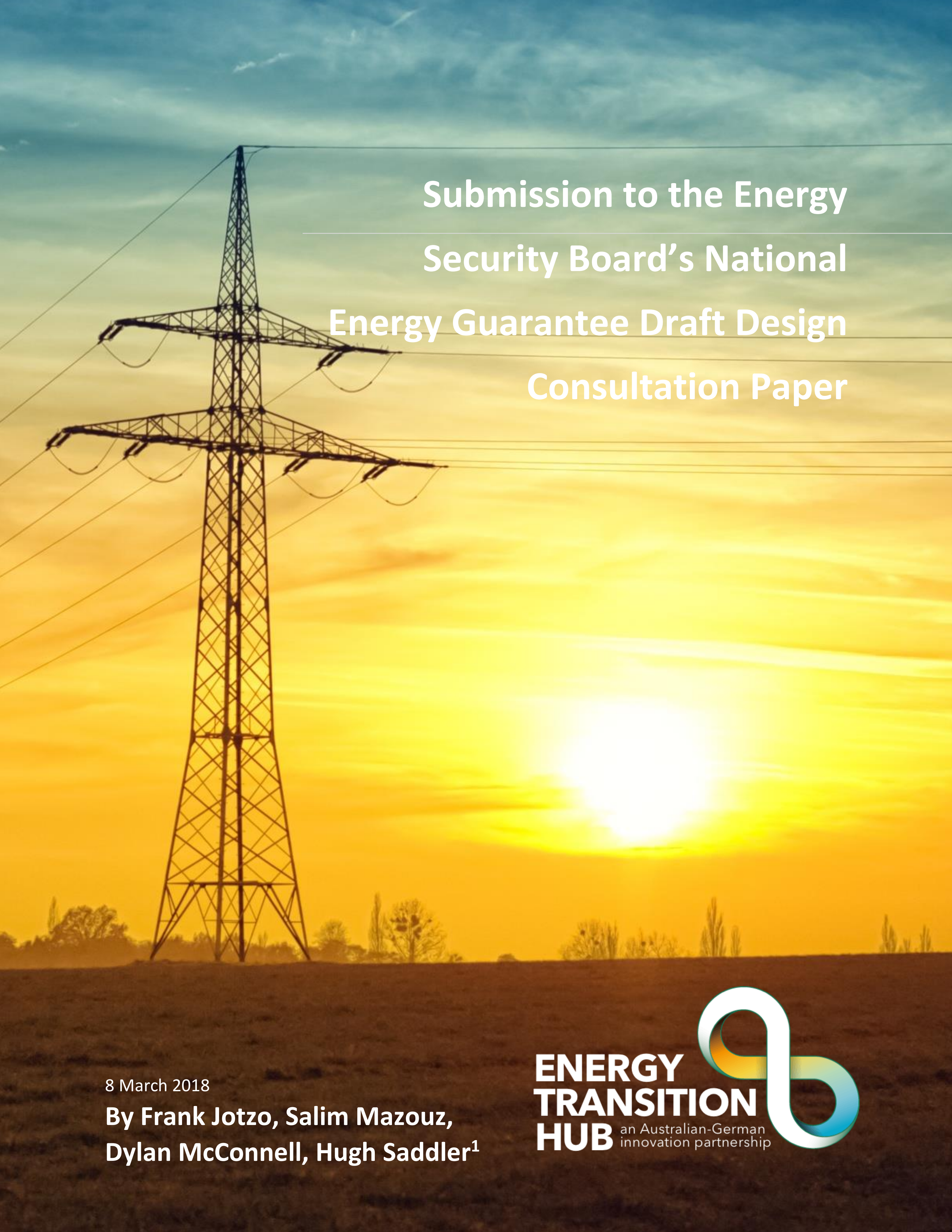

Submission to the Energy Security Board's National Energy Guarantee Draft Design Consultation Paper

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ENERGY TRANSITION HUB
an Australian-German innovation partnership

Summary

The proposed National Energy Guarantee scheme (the Guarantee) seeks to help improve the reliability of electricity supply while bringing down electricity prices and reducing emissions at the same time. To achieve this, the Guarantee aims to provide 'clear investment signals so the cleanest, cheapest and most reliable generation gets built in the right place at the right time'.

These are the goals we all share. But it is unclear whether and how the Guarantee, as described in the ESB's draft, could achieve this. A scheme with the proposed design might lock in inefficiently low ambition on emissions reductions in the electricity sector, potentially put upward pressure on power prices and may even fail to improve reliability.

In this submission, we highlight selected aspects of the proposal that in our analysis would need significant modification in order for such a scheme to be able to help meet the stated goals, and others that would need elaboration in order to assess how it would work in practice.

Reliability obligation

The key threat to reliability and prices is the exit of coal plants at short notice. The risk of such exits has been demonstrated most recently through the Hazelwood closure in VIC where five months' notice is all that was available. None of the key modellers (including AEMO) predicted it. If anything, the risk of sudden exit is rising as the coal plant fleet is ageing, the economics of coal plants is deteriorating and coal plants are increasingly load following, putting equipment under additional stress. Also, the effects of additional closures at short notice is likely to be more pronounced, at least in the short term, given the reduced capacity margins after the closure of the Hazelwood, Northern and Playford power stations.

The Guarantee as sketched does not offer comfort that additional capacity could be brought in more quickly or at lower cost than under current market frameworks in the event of a coal plant closure at short notice. The Guarantee would not have helped in the case of the Hazelwood closure. Requiring generators to give three years' notice as suggested by the Finkel Review and echoed in the ESB's consultation paper may offer a solution in theory but it is unclear how it would be enforced, and it would result in excess costs where the owners' commercial judgement is that closing the plant is the most economic option.

It also remains unclear how the need for a reliability mechanism under the Guarantee, as claimed by the ESB, is compatible with the findings in the latest AEMC Reliability Standards and Setting Review which found present market settings adequate to incentivise investment in enough generation capacity.[1]

More clarity is also needed about how the Guarantee would affect ongoing and planned efforts to enhance incentives to better integrate demand response, improved infrastructure investment (eg through integrated system planning), improved market settings to account for a changing technology mix (eg five-minute settlement and day-ahead markets), and enhanced contingency reserves. These will all be key to a reliable, low cost and clean electricity supply, but the description of the Guarantee in the consultation paper is too opaque to allow assessment of its effects on such reforms.

A key claim in favour of the need for the Guarantee is that it offers to integrate reliability requirements and an emissions obligation, all grounded in contracts that are meant to preserve the link between emission reduction policy and the physical needs of the system. There are many open questions about whether and how this could be achieved. We do not in detail explore the difficulties inherent in a system of contracts-based obligations, as distinct from tradable certificates which in our assessment are the preferable solution. We do however discuss some of these issues in the context of geographic neutrality.

Emissions obligation: targets

The proposed target of a 26% reduction in emissions from the electricity sector is not consistent with meeting the Commonwealth Government's national emissions target (of the same percentage) at least cost. Australia's electricity sector has large and ready opportunities to reduce emissions principally through a shift from coal fired to renewable electricity. All

[1] AEMC Reliability Standards and Setting Review 2018 (P1): *The Panel is not proposing to recommend changes to the reliability standard and reliability settings because:*

• The current reliability standard and settings are, in our view, achieving their purpose and are likely to continue to do so out to 2023/24.

• The market price cap and cumulative price threshold been effective at limiting market participants' exposure to excessive high prices with the overall market integrity maintained. These settings appear to be sufficiently high to allow investment in enough generation so there is not more unserved energy expected than that allowed for by the reliability standard.

relevant analysis suggests that with comparable effort, Australia's electricity sector would contribute a greater percentage reduction in emissions than the rest of the economy. Hence, any overall cost-effective strategy involves greater emissions reductions in the electricity sector than in the average of other sectors.

Given the pace of technological change and associated cost reductions in deploying renewables, the Commonwealth's proposed target may not be effective. Our analysis suggests that the emissions obligation under the proposed parameters would not be binding under existing State and Territory commitments to renewables and plausible assumptions about trajectories in electricity demand and supply (Victoria's target alone achieves it). As such, low cost emissions reduction options available in the electricity sector would not be harnessed to contribute to the task of reducing Australia's emissions under this scheme.

The implied low ambition on emissions may reflect current government preferences. However, the suggested five to ten-year lock-in period of the aggregate emissions targets would lock in such low ambition. It would preclude changes to achieve the existing national target cost-effectively through domestic action. It would also preclude future adjustments that may become desirable in light of possible developments such as a stronger national emissions target, or in the not unlikely event that a 26% reduction target in electricity turns out to be achieved without any effective contribution from the Guarantee's emissions obligation.

It would be preferable to set shorter term targets for emissions, coupled with a long-term indicative trajectory which gets adjusted at intervals according to requirements for future emissions trajectories, and the effect of an emissions obligation including any costs. For example, targets could be set on a rolling three-year basis with a fifteen-year indicative trajectory. The indicative trajectory and thus future targets could be adjusted on the basis of defined criteria such as the national emissions target and the price premium observed for compliance with the emissions target (emissions obligation) in the electricity sector.

Any possible use of emissions offsets in the electricity sector, as flagged in the consultation paper, needs to be balanced with the overall stringency of an emissions obligation. Any offsets used in compliance with the emissions obligation would result in allowable actual emissions in the electricity sector above the target, and thus slow the transition to a lower-carbon system.

Emissions obligation – mechanism

The Guarantee proposal suggests that emissions reduction requirements be implemented by way of an obligation on electricity retailers to hold a portfolio of supply contracts that on average remains below a defined emissions intensity (tons of carbon dioxide per megawatthour). On the basis of the information provided, it is unclear how such a system would be superior compared to the standard method of implementing such performance standards, namely by way of tradable certificates. Rather, our assessment suggests that a contracts-based system is in most respects inferior.

Contracts-based obligations would face a myriad of complexities and potential implementation difficulties, as is evident from the extensive discussion in the consultation paper. They risk imposing unnecessarily large transaction costs on industry participants and administration costs on regulators. A contracts-based system may also lack transparency about the price premium paid for low-emissions electricity sources. Absence of clear information about low-carbon premiums in turn would diminish investment incentives and hamper governments' and regulators' future decision making about scheme parameters.

None of these potential problems arise with certificate-based schemes, such as the previously mooted – and widely supported – proposal of an Emissions Intensity Scheme.

Voluntary action by individuals, companies and sub-national jurisdictions needs to be respected and their additionality assured. This is encouragingly spelled out in section 3.5 of the consultation paper and needs to be reflected in the final design. In contrast, section 4.2.5 is not consistent with additionality of voluntary action by sub-national government. Where State and Territory governments that have already paid for renewables in the NEM outside their NEM region (eg the ACT), this proposed design would make consumers pay again for emissions reductions they have already paid for.

Electricity system costs and prices

Would the Guarantee, as proposed, put downward pressure on electricity prices as claimed by the ESB or might it in fact put upward pressure on prices? Not enough detail about how the Guarantee might work in practice is known to come to a definitive answer but there is reason for worry.

The Guarantee is complex and the lack of transparency around contracts to fulfil emissions and reliability obligations may advantage large market participants and further entrench market power.

The consultation paper claims that certificate schemes are inherently inferior to schemes that reflect emissions constraints in wholesale prices and that requiring retailers to purchase more contracts from generators will put downward pressure on prices. But no evidence or analysis is provided to support this claim. It is not clear how the proposed design could achieve these claims without restricting the emissions obligation to the same geographical areas covered by the reliability obligation, which in turn would definitely compromise the cost-effectiveness of any emissions reductions achieved through an emissions obligation (see geographic neutrality section for detail).

What would put downward pressure on prices is additional capacity. But there again, it is not clear that the Guarantee, as proposed, would deliver. Weak emissions targets may reduce risk premiums for fossil coal plants but, especially if locked in for up to a decade as proposed, will cap the upside for renewables investments. Given that, as most analysts agree, commercial players are not going to invest in new coal fired generation capacity, such a scheme may well serve to *reduce* overall generation investment in the NEM.

The biggest risk for higher prices (as for reliability) in the NEM is large plant closures at short notice. However, as discussed in the context of reliability, the Guarantee does not offer comfort that additional capacity could be brought in at least cost and in line with long-term objectives, in the event of a coal plant closure at short notice.

The reliability guarantee interacts with the current reliability standards and may increase investments to service highly unlikely events. Such investments, geared primarily for guarding against very rare events, would further increase the cost of generation in the NEM and consequently consumer prices, in a way similar to the 'gold-plating' of transmission and distribution infrastructure over the past decade.

If the emissions obligation were applied to the same loads as the reliability guarantee (regionally specific), then achieving the same emissions reductions would be more costly than if emissions reductions could be achieved in a geographically neutral way. This would again mean higher electricity prices.

Finally, if the ambition to reduce emissions in the electricity sector were constrained to an inefficiently low level – such as the same percentage as the national emissions target – this would result in excessive economy-wide costs. Shielding the electricity sector from change would then simply impose additional costs on many other parts of the Australian economy.

The rest of this submission provides more specific discussion on the effect of selected design parameters of the Guarantee on electricity prices, emissions and reliability.

1. Reliability

The ESB is yet to explain how to reconcile the stated need for a reliability mechanism under the Guarantee with the findings in the latest AEMC Reliability Standards and Setting Review.[2] Indeed, a detailed discussion is needed of why the reliability levers available to the AEMC are inadequate and to the extent that a reliability problem is emerging, why the AEMC would not simply adjust the settings it has at its disposal.

The AEMC prepares an annual performance review. The table below illustrates the amount of unserved energy (NEM wide) reported in the most recent available reviews. As can be seen, there was no unserved energy at all between 2011-12 and 2015-16. This compares with the reliability standard of 99.998%, which roughly corresponds to 3.8 GWh of unserved energy across the NEM. On this measure, the NEM has been exceeding the reliability standard.

Year	Unserved Energy (GWh)
2011-12	0
2012-13	0
2013-14	0
2014-15	0
2015-16	0
2017-18	?

While performance data is currently not available for the previous 18 months (which includes the South Australian black system event), we consider it unlikely that the reliability standards would have been

[2] AEMC Reliability Standards and Setting Review 2018 (P1): *The Panel is not proposing to recommend changes to the reliability standard and reliability settings because: • The current reliability standard and settings are, in our view, achieving their purpose and are likely to continue to do so out to 2023/24. • The market price cap and cumulative price threshold been effective at limiting market participants' exposure to excessive high prices with the overall market integrity maintained. These settings appear to be sufficiently high to allow investment in enough generation so there is not more unserved energy expected than that allowed for by the reliability standard.*

breached[3]. As such, the case for increasing reliability should be established, as increased reliability comes with increased costs. There is an economically efficient level of reliability, and this is certainly greater than 0% unserved energy[4]. Having a system that ensured adequate supplies of electricity 100% of time for all possible scenarios would be prohibitively expensive.

Reforms are underway to better integrate demand response, improve infrastructure planning and investment (such as through integrated system planning), improve market settings to account for a changing technology mix (eg 5 minute settlement, day ahead markets…), and enhanced contingency reserves (strategic reserve). These will all contribute to ensuring a reliable (and low cost and clean) electricity supply.bMore clarity is needed about how the Guarantee would complement these efforts.

The notion that the Guarantee would provide market participants with ample time to build the required capacity in the event of a prospective reliability gap and avert triggering the reliability obligation is unlikely to hold true over the coming years given the difficulty for forecasters to predict power station closures.

Indeed, *none* of the major models (including AEMO's) predicted the Hazelwood closure. Most models expect coal plant closures at 50 years of age or more even though the 10 plants that did close since 2012 had an average age of about 40 years (black coal plants had an average age of just over 30 years at retirement and brown coal plants just shy of 50 years).

[3] Security events, such as the South Australia black system event do not contribute to unserved energy, and thus a failure to meet the reliability standard.

[4] It may even be economically efficient for unserved energy to be greater than 0.002%).

NEM region	Power Station	Plant type	Date of commissioning from	Date of commissioning to	Date of closure	capacity (MW)	Age at closure from	Age at closure to
NSW	Munmorah	Black coal	1969		2012	600	43	43
NSW	Redbank	Black coal	2001		2014	144	13	13
NSW	Wallerawang C	Black coal	1976	1980	2014	1000	34	38
QLD	Collinsville	Black coal	1968	1998	2012	180	14	44
QLD	Swanbank B	Black coal	1970	1973	2012	500	39	42
						Average age of black coal plants at closure	**29**	**36**
						Capacity weighted average age of black coal plants at closure	**40**	**44**
VIC	Hazelwood	Brown coal	1964	1971	2017	1760	46	53
VIC	Morwell	Brown coal	1958	1962	2014	189	52	56
VIC	Anglesea	Brown coal	1969		2015	160	46	46
SA	Northern	Brown coal	1985		2016	546	31	31
SA	Playford	Brown coal	1960		2016	240	56	56
						Average age of bown coal plants at closure	**46**	**48**
						Capacity weighted average age of brown coal plants at closure	**44**	**49**
						Average age of coal plants at closure	**37**	**42**
						Capacity weighted average age of coal plants at closure	**40**	**44**

Source: Australian Energy Council 2016. Submission to the Parliamentary enquiry, Retirement of coal fired power station, (submission 44, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Coal_fired_power_stations/Submissions)

Moreover, the economics of coal plants is adversely affected by increasing levels of renewables (in addition to carbon risk) which would lead one to expect a shorter economic life (including due to higher physical demands on the plants associated with load following behaviour).

The ESB mentions the three-year generator notification of closure rule change that was recommended in the Finkel review. Such a requirement, if implemented and effective, would provide three years' notice before a coal plant closure and therefore make our key concern here go away. Yet, it is unclear how a requirement of 3 years notice for closure would work and who would pay for it. For example, in the case of Hazelwood, the company would have had to spend hundreds of millions of dollars to rectify safety concerns in order to keep operating. It is unclear who would have been liable to pay for this. Furthermore, forcing failing plants to remain open (where the owners' commercial judgement is that closing the plant is the most economic option) would tend to cause additional system costs, and put upward pressure on electricity prices.

Without a credible and functional mechanism to bring about the orderly closure of existing ageing coal plants, the Guarantee provides for a highly interventionist model with the potential for price spikes, costly investment decisions and reliability risks.

Forecasting the reliability gap

Modelling demand and plant closures is inherently difficult and the historic performance of established modelling organisations, including AEMO, is not promising as a basis for a mechanism such as the proposed reliability obligation.

In their National Transmission Network Development Plan published in December 2016, AEMO still had the Hazelwood power station retiring in 2022. AEMO were aware of the closure announcement by then as noted in a footnote (see NTNDP 2016, p43, footnote 62) but this highlights that the models used by AEMO did not pick up the likely closure of Hazelwood even months out from its actual closure.

This is not to say that AEMO's forecasts are worse than others. They were far from alone. In fact, no model we reviewed predicted the closure of Hazelwood without significant policy intervention prior to Engie's announcement. Indeed, most had Hazelwood persisting well past 2020 even under their emissions reduction policy scenarios. As recently as 4 years ago, established and respected electricity market modellers even still had net brown coal capacity additions in their base cases over the coming decades.

The track record on demand forecasting is no better, though at least in the case of demand changes, they tend to be much less sudden, giving the industry more time to adjust.

Given the difficulties in forecasting these key variables responsible for emerging reliability gaps (and electricity prices and emissions), the wisdom of relying on a central forecast to set policy parameters and decide generation investments is questionable. Furthermore, the forecasting task which the proposed design of the Guarantee would impose on AEMO is far more difficult than the current task because a capacity shortfall may be associated not only with periods of high demand but also with prolonged periods of calm and/or cloudy weather, even when electricity demand is relatively modest. The added complexity may in fact mean that a dependence on a central forecast can potentially threaten reliability rather than serve to enhance it.

In particular cases, the reliability obligation could undermine the role of the wholesale market as the primary mechanism to incentivise new generation investments to the extent that triggering the reliability guarantee would affect the way in which capacity investment decisions are made in the NEM.

2. Emissions obligation – ambition and targets

The consultation paper proposes a target of a 26 per cent reduction in electricity sector emissions below 2005 levels by 2030.

This is the lower end of the existing national economy wide emissions target of 26-28 per cent under the Paris Agreement, which may well be strengthened under planned efforts to ratchet up global ambitions. The overwhelming assessment of analysts is that a commensurate contribution by Australia to a global 2-degrees outcome would entail a substantially stronger national emissions target.

There is no logical reason to set the ambition in the electricity sector at the percentage reduction as the overall national emissions targets. Rather, a cost-effective outcome would have the electricity sector achieve substantially larger emissions reductions than the rest of the economy, in line with the large extent of relatively low-cost options to reduce emissions in Australia's electricity sector in coming decades.

Adequacy of ambition in the context of the national emissions target

An emissions reduction target of 26% below 2005 levels by 2030 for the electricity sector is less than would be cost-effective given the abatement costs available in the electricity sector compared to other sectors of the economy. All major modelling exercises undertaken over the past decade in Australia – including Treasury's work for successive governments, the Garnaut Review and the Climate Change Authority – expect a much larger share of Australia's emissions reductions to come from the electricity sector than the pro rata reduction proposed for the Guarantee.

Expectations for business as usual emissions from the electricity sector have dropped over the years as renewable technology costs have fallen faster than anticipated by the modellers making the case for a pro rata target for the electricity sector even weaker.

It would be preferable to set shorter term targets for emissions, coupled with a long-term indicative trajectory which gets adjusted at intervals according to requirements for future emissions trajectories, and the effect of an emissions obligation including any costs. For example, targets could be set on a rolling three-year basis with a fifteen-year indicative trajectory. The indicative trajectory and thus future targets could be adjusted on the basis of defined criteria such as the national emissions target and the price premium observed for compliance with the emissions target (emissions obligation) in the electricity sector.

A 26% reduction target may be met anyway

Furthermore, given existing State and Territory policies the proposed target may be ineffective (or 'non-binding'), as the target may already be met without any effect of the emissions obligation. Indeed, meeting a NEM wide 26% reduction target would only require a modest additional investment across the NEM in wind and grid solar after 2020 (much less that current levels of new investment).

Preliminary modelling undertaken by us, based on the emissions intensity of all NEM power stations, shows that the Victorian VRET scheme alone would be sufficient to incentivise all the required additional capacity to meet the 26% reduction target. If Queensland's QRET is added to the VRET, emissions in the NEM would fall by about 36% relative to 2005 levels by 2030 – a full 10 percentage points further than the emissions target proposed in the Guarantee without any additional voluntary action or action in any of the other states beyond what is incentivised through the existing RET (see Box 1).

	Emission reduction by 2030 relative to 2005 levels	Revewables share in the NEM
Guarantee	26%	
VRET only	28%	21%
QRET and VRET only	36%	30%

Source: Modelling by the authors and data from ESB consultation paper

Box 1

We have undertaken internal modelling to ascertain the extent to which a 26% NEM wide emissions reduction target from 2005 levels to 2030 is likely to be binding.

Existing commitments in the ACT, Victoria and Queensland have been considered. The ACT has a target of 100% renewable share of its relatively small electricity consumption by 2020; it currently has contracts in place which will achieve that target. Victoria has a target of 40% by 2025 and is currently evaluating responses to its first reverse auction tranche. Queensland has a target of 50% by 2030 and is at an earlier stage of implementation. In addition, AGL has announced a detailed investment program for generation to replace Liddell power station, when it closes in 2022, consisting mainly of wind and solar generation, some storage and a small amount of new coal and gas.

Including all these commitments, in addition to the LRET, we analyse the potential mix of generation plant which could supply annual electricity consumption in each of the five NEM regions in each year between now and 2030. We assume that new renewable capacity displaces supply from older coal generators and that all existing gas generators remain available, with the exception of the change at Torrens Island A announced by AGL. The new gas plants at Torrens Island and in NSW, also announced by AGL as part replacement for Liddell are included. Our analysis has been undertaken using each of the three annual consumption projections (Weak, Neutral, Strong) presented in AEMO's 2017 National Electricity Forecasting Report. AEMO's corresponding projections of small (rooftop) solar generation are also used. No allowance was made for additional electricity consumption required to cover round trip losses in the operation of either pumped hydro or battery storage systems.

We find that, using the Neutral demand projection, the variable renewable share of grid generation in the NEM increases to 30% by 2029-30, and total NEM emissions fall to 27% below the current level and 36% below the level in 2005. Corresponding figures without QRET, but with LRET, VRET and AGL changes, are variable renewable share of 21% and emissions reduction of 28% below the 2005 level.

To the extent that the proposed target was nonetheless somehow binding (eg States and Territories abandon their targets), the proposed use of flexibility mechanisms (carry-over, deferred compliance and use of offsets) would serve to hold back the transition to a low carbon electricity sector. In addition, the use of offsets has the potential to undermine the stability of the investment climate in the electricity sector (and hence increase risk premiums for investors in generation assets) because the price of offsets is highly uncertain and very much dependent on the quality of supporting policies (eligibility rules, accounting for additionality etc) which remain uncertain at this stage.

3. Emissions obligation – mechanism

The proposed methods for calculating emissions per MWh need to be assessed in detail against their potential to increase administrative complexity, reduce transparency, undermine liquidity and increase market power by 'gentailers'.

Certificates versus contracts

The Guarantee proposal suggests that the emissions reduction requirement be implemented by way of an obligation on electricity retailers to hold a portfolio of supply contracts that on average remains below a defined emissions intensity (tons of carbon dioxide per megawatthour). On the basis of the information provided, it is unclear how such a system would be superior compared to the standard method of implementing such performance standards, namely by way of tradable certificates. Rather, our assessment suggests that a contracts-based system is in most respects inferior.

Contracts-based obligations would face a myriad of complexities and potential implementation difficulties, as is evident from the extensive discussion in the consultation paper. They risk imposing unnecessarily large transaction costs on industry participants and administration costs on regulators. A contracts-based system may also lack transparency about the price premium paid for low-emissions electricity sources. Absence of clear information about low-carbon premiums in turn would diminish investment incentives and hamper governments' and regulators' future decision making about scheme parameters.

None of these potential problems arise with certificate-based schemes, such as the previously mooted – and widely supported – proposal of an Emissions Intensity Scheme.

Voluntary action

Voluntary action by individuals, companies and sub-national jurisdictions to reduce emissions beyond the targets set by the Commonwealth Government needs to be respected and their additionality assured. This is encouragingly spelled out in section 3.5 of the consultation paper and needs to be reflected in the final design. Beyond accommodating GreenPower, the Guarantee needs to provide avenues for voluntary action to be additional. For example, it may need to recognise contracts for difference and other instruments used by different community groups, businesses and sub-national jurisdictions to ensure the additionality of voluntary action.

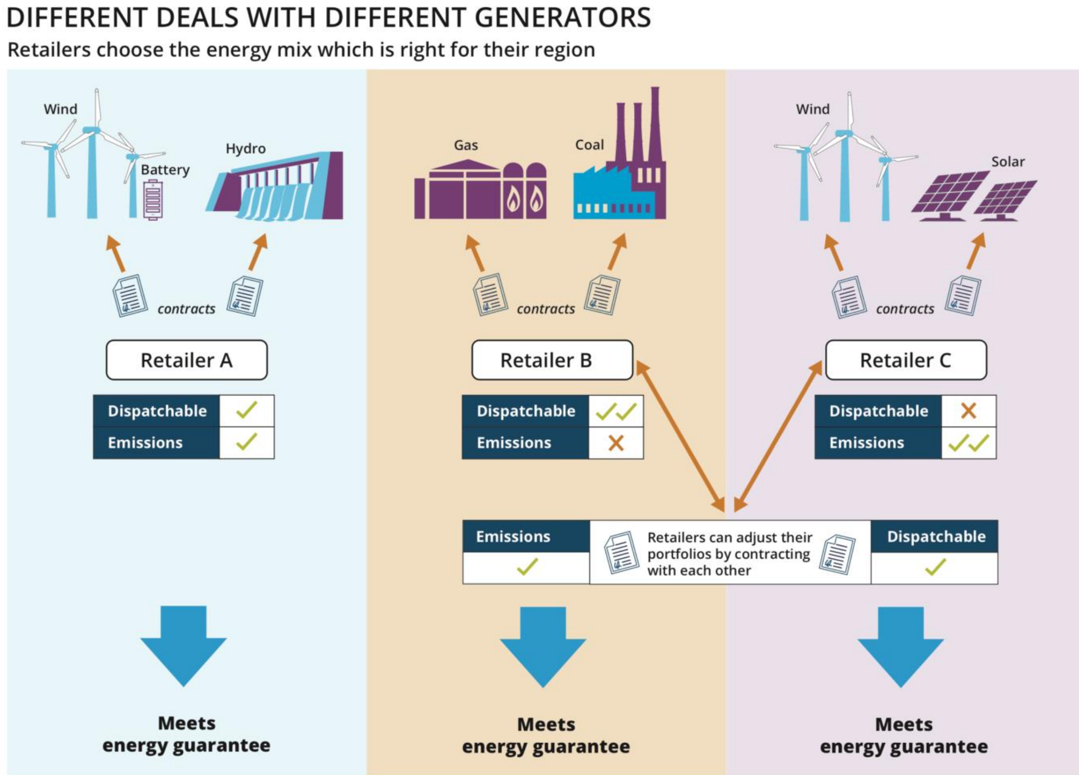
Recent months have seen a rapidly growing new trend by medium sized commercial consumers, such as banks and universities, to sign power purchase agreements additional to the LRET, including both the energy (black) and emissions (green) cost components, with wind and solar farm developers. It is essential that the Guarantee recognises the emissions reduction additionality of such agreements. In addition, however, the mechanism by which the Guarantee seeks to achieve continued system reliability appears certain to impose significant further costs and contractual complexities on these purchases, and thereby inhibit Australia's transition towards a lower emission electricity supply.

In contrast to the discussion of voluntary action in section 3.5, section 4.2.5 is not consistent with additionality of voluntary action by sub-national governments and, as such, undermines the ability of State and Territory Governments to respond to their constituents' desire for stronger ambition to limit global warming than provided by Commonwealth targets. This would remove one of the key ways in which ambition consistent with limiting global warming to 1.5 to 2 degrees may be achieved, namely, efforts by sub-national jurisdictions beyond those pursued by their national governments.

Geographic neutrality of emissions obligation

The infographic published by the ESB in November makes trading contracts for emissions and reliability look simple (as it would be if there were a certificate scheme in place) but how would it work in practice?

Figure 1: ESB infographic



The infographic's sub-heading states that the retailer would choose 'the energy mix that is right for their region' and this is further discussed in the consultation paper (p13, emphasis added):

> *The Guarantee places a dual obligation on retailers to acquire a mix of resources on behalf of their customer demand that allows them to in turn supply electricity that is affordable, reliable and overall complies with emissions reduction goals for the electricity sector. In particular, retailers are required to contract with generators or demand response providers for a minimum level of dispatchable electricity where there is an identified gap,* ***with the emissions produced by <u>that</u> electricity not exceeding an agreed level****. Bringing together climate and energy policy in this way will allow the two to evolve and keep pace with each other, which is important in light of the rapidly evolving power system.*

But in the chapter contributed to the discussion paper by the Commonwealth Government, a geographically neutral emissions obligation is advocated for efficiency reasons. This would allow retailers to account for contracts across the NEM in determining the emissions intensity of a retailer's loads (p 28, emphasis added

> *Consistent with the RET, the Guarantee will not prescribe any specific minimum or maximum levels of low emissions generation that are required within any particular jurisdiction. Instead,* ***retailers will be able to meet their emissions requirements from across the NEM****. Making the emissions element of the Guarantee geographically neutral allows the industry to find the most efficient outcomes and reflects the fact that to address climate change, it does not matter where the emissions abatement occurs.*

But if retailers are allowed to account for the emissions intensity of their customer loads using contracted renewables generation in parts of the NEM that can't deliver to their customers (eg a retailer contracting with a South Australian renewables generator to meet the emissions requirement of the Guarantee for customer loads in Queensland), then the direct link between the electricity market and the emissions obligation is broken and it is unclear how the emissions obligation could be made to work without affecting the outcomes of the reliability obligation (see box 2).

Box 2

To illustrate the difficulty in maintaining a link between physical generation and an emissions obligation that allows geographical flexibility across the NEM, consider a Qld retailer fulfilling its emissions obligations through a contract with an SA wind generator. This Qld retailer is now exposed to the SA market where they hold contracts with a wind generator for loads they cannot supply to their customers in Qld (given interconnector constraints in the NEM and how the dispatch engine works).

How would this retailer be able to sell the energy back into the SA market while being able to count the emissions component towards their Qld customer loads? The electricity has to be sold in SA (given that is where it is delivered) AND the associated emissions component has to be able to be accounted for (sold) separately.

If this is the case, however, the emissions component is separated from the physical generation and investment incentives look identical to an emissions reduction policy administered through a certificate scheme. But this would go against the arguments made by the ESB that linking the obligations to physical generation capacity is more efficient than certificates schemes.

Allowing the emissions obligation to be discharged through contracts that dissociate emissions from underlying generation would also affect the outcomes of the reliability obligation.

In our example about a Qld retailer contracting wind from SA to fulfil their emissions obligation, how is the reliability obligation of SA retailers affected? Given that the electricity from the wind farm cannot be delivered to Qld, it has to be part of the SA retailers' actual energy mix and hence a part of the calculations to ascertain compliance of SA retailers with the reliability obligation. Who is held accountable for the reliability impact associated with the intermittent nature of the wind farm output that is contracted to a Qld retailer but actually delivered in SA?

Given the options discussed in the consultation paper, it would appear that the Qld retailer would have no liability in respect of SA loads. If this is so, a wind farm built in SA and financed through say a PPA with a Qld retailer would impose reliability guarantee related firming costs on local SA retailers even where this would threaten the reliability of local supply.

It is also unclear how contracts associated with the emissions obligation would be accounted for under the proposal in the consultation paper (section 5.7.2) to account for all loads of each retailer under the reliability obligation (the requirement to be expressed as a total). What is the proposed approach to accounting for the PPA for wind in SA with a Qld retailer for reliability obligation purposes?

The ESB should clarify if the proposal is for the emissions obligation to be 'geographically neutral' (as per p28 of the consultation paper) or if it is to be restricted to the same region the reliability obligation applies to (as per p 13 of the consultation paper).

If the former is proposed, then emissions would have to be accounted for separately to the electricity sold, essentially replicating a certificate scheme through the contracts market and negating the claims that the Guarantee maintains a link between the emissions obligation and physical generation (see box 1).

If the second is proposed, then the emissions obligation would apply to each NEM region separately with significant adverse efficiency implications and with the potential for over compliance in some regions given the existing distribution of renewables (eg SA) with very limited ability to trade surplus low emissions generation across the NEM (trading would be restricted by physical loads on interconnectors). This may necessitate an allocation of the overall emissions reduction target for the electricity sector to NEM regions.

Furthermore, restricting compliance with the emissions obligation to contract within each NEM region would require consumers in jurisdiction that have paid for low emissions technologies to be deployed in other NEM regions (eg the ACT) to pay for the associated emissions reduction again, this time for (weaker) emissions reduction targets to be achieved in their NEM region (NSW in the case of the ACT).

4. Prices

Key claims about the Guarantee's effect on prices need to be substantiated to provide confidence that the Guarantee will indeed help bring prices down.

A key driver of claimed benefits from the Guarantee is that forcing retailers to buy more contracts from generators would lead to lower wholesale prices. Given that lower wholesale prices would also mean lower generator profit, this is not convincing. The Guarantee proposal amounts to forcing retailers to buy more contracts from generators, strengthening the hand of generators. To the extent that generators (and gentailers) have market power, it is unclear why generators would sell more contracts at lower prices and consequently lower their profits overall.

The claim that certificate schemes are inherently inferior to schemes that reflect emissions constraints in wholesale prices is not substantiated and unlikely to hold true if geographic neutrality (as discussed under a separate heading above) it to be maintained.

In fact, certificate schemes are more likely to be transparent and liquid and hence competitively neutral. Paying for emissions reductions will have a similar effect on investment incentives regardless of whether implemented through a certificate scheme or through contractual obligations. But forcing retailers to buy more contracts may further entrench market power by 'gentailers' and further reduce competition.

A contracts-based scheme may also impose substantial transaction and administration costs both on business and regulators.

The Guarantee as described would invite AEMO intervention funded by retailers if an identified reliability gap is considered imminent (which would be the case for most unexpected and short lead time large coal plant closures). This would provide large and vertically integrated retailers with a further advantage given they have much more information about the state of their own plants and those of their competitors than new entrants. In some circumstances, they are even the ones making the retirement decisions.

Climate policy risk premiums are no doubt present in Australia and increase the cost of capital for generation asset investors. Introducing stable electricity market and climate policies has therefore the potential to reduce the cost of capital for investments in the electricity sector. Risk premiums of several percentage points have been included in recent modelling of Australia's electricity sector.

However, the extent to which the Guarantee can reduce the policy risk premium remains unsubstantiated. There are question marks about this because:

- The Guarantee fails to clarify how it fits in the broader reform efforts to help transition the electricity sector to a low carbon footing and how the Guarantee fits in the Government's broader efforts to decarbonize the economy.
- Most analysts (as well as official modelling results over the years) make it plain that the pro-rata 26-28% target for the electricity sector will not deliver least cost abatement across the economy. This not only increases the cost of achieving a given target across the economy, it also puts pressure on governments to alter the electricity sector targets in the future. Unless there is an institutionalised avenue to adjust emissions targets in response to circumstances, this will tend to make emissions targets less credible and thereby increases carbon-related risk premiums.
- Flexibility mechanisms such as the use of domestic and international offsets as well as banking and borrowing make the likely cost of emissions in the electricity sector unpredictable.
- The Guarantee also fails to account for an emerging asymmetry in the improvement to risk premiums required to incentivise new investment. The increasing appetite for investors to hedge against climate risk coupled with the rapidly declining costs of renewables means that major new build is likely to be dominated by renewables. A weak target as proposed in the Guarantee (if credible) may reduce risk premiums for thermal plants. However new build of coal fired power stations is highly unlikely so a reduction in risk premium for these plants is likely to be ineffective in reducing electricity system costs.
- An emissions obligation with weak parameters will do nothing to reduce the cost of capital for renewables. In fact, a weak target, especially if locked in for the proposed 5 to 10 years simply serves to cap the upside available from investing in renewables.

The biggest risk for higher prices in the NEM is large plant closures at short notice. The considerations by the ESB around coal plant exit need to be strengthened and any policy proposals should account for plausible scenarios whereby coal plants close faster than current modelling expects.[5] The Guarantee does not offer comfort that additional capacity could be brought in at least cost and in line with long-term objectives, in the event of a coal plant closure at short notice.

As discussed in the section on reliability, how would the Guarantee have helped in the case of the Hazelwood closure? Requiring generators to give three years' notice may offer a solution in theory but how is this to be enforced? In the case of Hazelwood, the owners would have had to spend hundreds of millions of dollars to rectify safety concerns in order to keep operating. It is unclear who would have been liable to pay for this. Where the owner's commercial judgement is that closing the plant is the most economic option, forcing the plant to remain operational for three years would clearly impose additional costs, ultimately reflected in electricity prices.

The reliability guarantee interacts with the current reliability standards and may increase investments to service highly unlikely or rare events. There are real risks that this will further increase the cost of generation in the NEM in a way similar to the over-investment witnessed in transmission and distribution infrastructure and associated electricity price increases over the past decade. The AEMC Reliability Standards and Setting Review 2018 recommends that the reliability settings not be changed, arguing that '*The market price cap and cumulative price threshold been effective at limiting market participants' exposure to excessive high prices with the overall market integrity maintained. These settings appear to be sufficiently high to allow investment in enough generation so there is not more unserved energy expected than that allowed for by the reliability standard.'*

If this AEMC conclusion is correct, how does introducing an additional mechanism to further enhance reliability strike the right balance between the incremental cost of that reliability and incremental reliability benefits? It is not evident that the existing reliability standards and settings process is broken, and how superimposing a reliability guarantee as outlined by the ESB would help with any shortcomings.

The lack of transparency and potential benefits to large and vertically integrated electricity providers of the Guarantee, as outlined, has the potential to adversely affect competition and reduce innovation. This in turn could put significant upward pressure on prices and

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[5] Note that *none* of the model projections and forecasts (including AEMO's) predicted the Hazelwood closure. Most analyses assume coal plant closures at 50 years of age or more even though the 10 plants that did close since 2012 had an average age of about 40 years (black coal plants had an average age of just over 30 years at retirement and brown coal plants just shy of 50 years). But the economics of coal plants is adversely affected by increasing levels of renewables (in addition to carbon risk) which would lead one to expect a shorter economic life (including due to higher physical demands on the plants associated with load following behaviour).

stand in the way of a transition to a system over the coming decades with low cost renewables complemented by demand response, storage and other flexible generation.