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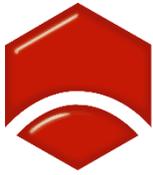
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# National Energy Guarantee Draft Detailed Design Consultation Paper

Engineers Australia Submission

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13 July 2018



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# 1. Executive Summary

## 1.1 System security

Engineers Australia believes the National Energy Guarantee (NEG) is a market mechanism that will help provide some long-term stability to the electricity industry, but there are some concerns which need to be addressed to aid in its success before it is implemented. System security was a key issue raised in the Independent Review into the Future Security of the National Electricity Market (the Finkel Review).

Although the design of the NEG specifically addresses what is defined as reliability, not security, there is a fine line of difference between the two topics when it comes to actual performance of the power system to “keep the lights on”. As the Energy Security Board (ESB) pointed out in their Health of the National Electricity Market (NEM) Report “Is the NEM able to keep operating in the event of a disturbance?”. System security services are missing in the NEG design documents, and the interaction and impact of the NEG on the provision of these should be articulated.

## 1.2 Reliability Obligation

One of the objectives of the Reliability Obligation should be to provide technology agnostic investment signals ex-ante as the NEG only triggers three years out from a reliability gap. Any “mature new supply options”<sup>1</sup> with a lead time in excess of three years will only be signalled under existing processes of the Australian Electricity Market Operator (AEMO) Electricity Statement of Opportunities (ESoO).

Therefore, from a reliability perspective, it appears that the NEG itself excludes a number of existing mature supply options. In particular, Engineers Australia is concerned that the NEG specifically omits any types of network solutions, such as interconnectors, from solving reliability problems within its framework.

Additionally, Engineers Australia has previously raised the question of what is clearly defined as a dispatchable resource, and who will define this in the future. Our understanding is that contractual compliance of what was dispatched will be done by retailers on an ex-post basis through a self-assessment process of which qualifying contracts were firm at the time of the peak demand. Ex-ante definition of what is dispatchable appears warranted and more beneficial as:

1. New dispatchable technologies are appearing and will continue to appear, and
2. Ex-post review of resources will only occur if the firming capacity of the resource is found to be inadequate, by which time reliability may have already been compromised.

## 1.3 Forecasting

Engineers Australia also notes that the NEG qualifying contracts will not be designed to address extreme peak demand (10POE probabilistic forecast 1 in 10 year events). The Reliability Obligation design only addresses 50POE (1 in 2 year events). Whilst it is understood that a perverse outcome would be overinvestment, extreme events are becoming more frequent. Better forecasting would assist alleviating some of this risk and reduce the

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<sup>1</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 34, Figure 3. 15 June 2018.

chance that AEMO will need to be 'procurer of last resort' for events which may be foreseeable.

## 1.4 Emissions Obligation

Engineers Australia raises concerns about the emissions reduction mechanism proposed for the NEG, and its ability to make a significant contribution to reducing emissions in the NEM. In the absence of stronger targets, there is a risk to current renewable projects, and to the broader industry beyond 2021.

## 1.5 Engineering expertise

The NEG brings a new level of complexity to the NEM, and this complexity will require sufficient technical expertise to avoid risking further cost to the system. Engineers are a key stakeholder in this process, and all market parties which hold new obligations should consider the technical expertise that will be required.

Engineers Australia acknowledges that there are technical challenges associated with the transition in the electricity sector, and Australia's engineers are well placed to provide optimal solutions.

## 2. Introduction

Engineers Australia is the peak body for the engineering profession in Australia. With about 100,000 individual members across Australia, we represent individuals from a wide range of disciplines and branches of engineering. Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

The Institution's response is guided by our Charter and Code of Ethics which states that engineers act in the interest of the community, ahead of sectional or personal interests towards a sustainable future. Engineers are members of the community and share the community's aspirations for Australia's future prosperity.

Engineers Australia appreciates the opportunity to respond to the ESB National Energy Guarantee Draft Detailed Design Consultation Paper. Engineers Australia strongly believes that engineering expertise is critical to the successful implementation of the NEG, given the increasing complexity in the electricity system and the direct focus on system reliability.

Engineers are vital in the electricity generation, transmission, distribution and consumer sectors, as well as NEM operations. The importance of the power system being operated safely for users and the public cannot be understated and this requires detailed engineering analysis and consideration.

Engineers Australia is a strong supporter of an energy policy that will deliver secure, reliable and least cost energy, while progressing towards a de-carbonised energy sector. Engineers Australia acknowledges that engineers should work proactively to address climate change as an ecological, social and economic risk and has highlighted this in its Climate Change Policy.<sup>2</sup>

This submission from Engineers Australia will address previous concerns raised in our submission to the February 2018 NEG Consultation Paper, which still remain unresolved in the current draft. Engineers Australia will also address some new issues raised in the current draft.

### 2.1 Integration of reviews

Engineers Australia's Submission to the February 2018 NEG Consultation Draft highlighted that there were a number of NEM reviews underway, and for stakeholders it was unclear how these reviews align with the NEG. These reviews include:

- The current work of the Australian Energy Market Commission (AEMC) in assessing an inertia market mechanism through the recently initiated Frequency Control Frameworks Review.
- Australian Energy Market Operator's (AEMO) current Integrated System Plan consultation.
- Demand Response in the Wholesale Energy Market through AEMC's Reliability Frameworks Review.

As a further example, AEMC's System Security and Reliability Action Plan (Update May 2018) document does not even mention the NEG, even under the 'Reliability' heading. The NEG Draft Detailed Design Consultation Paper does not make a mention of any of these reviews and how they form into any over-arching framework for how they may interact with each other. Engineers Australia recommends that a framework be developed and released that outlines the relationships between the NEG and these current reviews. This framework should outline

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<sup>2</sup> Engineers Australia, *Climate Change Policy*, November 2014.

a timeframe for the release and finalisation of these reviews, as well as outlining the critical paths and priorities.

## 2.2 Complexity and engineering expertise

Engineers Australia has consistently raised the issue that increased complexity of the electricity system requires technical expertise to avoid risking further cost to the system. The NEG Draft Detailed Design Paper only makes a brief reference to the requirement of technical expertise on Page 37:

*'The Australian Energy Regulator (AER) will be assigned the role as the independent entity, as expected functions of this role align with the AER's existing energy market regulation remit. The AER will need to develop technical capabilities to fulfil this function and will be tasked with determining whether to accept a recommendation from AEMO to trigger the reliability obligation.'*<sup>3</sup>

Engineers Australia again raises the importance of capable, specialist technical expertise, including power systems engineering within the decision-making levels of the energy market bodies. All market parties, including those which will hold any new obligations, should ensure they have the required power systems engineering expertise. The Preliminary Report of the Finkel Review<sup>4</sup> highlighted the need for technical solutions to be implemented into the system, and engineers are key stakeholders in this process.

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<sup>3</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 37. 15 June 2018.

<sup>4</sup> Independent Review into the Future Security of the National Electricity Market, Preliminary Report, December 2016.

## 3. Reliability Obligation design

### 3.1 Concerns for system security

In Engineers Australia's Submission to the February 2018 NEG Consultation Draft, concerns were raised for how the Reliability Obligation in the NEG will address security services. The submission pointed to the essential security services of synchronous inertia, system strength and voltage management outlined in the Finkel Review<sup>5</sup>. Engineers Australia again raises concerns for how the Reliability Obligation in the NEG will address the three security services outlined above. Engineers Australia believes this is an essential step in ensuring the reliability of the system.

### 3.2 Designing the reliability requirement (dispatchable resources)

Engineers Australia has previously raised the uncertainty surrounding the definition of dispatchable resources in its submission to the February 2018 NEG Consultation Paper. In the current NEG Draft Detailed Design Consultation Paper there is a broad description on what has been considered dispatchable in the past:

*'Historically, most of the installed generation capacity has been "dispatchable" (that is, able to generate as required) provided by coal, gas and hydro-electric plants. Provided these generating units have sufficient fuel (that is, coal, gas, stored water) and their operational positions allow it – and assuming no unexpected outages or transmission constraints – they can be called upon by AEMO to increase or decrease their output at any time in a predictable manner, given enough notice.*

*As a result of these factors, the proportion of available dispatchable generation capacity in the NEM is declining. While some new wind and solar investments in Australia are seeking to make themselves "dispatchable" by co-locating with a battery or storage such as pumped hydro, this is not true for the majority of these resources. Therefore, when wind and solar are not available an alternative source of power that can be dispatched is required.'*<sup>6</sup>

Engineers Australia has concerns about what the current NEG design considers to be dispatchable supply. The NEG Draft Detailed Design Consultation Paper seems to indicate that this is traditional fossil fuel generation, as well as hydroelectric plants, and renewables with sufficient storage ability. However, without a clear definition, ambiguity on the use of a dispatchable resource may arise, and this could particularly be the case if new technologies develop and have the ability to increase or decrease their output in a predictable manner.

Additionally, there is no authority to administer the determination of what is currently considered dispatchable, or what could be considered dispatchable in the future, and this can pose risks to system reliability. The NEG will utilise a self-assessment process (by the retailers), with an ex-post review in the event that the resource is found not to provide firming capacity. Engineers Australia believes this is not adequate, and needs to be addressed before the finalisation of the NEG design.

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<sup>5</sup> Independent Review into the Future Security of the National Electricity Market: Blueprint for the future, Final Report, June 2017.

<sup>6</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 14. 15 June 2018.

### 3.3 Triggering the reliability obligation

Engineers Australia has concerns about the triggering of the reliability obligation with a timeframe that is too short to consider a wider variety of supply options to fill the obligation. The current NEG Draft Design Consultation Paper has focused on a short time period out from an expected reliability gap.

For encouragement of new investment at a timeframe longer than three years, investors in new supply or demand-side options will continue to rely on the ESoO. Under “Compliance”, the NEG Draft Design Consultation Paper states:

*‘If AEMO identifies a ‘material’ gap in capacity three years in the future through the publication of the ESoO, it will make a request to the AER to trigger the reliability obligation. As the independent entity, the AER reviews AEMO’s request to trigger the reliability obligation, and if consistent with an assessment framework, the request is approved. If the gap persists in one or more NEM regions one year out, retailers and liable entities in the affected regions will be required to submit their contract position to the AER to demonstrate they have sufficient enduring qualifying contracts over the gap period.’<sup>7</sup>*

Engineers Australia’s concerns remain, because the Design Consultation Paper provides no further detailed information on this issue. The NEG does not provide any new investment signal for supply options more than three years out from a potential shortfall.

Without a new signal for investment, it is unlikely that supply options with longer lead times, or network connection options which could provide reliability options would be in consideration. The potential for investment in technology options with longer lead times would continue to rely on the ESoO forecast of potential demand. The proposed method will favour certain technologies, which is not a balanced approach.

Engineers Australia also has some concerns about the role of the independent entity. The NEG Draft Design Consultation Paper states:

*‘The AER will be assigned the role as the independent entity, as expected functions of this role align with the AER’s existing energy market regulation remit. The AER will need to develop technical capabilities to fulfil this function and will be tasked with determining whether to accept a recommendation from AEMO to trigger the reliability obligation. The AER as the independent entity should follow a transparent and efficient process, set out in a guideline, to give stakeholders confidence that the decision to trigger the reliability obligation is justified.’<sup>8</sup>*

Engineers Australia believes further clarification is required for the role of the independent entity when AEMO is required to fulfil the role of ‘procurer of last resort’. In this scenario, AEMO becomes a pseudo market participant and many of the existing roles of AEMO will shift to the AER. There is no mention of the potential conflict with other roles within the AER as the independent entity and how this may be addressed. Engineers Australia also questions using only one body to justify the trigger of the Reliability Obligation, because it is usual for at least two bodies to provide peer review.

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<sup>7</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 43. 15 June 2018.

<sup>8</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 37. 15 June 2018.

### 3.4 Network Solutions (including Interconnectors)

Engineers Australia notes that network solutions cannot be considered to address reliability obligations under the NEG. This is because they do not have a direct link to the electricity market which a liable entity uses to reduce exposure to high spot prices<sup>9</sup>.

This is a significant oversight which may not lead to the best solution being implemented to deliver reliability at an affordable cost. Two timeframes need to be considered:

- Years T-3 to T-1: Some network solutions could be implemented in relatively short timeframes. Examples include network reconfiguration, increasing capacity by surveying lines and upgrading clearances and hence ratings, and increasing operating voltage on key feeders.
- Years T-10 to T-3: Network solutions with longer lead times, such as the construction of interconnectors.

Engineers Australia has previously raised the importance of interconnectors and the role they play; this was done in the association's submission to the February 2018 NEG Consultation Draft. The two issues raised by Engineers Australia were:

- Management of flows between jurisdictions for reliability, and
- The probability of triggering an interconnector build with the different build regulations for this technology.

The first point has been acknowledged in the *Technical Working Paper on Forecasting the Reliability Requirement*:

*'When a shortfall occurs in a given region, it can either be managed as an independent system or through interregional transfers across interconnectors. Presently, the ESOO forecast modelling process accounts for flows across regional interconnectors and allocates capacity into regions to cover a shortfall.'*<sup>10</sup>

And continuing:

*'Similarly, when assessing the materiality of an identified reliability gap, a region can either be considered independently or according to its ability to share resources with adjacent regions.'*

Engineers Australia acknowledges that the ESB has highlighted the critical role that interconnectors can play in addressing system reliability. Engineers Australia also acknowledges that a business case for an interconnector may rely on a surplus of generation in a given area. However, interconnectors still warrant significant discussion and consideration in the NEM, as they can be crucial to connecting regions with different forms of energy, or to specific regions depending on weather conditions.

However, there are still concerns that there is no new signal to encourage investment in an interconnector which does not currently exist as an option to address a reliability gap. Engineers Australia previously raised the issues regarding the build of a new interconnector to help manage reliability:

*'A potential flaw in the current NEG policy [is that] it does not allow interconnectors to play a more significant role in assisting in meeting the reliability gap. According to the NEG policy, when a potential gap is forecast, participants will be required to respond and alleviate any forecasted shortfall in what could be seen as a market-driven*

<sup>9</sup> Energy Security Board, *Technical Working Paper: Demand Response*, Page 6. 15 June 2018.

<sup>10</sup> Energy Security Board, *Technical Working Paper on Forecasting the Reliability Requirement*, Page 21. 15 June 2018.

*solution. However, it would appear that a new build of an interconnector, with their ability to transfer flows between regions and fill the gap, would not necessarily have the same ability to compete in alleviating this shortfall. The current process for network companies to build a new interconnector is a strict and tightly regulated process (with long lead times), the RIT-T. It is unclear how the development of an interconnector could work in line with other market options due to the different and more difficult process for approval, even if it were the optimal solution to fill the gap.<sup>11</sup>*

The regulation framework for interconnectors, or a mechanism to encourage the feasibility of an interconnector as a technology that can firm reliability are not discussed in the NEG Draft Detailed Design Consultation Paper, or in the Technical Working Papers. Engineers Australia believes this is a significant gap in the NEG policy. The lack of an adequate mechanism means that networks solutions cannot be fairly considered in a technology agnostic approach. It needs to be recognised that the construction of a network solution, in particular an interconnector, has the long-term potential to drive down prices.

## 3.5 Penalties

The NEG Detailed Design Consultation Paper outlines penalties that apply for retailers who have fallen short of their Reliability Obligation:

*'Penalties will be assigned to retailers that are assessed to have fallen short of their reliability obligation. These penalties will include at least some of the cost of procuring necessary resources via the procurer of last resort function.'<sup>12</sup>*

This is followed up in more detail in the Technical Working Paper on Compliance and Penalties for the Reliability Requirement:

*'A liable entity found to be non-compliant will be charged a predetermined proportionate cost – based on its MW contribution to the shortfall multiplied by a contribution cost per MW - to contribute to the cost incurred by consumers as a result of the Procurer of Last Resort costs.'*

*In addition to the Procurer of Last Resort contribution cost, non-compliance with the core reliability obligation will be a civil penalty provision. Further civil penalties will also be attached to key obligations such as contract reporting.'<sup>13</sup>*

Engineers Australia believes there needs to be more clarity about the penalty revenue, in particular the administration of these funds. The Technical Working Paper specifies two potential options for how the cost is calculated, but not how it will be administered. Additionally, in the event of a surplus or deficit, there is no additional information on what will happen to excess revenue, or who would cover a shortfall. If this is put back on to consumers, it could have implications of additional costs.

## 3.6 Forecasting

### 3.6.1 How the gap should be forecast?

Engineers Australia stated in its submission to the February 2018 NEG Consultation Draft that the accuracy of the forecasting and the forecasting timeframes will be the most critical

<sup>11</sup> Engineers Australia Submission: National Energy Guarantee Consultation Paper. 8 March 2018.

<sup>12</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 44. 15 June 2018.

<sup>13</sup> Energy Security Board, *Technical Working Paper: Compliance and Penalties for the Reliability Requirement*, Page 3. 15 June 2018.

foundations of the NEG. Engineers Australia strongly supports any policy mechanism that could improve accuracy in forecasting, to address potential gaps, and apply mitigation measures where required.

Engineers Australia continues to raise concerns that the NEG does not add any additional mechanism to improve the forecasting of long-term accuracy of demand levels, and only provides a focus on three years out from an expected gap. The current design limits technology options that provide reliability. In its previous submission Engineers Australia stated:

*‘The suggested timeframe of three-years limits the scope of generation technology options which can respond to a reliability gap. Some generation technologies have the ability to be developed and established more rapidly than other technologies due to the lead times required of different power stations (renewable generation technologies compared to traditional synchronous forms of generation). This option prevents low cost alternatives with greater lead time, pushing electricity prices up further.’<sup>14</sup>*

Engineers Australia has also raised the shut-down notice period introduced for power stations, and how this is the same timeframe as the forecast period for a potential gap. More detail is required to explain if these time periods are linked and whether they change if the shut-down notice period is extended or shortened.

Careful consideration must also be taken in developing the forecasting timeframe to remain technology agnostic. Just as critical is the consideration of new energy sources and generation types, behind the meter technologies, and energy efficiency savings through changing consumer habits over time. This is an additional challenge to forecast accuracy owing to the difficulty in predictions for the development of these options, which means flexibility should be at the forefront of the forecasting mechanism.

### 3.6.2 Extreme peak demand

Engineers Australia also raises concerns about the NEG’s ability to respond to extreme peak demand. The NEG Draft Design Consultation Paper states:

*‘The reliability requirement is designed to give confidence to all stakeholders that sufficient dispatchable power will be available when required as the system transitions. At present, reliability is within the current standard set by the Reliability Panel. However, there is more uncertainty across the system and supplying peak demand, especially in summer, may become more difficult. The reliability requirement will incentivise sufficient investment in generation and demand-side resources to ensure continued reliability consistent with the standard.’<sup>15</sup>*

Engineers Australia has some concerns that the NEG may fall short when it needs to cater for extreme peak demand. In the Technical Working Paper on Forecasting the Reliability Requirement it states:

*‘The issue of reporting forecast accuracy when dealing with probabilistic (POE) forecasts is more complex and requires further work when monitoring the performance of peak demand forecasts. AEMO will be required to engage with industry on the development of these metrics.’<sup>16</sup>*

<sup>14</sup> Engineers Australia Submission: *National Energy Guarantee Consultation Paper*. 8 March 2018.

<sup>15</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 15. 15 June 2018.

<sup>16</sup> Energy Security Board, *Technical Working Paper: Forecasting the Reliability Requirement*, Page 11. 15 June 2018.

Engineers Australia believes there needs to be more clarity in the NEG for how it will cater for extreme peak demand. System capacity at time of maximum demand needs to be able to respond to the peak events. The current method for addressing this in the ESoO uses a 10POE and 50POE, but the NEG does not provide any detail how it will address the risk of a 1 in 10-year event.

## 3.7 Competitive markets

### 3.7.1 Retailer obligations

In its submission to the February 2018 NEG Consultation Draft, Engineers Australia raised concerns about the reliability guarantee's influence on smaller and mid-range retailers. A major concern was the potential viability of these retailers with an additional requirement applied to their operations, and their ability to respond to multiple simultaneous consultations.

In response to this concern, and from the concerns from many other stakeholders, the design document has a section on safeguarding competition:

*'Stakeholders have been clear in their engagement with the ESB that competition cannot be undermined through the design of the Guarantee. This was a particular concern for smaller retailers, but also for some jurisdictions and for the ACCC. The Guarantee has therefore been specifically designed to ensure it does not undermine, and may indeed boost, competition through measures that enhance market liquidity and pricing transparency in retail and wholesale electricity markets.'*<sup>17</sup>

Engineers Australia believes a focus on boosting competition and recognising this problem is a good start, and this must be followed through to the final design of the NEG.

The paper also raises the viability issue as a focus for all retailers, and raises the possibility of commercial contracts for large customers:

*'Retailers would need to impose additional costs on customers to manage the obligation without knowing whether they were ultimately responsible for the load associated with a large customer. Therefore, large customers will have the choice to either contribute directly to the reliability of the power system, or alternatively, enter into a commercial arrangement to have a retailer manage its obligation on their behalf. This should see the reliability requirement managed at least cost while providing retailers 18 (large and small) the opportunity to compete to manage the reliability requirement on behalf of large customers.'*<sup>18</sup>

As stated in the consultation draft, many retailers would need to pass on additional costs to manage the Reliability Obligation. There is the potential that this could be a challenge to remain viable for some of the smaller retailers, and it has the potential to drive up costs for consumers.

Additionally, Engineers Australia believes that there should be more clarity around commercial arrangements of large customers in managing their Reliability Obligation. It is unclear in the consultation draft if a large customer is able to enter into a commercial arrangement with someone other than their main supplier. Large customers who decide to manage their own reliability obligation will also need to consider their access to power systems engineering expertise.

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<sup>17</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 16. 15 June 2018.

<sup>18</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 17. 15 June 2018.

## 4. Emissions Obligation design

### 4.1 Emission Reduction Requirements

Engineers Australia raises some concerns about the emission reduction mechanism proposed for the NEG, because it has implications for the state-based renewable targets, and for the renewable energy industry. The NEG Draft Design Consultation Paper states:

*‘Many State and Territory Governments in Australia have also established schemes to encourage renewable energy and to reduce electricity sector emissions. State and Territory renewable energy schemes can operate with the Guarantee and contribute towards achieving the emissions reduction trajectory for the Guarantee.’<sup>19</sup>*

This outline in the Consultation Draft indicates that the state measures will not be additional to, but will substitute for, other acquisitions of renewable electricity made under the NEG. Engineers Australia raises concerns as reports already indicate that if implemented with the proposed 26% emissions reduction target, this design feature means that no mechanisms other than the Victorian Renewable Energy Target would be needed to reach the emission reduction target.<sup>20</sup> This could present a risk to current renewable projects, and to the renewable construction industry, particularly beyond 2021.

### 4.2 Calculation of load

In its previous submission to the February 2018 NEG Consultation Draft, Engineers Australia raised concerns about how the calculation of load method would work for behind the meter local sources.

The NEG Draft Detailed Design Consultation Paper addresses the calculation of load in section 3.3.3 *Accounting for generation and load*. It also has further details in the *technical working paper on market customer load*, where three options are suggested for incorporating solar PV into the scheme, a Gross Model, a RET Model or a Net Model<sup>21</sup>. All three have issues in measuring behind-the-meter sources.

For the Gross approach it states:

*‘The key challenge with the gross approach is that solar PV output is not directly metered and would need to be estimated. AEMO uses a methodology to estimate total solar PV in the NEM which could be allocated to market customers according to their share of energy but this would have the effect of giving all market customers the same proportion of solar PV and so there would be no benefit to market customers who actually have higher penetrations of solar PV.’*

For the RET approach:

*‘The RET approach, on the other hand, uses metering and billing data that is available to market customers and ensures all exports of solar PV into the NEM are included. Market customers will benefit from solar exports from their customers and thus be able to reward customers through feed in tariffs’.*

<sup>19</sup> Energy Security Board, *National Energy Guarantee: Draft Detailed Design Consultation Paper*, Page 19. 15 June 2018.

<sup>20</sup> Hugh Saddler, The Australia Institute: *National Energy Emissions Audit, Providing a comprehensive, up-to-date indication of electricity trends in Australia*, July 2018,

<sup>21</sup> Energy Security Board, *Technical Working Paper: Market Customer Load for the Emissions Reduction Requirement*, Page 11. 15 June 2018.

And for the Net approach:

*'Whilst the Option 3 (net) approach does not explicitly include solar PV, it does have an effect through the overall trend of increasing solar PV displacing grid-scale generation and lowering overall intensity.'*

The paper continues on with a slightly favorable perspective on the RET approach on balance, and because it rewards Solar PV. Questions still remain around the metering capability that captures this information.

The Gross Approach only estimates solar PV output, which could potentially be left open to manipulation. The actual metering data which would be included in the RET approach is preferred, but Engineers Australia believes there needs to be more detail about this metering. Specifically, this would be which body will administer any required metering for small-scale solar PV, consistent with the Power of Choice reforms.



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