

CSIRO nobbles nuclear (again) to support Labor’s ‘cheap renewables’ fantasy

By Richard Bardon

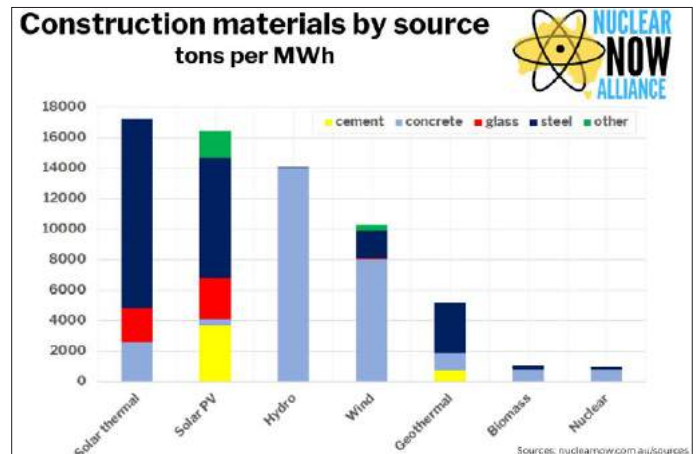
28 May—The Commonwealth Scientific and Industrial Research Organisation was once a world leader in inventing and developing technologies and industrial processes to improve the lives of Australians, and indeed all mankind. Now, under the direction of the Albanese Labor government, it is actively suppressing them, by producing junk research to support self-destructive policy prescriptions driven by ideology and fealty to vested interests. The technology in question is nuclear power. The junk research is the annual “GenCost” report, produced in collaboration with federal gas and electricity market manager the Australian Energy Market Operator (AEMO), which purports to show that “firmed renewables” (wind and solar power backed by batteries, pumped hydro and/or “peaking” gas turbines) are the cheapest pathway for Australia to achieve “net zero” greenhouse gas emissions, and nuclear the most expensive at nearly twice the price. Meanwhile the government refuses to countenance lifting the federal legislative ban on nuclear power, and thereby allow AEMO to do a proper costing in its biennial Integrated System Plan (ISP), despite having effectively admitted the ban is pointless—since if nuclear were really so uneconomical, the “free market” (of which Labor is no less enamoured than the Liberals) would never deign to invest in it anyway. Thus while almost all the world has by now come to see nuclear as absolutely necessary to achieving “net zero” without collapsing civilisation in the process, Australia—despite being by far the most uranium-rich nation on Earth—seems determined to remain both figuratively and, if coal plants continue to be shut down with nothing to replace them, soon literally in the dark.

The 2022-23 GenCost report used blatantly deceptive modelling to hide the overall costs of “renewables” by ignoring the enormous expense of all the major transmission and storage projects which must be completed by 2030 to connect and support them as “sunk costs”, while assigning arbitrarily high capital costs to the Small Modular Reactors (SMRs) the federal Opposition had proposed be installed on the sites of retiring coal-fired plants (thus requiring no new transmission infrastructure at all).¹ In GenCost 2023-24 the CSIRO performs the same trick by misrepresenting certain economic metrics, and sneakily re-defining others to suit its own purposes; flat-out lying about the comparative longevity, efficiency and average availability of renewables versus both SMRs and large conventional nuclear plants; and even *arbitrarily doubling the capital cost of the latter*, to make renewables look competitive.

Misused metrics

First, it must be asked why CSIRO, “Australia’s National Science Agency”, is doing economic modelling in the first place, let alone modelling so clearly tailored to support political agendas with no regard to the actual science involved. This is true not only of its work in the field of energy; for example, in 2022 CSIRO published research purporting to show that the Bradfield water diversion scheme in North Queensland, to turn millions of hectares of Australia’s arid interior into irrigated farmland, was

1. “Labor’s ‘renewables are cheapest’ lie exploded”, AAS, 16 Aug. 2023; see also A. Morrison, “The ‘sunk cost’ trickery that makes renewables seem cheaper than they are”, *Fresh Economic Thinking*, 23 July 2023.



Just one example of the massive difference in the construction costs of nuclear vs. renewables, which the CSIRO has tried to distort.

“technically feasible ... [but] not commercially viable”. As the *Australian Alert Service* reported at the time,² however, this conclusion was based on an economic premise adopted by Australian governments in the 1990s and early 2000s, that water projects must recoup their costs solely by the sale of water to irrigators. Where that premise applied historically, it would have stopped most of the infrastructure projects that built Australia—notably including the wildly successful Snowy Mountains Scheme that turned previously arid areas of the Murray-Darling Basin into Australia’s “food bowl” and drove a ten-fold increase in Australia’s nominal gross domestic product (GDP) between 1949 and 1974. In other words, CSIRO ignored the overall economic returns the Bradfield Scheme would generate, in favour of a narrow focus on mere financial returns. Even were its electricity cost projections accurate it would at best have fallen into the same trap regarding nuclear power. But they are not—and deliberately so.

As noted above, a complete comparative analysis of the overall costs of various power sources, including transmission and firming, ought properly to be done not by CSIRO but by AEMO; and indeed it has been asked repeatedly by political leaders, analysts and energy industry participants to do so. AEMO states on its website that its ISP “demonstrates that new renewables with new transmission, firmed with hydro, batteries and gas—is the lowest cost way to supply electricity to Australian homes and businesses as coal fired generation retires”, but adds that the ISP “does not model technologies that are not allowable under existing laws”—including nuclear, which is banned nationwide under the *Australian Radiation Protection and Nuclear Safety Act 1998* and *Environment Protection and Biodiversity Conservation Act 1999*, as well as by state laws in Victoria (1983) and South Australia (2000). AEMO claims however that GenCost “shows that nuclear generation is higher cost and has a longer lead time than renewables backed by storage and transmission”.

The problem is that GenCost *does not model full system costs*. Instead its assessment is based on the so-called “levelised cost of electricity” (LCOE), which is calculated by dividing lifetime costs (i.e. of installation and operation) by the amount of energy produced by each

2. “CSIRO’s Bradfield Scheme assessment a neoliberal fail”, AAS, 28 Sept. 2022.

generator or generator complex (e.g. large-scale solar or wind “farm”)—but implicitly assumes that other requisite infrastructure already exists, such that it can simply be plugged into the grid upon completion. The authors of the GenCost 2023-24 report claim to have responded to criticism of last year’s debacle by including the cost of transmission and storage projects scheduled for completion between now and 2030 in the costings for that year. As former economics professor and Productivity Commissioner Judith Sloan noted 28 May in the *Australian*, however, they still appear both to have underestimated the amount of storage required, and overestimated the likelihood that it will ever actually be built. “What is required is a system-wide LCOE”, she wrote, “because of the inherent intermittency of wind and solar and the inviolable objective of 24/7 power. When the wind blows and the sun shines, the cost of generating electricity by these means is very low. But because the wind doesn’t blow all the time and the sun sets, expensive back-up (or firming) is required. This back-up must be added to the cost of both wind and solar. And account must be taken of both extended wind droughts and cloudy periods—short-duration batteries will simply be inadequate. In practical terms, the option of long-duration, affordable batteries simply doesn’t exist and affordable pumped hydro is not possible in this country.” Moreover, she added, “instead of focusing on the entire cost of transmission, which feeds into retail prices, only the cost of additional transmission is included in the [GenCost] analysis. Again this is a bias in favour of renewable energy. Of course, one of the advantages of nuclear plants is that they can be located where existing transmission lines exist; the cost of foregone investment in transmission by rights should be included as reducing the cost of nuclear.”

‘Assumption’ begins with an ass

More importantly, many of the other assumptions upon which CSIRO’s costings are based are not merely dubious, but completely wrong. As Sloan puts it: “As with all modelling, it’s a case of garbage in, garbage out.”

One element required to arrive at an LCOE for each generation type is its “capacity factor”, meaning the ratio of actual output to theoretical maximum (or “nameplate”) capacity over a given period. But whereas in the real world the capacity factors of both wind and solar vary between 25 and 33 per cent due to their intermittent nature, a table tucked away in an appendix on the 91st of the GenCost report’s 131 pages reveals that in its lowest-cost scenario it has assumed capacity factors across a given year of up to 48 per cent for onshore wind and 52 per cent for offshore. That scenario does at least rate nuclear at a fairly reasonable 89 per cent (albeit the US Department of Energy, which pioneered nuclear power and thus has the world’s most extensive data set, puts the actual number at 92.5), and large-scale solar at 32 per cent. But the high-cost scenario (wherein each system is operating at its lowest presumed output), whilst it rates solar fairly at 19 per cent, puts on- and offshore wind at an entirely fantastic 29 and 40 per cent—while both SMRs and large-scale nuclear are reduced without explanation to a mere 53 per cent! The only possible reason for which is that rather than looking at nuclear as an *alternative* to renewables, the authors have taken the future preponderance of variable renewables—nearly 60 per cent of generating capacity by 2030, and ultimately up to 90 per cent—as a given, and are demanding that nuclear plants ramp their output up and down to suit. Whereas in

reality, with nuclear plants happily humming along at an average 92.5 per cent capacity all day every day there would be no need to build either renewables or the associated storage and firming in the first place.

Nor do the deceptions end there. The GenCost report assumes an “economic life” of 25 years for wind, and 30 for nuclear for both solar and nuclear—when in reality both wind and solar last a maximum of 20 years (and solar begins to deteriorate after as little as five), while nuclear plants have a design life of 60 years and an actual life expectancy of 80. How does CSIRO justify this outlandish claim? The conventional definition of “economic life”, per the Investopedia website, is “the expected period of time during which an asset remains useful to the average owner. When an asset depreciates to the point it is no longer useful to its owner, then it is said to be past its economic life.” Given that the cost of decommissioning a nuclear plant is essentially fixed regardless of how long it has operated, plainly the longer it runs without issue the more profitable it becomes. CSIRO declares however that “Economic life is the design life or the period of financing” (emphasis added). Thus a solar farm that has to be torn down and replaced after 15 years, having recouped only half the cost of investment, is magically put on the same level as a nuclear plant that keeps earning money decades after it has paid for itself, simply because the loans to finance them are assumed to have the same duration. “The historical longevity of large-scale nuclear has led many stakeholders to suggest it should have a longer amortisation period”, CSIRO objects, “even though there is little evidence presented that private financing would be comfortable with that risk.” What risk? And anyway, who cares? Does anybody seriously believe that project-specific bonds with a government-guaranteed return, of whatever duration, would not find a market? Let alone that the government could simply build them itself, “private finance” be damned.

And even with all those thumbs on the scale, in the final analysis nuclear would still have been neck-and-neck with renewables, if not for the most blatant piece of nonsense in the entire report. “The GenCost report uses the relatively successful example of Korea’s nuclear program to estimate the expected capital cost of a large-scale plant”, Sloan noted. “The figure is put at \$8700 per kilowatt, ... [but] then arbitrarily doubled because it would be the ‘first-of-a-kind’ in Australia. It is simply asserted that ‘FOAK premiums of up to 100 per cent cannot be ruled out’. This is absurd. After all, Australia would be importing the expertise from experienced players were nuclear plants to be built here. And as the nuclear energy industry enjoys a significant renaissance around the world, the number of companies and the depth of talent involved are increasing markedly.” Meanwhile Australia remains the only G20 country without nuclear power; the European Union has designated nuclear “green energy”; India, China and Russia are expanding their own nuclear sectors enormously, with the latter two gearing up to export their technology to developing nations worldwide; and the USA has announced plans to triple its nuclear power capacity by 2050. Asks Sloan: “Should we be assuming that all their governments are simply stupid by having such an expensive form of generation?” To ask the question is to answer it.

The *Australian* noted late on 27 May that Opposition Energy Spokesman Ted O’Brien MP has asked CSIRO to re-run its modelling, adjusted to include the above parameters. As of this writing, no response has been reported.