27 June 2007

Submission No: 83

AUSTRALIAN SUGAR MILLING COUNCIL

Australian Sugar Milling Council Pty Limited
A.C.N. 010 779 496 A.B.N. 44 010 779 496
North Podium Level, 192 Ann Street, Brisbane Q 4000
GPO Box 945 Brisbane Q 4001 Australia
Telephone (07) 3231 5012
Facsimile (07) 3229 2113
Website www.asmc.com.au

Committee Secretary
Standing Committee on Industry and Resources
House of Representatives
PO Box 6021
CANBERRA ACT 2600

Dear Sir/Madam

Please find attached a paper on renewable energy generation in the sugar industry and the current outlook for investment in generation projects.

The paper highlights the potential significant role of sugar milling generation in Queensland's energy infrastructure including:

- Total sugar milling generation in 2006-07 was in the order of 1100 GWh of which approximately 550 GWh was exported into the grid;
- Total greenhouse gas emission savings from current sugar mill generation displacing coal-fired generation is approximately 0.6 million tonnes CO_2-e;
- Generators attached to sugar mills provided over 5% of Queensland's electricity demand during the crushing season (June to December) with all mills operating and between 0.3% and 1.4% of monthly demand during the non-crushing season, including an average of 1% during the peak summer demand period (Dec-Feb).
- Recent and proposed new bagasse generation projects have the ability to operate for periods extending beyond the traditional crushing season and increasingly seek to operate through the peak summer (air-conditioning) demand period;
- ASMC has identified plans for bagasse generation projects providing 250 MW of export generation capacity valued at up to $1 billion that would be likely to proceed over the next seven years in the right policy environment. These projects would provide up to an additional 1000 GWh of electricity for export into the grid and create additional greenhouse gas emission savings for Queensland of in excess of 1,100,000 tonnes of CO_2-e annually;

Bagasse generation is a mature, low risk technology that is able to deliver real greenhouse gas savings within a short timeframe compared with proposed clean coal technologies. In the absence of increased renewable energy targets from the Australian Government, sugar mills are now looking to the recently announced Queensland Renewable and Low-Emission Energy Target to assist with achieving the necessary commercial drivers to stimulate investment in these cogeneration projects.

Yours faithfully

JM Craigie
General Manager

Electricity Generation in the Sugar Industry and Potential Projects

Electrical Generation in the Queensland Sugar Industry

For the processing of the 2006 sugar cane crop there was 392 MW of installed generation capacity in the Queensland sugar industry which resulted in the generation of approximately 1100 GWh of electricity. Approximately 550 GWh was exported from sugar mill sites to the state transmission or distribution networks.

Of the 23 sugar mills in Queensland in 2006, the largest bagasse generation installations are shown in Table 1.

Table 1 – Sugar Mill Generation Capacity – Largest Installations 2006 season
Source: ASMC Statistics

Mill	Company	Generation Capacity (MW)	Location
Pioneer	CSR Ltd	68	Brandon
Invicta	CSR Ltd	50.5	Giru
Rocky Point	Babcock & Brown	30	Beenleigh
Isis	Ergon Energy	25	Isis
Tully	Tully Sugar Ltd	21.4	Tully
Proserpine	Proserpine Co-operative Sugar Milling Association Ltd	20	Proserpine
South Johnstone	Bundaberg Sugar Ltd	19.3	South Johnstone
Marian	Mackay Sugar Co-operative Association Ltd	18	Marian

Sugar Mills – Periodic Generators

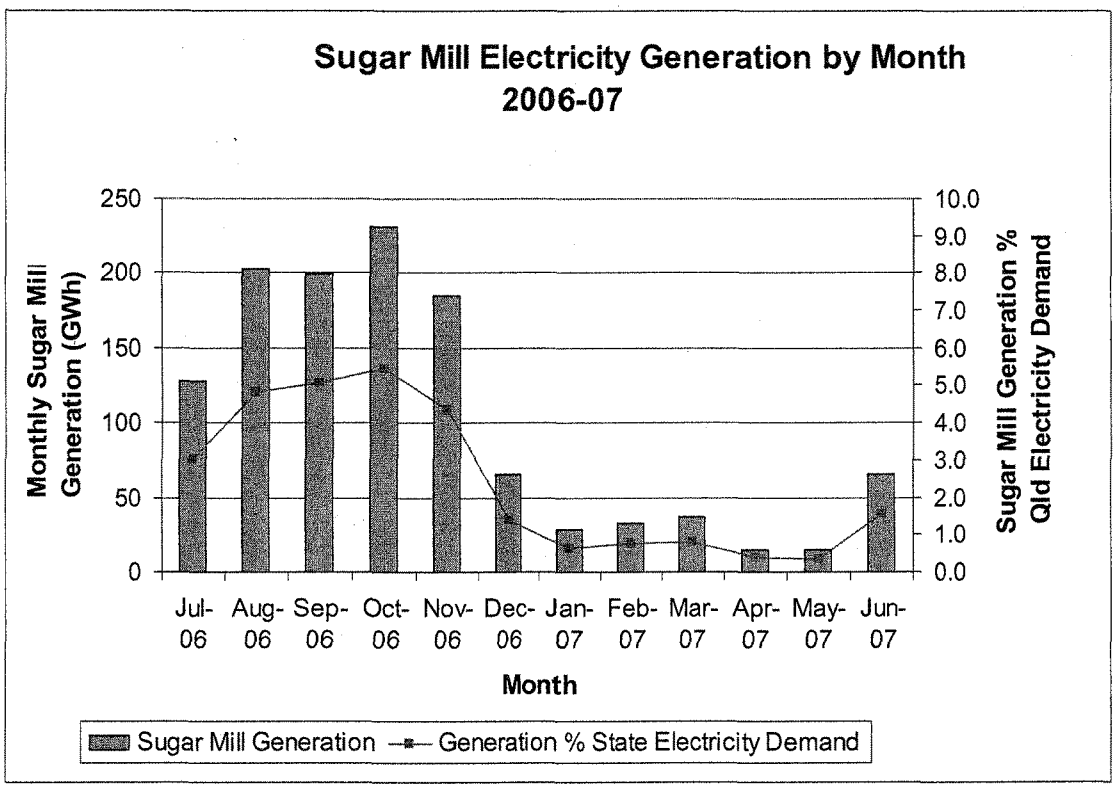
Sugar milling generation occurs primarily during the period from June – December which is the industry's traditional sugar cane crushing season. This period includes the majority of the Queensland winter peak demand period of June-August.

Whilst traditionally sugar mills have not generated electricity outside of the crushing season, this is now changing with the installation of more efficient boilers and improved steam efficiency in factories, generating surplus bagasse which can be stored for combustion outside of the traditional crushing period. Mills that store bagasse in this way generally seek to burn this bagasse during the period of December – March (usually following directly on from the end of the crushing period), to both use the surplus bagasse as soon as possible and to capture any price premium that can be obtained from operating in Queensland's summer peak demand period. This peak demand, being driven by summer air-conditioning load, is likely to increase with greater air-conditioning usage and reduced air-conditioner efficiency from higher average summer ambient

temperatures. Access to a natural gas supply and the addition of gas turbines to cogeneration facilities would provide the ideal circumstances for more sugar milling installations to supply into this peak demand period and operate year round.

Figure 1 shows the monthly electricity generation from generation attached to Queensland sugar mills for the financial year 2006-07 and this generation as a percentage of Queensland electricity demand.

Figure 1 – Sugar Mill Electricity Generation by Month
Source: ASMC Statistics



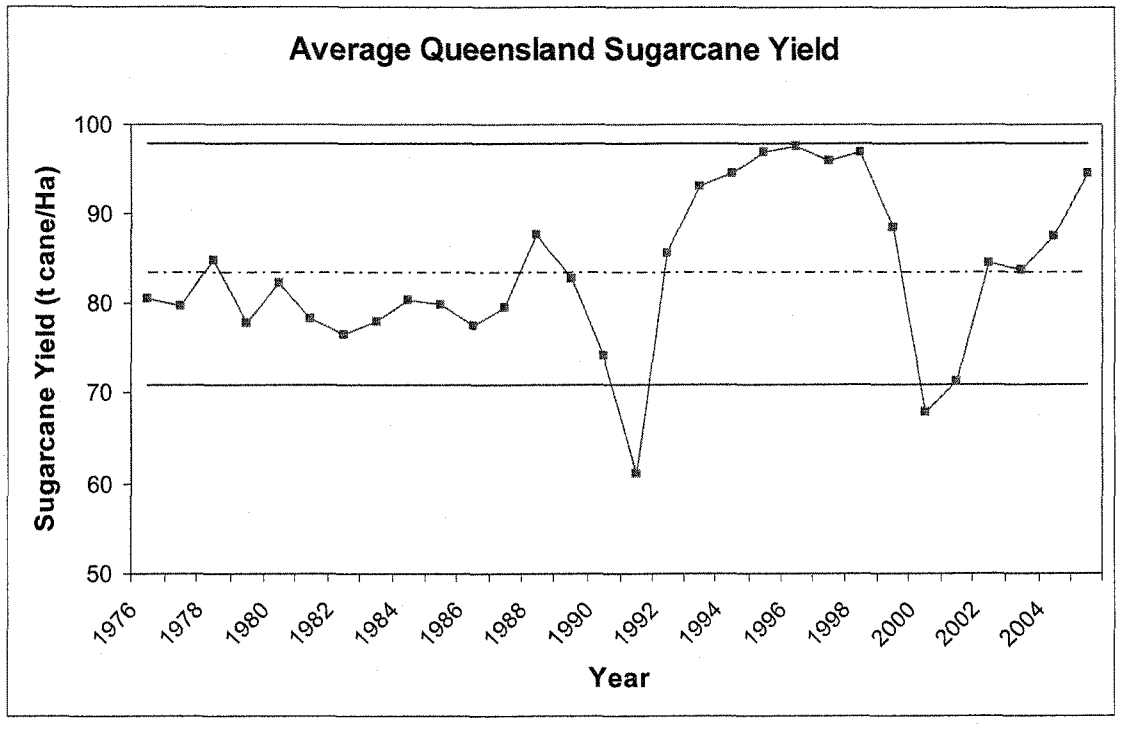
Many renewable energy projects are considered to be intermittent generators due to the intermittent nature of the resource, for example, wind power which depends upon windy conditions to generate power. Sugar milling generation is periodic – operating reliably for a generally predictable period each year.

The sugar cane resource from which bagasse is derived, on a state basis tends to be quite stable apart from occasional exceptional years of drought and/or disease. The average sugar cane yield for the last 30 years is 83 tonnes cane/Ha, and in only two years out of the last 30 years did the average yield for Queensland drop below 85% of this average value (Figure 2).

Bagasse is a periodic resource available generally during the traditional crushing season of June – December and increasingly between June - March. The predictability of the

resource should allow energy plans (including issues such as maintenance downtime for other power plants) to be scheduled with regard to sugar milling generation.

Figure 2 – Average Sugar cane Yield for Queensland 1975-2006
Source: ASMC Statistics



Proposed new sugar milling generation projects are associated with an increase in the number of days per year that the facility operates, improving their value as essential components of Queensland's energy infrastructure. Energy policy framework should provide incentives for Queensland sugar mills to be available for power generation for extended periods outside of the crushing season and particularly through the summer peak energy period.

Current Greenhouse Gas Emission Savings from Sugar Mill Generation

The savings in greenhouse gas emissions resulting from sugar industry generation from bagasse has been calculated based upon the emission factors listed in the Australian Greenhouse Office – Factors and Methods Workbook. Replacement of coal generation with renewable bagasse electricity generation in Queensland results in a saving of 1.058 kg CO_2-e/kWh (or 1.058 t CO_2-e/MWh).

Generation of electricity from bagasse from the 2006 season resulted in the avoidance of an equivalent quantity of coal fired generation, representing avoided greenhouse gas emissions for Queensland of approximately 1.2 million tonnes of CO_2-e. The potential exists for the industry to contribute much more significantly to Queensland's greenhouse gas abatement.

Potential Electrical Generation and Greenhouse Gas Emission Savings from Sugar Industry Generation

Whilst most sugar mills have medium and long term plans for boiler and generation plant upgrades, there are at least 5 new sugar mill generation projects that in the right policy environment would be likely to proceed in the short-medium term. These projects would provide up to an additional 250 MW of exportable generating capacity and generate for export an additional 1000 GWh annually. This would result in total sugar milling electrical exports of about 1,550 GWh (equivalent to 2.7% of the projected Queensland total electricity demand in 2006-07.

Such investment would result in an additional annual avoidance of greenhouse gas emission from Queensland's stationary energy sector of in excess of 1.05 million tonnes of CO_2-e, taking the total greenhouse gas avoidance from sugar industry export generation to approximately 1.65 million tonnes annually. It should be highlighted that the greenhouse gas emissions avoided by the installation of bagasse fired export generation capacity are avoided each year, resulting in cumulative emissions avoidance over the life of the plant.

Further investigations into additional bagasse projects (in addition to the 5 short-medium term projects already identified) are likely to be instigated within a positive policy environment for renewable power.

Value of Short-Medium-term Sugar Milling Generation Projects

Discussions with a number of sugar milling companies seem to indicate that in the current environment, the installation of capital to increase electrical generation output will cost in the order of $4.0 million per MW of installed capacity. Actual capital costs will of course vary with each installation particularly depending on whether or not a new boiler is required but also on the operational environment and extent of factory modifications required.

Given the potential of an additional 250 MW of generating capacity being installed, the anticipated value of this short to medium term investment is up to $1 billion (in 2007 dollars). Indications from sugar mills suggest that at these capital costs, returns in the order of $100 per megawatt hour for 15 years are required to generate investment.

The average value of electricity sales in typical sugar industry off-take agreements has been around $35/MWh and renewable energy certificates have fluctuated in value from $17 up to about $35/MWh in the last 12 months (a result of the drought and its impact on hydro schemes), limiting the returns from electricity export to a maximum of about $70/MWh, including an avoided TUoS (Transmission Use of Systems) component. This is not sufficient to justify further investment in cogeneration by sugar mills, given the significant increases in capital and construction costs that have occurred in recent years.

The Queensland Government, in its ClimateSmart 2050 Policy Statement states that the carbon price that would be initially set under an emissions trading scheme would be unlikely to stimulate investment in renewable and low emission technologies. In view of this the Queensland Government has established the Queensland Renewable and Low-Emission Energy Target (QRALET).

Details of the QRALET scheme are yet to be released and the Sugar Milling Council along with individual sugar milling companies are working closely with the State Government providing information aimed at ensuring the new scheme assists in establishing the appropriate commercial drivers to encourage further investment.

Additional Comments

Much has been published on the impact of climate change and the need for adaptation in anticipation of the changes. It seems incongruous that the sugar industry continues to operate at very low energy efficiencies to "waste" a renewable fuel, when improved electricity pricing incentives would result in a much more significant contribution from the industry to greenhouse gas abatement.

Despite initial expectations that much of the Australian MRET target would be met by biomass generation from bagasse, the anticipated levels of investment in sugar milling generation has not occurred. One of the reasons for this is that compared to other types of renewable generation (eg wind or solar hot water), sugar mill installations are much more complex requiring modifications to existing plant including factory efficiency measures. The engineering planning may take several years longer than that required for other standalone renewable energy technologies.

Despite the complexity of planning for cogeneration investment, generation from bagasse is proven technology. Australian Government grant programs for greenhouse gas reduction are focused on the development of new technologies, many of which may not be able to be commercialised for many years or decades. Sugar milling generation is mature low-risk technology that can start delivering greenhouse gas abatement within a comparatively short timeframe with relatively minimal impact on electricity costs.

The decentralised nature of the sugar industry offers security of electricity supply to regional areas, reduced electrical losses in the transmission network, and the potential to delay expenditure on Queensland's transmission system to cater for industry and population expansion along the Queensland coast. These benefits are not reflected in electricity prices available to embedded generators like sugar mills.

In the current environment, sugar mills are considering all options for implementing business efficiency measures including investment in new generation capacity. The Australian Sugar Milling Council is keen to continue discussions with the Department of Industry, Tourism and Resources that may provide a path to a policy environment in which this investment occurs.