

COUNTRY REPORT 1: AUSTRALIA



Broken Hill Solar Farm in Australia

Australia caught in the web of renewable energy and coal amidst rising power prices

Australia, a country with deep concerns on climate change, is torn between choosing coal for lower power prices and reliability, or choosing renewables for environmental and emissions commitments.

Last June, Australia's chief scientist Dr. Alan Finkel presented a blueprint to optimise the National Electricity Market (NEM) and it put forward a Clean Energy Target (CET), amongst other recommendations, as the mechanism to guide the electricity sector towards reduced emissions, stronger energy security, and increased reliability. But the Turnbull government has signaled hesitation to adopt the recommendation as it prepares to unveil an energy policy overhaul. This has spurred a heated

Clean coal proponents argue that high-efficiency coal-fired power plants should not be ruled out.



debate on Australia's energy options and what will work best for a country with deep concerns about climate change and rising electricity prices.

Environmental advocates have insisted renewables can be made more reliable with advanced battery storage technology, and stand as the smartest option if Australia wants to meet global emissions commitments and protect communities from toxic substances. On the other hand, clean coal proponents argue that high-efficiency low-emissions coal-fired power plants should not be ruled out of Australia's future energy mix due to their reliable generation and less pollutant potential.

At the centre of Australia's policy conundrum is an ageing fleet of coal-fired electricity generators, the majority of which will need to be refurbished, replaced, or retired by 2030, according to **Andrew Nance**, energy specialist at The Energy Project. The government has a range of energy and climate policy options available to take, but Nance explained that it is becoming clear to most experts that Australia will have to reduce its reliance on coal.

"All options deliver a shift away from coal as the dominant energy source for electricity generation in Australia to various combinations of gas and renewable energy sources – particularly wind and solar," said Nance. "Assumptions about the future price of gas and the technology costs of renewables are therefore key variables in the forecasting of future prices."

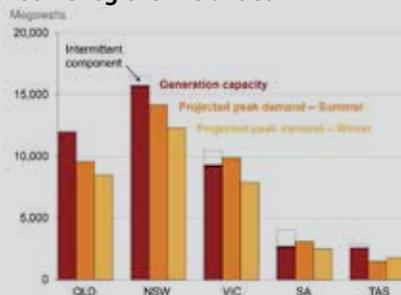
What about lower costs?

He explained that the uncertainty of technology costs and gas prices is contributing to a muddled forecast on future electricity prices. It also does not help, he said, that the prevailing uncertainty in electricity system investment due to the absence of clear climate policy is driving up prices.

Should the government choose to pursue policy options that require lower overall economic costs, then it will likely focus on market mechanisms such as direct carbon price or electricity sector-specific emissions intensity scheme, which Nance said showed consistently lower costs.

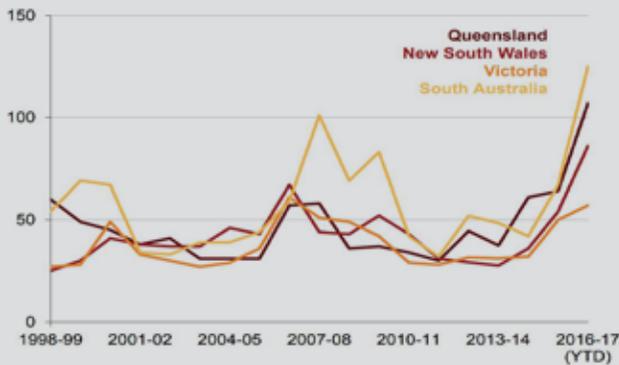
Environmental advocates have thrown

There is sufficient capacity across the NEM but supply is tight for some regions if islanded



Source: Grattan analysis of registered generation capacity by region

Wholesale electricity prices are now rising



Source: AER (2017c), AEMC (2013) and AEMC (2014)

their support behind policy options that support renewables, and shoot down extending the life of Australia's ageing coal-fired power stations due to their negative health and environmental impact on communities.

Nicola Rivers, director of advocacy and research at Environmental Justice Australia, cited the National Pollutant Inventory, which found Australia's coal-fired power stations emit more than 30 toxic substances. Under the Paris Agreement, Australia needs to clean up its act and reduce its emissions by 26-28% below 2005 levels by 2030, with the electricity sector viewed as the primary sector to drive this reduction.

Seeking to reduce electricity bills for its constituents and emissions, the Victoria State government is introducing a new renewable energy target into its legislation. The new policy sets a target of increasing to 25% the share of renewables in its power generation mix by 2020 and 40% by 2025, according to Enerdata, an energy consulting firm. It is also estimated to reduce household electricity bills by A\$30 (US\$23.6) annually over the life of the scheme and drive a 16% reduction in greenhouse gas emissions by 2034.

This month, expressions of interest will also begin for a 650MW competitive reverse auction for renewable energy sources, one of the largest of its kind in Australia. It is expected to attract around A\$1.3b (US\$1.02b) in renewable projects, including wind and solar farms.

"Looking to the longer term, market forces and climate goals are likely to make conventional coal and, eventually, gas power unviable, and bring on lots of renewables. But renewables remain variable and intermittent," said **Peter Burn**, head of influence and policy at the Australian Industry Group.

"Low-cost ways must be found to turn an intermittent abundance of energy into a dependable resource when we need it. And the underlying cost of generating electricity needs to be pushed as low as

possible if we are to be competitive."

He said that whilst technology costs for solar, wind and batteries are being driven down every year, there is still room to improve finance costs and construction productivity, which can be explored once Australia determines if it has structurally higher costs to build new energy than other economies.

Amidst criticisms on renewables, the Minerals Council of Australia, the industry association representing most of mining firms in the country, insisted that the policy path forward should still include coal but in the form of new high-efficiency, low-emission coal plants.

"The claim that having coal-fired electricity as part of our energy mix means that Australia cannot meet its emissions reduction targets under the Paris climate change agreement is wrong," said **Brendan Pearson**, chief executive of the Minerals Council of Australia.

He argued for replacing ageing coal-fired power stations with new HELE plants, and that doing so could deliver annual emissions reductions of 24 million tonnes of carbon dioxide-equivalent greenhouse gases (MtCO₂-e) by 2030, based on the council's analysis. Upgrading several other coal-fired power stations with new technologies which improve efficiency and reduce emissions-intensity could deliver an additional 9 Mt of annual emissions reductions in 2030.

On the issue of rising electricity prices, he further said that the clean coal option can take advantage of Australia's rich reservoir of high quality affordable coal and can provide the lowest-cost form of generation.

'Crisis point'

It will not be a surprise if the new government policy will be geared towards lowering electricity prices, which have ballooned in the past decade. Between 2006 and 2013, the average Australian household power bill increased by more than 85%, according to **Tony Wood**,



Tony Wood



Andrew Nance



Mark Stewart



Nicola River

energy program director at Grattan Institute.

"Australia's National Electricity Market (NEM) is at crisis point," said Wood. "Increasing prices for electricity have coincided with increasing concerns over whether the grid will break and whether there will be enough generation in future."

He recommended that policy should focus on stabilising a physical system with increasing levels of wind and solar. South Australia has provided a glimpse of the impact of inaction in this area - the region's high share of wind and solar power and subsequent closure of coal generators has pushed up prices due to an increase in expensive gas generation in the mix.

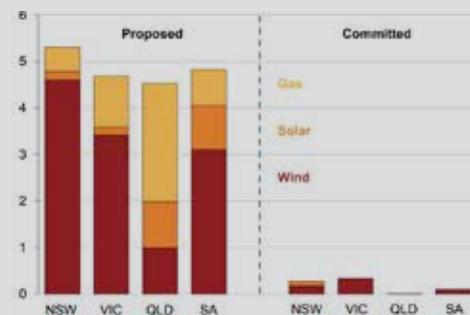
"New markets are already being developed to ensure the stability of the NEM. Rule changes are needed to ensure there can be quick and efficient responses if there are shortages in generation," added Wood on how Australia's policy should be shaped.

"Power generators should be rewarded for being flexible and responding quickly. And more consumers should be offered a financial incentive to reduce their demand at peak times, thereby reducing pressure on the system."

Burn likewise suggested multiple reforms that "encourage and reward" flexibility of Australia's electricity system. He also cited measures targeting demand-side response, particularly in reducing demand at critical periods, as well as energy storage that should help stabilise a system that incorporates an increasing share of renewables.

"If Australia is to reach its emission reduction targets, the future of energy generation will be spearheaded by new low carbon technologies, and new energy storage and distribution models coinciding with advancements in information and data analytics," said **Mark Stewart**, director of the centre for infrastructure performance and reliability at The University of Newcastle in Australia.

Invested pipeline is dominated by wind and solar



Source: AEMO (2017i)