

# COUNTRY REPORT 1: AUSTRALIA



## Renewables grow as policies reach crossroads

Over 10,400MW of renewables is likely to eat up 30% of peak demand in 2018-2019, leaving coal's future hanging.

Even after Australia had switched between five prime ministers in just five years, the absence of a central energy policy remains, subjecting consumers to the mercy of 80-90% electrical price hikes for the past decade. Clean energy advocates insist that shifting to solar and wind energy will lower power bills and reduce emissions even as pro-coal groups argue that investment in high-energy, low-emissions coal-fired power stations is the key to providing reliable and affordable power.

On one side of this contentious energy policy debate, some academics point to the strong growth momentum of solar PV systems and wind farms as a sign of

**Australia will likely install about 10,400MW of new renewable energy in 2018 and 2019, representing 30% of the country's peak electricity demand.**



the shifting tides in favour of renewable energy. Australia will likely install about 10,400MW of new renewable energy in 2018 and 2019, representing 30% of the country's peak electricity demand and comprising of 7,200MW of large-scale PV systems and wind farms together with 3,200MW of small-scale rooftop PV systems, according to paper written by researchers from The Energy Change Institute of the Australian National University (ANU).

"The Australian renewable energy industry is convincingly demonstrating its capacity to install large amounts of wind and PV systems," said **Ken Baldwin**, one of the authors of the ANU paper. He added that if the industry can continue to deploy wind and PV at the current rate into 2020 and beyond, then Australia will be capable of supplying up to 29% renewable electricity in 2020, 50% in 2025, and 100% in the early 2030s. In addition, the country should be able to surpass its 2020 large-scale Renewable Energy Target, or RET, of 33,000GWh.

The rapid cost reduction for renewable energy along with the RET has mainly driven the upswing in renewable energy projects such as solar and wind farms, according to analysts. Under the large-scale RET scheme, the government has set financial incentives for creating

or expanding renewable energy power stations such as wind and solar farms or hydroelectric power stations.

### Falling wind, solar costs

Baldwin said the current deployment rate of renewable energy in Australia could continue on the back of a rapid decline in wind and PV prices as well as the fact that more companies recognise the economic and environmental benefits of renewable energy. **Greg Jarvis**, Origin Energy's head of energy trading and operations, had reportedly estimated in early October that the cost of solar was at the mid-\$40s/MWh whilst the cost of wind was at the low-\$50s/MWh, having declined to the point of being cheaper than the marginal cost of coal generation.

"Wind and solar prices have fallen significantly in the past decade and they are now the cheapest type of new-build generation – far cheaper than a new coal power station," **Greg Bourne**, climate councillor at the Climate Council of Australia, said. "Even without considering the benefits of dramatically reduced emissions and other pollutants (such as better health outcomes), new wind and solar are cost competitive with new gas power stations, particularly as the price of gas has increased."

China-based renewables developer

**Annual PV and wind generation (TWh) and the consequent reduction in fossil generation**



Source: ANU Energy Change Institute

## Australia renewable energy generation

TECHNOLOGY	GENERATION (GWh)	PERCENTAGE OF RENEWABLE GENERATION	PERCENTAGE OF TOTAL GENERATION	EQUIVALENT NUMBER OF HOUSEHOLDS POWERED OVER COURSE OF THE YEAR
Hydro	12,920	33.9%	5.74%	2,811,140
Wind	12,873	33.8%	5.72%	2,800,914
Small-scale solar PV	7,725	20.3%	3.45%	1,680,412
Bioenergy	3,713	9.7%	1.65%	807,783
Medium-scale solar PV	197	0.5%	0.09%	42,959
Large-scale solar PV	695	1.8%	0.31%	151,243
Solar thermal	16	0.0%	0.01%	3383
Geothermal	1	0.0%	0.00%	152
<b>TOTAL</b>	<b>38,139</b>	<b>100%</b>	<b>16.94%</b>	<b>8,297,985</b>

Source: NEM Watch, Australian Energy Statistics, ARENA, Clean Energy Council Renewable Energy Database, SunWiz

Goldwind has been leading the charge in constructing large-scale projects. In September, it began construction on what is set to become Australia's biggest and one of its lowest cost wind energy projects, the 530MW Stockyard Hill wind farm in western Victoria. The company is also currently working the Moorabool wind farm in Victoria and Cattle Hill wind farm in Tasmania.

In total, Goldwind is offering a portfolio of more than 1GW of wind and solar colocation projects as well as wind projects across Queensland, Western Australia and Tasmania, which is expected to have a value of A\$3b after project construction. The company said the sales process will target existing participants and new entrants to the Australian renewables market.

Australian firm Acciona has also invested A\$288m in the 157.5MW Mortlake South wind farm, its fifth in the country and which is expected to boost the company's renewable energy capacity in the country by 36%. Construction is scheduled to start in early 2019 and finish by mid-2020.

Another factor that has buoyed renewable energy is the upswing in business demand, with some firms even venturing into setting up their own solar and wind projects as a long-term investment to cut down on energy costs.

"Businesses are taking control of their energy use by installing renewable energy and generating their own electricity," Bourne noted. "Renewables are so affordable that by building, contracting or investing in new wind and solar power plants, businesses can significantly reduce their reliance on grid electricity, reducing exposure to volatile electricity prices and future price hikes."

Bourne said Australia is experiencing a boom in renewable energy, with over 5,000MW of renewable energy projects like wind and solar farms under construction in 2018. He noted that agricultural organisations and food

producers, wholesalers and warehouses, manufacturers and healthcare facilities have been more keen in installing rooftop solar in a bid to reduce their power bill.

The beer company Carlton & United Breweries has signed a power purchase agreement to buy renewable energy from the 112MW Karadoc solar farm near Mildura, providing most of the firm's power needs for 12 years. Meanwhile, Nectar Farms, an agricultural business that is constructing a new vegetable greenhouse in regional Victoria, is also building a 196MW wind farm and a 20MW battery called the Bulgana Green power Hub, a partially-funded project by the Victorian government and is scheduled for completion in 2019.

### Businesses warm up to renewables

"The rising cost of energy is the leading concern for Australian businesses over the next ten years," said Bourne, citing how gas prices have tripled in the past five years whilst electricity prices for residential and small business users have jumped 80% to 90% in a decade.

He added that Australia has very high electricity prices that are above the EU average and more than twice as high as the US, based on Bloomberg data. Bourne attributed Australia's electricity prices to overinvestment by distribution companies in the poles and wires of the electricity network, as well as an increase in gas exports, a lack of competition and energy policy uncertainty.

Australian businesses are turning to renewable energy in a bid to lower their power bills, the Climate Council of Australia concurred. Nearly half of major companies are actively procuring renewable energy and total solar business have risen by 60% over 2016 and 2017, with over 40,000 commercial systems installed across the country.

The use of renewables has received strong public support, with 80% of Australians believing big business should be using renewable energy and 76% of



Ken Baldwin



Greg Jarvis



Greg Bourne



Frank Jotzo

Australians saying they would choose a product or service made with renewable energy over a product that is not.

### The future of coal?

Pro-coal groups, meanwhile, have been pushing for the government to instead build new high-efficiency coal plants, as well as make full use of the Latrobe Valley's brown coal reserves. They have argued that this approach provides both power reliability and affordability and generates much-needed jobs.

The Minerals Council of Australia said the coal industry employed around 46,000 workers in 2017, and supported an additional 120,000 indirect jobs.

In 2016-2017, the country exported 202 Mt of thermal coal worth \$18.9b, and the Council said Australian coal's high-energy, low ash traits made it ideal for the requirements of high-energy, low-emissions coal-fired power plants. It added that coal remains the dominant source of energy, providing 89% of power in New South Wales, 85% in Queensland and 82% in Victoria.

However, **Frank Jotzo**, director for the Centre for Climate Economics and Policy, Crawford School of Public Policy at the Australian National University, reckoned renewables are "stealing the march" over coal, and that the international outlook paints a lower coal demand.

"This change now reflects market economics. New wind farms and solar parks can now provide energy at much lower cost than any new fossil fuel powered generators. A new-coal fired power plant would need subsidies, take a long time to build, and suffer exposure to future carbon policy," the director added.

Coal plants could become less profitable and tend to be shut down earlier, typically in the face of major repairs or overhauls. He added that Australia's system does not need coal plants to run reliably, so a combination of regionally dispersed renewables, pumped hydro and battery storage, gas plants, and demand response should suffice.

"[Coal] will not be able to sell as much power, and get lower prices on average for every MWh of electricity produced. New wind and solar is now contracted at prices close to the operating cost of some existing coal plants, and renewables costs are falling further," said Jotzo.

Including the Hazelwood power station, 10 of Australia's coal stations have already shut down in the past six years, with at least eight more expected to close by 2040. Private investors are factoring in these risks, including the fact that a new coal station built in the coming years will need to continue operating well beyond 2050 in order to achieve a return on investment, Bourne noted.