

Summary of Tentative Findings Response By Pat McCarthy, 19Feb2016

I welcome the royal commission and the processes being followed, including this opportunity for public response. I attended the excellent presentation by Kevin Scarce at the Town Hall on 15 February. The Tentative Findings Report points on which I am commenting, in order, are:

- Point 2
- Point 44 (new technical idea)
- Point 49 as detailed below.

I understand Kevin Scarce's request for responses to focus on facts, and I have written most of this document to do that, but I make a preamble point on the tone of the Tentative Findings Report: I believe it way understates the benefits to humankind of large-scale near-zero-carbon-emission electricity. The tone of the Electricity Generation section is that there will be plenty of electricity generation and quite flat demand, and no need for large ~constant-load power stations, so nuclear power is not viable in South Australia in the next couple of decades (Points 38 to 54, other than Point 52c)... oh, except, if society wants the base load power generation to have near-zero carbon emissions (Points 55 and onwards). I suggest turning around the whole tone of the Electricity Generation section to state:

- Even if electricity demand associated with current usage remains flat for many decades, as is NEM's expectation, conversion of hydrocarbon-fuelled transport to electric power could add significantly to South Australia's electricity demand.
- Currently the principal base load electricity generation in South Australia and Victoria is very-high-carbon-emission brown coal in southern Victoria.
- Presuming that Australian Society wants to replace this brown coal ~constant-load power generation with near-zero-carbon-emission technology in the 2030s, nuclear power is an option, especially if society's vision includes electric-powered transport. Then nuclear power will compete with other near-zero-carbon-emitting baseload technologies.
- oh, except, if Society wants to continue burning very large quantities of hydro-carbon transport fuels and brown coal, then there will be plenty of electricity generation and quite flat demand, and no need for large ~constant-load power stations, so nuclear power will clearly not be viable in South Australia in the next few decades.

Patrick McCarthy response on Point 2

I suggest adding:

Authorities in many countries, most notably China and India, have recognised the enormous benefit of plentiful electricity to the quality of life and the extension/saving of life of millions, even hundreds of millions, of people. In recent years they have installed many large carbon-emitting ~constant-load coal-fired powered stations. In the future they may replace some of these with near-zero-carbon-emitting nuclear power stations, especially if a stable, reliable trading partner can provide uranium and disposal of the nuclear waste.

Rationale:

This would answer the type of question very emotionally posed in the Town Hall on 15 February: "What is the death of one person worth? If South Australia earns \$500 billion dollars from the nuclear industry but one or more people die because of it, is that worth it?" The answer is: The electricity being generated is extending/saving the life of many people.

Patrick McCarthy response on Point 44 (new technical idea)

Consider replacing:

“Current designs would necessitate access to seawater for cooling.”

with

“Current designs may necessitate access to seawater for cooling, unless an innovative system can be set up in a particular area. For instance, for years people have investigated the use of underground hot water, at rates in the order of 10 million litres per day, to generate electricity near Penola. In 2010 Panax/Raya drilled and tested the 4000m-deep Salamander-1 exploratory well for this purpose, adjacent to the large Victoria-South Australia Power Transmission Line. If it proceeds, the cooled water out of the geothermal power process might be used to cool a nuclear power station.”

Patrick McCarthy response on Point 49

Consider modifying Point 49 with

“The South Australian region of the NEM has the following notable characteristics:”

New Point a:

“Baseload supply is currently dominated by the three ~constant-load south-Victoria brown coal power stations Loy Yang, Yallourn and Hazelwood. Between them, in 2014, these power stations generated average A megawatts, B% of the total generation in South Australia and Victoria combined, and emitted C million tonnes per year of CO₂-equivalent, D% of estimated total human-generated emissions in the two states. (NFCRC experts would know these numbers A, B, etc). In ~2030s, Society may wish to replace this brown coal baseload generation with near-zero-carbon-emitting technology, possibly including nuclear power.”

New point b:

“Significant amounts of electricity are currently transported from Victoria to South Australia via the large Victoria-South Australia Power Transmission Line that has a capacity being upgraded from 460 to 650 megawatts in 2016 (Reference <http://www.electranet.com.au/network/current-and-planned-projects/south-east/sa-vic-interconnection-upgrade/>).”

a and b. unchanged except change a to c, and change b to d.

Change c to e and consider re-wording to: “Total SA demand is currently small, with low expected short-and-medium-term growth, such that a new very large generator would supply a large portion of the SA demand. On the other hand, if Victorian brown coal base load power generation ceased, much of the power from a new very large generator in SA could be exported to Victoria. Or events could result in electricity demand increasing beyond NEM expectations, for instance if aluminium processing in Portland Victoria (shutdown in 2014) recommenced or if electric power replaced hydrocarbon fuels in most of the vehicles in Australian cities. X% (NFCRC experts would know this number) of South Australia’s energy consumption is hydrocarbon transport fuels. In the medium-to-long term technological advances are likely such that most of this transport could be electric-powered.”

d . Consider excluding this, since covered in the other points.

e. Unless I'm wrong, the coal referred to there was Port Augusta, that was load following but is now shut down. So I suggest omitting "and coal" from this Point e. It might then become: "The penetration of wind and solar PV has altered the operational characteristics of existing gas generation from baseload to load following, or peaking, and contributed to the shutdown of Port Augusta coal-powered generation in 2015."

f. Consider modifying to: "Other than the large Victoria-South Australia Power Transmission Line, other existing connections between South Australia and the east-coast NEM are small and inhibit the import and export of electricity. Connection capacity could be increased in future, if commercially viable."

g. unchanged.

Patrick McCarthy response on Point 52

No change to introductory sentence.

Modified Point a:

"With most likely estimates of costs and under current market arrangements, nuclear power would not be commercially viable to supply baseload electricity to the South Australian subregion of the NEM from 2030 (being the earliest possible date for its introduction), especially if high-carbon-emitting Victorian brown coal power generation continues.

Point b:

Put existing point c here, and consider modifying to:

"Nuclear would be marginal in the event of a lower cost of capital that was typical for the funding of public projects and under strong climate action policies, especially if electricity demand increases beyond current NEM expectations. Then nuclear power will compete with other near-zero-carbon-emitting baseload technologies including gas-powered generation with carbon capture and storage, geothermal, and solar+wind with storage (batteries or other innovative energy storage techniques)."

a. Put existing point b here, and suggest changing to:
"Nuclear does not look economically viable, however, in likely forecast sensitivities including:" (i to iv unchanged).