

Green energy generates big costs for little gain

Alan Moran, AFR, 22 June 2015

In this newspaper last week Richard Denniss opined that there was a stampede of investment money out of coal ("Abbott blind to coal decline", AFR, June 15). He excoriated Tony Abbott both for failing to recognise the death of coal and for suggesting that wind farms, their preferred replacement, are a blight on the landscape.

With exquisite timing, Market Forces, an affiliate of Friends of the Earth, then issued a report that, contrary to the Richard Denniss view, lambasted Australian banks for actually lending \$6 in fossil fuel projects for every \$1 in renewables.

In fact, the real tragedy is that the banks are lending too much to exotic renewable energy developments. Even the cheapest of these, windfarms, need three times the price at which Australian coal generators can supply electricity.

Australia's coal resources are so abundant that across the eastern states that they can profitably supply electricity at a cost of \$40 a MWh. Windfarms require \$120 a MWh.

In addition, because wind generated supply is intrinsically unreliable it needs back-up in the form of fast start generators. Hydro-electricity performs that function in many markets but Australia has relatively little of this. Wind/solar generation in Australia currently has a 7 per cent share of supply. That level requires 6 per cent in additional back-up, according to the estimates by the Australian Energy Market Operator. That means fast start capacity that would not otherwise be needed.

Wind turbine development has been improved over the past 20 years but is now approaching its theoretical maximum efficiency. It will never be remotely price competitive with conventional generators notwithstanding wishful thinking.

Australia's renewable energy target for 2020 is colloquially though inaccurately referred to as the "20 per cent" target. Parliament has reduced that part to comprise wind (and large scale solar) 41,000GWh to 33,000GWh (in both cases plus an estimated 10,000GWh from rooftop solar panels). Some other changes in this week's legislation ensure that the "energy intensive" industries, smelting steel and cement, are now fully exempt from the requirement. Those industries account for about a fifth of electricity demand. But their exemption means additional costs for other commercial users and for households.

Crippling cost on consumers

Even so, the program entails a crippling cost on consumers. In annual terms this amounts to the price at which the RET certificates trade plus additional costs wind generation imposes on the system. The RETs have an effective ceiling price of \$92 a MWh; if they traded at \$75 in 2020, this together with an additional back-up and network cost would entail a cost of around \$90 a MWh.

In aggregate terms, the annual impost on electricity consumers is therefore from the 33,000GWh and means a cost to the customer of \$3 billion a year, on top of which is the cost of the rooftop solar panels of \$400 million (assuming their subsidy remains at around \$40 a MWh).

Overall, present legislation entails wind and solar panels having over 15 per cent of the market. If, as anticipated, the renewables displace coal they do so at a two fold cost premium. Overall, this results in an increase in the average wholesale cost of electricity of around 25 per cent from the level it would be if there were no regulatory requirement in place. Because energy intensive industries are sheltered from the effect, this is a much higher impost for other consumers.

These matters aside, unlike elsewhere in the world, Australia's black and brown coal resources are low-sulphur and hence pollution-free. In contrast to wind farms they do not require vast tracts of land

and disfigure the natural environment. Nor do they impose the detrimental health effects from low frequency noise and infrasound that, according to the Senate Committee on Wind Turbines, appear to affect 10 to 15 per cent of the population.

All of this has become increasingly topical with the issuance of Pope Francis' encyclical. For although the Pope has called for drastic reductions in emissions of carbon dioxide, this comes at colossal costs.

Even imposing a requirement like the Australian "20 per cent renewable" standard substantially raises the cost of electricity. And this is the easy part. In order to replace fossil fuels by the sort of numbers the Intergovernmental Panel on Climate Change sees as being necessary to dampen global warming requires unproven and perhaps infeasible technologies. Energy only comprises 25 to 30 per cent of emissions and Australia's renewable target might therefore reduce emissions by 4 to 5 per cent. This is a tiny step given that the eventual target for Australia is a reduction of 80 per cent from today's levels.

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AFR Contributor

Real concerns about turbines left blowing in the wind

Graham Lloyd, The Australian, June 27, 2015



Wind farm noise has yet to be proven unharzardous.

Each morning fine-wool grower Ann Gardner broadcasts her wind farm woes to an unreceptive world. Politicians, shock jocks, journalists and anyone Gardner hopes will listen are included as recipients of uncomfortable missives that outline the "torture" of living next door to Australia's biggest wind farm at Macarthur, Victoria.

Gardner is used to being ignored, unlike her neighbours, Hamish and Anna Officer, who routinely are quoted as model wind farm devotees.

Last week, as the deadline counted down for the revised renewable energy target agreement to be finally approved in federal parliament, the Officers again were displayed prominently on the front page of Fairfax newspapers rebutting the comments of Tony Abbott that wind farms were noisy. As

the Officers' immediate neighbour, Gardner thinks she, too, should have been asked by Fairfax papers about the noise.

If she had been, the Fairfax reports could have disclosed that the Officers receive an estimated \$480,000 a year for 25 years for hosting 48 turbines. And, a Senate inquiry has been told, after spending lavishly on renovating their Macarthur homestead the Officers will soon be moving on and leaving their wind turbines behind.

The Officers, no doubt, have good reasons for moving. And the facts can easily be construed to suggest Gardner is simply jealous about the good financial fortune of her neighbours thanks to big wind. But other evidence to the Senate inquiry from wind turbine hosts Clive and Trina Gare, who say they bitterly regret their decision to host turbines because of noise, undermine the widespread claims that only jealous neighbours have a problem with wind farm noise and health.

Gardner contends the failure to report the plight of the Gares or the full picture for the Officers is typical of the one-sided treatment the wind turbine issue has received. She says much of the media has shown itself willing to misconstrue findings from the National Health and Medical Research Council and suggest research had cleared wind turbines of ill effects.

In fact, the NHMRC said only limited, poor-quality research was available and the issue of wind farms and health remained an open scientific question. The NHMRC has called for tenders for targeted research with a particular focus on low-frequency noise and infrasound. After receiving evidence from more than 500 people, the Senate inquiry, chaired by John Madigan, this month released an interim report recommending urgent steps to improve scientific knowledge about the health effects of wind turbines. This includes the creation of an independent expert scientific committee on industrial sound to provide research and advice to the Environment Minister on the impact on human health of audible noise (including low frequency) and infrasound from wind turbines.

The Senate committee also calls for a national environment protection (wind turbine infrasound and low frequency noise) measure.

It says to get access to the billions of dollars' worth of renewable energy certificates, wind farm projects would have to adhere not only to the national wind farm guidelines but also with the National Environment Protection Measures.

In its deal to secure passage of the revised RET through the Senate, the federal government agreed to some of the Senate committee's key interim demands.

Federal Environment Minister Greg Hunt says the agreement with the crossbench senators includes the appointment of a wind farm commissioner to receive complaints, make inquiries and to make appropriate findings.

The Clean Energy Council says it is "disappointed about moves to introduce further red tape on the wind sector, given the stringent and robust regulatory framework already in place for wind energy in Australia".

However, CEC chief executive Kane Thornton says the industry will "work closely with the government to ensure these measures genuinely improve the regulatory framework and are developed based on credible scientific research by independent expert bodies".

The issue of wind farms and health is not confined to Australia. The executive board of the German Medical Association is considering a motion from this year's national congress calling for research on infrasound and low-frequency noise-related health effects of wind farms. Like the NHMRC, the German Medical Association congress motion says there are no reliable and independent studies. "Consequently, there is no proof that these emissions are safe from a health perspective," it says.

Japanese researchers who have measured the brain waves of people exposed to noise from wind turbines have found “the infrasound was considered to be an annoyance to the technicians who work in close proximity to a modern large-scale wind turbine”. And a new study by researchers from Oxford University’s Centre for Evidence-Based Medicine have found “the odds of being annoyed appear significantly increased by wind turbine noise”.

The research, published in *Environment International*, has found wind turbine noise significantly increases the odds of experiencing sleep disturbance, and results in lower quality of life scores. The evidence flies in the face of wind industry claims that complaints have been confined largely to Australia and English-speaking countries where vocal lobby groups have reinforced each other’s dissatisfaction.

In fact, as Australia prepares to ramp up construction of thousands of new wind turbines to satisfy the RET, governments elsewhere are cutting back because of concerns about the cost and social cohesion. The Finnish Energy Industries Association says the incoming government there effectively has “shut the door” on new wind farms.

Britain’s conservative government has pulled the brake on the UK’s onshore wind industry by closing its subsidy scheme a year early.

The move reportedly will stop about 2500 proposed turbines in 250 projects from being built.

Family First senator Bob Day, deputy chairman of the Senate committee that is undertaking public hearings, says in at least 15 countries people from all walks of life have come forward complaining about the health effects of wind turbines. The complaints include nausea, blurred vision, vertigo, tachycardia, high blood pressure, ear pressure, tinnitus, headache, exacerbated migraine disorders, sleep deprivation, motion sensitivity and inner ear damage.

Current thinking is that the low-frequency noise impact from wind turbines is felt most acutely by people who are susceptible to motion sickness. Publicly, the wind industry has an army of supporters ever ready to rubbish claims that wind farms can have any effect on health. But there is evidence the wind industry has known about the impact of infrasound for more than two decades.

The first documented complaints were made in 1979 by residents living 3.5km from an old model wind turbine in the US. The residents described a “feeling” or “presence” that was felt rather than heard, accompanied by sensations of uneasiness and personal disturbance. The “sounds” were louder and more annoying inside the affected homes, they said.

NASA researchers found the wind turbine operation created enormous sound pressure waves and the turbine was redesigned from downwind to upwind, swapping the blade location on the tower. The author of the NASA research, Neil Kelley, tells *Inquirer* modern turbines could have the same issues under certain conditions. In September 1982, the results of NASA research on human impacts was provided to the wind industry. In 1985 the hypothesis was developed for infrasound-induced motion sickness and major NASA research on community annoyance from wind turbines was released.

But over the following decade wind farm noise regulations were developed that specifically avoided measuring low frequency noise. This is despite the NASA research and the fact the harmful effects of low-frequency noise from other industrial sources have been firmly established and are well understood.

A federal Department of Resources, Energy and Tourism report into airborne contaminants, noise and vibration, published in October 2009, says “sound in the frequency range below 20 hertz is normally defined as ‘infrasound’ and can be heard (or felt) as a pulsating sensation and/or pressure on the ears or chest”.

The common sources of low-frequency noise and infrasound are large pumps, motors or fans and crushing circuits and screens.

The report says low-frequency noise can be particularly annoying and result in complaints many kilometres away from the source. And because low-frequency noises between 20Hz and 200Hz propagate with minimal attenuation across large distances and transmit easily through building fabric, “it can be quite prominent inside residences”.

The report does not refer to wind turbines but it accurately describes many of the complaints that are being made.

Hunt says the federal government will act in good faith on the Senate inquiry recommendations when the final report is made public in August. Done properly, the Senate committee recommendations should go to the heart of complaints being made by wind farm neighbours such as Gardner. They want real-time monitoring of noise, including low frequency and infrasound. And if limits are exceeded they want the turbines shut down, particularly at night.

One thing is certain: when the wind farm commissioner takes up the position there is a good chance they will be receiving plenty of correspondence from Gardner.