FACT SHEET 3

Wind Farming & The Environment

Why Are Renewable Energy Sources Like Wind Power Important?

Most (90%) of the electrical energy used in Australia comes from the burning of fossil fuels such as coal and natural gas. In April 2001, the Renewable Energy [Electricy] Act was passed as one of the measures proposed by the government aimed at reducing human induced changes to our climate. This Act set targets for the increased use of renewable energy through the Mandatory Renewable Energy Target (MRET). Wind energy is clean, free and renewable. The technology is proven, fast to build and cheap in comparison to other renewable energy technologies. Wind energy is well placed to grow and deliver greenhouse pollution cuts on an increasingly cost competitive basis.

Is Climate Change Real?

The Greenhouse Effect is a natural phenomenon whereby greenhouse gases trap heat in the atmosphere, keeping earth warm enough for us to habitate. Human activity is however, releasing unprecedented quantities of these gases into the atmosphere principally through the use of fossil fuels. This is believed to be causing too much warming and may lead to accelerated climate change. While the extent and severity of the effects on the environment are uncertain, it is a serious environmental problem for humanity. To avoid dangerous climate change, well beyond what we have seen already, greenhouse emissions will need to be reduced by at least 60% below 1990 levels by 2050. While the "Kyoto Protocol" will reduce emissions by an average of 5% by 2012, it will only be the first of many initiatives required to achieve the massive reductions needed.

Where Does Australia Rate In Greenhouse Gas Production?

Australia has the highest per capita greenhouse gas emissions in the developed world. Although Australia's emissions contribute only 3.6% to the global total, they are roughly the same as the combined emissions from Austria, Denmark, Finland, Ireland, New Zealand, Norway, Portugal, Sweden and Switzerland.

Why Are Australia's Greenhouse Emissions So High?

Electricity consumption due to the burning of coal and other fossil fuels, is the most significant source of greenhouse emissions in Australia (45%). This continues to increase rapidly with economic growth. In Australia, around 10% of our electricity is renewable, most of which comes from large scale hydroelectric power stations that were built several decades ago such as the Snowy Mountains Scheme .

How Much Energy Goes Into Building Wind Turbines?

It takes only a few months for a wind turbine to pay back the energy used in its manufacture and over its 20 year lifetime, a wind turbine will produce more than 50 times the energy used in its manufacture, transportation and erection. Once dismantled at the end of its life, it will leave very little legacy of pollution for future generations.

Are There Other Benefits To Wind Generation?

Rather than generating a large amount of power in one centralised location, wind farms are often located close to where the electricity is actually used. This means that the losses usually associated with the transmission of electricity over long distances (up to 10%) can be significantly reduced. This further increases the emission reduction benefits.

How Much Energy Can A Wind Farm Produce?

Depending on siting, a typical wind turbine can produce the equivalent energy needs of up to 1,000 homes. A typical 50 megawatt (MW) wind farm in Australia displaces between 65,000 and 115,000 tonnes of carbon dioxide per annum – enabling tens of thousands of tonnes coal to be left in the ground each year.

What Is The Impact On The Local Environment?

Wind power offers an environmentally benign means of generating electricity and since the area occupied by the wind turbines themselves is so small, the impact on the natural environment is usually quite minimal. Having said this, wind turbines do need to be located in elevated and exposed places and are often visually prominent in the landscape. There is little doubt that in terms of local environmental impact, it is the visual aspects which will tend to dominate debate. This is addressed in more detail in Fact Sheet # 7. In terms of other local environmental impacts, wind developers are often able to integrate beneficial local environmental measures into their construction and operational activities. This can include the collection of indigenous plant seeds, planting of shelter belts or habitat areas, land class fencing, erosion control measures or easing fire hazard management through improved site access. Income to landowners hosting wind generators can ease pressure on agricultural land by reducing the stocking or cropping of marginal land. In addition, these landowners are often able to adopt superior pest, weed and erosion management practices as well as affording environmental plantings and other land care initiatives.

What Is The Impact On Wildlife?

Wind farms undergo stringent environmental approval processes including detailed studies of the impact on wildlife. Generally, the adverse impacts if any, will be negligible and positive outcomes can often be achieved through the integration of environmental works by the developer and host landholders.

How do Wind Turbines Impact Birds?

Monitoring at the Codrington, Woolnorth and King Island wind farms has found bird deaths to be below levels predicted and accepted during the wind farm approvals process. The rate of bird mortality on those sites ranged from between 0.23 to 2.7 birds per turbine per year, none of which was a rare, threatened or endangered species. Putting this into perspective, millions of birds are killed by cars and other man made structures every year. Impacts on Birds are discussed in more detail in Fact Sheet #8.

What Are The Long Term Impacts Of Wind Farming?

The long term impacts of wind farming are negligible. During operation there is no depletion of the fuel source (wind). When a wind farm is removed, there is no lasting residual impact on the landscape and it can be returned to essentially the same state as it was before the wind farm was built. Most wind farm development approvals have clauses requiring developers to decommission wind turbines at the end of their design life or if they cease operation for an extended period of time.

How Much Land Do Wind Farms Take Up?

In Australia, the land occupied by wind farms may not be as much of an issue as in countries where vacant land is at a premium (eg. Europe or Japan). Yet in comparison with other energy generation technologies, wind farms still show a greater energy yield per square meter with the impact intensity of wind generation facilities being significantly lower than an equivalent sized fossil fuel based plant :

Technology	m2 land used per GWh
Coal	3,642
Solar Thermal	3,561
Photo Voltaic	3,237
Wind	1,335

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