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Australian Energy Markets Commission
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Re: Response to AEMC 2017, Reliability Frameworks Review, Issues Paper, 22 August 2017, Sydney

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Infigen Energy (**Infigen**) appreciates the opportunity to provide a response to the AEMC's Issue paper on the **Reliability Frameworks Review 2017 (Review)**.

Introduction to Infigen Energy

Infigen is a business actively participating in the Australian energy market. It is a developer, owner and operator of generation assets delivering energy solutions to Australian businesses and large retailers.

Infigen has 557 MW of installed generation capacity across New South Wales, South Australia and Western Australia with a further 113 MW under construction in New South Wales. It sells the electricity and Large-scale Generation Certificates (LGCs) through a combination of medium and long term contracts and through the spot market.

Infigen is looking to diversify and expand its customer base and will grow its generation portfolio in response to strong price and investment signals. In the short term it is targeting expansion in New South Wales and entry into the Victorian and Queensland regions of the National Electricity Market. Infigen will seek to do this through sales of electricity and LGCs and construction of assets within its development pipeline in those regions. Infigen is also developing innovative products with large customers.

Infigen agrees the Australian community needs an energy system that effectively balances price, reliability, security and manages the transition towards lower emissions (**Objectives**). Infigen notes that there are many factors that need to work together in order for the Objectives to be met including predictability and appropriate settings on policy (including gas, emissions reduction), competition in the market, market signals that result in the right mix of generation at any point of time in any region including retirement and investment, effective transmission investment and clear governance.

Infigen acknowledges the current market design and broad policy settings from Governments are not meeting and balancing these Objectives and that something needs to change. Infigen welcomes the Review and believes it offers the chance to reset the system. Infigen cautions however that in order to avoid unintended consequences that all elements of Objectives are considered together.



Infigen's responses to the questions posed by the Review are outlined below. Where Infigen has not responded to a question Infigen broadly supports the approach and considerations put forward by the AEMC.

Question 1 Assessment Principles

- a) Do stakeholders agree with the Commission's proposed assessment principles?**
- b) Are there any other relevant principles that should be included in the assessment framework?**

Infigen agrees the five proposed assessment principles outlined in the Issues paper are appropriate. Infigen recommends two further assessment principles as outlined below be considered.

1. **Promotes or facilitates competition:** The NEM was created at a time where retail and generation businesses were quite separate and effective competition therefore existed. Over time, in response to the need to better manage risk, the market has become more vertically integrated and more concentrated. The ACCC has outlined and made numerous comments to this effect. It is therefore important that future market settings encourage further competition. Infigen proposes that the AEMC considers the effect on competition of any future market re-design. As the AEMC has identified competition is required in order to have a liquid contract market. This will ensure diversity in decision making on future investment and ultimately drive the most efficient outcome for consumers.
2. **Meets community and customer expectations** – Fundamental to the design of the NEM is for periods of high price or low price to drive investment or retirement of assets. Since its inception, other than for very short periods (1-2 years) the NEM has largely been in oversupply. This has now changed. Access to cheap fuel, either gas that previously couldn't be monetised given there was no external market, or access to low cost coal has ceased. Portfolio bidding also now occurs, which can result in higher prices that might otherwise prevail if there was less integration/concentration. Further to this, investment cycles have lengthened, i.e. the market's ability to respond to high prices over a 1 -2 year period is low because to develop a gas plant is likely to take up to 5 years (when including access to gas and transport), to develop coal is up to 7 years, to develop pumped storage is likely to be greater than 5 years, and to develop renewables with sufficient storage is 3-5 years¹.

Prolonged periods of high prices are not acceptable to the community - either the householder or business. Like those that invest in generation, householders through their appliances and businesses through their equipment operate on longer term investment cycles. A system that is designed with long periods of very high prices or long periods of very low prices will not be a very effective or efficient system. Infigen proposes the principles provide explicit recognition of the need to meet community and customer expectations.

¹ These timeframes are provided without reference to the appetite of investors or financiers to fund the generation type

Question 4 Options to incorporate intermittent generation

- a) Do stakeholders consider that facilitating additional dispatchable generation, or facilitation of more flexible energy sources, or a combination of both, can more easily achieve the aims of better incorporating intermittent generation into the NEM?**
- b) What outcomes do stakeholders consider are necessary in order to better incorporate intermittent generation sources into the NEM, from a reliability point of view?**
- c) What factors should be taken into account when considering a Generator Reliability Obligation?**

In framing Infigen's response to the questions posed by the Review Infigen notes:

- The retirement of coal is inevitable. The existing coal fleet is ageing. The fleet will retire because fuel costs are increasing, fuel reserves are depleted or becoming more expensive to extract, equipment and workforces are ageing and overhaul costs and asset failure rates are increasing as equipment ages. At about 50 years coal assets will reach either their technical or economic life;
- Replacing the full coal fleet with Ultra-supercritical coal will not meet the Objectives because low cost coal resources are limited and HELE plants still have relatively high emissions. Some limited replacement of capacity may occur;
- Coal will play an important part in providing reliability and security, particularly as the market transitions from these larger scale investments into more distributed smaller scale generation types;
- Reliability and security challenges are being driven less by the emergence of new entrant technologies but more by the retirement of coal plant;
- Business models are evolving as the market is evolving, e.g. the long term PPA model is less of a feature in the market, aggregators of behind the meter are starting to exist at scale, the Power of Choice program will enable innovative pricing and deeper demand response;
- These new business models will support reliability if an appropriate market structure is in place;
- Interventions by Governments will remove the incentive and willingness to innovate and invest.

With the impending retirement of the existing coal generation fleet there is a need to ensure new generation types are facilitated into the market. This facilitation can take varying forms such as enhanced transmission access, low cost financing, re-design of market rules, increasing and supporting competition. A single form of facilitation is unlikely to be sufficient given the breadth of potential technology types and their characteristics. However in combination these solutions can deliver the reliability required in the market if the transition is managed in an orderly manner.

Infigen notes the AEMC's is considering the implementation of the Generator Reliability Obligation (**GRO**) as recommended by the Finkel review. Infigen's strong view is that reliability is a system issue that should be sourced and paid for on a system wide basis. The proposed GRO is attempting to ensure, upon the announcement of a coal plant retirement (the most likely cause for triggering a risk to dispatchability) that the next new entrant will be required to ensure that its generation will have (or deliver) an element of firming for its project to proceed. Infigen believes the more likely outcome in such a situation is that the next new entrant, which is being

asked to bear the cost of reliability for the market, will simply not invest and therefore the risk to dispatchability will ultimately arise regardless. Infigen is firmly of the view there are better market mechanisms to meet the Objectives and looks forward to future papers exploring these more deeply.

Infigen provides some questions to be considered in the design of a GRO should the AEMC wish to consider the matter further:

- When will the GRO trigger? Once it has triggered does it remain in place forever or until new capacity is built? How and when does it reset?
- If the mechanism is one of last resort, which it appears to be how is the market otherwise being re-designed to ensure it operates in advance of the GRO?
- How can AEMO be confident that once the mechanism triggers investment actually occurs?
- What other/better market mechanisms exist to reflect the market obligation resulting from the retirement (which is occurring due to age) e.g. capacity or ancillary service markets, that could provide greater confidence the required investment will occur?
- How much firming is required e.g. how much capacity?
- Is this capacity relative to the market or a new entrant's nameplate?
- How many hours will it be needed? (noting this will most likely change over time as technologies and the mix of capacity changes)
- Will it apply to all projects equally in a region?
- Will firming be attached to the project location or flexibility be provided in the location, noting there will be a best fit location for the network that may not be at the renewable entrant's site?
- If new capacity is required over what duration will it be required, e.g. 5 years to enable new technologies to develop, 15 years consistent with the suggested payments received under the CET or for the life of the project?
- How does the mechanism ensure the last new entrant isn't penalised for the decisions and actions taken from the previous ones e.g. the obligation may result in a race to be the first new installed renewable to minimise the risk of increased project cost through firming?
- How will the GRO link with the retirement notice recommendation/requirement?
- What implications will exist for the participant that provides a retirement notice, triggers the GRO, and either withdraws or amends it? How do you make any implications sufficiently punitive to deter gaming of the system?
- How, in an environment, where the vertically integrated controls the retirement decision of the most material generation plant in the market, they don't use this to ensure at a practical level they are the only ones who can invest and plan to invest with confidence?

Question 6 Interconnectors

- a) **What role can interconnectors play in relation to reliability?**
- b) **What factors should the Commission consider in this regard?**

The new energy market will be far more distributed and unscheduled, both in terms of;

- a) local household and business generation and storage; and
- b) renewable and gas generation that isn't located where the current transmission network exists.

Enhancing the interconnectors and transmission more generally will enhance reliability. The cost relative to the alternatives must be considered however. The Transmission Network and the frameworks that support it, such as the RIT-T, will need to be amended. Finding the balance between long term infrastructure investments versus the potential for growth in small scale distributed sources will be important, i.e. where investment takes place it should seek to connect not a project but a collection of projects to offer scale. The Queensland Government Clean Energy Hub is an example of how a transmission investment, which could not be sponsored by proponents individually, is able to unlock the scarce wind resources in Queensland. Wind resources being essential to complement the more plentiful solar resources in that region.

The following questions should be considered by the AEMC in determining the role interconnectors and transmission more broadly can play in relation to reliability:

- How is reliability valued? Is the unserved energy target of 0.002% still consistent with community expectations?
- How is long term transmission investment balanced with enabling innovation? How do you ensure assets don't become stranded?
- Should governments, the customers or some other market mechanism fund investment that delivers reliability? Are there bodies, such as Infrastructure Australia, better placed to consider these long term investment decisions?
- Is there some economy of scale to be obtained in the investment?
- What's the diversity and complementarity of the generation resources being unlocked?
- How does the generation unlocked assist system reliability and security within the region and across regions?
- How are electrical losses minimised? Should DC links be considered?
- To what extent is gas and electrical transmission considered together or separately? Is there value in complementary transmission investments?

A further matter the AEMC may consider is what amendments could be made to the RIT-T and RIT-D tests reflect the new norm - a more distributed rather than centralised energy system.

Question 7 Contract Market

- a) **Is generation and load becoming more capable of varying production and output in shorter timeframes, and if so, what will be the role of contracts?**
- b) **The proportion of intermittent generation in the market is increasing. Caps and swaps have traditionally been sold by dispatchable generators, which can turn on or off at will to 'back' their contractual obligation? How will the volume and types of contracts traded change as the generation mix evolves? Will this have implications for reliability?**
- c) **How significant is the demand-side in driving behaviour in the contract market?**
- d) **Over time, spot prices may become increasingly decoupled from domestic demand. More and more, spot prices may come to be driven by relatively unpredictable natural forces (wind and sunshine), as well as by movements in international markets (like demand for gas). How will this affect the role of prices in supporting reliability through domestic investment and operation?**

Generation and load are becoming more capable of variable production, output and consumption. Customers have more ability to generate behind the meter and control their energy usage than ever before. This will increase as the Power of Choice measures continue to be implemented, innovative tariff choices evolve and large customers invest more in demand side management. Likewise, smaller scale generation plant with intermittent output will also continue to be delivered in response to the retirement of coal. Faster response technologies, such as batteries will become more widely deployed.

Contracting is an important part of the market. In most circumstances some level of contracting, either medium term or long term, is required before investment occurs. Debt and equity providers want a level of certainty, within an appropriate risk appetite, before they will invest in a project. This applies no matter the generation type. Coal and gas plants have required very long duration contracts for fuel and transport (10 – 20 years) in order for investment to occur.

To date run of wind PPA contracts have not created incentives for large scale intermittent generation to develop firming options. This is because retailers (the predominant off-takers) have been willing to accept the risk of intermittent generation given the firming capacity they have within their portfolios. They also have had a greater need for the certificates to meet legislated liabilities.

A critical matter for the AEMC to consider is whether sufficient competition in the market exists. No matter what obligations may or may not be applied to the intermittent generator the contract market will only have sufficient liquidity if there is sufficient competition, i.e. there is risk in the market and numerous parties operating in it.

Market and policy design features will materially impact the level of competition. For example, if a Clean Energy Target ("CET") was to evolve and place the liability on the retailer this would ensure a consolidation of most of the future renewable build under the retailers. If the design features are right and they don't reinforce current market dynamics, sufficient market liquidity will enable new business models to evolve. Models such as the battery aggregators will exist, providing they can access sufficient capital and there are sufficient counterparties.

There are many factors that will impact the future shape of the contract market. Many of the proposed rule changes have the potential to positively or negatively impact the market including:

- 5 minute settlement rule change – potential to change types of contracts and the number and type of party offering them;
- Strategic Reserve, Day-ahead markets, Contingency events – potential to lower the price risk for market participants and thus reduce the appetite for contracting and/or the price offered to underpin the investment;
- Application of the liability for the CET on the retailer – lowers the numbers of contracting party and thus reduces liquidity; and
- Demand side management – the potential to increase liquidity in the market i.e. more parties offering services across distributed locations.

The contract market is an output of these market and policy design features. Every decision should be made being cognizant of it and a collective assessment of the impacts should be completed before conclusions are drawn on whether action should or should not be taken to enhance it. At all stages action should not be taken that ultimately limits competition.

Question 8 External Factors

- a) **What external factors (that is, not the contract or spot price) are influencing investment, retirement and operational decisions in the NEM?**

There are many factors that influence investment, retirement and operational decisions in the NEM. These vary by fuel and technology type. These include the factors listed by the AEMC such as emissions policies, government interventions and external linked fuel prices.

Other factors will include:

- **Asset based factors** - such as
 - when do major fuel and transport arrangements expire,
 - how long would they need to be extended for,
 - how much investment is required to keep the plant and/or mine operating,
 - what economies of scale are lost if a partial closure of a site were to occur,
 - are there sufficient capable staff to manage the asset longer term,
 - what does closure mean in relation to the incurrence of rehabilitation costs;
- **Portfolio based factors** – such as
 - an entity's long or short position in the region,
 - if short, can it be covered from other regions,
 - if long will the price uplift from removing the generation offset the volume loss,
 - what other investment does it enable, e.g. does it allow a gas field development that otherwise wouldn't have been developed,
 - does the entity have any single large load customer risk that may result in the need for generation not existing,
 - does it fit with brand and customer retention strategy;
- **Investment climate factors** – such as
 - how much certainty is there in the market and policy settings,
 - what is the chance they will change and by how much, what is the upfront capital contribution,
 - how long is the life of the investment and how long is it until a payback occurs,
 - how much funding is available, at what price and with what debt conditions,
 - how predictable are the revenue streams, i.e. are contracts available and of what duration are they being offered, does the investment meet the risk and return criteria of the equity investors,
 - the entities tax position.

It is the combination of these factors that will ultimately determine whether investment takes place, how that investment either existing or new operates and at what point it retires. Bringing certainty within a sensible set of market and policy settings provides the framework in which entities can balance investment decisions. It places back in the entities hands things which the entity rather than Government or Regulators are better able to control and risk manage.

Questions 10 – 17 Intervention aspects of the reliability framework

Infigen acknowledges the importance of intervention mechanisms as last resort mechanisms, they act as a “safety net” in the event the market has failed due to whatever cause. Infigen accepts that the market, until a market re-design takes place, may rely more heavily on these intervention mechanisms. Infigen also notes whilst intervention mechanism may be more heavily relied on in the short term they should not ultimately be seen as a replacement for the foundation market mechanisms. Whilst not provided specific comment on each question posed by the AEMC Infigen encourages the AEMC to ensure that when and if enhanced measures are put in place that they are firmly time limited, i.e. the use of them expires with normal market mechanism driving decisions from that point. As noted in previous sections predictability within an appropriate set of policy settings is important if investment is to occur.

We thank the AEMC for providing the opportunity to comment on the Issues paper for the ***Reliability Frameworks Review 2017***.

As discussed throughout the response Infigen is of the view that the Reliability Frameworks need to be modernised to reflect the future market, one where generation is more decentralised and customers have more control over their energy use. Deeper consideration of the impact of sustained high or low prices on the community, ensuring a robust level of competition, enhancing interconnection and developing market mechanisms to support reliability and security through transition will result in a market that meets the key objectives of effectively balancing price, reliability, security and managing the transition towards lower emissions

Infigen looks forward to engaging in the Review as it progresses. Please feel free to contact me directly in relation to Infigen’s submission.

Yours sincerely,



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