



South Australian Chamber of Mines and Energy

Energy Security Target Regulations

Submission to

Department of the Premier and Cabinet

May 2017

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Representing, promoting and protecting the resources industry of South Australia

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Executive Summary

The South Australian Chamber of Mines and Energy (“**SACOME**”) welcomes the Government policy to introduce a mechanism to maintain an adequate level of system strength in the South Australian market with the Energy Security Target (“**EST**”). SACOME has advocated in submissions to other recent reviews and consultations on energy security for market based mechanisms to value the services inherent in synchronous thermal generation.

Successive analyses by the Australian Energy Market Operator (“**AEMO**”), ElectraNet, the Australian Energy Market Commission (“**AEMC**”) and others have demonstrated that system strength in South Australia has been declining with the investment in non-synchronous technologies such as wind and solar PV. With these generation sources comprising nearly 50% of South Australia’s annual generation there is a need to value the services provided by synchronous generation to maintain adequate system strength.

The events that have led to periods of automatic under frequency load shedding and the system black on the 28 September 2016 have demonstrated the acute need to find solutions to enhance declining system strength.

The energy security target is a mechanism that SACOME supports in principle. The supporting information provided for this period of consultation and the briefing paper from Frontier Economics in March 2017 do provide some certainty of the objectives and proposed mechanism, however there is the need for detailed cost benefit analysis and demonstration of the modelling that was undertaken to satisfy the objectives of increased competition, lower prices and more system stability.

The definition of allowable generation source should be generalised rather than specified to a fuel source to allow the potential future deployment of other generation technologies that provide the system security services of inertia and voltage while meeting the Government’s criteria of “clean” generation. This will future proof the regulations against changes in affordability and availability of other “clean” generation sources.

In the following response to the draft regulations and consultation information SACOME requests and recommends:

- The Department outline the assumptions and show modelling that demonstrates the effectiveness of the target;
- To see the modelling and evidence to support the objective of increased competition; and
- The definition of eligible fuel source is redefined to meet a general objective in the regulations to allow all generation technologies sources that meet the general criteria to be able to become accredited.
- The regulations include a recurrent review period to assess whether the target is meeting the states objectives of the policy.

SACOME

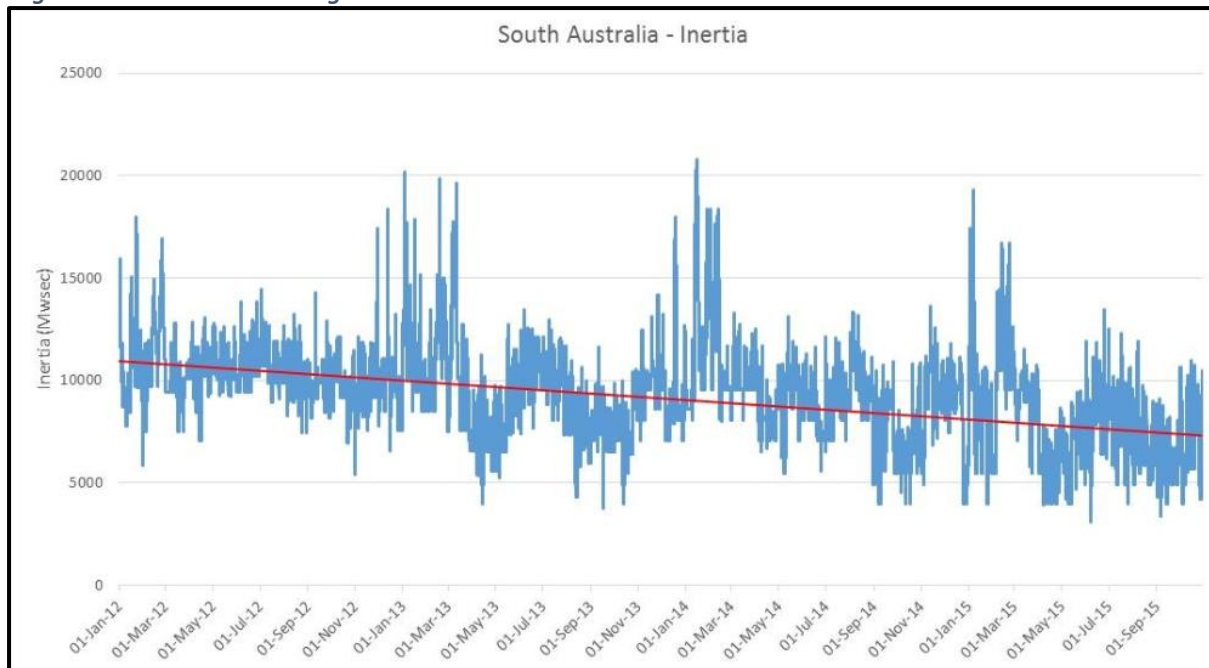
The South Australian Chamber of Mines and Energy (SACOME) is the peak industry association for all companies with business interests in the resources industry in South Australia, including those with business, vocational or professional interests in minerals exploration, mining and processing, oil and gas exploration, extraction and processing, power generation, transmission and distribution, logistics, transport, infrastructure, and those with clients in these sectors.

Response to Regulations

Context

The imperative to increase the level of system security in the South Australian electricity market is obvious given the gradual decline of network inertia and impacts this has on the ability for the network to absorb frequency shocks. Inertia provides the immediate response before frequency control and ancillary services (“FCAS”) can respond to rebalance the network. Figure 1 demonstrates the decline in inertia in SA since 2012.

Figure 1 - South Australia Region Inertia



The September 2016 system black event demonstrates the critical deficiency in the SA system when there is a sudden loss of generation and a lack of system inertia which led to a 6 Hz rate of change of frequency (“RoCoF”) event¹. The State-wide industrial impact was estimated to be at least \$367 million². SACOME, in discussions with members, has estimated the impact of the system black and other supply interruptions over the past 12 months to be over \$230 million.

Rapid changes in frequency is an issue that ElectraNet has noted in its transmission regulatory investment test (“RIT-T”) South Australian Energy Transformation report as an area of concern. Figure 2 demonstrates that larger RoCoF events in South Australia are becoming a more common phenomenon³.

ElectraNet emphasized that “where the RoCoF exceeds 3 Hz/s, it becomes highly unlikely that the Frequency Operating Standard will be met, with a consequent high risk of a ‘system black’ event”.⁴ Since 2010, RoCoF events exceeding 3Hz/s have increased to greater than 20%.

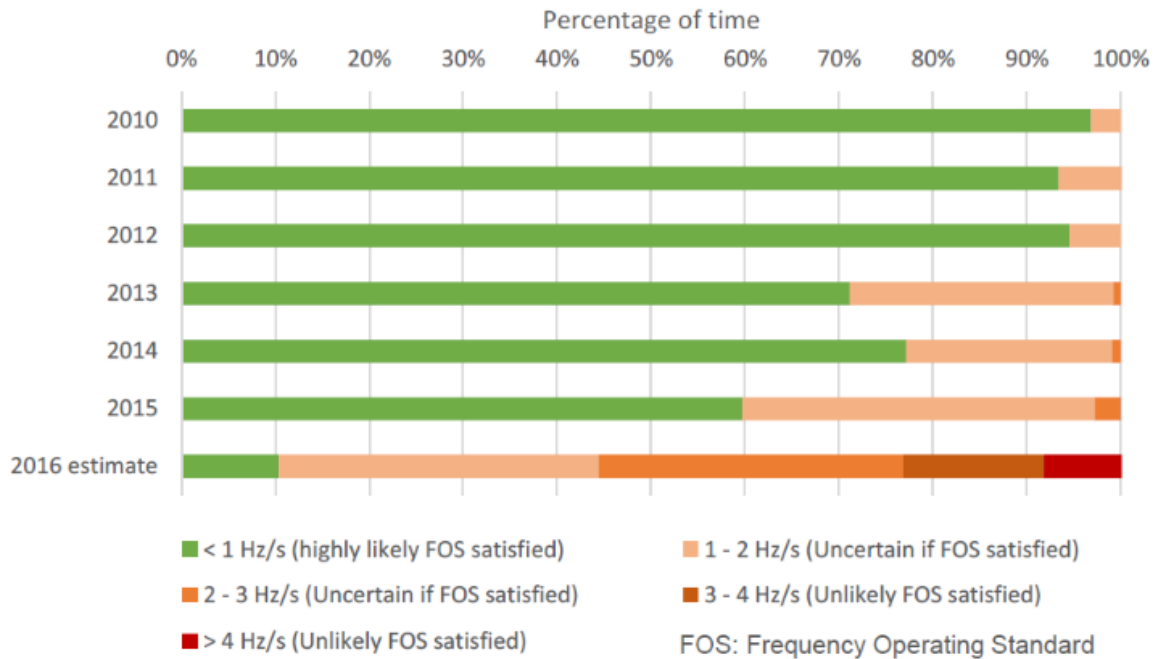
¹ AEMO, *Black System South Australia – 28 September 2016: Third Preliminary Report*, December 2016, p 58.

² The Australian, *Today in SA: blackout cost \$367m but could have been worse*, 9 December 2016

³ ElectraNet, *South Australian Energy Transformation: RIT-T Project Specification Consultation Report*, 7 November 2016, p 26.

⁴ *Ibid*, p 27.

Figure 2 - Increasing exposure to RoCoF in South Australia for separation



Source: AEMO Future Power System Security Program, Progress Report, August 2016

There are opportunities to replace retiring thermal generation units with lower emission units as needed. SACOME’s policy position on energy markets acknowledges the drive to a lower carbon generation sector, and it also places emphasis on ensuring reliability, security and affordability are at the forefront of any policy or mechanism.

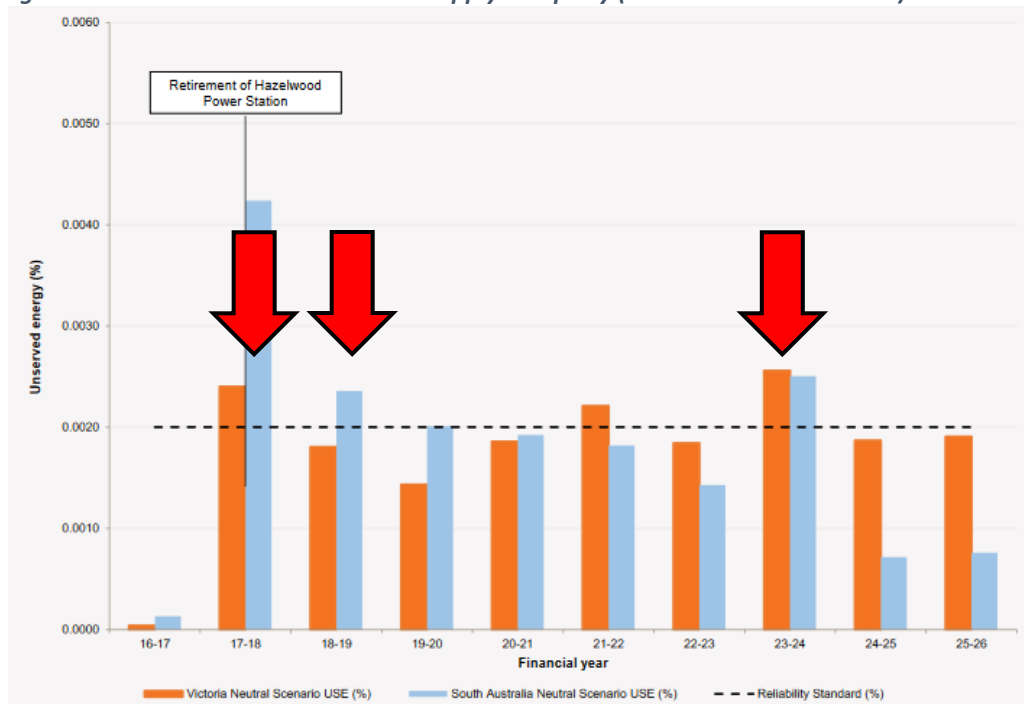
The integration of large penetrations of inverter connected non-synchronous generation in South Australia (Wind and Solar PV) with the incentive of the Large-scale Renewable Energy Target (“LRET”) and State feed-in-tariff schemes have led to challenging conditions in network management and erosion of system strength. The retirement of thermal generation has led to a higher reliance on the Heywood interconnector (South Australia to Victoria) and wind generation that have decreased network resilience.

This is highlighted in the AEMO annual report, Electricity Statement of Opportunities (“ESOO”), which forecasts with the withdrawal of Hazelwood power plant, periods of high demand will see low reserve conditions where the reliability standards will not be met (see Figure 3; red arrows).

While technological solutions can ensure that there is no detrimental effect to security, reliability, or affordability, recent events in South Australia have demonstrated that there is a need for regulatory and market-based mechanisms that ensure there is no detrimental impact whilst lowering carbon emissions. The ability for the network to adjust to faults and events will depend on the inherent strength in the network dictated by the rules and markets established to maintain system security and reliability standards.

System security reviews currently being undertaken, such as the Independent Review into the Future Security of the National Electricity Market (“Finkel Review”), System Security Frameworks review (AEMC) and Future Power System Security program (AEMO), will need to be co-ordinated with State based policies to ensure that there is a consistent national approach to energy security and reliability.

Figure 3 - Victoria and South Australia supply adequacy (Neutral Growth scenario)



Energy Security Target regulations

Financial model

SACOME as a part of its recommendations to the Finkel review outlined the need for continual assessment of system strength and the ability for rule or policy mechanisms to be able to improve the level of system strength where deficiencies have been identified. These policies need to be reinforced by robust analyses that identify reduced system strength⁵ gateways and the ability for the market to respond adequately to mitigate damaging events.

The briefing paper for the “Our energy plan” policy prepared by Frontier Economics in March 2017 outlined the rationale behind the seven measures a part of the policy. It notes the objective of the Energy Security Target (“EST”) is to improve the economics of scheduled and synchronous generators to ensure a targeted level of production is met annually. It is expected that there will be a flow on of the cost of the EST with the briefing paper noting:

Of course the retailers will seek to recover the costs of the subsidy from consumers. However, for reason described below, Frontier Economics believes that once the other measures are in place to deepen the competitiveness of the generation market, the net effect of the EST will be that consumers will be no worse off and, indeed, there are good reasons to believe that prices will in fact be lower.

There are a set of market variables that need to be further unpacked to determine the cost-benefit of this target. While SACOME supports market mechanisms to enhance system security, a thorough analysis is needed to ensure that the intended outcomes can be met adequately.

⁵ See AEMO and ElectraNet assessments of integration of wind energy in 2014 and 2016.

The levelised cost of electricity (“LCOE”) for new open gas, and solar thermal generation for Australia are above \$100/MWh, with solar thermal ranging up to \$300/MWh⁶, and between \$70-\$90/MWh for combined cycle gas⁷. For incumbent gas generation in South Australia the short run marginal cost can range from \$72 to \$108/MWh, however this can be higher if the plant is run in an intermediate load cycle and if there is a tight supply of gas on the short-term trading market (“STTM”). The subsidy will need to overcome these figures to provide an effective mechanism to enhance the priority of gas generation in the electricity market bid stack.

SACOME requests the Department outlines the assumptions and show modelling that demonstrates the effectiveness of the target.

Objectives of Regulations

The stated objectives of the regulations are to increase competition, put downward pressure on prices and provide more energy system stability. This is to be achieved by incentivising generation sources that provide inertia and voltage services to maintain an adequate level of system strength. As discussed above, modelling of the financial model is requested to understand the effectiveness of prioritising synchronous generation as well as understanding the effect of downward pressure on prices.

There presently exists 2,977 MW of registered capacity⁸ of plant that meets the criteria outlined in draft regulation 44EC. The majority of this generation is operated by three large energy companies⁹. This registered capacity has a theoretical generation of 20,863GWh that far exceeds the 2030 energy security target of 6,500GWh.

SACOME requests to see the modelling and evidence to support the objective of increased competition.

Definitions in Regulations

SACOME advocates for technology neutrality in energy policy to ensure that regulations and legislation is applied consistently to all electricity generation. Technological specific regulations limit the flexibility of the policy objectives.

The definition of “eligible fuel source” is limited in the regulations to only generations technologies that use gas or are renewable. These technologies are further limited by a technical constraint, “real inertia”, which is an example of a limit that can be applied consistently across all technologies to meet the objectives of the policy.

Draft regulation 44EC details the conditions necessary to satisfy the essential services commission for an electricity entity to have their generation assets accredited. They limit the accreditation to generators that are scheduled, provide fault current and real inertia, generates within South Australia, is connected to the NEM, and is of an eligible fuel source.

The current draft regulations appear to limit the generation sources to fuels that meet the emissions intensity target in the South Australian strategic plan (target 66). This target is to drive emissions intensity to 0.5 tonnes

⁶ Recent reverse auctions and PPAs for Solar Thermal technology with storage globally have been signed in the \$120-180/MWh range.

⁷ (CO2CRC 2015); NOTE: Gas price is assumed to be \$5-8/GJ, presently in South Australia is approx. \$9/GJ

⁸ (Australian Energy Market Operator 2016a)

⁹ (Australian Energy Regulator 2016)

CO₂ per MWh by 2020 and the energy security target aims to encourage 5,100GWh of synchronous generation in 2020. Language within the consultation package and State energy plan documents do note “clean” generation sources.

SACOME recommends that the definition of eligible fuel source is redefined to meet a general objective in the regulations to allow all generation technologies sources that meet the general criteria to be able to become accredited.

Review period

The draft regulations do not incorporate a mechanism where the EST target values (figure 5) are assessed on a regular basis to ensure the target is meeting the stated objectives. The objectives as stated above, increase competition, put downward pressure on prices and provide more energy system stability, are all important to ensure a scheme that will provide the essential security services at no impost to consumers.

The first priority for SACOME members is affordability of energy, where reliability and security are key components of the price of energy in South Australia. The target as drafted will in the first year if the cap is reached and all retail costs are passed on, as noted in the Frontier Economics briefing paper, will cost between 1.6 to 1.7c/kWh for consumers. If this scenario eventuates there needs to be a review period to ensure that there is no additional impost for major consumers and the target can be adjusted.

SACOME recommends that the regulations include a recurrent review period to assess whether the target is meeting the states objectives of the policy.