

# The Crisis of '22 in Australia's Energy Markets

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**Abstract**—On 15th June 2022 the Australian Energy Market Operator suspended the operation of the Australian National Electricity Market and commenced administrative directions for the dispatch of power outside of market arrangements. This short paper provides an overview of some key issues.

## I. THE CRISIS ERUPTS

During the first two weeks of June 2022 wholesale volume weighted average electricity spot prices in the Australian National Electricity Market (NEM) ranged from \$341/MWh to \$590/MWh<sup>1</sup>, roughly 5 times higher than average prices during Jan-March 2022 (See Figure 1). Base load futures contracts also became significantly more expensive, reflecting market expectations of a sustained period of high wholesale prices.

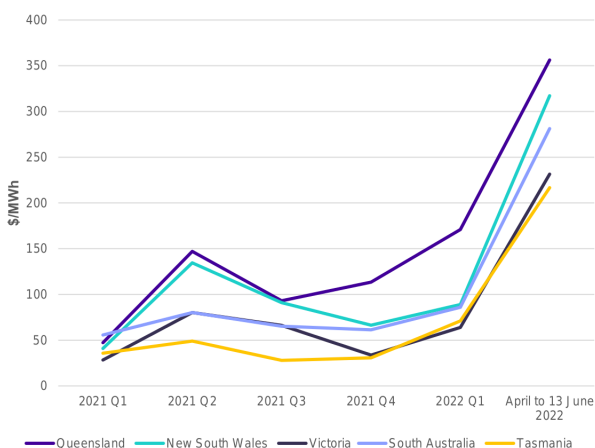


Fig. 1. Wholesale NEM quarterly VWAP. [1]

The high spot prices across the NEM triggered automatic rules capping prices at \$300/MWh in Queensland, New South Wales, South Australia and Victoria between 12 and 14 June 2022.

The price capping led to some reduction of generation capacity being offered. On 15th June 2022 the Australian Energy Market Operator (AEMO) concluded that “it has become impossible to operate the spot market in accordance with the provisions of the {National Energy Rules}” and suspended

<sup>1</sup>All “\$” refer to AUD

the operation of the NEM spot market[2]. This meant that dispatch of generation across the Eastern and Southern states of Australia is occurring under administrative directions.<sup>2</sup>

As of the time of writing<sup>3</sup> this continues to be the case, and the pathway back to an operational wholesale electricity market isn't clear.



Fig. 2. Nothing to see here....

Newspapers carried front page headlines warnings of the risk of blackouts (or conversely assurances that blackouts wouldn't be occurring (probably more hopeful than well informed), and public exhortations for households to turn-down heating to lower demand (probably fruitless).

Some electricity retailers have become insolvent (or been at risk of it), and have had to pass over customers under “retailer of last resort” arrangements. Others have voluntarily and publicly advised their customers to move to another retailer as a matter of urgency.

Forward markets for wholesale electricity are anticipating prices above \$150/MWh for much of 2022 across the eastern

<sup>2</sup>The interested reader who would like a detailed technical understanding of how the dispatch works during market suspension is recommended to read: <https://wattclarity.com.au/articles/2022/06/pricing-and-dispatch-during-market-suspension/>

<sup>3</sup>22th June 2022

states.<sup>4,5</sup>

The “big three” power companies (Origin Energy, AGL and EnergyAustralia) are all in various types of turmoil.

On 20 June 2022 one of the largest power companies, EnergyAustralia (owned by Hong Kong based CLP Group and operating an integrated generation and retailing company) issued a profit warning, stating it would suffer losses of \$1.3B (AUD) in the first 5 months of 2022.<sup>6,7</sup>

Whilst not directly related to the immediate crisis, AGL (one of the largest power companies in Australia) has had its entire strategy for dealing with its large coal fired generation assets rejected by shareholders in late May 2022 (essentially key shareholders wanted a faster divestment/closure of these coal assets that the company management proposed), leading to an almost total resignation of the board (and it not being clear what new management will be put in place), and a fundamental rethink of strategy being commenced by AGL.<sup>8</sup>

Origin Energy announced in February that they would be closing the Eraring Powerstation (one of Australia’s larger coal fired power stations) in 2025, 7 years earlier than had been previously anticipated. This generated considerable criticism from the then Federal Government, as well as concerns from large power consumers.

A range of “crisis meetings” of state and federal energy ministers, supported by “crisis proposals” from the key regulatory agencies are proposing a string of measures to reform the markets, including financial aid packages for business and manufacturers that are perceived as being at risk of failure due to high energy prices.

Default electricity tariffs<sup>9</sup> for end consumers are in the process of being significantly raised (by up to 20% in the case of NSW) to reflect increases in wholesale prices.

Whatever happens from here, consumers can expect their gas and electricity prices to be going up for the next couple

<sup>4</sup><https://www.afr.com/companies/energy/go-elsewhere-for-cheaper-power-this-retailer-tells-it-customers-20220531-p5apwa>

<sup>5</sup>Some energy retailers did not have full forward contract cover in place and hence have been immediately impacted by high spot prices. As a result, some have been publicly telling their customers to move to another retailer, or face large increases in bills. LPE, which has about 20,000 customers in Queensland, and Discover Energy in NSW and Victoria warned their rates would double from June 1. The Australian Financial Review reported that ReAmped Energy emailed its 70,000 customers in NSW, Queensland, Victoria, South Australia and Tasmania on in late May 2022 telling them transfer to another retailer. Community (and specialist “green”) electricity retailer Enova entered Voluntary Administration on 21 June 2022.

<sup>6</sup><https://www1.hkexnews.hk/listedco/listconews/sehk/2022/0620/2022062000285.pdf>

<sup>7</sup>“The prices and volatility in the forward contracts have further increased. The after tax negative impact of the significant unfavourable fair value movements on the Groups Operating Earnings increased from HK\$2.5 billion for the 2022 first quarter to HK\$7.2 billion for the five months ended 31 May 2022”

<sup>8</sup><https://www.afr.com/companies/energy/agl-in-crisis-as-split-set-to-be-scraped-20220529-p5apdt>

<sup>9</sup>“Default” tariffs are those that apply when customers do not make a choice of competitive retail offering, or are transferred under retailer of last resort arrangements. The prices of these are set by relation to wholesale spot prices, and are deliberately set such that they are above the prices that should be available in the competitive retail market. Accordingly as wholesale prices rise, the default tariffs will automatically ratchet upwards.

of years.

## II. THE IMMEDIATE CAUSES

This did not come from nowhere, although given the lack of general media reporting about the issues the casual observer could be forgiven for thinking so. In fact the crisis has been building for years, with the failure in 2007 to pass the Howard Government’s proposed Australia Carbon Trading Scheme and the failure in 2017 of the state and federal governments to approve the proposed “National Energy Guarantee” being two particularly noteworthy steps along the way.

As is generally the case with disasters, a set of long term issues and short term triggers can be identified. Some comments on the long term structural issues are in the next section, but the short term immediate causes of the market suspension included:

### A. Perverse impact of price caps

With AEMO applying the (seldom-used) price-capping rules in both the natural gas market<sup>10</sup> and the NEM<sup>11</sup>, generation companies were faced with circumstance where power might be sold at a loss due to the cost of generation exceeding the price at which electricity could be sold under the cap. Accordingly generation companies reportedly responded by reducing the quantity of generation being offered into the market dispatch algorithm (although not reducing the quantity reported as available for dispatch under administrative direction, and which is paid for at a higher rate).

Due to the lack of market offers of generation capacity on 14 June 2022 AEMO was forced to direct 5 GW of generation into the dispatch process (representing approximately 20% of total NEM output).

This lack of offered supply at (capped) market prices was the prima-facie cause of AEMO moving to suspend the market on 15 June 2022.

The drop in capacity being offered under the market arrangements also led to public allegations in the media of “withholding” of supply and “price gouging” on the part of generation owners, and resulted in the Australian Treasurer instructing the ACCC to investigate[1].

It is hard to see how “price gouging” is a motivation under circumstances where price caps have been applied, and whilst it is certainly possible that generation companies would identify that being directed to supply would be more profitable than bidding under price caps, this is unlikely to meet the

<sup>10</sup>AEMO operates a number of wholesale gas markets, in particular the Declared Wholesale Gas Market (DWGM) and the Short Term Trading Market (STTM). Refer to: <https://aemo.com.au/en/energy-systems/gas>

<sup>11</sup>The “Cumulative Price Threshold” rules automatically apply when a series of high price events have occurred.

definition of “Prohibited Energy Market Conduct”.<sup>12</sup> It will be interesting to see the report that the ACCC issues in July.

### B. *Unscheduled outages of major generation plant*

For a range of unrelated reasons, some due to electrical faults (such as the unexpected failure of a rotor at the Loy Yang Unit 2, delaying its scheduled return from maintenance by 4 months), others due to fuel supply issues, approximately 1/3 of the coal fired generation capacity in the NEM was unavailable at short notice during late May and June. This placed considerable extra demand on gas fired generation to pick up the load.

### C. *Spikes in natural gas prices*

Given its fast start and rapid ramping rates, gas generation has become the de-facto firming generation in the NEM (supported by large-scale Hydro), and there have been large price rises in the spot market for gas - prices since late 2021 have hit record levels (see Figure 3 as an example). With the outages of generation plant mention above, there



Fig. 3. Sydney STTM Gas Price (AUD/GJ) - 18 Nov 2010 to 17 Jun 2022

was additional demand for gas generation. These spot prices were sufficiently high to trigger AEMO to apply a price cap at \$40/GJ in the Victoria Declared Wholesale Gas Market (DWGM) on 30 May and in the Sydney Short Term Trading Markets (STTM) on 7 June. These price caps remain in place.

As discussed in the next section, there is a relationship between global LNG pricing and natural gas pricing within Australia, noting that the great bulk of local natural gas and export LNG is under long term contracts, and that there can

<sup>12</sup>On the currently reported facts it would seem unlikely that the legal tests of “market manipulation” would have been met, although the ACCC has an ongoing inquiry into the operation of the NEM (in fact, it is on its 7th inquiry), and has been specifically directed by the Australian Treasurer to “investigate the factors influencing electricity and gas prices, including profits and margins from a wide range of energy companies”, and to report back in July 2022. A reader looking for a primer on the current events would be well directed to commence with the ACCC Addendum issued on 17 June 2022[?] available at <https://www.accc.gov.au/publications/serial-publications/inquiry-into-the-national-electricity-market-2018-2025/inquiry-into-the-national-electricity-market-may-2022-report>

thus be a delay in the alignment of prices. Australia exports roughly 75% of natural gas production in the form of LNG and the domestic gas market spot market is quite thin - so can show significant volatility. Domestic spot gas prices are actually currently above the international LNG prices, so at these levels one would expect that has export capacity become free that the gas would be redirected locally. However it is not clear how long that would take, or what the willingness would be to cut back long term international exports (at what are normally above local prices) in order to take advantage of short term price spikes in the domestic market.

In the longer term this issue (of gas being the primary firming capacity) will be addressed by the Snowy Hydro 2 expansion project (albeit that this project is now not expected to be in operation until 2028, 3 years later than originally proposed), and by the increase of other forms of storage. It is of course also not clear how rapidly large scale battery storage will be coming into the system.

### D. *A cold start to winter*

As reported by the ACCC “In late May, a cold front affected households in south-east South Australia, Victoria, Tasmania, and eastern New South Wales, travelling as far inland as southern Queensland and southern Northern Territory. The cold snap caused daytime temperatures to stay 3 to 6 degrees below average, driving up energy demand. Additionally rain and strong winds damaged electricity infrastructure and triggered power outages in New South Wales and Queensland”.<sup>[3]</sup> Whilst it is the case the energy demand was higher in late May than at the same time last year, it was not way outside of the historical averages. Except for the co-incidence with the unscheduled outages, the Author doubts that the additional demand would have been a significant problem.

## III. THE BIG LONG TERM ISSUES

Whilst it is perhaps understandable that the impact of the Ukraine/Russia war which has caused global energy prices to spike and that coincides with a cold winter and some plant outages can cause difficulties, the Author’s view is that the crisis did not need to be as dramatic as it has been, and that the weaknesses now exposed have been building for many years. The author would identify five long term structural issues:

### A. *Issue 1: The failure to have a broad based carbon price*

The failure to pass the Howard Government’s Australian Carbon Trading Scheme (ACTS) in 2007 has led to a situation where due to the contested nature of coal fired generation it has become “unbankable”<sup>13</sup> and is being quickly retired from operation, faster in fact that was originally anticipated, and now fairly clearly also faster than alternatives have been fully put in place.

<sup>13</sup>Without a emissions pricing arrangement being in place, fossil fuel generation is increasingly viewed negatively by financiers. Partly due to commitments to remove emissions from their investment portfolios, and partly because absent an existing and agreed “polluter pays” scheme, investors worry about what new schemes will be forthcoming during the life of the asset, which may impact asset valuations.

The proposed ACTS legislation was put to Parliament by the Liberal-National coalition government (led by Prime Minister John Howard) in 2007. In a controversial political move, the Greens party voted with the Labor party opposition to reject the scheme, claiming that the targets were insufficiently aggressive (and possibly also with an eye to the forthcoming 2007 election). The Labor party government at the 2007 election (under Prime Minister Kevin Rudd), and (after various political dramas) ended up in a minority government (under Prime Minister Julia Gillard) supported by the Greens. Despite the Labor party having campaigned promising “no carbon scheme”, they proceeded to implement a form of carbon trading scheme due to pressure from the Greens, said scheme being firmly opposed by the Liberal-National opposition.

Ultimately the Liberal-National party succeeded in being re-elected (under Prime Minister Tony Abbott) on a strident platform of removing the Labor party’s carbon scheme (which duly occurred).

This has led to the politics of a broad based carbon trading scheme becoming highly contested, and it has remained to this day impossible to get a broad based carbon pricing scheme into agreed (bipartisan) operation in Australia.

Instead a long series of “second best” policies have been adopted, all of which have been putting additional distortions into the investment decision making environment.

It is this authors view that had a carbon price been implemented under Howard in 2007, the result would probably have survived in some workable form, and would have resulted in a more sensibly planned exit of coal generation from the NEM in a much less contested manner.

One of the most distortionary “second best” policies adopted was a significant ramp-up in the Renewable Energy Target Market (RET). The RET was increased from the original target of sourcing an additional 2% of generation (by energy) from renewables to sourcing an additional 20%. The policy is implemented using Renewable Energy Certificates, which each represent 1 MWh of renewable generation. As an energy only mechanism, there is no accounting within the RET for requiring firming capability or impacts on overall system stability from the additional intermittent generation.

As a result a significant change in NEM spot market pricing has occurred, with prices during the day dropping dramatically. This has itself impacted the viability of large scale generation at a much more rapid rate than initially anticipated. As a by-no-means isolated example, in February 2022, Origin Energy announced it would shut Eraring (one of Australia’s largest coal fired power stations) in 2025, seven years ahead of the scheduled date, explicitly linking in their announcement the impact on the stations profitability renewable energy bidding

behaviour.<sup>14</sup>

### B. Issue 2: The export dominated LNG sector and issues with gas supply

Australia is vying with Qatar for being the worlds largest exporter of LNG, with multiple LNG production trains established in the last 20 years in Western Australia, the Northern Territory and Queensland. Australia exports roughly 75% of its natural gas production. Most LNG and domestic natural gas is supplied under long term contracts, so the domestic spot market is relatively thin. Australia has not been bringing a lot of new natural gas production on line in the two largest domestic states of NSW and Victoria, with major potential gas developments caught up in “lawfare” (as is the case with the Narrabri gas project in NSW, refer to the press clipping at Figure 6 on page 8, or facing an outright ban on “fracking” as appears to be the case with Exxon’s Gippsland resource in Victoria).

The author cannot claim particular expertise on natural gas markets, but notes it is often alleged that the lack of a domestic reservation policy in respect of gas in the eastern states and the dominance of export by volume leads to domestic gas prices being higher and more volatile than might otherwise be the case. This is not an uncontested statement - some credibly point out that without the export market the resources may well not have been developed at all. Analysis by the ACCC seems to show that there is limited correlation between domestic spot gas prices and the LNG Netback price, as shown in Figure 4.

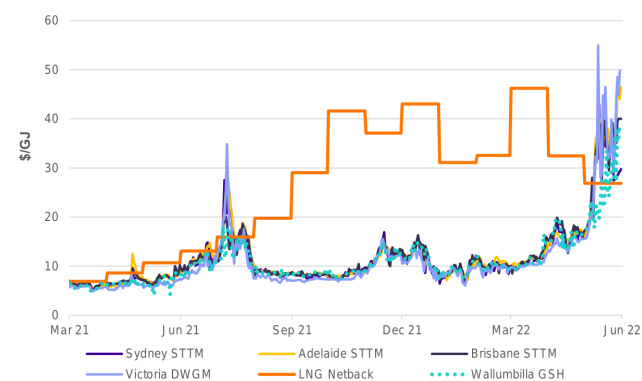


Fig. 4. ACCC analysis using AEMO and S&P Global Platts data. Figures show liquified natural gas netback and east coast gas market prices in real 2022 dollars.[1]

<sup>14</sup> “Origin’s proposed exit from coal-fired generation reflects the continuing, rapid transition of the NEM as we move to cleaner sources of energy. Australia’s energy market today is very different to the one when Eraring was brought online in the early 1980s, and the reality is the economics of coal-fired power stations are being put under increasing, unsustainable pressure by cleaner and lower cost generation, including solar, wind and batteries. {...}. the penetration of renewables is growing and changing the shape of wholesale electricity prices”. [4]



However the raw netback<sup>15</sup> pricing data would appear to show closer correlation with domestic spot gas prices (compare Figure 3 above with Figure 5 below), and given the high proportion of gas production going into the export market, and the absence of any formal east-coast domestic reservation policy, it would be very strange if such large rises in the global spot market for LNG did not work back through to the domestic market over time.

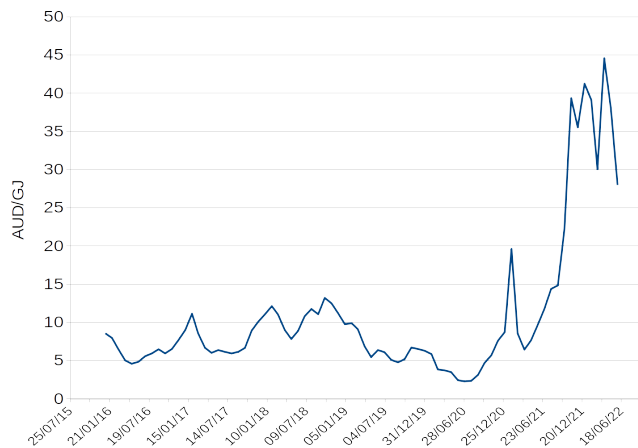


Fig. 5. raw LNG netback price data. [5]

It is not at all clear that domestic gas supply will be ramping up enough to fully supply the demands of the export LNG market (which with high international prices will probably want to increase export volumes) whilst also meeting the enhanced demands for natural gas fired electricity generation to provide firming capacity and replacement for coal generation that is being retired over the next decade.

1) *Issue 2(a): The export dominated coal sector, and issues with coal supply:* Australia exports roughly 85% of its thermal coal, mostly under long term contracts. Most coal fired power-stations have long term supply agreements (although a small number draw coal from a dedicated nearby coal mine). In this period of May/June 2022 where about 1/3 of coal fired generation was offline, the remaining coal fired generators were seeking to output beyond normal levels, requiring them to source coal from the short term market. It has reported in the press that this proved difficult to do.

### C. Issue 3: The transmission / distribution regulation model

With the introduction of the NEM in 1998, regional “nodes” were created that followed the historical state boundaries since these genuinely did represent at the time where the constraints existed in the transmission infrastructure - this being a reflection of the long preceding history of state

<sup>15</sup>The LNG netback price is a measure of an export parity price that a gas supplier can expect to receive for exporting its gas. It is calculated by taking the price that could be received for LNG and subtracting or netting back the costs incurred by the supplier to convert the gas to LNG and ship it to the destination port. LNG netback prices based on Asian LNG spot prices are generally assumed to play an important role in influencing gas prices in the east coast gas market.

government monopoly owned generation and transmission companies. Several processes then existed for handling new investment into transmission infrastructure either within a node, or between nodes.

A small number of “merchant” transmission links (generally controllable DC links between the nodes) were created, which attempted to generate a return for their investors by arbitraging between the nodal prices. The commercial history has not been happy, with Basslink going into administration[6], and the NSW-QLD merchant link moving to regulated status.

The process for deciding new transmission infrastructure under the regulated asset process (either across regions or within regions) involves having to pass the “Regulatory Investment Test for Transmission” (RIT-T). This process has been through multiple reviews and reforms since 1998.<sup>16</sup>

However the fundamental challenge remains, being that whilst it was (relatively) easy in the past to assess the “benefit” of constructing a transmission line between a known large coal fired power station supplying power to a known large major load (a city), where the electrical flows could be reasonably modeled and the commercial case easily established, it has proven much harder for the case to be made of building a transmission line that will “open up” an area of renewable energy resource that is currently not viable, and where there are not a coordinated group of renewable energy generators already committed to establishing themselves.

It raises the “chicken and egg” problem of “*you can’t justify building the transmission line without the committed generation, and the multiple renewable projects won’t commit if there isn’t transmission*”. It also raises the difficulty of showing that a given proposed investment is the “best” option (which is another important part of the RIT-T), since all the alternative options are also equally impossible to fully define.

The approach that has ended up being adopted is for state governments to re-enter the business of explicitly planning and co-ordinating transmission infrastructure, in a manner that is exactly what the introduction of a competitive market was supposed to do away with.

A good example is the state of NSW, which has created a state “Electricity Infrastructure Road Map” and a set of 5 “Renewable Energy Zones” (REZ)<sup>17</sup>, and has established a state owned corporation “EnergyCo NSW”<sup>18</sup> to:

- *Contributing to strategic, holistic planning for each REZ.*
- *Coordinating the technical design of REZs in consultation with the Australian Energy Market Operator (AEMO), Transgrid as the system operator and jurisdictional planner, program partners and generators.*
- *Strategically improving electricity networks and providing network solutions including technology solutions that could optimise the design and performance of REZs*

<sup>16</sup>The reader interested in the mechanism of the regulatory test is referred to: <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/regulation-of-large-transmission-projects>

<sup>17</sup><https://www.energy.nsw.gov.au/renewables/renewable-energy-zones>

<sup>18</sup><https://www.energyco.nsw.gov.au>

*or provide additional system strength and reliability to regional areas.[7]*

NSW is not alone with this approach. The state of Victoria has announced targets for offshore wind, 2 GW of capacity by 2030, 4 GW by 2035 and 9 GW by 2040 - and it is anticipated that towards the end of this period individual windfarm projects will be in the 2GW range.

The whole question of managing transmission (and to a lesser extent distribution) investment remains contested. Emerging issues to do with managing how the required investments are made to deal with the widespread introduction of electric vehicles, Vehicle-2-Grid, and “prosumers”<sup>19</sup> have only just started to be considered in a regulatory sense.

However this lack of fully developed “prosumer” regulation has not prevented entrepreneurial companies moving into the space, and as one example (among many) consider the RedEarth home solar-panel and battery storage systems (refer to Figure 9 on page 11), with a system that claims to use a “trading algorithm” to optimise “sending power to where it is most valuable”. The Author expects to see a great deal more of this kind of activity.

#### *D. Issue 4: Not reforming NEM bidding rules*

The NEM bidding rules are an **energy only 5 minutely offers to supply**. Multiple offers (confusingly referred to as “bids” in the NEM) are made as the time get closer and closer to dispatch. However the bid structure is essentially assuming that all forms of generation are equally able to ramp up and down as required. (This raises the interesting question of ancillary services markets, where a separate market exists for providing “raise” and “lower” and other “stability” services exists. These markets are critically important for the operation of the NEM, but are frequently overlooked in the public debate.

Renewable generators are generally not participants in the ancillary services markets (with the potential exceptions of those that have significant on-site battery storage), and this is in itself an issue as every more of the task of maintaining these services falls on a smaller proportion of on-line generation.

It has long been an emerging issue that this “energy only” design does not seem to be giving sufficient incentive for “firming capacity” to hold itself in availability.

This issue is not new. As a young engineer the author remembers the “energy only” versus “capacity market” question being hotly debated during the original design of the NEM in the early to mid 1990’s.

<sup>19</sup>As end users (such as residential buildings) begin to have solar panels, batteries, electric vehicles and “smart houses” where devices such as pool pumps, hot water and air-conditioners can be automatically adjusted, the possibility arises of no longer always being a “consumer” of electricity but also being a “producer”. Houses with large solar panel arrays for example now routinely export surplus power back to the grid, to the extent in fact that some areas of distribution networks are in aggregate now “running backwards”. This actually presents very real technical problems of grid stability and safety. These issues are by no means solved. Such customers are known as “prosumers”, implying that they are variously both producers and consumers of power.

The Australian Government (under Prime Minister Malcolm Turnbull) established the Finkel Review of security of the market in 2016, and which reported in June 2017 - a report that made clear that the NEM was heading for increasing issues of technical and commercial challenge[8]. This led to the 2017 National Energy Guarantee proposals (which were rejected by the States), and the current (2022) proposals for a “Capacity Market” being progressed by the Energy Security Board (ESB).

The current ESB proposal has been in development for a while - and building on previous work done for the National Energy Guarantee paper[9], with core design principles set at an Energy Ministers meeting in September 2021, with the Energy Security Board releasing a High-level design consultation paper on 20 June 2022.[10]

It is not obvious to the Author that a “Capacity Market” will itself be a “solution”, with significant difficulties existing in the design details.

The example the Author likes to give is the market for bread. If a government became concerned that there might be a bread shortage, and proposed to run a “capacity market” selling subsidies for the installation of “ovens”, all sorts of questions would naturally arise - such as on what basis does a government know how many ovens are required ? What exactly is being supplied - just that the oven is installed ? Or that it is used some amount of the time ? Who decides when it is used ? What will be the effect of this arrangement on the price of bread ? Particular if the subsidy is itself paid for by putting a tax on the sale of bread? (which is exactly what is proposed with the electricity capacity market designs).

In short, whilst it is clear that the existing “energy only” market design isn’t coping well, it isn’t clear that a “capacity market” is the answer. The Energy Security Board report themselves acknowledge that significant design decisions need to be made, and that there is a real risk that if a centralised body is setup to decide the capacity requirement, it will naturally tend towards over-investment in capacity, which will also increase electricity prices to consumers.

#### *E. Issue 5: Failure to adequately apply competition policy*

The original vision of the NEM was for a significant number of competing generation companies, with separate retail companies, and a vibrant and public forward/futures market enabling efficient management of pricing risk, and indeed as the publicly owned generation businesses were privatised that was approximately the situation.

However in the 25 years since the start of the NEM in 1998, the general trend has been for vertical re-aggregation, such that the bulk of the generation and retail supply is now re-aggregated into 3 major integrated “gentailer” companies (Origin, AGL, and EnergyAustralia). There has been corresponding reduction in forward trading/futures volumes (since these companies internally risk manage to a significant extent), which has made it particularly difficult for smaller retailers without any generation of their own to get contract cover to manage price risk.

We have seen this explicitly demonstrated in the current crisis, with a number of smaller retailers exiting the market (and EnergyAustralia announcing major financial losses).

A difficulty appears to have been the specific legal definition around a “lessening of competition” as applied by the ACCC, and which the Author suspects has not taken sufficient account of the temporal nature of market power in the electricity market - meaning that it can be possible to have what appears to be a competitive pricing, right up to the moment when suddenly there is an extreme price event and contract cover cannot be obtained. This issue appears to have played out in 2014, when AGL sought ACCC (Australian Competition Tribunal) merger approval to take over the assets of the (formerly NSW Government owned) Macquarie Generation (and at that time the last major generation asset in NSW not owned by one of the “big three”)[11]. The public hearings at the time involved significant discussion about the likely impacts on forward contract volumes, and what the appropriate test of “lessening of competition” would involve. This issue by itself could justify a significant academic research program....

#### IV. A FINAL THOUGHT

In October 2019, when the Author found himself as an executive in the electricity grid System Control for the Northern Territory of Australia, the issues of stability, constraints, Quality of Supply and prosumers had become pressing to the point of a Australian city being blacked out for 8 hours and the Northern Territory Energy Minister proceeding to sack the CEO of the Government owned monopoly power provider (Power and Water Corporation) for failing to adequately manage the energy transition.[12] [13].

Our response was to proposed revised bidding arrangements where all generators (including solar farms) needed to provide firm minimum bids for 1 hour into the future (roughly the time required to start a backup gas turbine from cold). This proposal however was not enthusiastically received by the solar farm proponents.

Despite being a small isolated system, the NT Power System (the NT Electricity Market or NTEM) actually (largely) applies the same National Electricity Law and rules as are applied in the National Electricity Market covering the eastern and southern states of Australia.

Comment was made at the time (2019) that the issues faced in the NTEM also existed in the NEM, but were less obvious due to the much larger scale of the NEM. Overall the Author has been unsurprised to see the situation in the NEM reach the point of crisis as has now occurred.

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# Gas project uncertain after eight-year wait

## Santos' Narrabri proposal

Aaron Patrick

Resources Minister Madeleine King says the proposed coal seam gas project in Narrabri "is an important gas reserve" that will help NSW deal with a future power crisis.

With governments and regulators battling to keep the lights on at vaguely affordable prices up and down the east coast of Australia, the Narrabri project could supply half of NSW's gas needs.

Extraordinarily, after eight years the project is still awaiting approval.

It was on March 31, 2014, that Santos, one of South Australia's leading companies, dispatched a letter to a senior NSW public servant that would initiate the project, which still has not been approved.

Depending on your perspective, the vetting process for coal-seam gas drilling in the Pilliga state forest, near the town of Narrabri in northern NSW, is bureaucratic and legal overkill or sensible and deliberate protection of the public.

The process began with a request to the NSW government to tell Santos how it would assess the project on environmental grounds. The same year the company applied for a petroleum production licence.

Even though the Coalition was in power in NSW, it did not seem eager for the project. In country areas, the Nationals were losing voters to right-wing populists, including the Shooters, Fishers and Farmers Party, and the coal-seam industry had received huge amounts of bad press despite operating successfully in the US.

It would take 2½ years for the government to settle on environmental requirements for the project. Five months later, in February 2017, Santos



An anti-Santos rally in Sydney in April.

AFRGA1 A004

submitted a development application and environmental impact assessment to the Department of Planning and Environment.

They argued the drilling of some 800 wells could be done without harming the local area, and would reduce the state's reliance on coal, which is a big emitter of greenhouse gases.

Environmentalists were not convinced. Objections poured in, and Santos was forced over the next year to provide more information about how it would protect the environment.

The consultation process extended into 2018, when other government agencies and other statutory bodies got to critique the project too. Once again, Santos had to defend its work.

By March 2020, the Planning Department was ready to hand over responsibility to the Independent Planning Commission, an agency designed to remove important decisions about land use from political influence.

After giving opponents another opportunity to make their case, the commission approved the project in September 2020. The commission found that the carbon emissions would be low.

Three months later that assessment was challenged in court by the Environmental Defenders Office, a legal charity with a long history of antagonism towards resources companies.

The EDO, as it is known, argued that Santos had underestimated the amount of climate-degrading carbon dioxide that would escape.

It also said the commission made a false comparison: it compared the emissions from gas drilling with coal mining to determine if the project would reduce emissions.

Despite a record of climate concern, the NSW Land and Environment Court did not accept the EDO argument. Last October it upheld the approval.

The project still was not cleared. Indigenous owners made a native title request for compensation.

The Native Title Tribunal is expected to determine the claim in coming months. Santos will then have to conduct more drilling to check whether there is enough gas to justify the estimated \$3.6 billion cost. Only then will the Santos board decide whether to approve construction, almost a decade after the plan began.

Fig. 6. Australian Financial Review reporting wrt the Narrabri Gas Project. 20 June 2022



# Transition tool isn't 'coal-keeper'

## Capacity mechanism

An insurance policy for dispatchable power will enable a swifter, less risky and more orderly decarbonisation of Australia's energy sector.



Anna Collyer

Our electricity sector is undergoing a once-in-a-century transformation. And it is happening quickly – in response to both market forces and jurisdictional climate change and energy policy measures.

Co-ordinating exit and entry of supply, including the mix of resources to ensure an orderly transition, is an enormously complex task and needs to be carefully managed. The stakes are high: electricity is an essential service, central to our economy and way of life.

Governments, acting on behalf of consumers, understandably want to be confident that there will be reliable and affordable supply as the National Electricity Market is decarbonised.

The necessary scale of investment to maintain reliability over the coming decades is dramatic. Coal generators, which account for more than half the NEM's generation output, are reaching the end of their technical lives.

The new capacity required over the next 28 years is more than seven times that built over a similar time frame since the NEM commenced 24 years ago, and about 50 times the amount built by the Snowy Hydro scheme.

The current crisis has exposed our reliance on ageing assets and exposure to the volatility of global commodity prices.

It is an example of why we need to speed up reform, not slow it down.

We can and must manage the immediate challenges in the system and progress longer-term reforms in parallel, because timely delivery is crucial if our sector is going to serve the community the way we must, as we decarbonise.

Dealing with emissions and delivering an orderly transition are not mutually exclusive. All governments are committed to net zero by 2050.

There is no longer a question of whether we should decarbonise, it is a question of how we decarbonise as rapidly and smoothly as possible.

As the energy transition accelerates, we want to ensure that we are not left with gaps in supply because we aren't prepared for retirements, and ensure that we are able to manage the changing nature of supply and maintain reliability under different scenarios.

We believe it's possible to address these issues, and to do so cost-effectively.

The Energy Security Board is releasing a consultation paper today on the high-level design of a capacity mechanism, seeking views from the sector on how we can deliver the best possible design.

A capacity mechanism is not a silver bullet – there is no silver bullet in energy policy – but it is a key tool to help minimise

*The new capacity required over the next 28 years is more than seven times that built over a similar time frame since the NEM commenced.*

risk and deliver an orderly transition as we decarbonise our energy system.

A capacity mechanism is essentially an insurance policy. In the same way that you pay your car insurance in case of an accident. The mechanism would reward capacity providers, such as generators or paid demand response, to be on the ground and ready to turn up during times of stress.

If these capacity providers don't turn up when needed, they won't be rewarded and may face penalties if they cannot deliver on their obligations.

In the past, the concept of a capacity mechanism has been dubbed "coal-keeper". It is a catchy line, but that is not the intent. The intent is to design a tool that provides more certainty around dispatchable capacity – that is, capacity

that can respond to a dispatch signal on demand. A tool that is responsive to the reality of our current market and supply mix while also providing the right market signals to encourage investment in new low-emissions dispatchable capacity when and where we need it.

A capacity mechanism is about confidence.

For market participants, it would reduce reliance on wholesale market outcomes that are becoming increasingly difficult to predict and provide confidence and the right incentives to invest in the new capacity the system needs.

For the market operator it will provide confidence that the right mix of resources is available to maintain reliability.

And critically, for consumers and the community it will increase confidence that the market is able to deliver essential electricity when it's needed in the face of sweeping change.

The ESB is aware of concerns that a capacity mechanism could cause customers to pay more for the same level of service. This is not the intent, and will be avoided through careful design that balances the income that capacity providers would earn between capacity and energy sources to promote lower cost investment, while ensuring payments are only made where benefits to consumers can be demonstrated.

The intent is not to provide an additional revenue stream, but rather an alternative revenue stream.

A capacity mechanism is not a new idea – most countries already operate markets that explicitly value capacity, and most use the tool to help manage the transition. But it is a big change for the NEM.

Designed well, the capacity mechanism will enable a swifter, less risky and more orderly transition to a net zero emissions energy system and give jurisdictions greater confidence that reliability is being explicitly managed with less reliance on other government interventions or emergency, out of market measures.

Ultimately, our job is to ensure we have a secure system that delivers decarbonised, affordable and reliable energy for all consumers and the best way to do that is to deliver co-ordinated, considered and collaborative reforms that make our energy system fit for the future.

Anna Collyer is chair of the Energy Security Board and the Australian Energy Market Commission.



# Capacity solution must be cleaner and pragmatic

**Energy**  
A back-up policy that is balanced with emissions reduction will require governments to set out a plan for reducing carbon from electricity.



Tony Wood

The Energy Security Board has released a design for the first major overhaul of the National Electricity Market since it was launched in the late-1990s.

The high-level design for a capacity mechanism may be complex and controversial in some areas, but it is also pragmatic and timely, given that the NEM is off the road after a major pile-up.

Concerns that the NEM might not be fit for the purpose required of the electricity market in a transition to a zero-emissions future have been around for the best part of a decade.

They gained most voice after the Finkel review of the security of the market and were expressed in the form of the National Energy Guarantee proposed by then-prime minister Malcolm Turnbull.

That policy was intended to drive lower emissions while ensuring that reliability was maintained at lowest cost.

Tragically, the first element was rejected by elements of the Coalition party room. Soon after, Turnbull's prime ministership was roadkill.

The Energy Security Board was given the task of driving a NEM reform program, with a critical element being a capacity mechanism in the market to ensure that dispatchable electricity is available to maintain reliable supply. The high-level design paper is the much-delayed result.

Many industry participants and analysts have argued that the market would deliver investment in reliable supply at lowest cost if there was clear policy guidance on governments' expectations for reliability and lower emissions.

The absence of both led to government investment ahead of an efficient market-led response, and therefore great investment risk.

The ESB's paper describes the result as a "misalignment between the expectations of governments and the needs of investors".

The proposed design includes major choices that strongly reflect this background. The need for ministers to have confidence that capacity will be available when needed leads to a design that favours



Some energy ministers want the mechanism to avoid fossil fuels. PHOTO: BLOOMBERG

*Many have argued that the market would deliver investment in reliable supply at lowest cost if there was clear policy guidance*

simplicity and certainty over complexity, uncertainty, and minimising cost.

The ESB's proposal for the Australian Energy Market Operator to determine future capacity requirements and procure that capacity via a centralised process is one example.

The ESB does not hide from the risk that

this approach can err on the side of higher cost through more procurement than might have arisen from a more decentralised system with greater involvement of market participants.

It suggests that this risk can and will be avoided, or at least minimised, through careful design, but that is a hard ask. Adding certainty for governments is very likely to bring added cost.

The controversial element of this design lies with the role of different technologies and how fossil fuel generation might participate in the capacity procurement and payment processes.

Australia's federal, state, and territory governments are all committed to net zero emissions by 2050, and some have interim, 2030 targets and programs to support renewable generation.

Some ministers value the right to exclude

coal and/or gas generators in their jurisdictions from capacity payments on the grounds they would prolong the operating life, and associated emissions, from such plants.

Some renewables industry voices have expressed similar concerns.

There is a solution. One of the 14 principles that the energy ministers set down for the ESB is a focus on continued reduction of electricity sector emissions.

Despite the commitments to targets, there is still no clear policy framework to meet this principle.

To deliver a capacity mechanism that meets the complete set of ministers' needs, the ESB seeks "further guidance on continued emissions reduction in the context of net zero and how the principle can be operationalised in the design".

It would probably be a little optimistic to expect a policy for electricity sector emissions to emerge from this simple request. Yet it is this request that can provide the answer to the concerns described above.

The ESB's design paper is high level, and several of the key elements have yet to be fleshed out. These include the design of the capacity auctions and the way in which different technologies might be valued.

Completing these details is the task for the next half-year.

The capacity mechanism proposed by the ESB is a pragmatic and necessary solution to a real problem. Continuing without it would be no more sensible than wishing that the energy market operator had not suspended the NEM last week.

The important task is to rigorously test the design with industry proponents and ensure it includes flexibility to respond and adjust as today's uncertainties become clearer.

Done well, the capacity mechanism will be a valuable next step in Australia's energy transition.

Tony Wood is head of the energy program at the Grattan Institute.

Fig. 8. AFR reporting wrt Home Solar Energy Trading. 20 June 2022



# Price cap hits rooftop solar income

## Exclusive

Tess Bennett

The Australian Energy Market Operator's unprecedented decision to pause the spot market on Wednesday afternoon put a handbrake on Michael Chard's solar trading plans, but the Brisbane resident says he has managed to dodge the high electricity prices plaguing households on the east coast.

Since installing a system of 44 solar panels and five batteries that store 20.5 kilowatts of electricity, Mr Chard has eradicated his power bill and has sold his excess power back to the grid, earning anywhere between \$6 and \$100 a day, depending on the wholesale price of power.

"The day I switched it on and connected up everything, I made \$101 in one day," Mr Chard told *The Australian Financial Review*.

AEMO's decision to suspend the spot market on Wednesday afternoon capped energy prices at 30c/kWh – which is still considered high – reining in the price volatility that has been delivering huge paydayes for some solar customers.

The automatic price cap is designed to protect consumers from surging wholesale prices, but also limits the ability for people to use their household batteries to take advantage of price volatility in the market.

Charles Walker, co-founder and chief executive of RedEarth, a Queensland-based renewable energy technology company that supplies solar-charged batteries and systems to households, said the move meant the "huge upside" his customers had been



Michael Chard is making a passive income from the solar panel and battery storage system in his home. PHOTO: JAMILA TODERAS

enjoying would be temporarily unavailable.

"While the cap is in place, the people who have made up to \$200 per day will be reduced to closer to the average of \$20 per day, for example," he explained.

The AEMO move has also come at a cost for customers who were topping up their battery from the grid during the day when energy costs around 30c/kWh, and then later selling it back to the grid for upwards of 55p/kWh during the evening peak.

Before AEMO stepped in, RedEarth

customers were making between \$7 and \$14 a day on average, Mr Walker said. But peaks have been much higher.

"The most we've ever made for customers is \$209 in three hours," Mr Walker said.

RedEarth's technology is designed to optimise electricity use, sending power to where it is most valuable, for example to power a home. "We're seeing these very large returns because consumers can make the power and in effect keep it until the prices are right – then our algorithm trades it out," Mr Walker said.

RedEarth is planning to list on the Australian Securities Exchange in the next year, after banking a \$12 million pre-IPO funding round led by Ord Minnett Private Opportunities.

Mr Chard expects it will take around five years until his system is paid off, and his last electricity bill was -\$145.

"When you're paying \$1000 in rates and water every three months, you've got no control over that. Your power bill is one bill that you can control," he said. "It's literally a bill you've eradicated, that you don't expect to come through every three months."

Fig. 9. AFR reporting wrt Home Solar Energy Trading. 20 June 2022