9 May 2018

BUNDABERG REGIONAL IRRIGATORS GROUP
REPRESENTING MEMBER IRRIGATORS IN THE BUNDABERG IRRIGATION AREA

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Energy Queensland
General Manager Regulation and Pricing
GPO Box 1461
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Dear Sir, Madam

Re: Customer Consultation – Network Tariffs 2020-25

Bundaberg Regional Irrigators Group (BRIG) was established to represent irrigators in the Bundaberg district across a range of commodity groups including sugar cane, grain and pulse crops as well as horticulture.

BRIG members farm on approximately 36,000ha and use an estimated 1,100 irrigation pumps and associated distribution systems to irrigate a variety of crops. A significant percentage of these systems (circa 90%) are currently powered by electricity.

Electricity is a significant cost to irrigators. This cost can be amplified depending on the actual farm location and source of irrigation water in terms of the amount of head that water is required to be pumped and the volume of water required.

Whilst there are a wide variety of crops in the region, sugar cane accounts for around 80% of the nominal irrigation allocations in both the groundwater and surface water systems.

SunWater Ltd is the 100% state government owned organisation that owns and operates the surface water irrigation channels and delivery systems in our area. This system provides approximately 60% of the nominal irrigation water.

Energy Consumers Australia (ECA) have recently defined the role of the grid supplied electricity system as providing ***comfortable homes*** and ***competitive businesses*** and that in order to achieve this role the system needs to *be affordable, individualised* and *optimised*.

Our members are all attempting to operate competitive businesses.

Affordable

The current cost of electricity results in the majority of our members not being able to sustain their enterprises using grid supplied electricity. Most are actively looking for alternatives to grid supplied electricity and have tasked BRIG to assist them in that endeavour.

At this point in time a solar diesel energy mix appears to be the most viable alternative and we are actively trialling a solar/grid mix with assistance from ARENA.

A few of our members have reverted to diesel pumps and whilst we believe this to be a sub optimal solution we can understand the economic basis as to why that decision has been made.

We have been able to define a sustainable and affordable tariff as follows:

> ***An affordable and sustainable electricity price is one that has a ceiling of 8 cents per kilowatt-hour for the electrons and 8 cents per kilowatt-hour for the network. (GST exclusive)***

We are pleased to note that ***Lower network costs for all customers*** is a stated objective in your briefing paper and request that Energy Queensland tasks the people working on this issue to begin with the end in mind and target a maximum ceiling of 8 cents per kwh for network charges.

We have attached (Annex 1) some work we prepared for a previous submission.

Whilst the Tariff rates have not been updated to current (Higher) levels the narrative is still relevant and the principles are the same.

Individualised

During the past eight years (8) we have engaged with the AER, ERGON, CEFC, CER, Federal and State Energy departments, Federal and State governments and elected representatives and more recently with Energy Queensland on behalf of irrigators.

We have also partnered with various other organisations and businesses that face the same issue of affordability on a range of projects.

We have had the opportunity to contract consultants and energy experts and we have been able to define in general terms what a food and fibre tariff might look like.

We have shared the entire reports with many in Ergon and Energex and are very pleased to note that ENERGY Queensland has identified the value in having a suite of food and fibre tariffs in your briefing paper.

The following is one of the suggested tariff structures from a report that we were involved with when Mr Bruce Mountain from CME was engaged by National Irrigators Council to design a food and fibre tariff.

We were asked to advise on the design of a tariff applicable to irrigators in Australia.

Our recommendation on this is as follows:

- ***Supply charges:*** *These charges are connection-specific and do not vary with consumption. They should be set at a level high enough to recover individual customer specific costs – such as for reading and supplying meters – (i.e. costs that are not shared with other consumers and which do not vary with the customers' level of consumption or demand. We would expect that such charges would not exceed $130 per connection per year.*

- ***Consumption charges:*** *These charges are levied per kWh consumed. They should be set to cover costs that are variable in the short term and also to make a contribution to the recovery of reasonably incurred sunk costs. The design of consumption charges should also reflect the following considerations:*
  a) It may be sensible to have consumption charges that vary by time of day: such as peak and off-peak or peak, standard and off-peak and where applicable should reflect seasonal variations.
  b) The difference between peak, off-peak and if applicable standard rates should reflect the existence of temporally defined capacity constraints and customers' temporally varying elasticity of demand.
  c) If there are to be significant differences between the peak and off-peak rates (peak rates greater than, say, twice off-peak rates) then it is important that the peak rates apply for limited intervals – not longer than say three hours - so that irrigators can respond to those prices by reducing their consumption.

- ***Demand charges:*** *Charges for peak demand in addition to, or as an alternative to consumption charges, introduce additional complexity in metering and billing: specifically the requirement for half-hourly remotely read meters.*

  Demand charges are plausible for higher consumption customers (those that are likely to consistently consume more than 100 MWh per year). An economically sound specification of demand changes should reflect the following:
  a) Demand charges should not be subject to minimum chargeable demand levels. Such minimum thresholds simply turn demand charges into fixed charges, which defeats the rationale for their inclusion.
  b) It is plausible to differentiate demand charges by voltage of supply (in recognition of the greater amount of infrastructure required to supply lower voltage customers relative to higher voltage customers).
  c) It is not plausible to differentiate demand charges on the basis of subscribed or minimum maximum demands.
  d) Demand charges should signal expected future network capacity shortfalls that may arise (depending on the network) during periods of simultaneous peak demands. The applicable period should be short (no more than three hours). This is adequate to capture the time periods when peak demands are most likely to arise. Sufficiently short peak demand charge periods are also necessary to provide irrigators with an opportunity to reduce their bills by reducing demand in those periods.

The SunWater scheme is a very high energy cost scheme and because SunWater recover their electricity charges from irrigators, Energy Queensland should also be considering bespoke tariffs for irrigation infrastructure operators.

Optimised

In the past a number of our members have worked closely with ERGON Energy representatives and irrigation equipment providers to have their pumping system designed and matched to the most suitable, sustainable and efficient tariff available. Significant

infrastructure and capital has been installed and is currently operating based on the characteristics of the specific tariff.

We are currently assisting DNRME and ERGON undertake a trial to determine irrigation patterns and requirements. Agronomically sugarcane is significantly more robust than most crops and is able to sustain periods of no irrigation better than snow peas or cut flowers. A genuine optimised control load tariff for crops such as sugarcane may help Energy Queensland to optimise supply at affordable levels.

We think that there are other opportunities in this area and are willing to assist deliver mutually beneficial outcomes for ENERGY Queensland and business consumers.

Please call should you require further information or clarification.

Dale Holliss
Company Secretary

Annex 1

The Negative Effects of Electricity Cost Increases on Sugar Cane Production in the Bundaberg Mill area.

Rapidly increasing costs of irrigation, mainly energy used on-farm and by the SunWater channel system, will lower farm marginal returns and lead to a reduction in water use by Bundaberg sugarcane growers. This potential loss of production is of serious concern as a 5 to 10% loss of production will increase the possibility of further sugar mill closure/s in the Bundaberg region and loss of jobs throughout the growing, harvesting, transport, milling and associated service sectors of the industry.

Bundaberg has arguably one of the most variable climates on the planet (Professor Rodger Stone, USQ) with rainfall varying from well below to well above the annual crop requirement year on year. In these circumstances, continued rapid rises in energy costs to essential inputs (irrigation) in agricultural industries will jeopardise the future viability of decades of community and private infrastructure development.

Tariff 62 is a common irrigation energy plan for the 60% of sugarcane irrigation users at Bundaberg with big gun travelling irrigators. Based on night off-peak use (65%) and day use (35%) the energy component in on farm irrigation costs has risen by 62% from 2008 to 2012 (4 years).

Energy used for pumping is also a major part of SunWater operational costs and water charges will be similarly impacted.

From 2006-07 to 2011-12 the average annual energy component of SunWater's total operating cost for the Bundaberg Irrigation Distribution System was 28.49% (QCA SunWater Irrigation price Review 2012-17). It is true that there were water availability and seasonal issues that impacted on the quantity of water used over this period, however, the same report indicates an expectation that from 2012-13 to 2016-17 the average energy cost will increase to 39.71% of the total annual operating cost.

Cost increases of this magnitude will have a significant impact on future sugar industry gross margins and threaten the longer term future of agriculture in the Bundaberg region.

Historically, enterprises reduce and even cease commercial sugarcane operations when commodity prices and/or input costs impact adversely on economic viability. This is an outcome that the Bundaberg sugar industry cannot afford.

Value of Irrigation

The value of irrigation to the Bundaberg region was realised in the 1960's when industry lobbied State and Federal Governments for an irrigation scheme to drought proof the region. The Bundaberg surface water irrigation scheme commenced in the 1970's and the immediate effect was a progressive increase in the area of land under production. This has supported the economy of the region for many decades.

Figure 1 shows that on average Bundaberg sugarcane crops produce an uneconomic 53 tonnes cane per hectare (TCHA) if no irrigation is applied. This increases by about 15 tonnes TCHA for the first megalitre per hectare (ML/Ha) of irrigation applied, 12 TCHA for the next ML/Ha and 10 TCHA for the third ML/Ha. Average sugarcane yield at Bundaberg since the inception of full irrigation is between 80 to 90 TCHA which equates to an average irrigation water use of about 3ML/Ha.

Figure 1 also clearly shows that on average the application of one ML/Ha of extra water (3 - 4 ML/Ha) produces an extra 6 TCHA while moving from 4 to 5 ML/Ha only generates an extra 4 TCHA of cane. The use of one extra ML/Ha (3-4 ML/Ha) raises productivity and profitability but escalating input costs are likely to limit water use at the higher end of the production curve thus restricting and/or lowering industry profitability.

The production curve shown *in Figure 1* is based on indicative information formulated from more than 10 years of actual district irrigation water use and yield data.

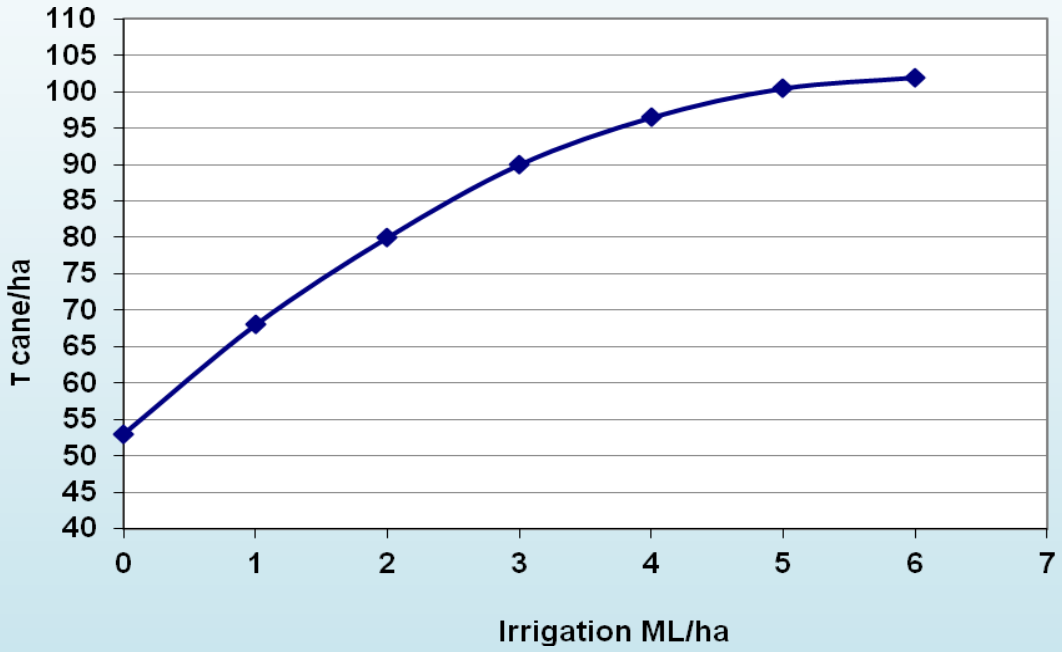

Figure1: Impact of Irrigation on Sugar Cane Yield in the Bundaberg Mill Area

Energy Use per Ml of Irrigation Applied

The impact of increased electricity cost is felt most severely by irrigators operating big gun travelling irrigators. Approximately 60% of the most productive sugarcane enterprises in Bundaberg operate these systems. Low pressure systems do offer a lower operating cost alternative but the size and layout of many landholdings in conjunction with district topography and conversion cost inhibits the uptake of this equipment. The average cost of energy to pump a megalitre (Ml) of water is shown in Tables No 1 and 2 below. Data collected during government funded water use efficiency projects and recent irrigation pump performance audits are compared to past, current and potential future electricity tariffs.

Table 1: Travelling irrigator electricity cost per megalitre (ML) based on tariff 62 - 65% night off-peak and 35% day use

Pump	Motor capacity	Energy Use	2008-09	2012-13	Draft 2013-14	Assumed 2014-15	Assumed 2015-16
	kW	kWh/Ml	@12.83 c/kWh	@20.77 c/kWh	@24.41 c/kWh	@28.67 c/kWh	@33.69 c/kWh
1	37	273	$35.01	$56.71	$66.64	$78.29	$92.00
2	37	333	$42.71	$69.18	$81.28	$95.50	$112.22
3	45	360	$46.17	$74.79	$87.87	$103.24	$121.32
4	45	390	$50.02	$81.02	$95.20	$111.84	$131.43
5	45	255	$32.70	$52.97	$62.24	$73.13	$85.93
6	35	369	$47.32	$76.66	$90.07	$105.82	$124.35
7	30	197	$25.27	$40.92	$48.09	$56.50	$66.39
8	22	224	$28.73	$46.53	$54.68	$64.24	$75.49
9	32	346	$44.37	$71.88	$84.46	$99.23	$116.60
10	45	402	$51.56	$83.51	$98.12	$115.29	$135.47
Average	**37**	**315**	**$40.39**	**$65.42**	**$76.86**	**$90.31**	**$106.12**

Table 2: Low pressure centre pivot irrigator electricity cost per megalitre (ML) based on tariff 62 - 65% night off-peak and 35% day use

Pump	Motor capacity	Energy Use	2008-09	2012-13	Draft 2013-14	Assumed 2014-15	Assumed 2015-16
	kW	kWh/Ml	@12.83 c/kWh	@20.77 c/kWh	@24.41 c/kWh	@28.67 c/kWh	@33.69 c/kWh
1	18	102.51	$13.15	$21.29	$25.02	$29.39	$34.54
2	22	233.69	$29.98	$48.54	$57.04	$67.00	$78.73
3	22	204.83	$26.28	$42.54	$50.00	$58.72	$69.01
4	30	196.67	$25.23	$40.85	$48.01	$56.39	$66.26
5	55	221	$28.35	$45.90	$53.95	$63.36	$74.45
Average	**29.4**	**191.74**	**$24.60**	**$39.82**	**$46.80**	**$54.97**	**$64.60**

A More Detailed Explanation

A more detailed explanation of the calculations used to generate Tables 1 and 2 follows.

This review of electricity price impact is based on the indicative information formulated from more than 10 years of Bundaberg district actual irrigation water use and yield data, Queensland Government Rural Water Use Efficiency project data and recent irrigation pump performance audits.

Energy cost applied is based on: ERGON Tariff 62 - actual rate - 2008/09: ERGON Tariff 62 - actual rate - 2012/13; ERGON Tariff 62 - proposed transition period draft rate - 2013/14; and ERGON Tariff 62 - proposed transition period potential rate increase - 2014/15 and 2015/16.

On farm energy cost is an average cost per kWh based on a travelling gun scenario operating 65% of time between 9pm and 7am (night time off-peak) and 35% of time between 7am and 9pm (day time peak)

- 2008-09 – average use @ 12.83c/kWh: plus service charges of $130.56 per metering point per annum (Tariff 62)
- 2012-2013 – average use @ 20.77c/kWh: plus service charges of $200.50 per metering point per annum. (Tariff 62 obsolescent)
- 2013-2014 – average use proposed rate @ 24.41c/kWh: plus service charges of $235.57 per metering point per annum
- 2014-2015 - assumed average use increase (2013-14 + 17.5%) @ 28.67c/kWh: plus service charges of $276.79 per metering point per annum
- 2015-2016 - assumed average use increase (2014-15 + 17.5%) @ 33.69/kWh: plus service charges of $325.23 per metering point per annum

Gross margin analysis utilises a constant cane price based on estimated 2012 season harvest pool value of $450 at 14.5 CCS. Water use charge is based on actual and recommended charges and energy component of SunWater operational cost as outlined in the *Final Report, SunWater, Irrigation Price Review: 2012-17, Volume 2, Bundaberg Distribution System, April 2012 (QCA)*

SunWater price impact

Electricity cost not only directly impacts on the viability on farm irrigation pumping systems but also the cost of the farm irrigation water supply.

The extent that electricity impacts on the cost per hectare of irrigation water from SunWater is illustrated by the SunWater forecast electricity cost for 2011-12 which was $29.12/Ml (page 99 of the QCA Irrigation Price Review: 2012-17). Total channel water charges for 2011-12 calculated on the basis of access and usage cost per hectare including fixed charges (Part A & C) $46.40/Ml and usage charges (Part B & D) $31.72/Ml were $78.12/Ml. This indicates that the forecast electricity component of the 2011-12 channel water charge was 37.27% of the total $/Ml cost to farm. It is shown in Table 3 that the recommended (A & C + B & D) 2012-13 bundled charge is 49.2% higher than the comparable charge in 2006-7 and the proposed price path increases the bundled charge by a further 19.1%.

When data presented in the QCA final report Irrigation Water Price Review 2012-17 is analysed it indicates that the average electricity component of total SunWater operating costs from 2006-07 to 2011-12 was 28.49% and average electricity cost as a component of the recommended price path (2012-13 to 2016-17) is 39.71%.

Table 3: Actual and recommended water price (QCA report)

Actual prices $/ML							Recommended prices $/ML				
	2006-7	2007-8	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
(Part A)	34.4	36.96	40.32	41.6	42.88	46.4	37.3	40.29	43.39	46.63	48.87
(Part B)	24.57	26.4	28.81	29.72	30.62	31.72	50.68	51.95	53.25	54.58	55.94
	58.97	63.36	69.13	71.32	73.5	78.12	87.98	92.24	96.64	101.21	104.81

It is shown in Table 4 that the direct cost in $/Ml of irrigation water applied arising from the electricity contribution to total operating costs of the Bundaberg Irrigation Distribution Scheme is a substantial constraint to the productivity and profitability of the Bundaberg sugar industry.

Table 4: Electricity component of SunWater bundled price ($/ML)

2006-07 to 2011-12 Actual prices $/ML	2012-13 to 2016-17 Recommended prices $/ML
Average cost = $69.07	Average cost = $96.57
Electricity % of operational cost = 28.49%	Electricity % of operational cost = 39.71%
Average electricity cost $/ML=$19.67	Average electricity cost $/ML=$38.34

Impact on Gross Margin

Since 2008-9 Bundaberg cane farmers have had their potential gross margins eroded by up to 20% as a direct result of energy driven pricing. Current proposals have the potential to further reduce their disposable income by an additional 12% over the next three years.

The following detailed marginal analysis reviewed five scenarios based on Bundaberg sugarcane farming practice. Variable cost including harvesting, planting, fertiliser and chemicals were based on 2012 expenditure values and remained constant for each scenario.

Variable irrigation costs ($/Ml) included the following:

- Specific yearly access and usage charge for the channel water supply;
- Electricity used for pumping based on average district audit data;
- Labour and infrastructure maintenance $/Ml of water pumped.

Water pricing and pumping costs for each period were taken from data already shown in this paper (QCA report in to water pricing and pumping cost from on farm system audits).

The gross margin analysis shown in Table 5 and Figure 2 illustrates the dramatic impact that the recent and proposed energy dominated price path is imposing on the Australian Sugar Industry.

Table 5: Detailed analysis of potential Bundaberg cane farm gross margin ($/ha) based on actual and assumed electricity tariff rates

Irrigation Ml/ha	Actual Tariff 2008-9	Actual Tariff 2012-13	Draft Tariff 2013-14	Assumed Increased tariff 2014-15	Assumed Increased Tariff 2015-16
0.0	$637.82	$664.70	$637.30	$610.20	$580.70
1.0	$1,046.31	$974.96	$963.04	$919.89	$871.92
2.0	$1,344.10	$1,174.52	$1,178.08	$1,118.88	$1,052.44
3.0	$1,568.09	$1,300.28	$1,319.32	$1,244.07	$1,159.16
3.5	$1,643.19	$1,326.26	$1,353.04	$1,269.77	$1,175.62
4.0	$1,662.93	$1,296.89	$1,331.41	$1,240.11	$1,136.73
5.0	$1,584.90	$1,126.95	$1,171.15	$1,058.40	$930.05

Figure 5 Impact of electricity tariff on Bundaberg sugar industry gross margin