

## Turnbull wants clean coal, battery storage and hydro to save the energy grid – 1.2.17



Genex Power's \$350 million Kidston project is planning to use an old gold mine for a hydro storage project.



by **Mark Ludlow**

### **Clean Coal technology:**

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.

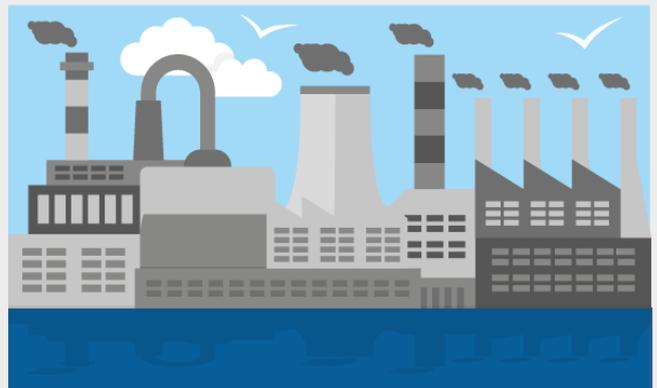
But its uptake in Australia has been slow, compared to overseas, while environmental

### **Clean Coal Technology**

**WHAT** 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 ultra-supercritical and super-critical coal technologies are in operation - Japan is an industry leader, with 16 times Australia's generation capacity.

**PROS/CONS** Low operating costs but still far greater carbon emissions than renewable energy sources.



groups say it's a diversion from the inevitable march to a clean energy future.

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.

By contrast, Japan - which is moving away from nuclear power following the Fukushima disaster - has plans to build 45 latest-technology power stations to diversify their energy supply. Mr Turnbull's commitment to coal to provide base-load power for decades to come predictably sent environmental groups apoplectic.

### **Battery Storage:**

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 short comings 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 the Prime Minister last week told the CEFC and ARENA to also start to look at backing battery storage projects.

"Large-scale storage will support variable renewables like wind and solar," Mr Turnbull said. "It will get more value out of existing base load generation and it will enhance grid stability - and we're going to get on with it."

### **Battery Storage**

**WHAT** 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.



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.

### **Pumped storage hydro:**

The Prime Minister'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 in Tasmania.

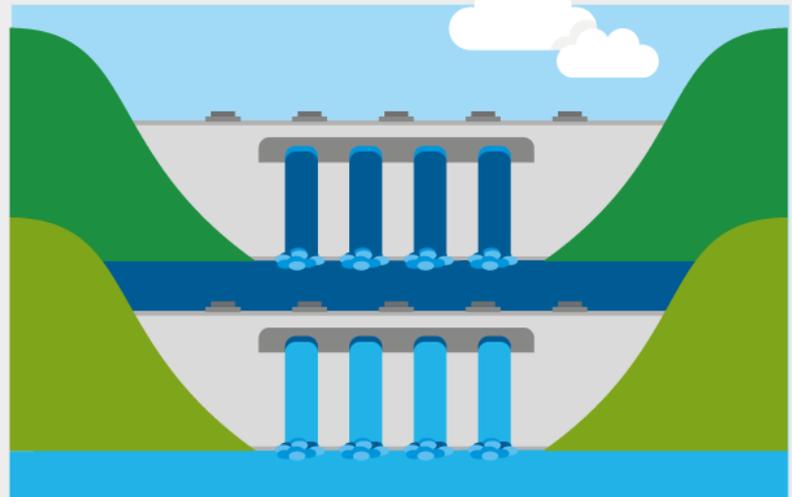
Pumped storage hydro - which requires water to be pumped from a lower reservoir into a higher reservoir and then dropped through a turbine to create electricity - is only in operation in three locations in Australia, two in NSW (the Tumut 3 1500 megawatt power station in the Snowy Hydro scheme and Origin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

### **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, one in Qld.

**PROS/CONS** A very clean and efficient way of producing electricity, but limited by geography because requires site with lower and higher storage dams.



SOURCE: FINANCIAL REVIEW GRAPHICS: MICHAELA POLLOCK

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 the Prime Minister who prides himself on innovation, he believes this is the future of a stable energy grid.

Read more: <http://www.afr.com/news/politics/turnbull-wants-clean-coal-battery-storage-and-hydro-to-save-the-energy-grid-20170201-gu34u5#ixzz4XTnRqVPz>

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