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Steps to an Energy [R]evolution

Wind power



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Wind power: leading the charge

Of all the new renewable power technologies, wind power is the most commercially developed and by far the largest provider of renewable, zero-emission electricity into the world's power networks. Skilled resource mapping and wind farm planning allows wind power to provide strong, reliable and predictable electricity, while providing plenty of benefits for local communities.

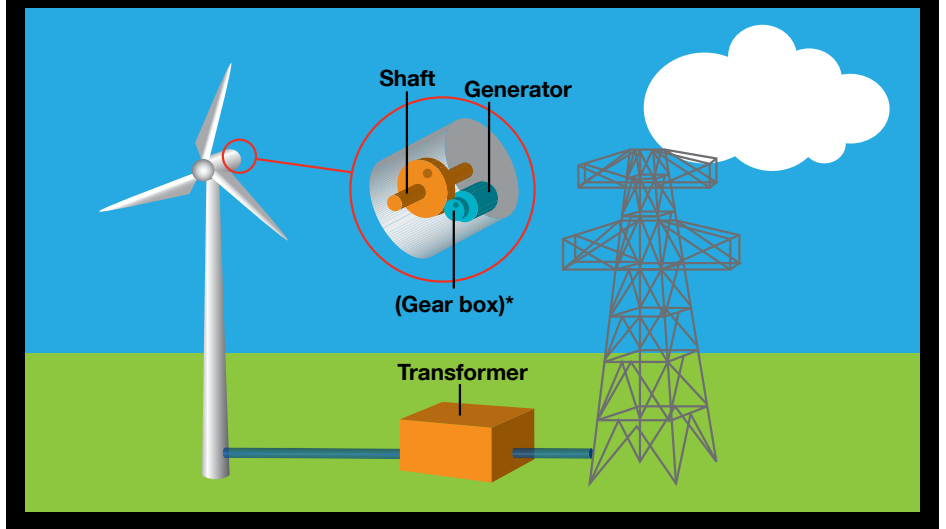
Wind power – how it works:

Wind power is a passive technology that catches the prevailing wind resource and turns that kinetic energy into electrical power. The windmills consist of a stem, blades and a turbine, which sits at the nexus of the blades. Instead of driving a turbine using steam from burning fossil fuels, in a windmill the turbine is spun from the rotation of the blades.

The electricity generated from the turbine is fed directly out of the windmill at its base and into the grid for us to use.

Modern-day wind turbine stems are about 100 metres high, with blades 50-60 metres long. The average new wind turbine has a capacity of 2 Megawatts, which over a year translates into enough electricity to power 750 Australian homes. However, a newer generation of wind turbines with generating capacity of 5-7 Megawatts is emerging, expanding the potential for wind power even further.

Diagram of how Wind Power works



*Some turbines are gearless/direct drive

- ▶▶ China is installing a new wind turbine every half an hour.
- ▶▶ Over 40% of new electricity generation capacity in the United States in 2008 was wind power.
- ▶▶ The Energy [R]evolution scenario shows that, by 2020 wind power could provide 21% of Australia's electricity, providing more than 19,000 Australian clean energy jobs.

Wind power around the world

In 2008, enough wind energy was produced worldwide to supply more than Australia's total electricity requirements. This is still a small share on a global scale, but the amount of installed wind power capacity has increased by 25-30% each year for the past five years and with major markets like China growing exponentially, this rate of growth is set to skyrocket.

The leading countries in wind power at the moment are the United States, China, Germany and Spain. Spain's wind industry has reached the point where in 2009 wind overtook coal to become the third-largest supplier of power. Countries that have developed wind power are also seeing the financial benefits. In the United States, Germany, Spain, Belgium and Denmark, wind power is noticeably lowering the average cost to produce electricity in these countries.

The country to watch is China. This is a country installing a new wind turbine every half an hour and its wind industry is still just warming up. In 2010, China will be manufacturing enough new turbines to completely replace Australia's existing wind farms every seven weeks. China also plans to have 150,000 Megawatts of wind installed by 2020, which would be enough on its own to meet Australia's electricity demand.

The potential for wind power in Australia

Australia has outstanding wind resources, especially in our southern states. A number of major wind projects have already been built, such as at Waubra and Portland, where hundreds of local jobs have been created in zero-emission power.



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However, with a major expansion likely because of the renewable energy target, what we're seeing now could be just the tip of the iceberg. Enough wind projects to meet half of the proposed 20% renewable energy target already have planning approval, meaning that this is a technology ready to move immediately and start replacing greenhouse-polluting coal.

Modelling commissioned by Greenpeace has revealed it is technically and physically possible that, by 2020, all of Australia's greenhouse-polluting coal-fired power stations could be replaced with a combination of seven renewable energy technologies and energy efficiency. Wind energy would represent the largest amount of any installed capacity, reaching 16,000 Megawatts, or 21% of Australia's electricity requirements in 2020. Doing so would create over 19,000 direct clean energy jobs.

As the technology with the greatest potential to move early, the role of wind energy essentially allows us to retire 8,500 Megawatts of polluting coal-fired power plant by 2020, equivalent to the power generating capacity of Victoria.

How can we deliver wind power in Australia

Australia urgently needs policies that revolutionise how we produce and use energy, moving us to zero-emission and energy efficient power as soon as possible. Governments must introduce policies that ensure no new coal-fired electricity plants are built, and the renewable energy industry is able to meet its full potential.

The most proven policy for renewable energy industry development is the feed-in tariff, which provides a financial incentive to generators of renewable-energy. Feed-in tariffs are what turned Germany into a country with more than 20 times Australia's installed wind capacity and a workforce in wind of about 85,000 people.

You can make the Energy [R]evolution happen!

We need Australians to use their power, as consumers, voters and active members of the community to help make the Energy [R]evolution a reality. The planet is teetering on the verge of triggering catastrophic climate change but we have the solutions to prevent it. You can:

- ▶ **Stay informed** – visit the Greenpeace website: www.greenpeace.org.au/climate to sign up for our monthly emails or learn more about climate and energy issues.
- ▶ **Contact your local MP** – use your power as a voter and make sure your local politicians are aware that this issue matters to you.
- ▶ **Put your savings to work** – like all working Australians, you've got savings in a superannuation fund. Unfortunately, the chances are that your hard-earned savings have been used to invest in risky, unsustainable, coal-fired power stations. Super funds have a legal obligation to consider inquiries from members – so write to yours and ask them to stop investing in coal and start investing in renewables.