epicenergy

Our Ref: ElectraNet PSCR Submission
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27 February 2017

Hugo Klingenberg
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By email (consultation@electranet.com.au)

Dear Mr Klingenberg,

Re: Submission to ElectraNet's South Australian Energy Transformation RIT-T: Project Specification Consultation Report

Please find attached Epic Energy South Australia Pty Ltd's submission to the above report.

We would welcome the opportunity to discuss further the contents of this submission should you deem it appropriate.

Yours sincerely

Reynard Smith
General Manager, Strategy and Commercial

Background

Epic Energy South Australia Pty Ltd (EESA) is supportive of the South Australian Energy Transformation (**SAET**) project being undertaken by ElectraNet and agrees with its purpose of identifying solutions that will facilitate South Australia's energy transformation focused on lowering prices, improved system security and the facilitation towards a transition to lower carbon emissions environment.

EESA is also appreciative of the consultative, inclusive and transparent manner in which ElectraNet has undertaken its review of available options. It is fair to say that global electricity markets are on the verge of significant transformation and the advent of cost efficient clean energy technologies, underpinned by growing environmental consciousness across social and political areas, has led to the emergence of a significant and permanent rise in renewable energy generation. Most regions are at the early stages of this transition with a few jurisdictions however the frontiers, amongst them, Denmark, Germany, California and South Australia[1].

EESA is of the view that policy makers and market participants in South Australia have an obligation to play an enabling role during this energy transition in order to design and implement solutions that are holistic in scope, long term in vision, environmentally sustainable in nature and economically efficient in operation. Ultimately, the common objective is to provide the people of South Australia with affordable, reliable and low carbon emission energy.

Noting the specific technical content in the reports you are seeking feedback on, EESA has taken a broader contextual view and provides the following comments/queries for consideration.

While the majority of network based options have been thoroughly investigated as part of the Project Specification Consultation Report (**PSCR**), and noting that the supplementary information paper was only released on the 13 February 2017, our preliminary assessments to date suggests that a more thorough assessment of non-network based options should be undertaken. EESA believes that it is critical for an independent expert to review and expand the full suite of non-network options, including their relative benefits and drawbacks.

Outlined in this submission are a number of issues that EESA requests ElectraNet to consider and report on, in the context of progressing the RIT-T process.

1. Enhanced competition between generators – questionable as an 'Identified Need'

The PSCR identifies three factors underpinning the proposed identified need: facilitation of the transition to lower carbon emissions, provision of security of electricity supply in South Australia and facilitation of improved competition between generators in different regions. While the first two factors are inherent to the purpose of the SAET, adequate inter-regional competition in electricity generation already exists.

The focus of the SAET needs to include increased security of electricity supply and transition to lower carbon emissions, but note that these objectives should be met in the most economically efficient way. With four independent generation companies currently operating

[1] REN21, 'Renewables 2016: Global Status Report', 2016, p. 34.

nine separate synchronous power stations in South Australia, it remains the view of EESA that sufficient competition already exists in the market. This point seems to be supported by the lack of ACCC concern regarding the South Australian market structure. Furthermore, the importing of cheaper Victorian/NSW coal fired generated electricity would go against the objective of lowering carbon emissions and further marginalise the competitiveness of existing under-utilised gas fired generation in South Australia, which is significantly lower in its carbon emissions than coal pushing them out of the market.

This is then likely to result in further reliability issues as South Australia magnifies its reliance on imported electricity from regions that are themselves going through an energy transformation shift to increased renewable generation, going against one of the objectives of the SAET.

2. Identified Need regarding system security must consider AEMO FPSS recommendations and the Finkel Review on the Future of the National Electricity Market

EESA understands that AEMO is currently undertaking its Future Power System Security (**FPSS**) program which has identified a number of energy security challenges to date. It is expected that AEMO will make recommendations regarding the most effective methods to strengthen system security, which should be comprehensively taken into account before ElectraNet's RIT-T can be completed.

Furthermore, with the current Finkel Review into the Future of the National Electricity Market looking specifically at developing a future blueprint focused on ensuring affordable, reliable and lower carbon emitting energy well advanced, consideration should be given to allowing this important piece of work to be completed and factored in before the RIT-T can be fully assessed.

3. South Australian merchant prices – questionable comparisons with NSW and Vic prices

The PSCR highlights that one of the needs for increased interconnection between South Australia and other eastern states is the forward merchant price delta: approximately $100/MWh in South Australia and $55-65/MWh in New South Wales and Victoria.

The primary reason for this difference is the significantly higher portion of coal fired generation in New South Wales and Victoria relative to South Australia. If increased utilisation of coal fired generation is the underlying driver for the economic benefits from interconnection, similar (and potentially greater) benefits could be obtained through the construction of new coal fired generation in South Australia (EESA does not endorse this option), and even greater benefits from the utilisation of existing gas fired generation in South Australia.

EESA believes that any comparison must be considered in the context of the future pricing considerations in each state as NSW and Victoria move towards a larger percentage of renewables. This is supported in EESA's view by the change in forward pricing seen in Victoria post the closure announcement of the Hazelwood coal fired power station.

4. Increased interconnection is not ideal for edge-of-grid jurisdictions such as South Australia

While increased interconnection has improved the energy security of regions such as Denmark and Germany which have high portions of intermittent renewable generation, these regions benefit from multiple interconnections with major supply energy markets. Denmark for instance has five direct connections to Norway, Sweden and Germany who between them generate approximately 26 times as much electricity as Denmark[2] and which provide ample supply and demand to absorb Denmark's intermittency.

South Australia is uniquely positioned at the edge of the National Electricity Market, with only two direct connections to Victoria, a region which itself is undergoing a highly unpredictable transition with announced closures of coal fired generation, moratoriums on gas drilling and an ambitious renewable energy target of 40% by 2025. Increased interconnection does not adequately enhance energy security in edge of grid regions such as South Australia which would continue to rely on one or two neighbouring regions.

5. Reliance on interconnectors increases exposure to high impact single points of failure

A high impact single point of failure was observed recently in December 2015 at Basslink's undersea cable. A six month outage resulted in the restarting of a mothballed local gas fired power station as well as extreme and expensive responses such as emergency diesel generators and shedding of major industrial loads.

Increasing the capacity of existing interconnectors magnifies inter-regional electricity flow concentration and materially increases the risk of a disruptive single point outage. The PSCR also notes that such 'separation events' which island South Australia from the rest of the National Electricity Market have historically occurred on average once in every four years[3].

6. Localised gas fired generation provides connection point diversity as well as fuel diversity

Increased reliance on local gas fired generation diversifies South Australian electricity supply across fuel (reliance on both gas and electricity imports into Adelaide) and connection point (reliance on importing energy through two electricity interconnectors and two gas pipelines). Increased reliance on electricity interconnection at the expense of reduced localised gas generation would materially reduce energy supply diversity and hence overall South Australian electricity security.

7. Benefits of synchronous generation for system strength must to be taken into account

As noted in the PSCR, while HVAC interconnectors have the ability to provide some system strength, it is the decline in the quantity of synchronous generators and increase in intermittent wind and solar generation that reduces system strength and increases risks to system security and public safety. Local synchronous generators (including the restarting of

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[2] Roger Andrews, 'Wind Power, Denmark, and the Island of Denmark', 2015.
[3] ElectraNet, 'South Australian Energy Transformation: RIT-T Project Specification Consultation Report', 2016, p.4.

existing generators that are currently mothballed) provide an immediate and proven improvement to system strength

8. Building new infrastructure – economic efficiency questionable when existing generators are underutilised

South Australia currently has c. 2,742 MW of local synchronous generation as well as 650 MW of synchronous electricity import capacity through the Heywood interconnector[4]. The combined capacity of 3,392 MW is greater than AEMO's projected 10 POE maximum demand of 2,639 MW to 3,081 MW over the period 2017 to 2026[5].

This existing installed capacity of 3,392 MW can be considered as sunk capital of approximately $2.5bn[6]. Therefore there is no issue with the ability of existing local synchronous generators to satisfy local demand and there is no question about the significant private sector capital already in place to support electricity demand.

The issue lies in the economic utilisation of this existing infrastructure as all synchronous power stations in South Australia (except the Osborne co-generation plant) have capacity factors of less than 25 percent[7]. Furthermore, ancillary infrastructure such gas transmission pipeline capacity is more than adequate to support the entirety of South Australian power sector's gas demand. As identified by the Grattan Institute's Energy Program Director, Tony Wood, immediate action is needed to ensure the best use is made of existing generation capacity, including plants that are currently mothballed. By utilising existing sunk capital, and economically supporting selective areas of market failure (such as gas supply availability and price), the overall economic cost of satisfying the objectives of the SAET project can be minimised.

9. Gas fired generation is a fundamental component of the optimal energy mix

Experiences in Denmark, Germany and California highlight that currently, and for the foreseeable future, energy systems can not solely rely on renewable energy generation and that the optimal energy mix includes a substantial contribution from conventional synchronous generation.

While nuclear and coal fired synchronous generation are utilised globally, neither is environmentally or politically palatable in Australia, highlighting the benefits of low emission gas fired generation. These views were supported by recent studies undertaken by AEMC[8] and AEMO[9] which showed that gas fired generation would play an important role in Australia's emission reduction process, potentially increasing to approximately 30% of the generation mix by 2030. Major industrial users such as BHP have also urged policy makers to bring more gas fired power back into South Australia[10].

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[4] The 220 MW MurrayLink interconnector is essentially non-synchronous as it is connected to the power system via invertors
[5] AEMO, '2016 Electricity Statement of Opportunities Results v2.0 - SA', 2016.
[6] For simplicity, the dollar value of the supply infrastructure is estimated assuming $0.75m/MW of construction cost, the estimated cost of new OCGT power stations as per ACIL Allen.
[7] Based on capacity factors for the period 1 July 2015 to 30 June 2016 as per ACIL Allen.
[8] AEMC, Final Report: Integration of Energy and Emissions Reduction Policy, 2016.
[9] AEMO, Advice on the Integration of Energy and Climate Policy: AEMO Stage Two Report, 2016.
[10] Australian Financial Review, 'BHP Billiton calls for SA gas power back', 21 October 2016.

In this context, it is imperative for the PSCR to comprehensively review options for increased local gas generation in South Australia when assessing the merits of the RIT-T proposal also.

10. Local synchronous generation reduces risk of system contagion

As all Australian states experience reduced coal fired generation and increased intermittent renewable energy generation, risks of system disruptions across all states in the National Electricity Market increase.

Reliance on neighbouring states which are themselves experiencing significant energy market transitions would expose South Australia to the risk of importing electricity market disruptions. Localised synchronous generation in South Australia would represent a remediating force under system contagion scenarios, ensuring that South Australia as a standalone electricity system can withstand external shocks. Effectively, while increased interconnection may export South Australia's energy system challenges today, in the future interconnection may import similar challenges from neighbouring states.

11. Increased interconnection is in direct conflict with the Identified Need

It seems as though the majority of network based solutions reviewed as part of the PSCR revolve around the central assumption that increased connectivity with neighbouring states, primarily Victoria, would enhance South Australia's electricity supply security and facilitate transition to lower carbon emissions. This central assumption is underpinned by what EESA considers are two questionable assumptions.

- Firstly, the improved energy security through interconnection is highly dependent on the continuation of synchronous generation in neighbouring states. The imminent increase in renewable energy generation in both states, based on Victoria's renewable energy target of 40% by 2025 as well as projections by AEMO showing that the large majority of proposed wind farms are located in Victoria and New South Wales[11], directly questions this assumption.
- Secondly, any temporary reliance on Victorian or New South Wales based synchronous generation is a reliance on electricity supply from high emission coal fired power stations. This also is in direct conflict with the proposed Identified Need of facilitating transition to lower carbon emissions.

12. The benefits of flexibility and optionality in proposed solutions must be assessed

Energy markets are increasingly dynamic as the system transitions towards increased renewable generation, low emission generation, decentralised generation, energy storage, demand side management systems and changing user patterns. This dynamism requires that all proposals as part of the SAET be assessed for their adaptability and responsiveness.

For example, major investment towards increased interconnection capacity would embed significant capital on the basis of an assumed economic life of beyond 40 years, when in fact the changing energy market may result in the redundancy of this infrastructure beyond even

[11] AEMO, 'National Transmission Network Development Plan', 2016.

a decade, should technology advancement such as battery storage evolve to a mass grid scale. By contrast, utilisation of existing sunk capital in the form of local and idle power stations provides significant flexibility to adjust the energy supply mix in the future, should this be required.

13. Non-network solutions have shorter deployment times

All the network solutions identified in the PSCR have potential energisation timings of 2021 and beyond. By comparison, existing local synchronous generation is able to be immediately utilised.

14. Additional renewable energy in South Australia would threaten system security

The PSCR identifies that greater interconnection within the NEM would allow renewable energy from South Australia to assist the nation to meet carbon emission and renewable energy targets at the lowest long run cost[12]. Further concentration of Australia's renewable energy generation within South Australia, which currently already represents 45% of the state's generation mix, would pose greater energy security risks and exposure to local weather patterns.

Greater geographic diversification of renewable energy generation would reduce intermittency while increasing the maximum total deployment of renewable energy across the NEM. In this regard, increased interconnection does not seem to meet the Identified Need regarding lower carbon emissions.

15. South Australian interconnector constraints are not limiting national renewable projects

The PSCR identifies that greater interconnection would enable renewable energy resources in Queensland, New South Wales and Victoria to be unlocked, contributing to the overall market transition. While this observation applies to general interconnection within the NEM, constraints in South Australia's interconnection capacity have never been identified as an obstacle to renewable energy development in other states. Queensland, New South Wales and Victoria also have significant local demand bases that would absorb local renewable generation with any export of renewable energy to South Australia highly unlikely to materially increase total renewable energy capacity.

16. AEMO's augmentation technical report should be published well before the PACR

A detailed review of the network augmentation required in South Australia and surrounding states is necessary in order to fully compare the relative costs and benefits of all proposed network and non-network solutions. AEMO's augmentation technical report should be published well before the publication of the Project Assessment Conclusion Report and ideally at the same time as AEMO's publishing of the summary of the Project Assessment draft report.

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[12] ElectraNet, 'South Australian Energy Transformation: RIT-T Project Specification Consultation Report', 2016, p18.

17. Conventional synchronous generation has superior inertial response capabilities

The most recent update on AEMO's FPSS program[13] noted the challenges associated with frequency control in South Australian and noted the inherent superiority of synchronous generation relative to Fast Frequency Response mechanisms due to its "instantaneous inertia". It also noted that at least for the near term, "some minimum amount of synchronous inertia is required to manage frequency control".

18. Fuel costs should not be considered when estimating cost of non-network solutions

ElectraNet's Supplementary Information paper notes that the assessment of stand-alone non-network options will review the costs of such options relative to the costs imposed by current arrangements. The costs of the current arrangements are said to include the extra cost of running gas fired generation in South Australia[14]. It is unclear how the evaluation framework will compare the incremental costs of solutions relative to current arrangements. For example, increased interconnector capacity would still impose fuel costs associated the increased generation required in neighbouring jurisdiction and these jurisdictions are transitioning away from coal and towards gas, so interconnection would not provide a fuel cost advantage relative to current arrangements utilising local gas fired generation in South Australia.

19. Proposed non-network solution

An alternative non-network solution would involve a long term capacity based contract for synchronous gas fired generation in South Australia, awarded through an auction process involving all the owners of existing gas fired power stations. Given the sunk capital costs of under-utilised gas generation that exists, this is likely to produce a better economic outcome for consumers in the longer term.

It remains the belief of EESA that before any significant decisions are made that will impose long term costs to consumers that more time is allowed to foster debate and discussion to arrive at what we understand is the intention of the ElectraNet SAET project being focused on lowering prices, improved system security and the facilitation towards a transition to lower carbon emissions environment.

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[13] AEMO, 'Progress report: future power system security program', 2017, p.8.
[14] ElectraNet, 'South Australian Energy Transformation, PSCR Supplementary Information Paper', 2017, p.22.