Dear AEMO

I have been a South Australian member of the Australian Nuclear Association for 20 years, a retired Fellow of the Australian Institute of Physics and member of academic staff of the Physics Department at the University of Adelaide and Royal Adelaide Hospital Department of Medical Physics. I am a PhD graduate in Experimental Nuclear Physics from The Australian National University. I have many years' experience in Australia, the UK and US.

I refer particularly to Section 6 Additional Feedback of the AEMO document.

1. Cost of Nuclear:
   I dispute the estimate of $16,000 per kilowatt for the cost of nuclear. This is a gross exaggeration of the current situation as can be ascertained from the **Small Modular Reactor** supplier NuScale in Oregon, USA. Their quoted figure by Mr Tom Mundy, CFO, at the October Biennial Conference of the Australian Nuclear Association at UTS, which I attended was US$3600 per kilowatt for an nth of a kind or A$5,200/kWe for Australia. The ANA puts the cost of a single 60 MegaWatt unit at around $400 million or about A$1.9Billion for a 6x60MW = 360MWatt power plant.

   According to Professor Jacopo Buongiorno of the M I T USA, which has carried out a thorough investigation, the reason for the inflated figures being quoted is the delays and cost over-runs of some overseas large builds in US and UK. These costs can and must be lowered considerably with proper planning and a trained workforce and factory builds. I refer AEMO to the 2018 paper by Professor Buongiorno "The Future of Nuclear Energy in a Carbon Constrained World": http://energy.mit.edu/research/future-nuclear-energy-carbon-constrained-world/ for a full cost analysis.

   The costs of SMRs from South Korea and China are in line with the figures which I have quoted for the NuScale SMRs.

   The most cost-effective, economical, and reliable solution to Australia's future electric power needs is approximately a 50:50 ratio of renewables vs nuclear power, with batteries used only as expensive emergency sources. Batteries utilise the scarce element lithium and the toxic elements cobalt and manganese. These lead to recycling and disposal problems after 10 to 15 years.

2. Need to include Nuclear in the AEMO Forward Estimates:
   There is general agreement that Australia needs to take urgent action to combat the menace of climate change. For many, the attraction of renewables, including Solar and Wind, appears irresistable. However, what is not generally understood is that neither of these generation sources provides synchronous despatchable power, needed for system security. South Australia has already suffered the consequences of lack of preparedness and an over-dependence on renewables in the disastrous peak hour blackout in September 2016. The renewable efficiencies at 20% and 30% respectively are low, meaning that much larger and more costly arrays are needed as well as a rapid-response backup when the renewables are not available. At present the main back up is provided by coal and gas which must both be phased out signficantly by 2030 and completely by 2050. What backup alternative is AEMO offering to the Australian public to safeguard our electric power supply?

   It is imperative that AEMO plan and manage for the future and take into account that nuclear can, and will very likely, provide much of the despatchable backup power needed.

The House Of Representatives Nuclear Prerequisites Inquiry announced in December 2019 has already forshadowed repeal of the Federal prohibitions on nuclear power in Australia, subject to parliamentary and public approval in sites considered. https://www.energy.gov.au/news-media/news/inquiry-prerequisites-nuclear-energy-australia "Not Without your Approval"

In fact SMRs would be ideal power sources to replace our ageing coal-fired power stations such as Liddell (4x500MWatts) near Newcastle, with the enormous advatage for emphasyma sufferers, of zero pollution. They would be invaluable power sources in remote areas such as Broken Hill and the BHP Olympic Dam mine and surrounds. BHP has already expresed its interest in nuclear power at Olympic Dam where several 60MWatt SMRs could fit their need. However, companies and industry have been held back by the prohibitions discussed above.

I therefore urge AEMO to include nuclear power in its forward planning. Let us join the OECD community of nations nearly all of which utilise nuclear power as part of their energy generation.

Regards,
John Patterson