



CLIMATE AND  
HEALTH  
ALLIANCE

## Position Statement Health and wind turbines

### Purpose

The Climate and Health Alliance has developed this statement in response to claims that there are adverse health effects associated with human exposure to wind turbines.

### Overview

Anthropogenic climate change poses serious and increasing risks to human health. Global average temperature increases resulting from the trapping of greenhouse gas in the Earth's atmosphere is leading to significant changes to Earth's systems.<sup>1</sup> These changes are predominantly associated with greenhouse gas emissions arising from the burning of fossil fuels, such as coal, oil and gas.<sup>2</sup> Reductions in emissions from fossil fuelled electricity generation and transport are required to reduce climate risks to all species, and the biosphere, and to reduce harm to human health.<sup>3,4</sup>

Renewable energy technologies offer Australia the opportunity to reduce its emissions from fossil fuels using its abundant natural resources. Wind and solar power technologies are currently available that make it possible for Australia to shift to 100% renewable energy for electricity generation in a relatively short time frame.<sup>5</sup>

Renewable energy generation such as wind power provides a safe and healthy alternative to fossil fuels. The balance of current scientific evidence indicates that while a small proportion of people may respond to annoyance from noise in some cases, on the whole no adverse physical health effects directly related to wind turbines have been demonstrated.<sup>6</sup>

### The evidence

To date, there is no credible peer reviewed scientific evidence that demonstrates a direct causal link between wind turbines and adverse health impacts in people living in proximity to them<sup>7,8</sup> There is no evidence for any adverse health effects from wind turbine shadow flicker or electromagnetic frequency.<sup>9</sup> There is no evidence in the peer reviewed published scientific literature that suggests that there are any adverse health effects from 'infrasound' (a component of low frequency sound) at the low levels that may be emitted by wind turbines.

There is some evidence to suggest that audible noise from wind turbines at elevated sound pressure levels may be associated with disturbed sleep and negative emotions.<sup>10</sup> Annoyance levels may be expressed more about wind turbines than for comparable industrial noise, in particular when people hold pre-existing negative attitudes towards turbines.<sup>11</sup> Annoyance may also be related to visual cues.<sup>12,13</sup>

Fear and anxious anticipation of potential negative impacts of wind farms can also contribute to stress responses, and result in physical and psychological stress symptoms.<sup>14</sup>

In addition, some people experience distress when they perceive a threat to the place that they live in the form of changes to the landscape, like a wind farm, but also other industrial developments, such as new housing estates, coal mines, or supermarkets.<sup>15</sup>

Local concerns about wind farms can be related to perceived threats from changes to their place and can be considered a form of “place-protection action”, recognised in psychological research about the importance of ‘place’ and people’s sense of identity.<sup>16</sup> The literature has previously identified the upsetting nature of place change, leading to feelings of grief or loss.<sup>17</sup> However it is important not to presume that energy projects specifically, and proposals for place change more generally, will necessarily disrupt place attachments. How changes to places are interpreted, rather than the form of change per se, is critical in determining whether the pattern of association between place attachment and acceptance is positive or negative.<sup>18</sup>

Economic reward can also affect attitudes to wind turbines, with people economically involved with wind farms more likely to show a more positive attitude to wind power than those who are not.<sup>19</sup>

### **Health effects of fossil fuels**

An examination of the health effects of *any* form of energy generation is meaningless unless it is placed into the context of alternative means of energy generation.

Australia’s current energy systems are heavily reliant on the burning of fossil fuels such as coal and gas for electricity generation.<sup>20</sup> These energy sources are not only implicated in driving climate change but, particularly in the case of coal, also pose significant risks to human health. A shift away from fossil fuels to clean renewable energy to reduce greenhouse gas emissions will therefore also reduce risks associated with the mining, transportation and combustion of coal, which contributes to increased risk of developmental delays, lung cancer, heart disease, chronic obstructive pulmonary disease, asthma and other conditions.<sup>21,22</sup>

People who live and work in industries associated with mining, transportation and combustion of fossil fuels face health risks.<sup>23</sup> However, the cost associated with damage to human health and the natural environment from burning fossil fuels is not widely recognised, and is currently not reflected in the costs of electricity from coal and gas fired power in Australia.<sup>24</sup>

If these currently externalised costs of electricity on climate change and health from Australian power stations were accounted for, the cost of power generated by fossil fuels would be considerably higher. The additional climate and health costs that are presently unaccounted for are estimated at: \$A19/MWh for natural gas, \$A42/MWh for black coal and \$A52/MWh for brown coal, while the external costs of wind are only \$ \$A1.50/MWh. This means the real costs of coal and gas fired electricity is more likely in the vicinity of \$100/Mwh, while on-shore wind power is around \$70/Mwh.<sup>25</sup>

### **Misinformation about wind power**

Some sections of the community with vested interests may be ideologically opposed to wind power, and recognise that creating doubt and anxiety about health effects of wind power may be an effective form of opposition. Other people may be genuinely concerned after being influenced by stories they have heard in the media or read on the internet. However, this sort of anecdotal information is not an accurate way of making judgements about the safety of wind power and the community and policymakers should look to scientific studies and objective measurements to obtain a true picture.

Some of the anxiety and concern in the community stems originally from a self-published book by an anti-wind farm activist in the United States which invented a syndrome, the so-called ‘wind turbine

syndrome'. This is not a recognised medical syndrome in any international index of disease, nor has this publication been subjected to peer review.<sup>26</sup>

There have also been efforts by anti-wind activists to argue that a lack of evidence directly linking wind turbines and physical health effects suggests the available research is not sufficient. Large scale commercial wind farms however have in operation internationally for many decades, often in close proximity to thousands of people, and there has been no evidence of any significant rise in disease rates.<sup>27</sup> In contrast, there has emerged a significant body of evidence relating to the health impacts from energy generation that relies on burning fossil fuels.<sup>28</sup>

It is relevant to note the links between some anti-wind campaigners and some organisations that promote doubt and scepticism in relation to the science of climate change. Further information is available at [www.windhealthfacts.net](http://www.windhealthfacts.net), a resource currently being developed by Sydney University.

### **CAHA Position on Wind Farms**

The Climate and Health Alliance:

- understands that despite the existence of large scale commercial wind turbines in densely populated areas for over 20 years, there is **no credible evidence** in the peer reviewed published scientific literature that there are any direct adverse physiological health effects from exposure to wind turbines;
- supports the deployment of wind turbines as an important source of zero emissions renewable energy for electricity generation to replace highly polluting and harmful fossil fuels to reduce climate risk as well as direct harm to human health;
- notes that wind power is associated with a high degree of safety compared to the significant and well documented adverse health impacts of fossil fuels and the risks of nuclear energy;
- acknowledges that a small proportion of individuals report what they believe to be adverse health effects related to wind turbines, and that audible noise appears to be the main exposure associated with this. Annoyance from this exposure appears to be influenced by a number of factors including views about wind power, perception, and psycho-sociological factors;
- recognises that careful community consultation is vital to ensure that communities in the vicinity of wind turbines are appropriately consulted and involved in any proposed wind farm development and that accurate and timely information about health and other implications is provided;
- notes that some anti-wind activists are exploiting a range of factors to oppose the deployment of wind energy technologies, including community concerns that commonly accompany the introduction of new technologies;
- urges policy makers to carefully review claims of anti-wind campaigners in the light of credible peer reviewed published scientific evidence;
- supports rigorous well-designed and ethical research into the risks to human health from energy generation, with the priority given to energy sources where there is already significant evidence of harm, namely fossil fuels; and
- proposes that consideration be given to remunerative models where the benefits from wind farms are shared amongst the whole community, not just those on whose land they are sited.

This statement has been prepared by the CAHA Committee of Management and Expert Advisory Group on behalf of CAHA Members and released in February 2012. It will be reviewed in 2013.

## References

- 
- <sup>1</sup> Hansen, et al. Target Atmospheric CO<sub>2</sub> : Where should humanity aim? *The Open Atmospheric Science Journal*, 2008, 2, 217-231.
- <sup>2</sup> Climate Commission, *The Critical Decade*, 2011.
- <sup>3</sup> Copenhagen Climate Congress, *Climate Change: Global risks, challenges and decisions*, 10-12 March 2009, Synthesis Report.
- <sup>4</sup> McMichael AJ, Butler CD. Climate change and human health: recognising the really inconvenient truth. *Medical Journal of Australia*, 2009; 191: 595-596.
- <sup>5</sup> Beyond Zero Emissions and Melbourne Energy Institute, *Zero Carbon Australian 2020 Stationary Energy Plan*, 2010.
- <sup>6</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>7</sup> Knopper, L. *ibid*.
- <sup>8</sup> Health Protection Agency, 2010, *Health Effects of Exposure to Ultrasound and Infrasound: Report of the independent Advisory Group on Non-ionising Radiation*, Health Protection Agency Centre for Radiation, Chemical and Environmental Hazards, Chilton, Didcot, Oxfordshire, UK.
- <sup>9</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>10</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>11</sup> Pederson E and Persson Wayne K (2007). Perception and annoyance due to wind turbine noise – a dose-response relationship. *Journal of the Acoustical Society of America*, 116(6): 3460-3470.
- <sup>12</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>13</sup> Leventhall, Geoff, (2010) Submission and Appendices to the Senate Inquiry: The Social and Economic Impact of Rural Wind Farms, available at [http://www.aph.gov.au/senate/committee/clac\\_cte/impact\\_rural\\_wind\\_farms/submissions.htm](http://www.aph.gov.au/senate/committee/clac_cte/impact_rural_wind_farms/submissions.htm)
- <sup>14</sup> Colby, W. D. et al (2009). *Wind Turbine Sound and Health Effects: An Expert Panel Review*. American Wind Energy Association, Canadian Wind Energy Association.
- <sup>15</sup> Devine-Wright, P. 2005. Beyond NIMBYism: Towards an integrated framework for understanding public perceptions of wind energy, *Wind Energy*, 7, 125-139.
- <sup>16</sup> Devine-Wright, P. Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community and Applied Social Psychology*, 2009, 19:6, pp.393-520.
- <sup>17</sup> Chow, K., & Healey, M. (2008). Place attachment and place identity: first-year undergraduates making the transition from home to university. *Journal of Environmental Psychology*, 28, 362–372.
- <sup>18</sup> Devine-Wright, P. & Howes, Y. (2010). Disruption to place attachment and the protection of restorative environments: A wind energy case study. *Journal of Environmental Psychology*, 30, 271–280.
- <sup>19</sup> Devine-Wright, P. (2005) 'Local aspects of renewable energy development in the UK: public beliefs and policy implications'. *Local Environment*, 10(1), 57-69.
- <sup>20</sup> Garnaut, R. Australia's emissions in a global context, in *The Garnaut Climate Change Review: Final Report*, Cambridge University Press, 2008, p.158.
- <sup>21</sup> Castelden, W. et al. The mining and burning of coal: effects on health and environment, *Medical Journal of Australia*, 195:96, 19 September 2011.
- <sup>22</sup> Physicians for Social Responsibility, *Coal's Assault on Human Health*, 2009. Available online: <http://www.psr.org/assets/pdfs/psr-coal-fullreport.pdf>
- <sup>23</sup> Hendryx, M. and Ahern, M. Relations between health indicators and residential proximity to coal mining in West Virginia, *American Journal of Public Health*, Vol 98, No. 4, April 2008.
- <sup>24</sup> Biegler, T. The hidden costs of electricity: Externalities of power generation in Australia, 2009, Report for the Australian Academy of Technological Sciences and Engineering (ATSE). Available online: <http://www.atse.org.au/resource-centre/func-startdown/63>
- <sup>25</sup> Melbourne Energy Institute, *Wind Energy*, factsheet. Available at <http://energy.unimelb.edu.au/uploads/MeiWindv05.pdf>
- <sup>26</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>27</sup> Knopper, L and Ollson, C. Health effects and wind turbines: A review of the literature, *Environmental Health*, 10:78, 2011.
- <sup>28</sup> Physicians for Social Responsibility, *Coal's Assault on Human Health*, 2009. Available online: <http://www.psr.org/assets/pdfs/psr-coal-fullreport.pdf>