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A CASE STUDY

40KW

On Grid Rooftop Solar PV System on Autobarn Dubbo Store

Dubbo, NSW





BACKGROUND

Autobarn Dubbo is one of the leading Autobarn stores in Australia having won the national franchise in 2012/13 and Best State Franchise in 2010, 2011 and 2012. With the store operating 7 days per week, the manager/owner, Mr Neil Sturrock was looking for options to reduce the operational costs of both the store and his very busy workshop.

Energy efficiency was one of the major considerations. The cost of power has increased by up to 90% over the past few years, and with the extended opening hours of the store, this was an area that was highlighted as a primary target. Neil's major objective was to reduce current and projected energy costs and also reduce the store's carbon footprint.

BMC Energy Systems were engaged to assess the site and provide recommendations on ways of reducing the operational costs at the site. The following areas were considered:

- Power Contract
- Lighting
- Solar Implementation

POWER CONTRACT

After an initial assessment of the current contract, we applied the following criteria to improve the result for the site

- Aggressively negotiate the electricity contract by tendering your requirements to ALL qualified suppliers
- Aggregation of load requirements of multiple customers to create economies of scale
- Dealing with portfolio managers at a supplier level allows us to remove account management commissions from contract rates
- Employing a tender process that maximizes competitive tension
- Changing network tariffs/revising contract demand charges (if deemed appropriate after network audit) Explaining various carbon pricing options available from suppliers and the risk associated with each of them

As a result of the above processes, we were able to secure an \$8,000PA reduction in the current electricity account. This allowed the management to apply these savings to other areas that would further reduce the energy savings.

LIGHTING

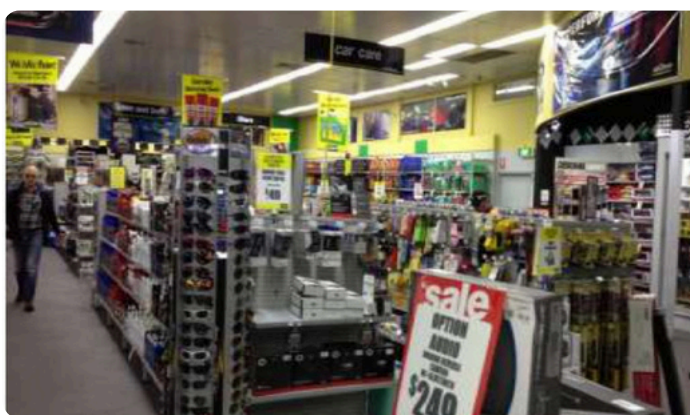
A full site assessment was conducted of the lighting that was installed. By retrofitting all of the lights along with a few modifications, we were able to reduce the lighting usage from 68,169kWh to 30,677kWh per annum. This represented a reduction of 37,490kWh and under the original contract represented a saving of \$11,622 per annum in year one. This also removed 39.7 tonnes of CO₂ PA from being emitted into the atmosphere.

EXISTING FITTING	FITTING WATTAGE	NO	TOTAL WATTS	DAILY HRS	OPER DAYS	CURRENT KWH	REPLACEMENT LED	FITTING WATTAGE	TOTAL WATTS	EST. YEARLY KW SAVE	EST. YEARLY \$ SAVE
1200 Fluoros	50	352	17600	8.6	362	54792	25w LED tubes	25	1250	27396	\$8,492.81
1200 Fluoros	50	8	400	8.6	362	1245	Hi Bays x 2	30	1500	498	\$154.41
Downlights Halide	50	14	700	8.6	362	2179	LED Downlights	6	300	1918	\$594.50
Ext MH Floods	150	2	300	10	365	1095	LED Flood x 1	40	6000	803	\$248.93
Hi Bays	400	3	1200	8.6	362	3736	LED Hi Bay x 1	40	16000	3362	\$1,042.30
CFL	15	3	45	8.6	362	140	LED Bulb	12	180	28	\$8.69
Hi Bays	400	4	1600	8.6	362	4981	LED Hi Bay	120	48000	3487	\$1,080.90
						68169				37492	\$11,622.54

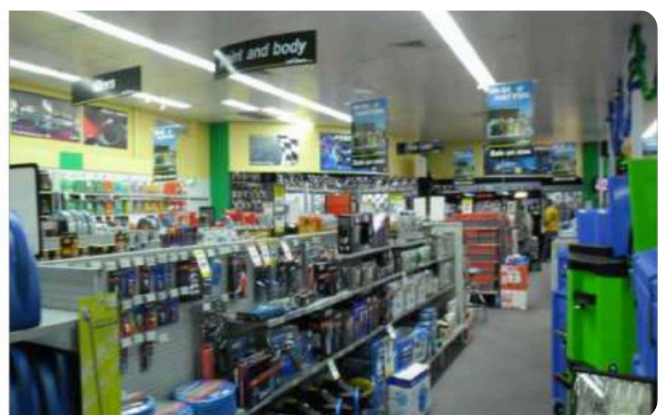
After the retrofit, the lighting levels and light consistency within the site increased significantly from the initial readings taken

AREA	PRE INSTALL LUX LEVEL	POST INSTALL LUX LEVEL
Office	253	376
Store	338	369
Workshop	311	401

Below are photos taken in the store before and after the lighting retrofit.



Before



After

PROJECT SAVINGS OPTIONS-40KW SOLAR SYSTEM

Consideration was given for the utilisation of the savings generated from the contract and light retrofit. A recommendation for a 40kW solar system was proposed. The system would potentially generate 58,000kWh and save \$18,000 in power costs under the original power contract. BMC Energy Systems engaged Regen Power Pty Ltd to design, engineer and supply a 40kW system. The system consisted of the following components

- ✓ 160 x 250W Solar panels
- ✓ 1 x SMA Tripower 17,000, 1 x SMA Tripower 15,000, 1 x SMA Tripower 12,000
- ✓ Inverters, 27 x Tilt Rail Kit
- ✓ Engineering Design
- ✓ Monitoring System

The engineering and design were based on the current power contracts with Regen's primary objective to reduce or eliminate as much of the peak and shoulder periods of the usage as possible.

Store Usage

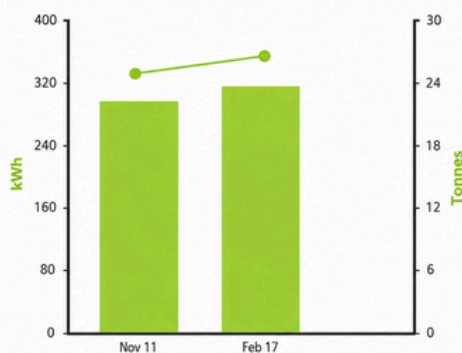
Your overall picture.

Usage

Average usage per day
311.77kWh

Same time last year
n/a

Average cost per day
\$94.06



■ Average daily peak electricity usage (kWh)
□ Average daily off peak electricity usage (kWh)
● Greenhouse gas emissions (Tonnes)

Greenhouse gas emissions

Total for this bill:
25.53 tonnes
from 28683kWh

For information on how to reduce your greenhouse gas emissions, visit
www.climatechange.gov.au

Put your business to the test at
www.agl.com.au/energychallenger

Workshop Usage

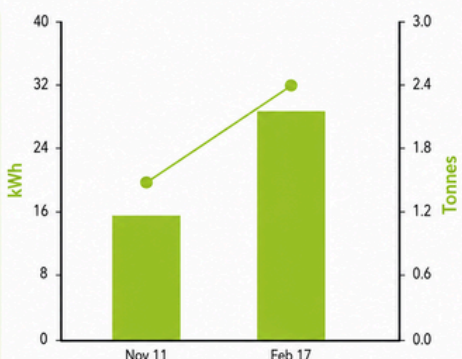
Your overall picture.

Usage

Average usage per day
28.88kWh

Same time last year
n/a

Average cost per day
\$10.91



■ Average daily peak electricity usage (kWh)
□ Average daily off peak electricity usage (kWh)
● Greenhouse gas emissions (Tonnes)

Greenhouse gas emissions

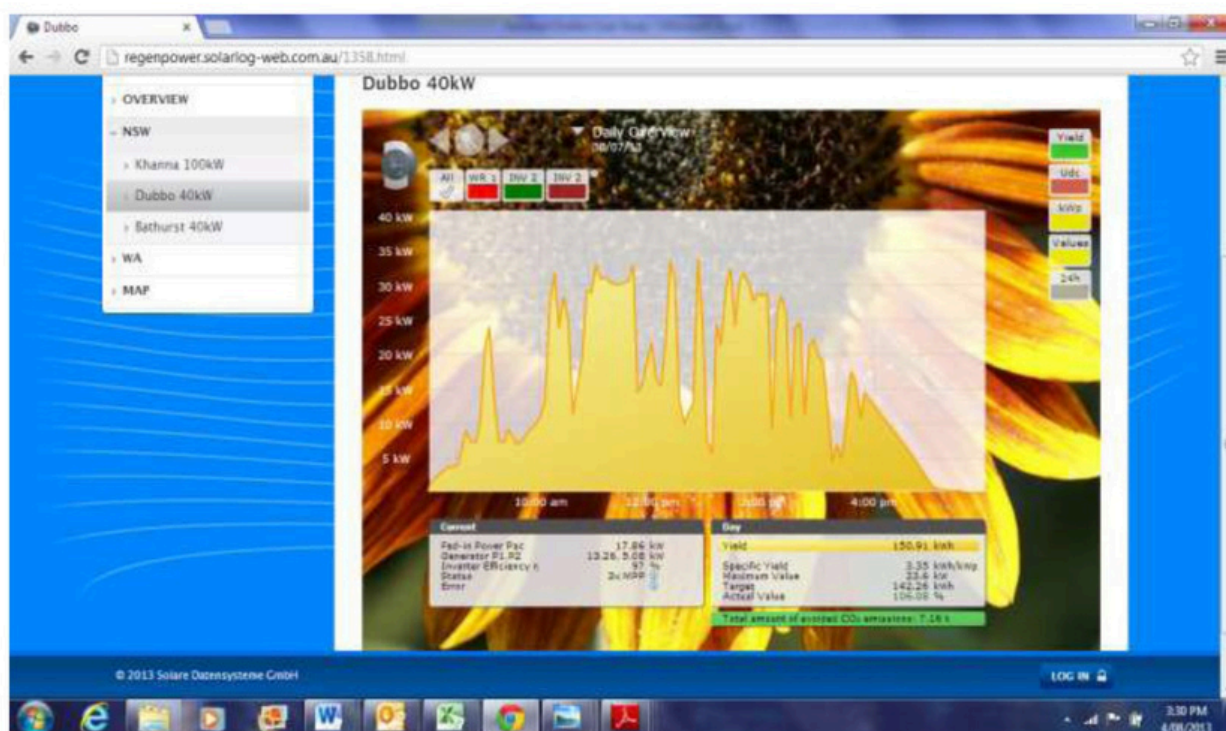
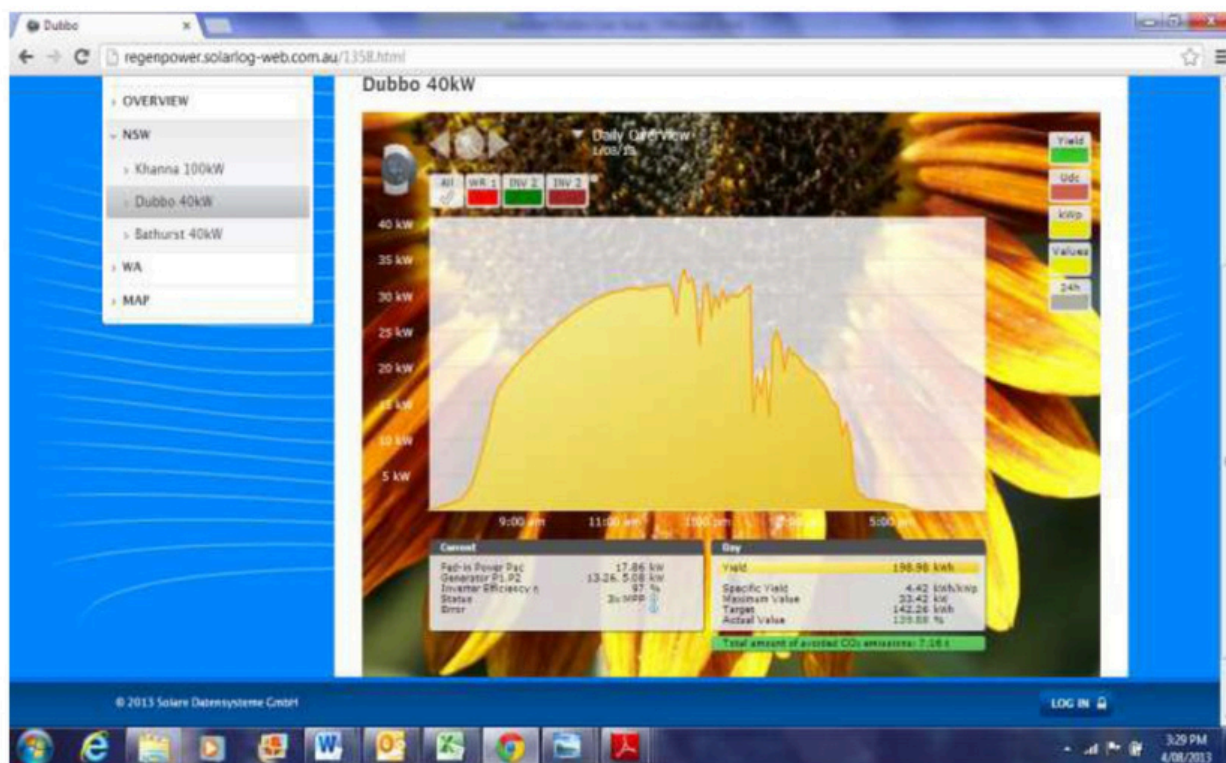
Total for this bill:
2.36 tonnes
from 2657kWh

For information on how to reduce your greenhouse gas emissions, visit
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Autobarn Management engaged the services of Scott Hansen of BTS Energy as the principle installation contractor. Scott subsequently engaged local company, Geoff Abbott Electrical services to assist with preliminary site issues. The installation was carried out by the BTS Energy team over a five day period, with the system being commissioned on the 24 May 2013.

Regen Power also supplied a power monitoring system for the project. This system allows selected parties to monitor the performance of the installation remotely. Below is a snapshot of a couple of days production from the Dubbo system.



As a result of the installation, BTS Energy Systems is very excited that the quality and professional commercial installation work completed for this project has been recognised nationally. GSES, the respected consultancy firm that inspect systems internationally, have selected this BTS project to present at the CEC professional development day during the ATRAA Clean Energy Week in Queensland. They stated in their document that the installation on this project was

“Quality above and beyond the standards.”

The system has consistently generated over 100% of the daily expected yield of 142kWh. This reflects the proactive design of the Regen systems. Consistently, even during the current winter months, over 200kW of power have been produced at the site in one day.



PROJECT INVESTMENT

A breakdown of the project is contained in the table below

Total Project Cost	\$148,231.55
Estimated savings in year one	\$ 31,315.00
The savings are made up of the following	
Lighting Savings	\$7,600
Estimated Power Generated from the Solar System	\$19,235
Yearly Power Account Reduction	\$4,480

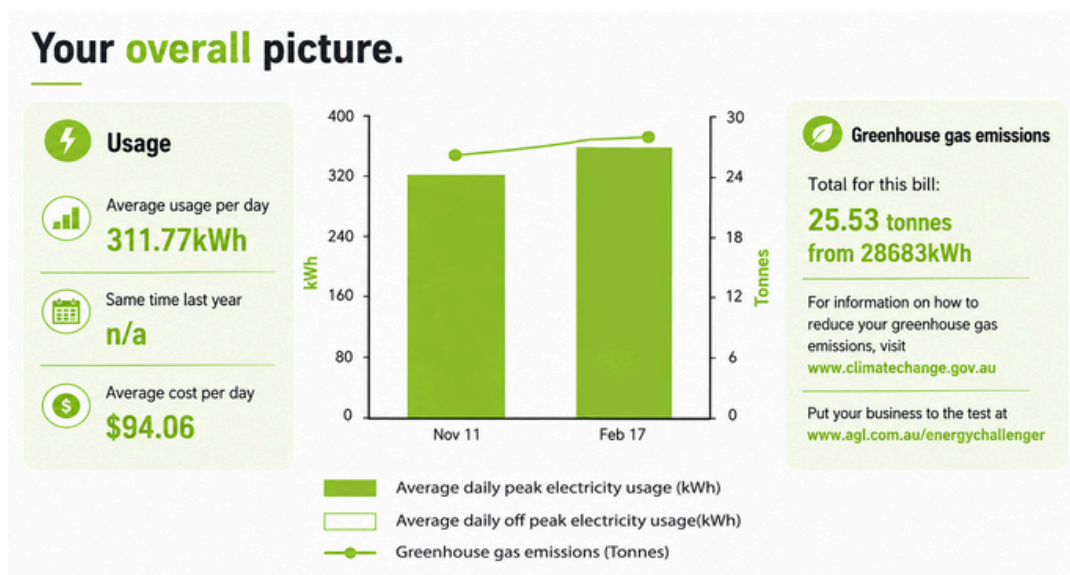
There is also a once off payment from the Energy Savings Certificates rebate in year one. This is paid as a lump sum payment and is not included in the figures.

The estimated savings generated in year one (\$31,315) is a recurring payment each year. This figure is based on the current cost of power that the site is currently paying. As power costs increase this figure would also increase. This figure does not include any tax or depreciation allowances.

POWER ACCOUNT RESULTS

Below are copies of the pre and post energy accounts for the main store. There has been a significant reduction in the usage at the site and subsequently, these savings have a flow on effect to the network and ancillary charges.

PRE-APPLICATION OF TECHNOLOGIES

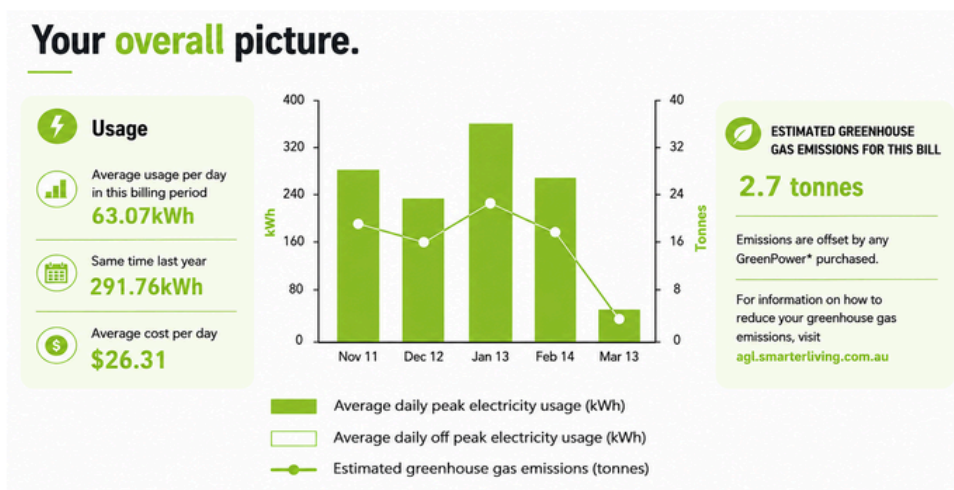


Your account in detail.

Supply address	U1/42 Erskine Street DUBBO NSW 2830 40011232256
NMI	17 Nov 2011 to 16 Feb 2012
Supply period Plan	Advantage 10%
Reading type	Actual read on 16 Feb 2012
Tariff description	General Supply – C

METER	NO.	DAYS BILLED	PREVIOUS READING	CURRENT READING	USAGE KWH
40061058	92		027927	031797	3870
40061058	92		105394	121049	15655
40061058	92		062600	071758	9158

USAGE	CHARGE
Peak 28683 kWh @ \$0.3003	\$8613.50
Supply Charge	\$114.55
Advantage Peak Discount	\$861.35cr
GST	\$786.67
Total usage and supply charges	\$8653.37



Your account in detail.

Supply address	U1/42 Erskine Street DUBBO NSW 2830
Supply period	16 May 2013 to 30 Jun 2013
NMI	40011232256
Plan	Advantage .15%
Reading type	Final read on 28 May 2013
Tariff description	General Supply – C

METER NO.	DAYS BILLED	PREVIOUS READING	CURRENT READING	USAGE KWH
40061058	13	050879	051320	441
40061058	13	193335	194915	1580
40061058	13	114036	114916	880

Reading type: Final read on 30 Jun 2013 • Tariff description: General Supply – C

METER NO.	DAYS BILLED	PREVIOUS READING	CURRENT READING	USAGE KWH
43305427	33	0000000	0000000	0
43305427	33	0000000	0000000	0
43305427	33	0000000	0000000	0
43305427	33	0000000	0000000	0

Balance brought forward	\$0.00
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New charges and credits – Usage and supply charges

Solar PVBuyback 0 kWh@\$0.0800	\$0.00
Peak 2901 kWh @ \$0.3618	\$1049.58
Supply Charge	\$69.92
Early Termination Fee	\$90.91
Total usage and supply charges	\$1210.41

Credits and rebates

15% Guaranteed Peak Discount	\$157.44cr
Transfer Credit	\$40.62cr
Transfer Credit	\$1158.27cr
Total credits and rebates	\$1356.33cr
Total GST for new charges	\$105.30
Credit balance	\$40.62cr

AUTOBARN TESTIMONIAL

"I hereby confirm that at Autobarn Dubbo we have purchased and recently installed a 40kw Solar system

This week I received my first account for electricity since the installation and am delighted to say that my \$8400 bill for 3 months up to May 2013 (average 273kw/day at a cost of \$103 per day) has been replaced by a \$40 credit for 1.5 months ending 30th June (average 63kw at a cost of 26.31 per day).

To achieve this fantastic result, Barry came to Dubbo, studied our previous electricity usage and charges and consulted with me on ways to reduce our usage by changing all of our fluoro and Hi bay lights to LED.

We also changed our electricity provider to obtain a much better rate and then financed the purchase and installation of the Solar System on the roof.

The entire project from start to finish was led by Barry professionally and ran like clockwork, the result I was after was to have a enough solar capacity to operate my shop, my first account shows clearly that this has been achieved, my electricity account has been replaced by finance payments for the next 3 years, and then I will be in a building with no power costs and much more carbon friendly!!!

Thanks Barry, and your team for a project well done!

Regards,

Neil Sturrock
Franchise Owner



Autobarn Dubbo

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