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Energy Security Board
FAO Dr Kerry Schott AO, Independent Chair

Sent via email only: info@esb.org.au

Dear Dr Schott

Submission on the National Energy Guarantee – Draft Design Consultation Paper

Thank you very much for the opportunity to provide input into the consultation process for the National Energy Guarantee (the **"NEG"**). The twin challenges of emissions reduction and system reliability are real concerns: not only because of the increasingly dramatic impact that climate change has around the world and in Australia, but also because of the importance of a reliable electricity industry for the ongoing prosperity of Australia.

Pegasus Legal – who we are

Pegasus Legal is a boutique legal practice serving discerning international investors, developers and contractors in the utility and commercial-scale renewable energy sector out of its Brisbane and Sydney offices. The undersigned director Gerald Arends focuses exclusively on advising the renewable energy industry in Australia and overseas.

In Australia, Pegasus Legal also engages in a number of industry partnerships by virtue of which it has a particular close proximity to the market. Pegasus Legal is working in the fields of development of pumped hydro storage systems, customer-focussed renewable energy procurement consulting in the mid-scale corporate PPA sector and machine learning/artificial intelligence-based demand management solutions.

Gerald Arends is an industry leader in the renewable energy sector with a particular focus in the utility-scale and commercial-scale solar and battery installations, pumped hydro developments and demand management. He has worked in the solar industry for more than 10 years, both within the industry and in private practice. He worked on projects in more than 20 countries, most recently in Australia, Japan, the Philippines, Thailand, Taiwan, Indonesia and South Africa. Gerald also taught Renewable Energy Law within the LL.M. programme at the University of Queensland.

Gerald was assisted in producing this submission by Ashley Kerrison, manager of operations and special projects at Pegasus Legal, who is currently studying for a Masters in Sustainable Energy at the University of Queensland. Ashley is instrumental to Pegasus Legal in furthering its industry partnerships.

The attached experience statements give an indication of the breadth and depth of experience available within Pegasus Legal.

Pegasus Legal – why this submission is important to us

It is part of our mission to support the mid-scale power generation sector, which is dominated by renewable energy technologies. While we freely admit that we have some bias for renewable energy, we strongly believe that the renewable energy industry must mature into a responsible participant in the electricity sector and take on obligations that would have been unthinkable in the past, else the further increase of renewables in the energy mix will not be viable.

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Energy & Infrastructure

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At the same time, we do believe that the resolution of the twin challenges sought to be addressed by the NEG must not further entrench the incumbent operators in the electricity sector but should be structured such as to facilitate competition and the ability for new and smaller players to enter the market.

Response to the Consultation Paper

Please find our responses to the consultation questions in the Appendix to this letter. We have chosen to only respond to those question on which we believe we can make a meaningful contribution to the discussion. We will follow the discussion paper's numbering convention in our below responses.

Thank you again for the opportunity to contribute to this important regulatory development.

Yours sincerely

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APPENDIX – RESPONSES TO CONSULTATION PAPER

3. EMISSIONS REQUIREMENT: ENERGY SECURITY BOARD DESIGN ELEMENTS

3.2 Applying the emissions requirement

3.2.2 Calculation of load

What are stakeholders' views on the process to calculate a retailer's load.

We note that the ESB has recommended a market customer-based approach for the NEG (see page 4 of the 20 November 2017 Advice). We would respectfully submit that this question should note be foregone conclusion, but a question on which the industry should be consulted, unless some significant clarifications can be provided.

We appreciate that the market customer-based approach offers relatively straight-forward opportunities for the management of the NEG and, to that extent, we have no objection to this approach.

From a broader perspective, we work on the assumption (informed by our own work) that there will be an increasing range of generator/customer relationships that will be conducted off-market. In those circumstances, neither the generator nor the customer is a retailer or a market customer, but one of them may be operating under relevant exemptions granted under the NERL. It appears that the electricity traded in these relationships will not be captured by the 'emissions' component of the NEG. We would want to point out that this electricity could be both renewable energy as well as conventional power.

While the lack of liability under the emissions guarantee of the NEG might be a positive simplification for the smaller operators in the C&I behind-the-meter generation industry (including solar, battery and conventional power), we would observe as follows:

- we believe it is important to bring all market participants into the new regulatory environment (while not creating hurdles that are insurmountable for smaller operators) so that the policy certainty created by the of the NEG is a long-lasting one. If an ever-increasing market segment does not contribute towards the emissions guarantee, then there will be a tipping point at which a further change to the policy will be required; and

- we would like to understand whether the behind-the-meter generation, which in itself is not counted towards the generation portfolio of a retailer or market customer, would still be entitled to participate in the expected contract market for low-emission contracts. The NEG is set to create new market incentives for investment and this market will be more liquid if all generation assets can contribute to this market.

3.3 Contracting and emissions

3.3.1 Contracts that specify a generation source

What are stakeholders' views on the methods for determining the emissions to assign to contracts where the generation source is specified?

If the contract specifies a portfolio of plants and the plants have differing emissions profiles (e.g. some are zero-emissions plants, and some are gas plants, used for firming the variable renewable energy), how should the emissions per MWh under the contract be determined?

We note the proposal to use AEMO's Carbon Dioxide Equivalent Intensity Index (the **"CDEII"**) under the National Electricity Rules. While the use of an existing measure provides for ease of implementation and familiarity, we are concerned that the CDEII is based on a generator-based emissions factor. This does not take into account the full lifecycle emissions of either the generator or of the fuel source.

If the emissions guarantee is meant to make a meaningful and technology-neutral contribution to emissions reduction, emissions from the supply chain of the fuel source need to be taken into account, this includes the inherent CO_2-e of mining and transporting coal, as well as fugitive emissions from mining and coal seam gas.

The flipside of our position is, of course, that also renewable energy technologies must have assigned their incorporated lifecycle CO_2-e emissions. The ESB may wish to refer to sources such as the IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation (2011) for further information on this topic.

3.3.5 Unhedged load

What are stakeholders' views on how to determine the emissions level to assign to unhedged loads?

We are of the firm view that unhedged load should not attract a punitive level of attributed emission. Sourcing load in the market is a legitimate strategy for market participants. Furthermore, if the NEG is seeking not maintain or increase competition, then it should not penalise those market participants that participate in, and thereby maintain, the most liquid market, namely the spot market.

We would further request that consideration is given to the manner in which emissions are determined that are allocated to pumped hydro energy storage systems (**"PHESS"**) and battery energy storage systems (**"BESS"**). Except in circumstances where they charged by a dedicated system of a low emissions technology, the stored energy will carry with it the emissions intensity of the relevant NEM sector, increased by the round-trip efficiency of the relevant storage system. Many energy storage systems use market price volatility to charge (use energy) during periods of low prices and discharge (produce energy) during periods of high prices. If a punitive emissions amount was applied, the very systems that might assist with the reliability target of the NEG might be economically less viable.

We are supportive of the weighted-average emissions per MWh for unhedged load.

3.4.1 Carrying forward overachievement

Should the emissions requirement allow for unlimited carry-over of overachievement or specify limits on the carry-over of overachievement?

If limits are to be specified, what should those limits be and how should they be designed? For example, should the size of limits vary inversely with the size of the retailer's load? This could give more flexibility to smaller retailers.

If limits are to be specified, how should overachievement in excess of the limits be treated? Should there be a process by which it is offered to the market?

We are supportive of carrying forward overachievement. We are of the view that if an overachievement adjustment factor is applied (i.e. a factor that only allows part of the overachievement to be carried forward) a differentiation could be introduced whereby:

- no overachievement adjustment factor is applied against traded overachievement; and
- an overachievement adjustment factor is only applied if the overachievement is "banked" for future own use.

This would assist in creating a more liquid market in emissions reduction.

3.4.2 Deferring compliance

What are stakeholders' views on the deferral of compliance?

Should all retailers be able to carry forward a fixed amount or should it be set proportionally to a retailer's load? This could give more flexibility to smaller retailers than large ones. If so, would any provisions need to be introduced to prevent large retailers re-organising themselves as several smaller retailers in order to gain the benefit of the higher limit?

If the limit on deferral should be a static percentage of load (rather than varying), what percentage is appropriate? That is, what percentage would provide the necessary flexibility without substantially increasing the risk that the overall emissions reduction target would not be met?

We would suggest that a compliance deferral mechanism could be useful while the market for emissions derivatives is being established and becomes more liquid. After an introductory period, compliance deferral should be limited to a de minimis amount only. This will encourage retailers to not "cut it finely" but rather strive for over-compliance. In a liquid market, non-compliance should not be an acceptable course of conduct.

We would also note that from an environmental perspective future abatement is less valuable than current abatement.

3.6.4 Enforcement tools for emissions requirement

What are stakeholder views on the proposed approach to compliance with the emissions requirement and particular:

(a) Whether this approach provides the appropriate drivers of compliance.

(b) The type of information the AER will need to access to ensure compliance.

Other possible enforcement tools, such as increased prudential requirements or restrictions on accepting new customers while emissions requirements remain outstanding.

We very much support the ESB's proposal to focus on a culture of compliance.

To support this approach, we are of the view that all enforcement action should be published. This will facilitate public trust in the compliance process and highlight to market participants that, while the type of sanctions might have different levels of severity, non-compliance will be taken up by the AER.

***3.7* Other considerations**

3.7.1 Competitive markets

What are stakeholder views on how the Guarantee may impact on competitive market?

We are concerned that the contracting requirements might reduce competition in the market. No doubt, renewable energy generators will be seeking to sell "low emissions" derivatives to retailers and will, increasingly, come to rely on such derivatives as a revenue source. Where such contracts are not only unfamiliar but also complex, smaller and one-off renewable energy developers will be at a significant disadvantage in their negotiations with either aggregators or directly with retailers.

***4.* EMISSIONS REQUIREMENT: COMMONWEALTH GOVERNMENT DESIGN ELEMENTS**

4.2.2 Form of the emissions target under the Guarantee

Stakeholder views are sought on options for setting the emissions targets under the Guarantee?

Australia has pledged to reduce its emissions by 26 to 28 per cent. on 2005 levels of greenhouse gas emissions by 2030. We appreciate that it is beyond the remit of the ESB to allocate the contributions that each sector of the industry has to make towards achieving that target and that different sectors might provide different contributions.

We respectfully submit that the proposal by the federal government to institute a trajectory of an emissions intensity measure of CO2-e per MWh is not consistent with the requirement of an absolute reduction. Absent higher contributions from other sectors of the economy, Australia is at significant risk of failing to meet its requirements under the Paris Agreement.

While the emissions intensity target might be achieved, overall emissions from the electricity sector could still increase if increased economic activity prompted an increase in electricity demand.

4.2.4 Timing and process for setting the electricity emissions targets under the Guarantee

Stakeholder views are sought on the proposed timing for updating the electricity emissions targets, including a five-year notice period.

We are of the view that a five to ten year time horizon is insufficient to deliver lowest cost investment decisions. Most power generation assets have a long asset life and should be financed over longer periods of time. If the emissions intensity targets act as a proxy for investment requirements, such signal should be maintained for a longer forward period.

5. **RELIABILITY REQUIREMENT**

5.3.2 How should the gap be forecast?

What are stakeholder views on the length of the forecasting period?

Should the existing ESoO and MTPASA forecasting processes be adapted for determining the gap, or should a separate bespoke process be developed?

What elements of the current MTPASA and EsoO processes should be reviewed in light of the potential for the process to lead to a compliance obligation? E.g. how should AEMO treat inputs from generators such as their forced outage rate or summer capacity if these assumptions could lead to a triggering of an obligation?

Should AEMO be able to determine assumptions independently or should responsibility for the accuracy of assumptions be placed on the market participant?

How should the forecasting methodology and assumptions be consulted on?

While going beyond the ambit of the specific questions raised here, we submit that the concept of "reliability" and/or "dispatchability" will require clarification. It would be an impermissible shorthand to assign zero reliability to renewable energy generators and full reliability to conventional power generators. We assume that this is not the ESB's intention.

Recent experience in the electricity sector has shown that an aging fleet of conventional power generators would have a higher and less predictable set of outages, significantly reducing their reliability. Conventional gas generators that do not have a stockpile of fuel and that need to reserve gas a day ahead (such as Pelican Point) have very low dispatchability.

On the converse, while solar and wind generation is resource-dependent and thereby subject to weather variability, measures are being taken in the industry to improve reliability. This not only includes improved forecasting techniques, but also typical arrangements such as the oversizing of PV arrays over the inverter/transformer output – effectively solar generators accept that some output in peak production periods will be curtailed (and will be lost) in return for a steadier generation profile. We are even aware of some PPA contracting proceeding in this way, moving away from a "generation following" hedge towards a fixed output hedge.

We would submit that the reliability of a renewable generator can be modelled and that stochastic processes allow this to be converted into a numerical value. By way of example, this value of reliability should be higher if the PV generator is designed to provide for greater over-sizing and therefore more curtailment. In effect, additional generation capacity can thereby act as a, potentially cheaper, substitute for storage. This touches on one of the fundamental design flaws of the NEM as an "energy only" market with no capacity component.

We would also submit that one of the great benefits of renewable generators is their distributed placement within the electricity network. In order to compare reliability figures with conventional power stations (which are often modular but in a single location), we would submit that renewable generators could be aggregated at a regional level. The average output of all solar power generator and/or all wind power generators is by far more reliable then the output of a single generator. It is our understanding that AEMO has significant experience in forecasting system-wide wind power generation.

Please also refer to our response at 5.5 below.

5.5 **Triggering the requirement**

What trigger point would be most appropriate and proportionate to the identification of the reliability gap?

Should a multi-year gap trigger a compliance requirement in only the first year of the gap or over the full duration of the gap?

What is the minimum feasible time period for the market to alleviate a potential shortfall?

If the length of the trigger period is such that the market is not given this minimum feasible time, is it appropriate for the Guarantee to contain the flexibility to have a shorter-term trigger to provide sufficient time for the market to have an opportunity to respond to the shortfall?

Avoid technology bias

If the reliability guarantee is designed to create investment incentives into new dispatchable capacity, then a potential interplay between the forecasting horizon and compliance trigger will need to be considered as it might create an unintended technology bias:

If there was a short relevant forecasting period (e.g. 2 years) or a longer forecasting period (e.g. 5 years) and a long trigger point (e.g. 3 years), then this might create a bias towards the deployment of those assets that have a short deployment cycle. If the market was to determine that a storage solution was optimal, then this could create a bias towards battery rather than pumped hydro energy storage systems, although the latter might provide for the more cost-effective solution in the longer-term. If the market was to determine that a conventional generation asset was required, then a less efficient modular gas-fired power station might be preferred over more expensive larger deployments.

Overall, while maintaining the shorter MTPASA, we recommend basing the reliability compliance obligation on a 10 year forecasting period (with regular annual updates) coupled with a 3 to 5 year trigger point. The 3 to 5 year trigger point would allow AEMO ample time to act as provider of last resort, but would also give the market a 5 to 7 year period to close the investment gap.

3 year notice of closure

We note the ESB's concern that a 3 year notice of closure for an existing generator, coupled with a 3 year trigger period could remove the entire warning period for the market. While Alan Finkel's recommendation for a 3 year notice of closure is an improvement of the status quo ante, we would submit that the dominant position that the large generators exercised in the power generation market for a long period of time should oblige those generators to ramp down their position over a longer period of time.

The conventional power generation industry asks the renewable energy industry – legitimately – to contribute to reliability, where the share of renewables significantly increases. As a flipside and using the same logic, conventional power generators should be required "ramp down" over a longer period so that the electricity system can adjust. Such a ramp down could occur physically or contractually, where the conventional power generator would have to bear the cost of reducing system reliability.

END OF SUBMISSION