



Hugo Klingenberg
ElectraNet
Adelaide, South Australia 5000

Lodged via email consultation@electranet.com.au.

Friday, 3 March 2017

Dear Mr Klingenberg,

RE: South Australia Energy Transformation Project Specification Consultation Report

ENGIE understands the challenges of maintaining energy security in South Australia, a state that has one of the most fluctuating energy load profiles in the world. We appreciate the opportunity to comment on the project specification consultation report (PSCR) which has been published by ElectraNet in relation to the South Australia Energy Transformation project.

ENGIE is a global energy operator in the businesses of electricity, natural gas and energy services. ENGIE is the number one independent power producer in the world with 115.3 GW of installed power-production capacity, 19 GW of which is renewable. ENGIE employs 1,800 people in Australia and provides generating capacity in Victoria, South Australia and Western Australia. ENGIE also owns Simply Energy which provides electricity and gas to more than 600,000 retail customer accounts across Victoria, South Australia, New South Wales and Queensland.

The PSCR states that the identified need for this regulatory investment test for transmission (RIT-T) is to create a net benefit to consumers and producers of electricity and support energy market transition in South Australia through:

- facilitating greater competition between generators in different regions, leading to lower dispatch costs and consequently lower wholesale prices, particularly in South Australia;
- providing appropriate security of electricity supply, including management of inertia, frequency response and system strength, in South Australia; and
- facilitating the transition to lower carbon emissions and the adoption of new technologies.

ENGIE supports measures aimed at improving electricity market competition, ensuring system security and supporting the transition to lower carbon emissions as these are all in the long-term interests of electricity

Australia

Level 33, Rialto South Tower,
525 Collins Street Melbourne, Victoria 3000, Australia
Tel. +61 (0)3 9617 8400 Fax +61 (0)3 9617 8401 engie.com.au

INTERNATIONAL POWER (AUSTRALIA) PTY LTD ABN 59 092 560 793
is part of a joint venture between ENGIE S.A. and Mitsui & Co., Ltd.



consumers. For this reason, ENGIE is supportive of the objectives that ElectraNet is seeking to meet in this RIT-T process.

The PSCR proposes a number of interconnector options that ElectraNet suggests may be able to meet the identified needs of the RIT-T, and also invites proposals for non-network solutions. In this submission ENGIE sets out a number of reasons why the interconnector options outlined in the PSCR are considered unlikely to succeed in meeting the identified needs, and therefore will not be in the long-term interests of South Australian consumers, who quite rightly expect access to a stable and affordable supply of energy.

ENGIE is confident that there are likely to be non-network options that will be able to meet the needs identified in the PSCR, and has included further discussion of these options in the second part of this submission. ENGIE has also provided a separate document to ElectraNet which outlines a proposed non-network option that would be able to be delivered quickly. As the non-network proposal contains commercially sensitive information, ENGIE has asked ElectraNet to treat the proposal as confidential.

Interconnector Options

The PSCR has provided a high-level description of four potential options for new interconnectors from South Australia to other regions ranging in cost from a minimum of \$500 million to \$2.5 billion. ENGIE is of the view that investing large amounts of money into a 30-plus year investment at a time of particular uncertainty about the future power system's operating conditions will lock South Australian consumers into a long-term cost, whilst there remains considerable uncertainty about the ability of an interconnector to achieve the stated needs.

In consideration of the three needs outlined in the PSCR, ENGIE is not convinced that a new interconnector will succeed in delivering the desired benefits. To support this view, ENGIE has provided further discussion below for each of the three identified needs.

Lower wholesale prices

ENGIE believes that it is incorrect to assume that a new interconnector will result in lower wholesale electricity prices in South Australia as suggested in the PSCR.

The factors contributing to the increases seen in the wholesale electricity price in South Australia are varied and complex. The recent closure of Northern Power Station has meant a greater reliance on more expensive gas-fired generators. This has been compounded by the dramatic increase in wholesale gas prices, which has applied upward pressure on the operating costs for gas-fired generators in South Australia.

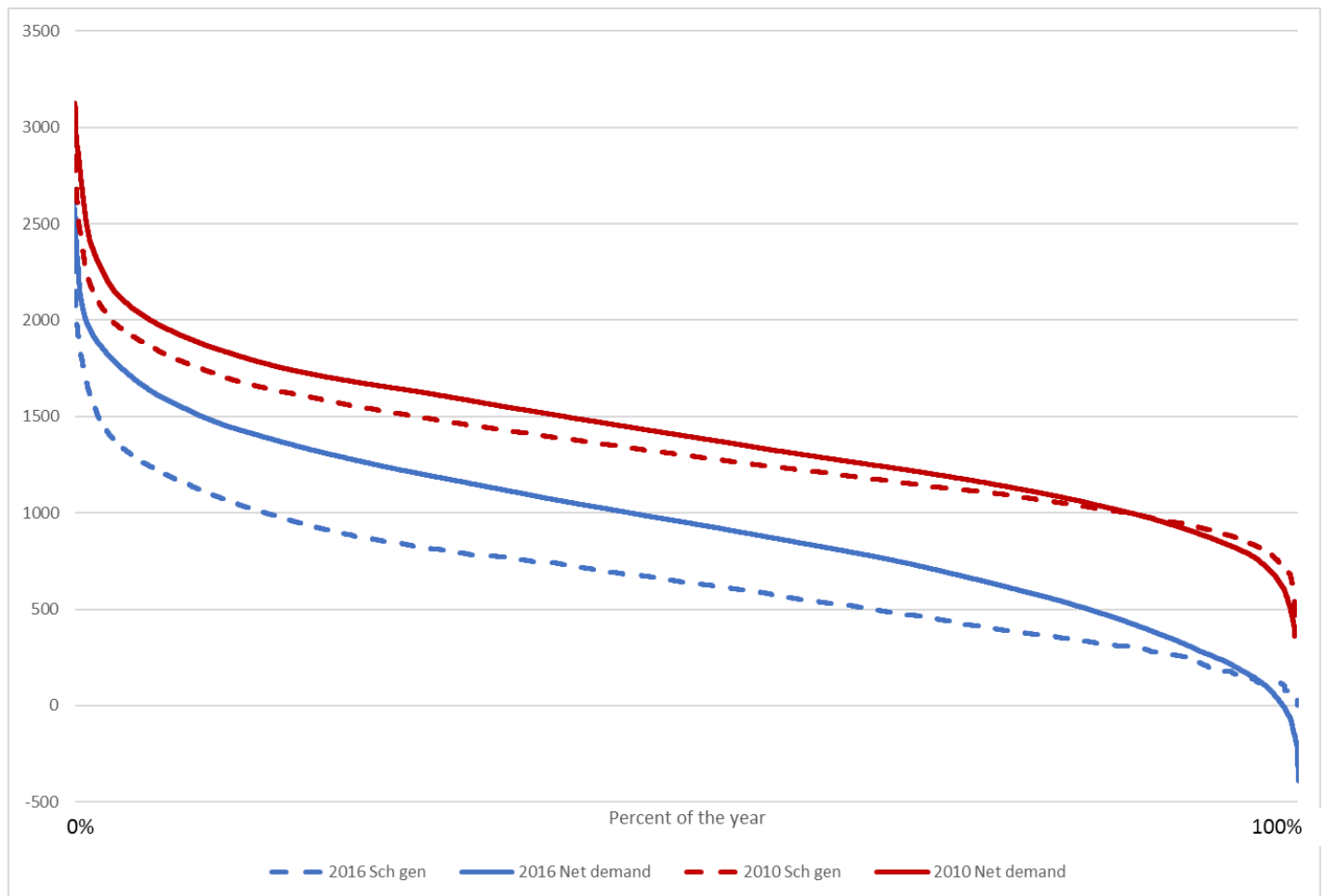
The impact of renewable energy on wholesale prices in South Australia also needs to be considered carefully. On the one hand, increased levels of renewable energy are having a price-suppressing effect as these forms of energy have essentially zero short run marginal cost (SRMC)¹. On the other hand, as synchronous generators have been displaced by lower SRMC renewable energy, the operators of these traditional generators have found the revenue that they can achieve in the NEM is now more uncertain. In response, some have decided to exit the market, leaving a smaller number of synchronous generators to maintain supply.

¹When the impact of the renewable energy certificates is included, the SRMC of renewable energy is effectively negative.

The remaining synchronous generators have found that in order to meet their ongoing operating and finance costs, they have needed to bid into the market at higher prices. This is leading to higher and more volatile NEM prices.

It is helpful to understand this issue by considering the impact of increasing renewable energy on South Australia's load duration curve. The South Australia load duration curve has always had a very sharp needle peak, resulting from the very high demand peaks in South Australia relative to the average demand.

The following chart shows the duration curves for the South Australia demand, less wind generation for the years 2010 and 2016. These curves, labelled 'net demand', represent the demand that needs to be met by scheduled generation in South Australia and/or imports from Victoria. Also shown on the graph for each year is the duration curve for the actual scheduled generation. The difference between the net demand and the scheduled generation curves for each year represents the energy imported into South Australia for that year².



² Note that the duration curves for net demand and scheduled generation for each year cannot be compared at any particular point on the curve as the time series data for each has been independently sorted to produce the duration curves. However, the area between the curves does represent the energy imported across the interconnectors.



It can be seen that the net demand has reduced dramatically from 2010 to 2016, with the MW reduction averaging approximately 460 MW across the year, or a total reduction in energy of 4.1 TWh. This represents the shrinking demand that scheduled generators are now competing for in South Australia.

Comparing the 2010 and 2016 scheduled generation curves shows an even more dramatic reduction from 11.7 TWh in 2010 to 5.8 TWh in 2016, a reduction of almost 50 percent. In an energy-only market that only pays generators for the energy that they provide, this reduction in energy represents the reduced opportunity for scheduled generators to earn revenue.

As a result, if these scheduled generators are to remain commercially viable, they will need to achieve a higher return for the smaller volume of energy that they are now able to sell in order to meet their fixed costs. This is the reason that the South Australia region wholesale electricity prices have been volatile and higher than other regions.

It is important to also note that the peak requirement for scheduled generation remains essentially unchanged from 2010 to 2016 at around 3000 MW. This demonstrates clearly that although the scheduled generators are providing much-reduced amounts of energy across the year, they are still being relied upon to deliver capacity during short-term extreme peak demand periods. It is therefore important that enough scheduled generation remains available to be able to meet the peak demand, even though the total time that the demand increases to this peak level is very small, leading to the peak being referred to as a 'needle peak'.

The RIT-T states that increasing the interconnector capacity into South Australia will put downward pressure on wholesale electricity prices in South Australia and lower the overall costs of electricity supply across the entire market. If this is true, then the outcome will be that the South Australian generators will receive less revenue from the market, making it less likely that they will be able to earn sufficient revenue to meet their fixed costs. In time, these generators will most likely make a commercial decision to close. Given the immediate need to secure sufficient synchronous generation to ensure ongoing power system security, this would be a particularly bad outcome for South Australia which is already suffering from a lack of competition in the generation sector.

For the reasons outlined above, ENGIE believes that building a new interconnector is unlikely to lead to wholesale price reductions in South Australia.

Security of electricity supply

The PSCR has identified the potential system security risk to the South Australian network following a non-credible loss of the Heywood interconnector at a time of high power import or export, and suggests that a new interconnector will overcome this risk.

As noted in the AEMC System Security Market Frameworks Review and the AEMO Future Power System Security project, the growth in non-synchronous renewable generation is having the effect of displacing traditional synchronous generation sources. This in turn is leading to a reduction in services such as frequency control, power system inertia, voltage regulation, system strength (fault level) and flexibility to respond to short-term variations in demand. Although there is potential for these services to be provided in the future by advanced inverter-based technology, there is a pressing need in the immediate to short term to ensure that sufficient synchronous generation sources remain available to continue to meet the needs of power system security and reliability.



The option of relying on an interconnector to import the desired level of system security services into South Australia seems to ENGIE to be one that involves a high level of risk as there may not be sufficient flexible generation services in the neighbouring states to assist South Australia. Already this risk is looming, with Victorian generation being substantially diminished following the closure of Hazelwood power station in March 2017, and generation closures expected in NSW at Smithfield in 2017 (170 MW) and Liddell in 2022 (2000 MW)³.

Facilitating the transition to lower carbon

As noted in the PSCR, around 45 per cent of South Australia's power generation now comes from renewable energy resources and successfully integrating the changing supply mix, while maintaining affordability, reliability and security of supply for customers is now a key priority for the energy sector. This integration will best be achieved by having sufficient flexible generation capacity within South Australia that is able to adjust its generation output dynamically in response to changes in consumer demand and variable generation output.

The proposal for South Australia to build a new interconnector does not address the renewable energy integration problem – it merely shifts it in the hope that the interconnected region will be able to deliver sufficient flexible generation capacity to meet its own needs as well as those of the South Australian region. It should also be remembered that the intention of interconnectors is to move surplus energy between regions and will never deliver firm generation capacity.

ENGIE believes that for the immediate to short term, the transition to lower carbon generation will require a sufficient amount of flexible synchronous generation to remain available to respond to sudden changes in demand and renewable energy supply.

Following the exit from the market of Northern Power Station, all remaining synchronous generation in South Australia relies on gas (or distillate) as a primary fuel source. It is clear that all gas-fired generation in Australia is facing the dual dilemma of increasing wholesale gas prices due to the rapid growth in liquid natural gas exports, and uncertain electricity prices due to the increase in renewable generation both at grid scale and consumer scale (behind the meter).

Successful integration of renewable energy requires both an immediate solution as well as longer-term solutions. ENGIE is not convinced that building a new interconnector would provide a viable option for the longer term, and it certainly cannot deliver an immediate-term solution.

ENGIE believes that a successful transition to lower carbon electricity supply can be achieved by ensuring that the existing flexible generation fleet is maintained until such time that new technology that can provide flexibility more economically becomes commercially available.

Non-network option

ENGIE believes that the most cost-effective and appropriate options for South Australia to achieve improved competition and system security are likely to be non-network options. It is likely that there will be a range of non-

³ See AEMO [Generation Information Page](#), NSW update 18 November 2016.



network options, and that the options available in the immediate to short term are likely to differ from options that may become available in the longer term, as technology and customer behaviours continue to evolve.

This inevitable evolution of service options was recognised by the Energy Networks Association in their submission to the Australian Energy Market Commission System Security Market Framework Interim Report, which noted:

“Given these factors, changing technologies and the current level of uncertainty in the market, Energy Networks Australia considers that the AEMC should recognise that the most optimal solution to providing additional system security services may vary over time.”

ENGIE agrees with this observation that locking in to a long-term option, such as an interconnector to achieve a system security benefit is not optimal, and that non-network options are therefore preferable.

ENGIE believes that there are a range of options that could contribute to improving the South Australia system security and assist with the integration of renewable energy. It is also important to recognise that with a number of reviews being undertaken at present on these very issues, it may be prudent to look towards short-term arrangements in the first instance, to allow the various reviews and rule changes to be finalised. It is likely that it will then be clearer what (if any) longer term measures may be required for ElectraNet to continue to ensure the security of the South Australia network.

With these thoughts in mind, ENGIE has lodged a separate confidential document with ElectraNet which outlines a non-network proposal for ElectraNet to consider.

ENGIE trusts that the comments provided in this response are of assistance to ElectraNet in its deliberations. Should you wish to discuss any aspects of this submission, please contact us via corporateaffairs@au.engie.com.