

Queensland raw sugar cost of production report

An analysis of the costs of producing raw sugar
in Queensland between 2018-2020 with sectoral
Earnings Before Interest and Taxes (EBIT)
and Return on Assets (RoA) results

JULY 2022

Prepared by the Australian Sugar Milling Council with the assistance of BDO Projects



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Executive summary

The Australian sugar industry is a large and vital regional industry. A 2020/21 study revealed that the industry injected \$3.85 billion in Gross State Product and supported almost 20,000 jobs in the Queensland economy¹.

Local government regions like Hinchinbrook, Burdekin, Mackay and the Cassowary Coast are highly dependent on a prosperous sugar industry.

The global demand fundamentals for sugar remain strong despite the moderation in end-user consumption patterns in recent times.

Driven by strong expected population and income growth in the developing world, global consumption and raw sugar imports are expected to increase by 1.5% and 2.1% per annum respectively out to year 2040². Fortunately, for Australia much of this raw sugar demand

will be in Asia where the Australian industry enjoys commercial and comparative advantages over its competitors. Also, the demand for sugar by-products, be that for bio-energy (co-generated power, bio-fuels or bio-methane for example) and synthetic food, plastics and chemicals is growing as de-carbonisation and food-security agendas gain momentum.

However, there are threats. Flat cane yields and falling cane supply and area under cane (trend terms over the past number of decades) is contributing to mill under-utilisation and a lack of economies of scale³. Falling cane supply and mill under-utilisation, in combination with rising cane growing and milling costs, volatile sugar revenues and limited revenue diversification will continue to undermine the financial viability of Queensland sugarcane and milling operations if not addressed. The recent closures of the Maryborough and Bingera mills demonstrate this.

This analysis is the first attempt in more than 20 years by the Australian sugar industry to understand the integrated cost of raw sugar production across multiple

milling regions and sectoral earnings and investment returns. The objective was to **understand the industry's real costs and exposure to the threats of mill under-utilisation, variable sugar revenues and limited value-add revenue diversification under various price scenarios.**

Undertaken by BDO Australia for the ASMC, a sample of mills, representing 80% of the Queensland sugar industry, provided detailed mill sector production costs, (own) cane sector production costs, sugar revenues, by-product revenues, cane supply and sugar production data for the years 2018, 2019 and 2020. BDO also sourced cane production costs from various other sources to work out the true cost of raw sugar production.

From this data ASMC was able to calculate Industry (aggregate) and separately, cane and milling sector Earnings Before Interest and Taxes (EBIT) and Returns on Asset (RoA). The results of the BDO analysis have been adapted in the charts and tables contained in this report. The key findings and learnings are summarised in **Table 1**.

1. <https://asmc.com.au/sugar-industrys-economic-contribution-2020-21/>

2. Internal industry analysis.

3. <https://asmc.com.au/target-34-a-pathway-to-sustainable-cane-supply-october-2021/>

TABLE 1: KEY FINDINGS AND LEARNINGS FROM THE BDO ANALYSIS

Key findings	Key learnings	Report reference
(1) Across the sample of 13 mills, the weighted average cost of producing a tonne of raw sugar between 2018-2020 was A\$427/t (with a range of A\$371/t to A\$484/t). This compares to a 5-year average raw sugar price of A\$436/t .	Given the ongoing distortions in the global sugar market, significant parts of the industry are at risk going forward if higher mill utilisation and additional revenues for sugar and beyond sugar manufacturing are not generated.	Chart 1
(2) Across the sample of 13 mills, and when by-product revenues from minor co-generation, molasses and mill mud are aggregated and treated as a cost offset, the weighted average cost of producing a tonne of raw sugar between 2018-2020 decreased from A\$427t (see finding #1 above) to A\$397/t (with a range of A\$350/t to A\$455/t). This compares to a 5-year average raw sugar price of A\$436/t .	Worth on average A\$30.66/t , by-product revenues are a very important revenue stream for the industry that support viability. Revenue from by-products has the potential to increase as the industry generates very large amounts of by-product feedstock that can be used more efficiently and in higher value-add ways. However, these investments will require regulatory reform and policy incentives (see below).	Chart 2
(3) Across the sample of 13 mills, and when by-product revenues from minor co-generation, molasses and mill mud are aggregated and treated as a cost offset AND full mill utilisation is (hypothetically) achieved, the weighted average cost of producing a tonne of raw sugar between 2018-2020 decreased from A\$427/t (see finding #1 above) to A\$384/t (with a range of A\$346/t to A\$431/t). This compares to a 5-year average raw sugar price of A\$436/t. In this sample of mills, the hypothetical increase in cane supplied was 3.6 million tonnes i.e. cane supply increased from 23.5 million tonnes (actual) to 27.1 million tonnes (hypothetical).	Worth on average A\$12.32/t , achieving full mill utilisation can lower costs and promote industry viability. This is because 80-90% of milling costs (excluding cane purchases) are fixed, meaning unit costs decrease for every additional unit of sugar output. Achieving this will require improved variety development and adoption, improved farming practices and maintaining the amount of land under cane production.	Chart 3
(4) The average milling cost increase across the 13 mills between 2018 and 2019 was 2.4% and 3.2% between 2019 and 2020.	The industry is incurring cost inflation. The main cost elements of producing a tonne of raw sugar are cane growing costs, milling administration and overheads, maintenance and factory operations. Offsetting these cost inflation pressures will require further improvements in cane yield and supply as well as maintaining sugar manufacturing efficiencies through mill maintenance and improvement programs.	Charts 4 and 5

TABLE 1: KEY FINDINGS AND LEARNINGS FROM THE BDO ANALYSIS

Key findings	Key learnings	Report reference
<p>(5) There is a correlation between those mills that achieve consistently high volumes of cane and mill utilisation and lower raw sugar production costs and viability.</p>	<p>Given the high fixed cost structure of mills (i.e. excluding cane costs, 80-90% of the costs of operating a mill are fixed), maintaining and increasing cane volumes to or close to mill utilisation is essential to:</p> <ul style="list-style-type: none"> ▪ Reducing costs ▪ Supporting substantial re-investment in the operating capacity of the mills ▪ Supporting further investment in revenue diversification opportunities, and ▪ Promoting industry viability. <p>Per key finding #3, achieving consistently higher cane supply will require improved variety development and adoption, improved farming practices and maintaining the amount of land under cane production.</p> <p>Milling performance can be improved through mill maintenance and improvement programs.</p>	Chart 6
<p>(6) Across the 13 mills, and between 2018-2020, the average EBIT per annum for the industry was A\$98.6 million, consisting:</p> <ul style="list-style-type: none"> ▪ For the milling sector A-\$22.6 million. ▪ For the cane growing sector A\$121.2 million. <p>Across the 13 mills, and between 2018-2020, the average EBIT per annum for the industry was A\$4.17 per tonne of cane supplied, consisting:</p> <ul style="list-style-type: none"> ▪ For the milling sector -A\$0.97 EBIT per tonne of cane supplied. ▪ For the cane growing sector A\$5.14 EBIT per tonne of cane supplied. 	<p>Whilst the industry as a whole recorded positive earnings (EBIT) during 2018-2020, on a sectoral basis, the cane growing sector achieved positive earnings whilst the milling sector incurred losses during this period.</p> <p>The higher earnings achieved by the cane growing sector (compared with the milling sector) reflects the application of the cane price formula that determines the price of cane purchased by the miller from the grower.</p> <p>However, EBIT does not take into account the quantum of the investment or the risk of the cane growing and milling sectors who have made investments in the industry. For these reasons a Return on Asset (RoA) analysis can be more appropriate. See points #8 and #9 below.</p>	Appendix 5 Table 2

TABLE 1: KEY FINDINGS AND LEARNINGS FROM THE BDO ANALYSIS

Key findings	Key learnings	Report reference
<p>(7) At 2020 cane growing and milling sector cost structures, the cane growing sector earns higher EBIT per tonne of cane supplied than the milling sector at all hypothetical sugar prices.</p>	<p>Reflecting the operation of the cane price formula, and the difference in the value of assets deployed in both sectors (cane growing approx. A\$5.7b compared to milling's approx. A\$2.4b in this sample), mill sector EBITs per tonne of cane are lower than cane growing sector EBITs at all hypothetical sugar prices.</p> <p>However, EBIT does not take into account the quantum of the investment or the risk of those parties who have made investments in the industry. For these reasons a Return on Asset (RoA) analysis can be more appropriate. See points #8 and #9 below.</p>	Chart 7
<p>(8) Assuming a A\$5.7b cane growing sector asset value and a A\$2.4b milling sector asset value in this sample of operations, an average EBIT return of \$121.2 million for the cane growing sector and -A\$22.6 million for the milling sector between 2018 and 2020 resulted in an average 2.1% RoA for the cane growing sector and an average -0.9% RoA for the milling sector.</p>	<p>When EBITs are utilised to calculate Returns to Assets (i.e. EBIT/asset values), both sectors recorded low RoAs during the 2018-2020 sample period. This highlights the need for additional value to be created along the sugar value-chain.</p>	Appendix 5
<p>(9) Assuming a A\$5.7b cane growing sector asset value and a A\$2.4b milling sector asset value, the cane growing sector earns a relatively higher RoA than the milling sector at all hypothetical sugar prices up to A\$575/t raw sugar.</p> <p>Assuming a 5-year average raw sugar price of A\$436/t, grower RoA is 1.8% and the miller RoA is -0.1%.</p>	<p>When scenario analysis is undertaken, and various lower and higher sugar prices are examined applying 2020 cost structures, the two sectors achieve the same 6.85% RoA at A\$575/t (US19c/lb @ AUD:USD 73c). When sugar prices are below A\$575/t, the cane growing sector earns a relatively higher RoA than the milling sector. When raw sugar prices are greater than A\$575/t, the milling sector earns a relatively higher RoA than the cane growing sector. There is not therefore a disparity in the earnings capability of the milling sector compared to the growing sector.</p> <p>Assuming an acceptable RoA for capital deployed is greater than 7%, both sectors at 2020 cost structures and at the 5-year average price of A\$436/t achieve RoAs below what is commercially acceptable for new investment.</p>	Chart 8

It is clear from the EBIT analysis that under reasonable raw sugar price assumptions the milling sector, and as a consequence, the industry's viability is compromised. It is also clear from the RoA analysis that under reasonable raw sugar price assumptions that new investment by the milling sector is unlikely in the absence of achieving compelling business cases, policy certainty and government support to assist with significant initiatives to lower costs and/or achieve higher revenues.

Achieving higher mill utilisation and value-add revenue diversification has proven to be difficult for the industry. Problems have included:

- Long periods of low sugar and hence, cane prices;
- Substitution to other crops and land purposes; and
- Limited policy incentives – especially for revenue diversification – where projects typically fail to reach commercial rates of return on a stand-alone basis.

The industry has acknowledged these threats and past problems and is developing a number of initiatives in response, including:

- Development of a 'Sugar Plus' industry vision and roadmap to 2040;
- Implementation of a *5-Year Trade Policy and Market Access Strategy*;
- Commissioning L.E.K Consulting to assess the commercial viability of various bio-energy opportunities;

- Significant changes to the industry-owned R&D services provider Sugar Research Australia's strategy and operational model;
- Regular meetings between industry leaders at the Sugar Industry Leaders Forum; and
- A more sophisticated dialogue with government to improve policy and regulatory settings (the Revitalisation Agenda).

The recently released Sugar Plus Vision and Roadmap is a particularly important document for this industry. The ASMC supports the cane supply and revenue diversification objectives of the document and a suite of **commercial and regulatory reforms and policies** to promote these objectives, including:

- The milling and grower sectors to consider different investment models that enable value chain participation based on risk and reward to increase revenue and returns overall for the industry;
- Amongst other things, adoption of innovative farm ownership and operability models;
- Protections for prime agricultural land and incentives for horizontal expansion;
- Supporting firms with innovative technologies to work with mills to bring to scale and commercialise the next wave of value-add products; and
- Incentives and removal of regulatory barriers to invest in the next wave of bio-energy projects.

While investment will require various types of incentives, the pre-contract arbitration provisions in the *Federal Sugar Industry Code of Conduct (2017)* and similar provisions in the *Queensland Sugar Industry Act* **remain a barrier to diversification investment by sugar mills given the risk that future returns can be expropriated after an investment decision has been made thereby undermining the integrity of the original investment decision.** ASMC looks to government and the industry more broadly, for support to transition from these provisions to promote the viability of the industry.

This document provides a comprehensive suite of reforms.

ASMC thanks BDO Projects for their assistance with this report and representatives of members who have contributed resources and time to compiling the data. It is hoped that the findings of this report, and the rich demonstration of the industry's challenges galvanises the industry and stakeholders to address the threats that exist and drive a pro-reform commercial and policy and regulatory agenda based on achieving higher cane supply and value-add, revenue diversification.

Introduction and context

- The Australian Sugar Milling Council (ASMC) is the peak representative body for the sugar manufacturing sector, representing the five companies that collectively produce approximately 90% of Australia's raw sugar at 16 sugar mills across Queensland.
- The ASMC engaged BDO Projects in 2021 to undertake an analysis of the costs of producing raw sugar in Queensland for the years 2018, 2019 and 2020.
- BDO Projects is a professional advisory firm that provides accountancy, tax and advisory services to clients Australia-wide.
- Whilst analysts estimate the costs of producing raw sugar in various countries, it has been 20 years since an independent expert has gathered and combined cane growing cost data with actual mill cost data to derive integrated (by mill) raw sugar production cost profiles for the Australian industry.
- This report has been prepared to inform stakeholders on the costs of producing raw sugar in Queensland and the earnings and asset returns of the grower and milling sectors between 2018-2020 and to fully understand the industry's costs and exposure to the threats of mill under-utilisation, variable sugar revenues and limited value-add revenue diversification under various price scenarios.
- The costs in this report come from BDO's independent analysis of the milling and cane production (own farm) cost data provided by ASMC member companies and various other State and Federal Government sources for third party cane supply. ASMC has subsequently converted BDO's independent analysis into several tables and charts. Utilising the BDO cost of production data (CoP), ASMC also undertook additional EBIT and RoA analysis. The policy implications provided in this report are the views of ASMC alone.

BDO and ASMC methodology

- To complete CoP, EBIT and RoA analysis for the last three years where companies had full account information, BDO in 2021 approached ASMC member companies to complete a comprehensive survey of costs and revenues, by mill, for the years 2018, 2019 and 2020. Data for 13 mills representing approximately 80% of Queensland's cane and sugar production in 2020 was provided to BDO on a confidential basis.
- Specifically, BDO requested data on:
 - Costs by mill (A\$) in the following categories – transport, factory, levies, maintenance, administration and overheads, cane pay constant plus allowances, depreciation, minor and major co-generation, and mud and molasses handling;
 - Cane supply tonnes including both mill-owned and third party to each mill;
 - Raw sugar (actual) produced (t) at each mill and the volumes that are marketed as Grower Economic Interest (GEI) and Miller Economic Interest (MEI);
 - Raw sugar revenues by mill (A\$);
 - By-product revenues by mill (A\$) including minor and major co-generation, molasses and mill mud. Major co-generation which required significant capital outlay was subsequently excluded from the analysis to allow a mill-by-mill comparison; and
- Cane supply costs (\$/t cane). This was obtained directly from mills from own-farm data, Farm Economic Analysis Tool (FEAT) and ABARES.
- **Appendix 1** summarises the grower costs data by grower milling region that was utilised. **Appendix 2** provides further details on how the CoP, EBIT and RoA analysis was undertaken as well as other key assumptions.
- For some of the analysis, ASMC assumed a raw sugar revenue figure **over five years** not the three years from the sample to reflect a longer and more representative price cycle. For years 2015/16-2020/21, ASMC calculated a 5-year average raw sugar (tonne) revenue figure to the Australian sugar industry based on QSL Gross ICE#11 pool price plus QSL Shared pool returns plus a pro-rated return from the net returns of the US Quota pool (full workings are outlined at **Appendix 3**). To provide a longer-term perspective, and to put today's 2022 sugar prices into context, **Appendix 4** provides ICE#11 raw sugar prices in Australian dollars in real and nominal dollars over the last 15 years.
- ASMC opted to show raw sugar production costs in three ways:
 - (1) Raw sugar manufacturing only occurs (i.e. no by-product revenue is earned) (**Chart 1**);
 - (2) Raw sugar manufacturing occurs and by-product revenue from minor co-generation, molasses and mill mud revenues is treated as a cost offset and subtracted from the raw sugar manufacturing costs (**Chart 2**); and
 - (3) Raw sugar manufacturing occurs, by-product revenue from minor co-generation, molasses and mill mud revenues is treated as a cost offset and subtracted from the raw sugar manufacturing costs AND (hypothetical) full mill utilisation occurs (**Chart 3**).

Key findings from BDO analysis

CHART 1: RAW SUGAR PRODUCTION COSTS BY MILL
(By-Product Revenues Not Assumed as a Cost Offset)
(AVERAGE 2018-2020) (\$AUD)

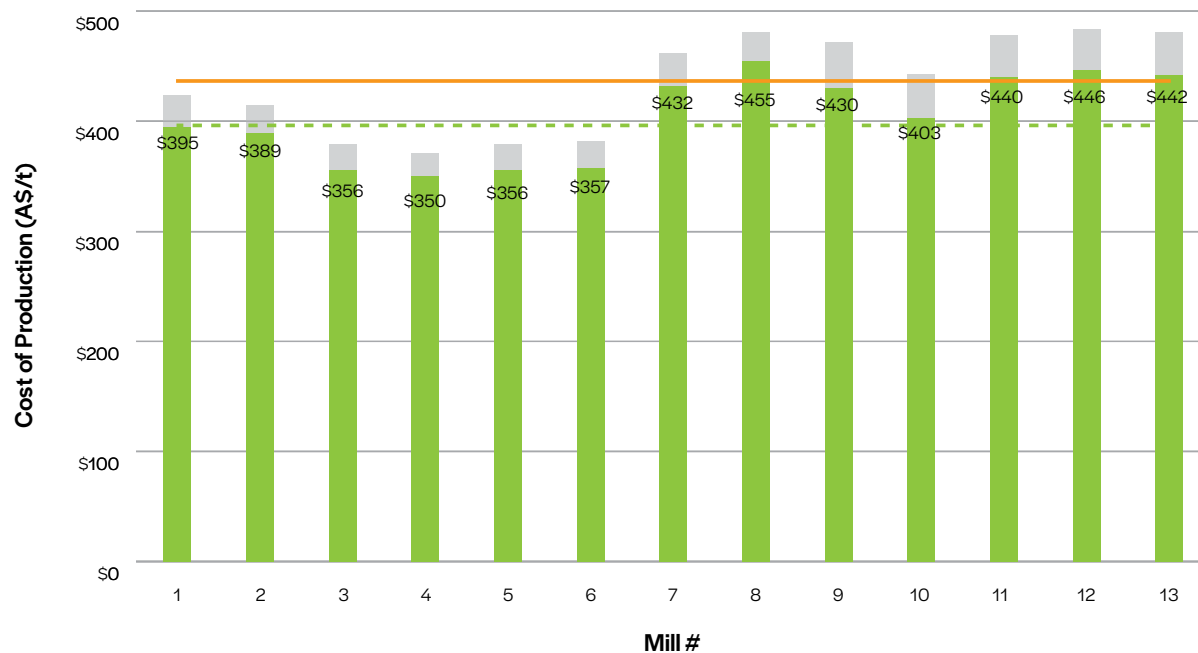


- On a weighted average basis, the **average raw sugar production cost** across these 13 mills between 2018-2020 was **A\$427/t (or US13.8c/lb at AUD:USD 0.71c*)**.
- Between 2018-2020 individual mill raw sugar production costs varied from **A\$371/t** (mill #4) to **A\$484/t** (mill #12). Costs include cane costs of production and all milling costs less major co-generation related costs and cane constant and allowances.
- The variances in the production costs reflect, in the main, the amount of cane being crushed (mills with higher volumes and mill utilisation generally have a lower CoP), as well as cane costs and other regional factors.
- If the average 5-year raw sugar price of **A\$436/t** (refer Appendix 3) is assumed, it was marginal - on an industry basis of 13 mills - to make raw sugar as revenues were on average **A\$9/t higher than costs**.

* Reserve Bank of Australia website and the average AUD: USD rate for the three years 2018-2020
Source: BDO data

CHART 2 - RAW SUGAR PRODUCTION COSTS BY MILL
(By-Product Revenues Assumed as a Cost Offset)
 (AVERAGE 2018-2020) (\$AUD AND USC/LB)

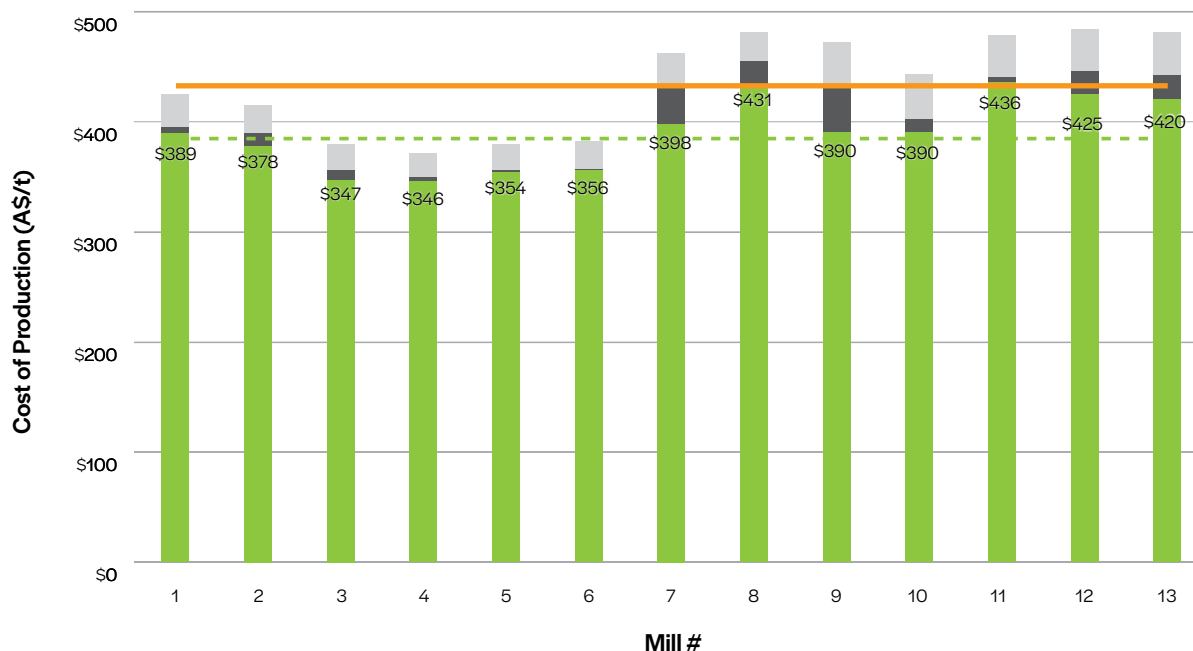
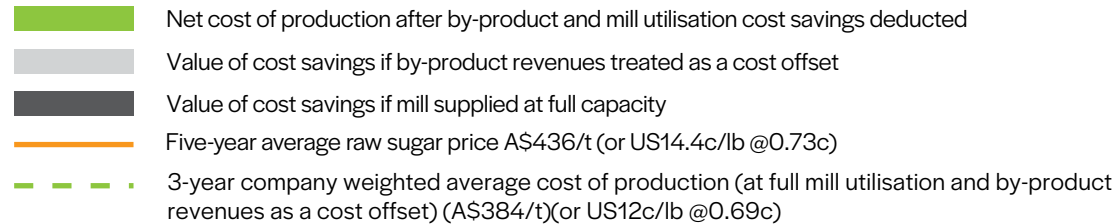
- Net cost of production after by-product and mill utilisation cost savings deducted
- Value of by-product revenues per tonne of sugar
- Five-year average raw sugar price A\$436/t (or US14.4c/lb @0.73c)
- 3-year company weighted company average cost of production (with by-products as a cost offset) A\$397/t (or US12.8c/lb @0.71c)



*Reserve Bank of Australia website and the average AUD: USD rate for the three years 2018-2020
 Source: BDO data

- On a weighted average production basis between 2018-2020, and when by-products are assumed as a cost offset, the **average raw sugar production cost** across these 13 mills was **A\$397/t (or US13c/lb at AUD:USD 0.71c*)**. This means by-product revenues (from minor co-generation, molasses and mill mud) are worth on average around **A\$30.66/t** to the milling sector (i.e. A\$427 less A\$397/t).
- Between 2018-2020, individual mill raw sugar production costs – when by-product revenues from minor co-generation, mill mud and molasses sales are subtracted as a cost offset - varied from **A\$350/t (mill #4) to A\$455/t (mill #8)**.
- If the average 5-year sugar price of **A\$436/t** is assumed, it was generally economic across the sector to produce raw sugar when by-product revenues are included because revenues were **A\$39/t** greater than costs on average.
- However, Industry earnings per tonne is a limited measure of financial strength as it does not take into account the quantum or the risks associated with the investment to achieve those earnings. The subsequent EBIT and RoA analysis in this report addresses this issue.
- **Chart 2** shows that by-product revenues are an important revenue stream for the mills. The by-product revenues are needed to increase EBITs and RoA's to support mill viability and continued investment in mill reliability and revenue diversification products.

CHART 3 - RAW SUGAR PRODUCTION COSTS BY MILL
(Cost Savings From Full Mill Utilisation And By-Product Revenues Deducted as a Cost Offset Shown)
 (AVERAGE 2018-2020) (\$AUD AND USC/LB)

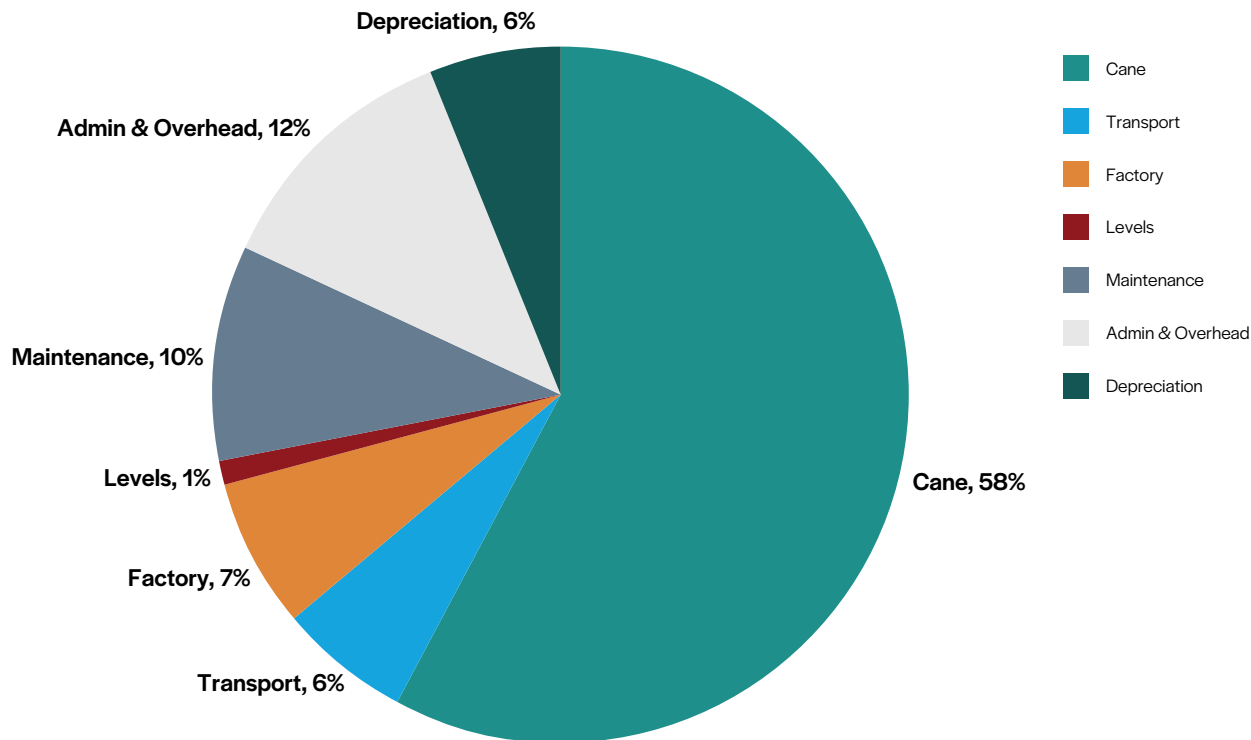


*Reserve Bank of Australia website and the average AUD: USD rate for 2020

Source: BDO data

- Across these 13 mills, and based on average 2018-2020 cost structures, the **average mill raw sugar production cost** – when the hypothetical cost savings of full mill utilisation **AND** by-product revenues are deducted – was **A\$384/t (or US12c/lb at AUD:USD 0.69c*)**.
- Across these 13 mills, and based on average 2018-2020 cost structures, achieving full mill utilisation (i.e. 3.6 million [hypothetical] increase in cane supply from 23.5 million tonnes [actual] to 27.1 million tonnes), lowers costs by approximately **A\$12.32/t** of sugar on average.
- Across these 13 mills, and based on average 2018-2020 cost structures, individual mill raw sugar production costs – when the hypothetical cost savings of full mill utilisation **AND** (actual) by-product revenues are deducted - varied from **A\$346/t (mill #4) to A\$436/t (mill #11)**.
- If the average 5-year sugar price of A\$436/t is assumed, it would have been economic across the sector to produce raw sugar if full mill utilisation was achieved **AND** by-product revenues were earned because revenues were **A43/t greater** than costs on average (i.e. A\$427/t less A\$31/t less A\$12/t equals A\$384/t).
- However, Industry earnings per tonne is a limited measure of financial strength as it does not take into account the quantum or the risks associated with the investment to achieve those earnings. The subsequent EBIT and RoA analysis in this report addresses this issue.
- **Chart 3** shows that by-product revenues **AND** achieving full mill utilisation are very important for the industry as they significantly lower costs and improve viability.

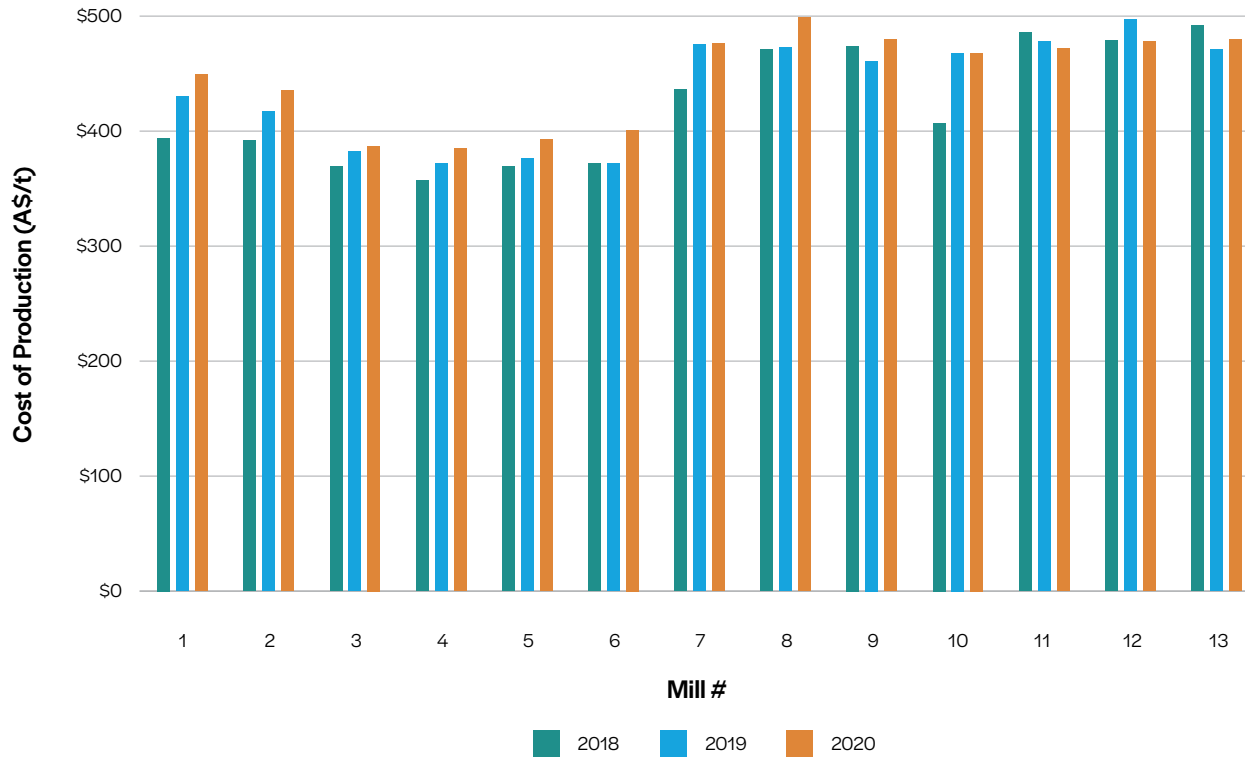
CHART 4 - RAW SUGAR PRODUCTION
Costs by Cost Element (2020)



Source: BDO data

- In 2020, the most significant raw sugar production costs were:
 - Cane growing (58 percent)
 - Admin & overheads (12 percent)
 - Maintenance (10 percent)
 - Factory operations (7 percent)
 - Transport (6 percent)
 - Depreciation (6 percent)
- Within the milling cost structure are significant additional cane-related costs over and above cane supply costs. These are both involuntary i.e. the 35c/t of cane contribution to the Sugar Research Australia levy and voluntary, for example:
 - 50/50 contributions to regional productivity services companies
 - Cane productivity improvement programmes
 - New / returning cane land planting incentive payments
 - Grower financing assistance e.g. water subsidies and land access.

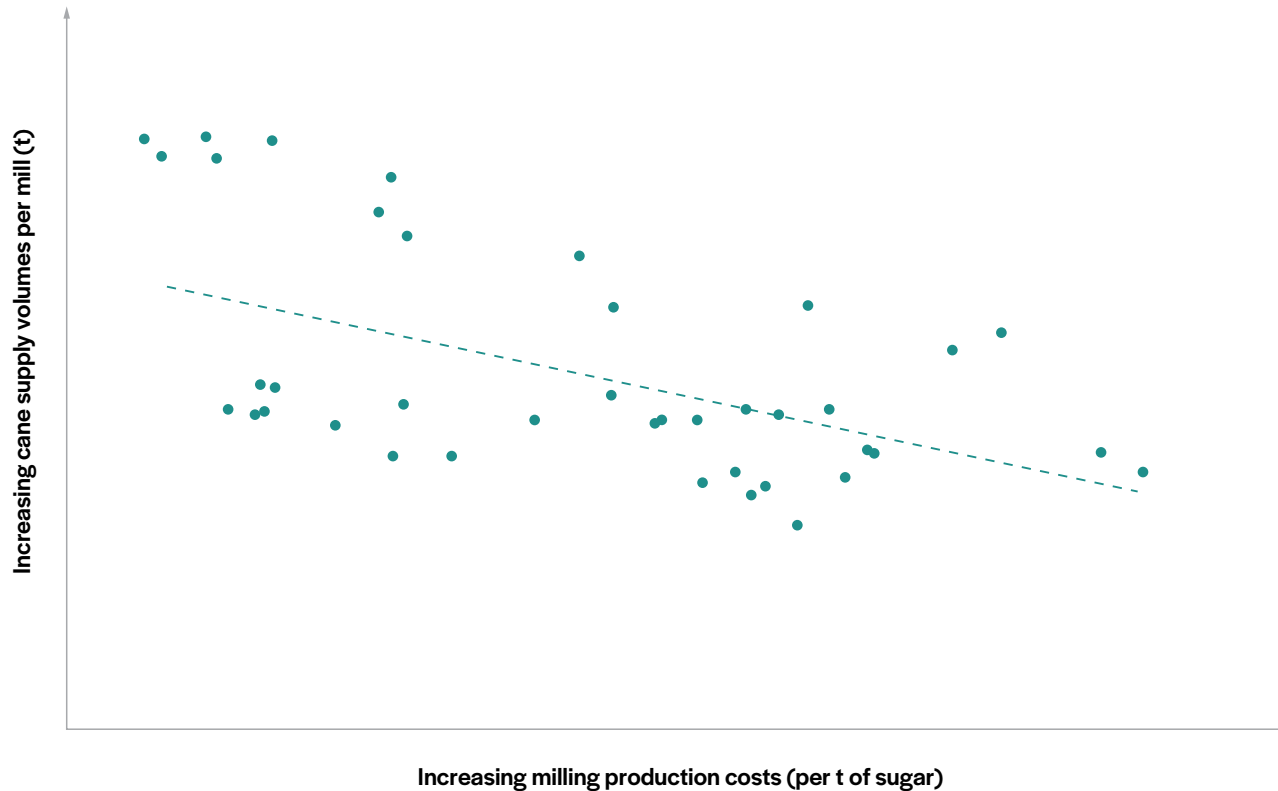
**CHART 5: RAW SUGAR PRODUCTION
Costs by Mill (2018-2020)**



- Between 2018 and 2020, raw sugar production costs generally increased for all but two mills (mills 11 and 12). The average cost increase across the 13 mills between 2018 and 2019 was **2.4%** and **3.2%** between 2019 and 2020.
- On a per tonne basis, all mills generally incurred increases in maintenance, administration & overheads, factory operations and depreciation costs between 2018 and 2020.
- **Note** – by-product revenues are NOT considered as a cost-offset in this chart.

Source: BDO data

CHART 6: CORRELATION BETWEEN MILLING PRODUCTION COSTS
(EXCLUDING CANE INPUT COSTS) AND CANE VOLUMES
(AUD\$) (2020)



Source: BDO data

- Chart 6 shows the relationship between **milling production costs (excluding cane input costs) and cane supply volumes** for each of the 13 mills in each year between 2018, 2019 and 2020 (i.e. 39 data references).
- There is a **positive relationship** between higher cane volumes through the mill and lower milling costs of production excluding cane costs.
- It is estimated that **80-90% of the costs of manufacturing sugar (excluding cane costs) are fixed**. This means that higher volumes of cane help reduce costs per tonne as costs are spread over more sugar production (output).
- **Note** – by-product revenues are NOT considered a cost-offset in this chart.

TABLE 2: INDUSTRY AND CANE GROWER & MILLING SECTOR EBITs
(A\$) per Tonne of Cane (2018-2020)

2018					
Industry revenues	\$64.76	Miller revenues	\$26.01	Grower revenues	\$40.37
Industry costs	\$58.79	Miller costs	\$26.73	Grower costs	\$33.67
Industry EBIT	\$5.97	Miller EBIT	-\$0.72	Grower EBIT	\$6.70
at AUD and		\$426.10 per tonne MEI and GEI sugar price 23,885,503 tonnes of cane supply			
2019					
Industry revenues	\$61.87	Miller revenues	\$24.98	Grower revenues	\$38.45
Industry costs	\$60.54	Miller costs	\$27.45	Grower costs	\$34.64
Industry EBIT	\$1.33	Miller EBIT	-\$2.48	Grower EBIT	\$3.81
at AUD and		\$409.82 per tonne MEI and GEI sugar price 23,090,839 tonnes of cane supply			
2020					
Industry revenues	\$66.25	Miller revenues	\$27.51	Grower revenues	\$40.38
Industry costs	\$61.04	Miller costs	\$27.22	Grower costs	\$35.45
Industry EBIT	\$5.21	Miller EBIT	\$0.29	Grower EBIT	\$4.93
at AUD and		\$443.62 per tonne MEI and GEI sugar price 23,512,153 tonnes of cane supply			

Totals 2018-2020 per tonne of cane

Industry EBIT (over 3 years)	\$12.52 per tonne of cane
Industry EBIT (average per annum over 3 years)	\$4.17 per tonne of cane
Milling sector EBIT (over 3 years)	-\$2.92 per tonne of cane
Milling sector EBIT (average per annum over 3 years)	-\$0.97 per tonne of cane
Canegrower sector EBIT (over 3 years)	\$15.43 per tonne of cane
Canegrower sector EBIT (average per annum over 3 years)	\$5.14 per tonne of cane

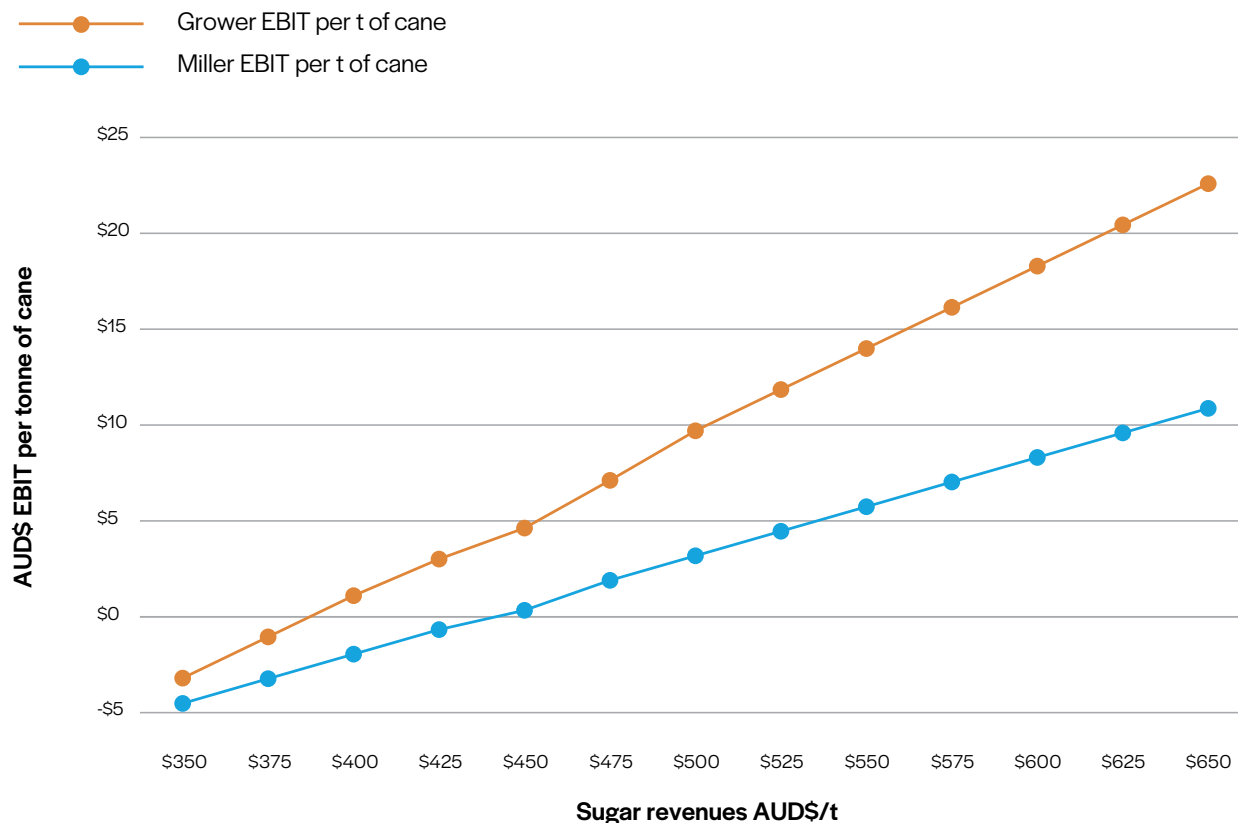
Source: ASMC utilising BDO data

* Assumes the same GEI and MEI sugar prices.

- For these purposes, the 'Industry' consists of the 'cane' and 'milling' sectors.
- Expressed in tonnes of cane, **Table 2** splits the Industry EBIT between the milling sector and cane growing sectors.
- Across the 13 mills, and between 2018-2020, the average EBIT per annum for the industry was **A\$4.18 per tonne** of cane supplied, consisting*:
 - For the milling sector **A-\$0.97** EBIT per tonne of cane supplied.
 - For the cane growing sector **A\$5.15** EBIT per tonne of cane supplied.
- The detailed assumptions for this analysis are provided at **Appendix 2. Appendix 5** shows these EBITs in aggregated dollar terms and with RoAs also.
- On average between 2018-2020, and notwithstanding the major CAPEX involved, inclusion of major co-generation net revenues would only have improved milling sector EBIT for those mills by 0.74c/tonne of cane.

CHART 7: HYPOTHETICAL CANEGROWER SECTOR AND MILLING SECTOR EBITs PER TONNE OF CANE AT VARIOUS SUGAR PRICES

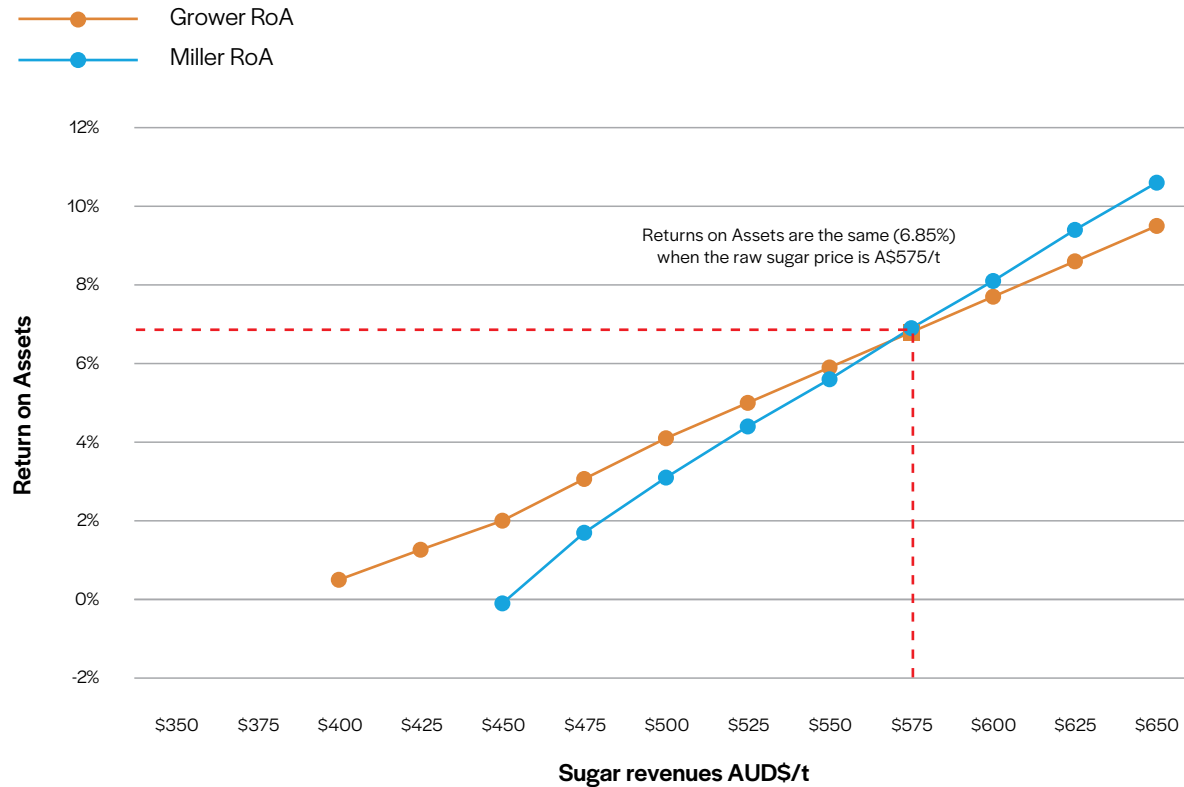
(Assumes 2020 Grower and Miller Costs And Sugar Production Levels)



Source: ASMC utilising BDO data

- The hypothetical EBITs per tonne of cane of the cane growing and milling sectors at various A\$ raw sugar prices at known 2020 grower and mill production costs is provided at **Chart 7**.
- Reflecting the operation of the cane price formula, and the difference in the value of assets deployed in both sectors (cane growing is approx. **\$5.7b** compared to milling at **\$2.4b** in this sample), mill sector EBITs per tonne of cane supply are lower than cane growing sector EBITs per tonne of cane supplied at all hypothetical raw sugar prices.
- EBITs do not however take into account the quantum of the investment or the risk of those parties who have made investments in the industry. For these reasons a RoA analysis can be more appropriate (see **Chart 8** below).

CHART 8: HYPOTHETICAL CANEGROWER SECTOR AND MILLING SECTOR RETURN ON ASSETS AT VARIOUS SUGAR PRICES
(Assumes 2020 Grower and Miller Costs and Sugar Production Levels)



- The respective and hypothetical RoAs of the cane growing and milling sectors at various A\$ raw sugar prices at known 2020 production and grower and mill cost levels is provided at **Chart 8**.
- Both sectors generate the same **RoA 6.85%** at a raw sugar price of **A\$575/t**
- The RoA of the cane growing sector becomes relatively higher at prices below A\$575/t of sugar and the milling sector RoA becomes relatively higher above A\$575/t.
- **Note** – the average raw sugar price was A\$436/t over the past 5 years.

Source: ASMC utilising BDO data

Policy and commercial implications

The Sugar Plus Vision and Roadmap is a particularly important document for this industry. The ASMC has set a goal of achieving 34 million tonnes (T34) of consistent Queensland cane supply per annum up from around 30 million tonnes per annum currently⁵.

The ASMC supports the cane supply and revenue diversification objectives of the Vision and Roadmap document and gives priority to the following **commercial approaches** and **regulatory reforms and policies** to promote these objectives.

Commercial collaboration

Generating more value from each tonne of cane processed would improve the viability of the supply chain and allow future growth of the industry. In investing in growth the sectors should consider different investment models that enable value chain participation based on risk and reward to increase revenue and returns overall for the industry. Risk and reward could be applied in various ways based on the particular circumstances and/or opportunities in a mill area for growers and millers.

Improved cane yields and cane supply can be achieved through:

- Improved cane variety development and adoption;
- Succession planning and adoption of innovative farm ownership and operability models;
- Improved extension and adoption approaches generally (i.e. improved farming practices); and
- Market based instruments such as Reef Credits if credits reward both improvements in cane productivity and environmental performance.

Improved milling performance can be achieved through mill maintenance and improvement programs.

ASMC's policy and regulatory reform agenda

Maintaining and then increasing the **amount of land under cane** can be achieved through:

- Capital grants for cane railway infrastructure⁶ and incentives that promote horizontal expansion through government provision of and/or low cost capital for private sector investment in rail extensions and water infrastructure;

- Improved land protections for prime agricultural land in the State Planning provisions especially protections against urban encroachment and Renewable Energy Zones;
- A streamlining of state government approvals processes (Department of Environment and Science/ Environmental Protection Agency) that provide mills pre-approval to fast track horizontal expansion to restore cane land or increase cane land to their existing mill capacity within their traditional catchment (provided the land is BMP certified);
- A streamlining of the current Foreign Investment Review Board (FIRB) obligations to facilitate additional investment by Australian sugar mills to assist growers maintain and expand their cane-growing operations; and
- A joint approach whereby Government works with the commercial lenders to guarantee the commercial debt of those new farmers wishing to acquire farming land and that have sound commercial proposals, thereby reducing equity requirements and the risk-adjusted interest rates.

5. <https://asmc.com.au/target-34-a-pathway-to-sustainable-cane-supply-october-2021/>

6. The ASMC is currently seeking \$25 million in financial assistance from Government to support the development of essential cane railway extensions.

Generating additional revenues for sugar can be achieved by implementing the Industry's *5-Year Trade Policy & Market Access Strategy* with a focus on capitalising on the industry's win against India in the WTO and obtaining greater access (tonnes) to the United States market.

For revenue diversification in bio-energy, a comprehensive suite of policy and program incentives to encourage investment, including:

- Government assistance for ASMC members to undertake detailed pre-feasibility and feasibility assessments – especially for more co-generation and for Sustainable Aviation Fuel (SAF) and low interest government capital and/or government capital grants to fund new co-generation, bio-fuel and bio-methane projects if viable;
- Carbon credits through development of new Australian Carbon Credits Units (ACCU) methodologies – especially for bio-methane produced from trash and bagasse;
- A streamlining of the processes undertaken by the Australian Energy Market Operator (AEMO) and Energy Queensland when assessing generator performance standards (GPS) and testing processes under the National Electricity Rules (NER);

- R&D incentives to improve the cost competitiveness of the various SAF technologies including Ethanol-to-jet fuel (ETJ) Sugar-to-jet fuel (STJ), Gas-to jet fuel (GTJ) and pyrolysis to make bio-crude;
- A Federal or Queensland Government Low Carbon Fuel Standard (LCFS) program and/or mandates to incentivise scale in the production of bio-fuels including SAF and to improve the viability of current bio-ethanol supply; and
- Long term government and/or private sector offtake agreements to address price and market volatility risk associated with supplying electricity (e.g. power purchase agreements between milling companies and the private sector, retailers, CleanCo, large generators for example).

Priority also needs to be given to lifting revenues for export raw sugar through improved trade policies and market access. The industry has recently formulated a *5-year Trade Policy and Market Access Strategy*. With the assistance of \$593,000 in ATMAC funding, implementation of this strategy commenced in 2022. There are nine priorities in this strategy including capitalising on the industry's win against India in the WTO and obtaining greater access (tonnes) to the US market. Expert economic modelling shows that achieving these two outcomes alone can substantially increase industry revenues.

Investments in high-value products like synthetic food and fibre **will require incentives that encourage firms to come to Queensland and establish pilot, demonstration and full commercial scale operations near mills.**

While investment will require these types of incentives, the pre-contract arbitration provisions in the *Federal Sugar Industry Code of Conduct (2017)* and similar provisions in the *Queensland Sugar Industry Act* **remain a barrier to diversification investment by sugar mills given the risk that future returns can be expropriated after an investment decision has been made thereby undermining the integrity of the original investment decision.**

ASMC looks to government and the industry more broadly, for support to transition from these provisions to promote the viability of the industry.

Under all sugar price scenarios, and at 2020 milling and cane growing cost structures and levels of cane and sugar production, **there is not a disparity in the returns** of the two sectors in favour of milling. The analysis shows that the cane growing sector generates higher RoAs than the milling sector at all price levels up to a price of **A\$575/t.**

Appendix 1

ASSUMED GROWER COST DATA BY GROWER MILLING REGION (A\$/T CANE)

Region	Source	2018	2019	2020
Far North Queensland	ABARES (2021)	\$32.68	\$33.52	\$34.38
Tully (3rd party)	ABARES (2021)	\$32.68	\$33.52	\$34.38
Tully (TSL)	Own data			Confidential
Burdekin Delta (3rd party)	FEAT (2021)	\$31.22	\$32.02	\$32.84
Burdekin BRIA (3rd party)	FEAT (2021)	\$33.54	\$34.40	\$35.29
Burdekin (Wilmar farms)	Own data			Confidential
Herbert (3rd party)	FEAT (2016)	\$33.45	\$34.31	\$35.19
Herbert (Wilmar farms)	Own data			Confidential
Proserpine (3rd party)	FEAT (2016)	\$35.31	\$36.22	\$37.15
Proserpine (Wilmar farms)	Own data			Confidential
Plane Creek (Wilmar farms)	Own data			Confidential
Plane Creek (3rd party)	FEAT (2016)	\$35.31	\$36.22	\$37.15
Mackay (MSL 3rd party)	FEAT (2016)	\$35.31	\$36.22	\$37.15
Isis (3rd party)	FEAT (2021)	\$33.36	\$34.21	\$35.09
Isis (ICSM farms)	Own data			Confidential

Source: FEAT, ABARES and mills

Appendix 2

METHODOLOGY AND GENERAL ASSUMPTIONS

Raw sugar cost of production	Assumes that raw sugar production is vertically integrated cane supply and milling operation with cane input costs calculated on a farm cost of production basis.
Mill sector costs	For each of the 13 mills, individual costs were collected including those associated with producing sugar (transport, factory operations, levies, administration and overheads, depreciation, cane constant and overheads) plus mill mud and molasses handling and minor co-gen operations in 2018/2019/2020 respectively. Storage & handling costs were excluded as raw sugar revenues were recorded on a net premium basis (i.e. where S&H costs are discounted). The costs associated with major co-generation were also excluded because major additional investment was required and not all of the 13 mills have significant (major) co-generation output. Whilst the cane payment formulae constant and allowances paid to growers for both 3rd party cane and mill owned cane was included as a miller cost in the EBIT calculations it was not included in the cost of production calculations as it is an internal transfer within the industry.
Cane sector costs	A combination of mill-owned cane farm data, Farm Economic Analysis Tool (FEAT) and ABARES (Financial performance of sugarcane farms 2020-21 to 2021-22) data by Grower milling region was applied (refer Appendix 1). Where data did not exist for either 2018, 2019 or 2020, known cane costs were inflated by 2.5% per annum (CPI) to achieve future year estimates, or deflated 2.5% per annum to achieve previous year estimates. These costs were multiplied by the cane tonnes reported.
Mill sector sugar production	For the 13 mills, data for the total tonnes of sugar (actual) produced in 2018/2019/2020 was collected. This was provided as either GEI (Grower Economic Interest – mill owned [notional] and third party farms) or MEI (Miller Economic Interest) sugar. GEI sugar reflects the growers' sugar price exposure through the operation of the cane payment formula.
Cane sector cane production	For the 13 mills, data for the total tonnes of cane supplied to the mill in 2018/2019/2020 (mill owned and third party farm supply) was collected and allocated against milling regions.
Mill sector revenues (for the EBIT analysis)	Mill sector revenues consist of actual sugar revenues (for all MEI tonnes produced) plus by-product revenues (minor co-generation, molasses, mill mud) in 2018/2019/2020. The revenues associated with major co-generation were excluded to allow a like mill-by-mill comparison (i.e. not all mills have large co-generation assets and associated revenues and costs). On a weighted average basis, the resultant sugar prices earned across the 13 mills were A\$426.10/t, A\$409.82/t and A\$443.62/t in 2018/2019/2020 respectively.
Cane sector revenues (for the EBIT analysis)	Cane sector revenues consist of all GEI sugar produced (from mill farms and third party farms) in 2018/2019/2020 multiplied by sugar prices plus cane constants and allowances. The sugar prices earned by growers for GEI sugar was assumed to be the same as the MEI sugar being A\$426.10/t, A\$409.82/t and A\$443.62/t in 2018/2019/2020 respectively.
Earnings before Interest and Taxation (EBIT)	A profitability measure, EBIT is Earnings Before Interest and Taxes and was calculated on an Industry basis with milling and cane growing sector breakdowns. Industry for these purposes means the grower and milling activities associated with the 13 mills (about 80% of total QLD sugar production). EBIT has been expressed in aggregate dollar terms as well as per tonne of cane supplied to the mills.
Return on Assets (RoA)	RoA (EBIT/total assets) was calculated at the industry level (being the sample of 13 mills) and distilled down at the cane growing sector and at the miller sector level. The total value of the assets of the milling sector within the sample of 13 mills was estimated to be A\$2.4 billion (on a depreciated replacement value basis). The total value of the assets of the 2,607 cane farms supplying the 13 mills was estimated to be A\$5.660 billion (being \$2.171 million per each 101 ha farm with an average land value of \$15,000 per ha and an additional \$650k in farm assets).
Full mill utilisation	The analysis compares the actual costs of producing raw sugar to the hypothetical cost of producing raw sugar if each mill in the sample achieved an increase in cane and achieved full mill utilisation. To calculate the benefits of full mill utilisation costs each of the 13 mills it was assumed that in 2020 each mill received an increase in cane supply equal to the mill's crushing capacity. In aggregate terms, this increase applied in 2020 was an increase from 23.5 million tonnes to a hypothetical 27.1 million tonnes. In calculating the decrease in each mill's costs of production, it was assumed that various costs were fixed and did not increase as cane supply increased and others were variable.

Appendix 3

CALCULATION OF FIVE-YEAR AVERAGE RAW SUGAR RETURNS TO THE AUSTRALIAN INDUSTRY

Assumed prices*

	QSL Gross ICE11 Pool (\$A) (a)	QSL Shared pool (b)	Total (c) = (a) + (b)	US Quota Pool (\$A) (net prices) (d)
2016/17	\$522.87	\$3.89	\$526.76	\$638.05
2017/18	\$413.02	\$1.54	\$414.56	\$578.91
2018/19	\$372.46	-\$3.79	\$368.67	\$641.11
2019/20	\$400.51	\$0.96	\$401.47	\$605.66
2020/21	\$407.27	\$31.09	\$438.36	\$701.96

Calculated revenues (A\$)

	US portion (g) = (f) * (g)	Balance of production (h) = (e) - (f) * (g)	Total (i) = (g) + (h)	Average revenue per t (j) = (i) / (e)
2016/17	\$68,150,631	\$2,372,854,574	\$2,441,005,205	\$530
2017/18	\$92,924,318	\$1,727,186,502	\$1,820,110,819	\$421
2018/19	\$39,164,128	\$1,659,309,608	\$1,698,473,736	\$372
2019/20	\$84,387,213	\$1,528,724,520	\$1,613,111,733	\$409
2020/21	\$90,454,566	\$1,777,980,958	\$1,868,435,523	\$446
Five-year average raw sugar revenues				\$436

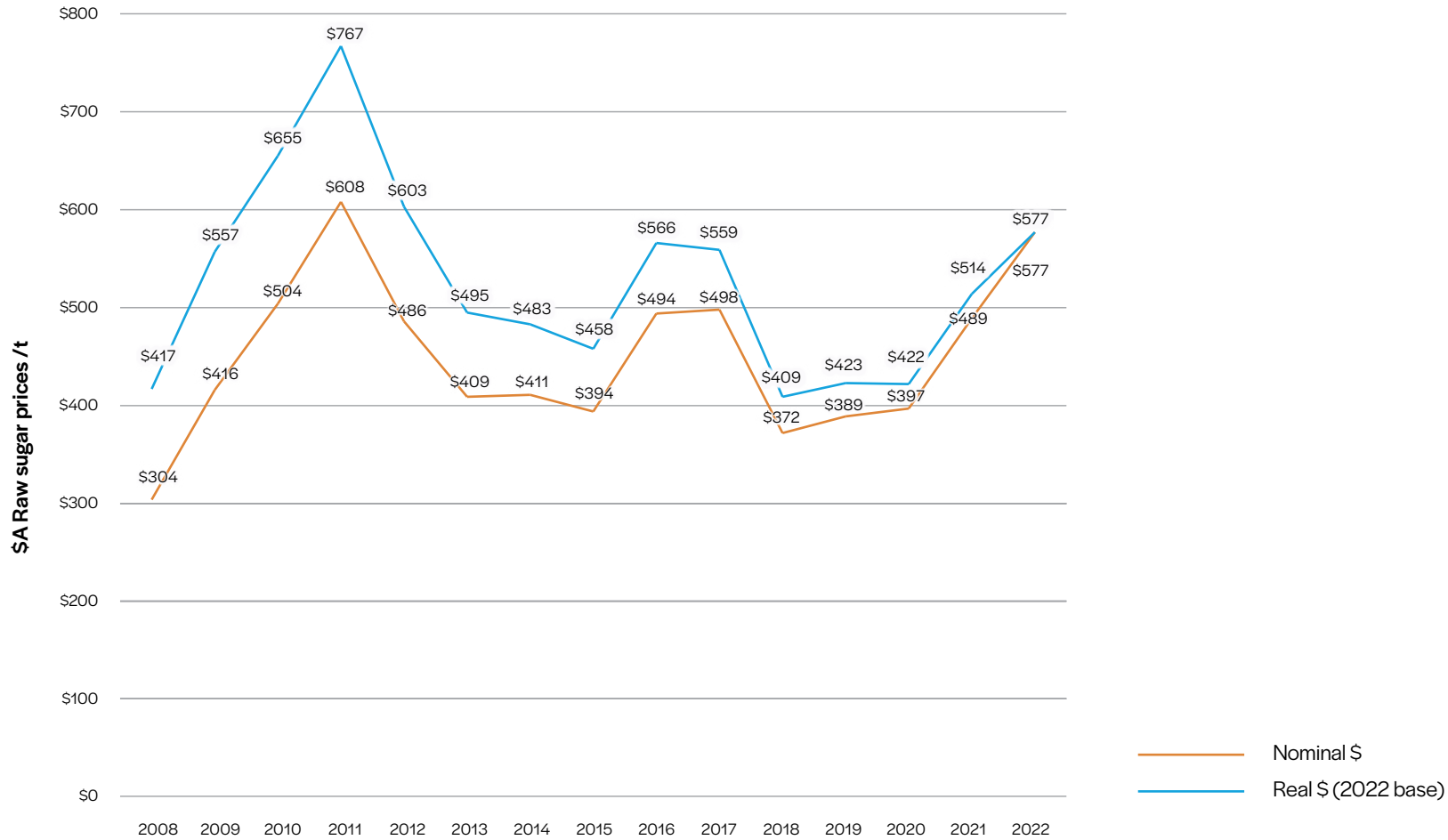
Assumed production and US exports (actual tonnes)

	Total Australian raw sugar production (actual tonnes) (e)**	Total US exports (actual tonnes) (f)***
2016	4,604,396	99,774
2017	4,326,828	160,516
2018	4,561,887	61,088
2019	3,947,149	139,331
2020	4,184,844	128,860

* QSL Annual reports ** ASMC survey of Australian sugar mills *** International Sugar Organisation 2021 Year Book

Appendix 4

15-YEAR RAW SUGAR PRICES (ICE#11) (A\$/T) (REAL AND NOMINAL)



Source: United States Department of Agriculture price data

Appendix 5

INDUSTRY AND CANE GROWER & MILLING SECTOR EBITs AND ROA (A\$) (2018-2020)

2018		Consisting			
Industry revenues	\$1,546,838,312	Miller revenues	\$621,146,833	Grower revenues	\$964,153,953
Industry costs	\$1,404,126,746	Miller costs	\$638,459,055	Grower costs	\$804,129,836
Industry EBIT	\$142,711,567	Miller EBIT	-\$17,312,222	Grower EBIT	\$160,024,116
at AUD		\$426.10 per tonne MEI and GEI sugar price			
2019		Consisting			
Industry revenues	\$1,428,662,875	Miller revenues	\$576,708,565	Grower revenues	\$887,771,701
Industry costs	\$1,397,941,812	Miller costs	\$633,894,350	Grower costs	\$799,864,443
Industry EBIT	\$30,721,063	Miller EBIT	-\$57,185,785	Grower EBIT	\$87,907,258
at AUD		\$409.82 per tonne MEI and GEI sugar price			
2020		Consisting			
Industry revenues	\$1,557,769,247	Miller revenues	\$646,718,001	Grower revenues	\$949,337,341
Industry costs	\$1,435,219,317	Miller costs	\$639,989,176	Grower costs	\$833,520,672
Industry EBIT	\$122,549,930	Miller EBIT	\$6,728,825	Grower EBIT	\$115,816,669
at AUD		\$443.62 per tonne MEI and GEI sugar price			

Totals 2018-2020 per tonne of cane

Industry EBIT (over 3 years)	\$295,982,560
Industry EBIT (average per annum over 3 years)	\$98,660,853
Industry asset value aggregate (est.)	\$8,064,753,503
Industry Return on Assets (avg per annum over 3 years)	1.2%

Consisting

Milling sector EBIT (over 3 years)	-\$67,769,181
Milling sector EBIT (average per annum over 3 years)	-\$22,589,727
Milling sector asset value aggregate (est.)	\$2,404,502,761
Milling sector Return on Assets (avg per annum over 3 years)	-0.9%
and	
Canegrower sector EBIT (over 3 years)	\$363,748,043
Canegrower sector EBIT (average per annum over 3 years)	\$121,249,348
Canegrower sector asset value aggregate (est.)	\$5,660,250,743
Canegrower sector Return on Assets (avg per annum over 3 years)	2.1%

Source: BDO data