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# Underwriting New Generation Investments

Engineers Australia Submission to the Australian  
Government Consultation

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# Introduction

## About Engineers Australia

Engineers Australia is the peak body of the engineering profession. We are a member-based professional association with about 100,000 individual members, many being electrical power systems engineering experts. Established in 1919, Engineers Australia is a not-for-profit organisation, constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community. Our members are governed by our code of ethics, using our knowledge and skills for the benefit of the community, ahead of personal or sectional interests.

## Engineering expertise

Power systems engineering experience is crucial to the success of Australia's electricity systems, as they have the technical ability to identify and support stable and secure power systems operation. At a time when Australia's electricity system is facing increasing complexity, sufficient engineering expertise is required at all levels to ensure a secure and stable system.

## The public consultation paper

Engineers Australia welcomes the opportunity for stakeholders to respond to the public consultation paper. 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>1</sup>.

Engineers Australia recognises the challenge of formulating policy within a market and regulatory environment that will enable an orderly transition of the electricity system towards minimum cost, without compromising reliability. Engineers Australia has previously addressed issues surrounding the electricity system in a number of submissions<sup>2</sup>.

The consultation paper highlights an emerging problem which is already affecting Australian industries and the wider economy, which is the increasing cost of energy, which has reduced international competitiveness and seen concurrent rises in domestic prices. Engineers Australia commends the government for addressing this issue.

This submission from Engineers Australia will address the issues associated with attracting investment and provide short responses to the consultation questions.

## Key messages

- Sufficient technical expertise, including the role of power systems engineers must be considered when appointing experts.
- Long-term energy and climate policy is required for policy stability in the electricity sector, and this will help to drive investment.
- Consistency with other policy initiatives and reforms such as the Integrated System Plan and the Retailer Reliability Obligation is required when considering any new generation project.
- All options for firming capability should be considered, not just generation projects, as stated in the consultation paper program objectives.
- Careful consideration must be taken when assessing capacity payments or capacity markets as this was previously addressed in the Finkel Review.

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<sup>1</sup> Engineers Australia, Climate Change Policy, November 2014.

<sup>2</sup> Engineers Australia, Submissions to Government. <https://www.engineersaustralia.org.au/Government-And-Policy/Submissions-To-Government>

# The aim of the consultation paper

## Attracting investment

Australia has been lacking a stable energy policy for almost a decade. It is unclear where the current consultation paper for *Underwriting New Generation Investments* connects with the governments previous energy policy proposal of a National Energy Guarantee (NEG).

Engineers Australia raised some concerns about the NEG in previous submissions, however could see that the policy had potential to provide solutions to addressing the energy trilemma, and would provide much needed policy stability. Policy stability creates an environment which attracts new investment, and this should be a priority issue.

Engineers Australia believes the government must re-open policy discussions about a national energy policy, and this policy must address security and reliability, affordability, and emissions reductions.

## Future demand trends

Future demand trends must be considered when assessing mechanism for attracting new investment, or underwriting any generators that can provide firm capacity. This includes the participation of prosumers and the role of solar PV in the energy market. Although the current role of the prosumer is relatively small, this consultation needs to address the expected significant and rapid technological change.

The role of the prosumer in the electricity market is expected to increase alongside the rapid reductions in the cost of battery storage and the rise of information technology in the energy system. This is expected to result in 41% of installed capacity being shifted to behind-the-meter by domestic and industrial prosumers by 2030, which will supply 17% of electricity demand<sup>3</sup>, a substantial proportion of electricity supply in Australia.

## ACCC Recommendation 4 and other policy initiatives/reforms

In the consultation paper, it is specified that Government is acting on ACCC Recommendation 4 from the report *Restoring electricity and affordability and Australia's competitive advantage: Retail Electricity Pricing Inquiry* as the basis for addressing market failure. Specifically, the Government is developing this program to underwrite new generation projects that meet its criteria.

One criterion point has gained particular prominence in the consultation paper which is:

*To qualify, a proposal must be capable of providing firm product so that it can meet the needs of commercial and industrial customers.*

The government has stated that it is concerned about the level of firm or firmed capacity available in the market. It states that:

*The firmness of the additional supply does not need to be provided through the supported generation project, but could be through any combination of generation, storage, demand response and financial contracts packaged through a retailer or other brokerage service provider.*

More clarity is required to see where the program objectives align with the Retailer Reliability Obligation which was originally developed as part of the NEG. The Energy Security Board (ESB) is

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<sup>3</sup> Annabel Wilton. August 1, 2018. Bloomberg New Energy Finance. *Australia's distributed energy future*, Australian Clean Energy Summit 2018.

continuing work to progress development of draft National Electricity Law amendments that would give effect to the obligation. Reading the paragraph above from the consultation draft, it seems that this firm capacity would already be covered by parts of the provisions in the Retailer Reliability Obligation.

In the consultation paper listed under *Program Objectives* the paper notes that:

*The design of the program will also consider interactions with other initiatives to improve reliability and security, including the proposed Retailer Reliability Obligation and AEMO's Reliability and Emergency Reserve Trader.*

The design of the program should not only consider the Retailer Reliability Obligation; it should align unconditionally with this obligation. The inclusion of the obligation is not mentioned any further in the consultation paper. In the COAG Energy Council 20<sup>th</sup> Meeting Communique<sup>4</sup> it is stated that:

*The Retailer Reliability Obligation will ensure enough of the right resources will be available to meet demand in the NEM particularly in regions with limited access to dispatchable generation. If the right investment does not come forward to address forecast supply shortfalls, this would trigger an obligation on electricity retailers to demonstrate they can meet their share of this peak demand.*

There needs to be more clarity in the consultation about how this firmness requirement will match with the Retailer Reliability Obligation set by the Energy Security Board. Whilst the Retailer Reliability Obligation also considers the 10-year forecasting horizon in the Electricity Statement of Opportunities, it specifically articulated action to be taken if there was a reliability gap. The ESB previously acknowledged in its advice that any reliability gaps within years 0 to 5 should be addressed by the Retailer Reliability Obligation<sup>5</sup>.

Engineers Australia notes that this proposal focuses on years 6 to 15. Although it is a different period, the framework should be consistent with the Retailer Reliability Obligation, in particular "Qualifying Contracts" and any new supply that may be commissioned as a result of the Retailer Reliability Obligation.

Furthermore, the Australian Energy Market Operator (AEMO) states in the *2018 Electricity Statement of Opportunities (ESOO)*:

*This highlights the need for a portfolio of resources including renewable generation, flexible thermal generation, storage, transmission augmentations, and demand response to close the reliability gap at lowest cost to consumers. The ISP portfolio development plans would be sufficient to maintain reliability.*

AEMO already sees the Integrated System Plan (ISP) as sufficient to maintain reliability. This raises the question about the urgency of this project to seek contracts signed in the short term. It would not be an ideal scenario to end up with an oversupply of capacity in the system.

Planning is a critical step when considering the underwriting of any new projects. Future planning documents such as the ISP are integral to considerations about future supply matching demand, and sufficient power systems engineering expertise is required at the planning level to ensure optimal outcomes.

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<sup>4</sup> COAG Energy Council, 26 October 2018. 20<sup>th</sup> Meeting Communique.

<http://coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/20th%20COAG%20Energy%20Council%20Communique.pdf>

<sup>5</sup> Energy Security Board. August 2018. National Energy Guarantee Reliability Requirement Pre-Condition Options. <http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/Reliability%20obligation%20pre-condition%20options.pdf>



## The way forward

The consultation paper notes in the section *The Way Forward* that the Government will be seeking expert advice on proposals put forward:

*The Government will be considering appoint experts to provide advice on parts of the proposal*

Engineers Australia believes that sufficient technical expertise, including the role of power systems engineers must be considered when appointing experts. Engineers have extensive technical knowledge of the electricity system, and how to operate it in a secure and safe environment, and therefore engineering expertise must be part of any expert panel.

## Question 2 for stakeholders

*Are there any alternative options, eligibility/merit criteria, and requirements that should be considered?*

Engineers Australia firstly raises the point that the criteria/requirements must align with the program objective, and this must include all options which can achieve the objectives. If the objective is for firm generation, then there should be no distinction between new generation which is considered firm, and the option to add firming to existing generation which is currently not considered firm. Both appear to equally meet the objective of more dispatchable generation.

In response to this question Engineers Australia will also raise some additional eligibility/merit criteria which should be included in the program, being emission reduction targets, and system security.

### Emissions reduction targets

The Consultation paper lists emissions targets as part of its project eligibility criteria in point d):

*d) The project would be unlikely to result in an increase in electricity sector emissions to a level that is more than minus 26 per cent of the sector's 2005 levels by 2030*

Engineers Australia believes that emission reduction targets should be listed as project eligibility criteria, and supports this inclusion. The latest IPCC Special Report on Global Warming of 1.5°C<sup>6</sup> has highlighted that large-scale government action is required to avoid dire consequences.

Engineers Australia believes stronger emission reduction targets should extend to the merit criteria in this project.

As a major contributor to Australia's greenhouse gas emissions, the electricity sector should play more than a proportionate role in the meeting of greenhouse gas emission reduction targets in meeting our international commitments at Paris COP21. Criteria with stronger emissions reduction options, can assist in the electricity sector taking the lead in emission reductions. It is easier to reduce emissions in the electricity sector, and this has benefits to reductions in other sectors that rely on electricity such as transport.

### System security

The consultation does not list system security settings as part of its project eligibility criteria. In the project merit criteria, it does state under point d):

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<sup>6</sup> IPCC. 2018. Global Warming of 1.5°C. <http://www.ipcc.ch/report/sr15/>

#### *d) The impacts on reliability and security of interconnected electricity networks*

Engineers Australia believes that when assessing reliability, system security settings must be considered as project eligibility criteria. The project merit criterion above also seems to only consider system security through the lens of firm and firmed capacity in the system, which is outlined in the consultation paper as an objective of the program:

*Improves reliability and security by increasing the level of firm and firmed capacity in the system*

Essential security services are missing from the current program objectives, and subsequently missing in the eligibility criteria. Essential security services are synchronous inertia, system strength and voltage management.

One of the key requirements of the Independent Review of the Future Security of the NEM (Finkel Review) was to establish a secure and reliable NEM and this included addressing essential security services<sup>7</sup>. Not including them in as part of eligibility criteria is a critical oversight. It is likely that Australia will face a rapid transition to inverter connected generation due to renewable energies, and system security needs to be addressed as many different thermal generators retire<sup>8</sup>.

Engineers Australia strongly recommends that consideration of essential security services must be included in the proposed eligibility criteria.

## Question 3 for stakeholders

*What are the key risks in relation to energy markets and investment associated with the various options?*

In this section, Engineers Australia will comment on one of the proposed mechanisms for attracting investment.

### **Capacity payment**

In the consultation paper the Government raises the option of *Capacity payments* and under this section states:

*Under this mechanism, the Government could support the generation projects by providing capacity payments for the availability of firm or firmed generation.*

Engineers Australia also notes the mention of capacity mechanisms in the recent the COAG Energy Council 20<sup>th</sup> Meeting Communique<sup>9</sup>.

In the Preliminary Finkel Report the option of capacity payments was raised. The report however, highlighted some issues which exist with capacity payments:

*Designing and operating capacity markets can be challenging. It requires operators to predict future electricity demand. Projections can therefore result in under or overinvestment in*

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<sup>7</sup> Independent Review into the Future Security of the National Electricity Market: Blueprint for the future, Final Report, June 2017.

<sup>8</sup> The changes that need to be managed include supply-demand adequacy with frequency regulation, system stability and quality of supply. Reduction in system inertia is a challenging engineering problem.

<sup>9</sup> COAG Energy Council, 26 October 2018. 20<sup>th</sup> Meeting Communique.

<http://coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/20th%20COAG%20Energy%20Council%20Communique.pdf>

*generation capacity. Overinvestment can increase the prices paid by consumers. In addition, capacity markets can limit innovation in the event that all options to meet supply, including demand response, are not considered consistently.*

Further, Engineers Australia notes the following comments from the Final Finkel Report:

*A capacity market is a significant market reform, which would require a long-term and costly departure from the existing market framework. Such a reform should only be considered in circumstances of irresolvable failure of the energy-only market to bring forward sufficient new capacity to ensure reliability. Given the more immediate nature of the reliability concerns facing the NEM, as well as the adequacy of other policy reforms available, the Panel does not believe a move to a competitive capacity market to be appropriate at this time.*

Engineers Australia believes careful consideration must be used when considering capacity markets or capacity payments, as the Finkel Review has highlighted some undesirable outcomes of this option.

## Question 4 for stakeholders

*Please provide additional feedback that may impact the Governments Program*

In this section, Engineers Australia will provide some additional feedback to this consultation.

### Project scope

The consultation paper mentions in the *Program Objectives* that:

*The program will offer a level playing field to enable the best and lowest cost generation options to be supported.*

And later goes on to say:

*The firmness of the additional supply does not need to be provided through the supported generation project, but could be through any combination of generation, storage, demand response and financial contracts.*

This would suggest that the Government would support the inclusion of any project which could assist with firming capacity and managing demand that would lower costs, broader than generation options alone. AEMO makes this clear in the 2018 ESOO:

*Firming capacity can be dispatched to maintain balance on the power grid. It can include generation on the grid, storage, demand resources behind the meter, flexible demand, or flexible network capability.*

Therefore, any underwriting framework should be extended to include mechanisms such as storage and demand response in addition to generation per se.

Other options which can assist with managing demand and firming capacity include interconnectors and network options. Energy efficiency and demand response may also have an impact on the long-term viability of any new generation project, and will need to be considered when managing demand.

### Interconnectors and network solutions

Looking at a national strategic approach, interconnection and network solutions would merit further consideration as these are options which can provide firming capacity, and can assist in system



security and reliability. One of the biggest strategic issues facing the NEM is managing the remaining high-capacity coal-fired power stations, most notably the major stations reaching the end of their economic lives in New South Wales and Victoria.

The ESOO states that:

*Transmission augmentations and new lines, as recommended in the ISP, would reduce the need for more dispatchable capacity by alleviating transmission congestion, leveraging resource diversity, and maximising the value of the existing generation fleet.*

As many of Australia's newest and lowest-emitting power stations are located in Queensland, this capacity could become available to meet any expected capacity shortfalls in the other states of the NEM through interconnectors.

Further consideration could also be given to meshing the NEM, so that there is added resilience in the system due to weather events, as well as help direct flows to minimise transmission losses, benefiting all regions of the NEM. Meshing scoping options can also be broad enough to consider the complimentary planning of Renewable Energy Zones (REZ) in a way that optimises these zones to service the entire country.

Another issue that it appears needs to be addressed is the pricing of interconnectors, where those interconnectors provide the ability to firm up generation in other NEM regions. While it is possible that investment in interconnector development could be assessed as economically justified through the application of the RIT-T, the current cost recovery mechanism for those investments sees all costs being borne by the customers of the interconnected regions.

It is quite possible that the benefits of this firming capacity could be more widely spread across the NEM. In the absence of a cost recovery mechanism for new interconnection that recovers revenue from all jurisdictions benefitting, it is possible that efficient transmission development will not proceed due to the disproportionate cost impact on consumers of one or more jurisdictions.

## **Energy efficiency and demand management (response)**

Energy efficiency has already played a major role in the reduction of demand in energy consumption, and energy efficiency may affect the long-term viability of generation projects as it could further reduce demand in the system.

Energy efficiency will also have the ability to reduce emissions, and this means that it should be considered alongside policies which require emission reduction targets. The built environment alone has the potential to reduce projected emissions in half by 2050, and more than a quarter of the national emissions target.

Curtailling of demand should also be given equal priority to creating more supply. Every Kilowatt hour saved does not need to be generated, and it is usually cheaper to save energy than to install new generation capacity. The broad uptake of new technologies must be considered as it has the potential to influence a new project.

A system of demand response, where voluntary consumers agree to have power cut for agreed time intervals to certain appliances or equipment, can also help AEMO stabilise certain areas of the grid. It has the added benefit of being more flexible than a fast-response battery as it can be used on the best locations with extremely fast response.



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