

In his speech this week to the National Press Club, Turnbull initiated a genuine “game-changer” in the debate about power generation in this country. It is instructive to focus explicitly on what he said.

Australia is the world's largest exporter of coal - we have invested \$590 million since 2009 in clean coal technology research and demonstration, and yet we do not have one modern High Efficiency Low Emissions (HELE) coal fired power station let alone one with [carbon capture and storage] CCS?...Here's the current picture - old, high emissions coal fired power stations are closing down, reducing baseload capacity. They can not simply be replaced by gas - because it's too expensive - or by wind or solar because they are intermittent.

Storage has a big role to play, that's true, but we will need more synchronous baseload power and as the world's largest coal exporter we have a vested interest in showing that we can provide both lower emissions and reliable base load power with state of the art clean coal fired technology.

The next incarnation of our national energy policy should be technology agnostic - it's security and cost that matter most, not how you deliver it. Policy should be “all of the above technologies” working together to deliver the trifecta of secure and affordable power while meeting our emission reduction commitments.

To date, as evidenced by Turnbull's remarks, clean coal has mostly been taken to mean carbon capture and sequestration (CCS). In my experience, although CCS technology can be shown to work, it is unlikely to be commercial without a carbon price of around A\$100-120 per tonne.

The other take out from Turnbull's remarks has been a focus on more efficient coal-fired power plants, what are called “supercritical plants”, Turnbull called HELE. These operate at higher temperature, and higher pressure, and are therefore more efficient than a traditional coal-fired power plant, but obviously cost more.

In terms of emissions, the current average for Australian coal-fired power plants is just a bit

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short of 1 tonne of greenhouse gas emissions per megawatt hour (mwh) (Hazelwood being the 'dirtiest' is over 1.6 tonnes per mwh) whereas a supercritical plant would reduce these to a little less than 0.8 tonnes per mwh.

However, proven commercially viable, Australian technology, can further improve the efficiency of the power generation, at lower cost, with lower emissions and no ash ponds or waste or particulate emissions.

The essence is to refine coal. Crude oil and wellhead gas need to be refined, why not coal?

Coal refining removes all of the non-combustible mineral matter (ash) and water from as mined, raw coal. The resultant pure hydrocarbon fuel produced as a result of this process is ground into a fine powder and mixed with air to create an artificial gas stream called atomised refined coal (ARC).

ARC can be used as a less expensive natural gas substitute to fuel combined cycle power stations that operate at an efficiency of up to 65% - compared with about 42% for a supercritical plant. This increased efficiency results in significantly lower greenhouse gas emissions of 0.57 tonnes per mwh, and the total capital cost is less than for a supercritical plant.

The significance of this technology is that it ensures the lowest cost electricity from any new power plant – be it raw coal fired simple cycle, natural gas fired, diesel, nuclear, hydro, or pumped hydro. These deliver base load power and ensures energy security, with the lowest emissions theoretically obtainable from coal.

Turnbull also focused on the significance of energy storage. Again, this is what he said, in full:

Energy storage - long neglected in Australia - will also be a priority this year. Last week, at my request, ARENA and the Clean Energy Finance Corporation (CEFC) agreed to work together on a new funding round for large scale storage and other flexible capacity projects, including pumped hydro.

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I have also written to Alan Finkel asking him to advise on the role of storage and pumped hydro in stabilising the grid. Large scale storage will support variable renewables like wind and solar, it will get more value out of existing baseload generation and it will enhance grid stability. And we are getting on with it.

Clearly, the challenge for renewables is to deliver cost effective base load power, and effective storage is fundamental to this, not only to ensure energy security, but also lower average power costs. That is, to eliminate the intermittency problem where, with the wind mostly blowing during the night, and the sun only shining during the day, the significant morning and evening peaks in demand can see average electricity prices ramped up significantly.

In the end, the power market will transition to the lowest cost, sustainable, power, with an imperative for renewables and other alternatives to lower costs to be competitive with current coal fired generation, the cost of which only needs to cover operating costs, as initial capital costs have been written off.

There are a host of energy storage proposals now in development for electric battery, thermal battery and pumped hydro, any of which could deliver schedulable, base load power from intermittent wind and/or solar generation systems. By giving renewable energy storage a priority, Turnbull will accelerate this process to hopefully be commercially competitive with fossil fuel generation systems in the near future.

Finally, politically, it would clearly be desirable to now achieve a degree of bi-partisanship in the energy debate, where we agree on the imperative of the long-term transition to renewables based power, but accept the reality that other technology solutions may have a role to play in the interim.

Disclosure

John Hewson is chair of the Asset Owners Disclosure Project, and was federal leader of the Liberal Party from 1990 to 1994. John has business interests in renewables and alternative technologies.

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