



Australian Sugar Milling Council submission

Energy Security Board

Draft Detailed design of the National Energy Guarantee

July 2018

Executive summary

The Australian Sugar Milling Council (ASMC) provides conditional support to a National Energy Guarantee (NEG) that supports a stable and secure energy system, and a competitive sugar milling industry.

The ASMC welcomes the opportunity to make a submission in response to the consultation on the Energy Security Board's National Energy Guarantee: draft Detailed Design Consultation Paper (the paper).

The ASMC is the peak body for the sugar milling sector. We represent six sugar milling companies who collectively produce approximately 95% of Australia's raw sugar at their 20 sugar mills in Queensland. Over 80% of Australia's raw sugar production is exported.

This submission examines, and makes six recommendations on modifications needed to areas within the paper that will have an impact on the sugar milling industry, in particular with respect to low emission, bio-mass (i.e. bagasse) fuelled co-generation plant co-producing both process heat and electricity.

Background on the sugar industry and bio-mass co-generation as well as the ASMC responses to specific areas of the consultation document are detailed below.

1 Background to sugar industry and bio-mass co-generation

Australia's sugar mills are self-sufficient in energy. By burning the fibrous bagasse cane by-product, bio-mass, mills generate electricity and steam to power all factory operations. Across the industry, more than 50% of the electricity produced is exported to the National Electricity Market (NEM) – providing clean, green electricity to over 170,000 households. Currently, bio-mass fuelled co-generation plant provides approximately 47% of the large-scale renewable energy capacity in Queensland¹.

More than 16,000 people are directly employed in the Queensland sugar industry and annual export earnings are over \$1.4billion. Additional indirect employment is generated through the sector's annual maintenance spend that currently exceeds \$300 million. Furthermore, under the right policy and commercial settings, the sector has sufficient bio-mass to install an additional 800 MW of bio-mass generation with associated CAPEX in excess of \$2 billion.

ASMC members rely heavily on the electricity system in their milling activities. The members are subject to the National Electricity Rules (NER) for their interaction with the National Electricity Market (NEM) for electricity purchasing, generation and sales. This is significant for those sugar mills that have electricity generation systems that run synchronised with the National Grid (Grid).

The co-generation plant operated by the sugar millers provides significant value to the environment and local economies through:

- energy productivity based on using bio-mass by-product from the milling process to generate renewable energy;
- support for the local network operation due to the plant being synchronous, high inertia generators – particularly in areas where the mills are connected to parts of the electricity

¹ The sugar industry currently has 484 MW of installed co-gen capacity. This compares to an estimated 1,032 MW large-scale renewable capacity.

network that are characterised by low system strength and in relatively remote parts of the system; and

- an invaluable source of additional revenue that assists in maintaining the viability of the mills and growers (especially during periods of low sugar prices such as currently being experienced).

While ASMC is generally supportive of the overall direction of the stated objectives of the NEG of ensuring low emissions, reliability and affordability of electricity supply, we have identified a number of policy areas that will impact on the operation of sugar mills. This submission details our views in the areas identified and presents recommendations on how concerns we hold may be addressed within the future design of the NEG.

2 National Energy Guarantee policy areas that impact the industry

Areas within the draft detailed design of the NEG that the ASMC has identified as having an impact upon the sugar milling industry include:

- Reliability Standards
- Liability of large (>5MW) customers to procure contracts for 'Dispatchable capacity'
- Accurate reporting of emissions intensity
- Co-generation economics and the valuing of the benefits of synchronous, dispatchable low emission generation
- Australian Carbon Credit Units (ACCU) and International Carbon Credits
- Electricity Network System Strength

3 Impact of National Energy Guarantee proposed policy on sugar industry in areas identified

3.1 Reliability Standards

The reliability requirement of the NEG only classifies 'dispatchable energy' as being reliable and able to satisfy the reliability obligations of liable entities should the reliability obligation be triggered. By 'dispatchable' we understand that the Energy Security Board (ESB) means that the generation will be registered as either scheduled or semi-scheduled in the NEM. Sugar mills are unable to operate as scheduled generation as the sugar milling process cannot proceed if the associated generator has not been dispatched or has been dispatched at a level below that required to ensure the on-site steam and electrical requirements can be supplied. Consequently all sugar mill generation presently operates as non-scheduled generation to ensure milling can proceed when product is available to the mill.

Despite the fact that the energy supplied from sugar mills is reliable, in that generators operate with high availability and to a well-defined schedule, under the NEG they will not be classified as a reliable energy source as they are not scheduled and dispatched.

Recommendation

ASMC considers that sugar mill generators should be capable of being classified as a 'reliable' source under the NEG, even though they are not generally registered as scheduled or semi-scheduled. This is because, unlike other renewable plant, the output of bio-mass fuelled, co-generation plant during times of operation of the mill is not intermittent and can be controlled, within the limitations of heat demand of the mill. ASMC considers that there should be a specific category established for such generators so that their capacity can underpin qualifying contracts for reliability.

3.2 Liability of large (>5 MW) customers to procure contracts for 'Dispatchable capacity'

The consultation paper states that it is presently proposed that a customer with 5 MW or above peak demand at a single site will be deemed a liable entity under the reliability requirement. At times the maximum demand for a sugar mill may exceed 5MW and as such would be deemed a liable entity under this proposal. As such sugar mills would have an obligation to procure reliability contracts for dispatchable energy should the reliability obligation be triggered in the region where they operate. The consultation paper also raises the possibility that if the obligation to procure contracts is transferred to retailers they may charge a large risk premium to take on that obligation on behalf of the customer. This is due to there being a "...range of very large customers in the NEM whose future demand for electricity is unknown and is unknowable to retailers".

Sugar mills are certainly not very large customers and their future demand for energy is well defined and quite predictable.

Recommendation

ASMC considers that the threshold size of 5MW peak demand for this obligation is too low and should be increased to at least 20MW to avoid increasing the risks and costs associated with operation of this key industry in Queensland. ASMC is supportive of the provision in the consultation paper that it would be optional for customers below this threshold to self-manage their reliability obligations if it is more efficient for them to do so.

3.3 Accurate reporting of emissions intensity

The paper states in section 3.3.4 that the emissions intensity of generation plant will be determined by the National Greenhouse and Energy Reporting Scheme (NGERS).

In the case of sugar mill cogeneration (and most likely any co-generator), carbon emissions from the combustion of fuels need to be allocated between generated electrical energy, and steam or thermal energy used elsewhere on the site. Annual NGERS Reports do not specifically report these figures, and a summary report would need to be included to provide the correct emission intensity data. Hence there is a need to expand the NGERS reporting template to ensure the emissions intensity for electricity supplied by bio-mass fuelled sugar mills is accurately calculated.

In the case of sugar mills which report using the CER LGC calculator spreadsheet "Renewable Electricity Eligibility Compliance for Bio-mass Generators", the calculated "Fraction of steam energy apportioned to power generation" figure would need to be applied to the site combustion carbon emissions, prior to dividing by total site generation, to calculate the correct electricity emission intensity. This process is complicated by the different reporting years of NGERS (financial year) and LGC Calculator (typically calendar year). ASMC requests that the ESB collaborate with the sugar industry to ensure that NEG legislation and regulations clearly cater for sugar mill cogeneration.

Recommendation

The NGERS process for calculation of energy emissions intensity requires modification to ensure that the emissions intensity calculated for sugar mill generators accurately reflects emissions associated with electricity production at bio-mass fuelled, sugar mill co-generation plant. Industry consultation would ensure that the correct level of greenhouse gas emissions associated with sugar mills could be calculated by the NGERS methodology.

3.4 Co-generation economics

Recently there has been a large increase in the connection of both large scale solar generation facilities as well as small scale residential and commercial rooftop PV systems. This has resulted in the daytime spot prices being reduced significantly. Concurrently, the morning and evening peaks, when solar generation is not available, are increasing in size as well as being subject to increasing spot prices at those times as non-renewable generators with higher marginal cost of operation are brought online to supply the necessary energy.

The daytime spot prices are presently at a level that compromises any further investment in sugar mill co-generation plant, given that the mills predominantly operate at reasonably consistent export levels both day and night. ASMC estimates that an additional 1 MW of bio-mass plant creates and sustains significantly more jobs in regional Queensland than an additional 1 MW of PV plant which has very little ongoing employment needs following construction and commissioning. In addition, each additional 1 MW of bio-mass fuelled, co-generation plant contributes to maintaining network system strength, given that the generation is high inertia, synchronous generation.

ASMC considers that in the development of the NEG, further consideration should be given to addressing the issues which are associated with the current expansion of large solar generators such as:

- available transmission capacity
- falling loss factors
- loss of prime agricultural land available to the sugar industry
- costs associated with firming intermittent renewable generation to meet the morning and evening peak loads
- significantly lower rate of growth of loads compared to growth of generation during the periods that PV generation takes place

There is presently nothing in the NERs to stop inefficient investment when establishing such plant due to each proponent being required, separately, by the relevant network operator to install plant to address system strength issues.

ASMC considers that providing a single register of all committed and proposed energy developments will create visibility of the projects to foster co-operation when establishing connection and shared infrastructure to minimise costs and provide the potential for sugar millers to contract with renewable developers to install additional co-generation to provide inertia/fault current to improve system strength.

The consultation paper states in the executive summary that the NEG will incentivise generators to be available at times the system most values generation output (i.e. when spot prices are high). However there does not appear to be many specific measures to address this requirement other than to forecast that the NEG will likely result in an increase in the proportion of generation capacity that is contracted. Almost all large scale PV generation constructed to date has little or no ability to generate outside of daylight hours which has resulted in spot prices during the day becoming very low but those during morning and evening peaks increasing. Additional flexibility in the dispatch of this generation is required to better match generation to loads and reduce network constraints that will result from having significant amounts of generation available over a restricted period of time.

Recommendation

ASMC would support additional measures in the NEG to ensure the economics of co-generation at sugar mills remains competitive, such as the:

- Establishment of a central database for new generation projects from time of application to a network service provider or time of expression of interest to connect.
- Linking of intermittent load such as desalination plants and pumping for irrigation with renewable plant generation which may help to extend arable area for sugar production.
- Encouragement of more flexible dispatch of energy from new generation to more efficiently utilise available network capacity and better match the availability of generation and loads.

3.5 ACCU and International Carbon Credits as offsets

The consultation document has indicated that offsets may be allowed to be used for compliance with the emissions reduction requirement of the NEG. ASMC supports the ability of retailers to use Australian Carbon Credit Units (ACCUs) as a proportion of their emissions reduction obligations under the NEG.

Whilst acknowledging the need to strike a balance between reducing costs to consumers and ensuring the domestic renewable sector continues to grow, ASMC supports a highly cautious approach to the use of international carbon credits to assist retailers meet their compliance obligations. In short, the environmental and economic potential of a larger domestic renewable sector is not yet fully understood given the significant rate of improvement over the past period and potential for further improvement and crowding out should not occur.

Recommendation

ASMC recommends that the NEG should allow the use of ACCUs to fulfil the emissions obligations of retailers participating in the NEM.

ASMC supports a highly cautious approach to the use of international carbon credits to fulfil the emissions obligations of retailers participating in the NEM.

3.6 Electricity Network System Strength

It is important to differentiate between power system reliability and power system security. Under the NEG, reliability relates to the available generation capacity, compared to peak demand, i.e. the amount of reserve capacity be it spinning reserve to cater for fluctuations, or plant that can be scheduled to meet forecast demand. The NEG deals with system reliability, not system security.

System security relates to the strength of the power network that can operate within defined technical parameters, even if there is an incident such as loss of a major transmission line or large generator.

Establishing large amounts of inverter based, intermittent renewable energy generation is likely to reduce system strength and hence system security, and this will be exacerbated in future as generation based on rotating synchronous machines is displaced.

Sugar mills provide high levels of renewable energy output from rotating synchronous generators and as such provide a means to address falling system strength in the geographic areas of the electricity network in which they operate.

While the national electricity rules introduced measures to ensure that system strength remains adequate for system security, there is presently no visibility of potential renewable energy developers with which sugar mill operators might negotiate to provide proponents of inverter based generation systems with the means to address system strength, if required, by utilising the plant that is already established in sugar mills. This would provide more cost effective outcomes for both the inverter based generation facilities as well as the sugar mills. It would also provide incentives to sugar mills to invest in further, reliable, low emission synchronous generating plant.

Recommendation

ASMC seeks the establishment of a central database for new generation projects from time of application to a network service provider or time of expression of interest to connect. This will create visibility of the projects that could provide the potential for sugar millers to contract with renewable developers to install additional co-generation and to provide inertia/fault current to improve system strength. This would improve the overall efficiency of the construction of new renewable generation plant.

ASMC also considers that there is merit in the NEG enabling the ‘unbundling’ of energy prices such that electricity produced from high inertia, high fault level contributing plant such as the sugar milling industry’s bio-mass co-generation plant is rewarded for providing these services to support system strength.

4 Mapping of refinement opportunities to the consultation paper

Issue	Consultation Paper Reference
1. Reliability Standards	Section 4.1
2. Liability to procure contracts for ‘dispatchable energy’	Section 4.5
3. Accurate reporting of emissions intensity	Section 3.3.1
4. Co-generation economics	Executive summary – Key ways to lower prices
5. Use of offsets	Section 3.4.3
6. System Strength	Not specifically addressed

5 Potential benefits of refinements to the sugar milling industry, sugar industry and rural Queensland

ASMC represents six sugar milling companies who collectively produce approximately 95% of Australia’s raw sugar at their 20 sugar mills in Queensland. Over 80% of Australia’s raw sugar production is exported with annual export earnings of over \$1.4billion.

More than 16,000 people are directly employed, and many more indirectly, in rural and regional areas by the Queensland sugar industry. The benefits of making the changes that have been recommended by the ASMC are that the sugar industry in Australia can remain competitive and it could foster additional investment in green energy generation.

6 Potential impact of National Energy Guarantee on sugar industry absent of refinements

Without the refinements detailed in this document future investment in any additional generation at sugar mills would be compromised and the economics of existing plant would become more marginal. The sugar industry competes in an international market place and consequently any measures that could increase operating costs and risks, or reduce revenues directly impact on the ability of the industry to price its product appropriately in the world market. The generation of electricity at the sugar mills must also remain competitive in the Australian electricity market in order to diversify income streams for the industry.

7 Summary recommendations

The six recommendations made by the Australian Sugar Milling Council (ASMC) in response to the paper are summarised below:

1. ASMC recommends that sugar mill generators be capable of being classified as a 'reliable' source even though they may not be registered as scheduled or semi-scheduled. ASMC recommends that there should be a specific category established for such generators so that their capacity can underpin qualifying contracts for reliability.
2. ASMC recommends that the threshold size of 5 MW peak demand for the obligation to have liability to contract a certain level of reliable generation is too low and should be increased to at least 20 MW to avoid increasing the risks and costs associated with operation of this key industry in Queensland. The ASMC is supportive of the provision stated in the consultation paper that it would be optional for customers below this threshold to self-manage their reliability obligations if it is more efficient for them to do so.
3. The NGERs process for calculation of energy emissions intensity presently requires modification to ensure that the emissions intensity calculated for sugar mill generators accurately reflects emissions associated with electricity production at bio-mass fuelled sugar mills. Industry consultation would ensure that the correct level of greenhouse gas emissions associated with sugar mills could be calculated by the NGERs methodology.
4. ASMC would support additional measures in the NEG to ensure the economics of co-generation at sugar mills remains competitive, such as the:
 - Establishment of a central database for new generation projects from time of application to a network service provider or time of expression of interest to connect
 - Linking of intermittent load such as desalination plants and pumping for irrigation with renewable plant generation which may help to extend arable area for sugar production
 - Encouragement of more flexible dispatch of energy from new generation to more efficiently utilise available network capacity and better match the availability of generation and loads.

5. ASMC recommends that the NEG should allow the use of ACCUs to fulfil the emissions obligations of retailers participating in the National Electricity Market. ASMC supports a highly cautious approach to allowing international carbon credits to fulfil the emissions obligations of retailers participating in the NEM.
6. As recommended in item 4, ASMC seeks the establishment of a central database for new generation projects from time of application to a network service provider or time of expression of interest to connect. This will create visibility of the projects and provide the potential for sugar millers to contract with renewable developers to install additional co-generation and to provide inertia/fault current to improve system strength. This would improve the overall efficiency of the construction of new renewable generation plant.

ASMC also considers that there is merit in the NEG enabling the 'unbundling' of energy prices such that electricity produced from high inertia, high fault level contributing plant such as the sugar milling industry's bio-mass co-generation plant is rewarded for providing these services to support system strength.