Nuclear Power Plants a Nightmare on the Modern Electricity Grids

by Humphrey Boogaerdt [1]

Nuclear and coal fired powerplants produce a fixed amount of electricity according to their specifications, that is either consumed or wasted. Technically it is not possible to let them produce more or slow those down to produce less, they have only two positions 'on' or 'off'. They just generate 'baseload'. Starting up these types of plants is not easy, it takes days and shutdowns take often longer. Nuclear Powerplants also need long periods of maintenance, generally periods of 30 to 60 days every one or two years. During those periods backup powerplants need to be available.

Over the last decade and especially the last few years there has been an enormous uptake of residential solar PV. The large amount of electricity generated from PVs during the day results in that the day time grid power demand is below the level of night time baseload and will approach zero demand for grid power by 2025. Showing this grid-power demand over a 24h period and over series of years results in a graph that is called the "**duckcurve**", as illustrated in Fig. 1.

The grid operators have one main very difficult task and worry : "how to keep voltage and frequency balanced in the very complex electricity grid network". For Nuclear and Coal-fired powerplants it is impossible to adapt to the projected 'duckcurves' of 2025 and they would make the task for the grid operators even more difficult. Quoting from Sustainable Energy Now's website (www.sen.asn.au) "This scenario does not consider any commercial solar installations, which will accelerate the impact. Without government intervention, the situation will inevitably arise that coal-fired generation will only be needed during certain periods (therefore raising consumer costs), or Government will need to legislate against consumer-generated solar electricity (causing political unrest). Governments will need to respond nimbly."

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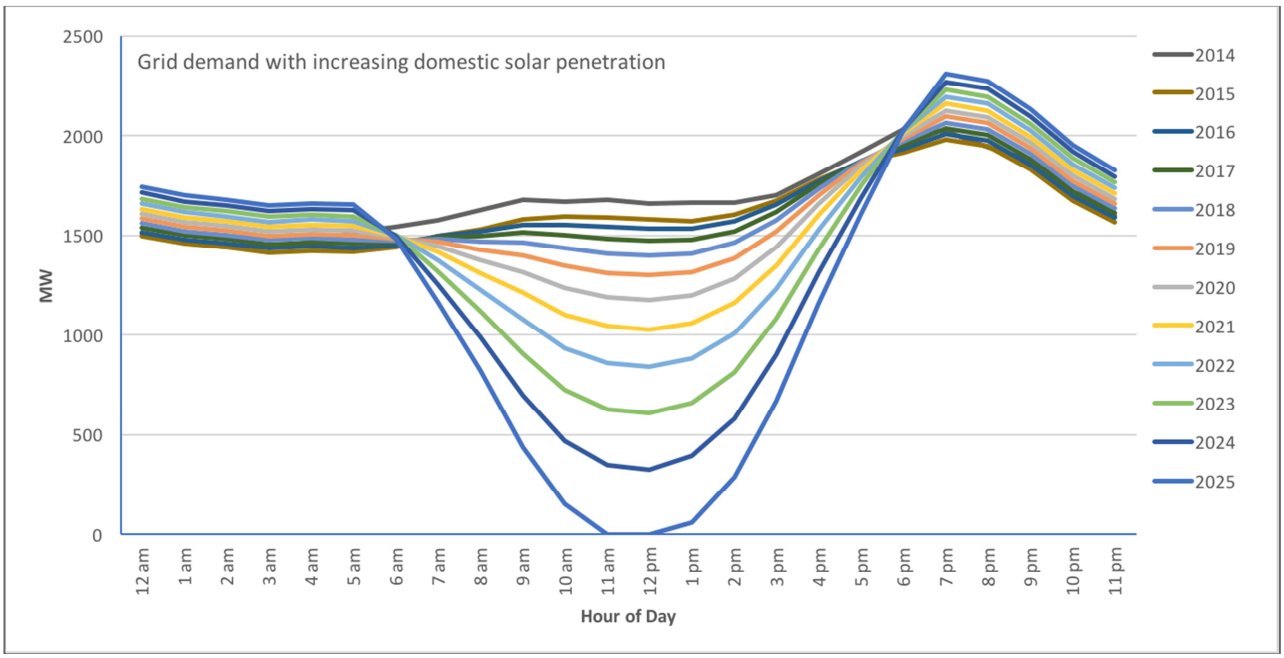

Figure 1. Predicted average amount of electricity supply required from the grid over the period from 2014 to 2025, showing how domestic solar production will decrease demand for centrally-provided power during the day (copied fully from Sustainable Energy Now website www.sen.asn.au).

Besides all likely technological innovation of the near future in PV, batteries, wind and other forms of renewable energy storage and generation it is clear from the above summary of technical issues that **Nuclear and Coal-fired powerplants have no place any more in electricity generation**.