

WIND ENERGY IN AUSTRALIA

Australia's Renewable Energy Target (RET) is a federal government policy designed to ensure that at least 33,000 GWh of Australia's electricity comes from renewable sources by 2020.

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Low operating costs and extensive availability make wind one of the most advantageous and effective renewable energy sources. To harness wind energy, large wind turbines rotate available wind energy within the area swept by the blade and produce a power output that is proportional to the air density and the wind speed cubed. These spinning blades are connected to electric generators that produce electricity for export to the grid. In 2014, 30 percent of total renewable energy produced in Australia was from wind. Wind power also supplied 4.2 percent of Australia's overall electricity during that year. By the end of 2014, Australia had 1,886 wind turbines spread across 71 wind farms. Australia began installing eight wind farms between 2014 and 2015 with a total power generation capacity of 566.7 MW. Three of the eight wind farms were completed by the end of 2014, and five more were completed in 2015.

Why Australia Should Move Toward Renewable Energy Production

Australia has one of the highest per-capita greenhouse gas emission levels in the developed world. This is due in part to its large domestic reserves of coal that has kept electricity prices low and attracted energy-intensive industry. Currently, more than 75 percent of total domestic electricity generation relies on coal-fired power. However, in recent years, concerns over climate change have prompted Australian policymakers to revive their energy policy and create a mandatory target for energy production using renewable energy including wind. Australia needs to meet future energy requirements in an increasingly carbon-constrained, multilateral policy environment that is challenging and in need of active mobilization of all available assets.

What Australia Is Doing To Promote Renewable Energy

Federal policy has changed since the publication of the Garnaut Climate Change Review study and several policies, targets, and initiatives have been announced to improve the renewable energy sector in Australia. Some of these initiatives include a Carbon Pollution Reduction



Scheme white paper, an announcement in 2010 of an Emissions Trading Scheme, and an announcement of a national mandatory renewable energy target of a 20-percent share of electricity supply in Australia by 2020.

The national Mandatory Renewable Energy Target was announced to achieve the following:

- Encourage the additional generation of electricity from renewable sources
- Reduction of greenhouse emission
- Ensure that renewable energy sources are ecologically sustainable

Is Wind Energy an Option for Australia?

Wind energy is a proven and mature technology with low operating costs. Wind turbines require low maintenance costs, which reduce the economic barriers related to work force and management. For wind-rich sites, wind energy holds great possibilities and can compete with other renewable sources of energy such as solar and biomass. Currently, wind cannot compete with the cost of electricity produced using a traditional or existing coal-based power plant that has already been depreciated and paid for by taxpayers and electricity consumers. However, wind energy is one of the cheapest of all the available renewable energy

sources. It is competitive with new clean coal-fired power stations and cheaper than new nuclear power.

Australia vs. the United States in Wind Energy Policy

By 2013, at least 144 countries have announced different renewable energy targets and policies to support renewable energy development at the national level compared with only 55 countries in 2005. There are also a large number of state/provincial level and local level policies in different countries such as Australia and the U.S. Similar to the national mandatory target in Australia, the Renewable Portfolio Standard (RPS) uses market mechanisms to ensure that a growing percentage of electricity is produced from renewable sources such as wind power. The Renewable Electricity Standards

(RES), also called RPS, provides a competitive and predictable market in which renewable energy generators compete with each other to lower the prices. Currently, RES policies exist in 29 U.S. states as well as the District of Columbia and Puerto Rico, but not at the national level. Additionally, the U.S. Department of Energy has also targeted to increase the contribution of wind energy to 20 percent of total electrical energy by the end of 2030. In collaboration with the American Wind Energy Association (AWEA), the DOE’s “Wind Vision Report” provides valuable insight into the cost, major impacts, and associated challenges in achieving the 20-percent wind by 2030, as well as wind energy supplying the U.2. with 10 percent of the country’s electricity by 2020, 35 percent by 2050, and road maps on how to get there. Wind Vision updates and expands on the DOE’s 2008 report, “20% Wind Energy by 2030: Increasing wind energy’s contribution to the U.S. electricity supply,” which galvanized the rapid growth of wind so that it now generates 4.5 percent of America’s electricity.

Conclusion and Advice for Further Improvement in Successful Utilization of Wind Energy

Utilization of software and sensors to constantly monitor forces exerted on the blades would help to significantly increase the amount of electricity generated and lower the cost of wind power. Grid constraints such as a lack of capacity or availability may limit the growth of wind energy in some areas that have good wind resources. In such areas, the upgrade and extension of the wind grid to the current grid may be needed to accommodate further wind energy development.

State	Number of Projects
Western Australia	21
South Australia	17
Victoria	14
New South Wales	10
Tasmania	7
Queensland	2
Northern Territory	0
Australian Capital Territory	0
	71

Table 1: Installed wind energy in Australia by the end of 2014

With new developments in wind energy technology, Australia is expected to reach a high level of wind energy generation over the next few decades. Deployment of wind energy in Australia may be further accelerated by improvements in wind forecasting technology and more accurate estimates of the likely output from wind farms.

Both Australia and the U.S. have set renewable energy targets to increase the scale of renewable energy applications, introduced legislation and regulations at national and state/provincial level, implemented different governmental programs, and provided incentives and funding to ensure that the targets can be met in required time. ↵

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