Radioactive Networks Pty Ltd

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Analysis of Green Loans Assessment Report AN200428993

Introduction

During February 2010, I received a Home Sustainability Assessment from an assessor who appeared to be quite competent and who spent his time doing the assessment. Once the report was received, I analysed it to determine how realistic the findings were.

Through my analysis[1], I was able to determine that there were a significant number of issues with my report[2]. These included cost savings in excess of actual expenditure in some areas, characterization of some savings as zero emissions as opposed to reduced emissions, incorrect usage data being recorded, incorrect electricity tariffs being used and seemingly cost effective actions being ignored. Unfortunately, many of the issues with the report go back to the raw data, and have the potential to contaminate the results any time data from this programme is used as a source of statistics. I have also identified $10M of existing waste and a potential for $48M total waste in connection with the lack the of self-assessment tool for householders increasing payments to Assessors.

I have been unable to verify the extent of the issues I have located, but logic would indicate that that I am not alone with the issues I have identified. At the end of this report I have included copies of the Home Sustainability Report I received, a sample report also containing issues as well as extracts from my water and electricity accounts. These are included so that an interested reader can follow my logic, verify my conclusions and examine if they have similar issues with their own reports.

Background

I am a Consultant Electrical Engineer in my 30's living by myself in a three bedroom brick veneer house in South West Sydney built in the 1970's. I spent 13 years working for Pacific Power[3], initially as a Cadet Engineer, and later as a Professional Engineer. I am now a self employed Consulting Engineer working with GPS, wireless and energy related technologies.

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[1] Disclaimer: I have analysed the available data comparing it to external sources as required. Without knowledge of the underlying assumptions in the model I am unable to totally confirm my conclusions. I have used my best effort as a professional consultant Electrical Engineer in order to examine the data.

[2] Throughout this document, where I refer to 'my report', this should be read as referring to the Home Sustainability Report issued under the Green Loan programme.

[3] Pacific Power was the new name of the Electricity Commission of NSW until it was broken up and sold off.

The house I am living in has off peak hot water, with R3.5 insulation in the roof and R1.5 insulation under the floorboards. The house also has a downstairs laundry, rumpus room, large garage, games room and workshop. It is not a small house, but is not overly large. It is however set up in a manner that allows me to work and live at the one location.

My motive is writing this report is to highlight the issues that I have found such that they can be fixed where possible, and also that similar issues will not happen in the future.

Hot Water

Introduction

I use an Off Peak Electric Hot Water Heater with a 315L tank[4]. I use very little hot water, tending to have short showers and use a washing machine that is only able to wash with cold water.

The Report

The Report lists the details of usage of the system I use as:

Electric Hot Water System	1970 KG GHG[5]

Under the Action Plan, it is recommended to:

Install Electric Boosted Solar or Heat Pump Hot Water System	
	1970 KG GHG
	$190[6]

Notice how the two GHG numbers are identical. The Report suggests that I can offset the energy usage by 100% by replacing an Electric Hot Water unit with electric boosted solar or with a Heat Pump model. This is incorrect as will be explained in the next two sections.

Corrected Savings for Electric Boosted Solar

Despite the suggestions in the Report, an electric boosted solar water heater still uses electricity. It needs to use electricity for circulating water, and for boosting the temperature of the water on cloudy days. The Victorian Government have produced a report[7] on listing the likely savings for Electric Boosted Solar Hot Water at 85% in 'Zone 3'[8].

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[4] This water heater was installed within the last 5-7 years. Although not relevant to this inquiry, although this heater is 'Solar Ready' and is not all that old, it must be replaced totally if I wish to install solar hot water if I wish to receive the REC's which might make the replacement economically viable. It is cheaper for me to replace the heater than to use it as part of an identical solar system!

[5] GHG: Green House Gas. Technically this is the CO_2 equivalent of Green House Gas.

[6] It is assumed that any dollar amounts copied from the Home Sustainability Report include any GST. Any dollar amounts that I have used include any GST. In general, GST is payable on electricity but not water.

[7] http://www.resourcesmart.vic.gov.au/documents/HotWater_RunningCosts_Victoria2008.pdf

[8] 'Zone 3' results for Victoria are likely to also be the same for many parts of NSW, including the part of NSW that I live in.

I have calculated my actual emissions and savings based on my current GHG emissions from the Report.

Electric Boosted Solar Emissions	296 KG GHG
Saving	1674 KG GHG

Corrected Savings for Heat Pumps

A Heat Pump water heater is the equivalent of a Reverse Cycle Air Conditioner being combined with a Water Heater. According to Table 82 of the '*2008 Energy Use in the Australian Residential Sector Report*', a modern Heat Pump installed this year will have a conversion efficiency of 247%. That is, for every 1W of energy that is used, it is the equivalent of 2.47W being used for heating.

Likewise, Greenhouse Gas Emissions are divided by 2.47 as compared to a Storage Electric Water Heater since both use electricity. Thus, the correct figures for replacing my Electric Hot Water System would be:

Heat Pump Emissions	798 KG GHG
Saving	1,172 KG GHG

Impossible Saving

The action plan suggests that I can save 1970 KG GHG and about $190 PA by replacing the Electric Hot Water System. Usage over the last 12 months has been averaged 4.1 kWh[9]/day, or 1496 kWh. This is about $104 at a price of $0.0693/kWh.

Actual Annual Hot Water Electricity Cost	$104

Thus, even if the Electric Hot Water unit was disconnected and not replaced, I could not save the suggested $190/year.

Suggested Annual Saving with Solar or Heat Pump	$190

The Report should never have suggested a saving greater than the existing annual usage.

Incorrect Tariff in Calculations

Assuming the 1970 kg GHG reduction and $190 savings are correct, we can work out the assumed electricity price. 1 kWh when multiplied by 1.06[10] gives the number of kg of GHG. Therefore 1970 kg GHG is the equivalent of 1858 kWh. This gives a Tariff of $0.102 / kWh. This is incorrect as I am presently paying $0.069/kWh for Off Peak electricity. The calculation appears to be about 3.3 cents/kWh too high.

Tariff used for Hot Water	$0.102 / kWh
Correct Tariff for Off Peak Hot Water	$0.069 / kWh

[9] A kWh is an abbreviation for kilowatt-hour. One 1 kWh is 1000 Watts being consumed for one hour. It is additive, so 5 kWh can be 1 kW consumed for five hours, or 5 kW consumed in one hour.

[10] In the section on electricity usage, I suggest that the Victorian GHG multiplier may have been used incorrectly. Whilst it may have been used for general electricity usage, there does not seem to be any evidence that it was used with Off Peak. If the Victorian GHG factor was used, the Tariff used for the Off Peak calculation would be $0.130.

Electricity Use

Introduction

Most of the energy use in my home is provided by electricity. I have a GAS heater that was converted from an OIL heater, but it is never used since I need to rely on bottled GAS, and operating a reverse cycle Air Conditioner is cheaper. Since I do not have GAS bottles for my heater and I intend to remove it, my assessor did not record any GAS use.

Information Accuracy

Examining the information from the last electricity bill, as shown to the Assessor, I have been able to determine that my average usage over the last 12 months has been 36.7 kWh/Day, or 13,395 kWh. This compares to the report which indicates my usage as something different.

Reported Annual Electricity Consumption (about 14,680 kWh)	15,708 KG GHG
Actual Annual Electricity Consumption	13,395 kWh

Looking at these numbers, it appears that the Assessor may have entered my electricity usage as a combined total of General and Off Peak, and separately entered the Off Peak figure[11]. If this is the case, an audit should be done to determine the extent of the problem. Alternately, there has been a data entry error that has impacted on my report.

Negative Energy Saving Recommendations

The Report suggests replacing my 1990 vintage top loading washing machine which uses cold water and no heater with a new front loading device. The report lists the following savings:

Estimated Cost Saving	$-1
Estimated GHG Saving (KG)	-8

In other words, the report is suggesting that I replace this washing machine with a unit that will be worse for the environment and will cost more money to run

Tariff[12]

Under Entertainment and Office in the Action Plan section of the Report, the savings are:

Estimated Cost Saving	$311

[11] Following checking the information with a Privacy Act request, it would appear that the Off Peak usage was entered incorrectly.

[12] A Tariff is the published price of electricity per kWh. The price varies depending on the amount of energy consumed during the time period, conditions on the use and possibly the time of supply. Off Peak electricity for heating hot water is cheaper since the supplier only promises to supply a certain amount of energy each night, and not the exact time that it will be available. This enables them to provide the energy when it is cheapest for them to do so.

Estimated GHG Saving (kg)	2161

Dividing the GHG by 1.07[13] gives 2020 kWh per year. Dividing $311 by 2039 kWh gives a tariff of $0.1540 per kWh. The current Integral Energy Tariff for under 1750 kWh/Qtr is $0.1952. This information could be found on the bill shown to the assessor, although the Assessor would need to know to add GST to the printed figure. Therefore it would appear as if the wrong Tariff has been used, and that the Tariff needs to be increased by about 30%.

Calculated Tariff from the Report	$0.1540 / kWh
Actual Tariff	$0.1952 / kWh

Was the Victorian Tariff used?

Victoria has a conversion factor of 1.35 to convert from kWh to KG GHG. If we take the $311 and the 2161 kWh and calculate the Tariff based on these figures, we get a tariff of $0.1943 / kWh. The problem is that the house is in NSW, not Victoria.

Calculated Tariff from the Report if Victorian GHG figures are used	$0.1943 / kWh
Actual Tariff	$0.1952 / kWh

As you can see, these numbers are much closer. With some rounding taken into account, these numbers seem suspiciously close.

What happened in Tasmania?

The Report seemed to concentrate on GHG Savings. Many figures were only given in KG of GHG. Australia is moving towards an Australian electrical Grid. Victoria and Tasmania are now connected through BASSLINK which allows the exchange of energy between Tasmania and the mainland when there is excess capacity in either state.

Prior to BASSLINK, only 10g to 70g[14] of GHG emissions were created for each kWh of electricity consumed. Now that some of Tasmania's energy is exported to the Victoria and some Victorian energy is exported to Tasmania, 240g of GHG emissions are created for each kWh consumed in Tasmania.

This is important because in worst case, the GHG levels listed on the Report for Tasmanian households will only be 18% of those in Victoria, or about 23% of those in NSW for a given amount of electricity consumed. This may suggest to householders in Tasmania that their impact on the environment is smaller than other states.

However, for every one kWh used in Tasmania, a similar amount of energy cannot be exported to Victoria reducing their emissions, or must be imported from Victoria. Concentrating on GHG in

[13] In NSW, the current figure is 1.07 KG of GHG are produced for every kWh of electricity generated. In Queensland it is 1.01, South Australia is 0.92 and Victoria is 1.35. These figures come from the Department of Climate Change and Energy Efficiency report titled 'National Greenhouse Factors' released 29 June 2009.

[14] The current Tasmanian figure is 240g of HGH for each kWh of electricity. Back in 2000 this was about 10g, and between 1990 and 2006 stayed between 10g and 70g per kWh.

Tasmania without commenting on the cross-border impact reduces the potential use of the Report in Tasmania.

Solar

Analysing the Solar GHG emissions gives some indications of some other possible issues.

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Install Photovoltaic Panels (Minimum 1 kW)        2764 kG
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I have been unable to determine where this number actually comes from. Assuming that this was in NSW, this would suggest the following figures:

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Annual Photovoltaic Generation                    2583 kWh
Daily Average Generation                           7.1 kWh
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Real world models suggest that for Sydney factors of 3.25 and 4.12 would be realistic to convert from kWh of Panels to kWh of daily generation. In Sydney, a system of close to 2 kW would be needed to obtain the suggested GHG savings.

The issue here is that there are recommendations being made with regard to GHG emissions where the householder has no idea how many solar panels are needed to meet the saving. A reasonable person would see the 'Minimum 1 kW' comment and believe that this capacity could meet the GHG reductions whereas a panel double the size would be needed.

Asymmetric Recommendations

The Action Plan items in the Report suggest that a low cost way of reducing cooling bills includes raising the temperature of the thermostat. There are no such recommendations with regard to lowering the temperature on the thermostat when you are heating the house. Australia may have mild winters, but householders should still be reminded to adjust their thermostat temperatures so that they are not too warm.

Irrelevant Questions for the Household

There were a number of questions asked by the assessor that appear to be useful from a statistical point of view, but did not appear to have any bearing on the report produced for the customer.

One such question was if a security alarm was installed in the house. This is a good question to determine the makeup of the steady state electrical load of the house, but it would not appear to be used in the other calculations to any great extent.

Such questions only seemed to add time to the assessment without an impact for the consumer.

Missing Recommendations

Replacing remaining incandescent lights

The Report suggests that I am good because I am using CFL or LED lights in my house. The report neglects the 1.5 kW of electric lighting in my house that is not CFL, LED or Fluorescent. Replacing these lights, particularly in my bathroom, has a potential to reduce emissions even further.

Exhaust Fan Hoods

The assessor asked if the three exhaust fans in the house had hoods to stop air escaping. My house contains two without such hoods, and no specific recommendation was made with regard to installing hoods[15]. A recommendation was made with regard to blocking an unused chimney in order to save $10 per year. The potential losses through a chimney are likely to be less than through an exhaust fan as the aperture is smaller and is lower down.

Being lower down makes it more difficult for hot air to escape. It would therefore appear as though blocking two exhaust fans would provide a greater energy saving than blocking one chimney. Hoods are a cost effective solution at only about $35 each.

It should be noted that the Assessor incorrectly recorded the exhaust fans as having hoods. It is unknown if there would have been a recommendation to install hoods if the fans had been correctly recorded.

[15] http://www.environmentshop.com.au/ProductDetails.asp?PID=2737

Water Use

Introduction

I am a fairly small user of water. I do not tend to use significant amounts of water irrigating plants, I do not have a swimming pool, and I live alone, wash clothes 1-2 times a week and tend to have short showers. Therefore my annual water consumption tends to be about 150L/Day according to my last water bill and is falling.

The Report

The Report lists the following uses of water in my house

Clothes washing and drying	20,774L
Other (including showers)	13,120L
Total	33,194L

Under the action plan, there are a number of estimated litres of water saved.

Replace toilet	10,220L
Outdoor and Garden: Tank	20,074L
Total	30,294L

Subtracting the water savings from the reported use gives

Calculated total use following action plan	2,900L or 8L/Day

I believe that the assumption here is that I use Gray Water and Rain Water for flushing toilets and watering the garden. It is also possible that some water may be used more than once, such as waste water from the washing machine being used to flush toilets. This would allow for a modest increase in the amount of water available for cleaning.

These figures assume that the water in any tank will only be used for toilets, washing clothes and external uses in accordance with Sydney Water recommendations for maximum water savings[16].

Given that an AAA rated shower head can use as little as 6L/Minute, the report tends to suggest that I shower for about a minute a day and wash clothes rarely.

You cannot choose multiple actions!

In reviewing the action plan items, I have come to the conclusion that savings are not cumulative. That is, a householder cannot perform all the actions listed and expect to gain the sum of all the savings listed.

[16] http://www.sydneywater.com.au/Water4Life/InYourGarden/RainwaterTanks/ResidentialCustomers.cfm

Using a water tank to provide grey water and rain water for use by toilets will probably save a lot of drinking water, close to the 20,074L noted. But if we replace the toilet, the amount of water used annually from the tank would be reduced by 10,220L.

As my uses for grey and rain water are basically limited to toilet use rather than garden use, it would appear that replacing my toilet would have no use on reducing household water usage if I install a water tank to supply water for use with the toilet.

I believe that the following options are a more accurate representation of the actual savings possible. These savings assume that there is little water being used in the garden, and that water is reused in the toilets.

Option 1	
Replace toilet	10,220L
Outdoor and Garden Tank	9,854L
Total	20,074L
Option 2	
Replace toilet	10,220L
Option 3	
Outdoor and Garden Tank	20,074L

Unfortunately, not only was there no indication that you should not be able to add savings, funding was available through the Green Loans to fund all these actions.

It should be noted that providing options like these on the reports would be complicated and would also produce a report that was not as easy to understand.

Information Accuracy

It is unknown where this water use information actually comes from. My last water bill was the one I used for my home assessment. It listed 15,000L or 153L/Day used in the previous three months. This is somewhat higher than the 90L/Day that was suggested by the assessment form.

Reported Water Usage	33,194L
Approximate actual annual Water Usage	60,000L

Lack of Washing Machine Replacement Water Savings

The report recommended replacing the washing machine with a unit that contained high stars for energy and water usage. Questions were asked about the use of the washing machine that allowed for the determination of existing water usage. Given that the existing washing machine is a pre-1990 model that is not particularly water efficient, the Report should have indicated water saving from the recommended action.

Water Conclusion

It would appear as if the entire process is susceptible to data input errors. In my case, for some reason the water consumption numbers listed on the report for usages were about half what they should have been.

It also appears that no review of the implications of applying all the water saving techniques has been done to ensure that the suggested outcomes are reasonable. Suggesting to a householder that they only use 8L of water a day does not seem to be based on reality.

Other Reports

Credit Union Report

It appears I was not alone with regard to negative savings. One of the Credit Unions provided a Sample Report on their Web Site. This is the only report I have been able to locate. It was downloaded in February 2010, having been submitted on 3-September-2009.

Their report lists about 79,000L of water savings are possible by performing certain recommended actions. The issue is that the consumption of this household is 76,000L. Ignoring the Rainwater Tank, this household of two people are left with 8000L per year of water use. This comes to about 22L to be used per day for drinking and washing.

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Actual Consumption                          76,007 L
Possible Savings                            79,135 L
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Whilst it is possible that the savings allow for future increases of water consumption, logically any increase in usage would also increase the possible saving. The issue is likely that savings are not cumulative as highlighted above.

Their sample report also listed:-

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Clean Fridge door seals and ensure it is in a
cool location
          Annual Saving                     $-49
                                            -337 KG GHG

Replace toilet with more efficient one using
less water
          Annual Saving                     $-255
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Uploaded report from the Traralgong, Victoria area

Through a careful search on the Internet I was able to find a second report that had been uploaded to the web site of a sporting club in the Traralgong area. It would appear that this assessment was done in the local area, and was as an example of the sort of report that people would get following the Assessment. As an inducement, the site noted that each Assessment would get the householder a $50 voucher, and the club would receive a $50 commission presumably paid by the assessor.

The report reference number is BK30940, and was submitted on 16 October, 2009 based on a 1 October 2009 assessment date. The report lists four members of the household, with a GHG level of 13,787 Kg and water consumption of 192,822 L.

One of the suggestions is that GreenPower is used in the house offsetting 100% of the GHG emissions of the electricity. Therefore, it is likely that this house uses electricity for cooking, cooling and heating only.

Once again, the householder is recommended to install Solar. In this case, the recommendation is for Gas Boosted Solar. In this case, electricity will still be needed to operate the pump to move water to the solar collector, and Gas will be needed to heat water on cooler days. Therefore this saving is unobtainable.

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Hot Water Heater with high energy or water consumption
                                                    1938 Kg
Recommend install Gas Boosted Solar                 1938 Kg
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Once again, if you add up all the Water savings, you save 192,822 L, leaving only 5,528L per year. Even ignoring the water tank, this still leaves only 37 L per person per day for showers, washing, drinking.

Using the savings for replacing the Hot Water, I was able to use the Victorian GHG conversion to determine that the Tariff used was $0.063 / kWh. This seems in line with what I would have expected. Once again, using the Entertainment and Office figures, I was able to get a Tariff of about $0.177. This also seems to be in line with what I would have expected.

The report recommends replacing the washing machine, but lists an annual additional electricity cost and GHG emission increase for a saving of 21,924 L. Given that water is often about $2/1000L, this water saving would be higher than the extra electricity cost.

Lack of Self Assessment will cost about $48M

According to the research I have done[17] [18],it was intended that householders would complete a self-assessment before the Assessor attended their home. From what I can gather, this was to assist the Assessor with some of the pre-work involved in auditing the house. Where the householder did not fill in the paperwork, the Assessor was going to be entitled to an extra $50 in addition to their $150 Assessment Fee and any travelling expenses.

As noted, in early June 2009 advice was being circulated noting that the householder self-assessment 'would not be available for the first few months'.

I was not asked to fill in a self-assessment before my Assessment in February 2010, and I have not found any references to such a self-assessment being available.

Excluding travelling costs, this single issue has caused the payment per assessment to increase by 33% from $150 to $200. As at 28 February 2010, there had been 210,864 Assessments, with 305,327 booked[19]. Assuming that self-assessments are not available for the Assessments booked at that date, this is an extra cost to the Commonwealth of $15.26M. With 15,000 assessments being able to be booked per week the additional cost for the lack of self-assessments is about $750,000 per week!

Assuming that all householders filled in their self-assessments before their Assessments, this will cost the commonwealth an extra $48M over the 960,000 Assessments. This is in addition to the $144M + Travelling Costs for the Assessments themselves.

[17] http://www.solarpanelrebate.com.au/green-loans/?bd7b53096f4cba9ed518fb9b5a82a67d=tswksyqywspnh
[18] http://www.environment.gov.au/greenloans/assessors/fee-schedule.html
[19] http://www.climatechange.gov.au/minister/wong/2010/major-speeches/March/sp20100310.aspx

Information Stored Following Home Assessment

Lack of Privacy Act Consideration

In March 2010 I requested a copy of the raw information that was collected during the assessment. A few days later I received an email noting that whilst the officer could see the raw data on their screen, this information was not in a format that would make sense to anyone. They were going to 'talk to IT' about what could be done.

The Department has not been able to post out the requested information until 25 March 2010 following implementation of the software changes.

Comparison between Actual and Recorded Data

The following section compares the information that was stored following the Assessment with the actual characteristics of the household. This was obtained by a Privacy Act request on the Green Loans Call Centre. The changes are highlighted in **BOLD UNDERLINE**. Some of these errors should are data entry errors, others presumably relate to errors in the database used for sample energy consumption or inflexibility in data entry.

Utility Data Entry

Electricity

The following information was recorded

Electricity Bill #1 – 91 Days	
Total Usage	2000 kWh
Off Peak	326 kWh

Electricity Bill #2 – 91 Days	
Total Usage	3078 kWh
Off Peak	512 kWh

This does not actually line up with the two bills. First, the number of days for each bill is incorrect, and secondly the actual electricity consumption did not include Off Peak usage.

Actual Electricity Bill #1 – **97 Days**	
Total Usage	**2326 kWh**
Off Peak	326 kWh

Actual Electricity Bill #2 – **95 Days**	
Total Usage	**3590 kWh**
Off Peak	512 kWh

Water

Water Usage	15,000L in 91 Days
Actual Usage	15,000L in 91 Days

The issue here is that the report listed my annual water usage as 33,194L. My usage from the entered data is actually 60,000L.

External Doors

It appears that my assessor misunderstood the definition of what a Door was. The correct definition appears to be a door that provides a pathway outside the home.

External Doors	13
Actual External Doors	**6**
Foyer, Lounge Room, Dining Room, Laundry, Rumpus Room x 2	

Security System

The energy consumption for my security system is much higher that it should be. 10W is a reasonable estimate. The Power Supply on my Security System, like almost every alarm on the market is under 30W. I suspect that the 100W figure is a figure that has been stored in a database as a default value.

Security System Power Usage	100W
Actual Power Usage	**10 W**

ADSL Modem

My ADSL Modem is listed as being only on one hour a day. This device is left on 24/7.

Typical Usage	1 Hour/Day
Actual Usage	**24 Hours/Day**

Under Floor Insulation and Under Floor Access

Under Floor insulation is installed under most of the upstairs rooms in my house. The only places it is missing is where there is a room under the upstairs room.

Rooms with Under Floor Insulation and Access	NONE
Actual Rooms with R1.5 Insulation and Access	**Lounge Room, Bedrooms 1-3**

Rooms with Wall Vents

A number of rooms a listed as having 'Wall Vents'. These rooms actually have ceiling vents. This is a minor change, but the environmental characteristics are slightly different.

Rooms listed as having Wall Vents	Bathroom 1, Bathroom 2, Kitchen
Actual rooms with Wall Vents	**NONE**
Actual rooms with Ceiling Vents	**Bathroom 1, Kitchen**

Exhaust Fans

There are some errors in the data entry with regard to some exhaust fans. These exhaust fans are not self-sealing and therefore waste enenergy.

Rooms listed as having self-sealing Exhaust Fans	Bathroom 1 x 2, Bathroom 2
Actual Rooms with self-sealing exhaust fans	**Bathroom 2**
Actual fans in Bathroom 1	**Non Self-Sealing**

Electric Razor

The energy consumption figures for my electric razor is probably the worst of all the data errors. The inputted data records my rechargeable razor as using 400W for 15 minutes a day. A correct figure for my razor is probably 4W when in use, and certainly no more than the 6W that the power supply can handle. Since this is a rechargeable device, entering accurate information is difficult. Sample corrected figures appear below. An equally valid figure is 6W 15 minutes a day without standby.

Consumption for rechargeable electric razor	400W 15 minutes/day
Actual Estimated Consumption	**0W (battery powered)**
Actual Estimated Standby / Charging	**6W 2 Hours/Week**

Down Lights

Two areas do not correctly record the use of Down Lights. This is a minor issue

Living Area #1

Light Switches 1-3,5	Surface Mount with CFL Globes
Actual Light Switches 1-3,5	**Recessed Down Lights with CFL Globes**

Bedroom #2

Light Switches 1	Surface Mount with CFL Globes

Actual Light Switches 1	**Recessed Down Lights with CFL Globes**

Whilst Living Area #1 and Bedroom #2 contain 11 and 2 'Recessed Down Lights', these are 240V fittings with Edison screw basis installed with CFL 'Warm White' globes. Each fitting uses between 5W and 13W depending on the location, and are individually controllable. Normal evening use in Living area #1 at night involves the use of two 7W CFL globes.

Construction

There are some issues with regard to the data recorded for Construction as it regards to energy efficiency.

Bedrooms #1, #2, #3, Living Area #1 Floor Covering

Construction	Timber Floor, Suspended
Actual Construction	**Carpeted Timber Floor, Suspended**

Living Area #1 Double Brick Wall

Construction	Brick Veneer Plasterboard Lined
Actual Contstruction	**Brick Veneer Plasterboard Lined Feature Double Brick Wall**

Occupier

Finally, the statistical information as to the Occupier is incorrect.

Occupier Age	45 – 64 Years
Actual Occupier Age	**35 - 44 Years**

Other Comments

The Solar Power Recommendation

One of the recommendations that seemed to attract most 'Green Loan' applicants was the Solar Power recommendation. I have heard of people being rather disappointed when the Solar option was missing from their report. I have come to the conclusion that Solar should probably never have been a recommendation without some significant conditions.

Throughout the country, electricity suppliers are starting to introduce 'Gross Feed In Tariffs'. With a 'Nett Feed In Tariff', solar power is first used within the home, with any excess supplied to the grid. The price of the electricity you generate is identical to the price of the electricity you use.

With the 'Gross Feed In Tariff', a second electricity meter is installed. All the electricity you generate is supplied to the grid, and then you buy electricity you need from the grid. The price you get is commonly higher than the price you buy the electricity back at thanks to the 'green' credentials. In NSW, electricity is being purchased at $0.60 / kWh and it is being sold back at about $0.20.

A 3 kW Solar system is presently being installed in NSW for about $9,995, and will generate about 4,500 kWh when installed in the Sydney area bringing in about $2700 per year. This allows the loan to be paid off in less than four years after which time the income will continue. It should be noted that the significant price differential is only certain in NSW for 7 years, after which time the solar Tariff may become somewhat smaller. But during this 7 year period, the householder will stand to make a profit of over $8,000.

With a life of over 25 years, the solar system will continue generating for years. Even if the solar tariff goes back to $0.20 / kWh, the system will earn the householder over $16,000. If the tariff remains at the higher rate, the Green Loan will enable a householder to make a profit of about $57,500 over 25 years.

By allowing the Green Loan to be used on items which have the potential to generate income as opposed to directly reducing the household emissions, the Green Loans program has been significantly skewed.

Future Data Use

When reviewing the available literature on the energy use within the average Australian home, I seem to always see references to the lack of availability of required data. This may be from the percentage of homes with different types of window coverings to the penetration of certain devices within the home.

In having gone through the Green Loan process, I am now certain that there are multiple aims with the programme:

- Assist householders with reducing their energy usage
- Generate accurate statistics on the Australian Home

It is my belief that the Australian Householder and almost all of the marketing for the programme concentrates on the first outcome and almost ignores the second outcome. However, this second outcome is potentially more valuable to the nation over time.

In fact, many of the questions being asked of the householder are only relevant for the generation of accurate statistics rather than in the assistance of reducing energy use.

It is my belief that without stringent audits that it would be dangerous to use the raw data as this will skew results significantly. I do not believe that there has been enough work done on ensuring that all the data is ‘clean’, and believe that until this is done, the availability of the raw data for the use of reporting on and modelling the Australian home should be restricted.

The Loan

I was lucky in that I was able to get a Green Loan through one of the last two Credit Unions listed on the Green Loans Web site. The delays in getting the reports out and the lack of competition were a concern, especially being self employed. However it did work out. In the end though, I did not have a

choice of financial institutions if I wanted to take out the loan. Thankfully I did not have any issues with the only organisation that I was able to take the loan out with.

A better process with deprecating the Green Loans would have been to state that anyone who had booked an assessment before the announcement had three months to get the assessment report and arrange their loan.

As at time of submission of this report, I am still waiting for final confirmation from the Credit Union that they have approved my application.

Lack of Detailed Recommendations

All the recommendations appear to be generic as far as possible. The assessment recorded information about the house by the room. However, the recommendations do not list outcomes by the room.

Any issues highlighted on a per-room basis would be useful to the householder. A report that suggests that a chimney in the lounge room or an incandescent light in a bedroom be changed could be produced at almost zero cost.

If complexity of the report was likely to be an issue, offering a more detailed report on a secure Web site would have been an option.

Lack of Greater Detail for each Recommendation

In the recommendations in the Report, there is a number beside each one in a square bracket. This number relates to the text of the recommendation. There does not appear to be a list available of these recommendations.

It would appear to be sensible if a list of the recommendations were available containing more information.

GST

No comment is made with the report with regard to the savings and GST. It is assumed within this report that the savings are actual savings post-GST. However this is only an assumption.

Lack of Suppliers for some Actions

Some actions are able to be implemented simply by a large number of suppliers. Others are difficult to arrange. An example of this is finding a supplier to install wall insulation in an existing house in the Sydney area. It took me probably close to a week of full time searching to find two companies that would provide such a service. As a result, there is little competition leading to an estimated price of $6,000 - $7,000 for the insulation projected to save me $148/year.

It would have been good to be able to log onto a web site, type in the recommendation number and see the companies that were able to provide the service in my area.

Lack of Sample Reports

The Green Loans website did not appear to have a single sample report showing people signing up what they were getting. As mentioned elsewhere in this report, I was only able to locate a single sample report anywhere on the Internet.

The Assessment

Getting through to the Call Centre

I booked my assessment by phone through the call centre in February 2010. I quickly worked out that the best way to do this was to ring at exactly 9AM when the call centre opened. This ensured that I was able to get through quickly. The use of a 1-800 number was good as it allowed me to call as many times as I wanted before the 9AM opening so that I could be sure that I got through as soon as it was opened.

First Assessment Booking

My first booking was made on a Thursday for the Saturday. I was informed that I would receive a call from the assessor 24 hours before the appointment, and to call back if they did not get the phone call. I never received the confirmation phone call, and the assessor never turned up.

Second Assessment Booking

Once the first assessor did not turn up I called the Call Centre. They generated a new Assessment Number and booked the appointment with a new Assessor. The Call Centre once again said to call back if I do not get the confirmation phone call. This was almost impossible as the Call Centre line was constantly busy.

A colleague of the Assessor rang following missing the appointment time to say sorry and to indicate that my Assessor was unable to attend due to personal reasons. He then made a new appointment with me.

The Assessment Process

The person who assessed my house was though and seemed to be familiar with many of the issues relating to energy efficiency and green house gas emissions. The computer seemed to suggest the path of the assessment.

Whilst this ensured that things were done in a logical manner, it did not really seem to allow the assessor to work in a way that suited the geometry of the house. For instance the computer apparently required him to assess the two bathrooms in the house at one time despite the fact that they were on separate floors. I could see that in a house like my brothers with four stories that this would get cumbersome.

The assessor was using a laptop with a 3G card to enter the data. This was not ideal as 3G coverage at my house is variable. To be honest, use of a laptop to do such an assessment is probably not ideal. If I were organizing such a widespread audit of homes, I would be issuing rugged PDA's to each assessor loaded with the software locally. This would negate the need for 3G coverage. I do not know if this was available to other assessors. My assessor did not have this available[20].

During the assessment, the Assessor used a laser tape measure to determine the height and width of each window, and needed to multiply the numbers together in his head to determine the window

[20] By reading other reports to the Senate Inquiry, I have found that notebooks were available to assessors so that they did not need to do their data entry in the home.

areas. It appears that the same happened with floor areas. When two areas were combined to form a room, the assessor needed to add these by hand too. This left the assessor subject to simple mathematical errors.

The assessor was able to combine spaces to create 'rooms'. This was apparently according to the rules of the scheme, but may not have been the best for the integrity of the data.

Apparent lack of flexibility when entering estimated appliance usage

The Assessment required that I provide estimated usage per day of each light an appliance. Subjective questions like this may not be ideal, but it is really the only way to get the detail required. The issue is that it appears that the answers were constrained in their format. As a householder I might say that my TV is used for about two hours per day, but that a specific outside light is used about 10 minutes per month.

There seemed to be an inability for the assessor to enter minutes, but rather needed to use fractions of hours. I also got the impression that the assessor was unable to enter much detail with regard to the timescale. I suspect that this has caused much of the detail collected with devices and appliances which do not get used much to be overrepresented as compared to their actual usage.

Lack of $50 Gift Card

Like all other people who signed up for an assessment, I have yet to receive the $50 gift card. I should note that I only found out about this when I was looking through parliamentary proceedings and found references to it.

The availability of the $50 card did not affect my decision to sign up for an assessment.

Other people I have spoken to have noted that they are rather annoyed at the lack of the gift card, as this was one of the factors that did affect their decision to have the assessment.

Decision to receive an Assessment

The decision to sign up for an assessment was probably primarily because of the availability of the Green Loan. As I consider myself reasonably intelligent and familiar with 'Green Issues' I did not feel that I was going to obtain a great deal from the Home Sustainability Assessment.

Before having the assessment done, I did not believe that I was going to be provided with a multitude of suggestions to save my electricity and water usage since I had already implemented many of the most cost effective items. Thus, the ability to apply for an interest free loan following the assessment was the driving factor into getting the assessment done.

Decision to receive an Assessment Now

My decision to receive an assessment was prompted by newspaper articles in early February concerning issues with the Green Loan programme. I remember hearing about the programme when it was originally announced, but at the time I was dealing with a deceased estate and did not have the time to investigate things further. The title to my house was transferred in December 2009, and I finally had some time to dedicate to some energy saving tasks.

As a consumer, I looked at the difficulties with getting the assessment and decided that I was not going to be left out if the programme ended early. And as a consumer I felt certain in early February 2010 that it was going to finish early.

Post Report Actions

Since I received my Home Sustainability Assessment and Report, I have taken very few actions.

I have taken out a Green Loan to install a 3kW Solar system on my house. The income from this will pay off my Green Loan within the four year period, and I will then be making more on electricity I produce than I spend on purchasing electricity.

I plan to install covers over each of my exhaust fans, which was not an explicit recommendation of my report. I will be replacing the remaining inefficient lights with more efficient units soon. I may end up installing wall insulation if I can find a company that can provide this for under $3,000, but I am dubious that I will.

I will not be installing a water tank. With my low water usage and the cost of water of only $2/1000L, a water tank is a poor investment. I may revisit this decision in the future but this is unlikely. I will not be installing a Heat Pump water unit as I do not believe that the investment is worth it given the energy saving is only about 60% and my existing usage is so slow.

I may install a Solar hot water heater at some stage in the future, but it does not make economic sense at the moment. After RECs and all the grants available, it would take over 10 years to pay for the new hot water heater if my bills reduced to nothing. Since the electricity usage is only about 85% reduced and the solar rebate has decresed from $1,000 to $1000, I doubt that I will be installing solar hot water any time soon.

Closing Remarks and Conclusions

In analysing the Home Sustainability Reports, I believe that I have gained a better than average understanding of the model that goes into producing the reports. I have found what appear to be flawed calculations and the use of inaccurate conversion factors. I have also noted faulty data collection and a misleading format.

From my point of view, it would appear that the errors I have highlighted would be serious enough that the reissue of a large number of Reports would seem to be justified. Allowing reports to go out with negative amounts on recommendations is such a basic error that just highlights the lack of Quality Control exhibited with the entire Green Loans programme.

What could have been done better?

One simple way to remove some of the data entry errors would be to access water, gas and electricity information direct from the suppliers. Whilst this would provide an administrative burden, at least then it would be certain that the data was accurate. Failing that, scans or photographs of actual bills should be taken with the data entry done by experienced operators.

It seems that not enough ‘sanity checking’ of the RMIT software used to generate the Home Sustainability Reports. A significant number of data sets need to be generated to ensure that the results are correct in all parts of the country, in all types of climate. This is a complex task, and but is essential for correct implementation.

Householders should also be given access to a more comprehensive report, dealing in specifics rather than generalities.

Appendix – Actual Home Sustainability Report

Green Loans Assessment Report

1. Assessment

Your Assessor: Ganapathy Mundiyolanda, HO51582
Assessment: AN200428993, 18-Feb-2010
Submitted: 10-Mar-2010
Your Household:

Congratulations! You've joined the growing number of Australians seeking ways to reduce their household bills and their impact on the environment. Your Home Assessment Report is your personalised action plan, and shows where the greatest opportunities for improvement are.

Your current home

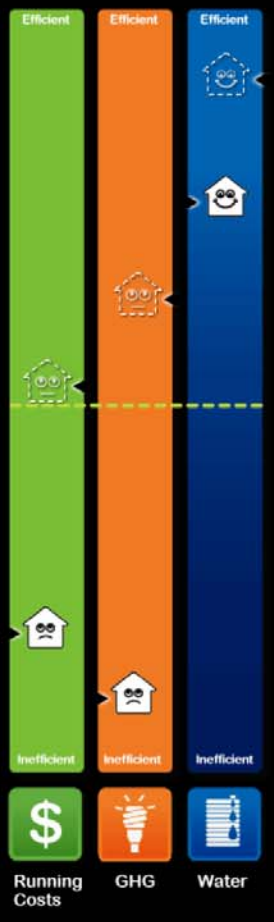
Priority areas

This table shows where your current home produced the most greenhouse gas (GHG) emissions and used the most water.

	CURRENT GHG KGS EMISSIONS	CURRENT WATER USAGE LTR
Hot Water System. You currently have:	1970	
a natural gas, LPG or electric hot water system with high energy and/ or water consumption		
Space Heating, Cooling and Comfort. You currently have:	3513	
an airconditioner that is using a lot of energy		
fans and/or evaporative coolers to help keep your home cool		
potential sources of air leakage that may be making your heaters or air conditioners work harder in some rooms		
Refrigeration. You currently have:	2655	
an inefficient fridge that could be close to its replacement age		
a fridge that may be using more energy than it should due to its condition, location, settings or usage		
Clothes washing and drying. You currently have:	64	20074
a washing machine that is not water efficient		
Entertainment & Home Office Equipment. You currently have:	5401	
high energy consumption from your entertainment and home office appliances		
a plasma television, which uses more than most other TV technologies		
Other. You currently have:	2105	13120
made an effort to reduce your water (and related energy) consumption in the shower by using a water-efficient showerhead and/or taking short showers		
Fluorescent, compact fluorescent (CFL) or LED lights installed		
not yet opted for Green Power through your electricity provider		
Current annual total.	15708	33194

How your home compares

Your home's potential with the top recommendations actioned



Green Loans Assessment Report

2. Action Plan

Your home recommendations

These recommendations could reduce greenhouse gas emissions or water use and lower the running costs for your home. Some of them may be Green Loans Eligible Items, see your included Eligible Items Certificate for details. You may need to do further investigation to determine whether they can be easily implemented in your home.

	Estimated item cost	Estimated savings (COST SAVING)	Estimated Kg GHG savings (GHG SAVING)	Estimated litres of water saved (WATER SAVING)	To do list
Hot Water System.					
● Replace your hot water system with an electric boosted solar or heat pump model (min 20 RECs). If you install a heat pump HWS, ensure it is located in the warmest place possible. [2]*	$$	$190	1970		○
● Low cost ways to reduce the energy use of your hot water system include reducing usage, lowering the thermostat (min 60°C for storage systems) and insulating the tank and pipes [7]*					○
Shower Bath & Toilet.					
● Replace your toilet with a water efficient model (min 4 star) or a composting toilet [8]*	$ - $$			10220	○
Heating & Cooling.					
● Install insulation with a minimum R2 in external walls if you have, or expect to have, access to the wall cavity [23]*	$ - $$	$148	1027		○
● Protect your heated or air conditioned home from air leakage by blocking any chimneys that are not being used. [10b]*	$	$10	73		○
● Install close fitting blinds, curtains and/or pelmets to better regulate the temperature in your home. [19b]*		$8	57		○
● Install external shading for north, east and west facing windows [20]*	$ - $$				○
● Install double glazing or other high performance window treatment to your windows to better regulate the temperature in your home. [19a]*	$ - $$$				○
● Low cost ways to reduce cooling bills include keeping your home sealed when using the airconditioner and increasing the thermostat setting [18]*					○
Refrigeration.					
● Consider whether you could reduce the number of fridges in your home. Turn off secondary fridges or freezers when they are not needed. [34]*		$175	1212		○
Clothes Washing.					
● Replace your washing machine with a front loader that has high star ratings for energy and water, and does not heat its own water [37]*	$	$-1	-8		○
Entertainment & Office.					
● Low cost ways to reduce bills include switching appliances off at the wall, using timers, and selecting home office appliances with an Energy Star label [45]*	$	$311	2161		○

● Replace desktop computers with laptops [44]*	$	$99	686		
Outdoor & Garden.					
● Install a rainwater tank or greywater treatment system and connect to as many usage points as possible [52a]*	$$			20074	
Powering your Home.					
● The simplest way to reduce your household's greenhouse gas emissions is to purchase 100% Green Power from your retailer [48]*			15629		
● Install photovoltaic panels to generate electricity (min 1KW system capacity) [46a]*	$$$		2764		

You may already be doing some of the activities listed in these recommended actions. Other recommendations may not suit your individual circumstances. Please consult appropriately qualified persons as needed when deciding which items to implement in your home.

Green Loans Assessment Report

3. Getting Started

Next steps to improving your home

Step 1.Choose and cost your recommendations.

Choose the recommendations that best suit your situation and budget. Have your priority actions costed by the appropriate service provider. You could:

- call a company to arrange the whole process (quotes, product advice and installation).
- source the products yourself and coordinate your installation.
- Do-it-yourself by visiting your local hardware store and installing some of the easy items.

Step 2. Arrange your finance.

Choose how you will finance your home improvements. You could use your own funds to purchase and install the recommendations, or, for the Green Loan Eligible items listed in your Eligible Items Certificate you could take advantage of the interest free loan of up to $10,000.

Also look for relevant Federal and State rebates to save on the upfront cost of some items.

Step 3. Get Started.

Get your home improvement underway and start saving now!

Step 4. Track your progress.

Save money, get involved in actively operating your home for reaping the savings. Monitor your progress by keeping and tracking your bills. This gives you valuable feedback on where you're doing well and where there's still room to improve. Keep your receipts to show how your home has been upgraded. It may even assist in a sale later on.

And finally, tell your friends about your success and encourage them to apply for a free home sustainability assessment!

More information

For more information about how certain home improvements can save energy and water go to:
www.livinggreener.gov.au
www.yourhome.gov.au

Links to help you find products include:
www.ata.org.au
www.energyrating.gov.au
www.waterrating.gov.au
www.choice.com.au
www.greenpower.gov.au

Links to help you find service providers include:
www.greensmart.com.au
www.masterbuilders.com.au

For a listing of the Green Loans participating financial institutions visit
www.environment.gov.au/greenloans

For a listing of the relevant State rebates, go to:
www.livinggreener.gov.au

Other National plans to improve home and appliance efficiency may be found at:
www.environment.gov.au/settlements/energyefficiency
www.environment.gov.au/energyefficiency

Why not email this link to your friends to show them how they could save too.
www.environment.gov.au/greenloans

Australian Government
Green Loans

Green Loans Assessment Report

4. Eligible Items Certificate

This is your certificate of Green Loans Eligible Items

Items

- Replace your hot water system with an electric boosted solar or heat pump model (min 20 RECs). If you install a heat pump HWS, ensure it is located in the warmest place possible. [2]*
- Replace your toilet with a water efficient model (min 4 star) or a composting toilet [8]*
- Install insulation with a minimum R2 in external walls if you have, or expect to have, access to the wall cavity [23]*
- Protect your heated or air conditioned home from air leakage by blocking any chimneys that are not being used. [10b]*
- Install close fitting blinds, curtains and/or pelmets to better regulate the temperature in your home. [19b]*
- Install external shading for north, east and west facing windows [20]*
- Install double glazing or other high performance window treatment to your windows to better regulate the temperature in your home. [19a]*
- Replace your washing machine with a front loader that has high star ratings for energy and water, and does not heat its own water [37]*
- Install a rainwater tank or greywater treatment system and connect to as many usage points as possible [52a]*
- Install photovoltaic panels to generate electricity (min 1KW system capacity) [46a]*

Disclaimer

Purpose and scope of Assessment Report

The material contained in this report has been prepared to assist you to identify ways to reduce the environmental impact of your home and is based on information that you provided to your Assessor during the Assessment, which may not have been complete or verified. The material in this report is specific to your home and current household and is liable to change. Based on the in-home assessment, this report identifies the top 10 recommendations that are eligible items for an interest-free Green Loan from a registered financial partner. It is possible that the report may not include items that you specifically want, such as photovoltaic panels, because it is about providing objective, unbiased advice on the sustainability priorities for your particular home. No representation or warranty (express or implied) is made as to the currency, accuracy, reliability, suitability or completeness of the material in this report or the methodologies employed to develop this report.

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Copyright:

Note

Numbers marked (*) refer to a range of recommendations for reducing greenhouse gas emissions or water use.

Appendix – Sample Report

Green Loans Assessment Report

1. Assessment

Your Assessor: Example Tester, HO12345
Assessment: BK12345, 30-Aug-2009
Submitted: 03-Sep-2009
Your Household:

Congratulations! You've joined the growing number of Australians seeking ways to reduce their household bills and their impact on the environment. Your Home Assessment Report is your personalised action plan, and shows where the greatest opportunities for improvement are.

Your current home

Priority areas

This table shows where your current home produced the most greenhouse gas emissions and used the most water.

	CURRENT GHG KGS EMISSIONS	CURRENT WATER USAGE LTR
Space Heating, Cooling and Comfort. You currently have:	2246	
a well sealed home		
Shower, Bath and Toilet. You currently have:	1767	61152
one or more single-flush toilets		
Clothes washing and drying. You currently have:	31	11215
an energy efficient washing machine or low usage		
Hot Water System. You currently have:	3312	
a gas, LPG or electric hot water system with high energy and/or water consumption		
Entertainment & Home Office Equipment. You currently have:	2268	
high energy consumption from your entertainment and home office appliances		
a plasma television, which uses more than most other TV technologies		
Other. You currently have:	2858	3640
CFL or LED lights installed		
an inefficient fridge that could be close to its replacement age		
a fridge that is using more energy than it should due to its condition, location, or usage		
a clothes line or drying rack, not a clothes dryer		
Current total.	12484	76007

How your home compares

Your home's potential with the top recommendations actioned (pv capped at 2kw system)

Green Loans Assessment Report

2. Action Plan

Your home recommendations

Implementing these recommendations can save the most greenhouse gas emissions or water and lower your running costs. Some of these recommendations may be Green Loans Eligible Items, see your included Eligible Items Certificate for details.

	Estimated item cost	Estimated savings ($ COST SAVING)	Estimated Kg GHG savings (GHG SAVING)	Estimated litres of water saved (WATER SAVING)	To do list
Heating & Cooling.					
Modify your windows or shading to increase the amount of sunlight into your home during winter and reduce your heating requirements. [17]*	$$	$289	2005		○
Install bulk insulation in the ceiling cavity with a minimum R3 rating [21]*	$	$255	1767		○
Install insulation with a minimum R2 in external walls if you have, or expect to have, access to the wall cavity [23]*	$ - $$	$255	1767		○
Replace LPG or electric heaters with a more efficient technology, such as a gas, solar, hydronic, or a reverse cycle air conditioner with a high star rating (min 4 stars) [11]*	$ - $$	$261	1473		○
Install close-fitting blinds or curtains, or install high performance window treatments to your windows to better regulate the temperature in your home [19]*	$ - $$$	$10	68		○
Protect your heated or air conditioned home from air leakage. For example, you could seal off gaps in the floor and skirting boards, fit dampers to vents, chimneys, and exhaust fans, and weatherstrip doors and windows. [10]*	$				○
Entertainment & Office.					
Low cost ways to reduce bills include switching appliances off at the wall, using timers, and selecting home office appliances with an Energy Star label [45]*	$	$131	907		○
Replace desktop computers with laptops [44]*	$	$23	159		○
Hot Water System.					
Consider installing an on-demand hot water recirculation system to reuse the cold water in the pipes between the tap and the hot water service [6]*	$$ - $$$			3800	○
Replace your hot water system with an electric boosted solar or heat pump model (min 20 RECs) [2]*	$$	$187	3312		○
Relocate your hot water system as close as possible to where hot water is most frequently used (ie bathroom or kitchen) to prevent hot water going cold as it sits in the pipes [4]*	$ - $$	$48	331		○
Low cost ways to reduce the energy use of your hot water system include reducing usage, lowering the thermostat setting and insulating the tank and pipes [7]*					○
Shower Bath & Toilet.					
Maximise water and energy savings by replacing inefficient showerheads with 3 star models and taking shorter showers [9]*		$182	1262	43680	○
Replace your toilet with a water efficient model (min 4 star) or a composting toilet [8]*	$ - $$	$-255		20440	○

Refrigeration.						
● Turn off secondary fridges or freezers when they are not needed [34]*		$88	610			
● Dispose of your inefficient fridge or freezer and replace it with a model of at least 4 stars. (Ensure its no bigger than needed) [33]*	$	$63	437			
● Low cost ways to reduce refrigeration bills include checking fridge seals are intact and clean, and that the fridge is positioned in a cool, well-ventilated place [36]*		$-49	-337			
Cooking.						
● Low cost ways to reduce cooking bills include using the microwave instead of the oven or cooktop, and only boiling as much water is as needed [29]*		$21	95			
● Replace your oven with a fan-forced, well insulated, double or triple glazed oven [27]*	$	$6	44			
Outdoor & Garden.						
● Install a rainwater tank or greywater treatment system and connect to as many usage points as possible [52]*	$$			11215		
Powering your Home.						
● The simplest way to reduce your households greenhouse gas emissions is to purchase 100% Green Power from your retailer [48]*			12321			
● Install photovoltaic panels to generate electricity (min 1KW system capacity) [46]*	$$$		2370			

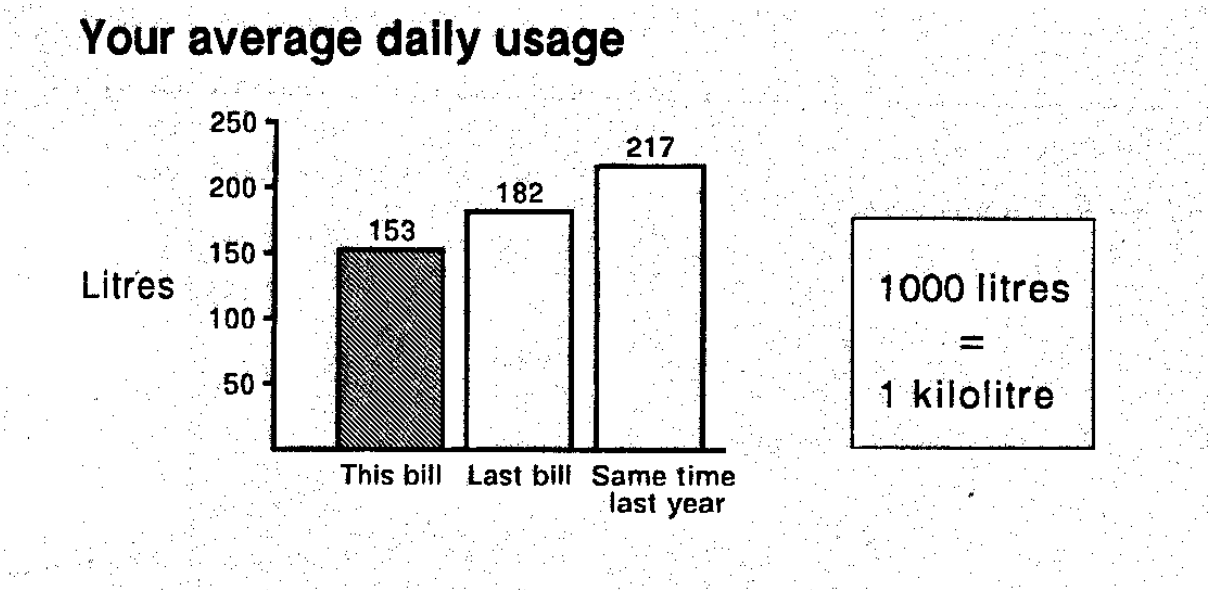
Appendix - Actual Usage

This appendix includes scans of the actual details provided to the Assessor. It is unknown how much of this information was actually used.

Water Usage

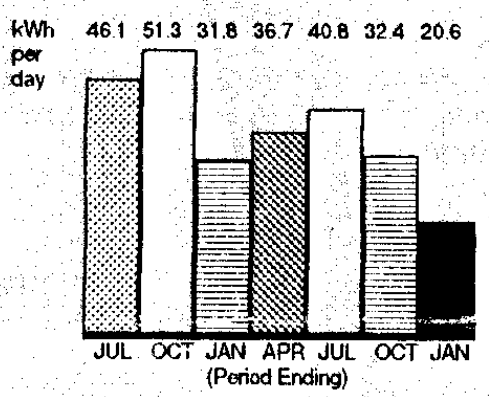
Usage charge - GST free 25 Aug 09 - 1 Dec 09

Water	25/08 - 01/12	15 kLs at $1.8700 per kL	*See over for details*	28.05

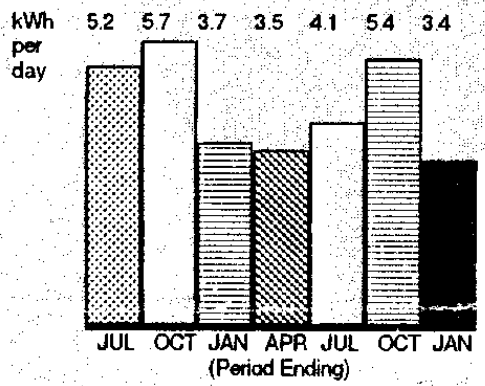


Electricity Usage

Your Electricity Usage



DOMESTIC USAGE



OFF PEAK USAGE

Itemised Details

Full

Meter Information for Period 06/10/09 to 11/01/10 - 97 days

Meter No	Const	This Read	Prev Read	Days	Usage (kWh)
0873166	1	69669	69343	97	326
OFF PEAK - Total Usage					326
0873164	1	70501	68501	97	2000
DOMESTIC - Total Usage					2000

Your Account Calculations

Pricing Option	GST Applies	Usage	Rate	Amount
OFF PEAK				
Off Peak 1	Yes	326.000	$0.063000	$20.53
Off Peak Access Chg $0.030000	Yes	97 days		$2.91
DOMESTIC				
Domestic - first	Yes	1860.000	$0.177500	$330.15
Domestic - balance	Yes	140.000	$0.193500	$27.09
System Access Chg $0.480000	Yes	97 days		$46.56
Electricity subject to GST				**$427.24**