CASE STUDY TAR-CS2

Tariff Assessment:

Furrow Irrigation System – Small Business Account

(to be read in conjunction with Case Study TAR-CS1 and Information Sheet 'TAR-IS1 Tariffs for Irrigators 2020/21')

A quarterly electricity account over the summer period is used as an example in this case study and Table 1 below summarizes the situation for this open-water pump servicing an adjacent furrow irrigation system and its energy use.

Table 1 *Energy usage information for the summer period, with costs based on Ergon prices as at 1st July 2020.*

Account classification: Small business				**Motor size: 15 kW**	**Tariff 65**
Current electrical energy cost for this period:				$ 6,237	
Billing period:	1/12/19 to 28/02/20	No of days billed:	90	Total kW.h:	20,160
Peak kW.h usage:	9,072	Off-peak kW.h usage:	11,088	PEU%:	45%

This information allows us to ask five important questions:

1 What impact does reducing the Peak Energy Usage % (PEU%) make to the energy cost?

Answer: Table 2 shows the impact of decreasing and increasing the proportion of Peak Energy Use (PEU%) while using Tariff 65. Decreasing the PEU% from the current 45% down to 20% would result in approx. $919 saving for this quarter (from $6,237 down to $5,319). The high PEU% indicates the tariff is not well suited to the current management strategy. Note that the cost increase/decrease will vary with each account.

2 Would a flat rate tariff, like T20 be more cost effective?

Answer: Table 2 shows that the flat rate tariff, T20 for "Small" business, would have had a lower energy cost for that bill by approx. 15% ($953 lower cost).

3 Is Tariff 33 (Economy) or Tariff 34 (Load-control) an appropriate option in my irrigation situation?

Answer: Table 2 shows that under all PEU% cases, T33 would have been cheaper than T65 for this account. With a PEU% of 45%, this account would have saved 40% ($2,489) if T33 was in use and would have saved 37 % ($2,285) if T34 was in use during this quarter.

The question to resolve is whether this tariff's potential to load shed will impact upon irrigation management. Automation can help manage the disruption by being able to restart pumps and irrigation equipment. However, many irrigation water supply schemes cannot cope with intermittent starting and stopping of irrigation pumps; in these situations, it is likely the irrigation water supply scheme managers would warn growers against using such tariffs.

4 How would other tariffs like T22A, T24 or T41 affect my energy cost?

Answer: These three tariffs have particular time conditions that must be met in order to generate potential savings. However, there is a risk of a higher energy cost if these set time conditions are not adhered to. Manually operated pumps make keeping to these strict time conditions very difficult, if not impossible. Automation can provide a solution to this problem. Due to the more complex nature of the analysis for these tariffs, it is recommended that specialist advice be obtained..

- **To cost out T22A** in direct comparisons, energy use between 10am and 8pm weekdays from beginning of December to end of February would be needed, rather than just the T65 12 hour per day 7-day per week Peak period energy consumption data given in this case. If no Peak period energy use occurred over this particular billing period, in the 84 hours of the T65 off-peak period available every week of the year, it would cost $4,584, whereas T22A in the 118 hours available off-peak each week from 1st Dec. to end of Feb., it would cost $4,946.
- For T24 comparisons, you would need the average of the 4 largest daily demands calculated from the average of the twenty ½ hour intervals between 10am and 8pm on those four days, which would provide the required chargeable

"Demand" in kW for each month. If only off-demand period energy (118 hours per week) were used during any of the summer months (Dec., Jan, or Feb.) the chargeable demand is 0 kW for each of the 3 monthly bills. A minimum chargeable demand of 3 kW applies for non-summer months. For the 90-day summer period of this bill, the total cost is $3,709. This compares favourably with the T65 only Off-Peak scenario costs (84 h per week) for the same billing period of $4,584 as shown in Table 3.

- For T41 comparisons, the largest ½ hour average interval "Demand" in kW would be needed in the billing period, and would normally be measured in the electricity meter. As an example, if it happened to be 15 kW, then this bill would be $4,777, compared to the Off-Peak only T65 from No.1 above of $4,584.
- For T24A comparisons, you would need the average of the 4 largest daily demands calculated from the average of the twenty ½ hour intervals between 4 pm and 9 pm on those four days, which would provide the required chargeable "Demand" in kW for each month. If only off-demand period energy (143 hours per week) were used during any of the months. The chargeable demand is 0 kW for that month. For the 90-day period of this bill, the total cost is $5,018, compared to off-peak T65 from No.1 above of $4,584 as shown in Table 3.
- T24B comparisons, you would need the average of the 4 largest daily demands calculated from the average of the twenty ½ hour intervals between 4 pm and 9 pm on those four days, which would provide the required chargeable "Demand" in kW for each month. If only off-demand period energy (143 hours per week) were used during any of the months. The chargeable demand is 0 kW for that month. For the 90-day period of this bill, the total cost is $4,501, compared to off-peak T65 from No.1 above of $4,584 as shown in Table 3.

5 Is this information enough to make a decision?

Answer: In short – No. Using energy information from a single bill rarely provides an accurate understanding of the energy pattern through the year, nor from year to year. Without the ½ hour time interval data from Ergon's meter, demand tariffs are challenging to compare with existing tariffs. In irrigated sugarcane, irrigation requirements and energy usage are seasonal, with summer months usually being the higher water use months. Also, year-to-year energy usage patterns can fluctuate considerably depending upon area planted, rainfall distribution and irrigation allocations. A minimum of two years of the ½ hour interval data from your meter should be examined.

Table 2 *Impact on energy cost by changing: 1) the proportion of T65 Peak:Off-Peak use, and 2) changing to the flat rate tariffs, T20, T33 and T34.* **BLUE** *values indicate a* **SAVING**, *while* **RED** *indicates an* **EXTRA COST**. *Based on prices published 16/10/2020, by Ergon, and include GST.*

TARIFF 65 PEU%		TARIFF 65 COST for the 90-day period	Compared to T65: SAVING or EXTRA COST by being on T20 or T33 or T34					
			T20	% Change	T33	% Change	T34	% Change
60%	More peak than off-peak	$ 6,789	$ 1,504	22%	$ 3,040	45%	$ 2,836	42%
50%	Equal amount of peak & off-peak	$ 6,421	$ 1,136	18%	$ 2,673	42%	$ 2,469	38%
45%	Actual for this bill	$ 6,237	$ 953	15%	$ 2,489	40%	$ 2,285	37%
40%		$ 6,054	$ 769	13%	$ 2,305	38%	$ 2,101	35%
30%		$ 5,686	$ 401	7%	$ 1,938	34%	$ 1,734	30%
20%		$ 5,319	$ 34	1%	$ 1,570	30%	$ 1,366	26%
10%		$ 4,951	$ 334	7%	$ 1,203	24%	$ 999	20%
0%	All off-peak	$ 4,584	$ 701	15%	$ 835	18%	$ 631	14%

Table 3 *Cost comparison between T65 with 0% peak energy consumption to 0% peak and 0 kW demand for T24, T24A and T24B,* **BLUE** *values indicate a* **SAVING**, *while* **RED** *indicates an* **EXTRA COST**. *Based on prices published 16/10/2020, by Ergon, and include GST.*

T65 Cost for 90-day period 0% Peak	T24 0% Peak 0 kW Demand/month	% Change	T24A 0% Peak 0 kW Demand/month	% Change	T24B 0% Peak 0 kW Demand/month	% Change
$ 4,584	$ 875	19%	$ 434	9%	$ 83	2%