

FINANCIAL REVIEW

News

PM sets out his fix for stable grid

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Energy blueprint - Power options

Clean coal technology has long been hailed as the saviour of the fossil fuel industry, with successive state and federal governments embracing the new technology as a way to keep coal as the predominant base-load power source in Australia while also lowering carbon emissions.

Prime Minister Malcolm Turnbull on Wednesday pointed to the fact that the Commonwealth had invested \$590 million since 2009 in clean coal technology research and pilot programs.

"Yet we do not have one modern high-efficiency low-emissions coal-fired power station, let alone with carbon capture and storage," he said.

Well, there's a few reasons why. No one has been able to develop carbon capture and storage facilities (which takes carbon from coal or gas-fired power stations which is then shipped or buried) that are commercially viable, while banks are reluctant to invest in any new coal-fired power stations in Australia, given the uncertainty about climate policy.

Banks have been more willing to invest in the more efficient super-critical coal-fired power stations in Asia, which have up to 40 per cent lower emissions than traditional coal-fired power stations, but not in Australia where there are only a handful.

While large-scale solar projects were the focus for clean energy advocates in the past few years, intermittency issues (they don't produce electricity when the sun isn't shining) as well as high costs associated with connecting to the electricity grid have dampened enthusiasm for solar.

But pundits hope large-scale battery storage will overcome many of the shortcomings of utility-scale solar. The federal government's Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA) have started to roll out significant investment in big solar projects.

But Mr Turnbull last week told the CEFC and ARENA to also start to look at backing battery storage projects.

ARENA chief executive Ivor Frischknecht said they would call for expressions of interest for demonstration projects under its "advancing renewables program", with at least \$20 million allocated to successful projects, while CEFC chief executive Oliver Yates says the agency was already looking at other ways to help fund projects.

Mr Turnbull's name-dropping of pumped storage hydro as a solution to provide base-load power was perhaps the biggest surprise of his speech.

Hydroelectricity has been around for more than 100 years but is a relative limited energy source in Australia, mostly due to limited geographic options. It is only in use in the Snowy Mountains and Tasmania.

Pumped storage hydro - which requires water to be pumped from a lower reservoir into a higher reservoir and then dropped through a turbine to create electricity - is only in operation in three locations, two in NSW (the Tumut 3 1500 megawatt power station in the Snowy Hydro scheme and Origin Energy's 240 megawatts Shoalhaven project on the South Coast) and one in Queensland (CS Energy's 500 megawatts Wivenhoe power station).

But ARENA has already ear-marked pumped hydro as an alternative energy source, allocating \$4 million to **Genex** Power's \$300 million 250 megawatt Kidston project in North Queensland, which will use an abandoned gold mine as hydro stage project or a "giant battery".

The listed company will use a 50 megawatt solar farm to power the storage plant's water pumps. It will then connect to the existing Powerlink transmission lines in North Queensland and then be connected to the grid.

For Mr Turnbull who prides himself on innovation, he believes this is the future of a stable energy grid.

Alternative currents

Energy technologies Malcolm Turnbull wants to prioritise

Clean Coal TechnologyWHAT Next generation coal-fired power stations, such as high-efficiency, low-emissions (HELE) plants that burn coal at higher temperatures and greater pressures to reduce emissions by up to 40%.WHERE About 518 gigawatts of super-critical and ultra-supercritical coal technologies are in operation - Japan is an industry leader, with 16 times Australia's coal-fired generation capacity.PROS/CONS Low operating costs but still far greater carbon emissions than renewable energy sources.

Battery StorageWHAT Battery storage allows energy produced by large-scale solar or wind projects to be stored on site.

WHERE Big in Europe but only a few projects in Australia so far.PROS/CONS Makes variable weather less of an issue for wind and solar power plants that only produce energy when the sun is shining and wind is blowing. But large-scale battery projects are still in their infancy.

Pumped Hydro WHAT Pumped hydro storage uses excess wind and solar-generated energy to pump water from a lower reservoir to a higher reservoir. It is then used to drive a turbine when the wind and solar energy is not delivering, such as at night. WHERE Only three projects in Australia, two in NSW and one in Queensland. PROS/CONS A very clean and efficient way of producing electricity, but limited by geography because requires site with lower and higher storage dams.