2 February 2026

THE CENTRE FOR INDEPENDENT STUDIES

(Limited by Guarantee) A.B.N. 15 001 495 012
Level 1, 131 Macquarie St, Sydney NSW 2000
Phone: 61 2 9438 4377 **Email:** cis@cis.org.au
cis.org.au

Mr Daniel Westerman
Chief Executive Officer
Australian Energy Market Operator

Lodged by email: forecasting.planning@aemo.com.au

Dear Mr Westerman,

Submission to Draft 2025-26 GenCost

The Centre for Independent Studies (CIS) appreciates the opportunity to provide a submission to the Australian Energy Market Operator and CSIRO on the Draft 2025-26 GenCost.

The CIS is a leading independent public policy think tank in Australia. It has been a strong advocate for free markets and limited government for 50 years. The CIS is independent and non-partisan in both its funding and research, does no commissioned research nor takes any government money to support its public policy work.

In this submission, we call for an overhaul of the method used to assess the cost of integrated renewables, in particular an abandonment of the framing of the questions being asked as about the perspective of an 'investor'.

The GenCost report should be viewed as an input to public debate on energy policy, not as a guide for investors. There is no evidence investors use GenCost in their decision-making, while there are numerous examples of GenCost being cited by policymakers in the public debate on energy policy.

The perspective of the electricity end-user is far more relevant than that of investors for this purpose.

Moreover, the framing of the cost analysis in terms of costs an investor would need to recover has resulted in the application of incoherent boundaries being drawn around the parts of the system being costed to integrate renewables.

For instance, the treatment of all committed projects at a future date as being 'sunk costs' that an investor wouldn't be exposed to is illogical. It requires the simultaneous assumptions that an investor is exposed to:

- All the system costs to integrate renewables, and
- None of the system costs that have already been committed.

In reality, there are many system costs necessitated by renewable energy generation that the investor never faces because the regulatory system passes them directly to consumers. And there are system costs an investor might face directly long after a project is committed (e.g., access fees for a Renewable Energy Zone). The perspective of an 'investor' doesn't correspond

with the current method CSIRO has used, nor any genuinely holistic attempt to cost integrated renewables.

The investor framing also supports the adoption of a future temporal boundary (e.g. 2030), behind which any system costs can be excluded, which allows enormous and essential components of the system required to firm renewables to be excluded. Many of these costs could and would be avoided if a different energy policy was adopted.

The exclusion of any ‘committed’ projects will also lead to the incorrect outcome where integrated renewables appear to become cheaper every year purely from the fact that more costs are excluded as more projects become ‘committed’.

The presumption that existing thermal generators remain available and ‘free’ to firm renewable generation, which is assumed to displace almost all their energy output, is internally inconsistent. CSIRO is claiming coal and gas are expensive, while simultaneously treating them as free when used in support of renewables.

This means CSIRO is no longer modelling the cost of an actual system that is remotely technically, economically, or financially viable. It is costing an arbitrary sub-set of a system that couldn’t operate in isolation and doesn’t usefully reflect any total cost that is faced by any party, either end users, investors, or taxpayers.

GenCost should address the specific, objective, and technical ‘what does this system cost?’ question, for a plausible system. Attempts to answer the far more complex and contestable public policy question ‘given where we are today, what should we build next?’, should not be attempted by CSIRO alone. The complexity and uncertainty around such an endeavour arguably belongs better with other agencies such as the Productivity Commission or Treasury.

The current question GenCost attempts to answer, i.e. ‘given where our current politicians have claimed we should be in five years’ time, what would a hypothetical investor build next?’, should not be attempted. It’s a question that pre-supposes the impossible, necessarily confirms and conforms to the policy settings it should be testing, and attributes the insight to the perspective of an objective, independent actor who would never use CSIRO’s method in making this calculation.

The GenCost methodology, as in the proposed draft, is illogical.

CSIRO must return to a technical analysis of technology and systems, assessing the total cost faced by an end user, for a viable and coherent system.

Yours sincerely,

Aidan Morrison

Director, Centre for Independent Studies Energy Program

Two rationales for omitting a portion of system costs

There are two rationales modellers can reasonably employ to omit a portion of system costs when comparing cost estimates of different generation technologies.

The first is a mathematically-degenerate outcome arising from the boundary outside which system costs are the same. In this case, we are using 'degenerate' to refer to different combinations of parameter values producing identical (or nearly identical) outputs. In other words, this rationale acknowledges that the common requirements of generators with respect to the rest of the electricity system mean that the cost outcome for non-generation parts is essentially the same and can be ignored when comparing the costs of different generation sources.

The second rationale is a mathematically-degenerate outcome arising from the existing system that has been built to date. As it remains the same when estimating costs across building different generation technologies in the future, the existing system can be ignored when calculating generation cost estimates. However, this notion can be misapplied, as the CSIRO has done in the draft GenCost report, as explained below.

Rationale 1: Degenerate outcome from system boundary: Common requirements for different generation sources

Prior to the advent of large-scale weather-dependent energy generation, Levelised Cost of Electricity (LCOE) was a significantly more useful metric. This was because the balance of system that supported a dispatchable, synchronous generator was essentially degenerate across different sources. No storage was required and transmission typically spanned manageable distances and was heavily utilised for any choice of coal, gas, hydro and nuclear. Hence, it made sense to focus on the project cost (i.e. LCOE) of just a generation source, because the cost of the rest of the system – which was still large, including transmission and the distribution network – was assumed to be much the same for any given generation type. The attractiveness of an investment was hence dominated by the levelised cost of the output of a generation project and was a close proxy for the attractiveness to the investors, which also tracked closely the interest of policymakers. In other words, it made sense to exclude the non-generation parts of the system, since they were degenerate across the different generation types, which were the logical point of interest in investment choices, and system design choices.

With the introduction of significant penetrations of weather-dependent energy, the balance of system to deliver energy begins to vary significantly. As such, it makes sense to incorporate more of the system in the cost estimates, i.e. to include all parts of the system that are no longer degenerate. Transmission, storage, firming, security assets and spillage costs vary greatly in systems with varying levels of weather-dependent energy. In recent years, CSIRO has included these as cost components to the extent that they are no longer degenerate. It should be noted that not *all* transmission has been included for the renewable energy system. *Some* transmission (closely approximating what currently exists) would be required by any other generation type, i.e. there is *an extent* to which transmission is degenerate across generation types. Consequently, only *incremental* additions of new transmission needed to support

weather-dependent generation, (e.g. new state interconnectors to pool diverse weather patterns, or renewable energy zones to connect new, dispersed resources) should be counted. This means there are logical and defensible grounds for including some, but not all, of the supporting system in the cost estimates, based on assessing how much of the system would have degenerate demand across generation types.

Rationale 2: Degenerate outcomes from temporal boundary: Sunk costs

A separate argument to exclude parts of the system from cost estimates for different generation sources is that these costs are sunk, because decisions to invest in these parts of the system have already been made. Consequently, only parts of the system that might still depend on future investment choices should be assessed.

This is a temporal boundary drawn around parts of the system based on when they are assumed to be committed. The sunk-cost argument could be applied to any part of the system, including storage, transmission, or generation, regardless of whether it is a component of the system which is efficiently or deliberately intended to support one generation type or another.

However, the exclusion of system elements based on a temporal boundary defined by investment commitment dates can confound the process of drawing clean boundaries around elements of the system based on whether they are necessitated by particular generation types, or degenerate across them. This is the essence of the flaw in the CSIRO's recent attempts to assess the cost of renewable energy, including in the current draft GenCost report.

GenCost's approach to renewables integration costs

2018 and 2019-20 GenCost reports

In the first two GenCost reports, CSIRO acknowledged the balance of system required to support wind and solar was higher than other sources, but only included storage costs in the final cost estimates while work on a better methodology was ongoing.[1]

2020-21, 2021-22 and 2022-23 GenCost reports

CSIRO acknowledged the balance of system required to support wind and solar was higher than other sources, and claimed to integrate the incremental increased system costs to support higher penetrations.[2] However, CSIRO only modelled these incremental system costs for 2030, with no current-year analysis being provided. This enabled the 'sunk cost' rationale to be used to exclude significant parts of the system, such as the 2022-23 report's exclusion of Snowy 2.0, Battery of the Nation, multi-billion-dollar transmission projects, gas peaking plants and 2 GW of eight-hour duration storage.[3]

Using sunk costs in this way was misleading, as these major elements of the system were explicitly required for supporting renewables yet were excluded from integration costs, even in cases (e.g. transmission projects) where funding was yet to be approved. This prevented the full cost of integrating renewables from being known.

2023-24 and 2024-25 GenCost reports

Facing criticism for its use of 'sunk costs', CSIRO shifted the GenCost methodology to be much closer to a logical attribution of system costs for generation sources requiring additional support i.e. wind and solar.[4] However, rather than calculating the incremental system elements that would be required by increasing shares of renewables, CSIRO simply moved the temporal boundary for assessment of sunk costs, creating a 'current year' assessment. This was much improved on the previous methodology, since it incorporated the additional cost of projects required to support renewables that were committed and expected to be complete by 2030. However, the improvement only arose due to the temporal boundary being shifted to the current year, which still created a logical problem.

In the 2024-25 report, the assumption that "any existing capacity in 2024 is free"[5] demonstrated how the strictness of the temporal boundary could result in an implausible and incoherent system. In 2024, large amounts of coal and gas generation are still available, but it is implausible that a system in that year could have over 90% of output coming from renewables while retaining the amount of coal and gas generation available in 2024. Consequently, any estimate of the balance of plant required to support renewables would significantly underestimate requirements for firming, as well as system security services (inertia, frequency control, black start etc.), given these services are all provided by existing plants in 2024.

2025-26 Draft GenCost report

In the current draft, CSIRO has reverted the temporal boundary from the current year forward to 2030, and added 2050. CSIRO has claimed its new methodology, which calculates a 'System Levelised Cost of Electricity' (SLCOE) as opposed to a 'Levelised Cost of Electricity', provides "a system perspective which inherently requires a bundle of technologies".[6] This implies the new methodology designates a system boundary that includes a more holistic set of elements and firming technologies than previous reports.

However, the simultaneous application of the temporal sunk-cost boundary in 2030 massively increases the scope of exclusions. This is especially true due to the aggressive 82% renewables target which has led to a large volume of generation and storage projects designed to support renewables being scheduled for completion by 2030. These project costs have been excluded from the 2030 model, as it "includes as existing 2030 capacity, all generation and storage capacity existing or committed in 2025"[7], with rooftop solar and home battery costs being similarly excluded.[8] CSIRO's 2030 SLCOE for 82% renewables appears to assume the following 'committed' projects and consumer-owned resources are free:

- Over 5 GW of solar farms totalling over $9 billion;[9]
- Almost 5 GW of wind farms totalling almost $16 billion;[10]
- The $2 billion, 750 MW gas-fired Hunter Power Station;[11]
- The $1 billion Kidston pumped hydro storage project;[12]
- The $20 billion Snowy 2.0 project;[13]
- Almost 7 GWh of new consumer batteries totalling almost $8 billion;[14]
- Almost 9 GW of new rooftop solar capacity totalling almost $11 billion;[15] and

- Almost 14 GWh of battery energy storage systems totalling $7 billion.[16]

This comes to a total of roughly $74 billion of 'committed' projects and consumer investments considered to be 'free' in the 2030 GenCost model.

CSIRO has advised "We have used the July 2025 Inputs and assumptions workbook for the draft".[17] The above list is based on the December 2025 update of IASR which excludes five wind farms, three solar farms, four battery projects, and two solar battery hybrid projects compared to the July version. Therefore, the total excluded costs above should be considered an underestimate of the amount of sunk costs assumed in the draft GenCost model.

The sheer magnitude of cost exclusions for projects designed to support renewables undermines the CSIRO's claim to be providing a "system perspective". Instead of including a broader scope of system costs than previous LCOEs, the shifted temporal boundary of the SLCOE includes a narrower one. As explained in the below sections, this methodology is misaligned with GenCost's real-world use case, is misleading to users of the report and requires substantial changes.

The Trouble with Transmission

As a side note, transmission projects appear to have been inexplicably treated differently than generation and storage projects. More methodological clarity is required.

For example, despite the Waratah Super Battery being among the list of committed battery projects in the 2025 IASR – which the GenCost model considers a 'sunk cost' – the Waratah Super Battery network augmentations do not appear to have been treated the same. The 2025 IASR 'Network capability' sheet indicates a transfer uplift will arise from this project for a few different flow paths, but this was not included in the GenCost 2030 or 2050 model.[18] The Waratah Super Battery network augmentation has been a 'committed' project since the 2023 IASR, so it is not a recent addition. CSIRO has advised:

> For both the 2030 and 2050 models we include transmission capacity that exists or is under construction as existing capacity. Any additional capacity the scenario needs must be purchased.[19]

This contradicts what has been stated in the SEM User Guide Section 5.1.3:

> The 2050 model and MIP 2050 include existing and committed transmission, hydro and pumped hydro as (exogenously) existing capacity in 2050. This means that existing or committed capacity of transmission and hydro in 2025 is cost-free in the sense that it can be used in 2050 without any new investment cost.

Rather than "existing and **under construction**" transmission capacity, the SEM User Guide clearly states the 2050 model includes "existing and **committed**" transmission capacity. Not all committed projects are under construction, so this needs further clarification.

Section 5.1.3 is silent on how transmission is treated in 2030, which adds to the confusion. This silence suggests that the 2030 model adopts the same approach as 2050 (i.e. excluding costs from existing and committed transmission projects), since no deviation from the 2050 approach is noted, in contrast to how generation and storage are treated.

HumeLink is another example which illustrates the arbitrary nature by which projects are considered inside or outside the scope of costs. CSIRO advised that HumeLink was not included as a sunk cost in the model because it was not officially considered 'committed' when the data was put into the model:

> We have used the July 2025 Inputs and assumptions workbook for the draft. Please note that when that workbook was prepared, Humelink was in the process of becoming committed and then construction started in September 2025.[20]

Despite HumeLink being approved by the regulator to receive regulated returns from consumers in 2024, CSIRO has decided not to treat the project as a 'sunk cost', while simultaneously treating as a 'sunk cost' rooftop solar and consumer batteries that are yet to be purchased and are far less certain of being added to the grid at the levels assumed compared to a regulated transmission project. This highlights the incoherent treatment of generation, storage and transmission projects under the current methodology.

Since construction has now begun, presumably HumeLink – a $5 billion project – will be excluded from the scope of costs in the final version of the GenCost report. Therefore, it can be expected that, all else equal, every annual iteration of the 2030 GenCost model will show integrated renewables becoming cheaper and cheaper – when in reality, this will simply be a result of the CSIRO's decision to exclude the costs of more and more projects, all of which will still need to be paid for by consumers, either through regulated payments, subsidies or higher wholesale prices. This is likely to mislead users of the GenCost report into believing a renewables-dominated system is much cheaper than it is in reality, and underscores the need to overhaul the current methodology, as explained in the sections below.

Regardless of necessary methodological improvements, CSIRO should publish its own spreadsheet containing the exact list of projects that have been included as 'free' along with their costs for each SLCOE. The current references to the IASR are too vague and do not contain sufficient explanation to make sense of the discrepancies. Without the exact list of committed and existing storage, generation and transmission projects assumed to be free in 2030 and 2050, the modelling assumptions are difficult to make sense of. It is important that CSIRO demonstrates full transparency in its modelling assumptions and limits confusion that can arise from vague descriptions and a lack of adequate explanation for modelling choices in the GenCost report.

Methodology misaligned with GenCost's use case

The framing of GenCost's purpose as informing investor choices should be abandoned. The report is not being used by investors in this way. On the contrary, it is being used by public policy makers, particularly politicians, for a very different purpose to which the current methodology is ill-suited. As a publicly-funded research organisation, CSIRO should ensure GenCost is fit for the purpose for which it is actually used – policy development – rather than a purpose for which it is not used – informing investor choices.

Moreover, GenCost's focus on the perspective of the investor has led to an incoherent and unworkable definition of the scope of costs considered, as outlined above. The elements of the system selected for inclusion and the time at which they are assumed to be costed (or not costed) are nonsensical, and cannot meaningfully inform any potential user of GenCost, whether it be the general public, policymakers, or a potential investor.

The incoherence of the investor perspective

CSIRO has consistently framed GenCost's LCOE estimates as being aimed at investors, rather than system planners or policymakers. This framing was used prior to the introduction of the SLCOE, as in the 2024-25 final report:

> GenCost calculates the breakeven cost of electricity needed for investors to recover their capital, fuel and operating costs, including a reasonable return on investment.[21]

Despite the introduction of the SLCOE, which signals an apparent greater focus on 'system' costs in the 2025-26 draft, GenCost has continued to focus on the investor perspective.

As the Draft 2025-26 GenCost states:

> Neither SLCOE or LCOE estimates guarantee a future wholesale electricity generation price outcome. They indicate the breakeven price required for investors to make a return on their portfolio or individual investments respectively… Given this background the SLCOE and LCOE data in GenCost are an indicator of the minimum price needed for investors to enter the market of their own accord ignoring any other uncertainties or external influences.[22]

CSIRO has used this continued focus on the investor perspective to justify adherence to temporal boundaries in the modelling of system costs i.e. by excluding committed projects scheduled for completion prior to 2030 from system costs, as these will be available to investors 'for free'. However, this rationale – the focus on a price an investor would need in order to proceed with a project – doesn't justify the adherence to a temporal boundary when one examines the system boundaries that are derived from it.

For example, 14 GWh of large-scale batteries have been committed prior to 2030, including through explicit government targets and priority projects, with $7 billion dollars being excluded from GenCost's cost estimates, as calculated above. But a new wind or solar farm may still depend directly on this battery for its viability and be liable to pay for it implicitly despite it being committed. This could be through a lower capture price for the sale of wind and solar generation, in order for the battery (already committed) to have sufficient arbitrage opportunity to perform the function of time-shifting the supply to another time in the market. In other words, the costs of projects already committed might still be imposed directly on a new investor. Hence the investor focus is not a sufficient justification for treating committed projects as 'sunk', since they will still affect the investor's decision.

The assumptions that the current investor framework relies upon are:

- An investor is exposed to incremental system costs that a generator necessitates; and
- An investor is not exposed to any incremental system costs that have already been committed.

Neither of these assumptions reflect reality. The investor is often not exposed to system costs that are otherwise passed on to consumers. But the investor can still be exposed to system costs that are already committed.

By incrementally increasing the carve-out of system costs as each new element of the system is committed on the assumption that we are building a low-cost system, this essentially guarantees path lock-in, where the next step in the same direction appears least cost, because this is the system that was being committed to in the previous step.

This approach is entirely illogical and incoherent. It does not provide valuable information for investors and can only serve to mislead the public, and policymakers, as demonstrated below.

GenCost is used by policymakers, not investors

The continued focus on the investor perspective is unjustified given there is no evidence private investors are using GenCost's LCOEs to inform their investment decisions. Investors make decisions based on the specific details of a particular project. Generalised cost estimates are therefore not useful in making individual investment decisions. Anecdotally, in private discussions with investors in energy projects, the CIS has found that GenCost is not considered a good source of information for this purpose.

GenCost itself acknowledges that its LCOE estimates are ill-suited to informing real investment decisions:

> Given that GenCost does not account for all potential additional project costs such as those captured in the list above, real projects are likely to cost more than indicated by the LCOE. Consequently, investors must do their own deeper studies to discover these. Likewise, investors who are interested in brownfield project development will need to source this information elsewhere (e.g., check AEMO publications) or do their own analysis.[23]

The AER has also provided a similar warning when using GenCost data for its Wholesale Electricity Market Performance Report:

> For this report, we have compared the levelised cost of electricity (LCOE) for new generation to the spot revenue that type of plant has earned over the last 5 years…we used the LCOE analysis conducted by CSIRO as part of the 2023–24 GenCost report… This analysis is only intended to be a proxy. Real-world investment decisions will be based on a range of factors including future expected revenue, contract arrangements, other market- and non-market sources of revenue, as well as overall market conditions and confidence.[24]

Thus there are no grounds on which to justify the continued framing of GenCost as providing cost estimates for investors. Given the primary use of GenCost as a source of evidence in public debate over energy policy, the GenCost LCOE/SLCOE methodology not being fit for this purpose is leading, and will continue to lead, to poor public policy decisions and therefore poor consumer outcomes.

There have been the numerous instances of GenCost being cited by policymakers to support the claim that renewables are the cheapest form of energy, and therefore justify plans to build a 90%+ wind and solar system using taxpayer funds. This is despite the GenCost methodology being ill-suited to answering the question of which generation mix provides the lowest cost energy system, and therefore the lowest bills, for consumers.

Policymakers who have cited GenCost to support the 'renewables are cheapest' claim include Prime Minister Anthony Albanese,[25] Climate Change and Energy Minister Chris Bowen[26], Treasurer Jim Chalmers[27] and Climate Change Authority Chair Matt Kean.[28] Think tanks and lobby groups have also cited GenCost in the same way, including the Australian Energy Council,[29] Institute for Energy Economics and Financial Analysis,[30] Clean Energy Council,[31] Climate Council[32] and the Smart Energy Council.[33] The 'renewables are cheapest' claim has likewise been stated as fact to the public, with GenCost used as evidence, through dissemination by numerous media outlets, including the ABC,[34] 9News,[35] *The Australian Financial Review*,[36] *The Australian*,[37] *The Guardian*[38] and the *Sydney Morning Herald*.[39]

CIS submits that CSIRO should abandon the investor framing, which is of little to no use to stakeholders, and instead frame GenCost as providing cost comparisons between systems with different generation mixes.

Recommended changes to GenCost's methodology

In order to match GenCost's methodology with its primary use case, CSIRO must cleanly separate the two rationales for drawing cost exclusion boundaries. In particular, the system boundaries should determine what costs are incorporated to support renewables. Only what is degenerate across generation types should be omitted from the calculation of costs. Different points in time should only be used to indicate expected evolution of costs, not the evolution of our progress to committing costs as sunk.

In other words, these two questions should be separated:

1. What does each generation type cost, and what is the least cost mix for Australia?
2. Given Australia's current generation mix, what should we invest in next to minimise future cost?

The first question is a factual, scientific assessment of technology types that can be used as a high level guide for policymakers and members of the public wanting to compare the costs of systems underpinned by different generation technologies. GenCost should answer this question by modelling each generation mix, including varying levels of integrated renewables, as a hypothetical overnight build of an optimal and coherent system, excluding from total costs only those parts of the system which can be confidently assessed as degenerate among all generation types.

This will ensure CSIRO is appropriately employing Rationale 1 (Degenerate outcome from system boundary) in GenCost. Whatever is not clearly degenerate between different generation mixes must be included in the system costs, such as e.g. the distribution network, if different systems are reliant on or presume varying levels of EV uptake. The LCOE estimates should be calculated from these total system costs.

If CSIRO wishes to provide cost estimates for different mixes in future years, the same hypothetical overnight construction of the system should be assumed and degenerate costs excluded, with the only change in methodology being the forecast capital and operating costs for the given year being taken as the input. This would address the problem of GenCost's

current misuse of Rationale 2 (Degenerate outcomes from temporal boundary), which has conflated the evolution in capital and operating costs with the evolution in the amount of costs considered 'sunk' in future years.

Alternatively, the CSIRO may decide to dispense with system boundaries altogether and instead calculate total system costs for each generation mix, including degenerate costs, from which SLCOEs would then be calculated. Either way, the mandatory condition for GenCost providing useful cost estimates is that it provides an apples for apples comparison between generation mixes to ensure they are assessed on a level playing field.

The second question listed above is a much more complex policy question, and must be dealt with separately outside GenCost. CSIRO's current method is not fit to answer it, as GenCost assumes 'committed' projects are locked in and therefore 'free' and thus does not identify the least cost energy system from all available options. The considerably greater resources allocated to the ISP would be much better placed to answer the second question, not GenCost. However, AEMO currently restricts the ISP to only considering government policy, a flaw which AEMO needs to remedy.

Recommended changes to coal assumptions

The GHD 2025 Energy Technology Cost and Technical Parameter Review cost estimates used by the CSIRO for the GenCost coal cost estimates have several flaws, all of which have been identified repeatedly by CIS in previous GenCost consultations, when Aurecon provided the Review.[40] It is concerning that none of these issues have been remedied in the most recent report, as this has resulted in the coal cost estimates being greatly overestimated compared to the costs of more realistic 'lowest hanging fruit' coal generation projects that could be built more easily.

The GHD report only considers new-build plants on greenfield sites, which are estimated to require $600m in land and development costs and a $200m single track rail line to supply fuel. If GHD considered coal refurbishments or building new units on existing sites, these additional costs would not be necessary. There is no reason to ignore the lower cost new coal generation options of refurbishments and new units under GenCost's current methodology, given they are generation projects an investor may choose to pursue.

Similarly, there is no reason to restrict consideration of new coal plants to a more expensive design. Despite providing operating, maintenance and retirement costs for subcritical and supercritical coal plants, GHD has not provided capital costs for these plant types. GHD has only provided capital costs for an advanced ultra-supercritical plant (AUSC) with steam pressures of 33.5 MPa and steam temperatures of 650 degrees Celsius, despite acknowledging that:

> An advanced ultra-super-critical power station with the above main steam conditions is yet to be constructed internationally, however, are currently being proposed by a number of OEMs globally. No ultra-super-critical or advanced ultra-super-critical coal fired units are installed or planned in Australia at present.[41]

It is unreasonable to exclude new subcritical and supercritical plants from the analysis, given Australia has experience in constructing these types of plants, while no country has experience in constructing the AUSC plant taken as the representative coal plant in the GHD report. CSIRO has attempted to justify this exclusion by stating that plants with higher emissions intensity are unlikely to be deployed due to current government policy:

> Some stakeholders take a view that although Australia has national and state net zero emissions policies by 2050, the highest greenhouse gas emitting options should remain on the table. The deployment of new coal has low plausibility given its high emissions intensity. A high efficiency design brings it closer to being plausible by reducing its emissions.[42]

CSIRO should not allow the policy of the government of the day to shape what should be an independent, dispassionate, technology-neutral comparison of costs. The role of GenCost should not be to pick and choose which technologies to include based on emissions intensity, as the current draft does. GenCost should provide an unbiased analysis of different generation mixes to inform policymakers of the varying costs of different systems. By making policy choices in what should be a technology-neutral analysis, CSIRO has abandoned its role as independent scientific advisor and usurped the role of policymakers. This has robbed the public and policymakers of information that could have added value to the energy debate, while providing 'evidence' for the false claim of politicians and bureaucrats that 'renewables are cheapest'.

Poor policy choices are a likely outcome of a dearth of objective information on the relative trade-offs of different courses of action. Only after the calculation of capital and operating costs of all the potential technology choices can trade-offs be made between emissions reduction and cost. GenCost should be an input to the public policy debate around trade-offs between cost and emissions, not a foregone conclusion.

There are two further points that expose the unstable foundation on which CSIRO has based its decision to exclude lower cost coal plant designs. First, the emissions reductions from building an AUSC plant compared to a supercritical, or even a subcritical, plant are minimal. GHD states:

> It is common knowledge that sub-critical coal technology produces the most CO2 emission as a result of its lower efficiency. Super-critical coal power stations have generally ~2% better efficiency and therefore produce less CO2/MWh than sub-critical power stations. Ultra supercritical is a technology having the highest plant efficiency of all coal technologies. Efficiency for ultra-super-critical technology is ~ 2% better than for Super-critical and therefore has the lowest CO2 emissions of all the coal burning technologies in a Rankine Cycle.[43]

A mere 2% difference in emissions cannot seriously be deemed to make such a difference in plausibility as to render AUSC fit for GenCost's analysis while supercritical technology remains unfit. It makes little sense for CSIRO to use government net zero policy as a justification for deeming the construction of supercritical plants implausible, while maintain that the construction of AUSC plants is plausible based on a 2% difference in emissions intensity. If CSIRO was committed to strictly following government policy – as AEMO's ISP does – GenCost would exclude consideration of new coal plants entirely (at least without near 100% CCS), and furthermore would exclude consideration of nuclear energy given current government policy

bans for this generation type. The logical conclusion of CSIRO's reasoning would therefore render the report almost useless.

If CSIRO were to instead provide an unbiased, technology-neutral analysis that was capable of informing policy choices – as it should – GenCost would not consider government policy as an input and would instead compare subcritical, supercritical and AUSC cost estimates to other technologies. As it currently stands, GenCost is stuck in a halfway house in which it is wielded in the energy debate as a technology-neutral report that proves the government's current policy is optimal, while in reality the CSIRO's supposedly-pure economic analysis has been compromised by assumptions shaped by that same government policy. This circular reasoning must end, and this can only occur if all types of coal plants are costed by GHD and compared to other technologies in the GenCost analysis.

---

[1] Graham, Paul, Jenny Hayward, James Foster, Oliver Story & Lisa Havas. 2018. 'GenCost 2018: Updated projections of electricity generation technology costs'. p 26. https://www.csiro.au/-/media/News-releases/2018/renewables-cheapest-new-power/GenCost2018.pdf; Graham, Paul, Jenny Hayward, James Foster & Lisa Havas. 2020. 'GenCost 2019-20'. p 22. https://www.csiro.au/-/media/EF/Files/GenCost2020-21_FinalReport.pdf

[2] Graham, Paul, Jenny Hayward, James Foster & Lisa Havas. 2021. 'GenCost 2021-22 Final report'. p viii. https://www.csiro.au/-/media/EF/Files/GenCost2020-21_FinalReport.pdf; Graham, Paul, Jenny Hayward, James Foster & Lisa Havas. 2022. 'GenCost 2021-22 Final report'. p ix. https://www.csiro.au/-/media/News-releases/2022/GenCost-2022/GenCost2021-22Final_20220708.pdf; Graham, Paul, Jenny Hayward, James Foster & Lisa Havas. 2023. 'GenCost 2022-23 Final Report'. p viii-ix. https://www.csiro.au/-/media/EF/Files/GenCost/GenCost2022-23Final_27-06-2023.pdf.

[3] Graham, Paul, Jenny Hayward, James Foster & Lisa Havas. 2023. 'GenCost 2022-23 Final Report'. p 52. https://www.csiro.au/-/media/EF/Files/GenCost/GenCost2022-23Final_27-06-2023.pdf.

[4] Graham, Paul, Jenny Hayward & James Foster. 2024. 'GenCost 2023-24 Final Report'. p 65. https://www.csiro.au/-/media/Energy/GenCost/GenCost2023-24Final_20240522.pdf;

[5] Graham, Paul, Jenny Hayward & James Foster. 2025. 'GenCost 2024-25 Final Report'. p 70. https://publications.csiro.au/publications/publication/PIcsiro:EP2025-2701/SQGenCost/RP1/RS25/RORECENT/STsearch-by-keyword/LISEA/RI2/RT16.

[6] Graham, Paul & Jenny Hayward. 2025. 'GenCost 2025-26: Consultation draft'. CSIRO. p 46-47. https://www.csiro.au/en/research/technology-space/energy/Electricity-transition/GenCost.

[7] Graham, Paul, James Foster, Chathurika Mediwaththe, David Green & Thomas Brinsmead. 2025. 'SEM user guide'. CSIRO. p 7. https://data.csiro.au/collection/csiro:71289.

[8] Ibid, p 8; Graham, Paul & Jenny Hayward. 2025. 'GenCost 2025-26: Consultation draft'. CSIRO. p 50-51. https://www.csiro.au/en/research/technology-space/energy/Electricity-transition/GenCost.

[9] The 2025 IASR 'Existing Gen Data Summary' tab lists 35 committed solar farm projects totalling 5663 MW. At GenCost's 'Current policies' 2025 prices of $1621/kW, this would cost $9,179,723,000.

[10] 14 committed wind farm projects totalling 4889 MW at $3248/kW total $15,879,472,000.

[11] The Hunter Power Station (also known as the Kurri Kurri Power Station) is now likely to cost $2 billion or more. Source: Woodley, Ted. 2025. 'The abject saga of one of Australia's most controversial gas fired power station projects'. RenewEconomy. https://reneweconomy.com.au/the-abject-saga-of-the-soon-to-be-completed-kurri-kurri-power-station/.

[12] The Kidston Pumped Hydro project is estimated to cost $777 million. Source: Australia New Zealand Infrastructure Pipeline. 2024. 'Project: Kidston Pumped Hydro'. https://infrastructurepipeline.org/project/kidston-pumped-hydro-project.

[13] Snowy 2.0 is likely to cost around $20 billion. Source: Kinsella, Luke & Angela Macdonald-Smith. 2025. 'Turnbull hits back at Snowy Hydro critics after 900pc blowout'. Australian Financial Review. https://www.afr.com/companies/energy/turnbull-hits-back-at-snowy-hydro-critics-after-900pc-blowout-20251005-p5n04q

[14] The 2025 IASR Workbook Step Change scenario forecasts 11,643 MWh of small-scale battery capacity being available in 2029-30, an increase of 6,912 MWh on the 2025-26 capacity of 4,731 MWh. At $1100/kWh, this represents $7,603,200,000 of 'free' new capacity.

[15] The 2025 IASR Workbook Step Change scenario forecasts 37,069 MW of rooftop solar capacity being available in 2029-30, an increase of 8,827 MW on the 2025-26 capacity of 28,242 MW. At $1216/kW, this represents $10,733,632,000 of 'free' new capacity.

[16] 25 committed battery projects totalling 13,981 MWh and 5538 MW would cost $7,033,089,000 total. 1288 MWh of 1 hour storage at $778/kWh costs $1,002,064,000, 8173 MWh of 2 hour storage at $525/kWh costs $4,290,825,000 and 4520 MWh of 4 hour storage at $385/kWh costs $1,740,200,000.

[17] CIS correspondence with CSIRO 28/1/26.

[18] The IASR indicates an uplift of 660 MW for the CNSW-SNW Northern Limit, 250 MW for the CNSW-SNW Southern Limit, 250 MW for SNSW-CNSW and 300 MW for CNSW-NNSW, none of which have been reflected in the 'TranCap15Region' sheet in both the 'ParameterData2030' and 'ParameterData2050' workbooks.

[19] CIS correspondence with CSIRO 20/1/26.

[20] CIS correspondence with CSIRO 28/1/26.

[21] GenCost 2024-25 Final Report, p 121.

[22] Graham, Paul & Jenny Hayward. 2025. 'GenCost 2025-26: Consultation draft'. CSIRO. p 50. https://www.csiro.au/en/research/technology-space/energy/Electricity-transition/GenCost.

[23] GenCost draft, p 92.

[24] AER. 2024. 'Wholesale electricity market performance report 2024'. p 102-103. https://www.aer.gov.au/system/files/2024-12/Wholesale%20electrcity%20market%20performance%20report%20-%20December%202024.pdf.

[25] Albanese, Anthony. 2024. 'Radio interview - ABC Melbourne'. https://www.pm.gov.au/media/radio-interview-abc-melbourne-7.

[26] Bowen, Chris & Ed Husic. 2023. 'Joint media release: GenCost confirms renewables remain the cheapest form of energy, as the cost of nuclear reactors skyrocket'. https://minister.dcceew.gov.au/bowen/media-releases/joint-media-release-gencost-confirms-renewables-remain-cheapest-form-energy-cost-nuclear-reactors-skyrocket.

[27] Ganko, Josefine. 2024. 'Watch: Jim Chalmers and Jason Clare speak in Melbourne'. WA Today. https://www.watoday.com.au/national/australia-news-live-one-dead-30-injured-after-severe-turbulence-on-singapore-airlines-flight-ozempic-dupes-banned-20240522-p5jfk7.html?post=p570kj

[28] Commonwealth of Australia. 2024. 'Proof Committee Hansard Senate Environment and Communications Legislation Committee Estimates, Monday 4 November 2024'. p 53, 61. https://www.aph.gov.au/-/media/Estimates/ec/supp2425/DCCEEW/4_November_2024_-_Environment.pdf.

[29] Kitchen, Carl. 2023. 'GenCost verdict: Onshore wind and solar remain lowest cost generation'. Australian Energy Council. https://www.energycouncil.com.au/analysis/gencost-verdict-onshore-wind-and-solar-remain-lowest-cost-generation/.

[30] Institute For Energy Economics And Financial Analysis. 2025. 'Improving energy affordability aligns with net zero'. https://ieefa.org/resources/fact-sheet-improving-energy-affordability-aligns-net-zero.

[31] Clean Energy Council. 2025. 'GenCost 2024-25 reaffirms renewables as lowest cost energy transition pathway'. https://cleanenergycouncil.org.au/news-resources/gencost-2024-25-reaffirms-renewables-as-lowest-cost-energy-transition-pathway.

[32] Climate Council. 2024. 'CSIRO confirms nuclear fantasy would cost twice as much as renewables'. https://www.climatecouncil.org.au/resources/csiro-confirms-nuclear-fantasy-would-cost-twice-as-much-as-renewables/.

[33] Smart Energy Council. 2024. 'Nuclear: Double the Cost and Decades Off'. https://smartenergy.org.au/nuclear-double-the-cost-and-decades-off/.

[34] Fitzgerald, Bridget. 2025. 'Renewables cheapest energy technology, report finds'. ABC. https://www.abc.net.au/listen/programs/worldtoday/renewables-cheapest-energy-technology-report-finds/105586216.

[35] Jeffrey, Daniel. 2024. 'Nuclear energy questioned again as new CSIRO report finds it will push up power prices'. 9News. https://www.9news.com.au/national/csiro-gen-cost-report-nuclear-twice-expensive-renewables/53b37f54-ad6e-4542-9ab0-35fdf48dec96#.

[36] Macdonald-Smith, Angela. 2024. 'CSIRO doubles down on nuclear power as too costly, slow'. Australian Financial Review. https://www.afr.com/companies/energy/csiro-doubles-down-on-nuclear-power-as-too-costly-slow-20241204-p5kvvp.

[37] Commins, Patrick. 2023. 'Nuclear still most expensive energy, says CSIRO'. The Australian. https://www.theaustralian.com.au/business/mining-energy/nuclear-still-most-expensive-energy-says-csiro/news-story/366fdf9f64a13c83176ee64356744153.

[38] Readfearn, Graham. 2024. 'The CSIRO pours cold water on the Coalition's nuclear claims in a new report. Here's how'. The Guardian. https://www.theguardian.com/australia-news/2024/dec/09/csiro-gencost-liberal-coalition-nuclear-power-plan.

[39] Foley, Mike. 2023. 'Renewables cheaper than nuclear, coal now and into the future: CSIRO'. Sydney Morning Herald. https://www.smh.com.au/politics/federal/renewables-cheaper-than-nuclear-coal-now-and-into-the-future-csiro-20231219-p5esga.html.

[40] Morrison, Aidan. 2024. 'Submission to Draft 2023-24 GenCost'. Centre for Independent Studies. https://www.cis.org.au/submission/submission-to-draft-2023-24-gencost/; Morrison, Aidan. 2025. 'Submission to Draft 2024-25 GenCost'. Centre for Independent Studies. https://www.cis.org.au/submission/submission-to-draft-2024-25-gencost/.

[41] GHD. 2025. '2025 Energy Technology Retirement Cost & O&M Estimate Review'. p 67. https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2025/draft-2026-fau/ghd-2025-energy-technology-cost-and-technical-parameter-report.pdf.

[42] GenCost draft, p 88.

[43] Ibid.