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Senate Inquiry into the Social and Economic Impact of Rural Wind Farms

Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600
Australia

By email: community.affairs.sen@aph.gov.au

Dear Sir/ Madam,

A Response to the Social and Economic Impact of Rural Wind Farms

Please accept our submission to the Senate Inquiry into the Social and Economic Impact of Rural Wind Farms.

Friends of the Earth (FoE) Australia is a federation of independent local groups working for a socially equitable and environmentally sustainable future. We are a membership-based environmental organisation which was established in 1974. FoE Australia is part of FoE International, which is active in more than 70 countries, has almost 2 million individual members and supporters, and around 4,500 local branches.

With what we know about climate change and the need to greatly reduce our greenhouse emissions this decade, it is clear that we will need to move away from our current reliance on coal and other fossil fuels to meet our energy needs as soon as is humanly possible.

The good news is that we already have the technology to do this. What is lacking at present is the political will to act at the scale that mainstream climate science tells us is required. The facilitation of a massive roll-out of renewable energy across Australia will be essential if we are to hope to reduce our emissions sufficiently to have a chance of avoiding dangerous climate change.

Wind is currently the most advanced and cheapest renewable energy option for us to begin the required transition away from coal. Well planned wind energy projects must be a cornerstone of this new renewables industry.

Wind energy is of great benefit to communities in regional Australia and is already producing a considerable job yield while also providing direct financial support for many farmers and other land owners. In 2009-10 alone, wind energy in Australia generated almost $1.6 billion in investment (Bloomberg, New Energy Finance, 2010). The wind industry is of huge economic importance to the nation, not only through the creation of jobs during the development, construction and ongoing operation of each wind farm but also throughout the supply chain, including the manufacturers and suppliers of products and services to the industry. The supply of steel for wind turbine towers is just one example of the importance of the wind industry to the broader Australian economy.

Apart from direct jobs in the industry, there is considerable 'down stream' employment opportunities, as well as an obvious economic boost for towns and communities which helps to diversify and strengthen these communities. This in turn reduces the need for individuals to leave these areas to seek employment. A key advantage of wind farm development is that the jobs created are spread over a considerable number of regions, not concentrated in a few areas, as tends to occur with larger scale fossil fuel plants such as coal.

Significantly, wind farming is compatible with other land uses, meaning that it adds value to agricultural activity rather than competing with it. This is certainly not the case with coal mining and coal seam gas exploration, which is impacting negatively on rural areas in some of our richest agricultural regions, including the Hunter Valley in NSW and the Darling Downs in Queensland.

We would like to respond to specific areas of interest outlined in the scope of the inquiry.

"This inquiry will look into the social and economic impacts of rural wind farms, and in particular:
(a) Any adverse health effects for people living in close proximity to wind farms"

Recent research and scientific investigation have found that there are no adverse health effects for people living in close proximity to wind farms.

The following is a summary of some key research in this realm:

- The National Health and Medical Research Council (NHMRC, 2010) recently found that "*there is currently no published scientific evidence to positively link wind turbines with adverse health effects*".

- In addition the World Health Organisation (undated) states that "*there is no reliable evidence that sounds below the hearing threshold produce physiological or psychological effect*".

Further international studies in North America and the United Kingdom support this finding.

For instance, the American and Canadian Wind Energy Associations (2009) established a scientific advisory panel comprising medical doctors, audiologists and acoustic professionals from the US, Canada, Denmark and the UK. This panel concluded that labels such as "wind turbine syndrome" are not a recognised medical

diagnosis but rather reflective of symptoms associated with annoyance. Factors culminating in annoyance include the nocebo effect defined as "*an adverse outcome, or worsening of mental or physical health based on fear or belief in adverse affects*".

The large volumes of negative media coverage related to the effects of wind turbines we are seeing in Australia only serve to create fear in some people that they will experience adverse effects from wind turbines. However, in many instances, once the farms are actually operating, the resulting intrusion is far less than had been anticipated by people living around the developments.

Research produced by Sonus for the Clean Energy Council (CEC) highlights this fact - it found that once wind farms are built, the rates of complaints are very low in Australia and New Zealand. It also found that if a noise can be heard, then annoyance can result for some people, regardless of the noise level experienced.

This effect is backed up by the NHMRC review, which concludes "*it has been suggested that if people are worried about their health they may become anxious, causing stress related illnesses. These are genuine health effects arising from their worry, which arises from the wind turbine, even though the turbine may not objectively be a risk to health*" (Chapman, 2010 – quoted in NHMRC review).

(b) Concerns over the excessive noise and vibrations emitted by wind farms, which are in close proximity to people's homes;

Research conducted on modern wind turbines has shown that the levels of low frequency noise and infrasound are within accepted thresholds.

Modern wind turbines can generate noise across the frequency range of human hearing. As with most sounds, some of this energy occurs below the level of human hearing. Human hearing ability ranges from 20Hz to 20,000Hz, with 1dB being the smallest change in noise that humans can detect. Low frequency noise refers to noise in the range of 10 to 200 Hertz (Hz) and infrasound occurs in the range of 20 Hz down to 0.001 Hz – below what the human ear can pick up. Low frequency noise and infrasound is emitted by many other natural sources, for instance wind passing through trees or waves at a beach or human-made sources such as industrial processes, air-conditioning and vehicles.

There is currently no peer reviewed scientific data to suggest that the levels of low frequency noise or infrasound emitted by wind turbines make humans sick. Research to date has not shown any negative health effects at the sound levels produced by operational wind turbines.

Advances in technology mean that noise from wind turbines is minimal. Research conducted on modern wind turbines has shown that the levels of infrasonic noise and vibration radiated from modern wind turbines are at a very low level, in fact so low that they lie below the threshold of perception, even for those people who are particularly sensitive to such noise and even when very close to turbines (British Wind Energy Association, 2005).

Large scale generation of electricity by wind turbines began more than 100 years ago. There are now more than 150,000 turbines installed globally, and some of these have been in place for more than 20 years. With many decades of successful wind energy production, there has been ample opportunity for any negative effects to be identified. The fact that no credible scientific research has identified any negative

effects supports the prevailing view that wind power is one of the safest ways of generating electricity.

In contrast, coal-based energy production, which is a major contributor to our current greenhouse gas emissions, is literally fuelling climate change and hence impacting directly on human health. The individual and public health implications of climate change are well documented, widespread, and already occurring on massive scale. For instance, the United Nations Intergovernmental Panel on Climate Change (IPCC) suggests that 150,000 people around the world actually die as a result of climate change ***every year*** (World Health Organisation, 2010). Climate change science tells us that the recent massive flooding in many parts of Australia is indicative of the type of extreme weather events we can expect in coming decades unless we take substantial action at a global scale to reduce emissions to a safe level. It is easy to see the massive human suffering that has come with these floods, and imagine what could happen to many individuals, families and communities in coming decades should we decide to take insufficient action on climate change as we experience ever more natural disasters. Australia, as one of the highest per capita greenhouse gas emitters, and one of the richer nations on the planet, must show leadership in reducing our emissions. We need big picture thinking if we are going to be able to respond at sufficient scale to the problem of climate change. Yet growing numbers of people engaging in the domestic debate around energy are incredibly focused on themselves and perceived impacts on their amenity from the wind industry. Fear stories always make for good copy in the media. However, we would trust that a committee reporting to the Australian Senate will be able to think on a larger scale, and see that many of the claims of ill-health associated with wind energy are over stated, grounded in poor methodology, or based on conjecture.

There has been research carried out locally about possible impacts of infrasound. Wind operator Pacific Hydro commissioned Sonus (2010) to measure and compare infrasound levels from wind farms and some common environment infrasound sources, both natural and human-made. The report titled "*Infrasound and Measurements from Wind Farms and other Sources"* demonstrated that the levels of infrasound produced by wind turbines is well below established perception thresholds and, importantly, is also below levels produced by other natural and human-made sources.

Infrasound was measured at two wind farms - Clements Gap in South Australia and Cape Bridgewater in Victoria. As a comparison, measurements were also taken in the Adelaide CBD and suburbs, at the beach, on a coastal cliff, inland from the coast and at a gas-fired power station. At all these locations infrasound was not audible to the human ear and the infrasound was recorded at higher levels on the beach and in the Adelaide CBD than it was near a wind turbine. The report re-affirms that infrasound is not unique to wind farms and provided further evidence to support existing data which shows that infrasound emissions from operational wind farms are significantly below recognised perception thresholds.

(c) The impact of rural wind farms on property values, employment opportunities and farm income;

Studies have found no statistical evidence that wind farms reduce property values.

In 2009, an assessment of 45 property sales located within a 10 kilometre radius of 8 wind farms sites was carried out by the NSW Valuer General. It considered the impact of wind farms on surrounding land values and found that wind farms do not appear to have negatively affected property values. No reductions in sale price were evident for rural properties located in nearby townships with views of the wind farm.

The findings of the NSW Valuer General are consistent with studies in the United States and United Kingdom which also found no statistical evidence of reduction in property values associated with the development of wind farms.

An extensive and rigorous assessment of the relationship between wind farms and property values was completed in December 2009 by the U.S. Department of Energy's (DOE) Lawrence Berkeley National Laboratory (LBNL). The report titled "*The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis"* was based on site visits, data collection and analysis of almost 7,500 single-family home sales in areas where wind farms have been developed. The data was collected on homes situated within 10 miles of 24 existing wind facilities in nine different U.S. states. Each home in the sample was visited to collect important on-site information such as whether wind turbines were visible from the home. The home sales used in the study occurred between 1996 and 2007, spanning the period prior to the announcement of each wind energy facility to well after its construction and full-scale operation.

The analysis revealed that home sales prices are very sensitive to the overall quality of the scenic vista from a property, but that a view of a wind farm did not demonstrably impact sales prices. Neither the view of wind farm nor the distance of the home to wind farm was found to have any consistent, measurable, and significant effect on the selling prices of nearby homes.

The Berkeley Lab researchers also did not find statistically observable differences in prices for homes located closer to wind facilities than those located further away, or for homes that sold after the announcement or construction of a wind energy facility when compared to those selling prior to announcement. Even for those homes located within a one-mile distance of a wind project, the researchers found no persuasive evidence of a property value impact.

Another Canadian study by consultants Canning & Simmons, 2010 demonstrated "*where wind farms are clearly visible, there was no empirical evidence to indicate that rural residential properties released lower sale prices than similar residential properties within the same area that were outside of the viewshed of a wind turbine.*"

The employment benefits are substantial.

The benefits of wind farms to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners, direct employment opportunities for locals, and flow-on employment for local businesses through provision of products and services to the project and its employees.

This is demonstrated in a study titled "*The Economic Impact Assessment of the Hallett Wind Farms"* prepared by SKM (2010) which investigated the economic impacts that AGL's Hallett wind farm project had on the mid-north region of South Australia. The report found that $800 million had been spent on the project, including $88 million spent directly in the region. It reported that 98 construction jobs and 15 ongoing jobs were directly created by the wind farm, which will increase to 42 upon

completion. The study also found that for every job created directly by the wind farms, at least three further jobs are created indirectly.

In contrast, the situation in Victoria, where the Coalition government intends to apply a very restrictive wind farm policy, appears to be moving towards a reduction in employment in the sector. A number of companies have spoken about the likely negative employment impacts of the Coalition's plan. For instance, Portland wind tower manufacturer Keppel Prince has said it could be forced to move its business interstate because of the Victorian Government's wind farm policy (ABC, 2010).

The company had recently won a $27 million contract to build towers for the Macarthur wind farm, which was expected to create hundreds of jobs.
General manager Steve Garner said that some aspects of the Coalition's wind farm policy, like the minimum turbine set-back distance, could mean fewer new wind farms are built, with obvious loss of jobs as a result.

With sound policy that facilitates the development of wind energy, many overseas nations have been able to build large workforces (with all the associated benefits of 'downstream' employment that occurs with new jobs). One obvious example would be in the UK, where employment in the countries wind energy industry has almost doubled over the past three years, rising 91 per cent between 2007/8 and 2009/10 to more than 10,000 full time employees (Renewable UK, 2011).

(d) The interface between Commonwealth, state and local planning laws as they pertain to wind farms;

We certainly accept the need for robust planning processes, to ensure wind farms are placed in appropriate locations. Equally, the wind industry accepts the need for effective standards for wind projects.

We would urge caution in regards to making substantial changes to existing guidelines simply to appease the vocal but relatively small number of opponents to wind energy, as appears to be the case in Victoria where the new Coalition government has announced that it intends to introduce a very restrictive wind energy policy.

Wind energy projects, like any infrastructure project may be opposed by a small number of local community members. Planning policies should recognise this, while balancing the need for outcomes in the greater public good.

Wind farms should not be required to meet unnecessary higher standards than what is faced by other infrastructure developments such as coal mines, conventional power stations or other major industrial operations.

We believe that the planning systems already in place provide a sufficient framework to assess proposed developments, and thus balance the benefits of wind farm development with any impacts that may arise. Unnecessary burdens on clean energy development are contrary to the government's 20 per cent renewable energy target and are detrimental to the attraction of clean energy investment and the creation of clean energy jobs in Australia.

Wind energy proponents already apply rigorous processes to their developments to ensure they are appropriately managed and mitigate potential impacts on the environment or the amenity of local communities. Extensive and exhaustive

assessments are undertaken by proponents prior to submitting a development application to determine whether a wind farm is feasible on a specific site and as to whether there are any potential environmental or social issues that will impact upon the viability of a proposal.

In addition to this, it is standard practise for proponents to engage with a range of stakeholders in the early stages of feasibility assessment to determine whether there are any further environmental, cultural or amenity impacts that need to be understood and responded to as part of the development. Stakeholders that are consulted include not only the local community, the landowners, local council, but also the State and Federal Governments, government agencies such as CASA, Network Service Providers, electricity retailers, indigenous groups and other specific interest groups including those concerned with the protection of local fauna or flora.

As a result of the input received during this process, the final form of the proposed development is often substantially different from the original plan, because of issues that have arisen during the planning and approvals phase. One example occurred recently at the Stockyard Hill project, between Beaufort and Skipton in Victoria, where 41 turbines were rejected by the Panel appointed by the planning minister due to their possible impact on a local brolga population (Moreton, 2010). We would argue that this shows that existing systems are working effectively to find the balance between what a developer wants and what the community will support.

There are numerous planning requirements currently in place at Federal, State and local government levels. The interplay of these existing laws already create a sometimes ineffective and unnecessary hurdle to the development process of wind farms, with differing regulatory controls in different jurisdictions making it more cumbersome for developers working across jurisdictions. Certainly, the intention of the Coalition government in Victoria to introduce an exceptionally restrictive set of guidelines covering arbitary setback of turbines and the declaration of ‘no go’ zones, will negatively impact on the further development of wind energy in that state.

Adding additional regulatory controls would only act to add to this red tape and make wind energy more expensive.

The industry group for the sector, the CEC, has previously highlighted concerns with the Draft National Wind Farm Development Guidelines. In 2008, a report was developed for the Environment Protection and Heritage Council (EPHC) *Report on Impediments to Environmentally and Socially Responsible Wind Farm Development*. This report identified that the existing approval systems in the jurisdictions are generally robust and that many of the issues that have been identified are adequately dealt with through the existing procedures.

National guidelines do have the potential to encourage greater consistency between State planning regimes and remove impediments to further development. However the Draft National Wind Farm Development Guidelines as currently proposed only add substantial impediments to wind farm development beyond those imposed on other infrastructure investments. This will lead to reduced certainty for the planning assessment process by introducing additional, and often conflicting guidelines, and in turn, this would add additional costs and delays to wind farm developers without delivering improved outcomes.

(e) Any other relevant matters.

We would like to briefly address the following additional, and very relevant, points:

- **Community support**

It should be remembered that while there has been a vocal campaign organised by some people and organisations against the development of the wind industry, it remains well supported in the broader society.

A range of polling shows this to be the case.

For instance, a Newspoll survey commissioned by the Clean Energy Council in December 2009 found that in regional areas 90% of people said that Australia should produce more renewable energy.

Similarly, an AMR Interactive survey commissioned by the NSW government in mid 2010 on community attitudes to wind farms, found wind farms were regarded as an acceptable form of power generation by 81% of the population. The survey also found that 80% of residents were supportive of wind farms being built in their local region and more than 60% supported them at 1 to 2 kilometre from their residence. There was also broad acknowledgement of the benefits of wind farms to the local community including economic and employment benefits and broad endorsement of more wind farms being built in the area.

- **Greenhouse abatement**

The other obvious benefit of wind farms is the greenhouse emissions abatement that they provide.

A study by MMA (2010) on "*Estimating Greenhouse Gas Emissions Abatement from Wind Farms in NSW"* found that wind displaces fossil fuel generation and can act to lower wholesale electricity prices. Wind reduces demand for electricity from other sources, which are typically fossil fuel based generation. An average sized wind farm of 150 MW will displace from 150 kt CO2e to 450 kt CO2e per annum, while a large (500MW) wind farm will displace from 900 kt CO2e to 1,600 kt CO2e per annum.

The level of greenhouse gas abatement varies depending on the location of the wind farm. Increased greenhouse abatement occurs for wind farms located in areas with good quality wind resource which are close to electricity users or high quality transmission lines. For many projects the commercial viability of a wind farm relies on optimisation of wind turbine types and layouts to maximise the electricity output which in turn would result in the highest emission abatement. This consideration is of particular relevance for this inquiry.

The MMA study also found that the emissions resulting from the manufacture, construction and operation of wind farms are low relative to those associated with the manufacture, construction and operation of large fossil fuel plants. For a 50 MW wind farm of average output it takes about 14kg CO2e/ MWh to manufacture, build and operate it. This represents less than 2% of the typical emissions reduction that such a wind farm would achieve from displacing fossil fuel generation.

- **Low water consumption**

An additional benefit of wind energy is the fact that unlike traditional cower-fired power stations it does not consume any water for generation. Coal powered stations

require large quantities of water to generate steam to drive the turbines, and for cooling the exhaust steam. Thermal power plants, primarily coal-fired power stations, are responsible for around 1.4 % of total water consumption in Australia (ABS, 2005).

Given the on-going water stress in most parts of Australia, especially in regions where our largest population centres are located, and growing demands for fresh water supplies for agricultural and other human use as well as to ensure environmental flow in our river systems, wind looks even more attractive compared with older, and dirty, coal fired power generation.

Conclusion

In conclusion, we urge you not to give in to unsubstantiated rumour and outright fear campaigns about wind energy.

With appropriate controls and robust planning processes, wind has proven itself to be an excellent form of energy as part of a broader mix, while driving investment and employment and direct benefit for landowners in rural areas and acting to reduce our greenhouse emissions.

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