



Smarter energy use on West Australian dairy farms

Buying power better

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As part of the national energy assessment program *Smarter energy use on Australian dairy farms*, a number of farmers in WA had an energy assessment undertaken to assess the changes in their energy use and to investigate if there were any potential energy savings to be made from investment in energy efficient technology. 75 dairy shed energy assessments were conducted as part of the Dairy Australia project funded by the Department of Industry and Science as part of the Energy Efficiency Information Grants Program. This case study shows how dairy farmers can better understand the energy market and select the right tariff structure for their business.

Introduction

In the deregulated West Australian energy market dairy farmers no longer wait for the power account from the sole energy supplier and just pay the bill, no questions asked. Much like telephones, electricity supply has become more complex with more energy retailers in the market. With increased competition comes more complex market offerings. Sifting through the range of tariffs can be confusing but understanding the energy market and selecting the right tariff structure can provide significant savings.

This fact sheet will look at:

- › what different tariffs are out there
- › how retailers set tariffs, and
- › what dairy farmers can do to buy power better.

Set tariffs

The majority of WA dairy farmers use Synergy for their energy supply. The remainder of the market is supplied by Perth Energy and to a lesser degree Alinta. There is also the emergence of energy traders or brokers in the market place.

Synergy offers the following tariffs which are commonly used by WA dairy farmers. Prices are from 26/3/15.

Home business plan (K1)

1–20 units per day
@24.59161 c/kWh
Next 20–1649 units per day
@28.16c/kWh
More than 1650 units per day
@25.4102c/kWh
Supply charge 45.1516 per day

Features

Sliding tariff scale. Well suited to farms where the non-dairy peak use is high or unusual milking times.

R1 time of use

On peak 30.8332
Off peak 9.507
Supply charge \$1.7566 per day

Features

For smaller dairies who use less than 50 megawatt hours annum. Well suited to farms where 35% or more of electricity consumption is off peak (10pm-8am weekdays and weekends).

R3 time of use

On peak 46.0100
Off peak 14.1644
Supply charge \$2.6279 per day

Features

For larger dairies who use more than 50 megawatt hours annum. Well suited to farms where 35% or more of electricity consumption is off peak (10pm-8am weekdays and weekends)

P11 and P13 time of use contracts

Tariff is determined by your power use profile.

Features

The P11 and P13 contracts are for 24 months and the tariff is determined by Synergy from your energy use profile. In the 2014/15 energy assessments these tariffs were always lower than the corresponding R1 or R3 tariff.

Perth Energy and Alinta

Perth Energy and Alinta offer similar tariff structures to the P11 and P13 contracts. They are not always quoted the same with some of the charges separated out (i.e. LFAS Charge). It is therefore important to add these to the headline tariff to compare apples with apples.

Farmer options

Understand your energy use profile

For some farmers, understanding their power use profile is the first step in selecting the right tariff. The interval data recording service is a great way to do this. For most farmers a *Time of Use* tariff will be the preferred option as only five milkings a week are on peak power. However centre pivot irrigation complicates this particularly if it is run through the peak period.

Get quotes

All Synergy customers should consider using the P11 or P13 contract system as the tariff is consistently cheaper. There is also no harm in getting quotes from the other suppliers in the market to compare offerings.

Targeted alternative energy

Dropping from a R3 tariff to a R1 tariff is significantly cheaper. For example if a 65 megawatt per annum user with 67% off peak use was able to reduce power consumption by 15 megawatt with alternative energy (i.e. solar) or other energy savings in the dairy, this would save \$4,382 from a reduced tariff alone. A further \$6,300 can be saved from the power generation by using solar during the peak period. This smaller targeted use of alternative energy is where such capital investments work.

Unbundle v bundled offers

Bundled electricity supply is a fixed peak and off price where the energy supplier includes the network and capacity costs. Therefore the energy retailer takes the risk on the network and capacity cost which can fluctuate. These are the most common for dairies.

Unbundled is a fixed tariff for consumption – but the consumer pays the network and capacity costs. The capacity charges for all supplier's contracts are set by Western Power and determined by 16 measurements over four peak days in January and February. So this obviously means the hottest day in each of the warmer months. The capacity charges are reset annually. The network charge is based on your annual usage and reset every October.

The consumer can keep a close eye on these fluctuations and adjust power use accordingly to reduce the capacity costs in future years. A targeted alternative energy source, such as solar or diesel generation, targeting the power use in this window will reduce your overall tariff plus the saving on the power generation itself. Often the approach with alternative energy sources has been wrongly targeted by trying to generate all of the dairies energy requirements with a large capital investment. In reality the best returns are smaller targeted alternative generation.

Unbundled bills are quite complex (see example Table 1) and they are not always cheaper. It requires good farmer knowledge of their power use and the ability to change consumption to extract savings.

Separation

Rather than include all power use on the one bill it can be cheaper to have separate accounts with a tariff suited to that energy use profile. For example if a house and dairy is on the same contract it may be useful to have separate accounts with the house on a domestic tariff and the dairy on a time of use option.

Seek advice

There are commercial energy brokers who can assist farmers to negotiate their power supply on their behalf. Much like mortgage or insurance brokers they can sort through the complexity of the market offers to get the best deal possible.

Case study

Greg Norton – Capel

Greg Norton runs a 300 head dairy with a 70 ha centre pivot in Capel and uses approximately 400 megawatts of electricity per annum. They also have horticultural interests. Approximately 12 months ago, when their existing 2 year electricity contract was due to expire, they were confronted with a doubling of their electricity costs.

This sudden increase in costs motivated Greg to look into his electricity supply arrangements to try and extract a better deal for his business.

After considerable research Greg now has implemented the following:

- > Unbundled power bills
- > 30kW solar generation on the dairy
- > Use of an electricity trader for some of their energy requirements
- > Diesel generation at peak times.

Unbundled bills

As previously mentioned this method of electricity supply separates the components of power supply into the cost of the electricity itself, capacity costs, networks costs and some other smaller fees. Traditionally this is all bundled together by the energy retailer who takes all the risk with fluctuations on the capacity and network costs. This is then updated annually based on your power use profile and the power used on the hottest days. In theory this offering has some margin for the retailer. It is this margin and the capacity for farmers to manage the capacity and network charges where Greg has been able to find savings by unbundling. For Greg the tariff, the capacity cost, and the network cost each represented around a third of the total bill (see Table 1).

Solar generation

Seeing the capacity and network costs has made it easier for Greg to make changes to his practices. He has invested in the area of solar power generation knowing that using less power will reduce power consumption but also his capacity and network charges in time. The original viability report suggested that the power savings alone will be a cash neutral position for a 30kW solar unit on a 48 month Hire Purchase arrangement. Greg reports that the solar system while effective has not performed as hoped at the moment. He also suggests that when using solar that you use as much of the solar power generation as you can on farm as you get nothing by putting it back into the grid.

During winter he pays more as the capacity and network charge stays the same.

Greg does stress that the approach to buying power will be different for individual farms. It also requires a holistic approach to buying power. This process is best suited to farmers who use large volumes of electricity. It also requires significant input from the farmer to understand and monitor the electricity market and/or employ the use of a broker on their behalf.

Table 1: An unbundled power bill.

Usage Start Time:	25 Jan 2015 00:00		
Usage End Time:	24 Feb 2015 24:00		
Number of days in period:	31		
Capacity Charges	Usage	Rate	Charge
Capacity Charge	6.510	335.418800/ MWDays	\$2,183.58
Shared Reserve Capacity Cost-SRCC	50.520	1.000000/ MW	\$50.52
Shared Reserve Capacity Cost-SRCC	191.930	1.000000/ MW	\$191.93
Energy Charges	Usage	Rate	Charge
H&A Norton \$ Sons REC Charge with loss factors - REC	66,197.334	0.010000/ kWh	\$661.97
H&A Norton & Sons with Loss Factor - Off Peak	22,955.254	0.039800/ kWh	\$913.62
H&A Norton & Sons with Loss Factor - Peak	20,918.858	0.069800/ kWh	\$1,460.14
H&A Norton & Sons with Loss Factor - Weekend	22,323.221	0.039800/ kWh	\$888.46
IMO Market Fees - IMO	60,636.928	0.000873/ kWh	\$52.94
LFAS Charge - IMO	60,636.928	0.002990/ kWh	\$181.30
Supply Charge Daily \$1.99	31.000	1.990000/ Days	\$61.69
Network Charges	Usage	Rate	Charge
WP RT4 Fixed Meter Charge (Stream Based)	31.000	0.072270/ Days	\$2.24
WP RT4 UoS Fixed Charge (Stream Based)	31.000	1.369860/ Days	\$42.47
WP RT4 UoS Var Charge - Off Peak	21,027.072	0.031520/ kWh	\$662.77
WP RT4 UoS Var Charge - Peak	19,161.728	0.138690/ kWh	\$2,657.54
WP RT4 UoS Var Charge - Weekend	20,448.128	0.031520/ kWh	\$644.52
WP Var Metering Charge - Off Peak	21,027.072	0.002160/ kWh	\$45.42
WP Var Metering Charge - Peak	19,161.728	0.002160/ kWh	\$41.39
WP Var Metering Charge - Weekend	20,448.128	0.002160/ kWh	\$44.17
Electricity Charges			\$10,786.67
GST on Electricity Charges			\$1,078.66
Total Electricity Charges			\$11,865.33
Average Daily Usage :	1,956.03 kWh		

Sourcing power from a trader and diesel power generation

Greg gets some of his power through an electricity trader (or broker).

This is where the broker purchases electricity on the wholesale market and is at a rolling market price. This model has its risks such as where power supply is interrupted. It also requires a 160 megawatt per annum minimum power use which is higher than many farms. It also requires a significant private bond as surety. Greg and his trader are constantly looking at the wholesale energy market through the IMO website to determine when prices will be high. This is usually the hottest days over summer for the afternoon milking. This enables Greg to use diesel power generation to avoid the most expensive tariff but also reduces his capacity and network costs for the next round of tariff negotiations. Table 2 is an example of a bill from an electricity trader.

Savings summary

Greg is still to calculate the final annual savings from the changes he has made. However his preliminary estimates for the first 8–9 months are that unbundling has reduced power usage by 9% and the cost by 12%. Using a broker for some of their requirements and unbundling has reduced power costs by 12% for electricity bought this way.

Table 2: A power bill from electricity trader.

Number of Days	31.00	Account No	287000269	
Load Information		Usage Information		
NMI	80010172492	Peak Consumption (kWh)	25,627.36	
Meter No	0140000255	Off-peak Consumption (kWh)	70,512.82	
		Total Consumption (kWh)	96,140.18	
Transmission Loss Factor	1.0452	Average Daily Usage (kWh)	3,101.30	
Distribution Loss Factor	1.0465	Max Peak 30 Minute Demand (kW)	262.14	
Total Loss Factor	1.0917	Max Off-peak 30 Minute Demand (kW)	265.54	
		Average 30 Minute Demand (kW)	129.22	
		Monthly kW Load Factor	49%	
Electricity Charges				
Component	Amount	Rate	Ratio	Charge
Energy	104,957.08 kWh	Balancing Price		\$ 3,090.29
Network Access - Fixed	31.00 Days	1.44213 \$/Day		\$ 44.71
Network Access - Peak	25,627.36 kWh	14.085 c/kWh		\$ 3,609.61
Network Access - Off Peak	70,512.82 kWh	3.368 c/kWh		\$ 2,374.87
Capacity	198.82 kW	122,427.87 \$/MW/Year	1.8497	\$ 3,751.89
Renewable Energy - STC	100,610.69 kWh	40.0 \$/MWh	10.48%	\$ 421.76
Renewable Energy - LTC	100,610.69 kWh	40.0 \$/MWh	9.87%	\$ 397.21
Ancillary Services	104,957.08 kWh	0.3 c/kWh		\$ 314.87
Market Fees	104,957.08 kWh	0.0873 c/kWh		\$ 91.63
Total Electricity Charge (GST Exclusive)				\$ 14,096.84
Retailer Fee				\$ 800.00
Enigin Service Fee				\$ 200.00
GST				\$ 1,509.68
Interest on Security Deposit- September				-\$ 102.82
Total Payable - net of interest				\$ 16,503.70
Average Price (GST Exclusive)				15.7 c/kWh

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