SOUTH POLE AND McCULLOUGH ROBERTSON CLIMATE LEADERS FORUM

CHALLENGE: HOW CAN QUEENSLAND'S SUGAR MILLING INDUSTRY UNLOCK THE HUGE POTENTIAL OF RENEWABLE CO-GENERATION USING WASTE PRODUCTS FROM THE MILLING PROCESS TO HELP DECARBONISE THE STATE'S ENERGY SYSTEM?

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David Rynne speaking points

- Thank you to Tom and Dominic for the invitation to discuss the Australian sugar industry's renewable energy agenda and some of the commercial and regulatory barriers we're currently facing in assisting with the transition to a low carbon economy.
- My name is David Rynne and I am the Director of Policy, Economics and Trade at the Australian Sugar Milling Council.
- ASMC is the peak industry organisation for raw sugar manufacturing. We represent five sugar manufacturing companies which collectively produce 90 percent of Australia's raw sugar at 16 sugar mills in Queensland.
- The Australian sugar generates around $2.6 billion in revenues per annum – with about 90% coming from domestic and export raw sugar sales and the balance coming from domestic electricity, ethanol, molasses and white sugar sales.
- The industry is however under threat. This very high revenue reliance on global raw sugar sales (associated with highly volatile global prices) and increasing mill under-utilisation is a risk to the industry's profitability and financial sustainability, host communities and the wider Queensland and Australian economies.
- To promote long-term grower and miller financial viability, and support resilient sugar communities ASMC members are vigorously pursuing an industry *Revitalisation* plan.
- Revitalisation focuses on three key 'pillars'.
    1. Increase cane and sugar yields and volumes thereby decreasing operational costs.
    2. Increase or at least maintain the area where sugarcane is grown.
    3. And of high relevance to today's discussion, increase revenues from complementary, diversified, value-added outputs and products. This could for example be from co-generated electricity production from the bagasse waste product, ethanol from molasses, bio-methane from bagasse or cane trash.
- Our largest sugar-exporting competitors – Brazil and Thailand – continue to reduce their exposure to sugar price volatility by implementing government reforms that promote revenue diversification mainly (co-generation and ethanol but also bio-plastics and bio-chemicals).
- ASMC is currently reviewing the evolving domestic and global energy landscape and we continue to engage government and industry experts on our opportunities, problem statement and to find solutions.
- In the time I have I wish to focus on our renewable energy potential, the barriers and sizeable environmental and economic benefits that could be generated.

The sugar milling sector's co-generation (steam and electricity) revenue potential

- Sugar mill co-generation plants utilise the by-product cane fibre (bagasse[1]), and other feedstock, to generate high and low pressure steam from boilers that are used for electricity generation and to power internal processes.
- The electricity is used internally or externally (sold into the NEM or into wholesale markets).
- The milling sector currently has around 438 MW of installed co-generation capacity, annually generating 1 million MWh's of total electricity from units ranging from 8 to 68 MW of nameplate capacity. Of the 1 million MWh's generated, 567,000 MWh's are exported to the grid.
- The predominant fuel source for sugar mill co-generation is bagasse – although other feedstocks are used when co-generated steam and/or electricity supply is needed in the non-crush season to power a neighbouring refinery or ethanol distillery for example.
- There remains considerable scope for the Australian sugar industry to increase its co-generated steam/ electricity output, including exports to the grid, because mills currently store bagasse or opt to burn it, but burn it inefficiently to reduce storage costs.
- ASMC estimates that if the bagasse that is currently stored was fully utilised with stored bagasse burnt and steam on cane settings and boiler efficiencies improved, the sector could theoretically triple its electricity output from 1 million to around 3.4 million MWh's of which approximately 2.7 million MWh's[2] could be exported to the NEM (i.e. 2,700 GWh).
- Green Energy Markets in June 2020[3] estimated that the gap to achieve QLD's 50% by 2030 renewable energy target was 2,983 GWh's. Applying a more conservative latent energy supply of 1,500 GWh (not the maximum 2,700 GWh) the QLD sugar industry could meet half of QLD's renewable supply gap under the right commercial and policy settings.

The benefits of bagasse co-generation

- Assuming commerciality, increasing NEM exports from 0.567 million MWh to 2.7 million MWh's would increase the sector's milling revenues from around $19 million to $122 million per annum at $45/MWh export revenues. This revenue would improve the milling sector's viability thereby preserving the estimated 23,000 direct and indirect operational jobs the QLD sugar industry generates[4].
- Depending on a range of technical, policy and commercial factors, achieving 2.7 million MWh of export could result in another 400 MW of co-generation capacity being installed as green and/or brownfield investment. At approximately $3,000/kWh for new capacity, this would result in approximately $1.2 billion in CAPEX being injected into regional Queensland and generate additional employment and benefits.
- Co-generation from bagasse provides a clean and renewable energy source with a 0.01t CO2-e/MWh greenhouse gas (GHG) signature. This compares to a 0.81 CO2-e/MWh GHG

[1] In 2020, the QLD sugar milling sector crushed 29.3 million tonnes of cane and generated 6.3 million tonnes of bagasse.

[2] This assumes that every tonne of bagasse produced by the industry is utilised in co-generation and the steam on cane settings for each generation unit are set to achieve the maximum technical energy efficiency for that particular generation unit. These efficiencies range from 0.1 to 0.31 MWh per tonne of bagasse.

[3] June 2020 Renewables Report, page 47

[4] See ASMC https://asmc.com.au/policy-advocacy/sugar-industry-overview/economic-contribution-sugar/

signature across the NEM currently with various renewable and non-renewable energy supplies in the mix[5].

- Assuming that 3.4 million MWh is reached and the balance beyond the industry's internal is exported to the NEM, this 2.7 million MWh would power approximately 386,000[6] dwellings for 12 months with renewable power.
- Furthermore, this power would lead to around 2.1 million tonnes of GHG tonnes abated per annum.
- Further, and unlike intermittent renewables, cogenerated bagasse supply is synchronous and can provide invaluable reliability and security to the grid – a key objective of policymakers such as the Energy Security Board at present.

Barriers to fully utilising this latent bagasse supply for power generation

- The advent of the Renewable Energy Target (RET) in 2001 and creation of revenue streams via RECs and later Large-scale Generation Certificates (LGC) led to cogeneration (bagasse) capacity increasing from 233 MW pre-RET to 438 MW. However, the significant downward revision in the RET target in 2015 has meant that the RET became fully contracted earlier than envisaged with LGC prices falling consistently to $20-$30 since 2019.
- AEMO and Energy QLD's enforcement of the NER generator performance standards (GPS) is becoming unworkable for the sector in terms of process delays and compliance costs. For example MSF's $100 million, 24 MW Tableland co-generation facility remains largely idle three years after being commissioned due to regulatory approval issues and industry compliance mistake. The delays have been expensive and have prevented co-generation revenue from flowing to the mills and supporting payments for sugarcane from growers.
- In summary, in the absence of further regulatory incentives or some other commercial opportunities, low LGC and NEM prices and increasing regulatory pressures threatens the viability of current and potential new co-generation supply.

Thankyou.

[5] Being the current NGERS all electricity emission intensity default value from Australian Government Department of Environment and Energy. National Greenhouse Accounts Factors – July 2017

[6] While various estimates of average household energy consumption exist, for these purposes 1 house = 7MWh