Statement of Approach: AER Price Comparator Website

Comments by Alan Hughes

January 2012

http://www.aer.gov.au/sites/default/files/Statement%20of%20Approach%20-20AER%20price%20comparator%20website%20-%20January%202012.pdf

AUSTRALIAN ENERGY REGULATOR

AER Retail Pricing Information Guideline Version 3.0[1]

Constructive comments

For the most informed customers the Guideline requires three components

1. **An interactive Website comparator**
2. **A print version of the proposed contract**
3. **A Bill**

This document is set out as follows;

1. Constructive comments on the AER Retail Pricing Information Guideline Version 3.0.
    a. Suggested additional requirements
    b. This section also includes amended examples of the contract details
2. An example of a proposed interactive website comparator.
3. An example of a bill and how it is used with the proposed interactive website comparator.

My objective in this document is to simplify the comparison of retailers and to make the calculation from meter reading to the final price traceable and transparent.

Thank you for your consideration,

Alan Hughes

Dip. Electronic Engineering

[1] http://www.aer.gov.au/sites/www.aer.gov.au/files/D12%2090577%20%20AER%20Retail%20Pricing%20Information%20Guideline%20-%20June%202012.pdf

1. Constructive comments on the AER Retail Pricing Information Guideline Version 3.0.

Background information

"**Australian Legal Units of Measurement**

The national measurement system is a coherent formal system which ensures that measurements can be made on a consistent basis throughout the country. It ensures that practical measurements made by industry and the community are linked to the International System of Units (SI)."

National Measurement Institute[2] is a Commonwealth Government Institute responsible trade measurement which requires the use of SI metric measurement units.

The SI metric Unit for *energy* is the Joule and thus the price of energy is in $/GJ

The SI metric Unit for *power* (the rate at which energy is moved or used) is the Watt.

Energy is available as electricity, natural gas, petrol, liquid petroleum gas, coal, sunshine and uranium to name a few.

2.2 Price Information Requirements Page 4

1. "the unit price for electricity and/or gas applicable under the *contract offer* in cents per kWh and in cents per MJ respectively in the manner that they would apply to *customers."*

Why is such a small unit used to price? The units are in cents when a typical bill is in $1,000's per year. This is similar to pricing milk by the teaspoon instead of the litre. A supermarket charges a 1.46 c/teaspoon what is its price per litre[3]?

The customer cannot compare the price of electricity to gas when they are in different units.

The Systems International unit for all energy is the Joule. This unit is very small so 1 thousand million Joules or the GigaJoule (GJ) is much more appropriate. This can be used for all forms of energy from electricity through gas, petrol, diesel to heat….

1. The price for energy should be in $/GJ.

$$\$/\boldsymbol{GJ} = \frac{c/kWh}{0.36} \qquad \$/GJ = 10\ x\ c/MJ$$

This will allow the energy users to choose on price between gas and electricity particularly for producing heat.

1. the *contract offer* must be in $/GJ

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2 http://www.measurement.gov.au/measurementsystem/Pages/HowAustraliasMeasurementSystemWorks.aspx

3 $2.92

2. "any fixed or standing charge that is applicable under the *contract offer* in "cents per day". A fixed or supply charge must be expressed as "daily supply charge" (examples are provided below)."

Cents/day is too small a unit for easy comparison and is a 1/365th of what customers have to pay. $/year is much more realistic.

2. *any fixed or standing charge that is applicable under the contract offer in "$/year". A fixed or supply charge must be expressed as "supply charge" (examples are provided below).*

Example: Importing Energy by Residential Customers

The price is the total of the GST and carbon charges.

Example 1 – Electricity, single rate

Applicable charges	Tonne CO_2/GJ	Price
Electrical energy charge		$/GJ
+Supply charge		$/year

Example 2 – Electricity, Time Use

Applicable charges	Tonne CO_2/GJ	Price
Weekday Peak Energy charge **11:00 – 17:00** *07:00 – 11:00, 17:00 – 21:00*		$/GJ
+ Weekday shoulder Energy charge **07:00 – 11:00, 17:00 – 21:00** *11:00 – 17:00*		$/GJ
+ Weekend Shoulder Energy charge 07:00 – 21:00		$/GJ
+ Off Peak Energy charge 21:00 – 07:00		$/GJ
+ Supply charge		$/year

Bold = 21/9/2012 – 21/03/2013 *Italics= The balance of days*

Example 3 – Electricity and Gas using block tariff

Applicable charges	Tonne CO_2/GJ	Price
Average Electrical power ≤465 W		$/GJ
+ Average Electrical power >465 W		$/GJ
+ Average Gas power ≤12.7 W		$/GJ
+ Average Gas power >12.7 W		$/GJ
+ Supply charge		$/year

Example 4 – Electricity, Cap plan 1

Applicable charges	Tonne CO_2/GJ	Price
Long Term Average power		$/GJ
+ Current average power - Long term average Power ≤465 W		$/GJ
+ Current average power - Long term average Power > 465 W		$/GJ
+ Supply charge		$/year

Example 4 – Electricity, Cap plan 2

Applicable charges	Tonne CO_2 / GJ	Price
Long Term Average power		$/GJ
+ Current average power which exceeds Long term Average power by ≤12.5 %		$/GJ
+ Current average power which exceeds Long term Average power by - >12.5 % - ≤25 %		$/GJ
+ Current average power which exceeds Long term Average power by >25 %		$/GJ
+ Supply charge		$/year

Long term average power is the power purchased from a supplier over the past 365 days. This long term average needs to be transferable between retailers in a similar way as health funds transfer information.

All electrical retailers must include a purchase schedule for residents to export their power. This table must follow the import table.

Example: Exporting Energy by Residential Customers

Power is only exported when the residential generation of power exceeds the power consumed by the residence.

Example 1 – Electricity, single rate export

Applicable charges	Price
Energy charge	$/GJ

Example 2 – Electricity, Time of Export

Applicable charges	Price
Weekday Peak Energy charge **11:00 – 17:00** *07:00 – 11:00, 17:00 – 21:00*	$/GJ
+ Weekday shoulder Energy charge **07:00 – 11:00, 17:00 – 21:00** *11:00 – 17:00*	$/GJ
+ Weekend Shoulder Energy charge 07:00 – 21:00	$/GJ
+ Off Peak Energy charge 21:00 – 07:00	$/GJ

Bold = 21/9/2012 – 21/03/2013 *Italics= The balance of days*

Quotes for business and industrial customers

These quotes need to be itemised for the base energy price, the quantity of carbon dioxide generated, the price of this CO_2 and a total without GST.

Customer metering

Gas: Gas meters measure the volume of the gas and not a measure of energy. Some retailers do not quote the energy density of the gas they are selling. This means that the customer cannot check the accuracy of the meter reading and the conversion to energy units.

Electricity: Electricity meters currently measure energy but in kWh.

Gas: 1 GJ = 0.0393 m^3 Electricity: 1 GJ = 0.0036 kWh

Schedule of refunds for a lack of supply

There is no penalty clause for a failure of supply. The contract is with the retailer and not the supplier of the energy. The retailer will have to recover costs from the appropriate supplier.

This is required because of the costs incurred by the consumer for example food in the freezer which thaws.

Uninterrupted electricity supply

Some customers require continuous electricity for life threatening conditions. Seehttp://www.synergy.net.au/life_support.xhtml

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~~In addition to the above, a *retailer* must define the following terms on an *Energy Price Fact* Sheet using the definitions stipulated below. *Retailers* may choose the format for including the definitions (i.e. footnotes; use of symbols etc) but must ensure the definition is clear to readers.~~
~~1. Daily supply charge: a charge that applies for supplying electricity/gas[10] to your premises for each day of the billing period, regardless of how much electricity/gas you use.~~
~~2. kWh: 'kWh' stands for kilowatt hour and is the unit of measurement for your electricity bill.~~
~~3. MJ: 'MJ' stands for megajoule and is the unit of measurement for your gas bill.~~

2.3.7 Optional information
The AER encourages *retailers* to provide on an *Energy Price Fact Sheet*, examples or other guidance that may assist *small customers* to get a practical understanding of what a kWh of electricity or MJ of gas represents in terms of appliance usage. Attachment B provides an example of how this information can be provided.

Some addition information is required

The definition of power is required along with examples of how it is used.

2.3.7 Compulsory information
The AER requires *retailers* to provide on an *Energy Price Fact Sheet*, examples or other guidance that may assist *small customers* to get a practical understanding of how power is used on accounts. Attachment B provides an example of how this information can be provided.

Page 10

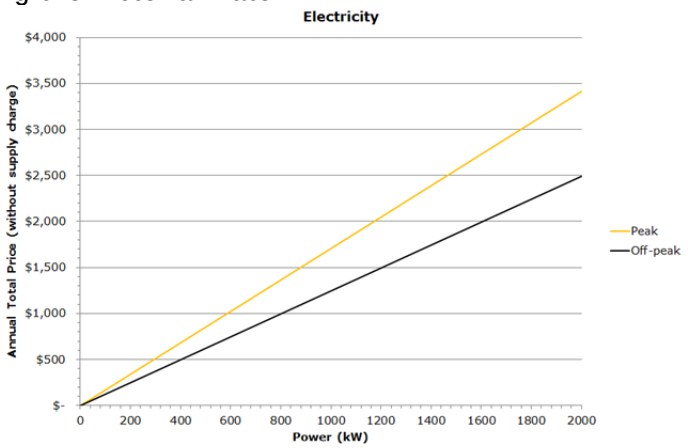
~~Solar feed-in tariffs available~~	~~[description of tariff]: X cents per kWh exported inc (GST)~~ ~~[description of tariff]: X cents per kWh exported inc (GST)~~

"Solar feed-in tariffs" is a poor name because consumers can also generate wind energy when the sun is down! Export of electricity must be offered on all electricity contracts.

Attachment A Page 20 Values match this page

Applicable charges	Tonne CO2 / GJ	Total Price
Peak Energy charge 07:00 – 23:00 Monday - Friday	0.376	$54.08 /GJ
+ Off Peak Energy charge All other times	0.376	$39.47 /GJ
+ Supply charge		$212.94 /year

CO_2 pollution is using the Victorian rate[4]



What is a ~~daily~~ supply charge? A charge that applies for supplying ~~electricity~~ energy to your premises for ~~each day of~~ the billing period, regardless of how much ~~electricity~~ energy you use. If the supply is less than a year an appropriate proportion of the supply charge is charged.

What is a kWh? 'kWh' stands for kilowatt hour and is commonly used on your electrical energy meter. To multiply the number of kWh by 0.0036 to convert to GJ.

An average power consumption of 1 kW (1000 Watt) will take 1 million seconds to use 1 GigaJoule. 1 million seconds = 11 days, 13 hours, 4 minutes and 4 seconds.

Energy consumption with an average power consumption of 1 kW

Period	Period (seconds)	Energy (GJ)
Year (365 d, 5 h, 18 min 46s)	31,556,926	31.56
Quarter	7,889,232	7.889
"2months" (year/6)	5,259,488	5.259
"month" (year/12)	2,629,744	2.630
Fortnight	345,600	0.346
Week	172,800	0.173
Day	86,400	0.086

Price of energy consumption = Power (kW) x Energy for the selected period x $/GJ.

[4] http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx

Attachment B Page 22

The values used in the table below are the equivalent of those in the original document.

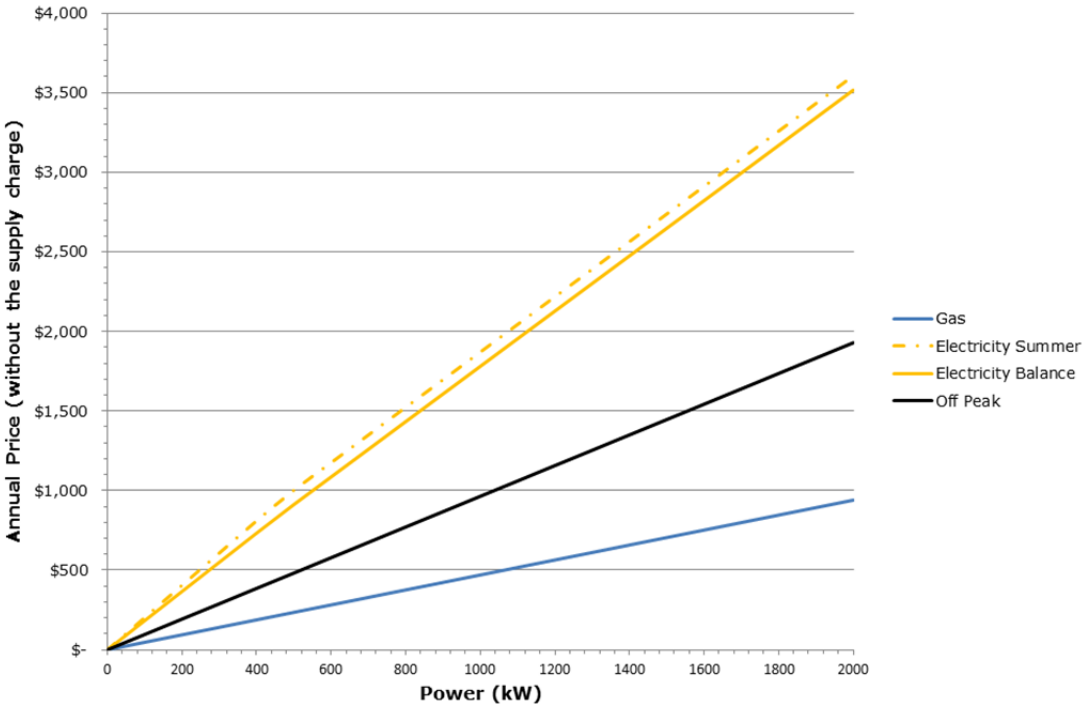
Charges	Tonne CO2 / GJ	Prices
Gas Energy	0.004	$14.90 /GJ
+ Electrical power ≤465 W 1 December – 31 March	0.376	$64.17 /GJ
+ Electrical power >465 W 1 December – 31 March	0.376	$55.00 /GJ
+ Electrical power ≤465 W 1 April – 30 November	0.376	$58.06 /GJ
+ Electrical power >465 W 1 December – 31 March	0.376	$55.00 /GJ
+ Off-peak hot water controlled load (if you have a controlled load metering configuration)	0.376	$30.56 /GJ
Supply charge		$341.50

Tonne CO2/GJ are values for Melbourne in 2011-2012.

Energy consumption with an average power consumption of 1 kW

Period	Period (seconds)	Energy (GJ)
Year (365 d, 5 h, 18 min 46s)	31,556,926	31.56
Quarter	7,889,232	7.889
"2months" (year/6)	5,259,488	5.259
"month" (year/12)	2,629,744	2.630
Fortnight	345,600	0.346
Week	172,800	0.173
Day	86,400	0.086

Price of energy consumption = Power (kW) x Energy for the selected period x $/GJ.



2. An example of a proposed interactive website comparator

The purpose

- To be able to compare retailers to get the cheapest price for the customers' power consumption pattern.
- Warn customers of what will occur if their power consumption pattern changes through the use of graphs
- Compare the price of electricity with gas to determine if it is cost effective to convert heating appliances to gas, even bottled gas.
- Use the power figures from their bill to insert into the interactive website to accurately predict the price over any time period, provided the usage pattern does not change.

Home Screen

- This screen is for the consumer to input the required information for the results to be calculated
- Postcode and the account type is used to determine which account to use.
- The Time period in the centre is used to calculate the energy transfer during that time so that the prices can be calculated. Thus the consumer can price by the day, fortnight, quarter or the year. These selections are on a drop down menu.
- A year is 31,556,926 seconds long. This has been used so that leap years can be ignored.
- Inputting of power information
    - If a residential account is selected the Watt unit is selected. If the business account is selected the kilowatt is selected. These are default values, to which the user can click the opposite option if they wish.
    - The peak and off peak gas power are usually copied off the bill which is of the type shown in part 3 of this document.
    - Electricity can be inputted a number of ways;
        - Average Electrical Power is used by those on a fixed rate supply. The Time of Use power values will be calculated as a proportion of this average, assuming a steady, constant consumption.
        - Time of Use Averages of electrical power are inputted on the left side. The Average Electrical power is automatically calculated.
        - Using these options it allows the price of fixed rates and time of use consumption to be compared in price.
- The grey default values should be the average values for this category customer by that retailer. If the enter key is depressed they are used.

Home Screen

Tropical year = 31556926 s
Seasonal (¼ y) = 7889232 s
"2 Month" (year/6) = 5259488 s
Fortnightly = 1209600 s
Weekly = 604800 s
Daily = 86400 s

Australian Standard colour codes AS1345 are used for gas and electrical background boxes

Commercial and industrial customers, tick boxes change to kW and MW

Residential
Business
Commercial
Industrial

Please type in the postcode, power values you wish to price, select the calculation period and the account type.

0000

Tropical year =31556926 s

Residential

Postcode

Calculation period

Ignore leap year

Account Type

Weekday Peak	208	☒ W ☐ kW	
Weekday Shoulder	208	☒ W ☐ kW	
Weekend Shoulder	167	☒ W ☐ kW	
Off Peak	407	☒ W ☐ kW	
Peak Gas Power	250	☒ W ☐ kW	
Off-peak Gas Power	750	☒ W ☐ kW	
Average Electrical Power	1 000	☒ W ☐ kW	
Average Electrical Power for Sale	500	☒ W ☐ kW	

If data is entered into the Average Electrical power the timed use fields go to zero. If values are entered into timed use the Average Electrical power is the total of the timed use fields

All numerical fields except postcode contain a decimal point each

OK

Grey suggested values assume a non-varying continuous rate of consumption

Residential example of the home screen

Please type in the postcode, power values you wish to price, select the calculation period and the account type.

Postcode	Calculation period	Account Type
0000	Tropical year =31556926 s	Residential

Ignore leap year

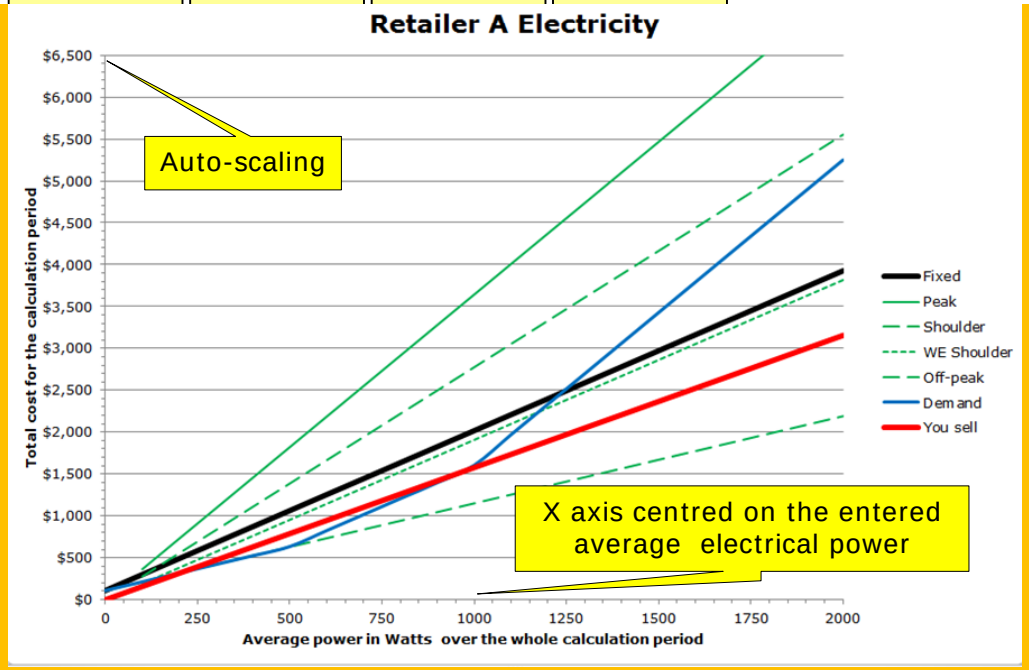
Weekday Peak	208	W / kW
Weekday Shoulder	208	W / kW
Weekend Shoulder	167	W / kW
Off Peak	407	W / kW
Peak Gas Power	250	W / kW
Off-peak Gas Power	750	W / kW
Average Electrical Power	1 000	W / kW
Average Electrical Power for Sale	500	W / kW

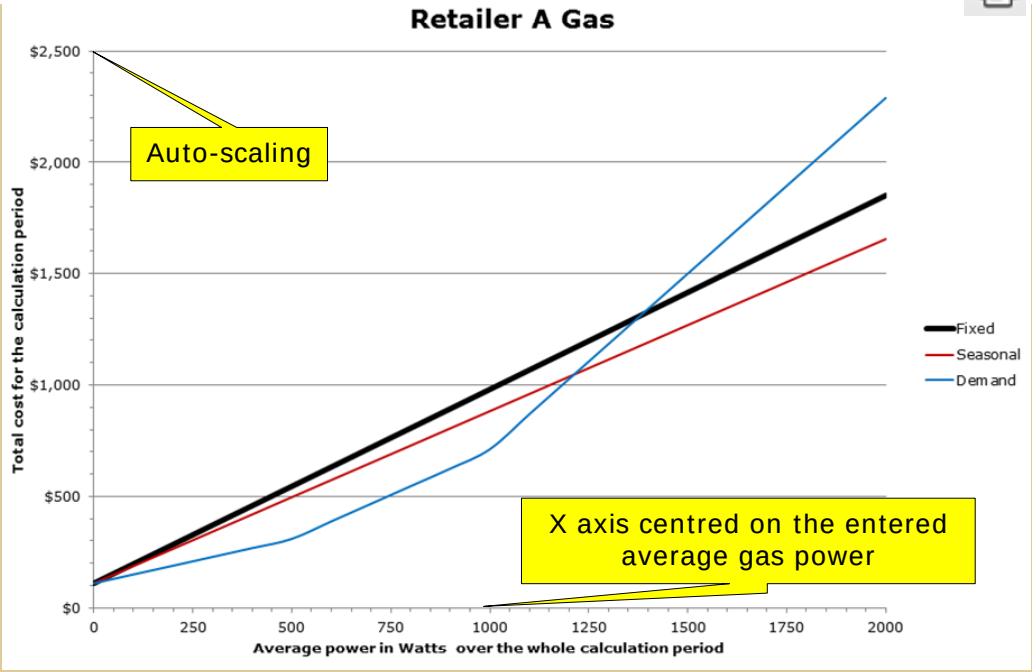
OK

suggested values assume a non-varying continuous rate of consumption

Retailer A | Retailer B | Retailer C | Retailer D

Annual Prices





The power values (W) are those inputted on the home screen

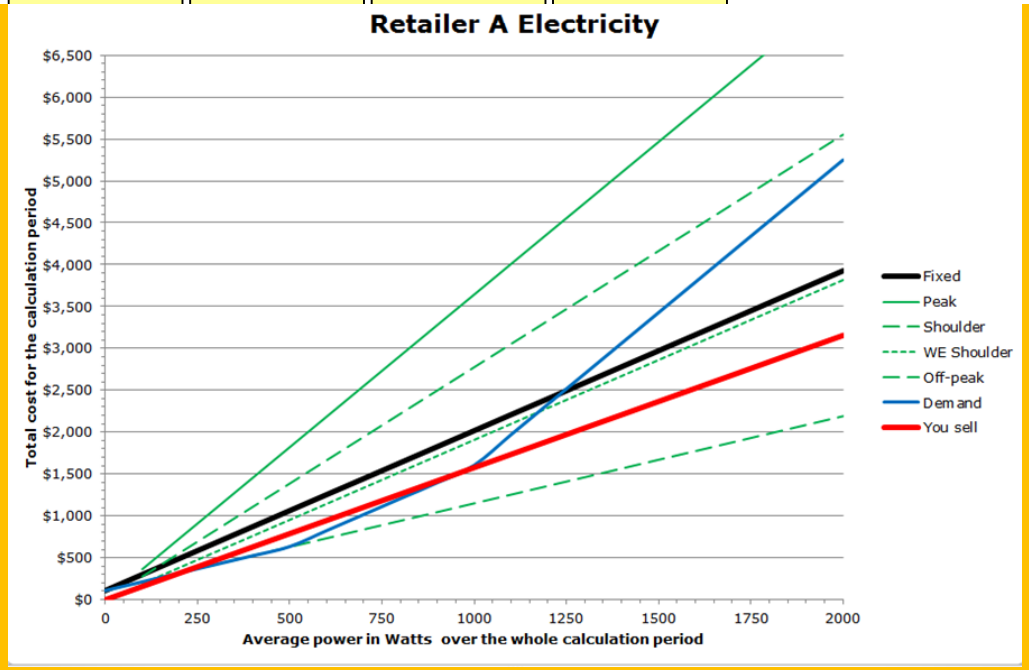
1000 Watts consumed for a tropical year = 31.56 GJ		
CO2 Emissions = 11.58 tonnes		$172.74
Supply Charge		$110.00
Fixed Energy charge for	1,000 W $	1,835.63
Total Cost for fixed tariff		**$2,212.00**
Timed Energy Charge for		
Peak 11:00 – 17:00, 07:00 – 11:00, 17:00 – 21:00	208 W	$ 722.02
Shoulder 07:00 – 11:00, 17:00 – 21:00, 11:00 – 17:00	208 W	$ 541.52
WE Shoulder 07:00 – 21:00	167 W	$ 289.85
Off-peak 21:00 – 07:00	407 W	$ 353.20
Total Cost for timed tariff		**$2,282.96**
Demand Energy charge for	1,000 W	$ 1,606.27
Total Cost for demand tariff		**$1,699.90**
Fixed Energy for sale by the customer	500 W	**$ 788.92**

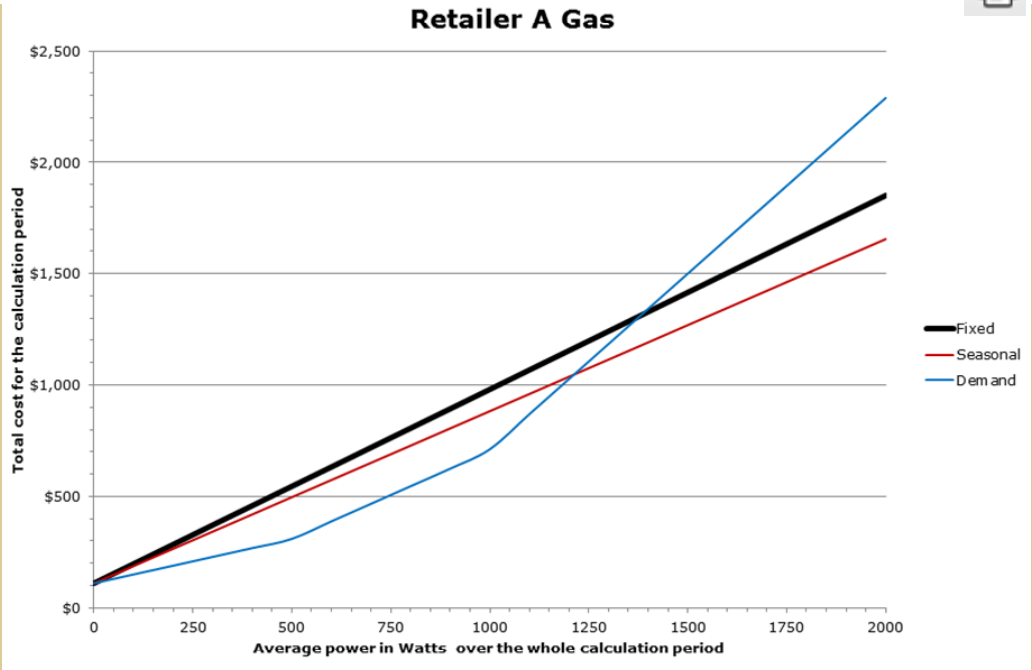
1000 Watts consumed for a tropical year = 31.56 GJ		
CO2 Emissions = 0.126 tonnes		$2.90
Supply Charge		$110.00
Fixed Energy charge for	1,000 W $	867.82
Total Cost for fixed tariff		**$980.72**
Seasonal Energy Charge for		
Winter 21/6/2012 21:05 –21/09/2012 04:32	250 W	$ 76.70
Balance of the year	750 W	$ 345.17
Total Cost for seasonal tariff		**$882.85**
Demand Energy charge for	1,000 W	$ 601.60
Total Cost for demand tariff		**$711.60**
Meter reading discount for a pair of meters		$ 10.00

Note: The average power is continuous over the calculation period for example:
For a calculation period of a year, it is assumed that the average power transferred is unchanged during that time. (Input the long term average)
This data is for **Domestictown, State.** The data is for tropical year at the tariff rates which are in current use.
Included is GST @ 10 % Electricity emission factor 0.258 t/GJ, Gas emission factor 0.004 t/GJ. CO_2 emissions at $23.00 /tonne.

Retailer A | Retailer B | Retailer C | Retailer D

Annual Prices





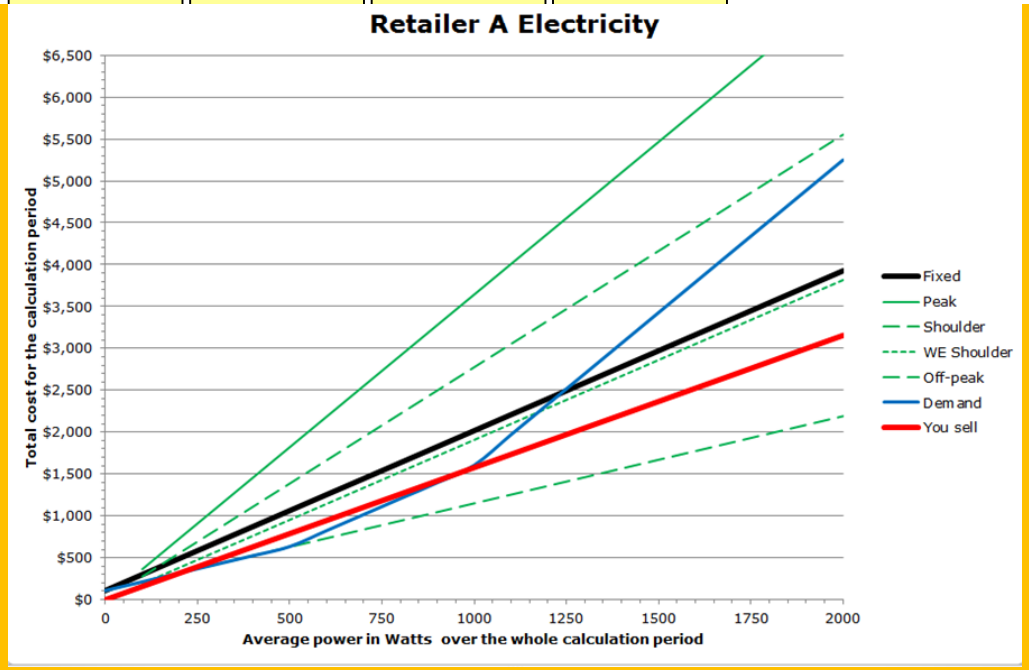
1000 Watts consumed for a tropical year = 31.56 GJ		
CO2 Emissions = 11.58 tonnes		$172.74
Supply Charge		$110.00
Fixed Energy charge for	1,000 W	$ 1,835.63
Total Cost for fixed tariff		**$2,212.00**
Timed Energy Charge for		
Peak 11:00 – 17:00, 07:00 – 11:00, 17:00 – 21:00	208 W	$ 722.02
Shoulder 07:00 – 11:00, 17:00 – 21:00, 11:00 – 17:00	208 W	$ 541.52
WE Shoulder 07:00 – 21:00	167 W	$ 289.85
Off-peak 21:00 – 07:00	407 W	$ 353.20
Total Cost for timed tariff		**$2,282.96**
Demand Energy charge for	1,000 W	$ 1,606.27
Total Cost for demand tariff		**$1,699.90**
Fixed Energy for sale	500 W	**$ 788.92**

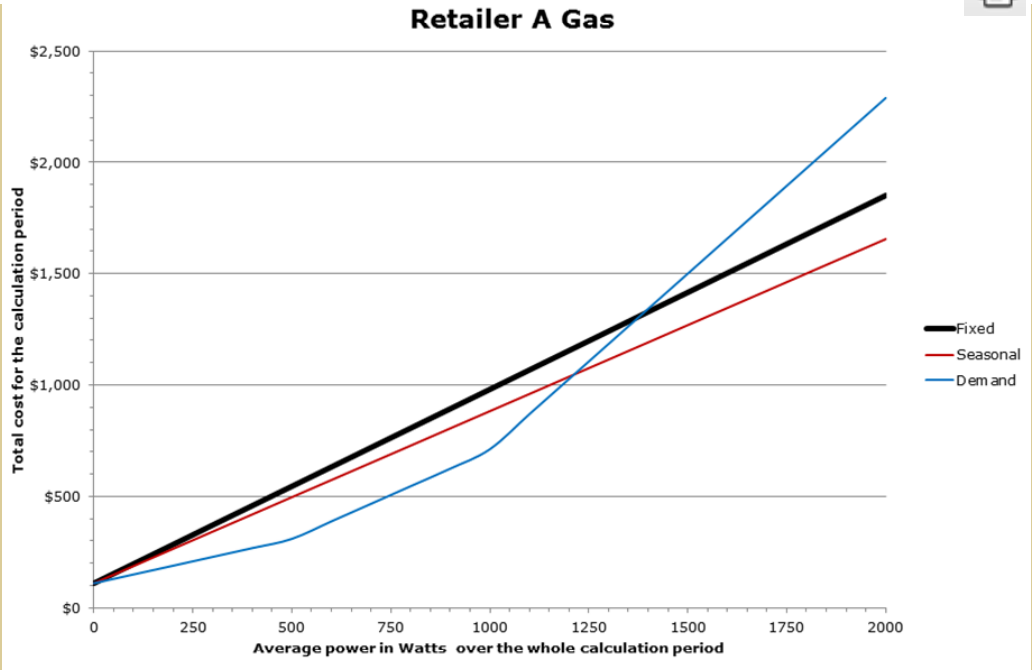
1000 Watts consumed for a tropical year = 31.56 GJ		
CO2 Emissions = 0.126 tonnes		$2.90
Supply Charge		$110.00
Fixed Energy charge for	1,000 W	$ 867.82
Total Cost for fixed tariff		**$980.72**
Seasonal Energy Charge for		
Winter 21/6/2012 21:05 –21/09/2012 04:32	250 W	$ 76.70
Balance of the year	750 W	$ 345.17
Total Cost for seasonal tariff		**$882.85**
Demand Energy charge for	1,000 W	$ 601.60
Total Cost for demand tariff		**$711.60**
Meter reading discount for a pair of meters		$ 10.00

Note: The average power is continuous over the calculation period for example:
For a calculation period of a year, it is assumed that the average power transferred is unchanged during that time. (Input the long term average)
This data is for **Domestictown, State.** The data is for tropical year at the tariff rates which are in current use.
Included is GST @ 10 % Electricity emission factor 0.258 t/GJ, Gas emission factor 0.004 t/GJ. CO_2 emissions at $23.00 /tonne.

Retailer A | Retailer B | Retailer C | Retailer D

Quarterly Prices





750 Watts consumed for a quarter = 5.917 GJ		
CO2 Emissions = 1.611 tonnes		$37.06
Supply Charge		$37.94
Fixed Energy charge for	750 W $	$409.03
Total Cost for fixed tariff		**$484.03**
Timed Energy Charge for		
Peak 11:00 – 17:00, 07:00 – 11:00, 17:00 – 21:00	156 W	$ 156.66
Shoulder 07:00 – 11:00, 17:00 – 21:00, 11:00 – 17:00	156 W	$ 83.48
WE Shoulder 07:00 – 21:00	126 W	$ 56.94
Off-peak 21:00 – 07:00	313 W	$ 95.70
Total Cost for timed tariff		**$467.79**
Demand Energy charge for	750 W	$ 301.18
Cost for demand tariff		**$376.17**
Fixed Energy for sale	500 W	**$ 788.92**

750 Watts consumed for a tropical year = 5.917 GJ		
CO2 Emissions = 0.4358 tonnes		$10.02
Supply Charge		$16.93
Fixed Energy charge for	750 W $	867.82
Total Cost for fixed tariff		**$980.72**
Seasonal Energy Charge for		
Winter 21/6/2012 21:05 –21/09/2012 04:32	250 W	$ 76.70
Balance of the year	750 W	$ 345.17
Total Cost for seasonal tariff		**$882.85**
Demand Energy charge for	1,000 W	$ 601.60
Total Cost for demand tariff		**$711.60**
Meter reading discount for a pair of meters		$ 10.00

Note: The average power is continuous over the calculation period for example:
If your quarterly power average power transfer for the same season last year is inputted then you may estimate this quarter. If the long term average is used then it will display the price of a quarter at the average power (Use long term average)
This data is for **Domestictown, State.** The data is for tropical year at the tariff rates which are in current use.
Included is GST @ 10 % Electricity emission factor 0.272 t/GJ, Gas emission factor 0.0736 t/GJ. CO_2 emissions at $23.00 /tonne.

- Results screens
    - There is a pair shown, one for yearly price and the other for a quarter of a year. Notice that if the consumption does not change the power does not change. This can allow the increase in the various seasons to be compared. The energy transferred depends on the duration of when the power is consumed or generated.
    - All averaging is continuous regardless of whether a power transfer is occurring or not. When using Time of Use metering this enables each time slots' averages to be added to give a full time average.
    - The graphs are centred on the inputted average values to inform customers of what happens if their pattern of use changes.
    - The colour coded prices match the graphs and give exact values from the graphs and add supply charges

3. The Bill

The bill follows on the next pair of pages,

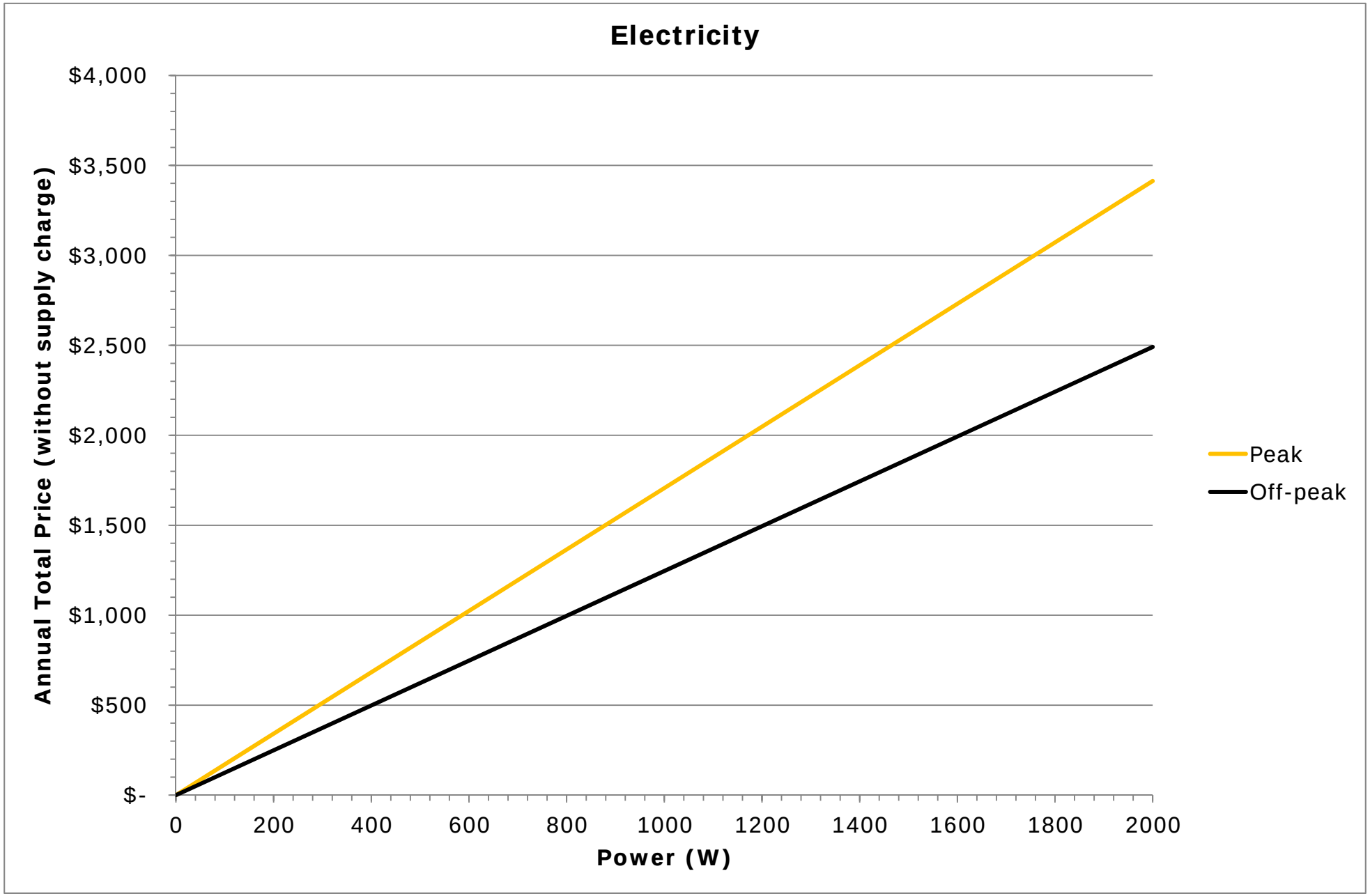
- The front page gives corporate details, for this delivery energy, the delivery and billing address, how much which needs paying and by when.
- The bottom half of the front, shows current and previous usage.
- The back page shows how the final figure is arrived at.

4. Conclusion

The aim is to use a common energy unit, the GJ so prices can be compared and the concept of power using the Watt enables the rates of consumption or generation can be easily compared.

Alan Hughes

25/07/2012


Electricity
Annual Total Price (without supply charge)
$4,000
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
$-
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Power (W)
Peak
Off-peak

Power (W)	Gas	Electricity Summer	Electricity Balance	Off Peak	GJ/year
		$ 941.63	$ 851.97		14.67397059
0	$ -	$ -	$ -	$ -	31,556,926
100	$ 47.02	$ 202.50	$ 183.22	$ 96.44	
200	$ 94.04	$ 405.00	$ 366.44	$ 192.88	
300	$ 141.06	$ 607.50	$ 549.66	$ 289.31	
400	$ 188.08	$ 810.00	$ 732.88	$ 385.75	
500	$ 235.10	$ 1,002.38	$ 912.72	$ 482.19	
600	$ 282.12	$ 1,175.94	$ 1,086.28	$ 578.63	
700	$ 329.14	$ 1,349.50	$ 1,259.84	$ 675.07	
800	$ 376.16	$ 1,523.07	$ 1,433.41	$ 771.50	
900	$ 423.18	$ 1,696.63	$ 1,606.97	$ 867.94	
1000	$ 470.20	$ 1,870.19	$ 1,780.53	$ 964.38	
1100	$ 517.22	$ 2,043.75	$ 1,954.10	$ 1,060.82	
1200	$ 564.24	$ 2,217.32	$ 2,127.66	$ 1,157.26	
1300	$ 611.26	$ 2,390.88	$ 2,301.22	$ 1,253.69	
1400	$ 658.28	$ 2,564.44	$ 2,474.79	$ 1,350.13	
1500	$ 705.30	$ 2,738.01	$ 2,648.35	$ 1,446.57	
1600	$ 752.32	$ 2,911.57	$ 2,821.91	$ 1,543.01	
1700	$ 799.34	$ 3,085.13	$ 2,995.47	$ 1,639.45	
1800	$ 846.36	$ 3,258.70	$ 3,169.04	$ 1,735.88	
1900	$ 893.38	$ 3,432.26	$ 3,342.60	$ 1,832.32	
2000	$ 940.40	$ 3,605.82	$ 3,516.16	$ 1,928.76	

465
$ 14.90
$ 64.17
$ 55.00
$ 58.06
$ 55.00
$ 30.56
$ 941.63
$ 851.97

Energy Account – Tax Invoice

Account: ### ### #### **Meter:** ### ### #### ### ### ####

@ 2012 08 31 your account is

Total of last bill:	$ 543.21
Payments	$ 543.21
Adjustments	$ 0.00
Balance	$ 0.00
Current Charges	**$ 462.83**
You Pay	**$ 462.83**

This account includes 10 % GST on Energy

Direct Debt / Due by Date:
14 September 2012

The Energy Company
www.theenergyco.com.au
13 4567 13 5678
TIS 131 450
PO Box 1234
Energy 1234
ABN 12 123 456 789

Mr Delivery Address
1/1111 Home St
Hometown 9876
Customer Barcode

Metering Address: 8/8888 Home St Hometown 9876

Meter Reading was at 2012 08 31 16:43:23

Electricity

Long Term average power balance **800 W**

Average import power
2012 06 31 08:00:00 → 2012 09 30 15:27:00

Peak	156.4 W
D Shoulder	156.4 W
W shoulder	126.3 W
Off Peak	313.7 W
Total	**752.9 W**

Average Export Power
2012 06 31 08:00:00 → 2012 09 30 15:27:00

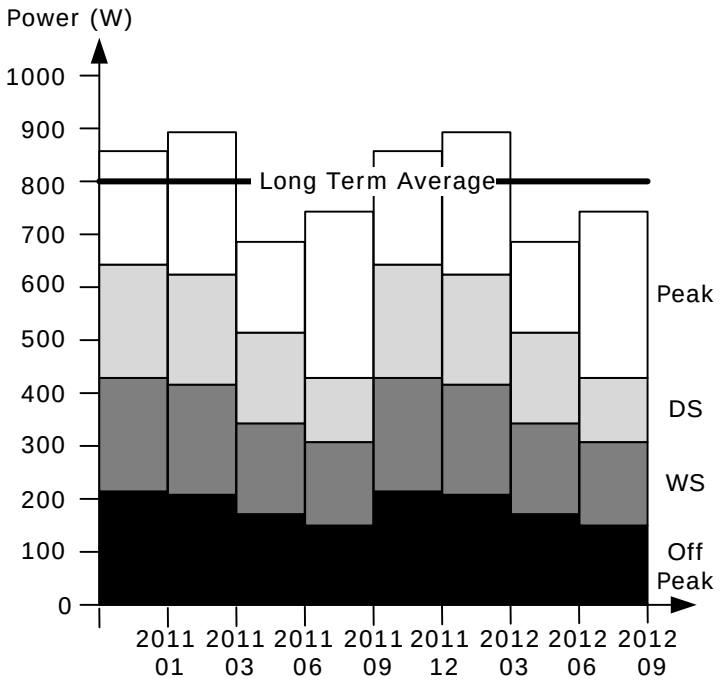
Peak	119.1 W
D shoulder	59.3 W
W shoulder	71.2 W
Off peak	0 W
Total	**249.6 W**

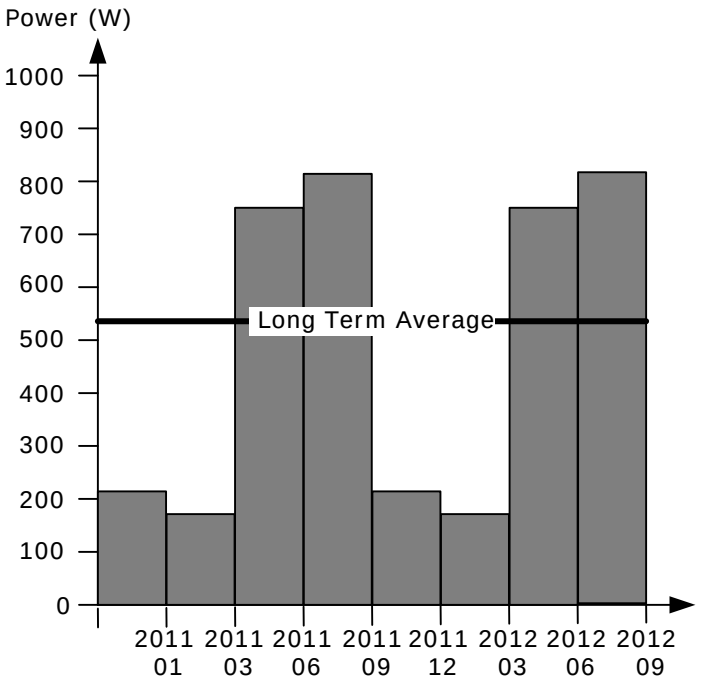
Natural Gas

Long Term average power consumption **543.2 W**

Average power consumption
2012 06 31 08:00:02 → 2012 09 30 15:27:02

Off Peak	**815.7 W**
Total	**815.7 W**





Reading on: 31/06/2012 08:00:00
Reading on: 30/09/2012 15:27:00
Duration: 7889232 s
Energy Conversion: 0.0036 GJ/kWh

Time	Previous	Current	Previous	Current
Peak	256 kWh	599 kWh	0.922 GJ	2.156 GJ
D Shoulder	256 kWh	599 kWh	0.922 GJ	2.156 GJ
W Shoulder	207 kWh	484 kWh	0.745 GJ	1.742 GJ
Off Peak	514 kWh	1202 kWh	1.850 GJ	4.325 GJ

Time	Energy purchased (GJ)	Rate ($/GJ)	Cost ($)	Power (W)
Peak	1.234	127.44	157.27	156.4
D shoulder	1.234	67.91	83.81	156.4
W Shoulder	0.997	57.35	57.17	126.3
Off Peak	2.475	38.82	96.07	313.7
Total	**5.940**		**$ 394.32**	**752.9**
10 % GST			**$ 43.23**	
Carbon Debt	5.940 GJ	0.2723 t_{co2}/GJ	0.1618 t	**$ 37.21**

Energy Exported (GJ)

Time	Previous	Current	Previous	Current
Peak	261 kWh	522 kWh	0.9396 GJ	1.8792 GJ
D Shoulder	130 kWh	260 kWh	0.4680 GJ	0.9360 GJ
W Shoulder	156 kWh	312 kWh	0.5616 GJ	1.1232 GJ
Off Peak	0 kWh	0 kWh	0 GJ	0 GJ

Time	Energy purchased (GJ)	Rate ($/GJ)	Profit ($)	Power (W)
Peak	0.9396	23.36	21.95	119.1
D shoulder	0.4680	23.36	10.93	59.32
W Shoulder	0.5616	23.36	13.12	71.19
Off Peak	0	23.36	0	0
Total	**1.9692**		**$ 46.00**	**249.6**
Subsidy	1.9692	111.11	**$ 218.80**	

Reading on: 31/06/2012 08:00:02 — 01234 m³
Reading on: 30/09/2012 15:27:02 — 01399 m³
Consumption: — 165 m³
Duration: 7889232 s
Energy Density: 0.039 GJ/m³
Consumption: 165 x 0.039 — 6.435 GJ
Average Power: 6.435 x 1000000000/7889232 — 815.7 W
Average Power >500 W: 815.7 – 500 — 315.7 W
Energy for 500 W: 500 x 7889232/1000000000 — 3.945 GJ
Energy for 315.7 W: 6.435 - 3.945 — 2.490 GJ

Av. Power	Energy (GJ)	Tariff ($/GJ)	Debit($)
<500 W	3.945	35.53	140.14
317 W	2.490	32.06	83.79
Total Energy	6.435		**$219.97**
10 % GST			**$22.00**

Energy Imported (GJ)		t_{CO2}/GJ	t	$/t	
Your Carbon Debt	6.435	0.07365	0.4739	$23.00	**$10.90**

Balance

Supply charge **$ 37.94 + 16.93 = $ 54.87**

(394.32 + 43.23 + 37.21) – (46.00 + 218.80) + (219.97 + 22.00 +10.90) + 54.87

$ 462.83