feb 2004 when Baroness Platt of Writtle questioned Mr Sinden, the lead author of the report. He replied: -

"The analysis that I ran was of wind speeds being so low that electricity would not be generated... If you raise the bar higher and say "We want 20 per cent output or 30 per cent output" then it may look a little bit different but we have not carried out that analysis." (12)

Is there a consensus?

Reading the above account no one could be blamed for concluding that this was one of those childhood exchanges - "tis... tisn't... tis... tisn't..." and so on forever.

That this is happening and that the British Wind Energy Association and UK government are devoting so much effort to disproving the obvious, seems proof enough to me. The EON report was written by working wind power engineers - so was the ESB report. These reports say intermittency is a serious problem on the Atlantic seaboard and further away in Germany on the fringes of continental Europe. It will be a problem here in the UK, whatever the DTI wishes us to believe.

I discount the Oxford report which accidentally (or deliberately) used a zero generation as a baseline and thus concluded that there would always be "some" generation - so what if a few turbines on an outer Scottish island may be lazily turning?

Several of the reports I have quoted also suggest there is no real problem up to the 2010 target of 10% of electricity from all renewables - of which 75% to 80% will have to be wind. The reason given is that there is already back-up in place.

BWEA's FAQ for example claims: - "When the wind stops blowing, electricity continues to be provided by other forms of generation, such as gas etc. Our electricity system is mostly made up of large power stations, and the system has to be able to cope if one of these large plants goes out of action. It is possible to have up to 10% of the country's needs met by intermittent energy sources such as wind energy, without having to make any significant changes to the way the system operates." (13).

The UKERC 2006 report (4) similarly claims "... there may already be more than sufficient reserve capacity on the system to deal with intermittency – particularly if the amount of intermittent generation is a small proportion of total supply."

It is quite correct that reserve capacity is provided for the conventional generating system. The National Grid plc aims for a system margin of about 20% over peak demand thus insuring against generating plant or transmission failure. Some of this spare capacity would be on 'hot standby', i.e. connected to the network and operating at part load to ensure a stability of connection as in the case of steam plant, or available for instant start-up and connection as is the case for hydro and gas-turbine plant (14).

It is this "instant start-up" component which wind-power calls upon to smooth its short term vagaries and it is dishonest of the wind power industry and DTI to claim "The reserves needed to guard against loss of a large power station will readily cope with the small perturbations due to the wind" (15). This may be true at the moment, with wind power providing less than one percent of average generation from an installed capacity of just 1500 MW but if the contribution of wind power should rise to (say) 10% of average generation i.e. 4,500 MW we would need a wind installed capacity of up to 18,000 MW to provide it (at a load factor of 25%).

Thus within a period of just a few hours, wind output could swing by a substantial fraction of 18,000 MW, balanced against that peak load insurance of 20% (which represents about 11,000 MW). It can't be done. We shall in due course need a bigger insurance policy and as Dr Helm said, for the DTI (5. above) "the paradox of building windmills is that you have to build a lot of ordinary power stations to back them up..."

This problems has already arisen in other countries. On March 1, 2005 the Spanish grid operator, Red Electrica Española, advised 300 heavy electricity users it was going to avail itself of the interruption clause in their contract. Then, their electricity supply was cut off. The reason for this was made clear by a Radio España's Radio Litoral news bulletin which explained the "brownout", saying the wind had dropped and reduced the electricity production of 11,000 windmills to 700 MW. Spain was unprecedentedly cold at the time, demand for electricity was high, gas reserves were low, and 5,000 MW of reserve capacity were out of commission, so the loss of wind power created a risk of blackout. Hence the decision to pre-empt by reducing

demand in a controlled sector. It is not fortuitous that almost 6.9 GW of new gas-fired CCGT plant has been installed in Spain since 2002, and a further 6.8 GW is under construction!

It is my view that the BWEA and the DTI are misleading us over this matter. There is certainly no consensus that intermittent wind power can be fed into our electricity network in large quantities without action being taken, soon, to ensure stability.

The consequences of intermittency

It is not a serious failing in itself that wind power is unpredictably intermittent in yield. The corn miller charged sufficient in producing his flour to compensate for his enforced idleness when the wind did not blow - and the trade became proverbially dishonest (16)!

Rainfall, likewise, is intermittent and yet all life depends upon it. However water can be stored, but electricity cannot, at least not economically in huge quantities. So - it is not that wind generation is "inefficient" (an unfortunate and inappropriate word) but the fact that every kilowatt hour of electricity from these machines must be used instantaneously or "spilled" (another unfortunate weasel word meaning, in truth, that wind turbines have to be shut-down).

The problem is most easily solved if the wind electricity is fed directly into a nationwide grid system in which other flexible sources can be "switched-on" or "off" at very short notice. Such sources are conventional fossil-fuelled generators and using them to balance wind and other renewables imposes limitations and unavoidable expense.

Security of supply and need for backup

There is no argument about the need for some form of backup to compensate for the vagary of wind power (3, 4 & 5 above). This is indeed accepted by the industry and it is dishonest to suggest that we can continue progressively to compromise the existing backup insurance as the DTI has suggested (15). Wind power is already twice as expensive as conventional generation, a fact camouflaged by the covert subsidy of the Renewables Obligation. The main reason that the wind power industry is attempting to deflect discussion of the looming need for dedicated backup is that it will further increase prices, as well as negating some of the saving of CO2 emission.

CO2 emission and fossil fuel consumption

The rush into wind power has primarily been justified by the perceived need to reduce CO2 emission by limiting fossil fuel consumption.

If wind power is fed into the electricity network it displaces thermal generation of which the fossil fuelled component emits CO2. "It is unambiguously the case that wind energy can displace fossil fuel-based generation, reducing both fuel use and carbon dioxide emissions." (4.) But "the paradox of building windmills is that you have to build a lot of ordinary power stations to back them up..." (5 - above). Those ordinary power stations will emit CO2. It is not feasible to use nuclear generation for rapid response backup. Consequently fuel-use and CO2 emission is not reduced proportionally in ratio between MWh of wind and MWh of thermal generation.

Various workers have attempted to quantify this relationship.

A Tyndall Centre project concluded in 2004: - "Due to a disproportion between the conventional capacity and the energy substitution by the wind source, a considerable number of thermal plants will be running at low output levels over a significant proportion of their operational time in order to accommodate wind energy. Consequently these plants will have to compromise on their efficiency, resulting in increased levels of fuel consumption as well as emissions per unit of electricity produced." (17)

The degree to which control of CO2 emission is compromised is still a matter of argument. West Denmark, with the highest per capita proportion of wind power generation in the world has been warned "Increased development of wind turbines does not reduce Danish CO2 emissions" (beyond the present capacity) (18)

Some engineers have indeed suggested that the entire displacement of CO2 may be negated by the need for balancing generation. Bass and Wilmot (2004), indeed, concluded for a worst-case scenario, that their analysis "suggests that the current 'Dash for Wind' could actually make the situation worse." (19).

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40. Wind farms "will mean higher bills" by Elaine Bowers 11 August 2006

WIND FARMS could cost the British public a staggering £30,000 million.

Sir Donald Miller, the former chairman of Scottish power, made the revelation yesterday during the enquiry into the proposed wind farm at Greenock's Corlic Hill.

He said the burden of the cost of subsidising wind farms across the country is likely to be met by customers who will face an increase in their electricity bills. Sir Donald said if wind farms go ahead, bills of £30,000 million will run up before 2020.

And he pointed out the amount involved was more than this year's education budget for the UK and more than half of the total money available for national health services.

Sir Donald who is retired and lives in Kilmacolm, told the inquiry: "My objections to this development are biased on the visual intrusion, the noise and the costs. I hope it is not too late to prevent this illogical, costly and ineffective desecration of our countryside".

In the statement presented to the enquiry he said it was "no wonder that wind farm development has been linked to subsidy farming".

He added: "it is surely time the electricity customer was made aware of these massive subsidies which are being awarded to wind power developers in his name".

Sir Donald said it was "difficult to believe this muddled and damaging policy is being perused when fuel poverty is still a major issue for many households and when the Chancellor is expressing concerns about the competitiveness of British Industry".

He expressed a view that "such massive sums would be more effectively employed in securing economic and reliable electricity supplies for the future, for example developing the more efficient cleaner coal technology such as that advocated by Babcocks".

A decision of the plan will be given later.

41. Europe-wide blackout hints at renewable cause, Environment Times, December 5, 2006

The Renewable Energy Foundation is claiming that uncontrolled renewable energy in the form of wind power was a key factor in the grid disturbance and blackout that affected millions in Europe. They write:

' Europe's principal grid authority the "Union for the Co-ordination of Transmission of Electricity" (UCTE) has published a detailed interim report into the grid disturbance that left 15 million households without power, and came close to resulting in a pan-European blackout.

The report reveals that the causes of the event were multi-factorial, but that the key trigger was an unexpected rise in the load on the Landesbergen-Wehrendorf grid link, which joins the grid control areas of E.ON Netz and RWE.

The precise causes of this increase are at present not clear, or have not yet been published, but the role of an unpredicted rise in wind generation (documented by E.ON Netz) appears to be a potentially important feature.

Moreover, UCTE makes it clear that the subsequent behaviour of uncontrollable wind generation was a significant factor in the development of the crisis and the difficulties that the grid operators experienced in restoring the service.

UCTE notes (p. 25) that 60% of wind units tripped in response to the emerging crisis, and then began automatically reconnecting (p. 26ff) exacerbating an already grave situation (p. 30).

John Constable, Director of Policy and Research at the Renewable Energy Foundation said: "The regrettable part played by uncontrollable renewable generation in the European grid crisis of 4th November graphically illustrates the need for scrupulous engineering in UK renewable energy policy.

"At present too much is being left to politics and to chance. This is bad for everybody, and particularly bad for the renewables sector itself."

LINKS

Renewable Energy Foundation
<http://www.ref.org.uk>

Union for the Co-ordination of Transmission of Electricity" (UCTE) interim report into the grid disturbance
<http://www.ucte.org/>

For additional information see the report of E.ON Netz on <http://www.eon-netz.com/>

Web link: <http://www.environmenttimes.co.uk/cgi-local/newspr...>

42. MELBOURNE, Aug 3 AAP - Plans for a 14-turbine wind farm near Ballarat have been scrapped on commercial grounds.

A feasibility study by Wind Power Pty Ltd showed residential growth would limit the project at Bo Beep, 12km west of Ballarat, to four turbines at most, and would not be economically viable. The company already operates a six-turbine wind farm in the state's east and has mounted a legal challenge to federal Environment Minister Ian Campbell's rejection of its \$220 million 52-turbine proposal at Bald Hills in South Gippsland. But a lobby group which opposes wind farms said Wind Power's decision to drop the Bo Peep proposal in the marginal federal Labor seat of Ballarat raised questions about its relationship with the state Victorian Labor government. The company's director Andrew Newbold rejected allegations the wind farm industry had become too close to the state government. "Certainly we are not in bed with government," Mr Newbold told ABC radio. "We work constructively with government. Government has put out a policy which they think is in the best interests of all Victorians. "We're a small Victorian company that's seeking to fulfil that policy."

The state government's decision last month to set a renewable energy target of 10 per cent for the state's power supply has given a considerable boost to the emerging wind industry. Tarwin Valley Coastal Guardians issued a statement today questioning the integrity of the state's planning process for wind energy. "It is simply amazing of the 14 facilities constructed, approved or close to approval in Victoria only two are in Labor seats," the group's spokesman Tim Le Roy said. "There needs to be a public inquiry into who will really benefit from (Victorian Premier Steve) Bracks' wind policy. There are just too many convenient coincidences here." Mr Le Roy said the planning process could easily be manipulated "to suit the politics of the day". "Three wedge-tailed eagles a year, out of a population greater than 100,000, can stop a wind facility near Ballan (in a Labor seat)," he said, referring to the state government's rejection of another project last year. "Yet the full force of the Bracks' media machine is unleashed due to the threat to the orange-bellied parrot, of which only about 200 survive in the world, in a Liberal/National seat." Senator Campbell has blocked Wind Power's proposal at Bald Hills, citing a theoretical threat to the endangered orange-bellied parrot.

The state government has in turn accused Senator Campbell of using a potential but minimal threat to the parrot as a pretext to garner political support in the local seat of McMillan.

Mr Newbold said his company's decision to drop the Bo Peep proposal was "a purely commercial one and taking account of local factors". "It strikes me that if we're proceeding with one (project) we get hammered and if decide to not proceed with one for good sound reasons ... also there are accusations against us."

43. [A Critique by Ted Trainer Social Work Univ. of NSW Kensington of "Clean Energy Futures for Australia"](#), by M. Diesendorf, H. Sadler and R. Denniss, (2004), Clean Energy Futures Group, Melbourne

Renewable energy.

The most challengeable elements in the study concern the contributions renewable energy sources are claimed to be capable of making. The general claim is that these plus use of natural gas can meet demand in 2040 and there is no hint of any problem in renewable energy sources being able to meet demand in subsequent years. Indeed the above quote asserts without qualification that renewables can meet demand.

Except for biomass and to some extent wind renewable technologies are described briefly without considering quantitative limits or deriving conclusions about the quantities they can provide, and the conclusions re contributions to the 2040 energy mix are stated not argued.

Wind; The main problem re wind energy is to do with variability and therefore the fraction of demand it can meet. The study gives an inadequate and misleading analysis of this problem. It claims it is a myth that "Since wind is an intermittent source it cannot replace coal fired power unless it has expensive dedicated long term storage." This is said to have been refuted by theoretical studies carried out 20 years ago.

Obviously wind can replace some coal-fired capacity, but the focal question is how much. The study says "It may well be possible to operate an electricity grid with 40% or more of its energy generated from the wind." "Denmark generates 18% of its electricity from wind." Firstly Denmark's electrical production is equal to about 18% of its consumption, but the proportion of Denmark's electricity demand met by wind is only around 5%, and there are significant problems of integration. Denmark has been able to develop wind energy extensively because of its capacity to frequently sell excess energy to neighbouring countries (and buy electricity from them at high prices.) Australia will not be able to do this. The situation in Germany, with the world's highest commitment to wind energy, seems worse, with wind contributing under 5% of national electricity use and serious integration problems being encountered. In the E.On Netz supply system, Germany's largest wind company, annual wind capacity was a remarkable 16% in 2003, and 19% in 2004... a long way below the 35 or 40% typically assumed by wind enthusiasts. Denmark is usually regarded as the leading wind nation and is in one of the best wind regions in the world, yet the average infeed capacity of its wind energy system in 2003 was 17%. (Sharman, 2005.)

A number of sources indicate that wind begins to cause significant integration problems when it approaches 10-15% of demand, and that the limit even in good regions such as the UK is probably 20%.

The study discusses the capacity to back up wind power sources by gas generators when winds are low, but fails to recognise that wind seems to have a very low "capacity credit"; i.e., it does not eliminate much need for fossil fuel plant.

It is probable that where wind is a significant contributor little fossil fuel capacity could be retired. Wind varies greatly over time and sometimes there are days on end with little or no wind, even in good sites. This means that almost as much back up capacity as wind capacity must always be available. The E.On Netz reports stress the issue of "capacity credit" (as does Sharman re Denmark and the UK.) If we build a lot more windmills we must also build a lot more coal, gas or nuclear power stations to turn to when the winds are down (...and grid extensions, and grid reinforcements to move large surpluses of wind energy around.)

The evidence is that wind creates little "capacity credit", perhaps 20% at best according to the E. On Netz reports, and much less according to others. The Clean Energy Futures report in effect recognises this later by saying that "...to maintain reliability ... (in a 2GW system)...up to 300MW of peak load gas turbines may have to be installed."..fossil fuel equal to half the wind system capacity (optimistically) expected.

Wind advocates often assume that dams can easily provide the necessary storage capacity to smooth out variability in wind generation. World hydro-electric capacity is only about 8% of world electricity use, so dams could not substitute for much wind capacity in a system with more than a small contribution from wind.

This means that, as has been pointed out by various people, wind is not a replacement for coal or nuclear capacity — it is an alternative. If we build a system with a lot of wind capacity we must also build almost as much coal, gas or nuclear capacity that will stand idle much of the time but have to be turned to when winds are down. One major implication is that the usually quoted capital cost of wind power, c \$1000/kW is quite misleading. Firstly this is a peak figure and so in a system with a .16 capacity the figure per kW of electricity delivered is \$7000. But then we should add the cost of the grid extensions and reinforcements, and of the additional perhaps .8 kW of fossil or nuclear plant that must also be built. So the real all-in capital cost of a wind system will be close to 10 times the figure wind enthusiasts usually state.

Easily overlooked is the need to reinforce existing grids so that when large amounts of surplus wind energy become available in one region they can be transmitted to others.

The variability problem cannot be overcome by improved forecasting. It is due to the fact that sometimes there is little or no wind, whether this is predicted or not. Davey and Coppin (2003, p. 11) found that in Eastern Australia the amount of a wind system's capacity likely to be "reliably available" (i.e., with 95% certainty) is only a remarkable 4.6%...and this does not apply to the worst season of the year (Autumn.)

The important question regarding wind is therefore not to do with the areas getting good winds and the associated sheer quantity of electricity that could be generated, but the limits set by its integration into the supply system because of its variability... and serious problems are arising in large national systems where infeed is around 5%. Thus we should be quite cautious re the study's assumption that wind can supply 20% of Australian demand.

44. Tilting at Wind Energy by William Tucker Published 2/15/2007

Whenever anybody starts talking about how we can solve our energy problems and end oil imports, they always end up talking about windmills.

Wind is indeed the fastest growing form of energy generation in the U.S., expanding at a brisk 25 percent a year. Installed capacity now stands at 11,500 megawatts (MW) -- the equivalent of ten or twelve standard nuclear or coal plants. Huge projects are popping up everywhere -- driven by tax incentives and state demands for "renewable energy portfolio."

What's interesting is that these projects are now beginning to run into their own environmental opposition. It's not hard to see why. The standard 1.5 MW structure is now 40 stories, taller than the statue of liberty. The 3 MW towers waiting in the wings are as tall as New York's Citicorp Center, the third tallest building in Manhattan.

In the Midwest these giant structures are being located on farms, where landowners can collect a few thousand dollars rent a year. On the East and West Coasts, however, the best place is on mountaintops since -- according to Bernoulli's Principle -- the wind always accelerates as it is funneled through a narrower space. That means mountaintops all along the Alleghenies, in upper New York State, and in Washington and Oregon are being decorated with little distant pinwheels that make the landscape look like a carnival.

All this has been parading under the banner of solar and renewable energy, of course, and that makes it good. But people are starting to notice. When the Marriott Corporation chain -- a big windmill builder -- arrives in your town hoping to gain tax credits by covering the tops of the local hills with windmills, people start to ask questions.

And so an *anti*-windmill culture has arisen, also parading under the banner of environmentalism. They have names like "Windstop," "War Against Wind," "Vermonters With Vision," "Stop Ill Wind," "Save Our Allegheny Ridges," and "Mountain Communities for Responsible Energy." Most of them have now aggregated in Internet communities such as Wind-watch.org, WindAction.org, and AWEO.org (American Wind Energy Opposition).

"I started out a strong environmentalist supportive of alternate energy and concerned about global warming," says Jon Boone, a western Maryland resident who has become a prominent opponent of wind farms on the East Coast. "But the more I looked into it, the more I realized how insubstantial the claims of wind advocates have become."

"I just do this because I have some experience in the electric industry and I know what isn't being said," adds Glenn R. Schleede, a semi-retired electrical engineer who has written several Internet papers on the subject. "The things that people are claiming about wind just aren't true."

Besides changing the scenery, windmills produce a low-level drone that drives some people crazy. Opposition groups are now passing around tape recorders and studies are being made on the psychological effects. The other problem that has plagued them since the beginning is that they are not kind to migrating birds. Altamont Pass, the first great wind farm east of San Francisco, was such a disaster that the Audubon Society became one of its biggest detractors. "We have a bias in favor of wind energy, but the key is siting," says Greg Butcher, director of bird conservation at National Audubon, "We want to keep windmills away from important areas."

The problem is likely to grow worse now that wind enthusiasts are eyeing the Upper Midwest -- the "Saudi Arabia of Wind" but also a prime route for migrating birds. In his Discovery Channel special, "Addicted to Oil," Thomas Friedman, the *New York Times* columnist finally threw in the towel. "So what if we lose a few bird species," he said. "The important thing is to end our oil dependence." Not everyone is likely to agree.

But the real question about windmills is whether they are producing any useful electricity at all. A modern electrical grid is a very delicately balanced high-wire act. Supply and demand must be kept in balance at all times. The National Electrical Reliability Council estimates that voltage levels can vary about 5 percent before trouble begins. Computer geeks talk about the "high 9's," meaning current must remain consistent within a range of 99.9999 percent to avoid erasing data. In *Digital Power*, Peter Huber and Mark Mills report, "Some years ago, a Stanford computer center found its power fatally polluted by an arc furnace over one hundred miles away." As the *Industry Standard* once put it: "Blips as brief as 1/60th of a second can zap computers and other electronic gear, and blackouts can be catastrophic."

The problem with wind energy is that it is always fluctuating. The physics of windmills make it worse because output varies with the cube of the velocity. A 20 percent increase in wind speed will double output in a few

minutes. Under these circumstances, large numbers of windmills are viewed by grid operators more as a liability than an asset.

Unfortunately, where the wind is predictable, it doesn't co-ordinate very well demand. The wind blows strongest at night and in the spring and fall. Electrical demand peaks in the daytime and summer and winter.

This is why claims about wind's installed capacity have to be met with a grain of salt. At best, windmills produce electricity less than one-third of the time. Over the last ten years, California's 1500 MW have averaged only 25 percent of their "nameplate" capacity. During peak summer demand it was only 9 percent. Germany has found its windmills producing only 6 percent of their nameplate capacity during hot summer days.

This does not make windmills completely useless. Grids must always maintain a "spinning reserve" of 20 percent extra output in case of emergency interruptions. The sudden loss of a major generating station, for example, can send a power surge cascading through the whole system, causing a blackout. Windmills can provide some spinning reserve -- when the wind is blowing. Still, as long as those windmills are turning, they must be producing some electricity, right? Unfortunately, even this may not be true. Because wind power is so unpredictable, fossil fuel plants must be kept running all the time anyway for backup.

A study commissioned by Norway in 1998 found that wind power in Denmark had "serious environmental effects, insufficient production, and high production costs." Reporting on the Danish experience to a British audience in 2005, Dr. V.C. Mason [concluded](#):

Although one fifth of the electrical power produced annually in West Denmark is generated by its enormous capacity of wind turbines, only about 4% of the region's total power consumption is provided from this source. Most of the output of wind power is surplus to demand at the moment of generation and has to be exported at reduced prices to preserve the integrity of the domestic grid. Savings in carbon emissions are minimal.

Perhaps the best that can be hoped for, then, is that wind can provide the spinning reserve required for all grids. It is not surprising to find countries like Denmark and Germany topping out at 20 percent. That is the point where spinning reserve ends and base-load responsibilities begin.

Beyond that 20 percent wind will not be able to penetrate. It would be impossible -- i-m-p-o-s-s-i-b-l-e -- to run a contemporary electric grid on wind power alone. Its role will remain marginal and supplementary. At bottom, wind is still a medieval technology.

William Tucker writes every week for The American Spectator online.

45. Media Release - Minister's Office, Sydney: 1 March 2007

CULLERIN WIND FARM TO GENERATE POWER FOR 12,000 HOMES

The lemma Government has approved a new wind farm in the Southern Tablelands after a thorough environmental assessment and public feedback on the proposal.

Planning Minister Frank Sartor said he had imposed 105 conditions of approval to strike a balance between local interests and the broader environmental benefits of green energy.

The Cullerin Wind Farm will be built 40km southwest of Goulburn, on the Cullerin Range which forms part of the Great Dividing Range.

Epuron Pty Ltd plans to construct up to 15 wind turbines in the \$50 million project, which will create around 50 construction jobs.

"Any wind farm proposal is assessed in detail, looking at any concerns of local residents and how we might address them," Mr Sartor said.

"In this instance, after listening to community feedback, I imposed more than 100 conditions on the proposal.

"At the same time, this project will provide a new, clean, renewable source of energy for the State's growing population -- meeting the average consumption needs of 12,000 homes.

"It will also save around 95,000 tonnes of greenhouse emissions each year -- the equivalent of removing up to 19,000 cars from our roads.

"And it will result in substantial savings in water consumption and reduced pollution, by replacing coal and other fossil fuel-fired electricity."

The wind farm is expected to produce up to 95,000 MWh of renewable electricity per year, for 30 years.

The Minister's conditions include:

- The proponent must negotiate individual landscaping for residents within 4km and with views of the wind farm upon request, to help minimise any visual impact; and
- The project must comply with noise limits recommended in the South Australian Noise Guidelines.

The project was publicly exhibited in mid-2006 and submissions from the public, Council and government agencies were considered in the assessment process.

The Minister said the project was consistent with the lemma Government's renewable energy targets, which will ensure 10% electricity consumed in NSW by 2010 comes from renewable energy sources – including wind – and 15% is renewable energy by 2020.

46. . Lawyers hope for Yambuk fire settlement soon, ABC Tuesday, 20 February 2007

Lawyers proceeding with a class action claim for fire-affected farmers in Yambuk are hoping a settlement can be reached.

Police are investigating the cause of the January fire and have interviewed a man in relation to the 1,000 hectare blaze.

Gary Foster from Maddens Lawyers says it is understood workers at a wind farm test site are responsible for the fire.

He says compensation is being sought for 11 burnt-out landowners.

"In some circumstances the loses run to hundreds of thousands of dollars and in other cases the damage is less substantial, but in each of the cases we hope to effect a fair settlement as soon as we can," he said.

47. Water on the Brain by Andrew Bolt, Herald Sun March 23, 2007

NO kidding, all these celebrity water-saving secrets are as useless as bailing out the Titanic with a teaspoon

To seem good once meant you actually had to do it. You know the kind of thing -- work as a missionary in malarial Africa, or at least spoon out soup to the poor. Make a difference.

But now?

To seem good in the fashionable way means now doing the most useless thing in the most hopeless cause in the most public way.

It means, in short, showing you're an idiot. It means . . . well, here's a few examples.

The *Sunday Herald Sun* last weekend asked nobly ecological celebrities for their water saving secrets to stop the city's dams from running dry.

Here, no kidding, are some of their answers.

We learned that Livinia Nixon, television star, "puts a bowl in the sink whenever she is washing vegetables or the like, with the leftover water going straight into the garden".

Gosh, make that sacrifice a mere three or four trillion times a year and we might not need a new dam after all.

Rebecca Maddern, TV newsreader, turns off the tap when brushing her teeth.

Premier Steve Bracks has a watering can in the sink to catch the water from the hot tap while he waits for it to run warm, and Opposition Leader Ted Baillieu declares: "When I swim I take particular care not to splash."

God spare us.

Of course, we didn't really need Productivity Commissioner Neil Byron, who has led inquiries into our water use, to point out the elephantine obvious this week -- that all this would be as useful as bailing out the Titanic with a teaspoon.

"The little water-saving gestures, like putting a bucket in the shower, or turning off the tap while you brush your teeth -- while they are good measures, and I do them myself -- are exactly that, gestures," he said.

"They are going to contribute almost nothing to solving Australia's water crisis and we are deluding ourselves if we think it's going to be enough."

But deluding ourselves is now seen as the acme of holiness. The Useless Gesture is the benediction of a saint. In fact, 'tis nobler not to splash in the pool than to just build that damn dam.

So far has the rot spread that the Useless Gesture has become government policy, especially when it comes to saving the planet from allegedly frying.

Think only of the Bracks Government's crusade to build wind farms on the prettiest coastal views to give us green power (at twice the price). Calculate how truly useless that gesture is.

First, we can't actually be sure the globe is warming because of us, or even that it will keep warming.

Second, the difference a few wind farms in Victoria could make to the world's temperature is so invisibly tiny you wouldn't even find it with Alarmist of the Year Tim Flannery's Giant Exaggerating Microscope.

After all, China alone is building a new coal-fired power plant every five days. And studies show that even if all gassy Europe -- never mind tiny Australia -- cut emissions by 20 per cent by 2020, this would simply delay the warming we expect in 2100 by a mere two years.

So our wind farms are the ultimate Useless Gesture -- money-grinding monuments to remind us of the seem-good lunacy of our times.

Yet, this Government skites that it has plans for plenty more.

"Victoria's wind farms are saving more than 250,000 tonnes of greenhouse gas emissions per year -- the equivalent of taking 60,000 cars off the state's roads," burbles "No Water" Minister John Thwaites.

BUT that claim -- based on an official assumption that the wind blows enough for wind farms to generate 33 per cent of their installed capacity -- is another of the wild exaggerations typical of this seem-good faith.

As the annual planning report of Vencorp (which oversees our power network) reveals, the wind is actually so unreliable that our wind farms cranked out as little as 4 per cent of their maximum power on our hottest days -- just when we needed them most for our airconditioners.

A consultant report to Vencorp warned: "In the past two years . . . load at maximum demand times has averaged 16.1 per cent of installed capacity".

In short, these expensive wind farms, already useless at best, aren't even half as good as the Government claims.

But who cares? The gesture is everything. Seeming counts for more than doing.

How many examples of the Useless Gesture do you want? We have young world-changers who think they can Make Poverty History just by going to a rock concert -- a free rock concert, where all they have to donate to the poor is their applause.

We have 200,000 Australians who think ending Aboriginal poverty is as easy as walking across Sydney Harbor Bridge on Sorry Day, offering nothing but apologies. And only once, in 2000.

We have eager global-warming believers who think we can stop the planet from melting simply by installing better light bulbs, and get the timid Howard Government to insist on it.

We have the *Sydney Morning Herald* organise an "Earth Hour" for March 31 to fight global warming and think it enough to turn off just some of its lights for just one hour, on just this one Saturday evening, when almost all its staff have already gone home anyway.

On it goes. A Google founder shows off the solar-panelled rucksack he uses to charge his mobile phone, before stepping on to his private Boeing 767 jumbo.

British Conservative Party leader David Cameron announces he's cycling to work to cut emissions, yet has a car follow him each morning with his briefcase.

As the eminent climate scientist Prof Richard Lindzen said this month of the global warming preachers now so popular: "Just as in many religions, the route to personal salvation lies in the performance of superstitious rituals, such as changing a light bulb or arranging for a tree to be planted after every plane journey."

How did we become so trivial? So devoted to the Useless Gesture? So concerned with seeming rather than doing?

I ask this often as a guest speaker at fundraisers for groups such as Rotary last Monday or Friends of Epworth today.

The people there say they are baffled too, and shrug.

Then we draw the tickets for the raffle. Last Monday's proceeds went to a rehabilitation track for patients at a nearby clinic. The doctor accepting the cheque said it would make a real difference.

That seemed good to me.

Tell us how to be good on blogs.news.com.au/heraldsun/andrewbolt

Vencorp document at

http://www.vencorp.com.au/index.php?action=filemanager&doc_form_name=download&folder_id=579&doc_id=2657

48. The Low Benefit of Industrial Wind, Eric Rosenbloom — January 20, 2006

Driving the desire for industrial wind power is the conviction that it will help reduce fossil and/or nuclear fuel use. Thus the local impacts of large wind turbine installations — with their clearing of trees, substantial concrete foundations, new roads, transmission support, flashing lights, and grinding noise — are thought to be justified by a greater good of healthier air and water, reduction of carbon emissions, and moving away from harmful mining and fuel wars. These are all without question important goals.

While the wind power industry tends to downplay its negative effects, many conservation groups call for careful siting and ongoing study to minimize them. There is debate, therefore, about the impacts but not about the benefits. Even the most cautious of advocates do not doubt, for example, that “every kilowatt-hour generated by wind is a kilowatt-hour not generated by a dirty fuel.”

That may be true for a small home turbine with substantial battery storage, but such a formula is, at best, overly simplistic for large turbines meant to supply the grid. The evidence from countries that already have a large proportion of wind power suggests that it has very little, if any, effect on the use of other sources. This is not surprising when one learns how the grid works: A rise in wind power most likely just causes a thermal plant to switch from generation to standby, in which mode it continues to burn fuel.

Documents

- “Impact of Wind Power Generation in Ireland on the Operation of Conventional Plant and the Economic Implications,” ESB National Grid, February 2004, available at: www.eirgrid.com/EirGridPortal/uploads/Publications/Wind%20Impact%20Study%20-%20main%20report.pdf

This study by the Irish grid manager finds that the benefits of wind-generated power are small and that they decrease as more wind power is added to the system. Their model generously assumes that all energy produced from wind facilities would be used and did not consider output fluctuations within time periods of less than an hour.

They describe three problems that mitigate the benefits of wind power:

- large amount of extra energy required to start up thermal generators that would otherwise not have been turned off
- mechanical stresses of more frequent ramping of production levels up and down
- increased prices of energy necessary to pay for any lower usage of thermal plants.

Wind plants add more capacity (requiring more infrastructure) with almost no reduction of non-wind capacity, the latter of which must be used more inefficiently than otherwise. As for CO₂ reduction, the study concludes,

The cost of CO₂ abatement arising from using large levels of wind energy penetration appears high relative to other alternatives.

Their model generously assumes that all energy produced from wind facilities is used and disregards output fluctuations within time periods of less than an hour. And they did not consider at all the environmental toll of expanded industrial wind development.

- “Response to the House of Lords Science and Technology Select Committee Inquiry Into the Practicalities of Developing Renewable Energy,” Royal Academy of Engineering, October 2003, available at: www.raeng.org.uk/policy/responses/pdf/practicalities_of_developing_renewable_energy.pdf

Table 4 of this report shows that even with generous assumptions of wind power performance, as its share of generating capacity increases, its ability to displace conventional sources decreases — the conclusion also reached by EirGrid (preceding) and E.ON Netz (following). To meet the U.K.’s peak of 50,000 MW for 90 of 100 winters, 59,000 MW of conventional capacity is currently maintained along with 500 MW of wind plant. If the amount of wind is increased to the 2010 target of 7,500 MW, 57,000 MW of conventional capacity must still be kept. With the 2020 target of 25,000 MW of wind, conventional capacity is still at 55,000 MW. That is, wind power is essentially adding surplus capacity rather than replacing conventional plants.

From wind data records covering the whole of mainland UK, there is a sizeable probability of little or no wind blowing across the entire country, regardless of the capacity installed. Figure 1 illustrates the situation where a hypothetical wind power capacity of 7,300 MW installed throughout the country is correlated with actual Met Office wind data. The most likely power output nationally is seen to be less than 200 MW.

Figure 1 of the report shows that one third of the time, widespread wind power facilities in the U.K. (which boasts the best wind resource in Europe) would be producing at less than 14% of capacity. They would be producing at less than 8% capacity a fourth of the time and at 4% or less for 11% of the time.

- “Green Mountain Power Wind Power Project Third-Year Operating Experience: 1999–2000,” U.S. Department of Energy–Electric Power Research Institute [EPRI] Wind Turbine Verification Program, December 2002, available at: epriweb.com/public/00000000001000960.pdf EPRI reported that the ridgeline facility in Searsburg, Vermont, produced no electricity at all — not even a trickle — almost 40% of the time:

On average, the Searsburg turbines generate electricity more than 60% of the time. ... Individual turbines generated electricity 51% to 75% of the time during the third year, and from 45% to 77% of the time during the second year. The turbine generation time is related to both wind speed and availability.

- "Wind Report 2005," E.ON Netz, available at: www.eon-energie.de/bestellsystem/frameset_eng.php?choosenBu=eonenergie&choosenId=1725

E.ON Netz manages the transmission grid in Schleswig-Holstein and Lower Saxony, about a third of Germany, hosting 7,050 MW of Germany's 16,394 MW installed wind-generating capacity at the end of 2004. The total production in their system was 11.3 TW-h in 2004, representing an average feed of 1,295 MW (18.3% of capacity).

Wind energy is only able to replace traditional power stations to a limited extent. Their dependence on the prevailing wind conditions means that wind power has a limited load factor even when technically available. It is not possible to guarantee its use for the continual cover of electricity consumption. Consequently, traditional power stations with capacities equal to 90% of the installed wind power capacity [a little over the maximum historical wind power infeed] must be permanently online in order to guarantee power supply at all times.

Graphs in this report (and the similar 2004 report) show that half of the time, wind power infeed is less than two-thirds of its annual average. It is greater than its annual average only a third of the time.

A similar power vs. time curve applies to all wind power facilities, whether their annual average output in relation to rated capacity is higher or lower than those in Germany. The 11-turbine facility in Searsburg, Vermont, produces no power at all more than a third of the time.

Both cold wintry periods and periods of summer heat are attributable to stable high-pressure weather systems. Low wind levels are meteorologically symptomatic of such high pressure weather systems. This means that in these periods, the contribution made by wind energy to meeting electricity consumption demand is correspondingly low. ...

The feed-in capacity can change frequently within a few hours. This is shown in the Christmas week from 20 to 26 December 2004. Whilst wind power feed-in at 9.15 am on Christmas Eve reached its maximum for the year at 6,024 MW, it fell to below 2,000 MW within only 10 hours, a difference of over 4,000 MW. This corresponds to the capacity of 8 500 MW coal fired power station blocks. On Boxing Day, wind power feed-in in the E.ON grid fell to below 40 MW. ... In 2004 two major German studies investigated the size of contribution that wind farms make towards guaranteed capacity. Both studies separately came to virtually identical conclusions, that wind energy currently contributes to the secure production capacity of the system, by providing 8% of its installed capacity.

As wind power capacity rises, the lower availability of the wind farms determines the reliability of the system as a whole to an ever increasing extent. Consequently the greater reliability of traditional power stations becomes increasingly eclipsed. As a result, the relative contribution of wind power to the guaranteed capacity of our supply system up to the year 2020 will fall continuously to around 4%. In concrete terms, this means that in 2020, with a forecast wind power capacity of over 48,000 MW, 2,000 MW of traditional power production can be replaced by these wind farms. ... [[T]he increased use of wind power in Germany has resulted in uncontrollable fluctuations occurring on the generation side due to the random character of wind power feed-in. This significantly increases the demands placed on the control balancing process [and bringing about rising grid costs. The massive increase in the construction of new wind power plants in recent years has greatly increased the need for wind-related reserve capacity.—Wind Report 2004].

That is, wind power construction must be accompanied by almost equal construction of new conventional power plants, which will be used very nearly as much as if the wind turbines were not there.

- "Danish Wind: Too Good to be True?" David J. White, The Utilities Journal, July 2004, available at: www.aweo.org/White-DenmarkTooGood.pdf

Denmark has installed 3,100 MW of wind turbine capacity to date, which is in theory capable of generating 20% of the country's electricity demand. Of that capacity, 2,374 MW is located in western Denmark (Jutland and Funen). The statistic is misleading because it implies that 20% of Denmark's power is supplied continuously from its wind capacity, but the figure appears to be a promotional statistic rather than a factual representation of the supply pattern.

Jutland has cable connections to Norway, Sweden and Germany with a capacity of 2,750 MW. In other words, it has the means of exporting all of its wind production. The 2003 annual report of Eltra, the western Denmark transmission company, suggests an export figure of 84% of total wind production to these countries in 2003, with figures that ramped up rapidly over previous years as Denmark found that it could not absorb wind output into the domestic system."

There is no CO₂ saving in Danish exchange with Norway and Sweden because wind power only displaces CO₂-free generated power. When the power is consumed in Denmark itself, fluctuations in wind output have to be managed by the operation of fossil-fired capacity below optimum efficiency in order to stabilise

the grid (ie, spinning reserve). Elsam, the Jutland power generator, stated as recently as May 27th at a meeting of the Danish Wind Energy Association with the Danish government that increasing wind power does not decrease CO2 emissions. Ireland has drawn similar conclusions based on its experience that *the rate of change of wind speed can drop faster than the rate at which fossil-fuelled capacity can be started up* [emphasis added]. Hence spinning reserve is essential, although it leads to a minimal CO2 saving on the system. Innogy made the same observation about the operation of the UK system [D. Tolley, presentation to Institute of Mechanical Engineers, January 2003].

The result is that, while wind-generated power itself is CO2-free, the saving to the whole power system is not proportional to the amount of fossil-fuelled power that it displaces. The operation of fossil-fired capacity as spinning reserve emits more CO2/kWh than if the use of that plant were optimised, thus offsetting much of the benefit of wind.

- Flemming Nissen, head of development, Elsam (operating 404 MW of wind power in Denmark), presentation to “Vind eller forsvind” conference, Copenhagen, May 27, 2004

Increased development of wind turbines does not reduce Danish CO2 emissions.

- “Windfarms provide no useful electricity,” Richard S. Courtney, presentation to conference of Groups Opposed to Windfarms in the UK, 2004, available at: www.aweo.org/windCourtney1.html

Electricity is wanted all the time but the demand for electricity varies from hour to hour, day to day, and month to month. The electricity grid has to match the supply of electricity to the demand for it at all times. This is difficult because power stations cannot be switched on and off as demand varies [because they take so long—several hours to a couple of days—to warm up]. The problem of matching electricity supply to varying demand is overcome by operating power stations in three modes called “base load,” “generation,” and “spinning standby.”

Some power stations operate all the time providing electricity to the grid, and they are said to provide “base load.” Other power stations also operate all the time but do not provide electricity all the time. They burn (or fission) their fuel to boil water and superheat the resulting steam which is fed to the steam turbines that are thus kept hot and spinning all the time. Of course, they emit all the emissions from use of their fuel all the time. But some of this time they dump heat from their cooling towers instead of generating electricity, and they are then said to be operating “spinning standby.”

One or more power stations can be instantly switched from spinning standby to provide electricity to match an increase in demand for electricity. It is said to be operating ‘generation’ when it is providing electricity. Power stations are switched between spinning standby and generation as demand for electricity changes. ... Windfarms only provide electricity when the wind is strong enough and not too strong. As they suddenly provide electricity when the wind changes, the grid operator must match this changed supply of electricity to the existing demand for electricity. This is achieved by switching a power station to spinning standby mode. That power station continues to operate in this mode so it can provide electricity when the windfarm stops supplying electricity because the wind has changed again.

Windfarms only force power stations to operate more spinning standby. They provide no useful electricity and make no reduction to emissions from power generation. Indeed, the wind-farm is the cause of emissions from a power station operating spinning standby in support of the windfarm.

Summary

- ❖ The addition of industrial wind power, which is nondispatchable and varies according to the wind, requires corresponding maintenance and eventually addition of back-up conventional power, along with expansion of transmission capacity.
- ❖ ¶The accommodation of wind power causes thermal plants to run less efficiently, adding to financial costs and increasing emissions.
- ❖ ¶Spinning standby power must be kept burning to cover the short-term fluctuations of wind power.

Thus, while wind power may displace generation of power from such plants, it does not displace the burning of fuel in them — the heat is simply diverted.

The most glaring cost of big wind is industrial development of rural and wild areas, which inarguably degrades rather than improves our common environment. That is impossible to justify if the benefits claimed by the industry’s sales material are in fact an illusion, propped up by subsidies and artificial markets for “indulgence credits” which allow the flouting of emissions caps and renewable energy targets.

Addendum

Why then do utilities generally support wind as a renewable power source? Actually, they don’t. In Japan, as reported by Asahi *Shinbun* on May 18, 2005, utilities severely limit the amount of wind power on their systems, because, as documented above, “introducing too much of the electricity, whose supply can fluctuate wildly, can cause problems for utilities’ power grids. ... If there is no wind, the utilities must rely entirely on other facilities. And even when wind power can satisfy all of the demand, they must continue operating thermal generators to

be ready for any abrupt shortfalls in wind power. " With so-called market solutions such as renewable portfolio standards (RPS), utilities must buy a specified proportion of their power from renewable sources or buy credits equal to their shortfall. As long as they can say that, for example, 20% of their power comes from wind, it doesn't matter if they're burning as much nonrenewable fuel as ever to back it up. Most importantly, however, "green credits" are generated in addition to actual electricity. They are tokens of the renewable energy already sold but are much more valuable. Burdened with the directive to buy renewable energy, utilities want to be a part of wind power development so they can share in the lucrative sale of the credits.

Ironically, analyses for New Jersey utilities and by the U.S. Energy Information Agency have shown that the only effect on emissions that an RPS might have is to drive down the cost of exceeding emissions caps or missing renewables targets.

With rising fuel prices, however, many utilities have started to demand actual useful energy targets

from wind facilities. As *Renewable Energy Access* reported on Nov. 7, 2005, from an American Wind Energy Association financing workshop in New York City, this has worried investors. Wind turbines can not provide base load power and are unreliable providers of peak load power; they do provide, however, the very marketable appearance of green energy, though not actual relief from other sources.

Eric Rosenbloom is a freelance writer and science editor living in Vermont.

He is a founding member of National Wind Watch and Vermonters with Vision.

This paper is available at: www.aweo.org/LowBenefit.pdf.

49. Independent UK, German Greens fight coal-fired power station plan by Tony Paterson in Berlin 23 March 2007

Efforts by the German Chancellor, Angela Merkel, to put Europe at the forefront of cuts to greenhouse gases are being threatened by her own government's plan to build 26 coal-fired power stations.

A €30bn (£20bn) scheme for the construction of 26 new coal-fired power stations by 2020 has been approved by Ms Merkel's grand coalition, as the country moves to abandon nuclear power.

Some of the power stations, which aim to use cheap Polish and South African coal and highly polluting German lignite coal, have already been built and others are at an advanced planning stage. Thirteen of the new stations alone have been earmarked for Germany's most populous state of North Rhine Westphalia.

The project has infuriated environmentalists, who are already angered by Ms Merkel's lobbying to ensure tough new curbs on CO2 emissions are not imposed on European car makers.

Reinhard Loske, a Green Party spokesman, said that if all 13 coal-fired stations went ahead in North Rhine Westphalia then the state would end up with a higher CO2 output than the whole of Switzerland. New gas-fired power stations emit 365g of CO2 per kW/hour, hard coal plants produce 750g and lignite-fired plants up to 1,153g.

Germany's Federal Environment Agency insists that new power plants will lead to an overall reduction of the country's current CO2 emissions, but only by 14 per cent, much lower than Ms Merkel's 40 per cent target.

50. Scientists Present Roadmap for Reducing Climate Change Risks February 27, 2007

NEW YORK, NY (February 27, 2007) -- The United Nations Foundation and Sigma Xi, The Scientific Research Society, today released "Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable," the final report of the Scientific Expert Group on Climate Change and Sustainable Development. The report, prepared for the upcoming meeting of the UN's Commission on Sustainable Development (CSD), outlines a roadmap for preventing unmanageable climate changes and adapting to unavoidable ones.

Two years in the making, "Confronting Climate Change" was written by an international panel of scientists co-chaired by Sigma Xi past-president Peter H. Raven, director of the Missouri Botanical Garden, and Rosina Bierbaum, dean of the University of Michigan's School of Natural Resources and the Environment. John P. Holdren, director of Woods Hole Research Center, was among the co-authors. The expert team was invited by the UN's Department of Economic and Social Affairs, Secretariat to the CSD, to make recommendations on climate change mitigation and adaptation. Visit www.confrontingclimatechange.org to download the full report.

"This report defines the seriousness and urgency that must characterize global efforts to respond to the unfolding and far-reaching challenge of climate change," said Timothy E. Wirth, president of the UN Foundation. "It makes clear that we must start immediately to stabilize and reverse the trajectory of greenhouse gas emissions."

"Our recommendations are designed to help the international community get on a path to stabilizing atmospheric concentrations of greenhouse gases and managing the impacts of climate change," said Raven, a National Medal of Science recipient. "These steps will contribute to achievement of the UN's Millennium Development Goals; failing to do so will make those goals much harder, if not impossible, to reach."

"The world is experiencing climate disruption now and future increases in droughts, floods and sea-level rise will cause enormous human suffering and economic losses," said Bierbaum, former acting director of the White House Office of Science and Technology Policy. "We can manage water better, bolster disaster preparedness, increase surveillance for emerging diseases . . . and enhance local capacity to cope with a suite of expected changes."

"It is still possible to avoid an unmanageable degree of climate change, but the time for action is now," said Holdren, chairman of the board of the American Association for the Advancement of Science.

The report's key findings include:

--Exceeding global average temperature increases of 2-2.5 degrees C above the 1750 pre-industrial level would entail "sharply increasing the risk of intolerable impacts." To avoid that will require stabilizing atmospheric concentrations at no more than 450-500 ppm of CO₂ (compared to about 380 ppm CO₂ today). That in turn requires that global CO₂ emissions peak no later than 2015 to 2020 at not much above their current level and decline by 2100 to about a third of that value.

The technology exists to reduce emissions globally and provide other economic, environmental and social benefits. Policy-makers must immediately act by:

--Improving transportation through vehicle efficiency standards, fuel taxes and registration fees/rebates that favor efficient and alternative-fuel vehicles.

--Improving the design and efficiency of commercial and residential buildings.

--Expanding the use of biofuels through energy portfolio standards and incentives.

--Designing and deploying coal power-plants that can be affordably retrofitted to capture and sequester CO₂.

Societies must do more to adapt to climate change by:

--Improving preparedness/response strategies and management of natural resources.

--Addressing the adaptation needs of the poorest nations, which will bear the brunt of climate change impacts.

--Planning and building climate resilient cities.

--Strengthening international, national and regional institutions to cope with weather-related disasters and climate change refugees.

The international community, through the UN and related multilateral institutions, can play a crucial role in mitigation and adaptation by:

--Helping poorer nations to finance and deploy energy-efficient and new energy technologies

--Educating all about the opportunities to adopt mitigation and adaptation measures.

The coordinating lead authors of the report, in addition to Raven, Bierbaum and Holdren, included MICHAEL MACCRACKEN, chief scientist for climate change programs, Climate Institute, Washington, D.C.; and RICHARD H. MOSS, senior director, Climate and Energy, UN Foundation and University of Maryland.

Other lead authors were: ULISSES CONFALONIERI, professor, National School of Public Health and Federal University of Rio de Janeiro, Brazil; JACQUES DUBOIS, member of the executive board, Swiss Re, United States; ALEXANDER GINZBURG, deputy director, Institute of Atmospheric Physics, Russian Academy of Sciences; PETER H. GLEICK, president, Pacific Institute for Studies in Development, Environment and Security, United States; ZARA KHATIB, technology marketing manager, Shell International, United Arab Emirates; JANICE LOUGH, principal research scientist, Australian Institute of Marine Science; AJAY MATHUR, president, Senergy Global Private Limited, India; Nobel laureate MARIO MOLINA, professor, University of California, San Diego; KETO MSHIGENI, vice chancellor, Hubert Kairuki Memorial University, Tanzania; NEBOJSA NAKICENOVIC, professor, Vienna University of Technology, and program leader, International Institute for Applied Systems Analysis, Austria; TAIKAN OKI, professor, Institute of Industrial Science, University of Tokyo; HANS JOACHIM SHELLNHUBER, director, Potsdam Institute for Climate Impact Research, Germany; and DIANA URGE-VORSATZ, professor, Central European University, Hungary.

ABOUT SIGMA XI Sigma Xi, The Scientific Research Society is an international honor society for research scientists and engineers, with more than 500 chapters and 60,000 members in North America and around the world. The society sponsors a number of programs that promote science and engineering and also publishes American Scientist magazine. Sigma Xi's administrative offices are in Research Triangle Park, N.C.

www.sigmaksi.org

ABOUT THE UN FOUNDATION The UN Foundation was created in 1998 with entrepreneur and philanthropist Ted Turner's historic \$1 billion gift to support UN causes and activities. The UN Foundation builds and implements public-private partnerships to address the world's most pressing problems and also works to broaden support for the UN through advocacy and public outreach. The UN Foundation is a public charity.

www.unfoundation.org

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51. Herald Sun, Monday, August 21, 2006 Wind farm go-ahead by Michael Warner

Nation's biggest to create power for 133,000 homes

AUSTRALIA'S most powerful wind farm will be built near Colac at a cost of \$380million.

The 116-turbine project has been approved for Mt Gellibrand on land leased from local farmers.

Planning Minister Rob Hulls said it would generate enough capacity to power more than 133,000 Victorian homes a year.

"This is great news for the environment and great news for Victoria ... and the Colac region," Mr Hulls said yesterday.

He said the wind farm was approved after advice from an independent planning panel.

Victoria's ninth wind farm will create up to 120 construction jobs and 20-25 full-time jobs.

Mr Hulls said he did not believe federal Environment Minister Ian Campbell had any authority to block the project as he did with the \$220 million Bald Hills wind farm in South Gippsland.

Bald Hills was initially rejected over fears it could harm endangered orange-bellied parrots. Developers said there was no evidence the farm would affect the parrots, but dropped court action in return for the Government reconsidering plans.

Mr Hulls said Bald Hills was a controlled action that required approval by the federal Government under the Environment Protection and Biodiversity Conservation Act. "This is not a controlled action so it doesn't have to go through the federal Government," he said.

Mr Hulls said endangered birds would not be at risk by the Mt Gellibrand operation, due for completion in 2009. "The issue of broilgas was taken into account and the panel recommended any amelioration of the impact on broilgas can certainly be done by the proponent." he said. "The proponent is prepared to do that."

Mr Hulls said only nine objections had been lodged after widespread community consultation.

"This is the most substantial announcement yet in Victoria in terms of wind farms ... and I hope to be in a position to announce further wind farms in the not too distant future," he said.

German company Pro Ventum International won the contract for the Mt Gellibrand site and will start work early next year.

The turbines will be 125m high and visible from the Princes Highway.

Local landowner Tim Gore, who plans to have 32 turbines on his property, said he was not concerned about turbine noise.

Wind farms are shaping as a key point of difference between the Bracks Government and Opposition before the November 25 state poll.

Liberal leader Ted Baillieu has promised a moratorium on any new developments, saying they are too heavily subsidised and inappropriately placed. Tarwin Valley Coastal Guardians spokesman Tim Le Roy said wind farms are less economically efficient than coal-fired generators.

52. Communication from Yvonne McRae -- how much green power is available?

Just received this ambiguous reply how long IS a piece of string? Moral of story – don't think paying extra for GREEN POWER will save the planet - it will just make your pockets much lighter.

Yvonne

----- Original Message -----

From: <gew@tec.org.au>

To: "Yvonne McRae" <eviemac@dcsi.net.au>

Sent: Thursday, April 05, 2007 3:46 PM

Subject: Re: Fw: Copy of: how much green power is available?

Dear Yvonne,

Ultimately that might be the case, but at the moment there is such a large capacity waiting to be tapped and such a relatively small amount being generated that we have a long way to go. If it is accredited GreenPower (shown as a percentage) then there is a reliable auditing system operating to assure that the power is being generated,

GEW

Quoting Yvonne McRae <evimac@dcsi.net.au>:

Dear people,

Is there to be an answer to my query re availability of green energy, or is it too hard?

Yvonne McRae

----- Original Message ----- From: "Green Electricity Watch"

<greenelectricity.watch@tec.org.au>

To: <evimac@dcsi.net.au>

Sent: Tuesday, February 27, 2007 9:39 PM

Subject: Copy of: how much green power is available?

This is a copy of the following message you sent to Green Electricity Watch via Green Electricity Watch

This is an enquiry e-mail via <http://www.greenelectricitywatch.org.au> from:

Yvonne McRae <evimac@dcsi.net.au>

I have asked AGL this question and could not get an answer. It is obvious there is a limited amount of green power available in Victoria/Australia. If 100% of customers decide they all want green power only how is this possible? Where are the new sources? The trickle from wind turbines is unreliable (There are 6 near my house and much of the time they are stationary), there is no commercial solar power generation and the amount of hydro is limited, so I repeat where is the green power to come from to service people who want it? Is there a cut off point and suppliers tell customers their green power needs cannot be met because of unavailability, or do suppliers keep 'mum', collect the increased tariffs and the foolish customers are just getting coal-fired generation to their homes? The whole thing is shonky I think.

Yvonne McRae

149 Reed Cres

Wonthaggi 3995