

Dr Kerry Schott AO
Chair | Energy Security Board | John Gorton Building
King Edward Terrace | Parkes, ACT 2600
Submitted via: info@esb.org.au

13 July 2018

Dear Dr Schott,

Response from EnerNOC to the Energy Security Board's **National Energy Guarantee Detailed Draft Design Consultation Paper**, dated 15 June 2018.

EnerNOC is an independent demand response aggregator with experience operating in twelve countries. We work with commercial and industrial energy users to enable dispatchable demand-side flexibility, and offer that flexibility into wholesale capacity, energy, and ancillary services markets, as well as to networks and utilities. Locally, EnerNOC is a market participant in the Wholesale Electricity Market (WEM) and the National Electricity Market (NEM). EnerNOC's regional head office for Asia-Pacific is in Melbourne. In 2017, EnerNOC became part of the Enel Group.

EnerNOC is grateful for the opportunity to comment on the Energy Security Board's (ESB) detailed design consultation paper. As an independent demand response aggregator, we have focused the comments in this submission narrowly on wholesale demand response (DR), and what must occur in order for DR to play its envisaged role in the National Energy Guarantee (Guarantee). EnerNOC's local affiliate Enel Green Power Australia has lodged separate submissions with the ESB and the Commonwealth providing holistic comments on the Guarantee and Commonwealth Elements from the perspective of a generation project developer.

With any questions relating to this submission please contact Matt Grover on 03 8643 5907 or [mgrover\[at\]enernoc.com](mailto:mgrover[at]enernoc.com). EnerNOC would be glad to contribute further to the ESB's consultation process upon request.

Regards,



Jeff Renaud
Vice President & Managing Director - Asia Pacific

Introduction

EnerNOC is encouraged by the consideration given to wholesale demand response in the ESB's published materials to date. We commend the ESB for building on the recommendations of the 2017 Finkel Review and making clear its intention that dispatchable DR should be classified as a resource eligible for use in the reliability obligation aspect of the Guarantee.

With a properly functioning mechanism to incentivise, recognise, and quantify wholesale DR, EnerNOC estimates that at least 5% of the dispatchable capacity contracted under a triggered reliability obligation would come from DR, because DR is a reliable and low-cost source of dispatchable capacity that can be developed relatively quickly. The potential market-wide benefits to both reliability and cost from incorporating wholesale DR are significant, as properly incorporating wholesale DR into the NEM will reduce the need for incremental peaking generation plant to be built.

We note that the history of DR in the NEM has primarily involved commercial and industrial (C&I) energy users curtailing large loads or switching to standby generation sources for periods of time – but that this paradigm is shifting. Our use of the term 'wholesale DR' in this submission should be thought of to refer equally to the actions of C&I energy users, and also 'virtual power plants' comprised of distributed dispatchable energy resources (DER) – the most obvious of which are the NEM's emerging fleets of behind-the-meter batteries (including those at residential premises). Accordingly – in this submission the term 'wholesale DR' refers to any flexible behind-the-meter resource that can be coordinated to act in concert with other such resources in order to provide a dispatchable, firm response in the aggregate.

Executive Summary

The framework laid out for DR integration in the ESB's Draft Design Consultation Paper and the Technical Working Papers provides a largely workable mechanism to ensure that DR *can* play a role in the Guarantee. However, the framework does little to ensure that DR *will* play a role in the Guarantee. The Guarantee on its own introduces neither new mechanisms nor new incentives for liable entities to engage in wholesale DR, and is thus unlikely to alter the low levels of DR participation seen in the NEM under today's status quo. In addition, wholesale DR is unlikely to contribute usefully to preventing the occurrence of a 'reliability gap' and subsequent triggering of the reliability obligation, because today's wholesale DR is implicit: it does not explicitly *participate* in the wholesale market, and thus cannot be reliably modelled into the ESOO forecasts that AEMO uses to identify reliability gaps.

The Guarantee would be much strengthened by the introduction of a complementary new wholesale demand response mechanism, as has been recommended by multiple contemporary reviews (Parer 2002, Power of Choice 2012, Finkel 2017, ACCC retail pricing 2018), and is currently under consideration in the AEMC's Reliability Frameworks Review. Without a complementary new wholesale DR mechanism, there will be little change to the status quo, and wholesale DR will fail to emerge and flourish as a new and useful source of peaking capacity.

In the sections below we provide more detail on these themes, and provide comment on some DR related aspects of the Guarantee design that require additional thought. Our primary recommendations are: to introduce standardised baseline methodologies for measuring and quantifying wholesale DR, to rethink the way shares of region peak demand are calculated, and to implement a robust certification process for independent auditors, along with a standardised framework against which auditors would assess contract firmness.

How DR fits into the Guarantee

DR will be most useful in the NEM if it is able to help *prevent* the triggering of the Guarantee's reliability obligation

Much of the ESB's published materials relating to the reliability obligation are focused on the complex administrative procedures that must be followed following the identification of a reliability gap, and subsequent triggering of the reliability obligation at year T-3. These procedures are cumbersome - any triggering of the reliability obligation would inevitably introduce substantial administrative costs that would ultimately be borne by consumers. Undoubtedly, the best outcome for consumers would be if the reliability obligation need never be triggered.

Today's DR won't help prevent triggering, because today's DR can't be properly modelled into AEMO's annual ES00

For DR to play a role in ensuring the Guarantee's reliability obligation does not trigger, DR needs to be able to make itself known and visible to the market, so that AEMO can model firm quantities of DR into its annual Electricity Statement of Opportunities (ES00). Unfortunately AEMO has a very limited ability to model DR into the ES00 at present, primarily because all the DR in the NEM today is non-scheduled and does not *participate* in the wholesale market: there are no scheduled DR resources in the NEM that make firm bids into central dispatch and which have an obligation to submit availability forecasts to Medium Term PASA. What wholesale DR does exist today is of unknowable firmness and unknowable quantity, due to the commercial-in-confidence nature of non-scheduled DR contracts. Consequently, when composing the annual ES00, AEMO is left to guess how much DR might eventuate at various high spot price levels¹. AEMO formulates a guess by combining historical observations with information surveyed from participants and collated into the new Demand Side Participation Portal (DSP Portal)².

¹ AEMO's most recent guesses can be found [here](#). During summer 2017-18, AEMO assessed there to be a maximum of 278 MW of wholesale DR that could be sufficiently identified, modelled, and incorporated reliably into its forecasts of future resource adequacy.

² Information submitted to the DSP portal does not reflect firm quantities of DR that are guaranteed to eventuate at specific spot price thresholds (and thus can be confidently modelled into the ES00). Rather, the Portal collects simplistic information relating to DR quantities that *sometimes* or *might occasionally* respond to various spot prices. The representations in the DSP Portal are much less accurate, precise, and firm than bids submitted to central dispatch and forecasts submitted to MT PASA. Participants submit a single MW value for each NMI to the DSP portal, which is overly simplistic, as the quantity of wholesale DR available at any NMI will vary dynamically by season, day, and trading interval, based on a variety of commercial and operational variables. The ESB's plan to utilise the DSP Portal to administrate DR in the Guarantee is likely to require

It is noteworthy that the wholesale DR that exists in the NEM today does not *participate* in the wholesale market. It does not make its intentions, quantities, and price sensitivities clear, and it does not sit inside the merit order and contribute to price formation. Rather, today's wholesale DR is forced to *respond* to already-published prices, in a manner can cause consternation for AEMO and other market participants. Stanwell articulated this distinction elegantly in a recent submission to the AEMC:

*Demand side **participation** is distinct and far more beneficial than demand side **response**. Demand side participation is when the intentions and price sensitivities of demand are understood by AEMO and can be properly incorporated into forecasts, dispatch and frequency requirements. Demand side response on the other hand occurs when sophisticated loads (individually or in aggregate) react in an un-forecast manner, contributing to price volatility and frequency deviations...*

...There is growing recognition of the need to transform "demand side response" into "demand side participation". Stanwell requests the AEMC urgently review how best to integrate distributed energy resources and other demand response into the market - if AEMO does not know about and/or cannot control these resources this will result in price volatility and increased FCAS requirements³.

The Guarantee itself provides no new incentive to develop wholesale DR pre-trigger

The Guarantee on its own provides no new incentive for liable entities to develop wholesale DR resources pre-trigger. That is, the Guarantee is not likely to drive any change to the status quo, or increase the amount of wholesale DR that is present in the market. We anticipate that, post-trigger, there would be a flurry of interest in DR as liable entities scramble to arrange cost-effective cover between years T-3 and T-1. However, it would be a much better outcome for the NEM if greenfield firm DR resources were developed pre-trigger, modelled into the ESOO, and used to prevent the occurrence of reliability gaps and triggering of the reliability obligation in the first place.

Fortunately, the AEMC is considering a fix

The AEMC through its Reliability Frameworks Review is currently considering a mechanism that will remedy many of these shortcomings. At the request of Dr Finkel⁴, the AEMC is considering the introduction of a new mechanism that would allow consumers to sell their wholesale DR capability to parties other than their current retailer, and for DR resources to become scheduled – bidding firm commitments into central dispatch, at transparent quantities and prices. Such a new mechanism would provide a new incentive for retailers and independent aggregators to develop DR, and would allow DR resources to compete in the wholesale market on an equivalent basis to supply side

modifications to the existing DSP portal and the data it collects, particularly so that "firm, Guarantee DR" can be flagged and differentiated from "non-firm, sometimes available" DR.

³ Stanwell Corporation Limited, *FREQUENCY CONTROL FRAMEWORKS REVIEW, Response to issues paper* - December 2017

⁴ See Finkel recommendation 6.7. More contemporaneously, the ACCC's *Electricity supply & prices inquiry* final report published 11 July 2018 recommends that "*a mechanism should be developed for third parties to offer demand response directly into the wholesale market. Design of the mechanism should commence immediately*" (p XX).

resources⁵. Importantly, under a new mechanism, quantities of DR would be included in MT PASA and could be captured reliably in AEMO's annual ESOO. This will ensure the presence of wholesale DR is fully accounted for and incorporated into AEMO's resource adequacy assessments used to identify potential 'reliability gaps' in each ESOO. If the AEMC elects to recommend a new wholesale DR mechanism in its forthcoming final report on the Reliability Frameworks Review, it would lead to an investment boom in firm, transparent DR resources that for the first time truly *participate* in the wholesale market, and which would help ensure the reliability guarantee never triggers. Without a complementary new DR mechanism, the Guarantee will do very little to drive incremental demand side participation in the NEM.

The ESB's proposed framework for incorporating DR

Noting that the introduction of a new wholesale DR mechanism is the single most critical element that would ensure DR plays a useful role in the Guarantee, the ESB has been wise to consider the possibility that a new mechanism will not eventuate, and to create a framework that ensures DR is still able to be used as a qualifying resource in the absence of a new mechanism. In this section we provide comment on the detailed framework presented in the ESB's publications to date including the Technical Working Papers dated June 2018.

The ESB has the principles right, but the design wrong

The bulk of the ESB's technical working paper focuses on ensuring that DR is never double counted⁶, and that each liable entity's share of system peak demand (and corresponding capacity liability, in MW) is calculated correctly. It strives to ensure that the share of liable entity A does not change based on the DR quantities that might be utilised by liable entities B and C (which would reduce the measured system peak demand). These are correct and essential design principles. However, the way the ESB has proposed to implement them in its *preferred approach*⁷ is sub-optimal, needlessly complex, and unduly leaves the mechanism open to gaming.

The most glaring missing element is the lack of standardised DR baselines

The ESB's design proposes to let each liable entity simply invent the counterfactual level of demand⁸ against which the quantity of delivered DR (in MW or MWh) is measured, assessed, and credited against a liable entity's obligation. This is an objectively bad idea, and contravenes global best practice in DR administration. Liable entities would face a strong incentive to over-estimate the counterfactual level of demand, and claim a greater quantity of DR than has physically benefited the power system. The ESB's framework would be much improved by ensuring that all DR is measured

⁵ We have detailed our thoughts on the need for, and benefits of, such a new mechanism more fully in our submission to the Reliability Frameworks Review Interim Report, which can be found [here](#), from page 8.

⁶ The concept here is that without a defined mechanism to avoid double counting, a liable entity could use DR BOTH to reduce its share of system peak demand AND also as proof it has met its liability. This is an undesirable outcome that the ESB's framework correctly strives to avoid. Each MW of DR activated by a liable entity should be able to EITHER meet the entity's obligation or reduce the entity's obligation, but not both.

⁷ ESB, Technical Working Paper – Demand Response, p7

⁸ i.e. the "baseline" level of energy consumption, or the energy that "would have been consumed" were the DR not activated

against a centrally administered and standardised baseline calculation formula, or suite of baseline calculation formulas, such as those being developed in the course of the ongoing AEMO-ARENA demand response trial.

The preferred method for calculating shares is confusing, inaccurate, and needlessly complex

The ESB's technical working paper states that: (bold emphasis ours)

*One specific difficulty that arises in relation to DR is with the measurement of the liable entities actual demand at time T due to **uncertainty about the amount of DR that was activated** at that time⁹.*

There need not be any uncertainty about *the amount of DR that was activated*, if all activated DR is measured against a standardised baseline(s), and reported to AEMO. Even better would be if the DR was *participating* in central dispatch. This would require a new wholesale DR mechanism, but would mean that each resource would declare its precise quantity in each trading interval in advance via its bids, and the precise delivered quantity would be measured and verified after-the-fact by AEMO and judged compliant (or not) against its bids by the AER.

The Technical Working Paper continues:

*In theory, the more accurate approach would be to identify how much DR was activated by each liable entity, and then add the liable entity's DR to its measured demand, and the **sum of all DR amounts to the actual system demand. This would be a very complex compliance task** for the AER and liable entities. An approximation that is preferred would calculate each liable entity's scaled obligation based only on its measured load and its DR amount¹⁰.*

This need not be a *very complex compliance task* at all. When standardised baselines are employed, this is a very simple task. In fact, AEMO is already undertaking standardised baseline calculations automatically as part of its administration of its RERT contracts, including those contracts that are part of the ongoing AEMO-ARENA demand response trial. With standardised baselines, all DR quantities would be measured on an apples-to-apples basis, and there would be no leeway for a liable entity to game the mechanism, and manually inflate the quantity of DR it had contracted/activated.

With standardised baselines in place, each liable entity would simply need to declare (privately, to AEMO) which NMIs it had activated for DR during which trading intervals¹¹, and AEMO's systems could automatically calculate the counterfactual demand levels, assess the delivered DR quantities, and calculate the reconstituted system peak demand value. Because AEMO would have all the

⁹ ESB, Draft Detailed Design Consultation Paper, p7

¹⁰ ESB, Draft Detailed Design Consultation Paper, p7

¹¹ Presumably, retailers would only need to report this data in the (hopefully, rare) situation where reliability obligation compliance need be assessed: which (as currently proposed by the ESB) would mean the reliability obligation had triggered at T-3, AEMO had exercised its procurer of last resort function after T-1, AND the 50% POE forecast was exceeded during year T. The Guarantee is designed to prevent this situation from occurring, but even if it did occur – the reporting burden would be light: liable entities could file a single one-off report with AEMO at the end of the season, indicating when and where it had activated its DR contracts during the relevant system peak intervals.

information on hand, "the more accurate approach" would be easy and simple to implement: all DR that occurred in a trading interval (no matter which liable entity organised it) could be easily added back on to reconstitute what the regional demand would have been in the absence of the DR.

The ESB's *preferred approach* of measuring each liable entity's share of system peak demand where "only **its own** activated DR contracts will be added back on the gross load of the region for that liable entity"¹² is unnecessarily inaccurate and confusing. In the ESB's Example 1, the shares of the three retailers calculated using this method do not sum to 100%¹³. It would be more logical and accurate to calculate each entity's share by taking into account all region-wide DR that was utilised (measured against standard baselines) – to fully reconstitute what the region peak would have been – before calculating individual shares¹⁴. In this way, all shares sum to 100%, and the possibility of both gaming and double counting are eliminated, as all DR quantities are measured in a standard way, and all DR is used only to meet liable entities' obligations, never to reduce them.

It will be essential to create a process for recognising and certifying qualified auditors

The Qualifying Contracts Technical Working Paper notes that auditors will play a central role in assessing the "reasonableness" of a liable entity's qualifying contracts, and also certifying the "firmness factor" the liable entity has applied to each qualifying contract – a factor which effectively becomes a multiplier against the MW quantity of the contract. As such, the role of the auditor is fundamental to the integrity of the Guarantee, and in providing assurance that the Reliability Obligation actually adds value and incrementally improves reliability in the NEM. Allowing each liable entity to determine its own firmness factor for each contract (as the ESB has proposed) is likely to introduce apples-to-oranges assessments between different liable entities. It will be important to have trained auditors that provide assurance using a consistent, AER-administered assessment framework.

This challenge is likely to be most acute in assessing the firmness DR contracts: while many market participants are familiar with generation contracts and have battle tested risk management reporting frameworks in place for them, few liable entities will be experienced with DR contracts, and we are unaware of any "widely accepted" methodology for assessing the firmness of a DR contract. DR contracts are more likely than generation contracts to use a wide range of different strike prices, so a consistent methodology for adjusting the firmness factor based on the strike price will be essential.

Ensuring that the AER oversees the auditors in some way – certifying them and providing them with a consistent framework for assessing firmness – will be essential to address these challenges and maintain the Guarantee's integrity.

¹² ESB, Draft Detailed Design Consultation Paper, p7

¹³ See bottom row of table 1, denoted "Corrected grossed up DR"

¹⁴ In table 1, these are the values reflected in the second to bottom row, denoted "This is what it would have been without DR"