

The Green Hubs Guide

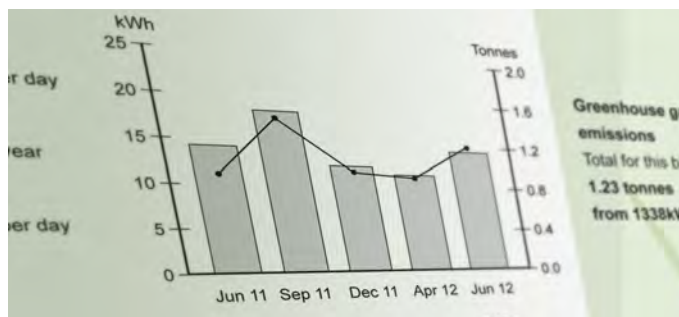
Energy saving ideas for community organisations

Benefits of energy efficiency

Energy efficiency is the cheapest and smartest way to save energy, lower power bills and reduce carbon pollution. It is a great investment. Energy efficiency means using less energy to provide the same or improved level of energy service.

This guide has been designed to help community organisations identify simple ways of saving energy and creating more comfortable buildings.

Some of the actions suggested in this guide will involve little or no cost. Other initiatives may involve an up-front cost, but in many cases the energy savings will offset the financial cost in a short period of time.



Top Tips

- Heating and cooling are the biggest energy uses in many buildings – only turn them on when needed and keep the thermostat as low as is comfortable in winter (around 19°C) and as high as comfortable in summer (around 24°C).
- Borrow a power meter (most municipal libraries have these with audit kits for loan) to test how much energy your equipment and appliances are using – when in use and on stand-by.
- Any indicator lights mean an appliance is still drawing power and should be turned off at the wall.
- Select the highest rated energy efficient products when buying any new equipment.
- Use the most efficient (lowest wattage) lighting practical for each purpose and switch all lights off when not needed.

Energy saving myths



Screen savers save energy: Many people think that when the screen saver pops up, the computer has gone into energy saving mode. In reality, the screen saver doesn't do anything at all to save energy.

To get the most energy savings from your computer, skip the screen savers. Instead set your computer to go into sleep mode after a short period of inactivity—say 10 or 15 minutes. Also, set your monitor to turn off in the same, or an even shorter time frame.



It's OK to leave my computer in sleep mode overnight: Computers in sleep mode still use energy so they are ready when you want to use them again.

Any time a computer or monitor (or printer or photocopier) is not going to be in use for hours at a time, make sure it is turned off.



Turning fluorescent lights off and on uses more energy than leaving them on: There is a common myth that fluorescent lights should not be switched off for a short time as they require more energy to start than can be saved by turning them off. In reality, leaving your lights or appliances on for more than 2 minutes uses more energy than turning them off and then back on when you need them.

If you find that lights are often left on when they shouldn't be, try an occupancy sensor.



A few drafts here and there don't make much difference.

Draft sealing around doors and windows can save up to 25 per cent of heat losses and gains in many cases.

DIY Energy Audit

Conduct an energy audit at your organisation by following the steps below. Read the questions in the 'current situation' column and tick the yes or no arrow boxes. If your answer is no follow the advice in the opportunity column. The items with the green star are the highest priority.

★ = high priority

Heating and Cooling

Current situation	Yes	No	Opportunity	
Are heating and cooling appliances maintained properly to ensure they operate efficiently?	<input type="checkbox"/>	<input type="checkbox"/>	Cleaning filters is a simple place to start. Follow the manufacturer's maintenance instructions. Resources: Review air-conditioner manual. These can often be found on-line.	★
Are heating and cooling appliances efficiently controlled?	<input type="checkbox"/>	<input type="checkbox"/>	The most efficient way of operating heating and cooling systems is to only turn them on when required and switch them off as soon as they are not needed. An ideal option is to manually start systems and have them switch off automatically after a couple of hours of operation (they can always be switched on again).	
Is the air-conditioning system functioning well after maintenance?	<input type="checkbox"/>	<input type="checkbox"/>	If replacing a system select the highest efficiency system possible and avoid ducted refrigerative or gas systems where practical as they have high losses. Resources: Compare the efficiency of different units at http://reg.energyrating.gov.au/comparator/product_types/64/search/	★
Are only rooms that are being used heated and cooled?	<input type="checkbox"/>	<input type="checkbox"/>	Close doors to unused rooms so only the smallest possible areas are heated or cooled. If it is a ducted system it may already be divided into zones. Make use of zones to only heat or cool occupied areas.	
Does the building have insulation?	<input type="checkbox"/>	<input type="checkbox"/>	Install insulation in the ceiling (and walls) if there is none or if it is insufficient. Resources: Detailed information is provided at http://www.yourhome.gov.au/technical/fs47.html . While residential in focus this material is readily transferable to commercial buildings.	
Have drafts been sealed?	<input type="checkbox"/>	<input type="checkbox"/>	Use draft excluders, door and window seals or gap filler to prevent drafts. Exhaust fans, old wall vents and fireplaces are other common sources of drafts. You can check drafts by: <ul style="list-style-type: none"> - looking for daylight around edges of doors and windows - looking for gaps around skirting boards - feeling drafts on a wet finger Important: When using unflued gas appliances ensure there is adequate ventilation.	★
In winter, are curtains, blinds and external shades open so the sun can heat the building?	<input type="checkbox"/>	<input type="checkbox"/>	Use the sun as free heating in cooler months. Sunlight shining directly onto north, east and west facing windows can produce the same amount of heat per square metre as a one bar radiator.	
In summer, is external shading used or curtains and blinds closed?	<input type="checkbox"/>	<input type="checkbox"/>	In summer, keep building/s cooler with external shading and by closing curtains and blinds to protect from the sun's heat.	



Current situation Yes No Opportunity

When heating, is the temperature set as low as people are comfortable with?



Most people will find a temperature between 18°C and 21°C comfortable for heating. Every 1°C higher adds 10% to the running costs of the heating appliance.

When cooling, is the temperature set as high as people are comfortable with?



Most people will find a temperature between 24°C and 27°C comfortable for cooling. Every 1°C lower adds 10% to the running costs of the cooling appliance.

Are reversible ceiling fans in use to assist the heating and cooling appliances?



Reversible ceiling fans create cool breezes in summer and can redirect warm air down in winter.

Refrigeration

Are domestic refrigerators in use?



Use domestic refrigerators rather than commercial units; commercial units use up to ten times the amount of energy (per volume)! If commercial units are required, select high efficiency units with solid doors. When replacing an old fridge or freezer, choose an energy efficient one. Choose the right size fridge first then select the model with a high star rating. **Resources:** Compare the efficiency of different units at: http://reg.energyrating.gov.au/comparator/product_types/28/search/ units at http://reg.energyrating.gov.au/comparator/product_types/28/search/



Is the amount of refrigeration appropriate for the facility?



If there is excess capacity, rationalise the refrigeration units down to the minimum required. Only run additional fridges and freezers where necessary - eg a bar fridge could be turned off when not required.

Are fridges and freezers set to the right temperature?



Adjust fridge temperature to between 3°C and 5°C and freezer temperature to between -15°C and -18°C. If you are using a thermometer, place it below the top shelf and towards the front of the fridge, or anywhere in the freezer. Leave the thermometer in the closed fridge or freezer for about 30 minutes and then observe the temperature.

Are fridges and freezers located in a cool, well ventilated area out of direct sunlight?



Move unit to a cooler location if possible or shade windows to stop direct sunlight. Ensure air can circulate around all sides.

Do the fridge and freezer doors seal properly?



Replace door seals if ineffective. Close the door on a piece of paper. The door seal should be strong enough to firmly grip it. Check in several places around the edge of the door. Look for sections that are cracked and brittle or pressed out of shape. If the paper slides out easily, have the seal replaced.

Is the freezer kept free of frost build up?




Frost build up in the freezer should not exceed 5mm. Defrost the freezer regularly. Auto defrost models should do this automatically.

DIY Energy Audit








Continued...

 = high priority

Lighting

Current situation	Yes	No	Opportunity	
Is the most efficient (lowest wattage) lighting in place?			Use the most efficient (lowest wattage) lighting practical for each purpose. Replace incandescent and halogen lamps/fittings with fluorescent or LED lamps/fittings where practical. Resources: The NSW Government Energy Efficient Lighting Report is a great resource and is available at http://www.environment.nsw.gov.au/sustainbus/energyefflight.htm	
Are single lamp light fittings in place?			Single lamp light fittings are more efficient than twin or triple types.	
Are lights switched off when not in use?			Switch all lights off when not needed. This can be done manually or by using an occupancy sensor or time switch.	
Are curtains and blinds open to use daylight instead of turning on lights?			Daylight costs nothing. Open curtains and blinds before turning on a light. However, be aware of the potential conflict between lighting and excessive heat gain in summer - lighting is cheaper to run than air-conditioning.	
Are light fittings cleaned regularly?			Keep light fittings clean. Dust or dirt on light fittings can block some of the light produced and reduce the efficiency of lighting.	

Hot Water

Does the building have a solar, electric heat pump or a five star energy rated gas water heater?			Consider choosing an energy efficient water heater when the current water heater needs replacing. For high demand applications a solar boosted gas system is a very efficient option.	
Is the hot water system suited to the facility?			Avoid large storage electric systems and avoid circulating loops where possible as they have extremely high losses. For facilities with low hot water demand, instantaneous or point of use systems are the best option. Small electric storage systems that are used infrequently can be fitted with a timer or turned off after hours. Resources: Information about water heaters is available from http://sa.gov.au/subject/Water%2C+energy+and+environment/Energy/Saving+energy+at+home/Household+appliances+and+other+energy+users/Water+heating+%28including+requirements%29/Choosing+an+efficient+water+heater	
Are kettles or urns used in the place of boiling units?			Avoid boiling units. Use a kettle or urn instead where practical.	



Current situation **Yes** **No** **Opportunity**

<p>Are taps maintained regularly so they do not drip?</p>		<p> Have dripping taps fixed as soon as possible. Not only do they waste water, leaking hot water taps waste energy too.</p>
<p>If there are showers in the building, are users encouraged to take short showers?</p>		<p> Taking shorter showers will save water and reduce the energy needed to heat water. Four minute timers can be used to encourage shorter showers.</p>
<p>If there are showers in the building, is the shower flow rate nine litres per minute or less?</p>		<p> If your flow rate is more than nine litres per minute, consider installing a three star rated water saving shower head. To measure flow rate, place a bucket under the shower head or tap, turn both taps on to full flow and run for 10 seconds before turning off. Measure the amount of water in the bucket and multiply by six to calculate the flow rate per minute.</p>
<p>Is there insulation on external water heater pipes?</p>		<p> Insulate pipes with foam tubing, known as lagging, to prevent heat loss. You can purchase foam tubing from hardware or plumbing stores. Look for one that has been cut along its length and has a self-sealing adhesive strip.</p>

IT Equipment

<p>Have power management features been enabled on computers in the building?</p>		<p> Make sure power management features are enabled on computers to automatically switch off screens and hard-drives when not in use.</p>
<p>Are computers switched off when not in use?</p>		<p> Switch off computers, photocopiers, printers and other equipment when not needed, particularly overnight.</p>
<p>Is a printing policy in place to ensure paper isn't wasted?</p>		<p> Use double sided/duplex copying and printing to save paper. Print only what you need. Consider rationalising to a small number of multi-function devices.</p>
















DIY Energy Audit

Continued...

★ = high priority

Appliances

Current situation	Yes	No	Opportunity
Is it known how much power appliances use?			If it is known how much power appliances use, the amount they cost to run can be calculated. Use a portable plug-in power meter to check the power consumption of appliances in standby and active modes.
If there are dishwasher/ washing machine facilities in the building, are they always run with a full load?			Washing a full load means fewer washes overall and reduces the amount of wasted energy and water.
If there are washing machine facilities in the building, are clothes washed on a cold cycle?			Cold water cycles will use less energy than warm or hot cycles. The majority of energy used by washing machines is for heating water. Turn appliances off at the wall to prevent stand-by power. 
If clothes are washed on the premises, are they hung out to dry instead of using a dryer?			Clothes dryers can use a lot of energy. Hanging clothes out to dry uses no energy at all.
Are clothes washers or dryers operating efficiently?			Consider an energy efficient model when you replace your old clothes washer or dryer. Resources: The Energy Rating website provides detailed energy efficiency information for clothes dryers and washers, dishwashers and televisions http://reg.energyrating.gov.au/comparator/product_types/
Before purchasing appliances, do you check energy rating labels to compare running costs on difference appliances?			Consider the ongoing running cost when choosing an appliance. Energy efficient models will cost less to run over the life of the appliance. Check out the options at http://reg.energyrating.gov.au/comparator/product_types/ (covers airconditioners, fridges, televisions etc).



Education

Current situation

Yes No Opportunity

Are staff and volunteers involved in the process of saving energy in the building?



Get staff and volunteers involved in identifying ways to save energy.

Is reviewing your energy bill and energy saving on the agenda of every meeting or regularly on the agenda?



Put reviewing your energy bill and energy saving on the agenda for meetings to make sure they are examined regularly.

Is there signage to remind people to switch off lights and equipment?

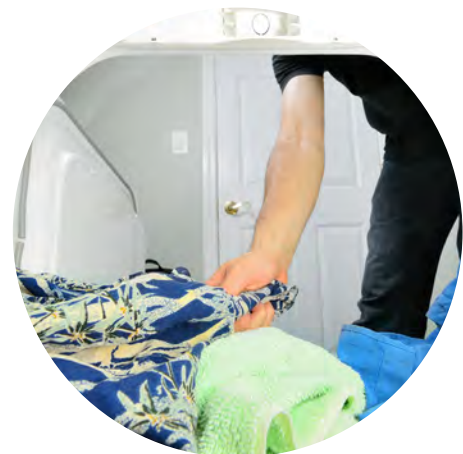


Use prompts to remind people about switching off lights and equipment.

Is the energy consumption of the building tracked and displayed visually?



Track and display your energy consumption to provide a visual display of progress eg with data collected from a smart meter.



Understanding Electricity Bills

Electricity bills contain a lot of information that can help you understand how much energy you use in your organisation.

You should take note of:

- the average number of units (kWh) used per day
- the pattern of your electricity use and changes in consumption patterns between billing periods and seasons
- the prices you are paying per unit of energy.

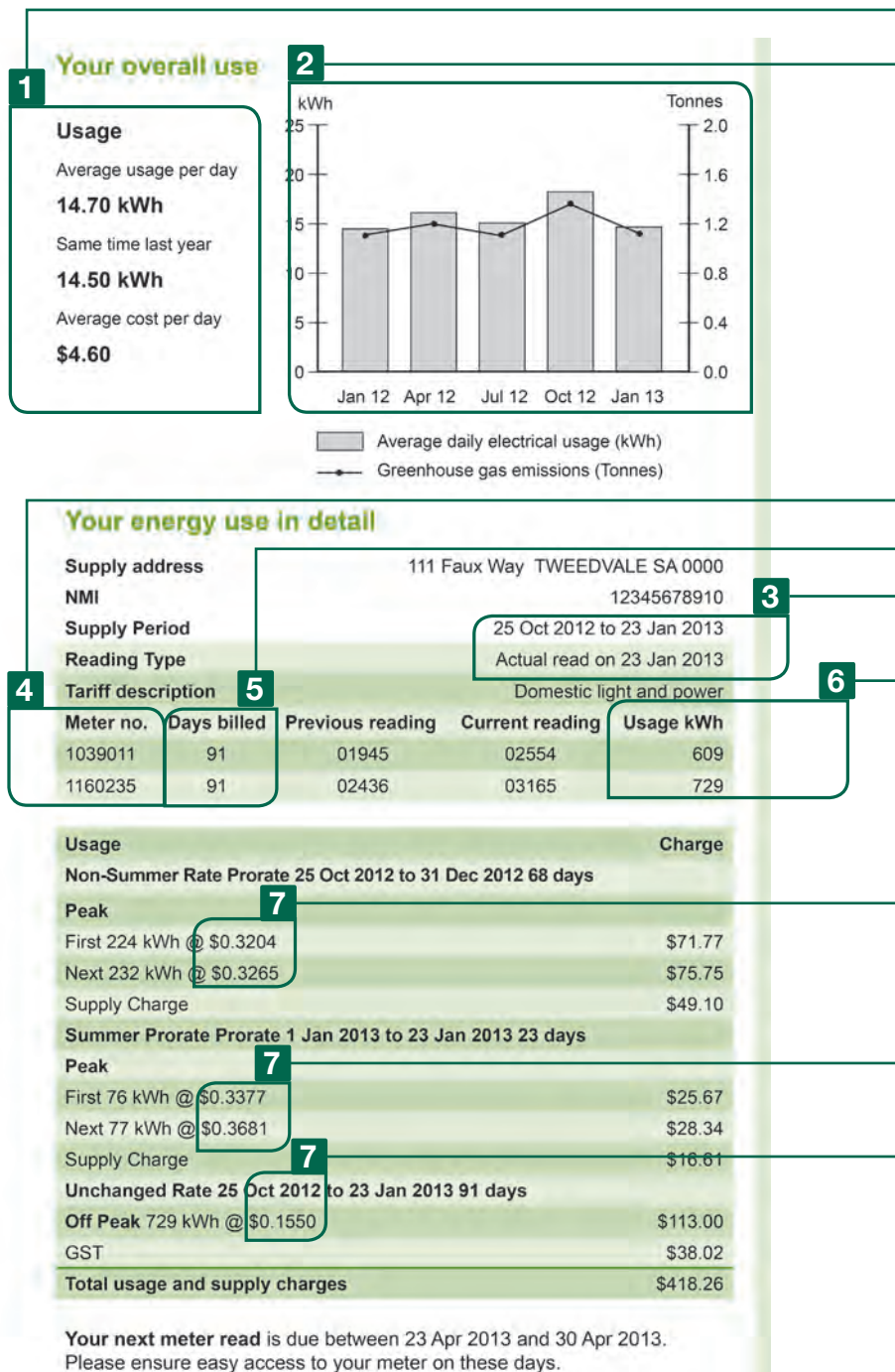
An estimated meter reading is based on energy used in the past. It is indicated on your bill by the words 'estimate' or the letter 'e' near the meter reading. An actual reading may be indicated by an 'a'.

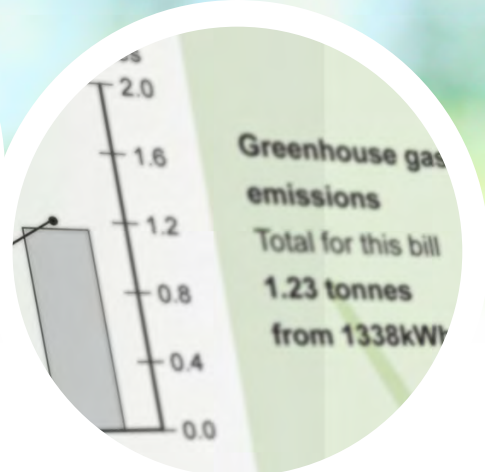
You can check the accuracy of the estimated or actual reading by reading the meter yourself.



This bill is an example to show you what to look for.

Please note, your bill may look different and contain different information, for example if you have a pv system you will also have information about the kWh exported.





1

The average number of units (kWh) used per day over the last billing period and compared to the same period last year.

2

This graph shows you the **pattern of your electricity use** compared with previous billing periods, allowing you to compare your use across billing periods and seasons.

3

This area shows the **billing period** and whether the bill is based on an **actual reading or an estimate**.

4

Many organisations have more than one electricity meter, for example one for Peak and the other for Off Peak. Use the meter number when checking the related reading. A digital meter can record Peak and Off Peak so may show on the bill as the same meter number twice.

5

The number of days this bill covers. For organisations that are billed quarterly, this will be around 90 days.

6

The total number of electricity units used per meter – a unit is a kilowatt-hour (kWh).

7

The prices you are paying (per kWh) for your electricity, in different periods, eg summer rate, non-summer rate and Off Peak rate. The Unchanged Rate normally refers to a rate that does not change in summer. In this example it is Off Peak.



Reading Electricity and Gas Meters

Electricity and gas meters are used by your energy provider to measure the energy you use.

Knowing how to read a meter allows you to:

- keep track of your energy use as often as required
- check the meter reading on your bill is close to your actual reading.

Digital electricity meters

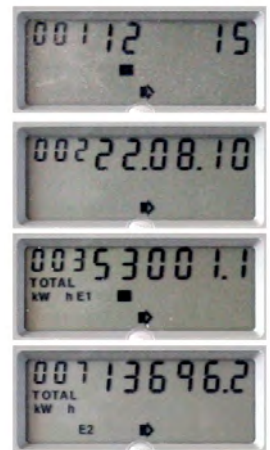
Digital electricity meters display the meter readings as a row of numbers, like the kilometre indicator in a car. You simply read the number from left to right.

There may be a number of screens to scroll through before you reach the electricity meter readings – eg time and date.

The screens containing the meter readings are numbered, look for:

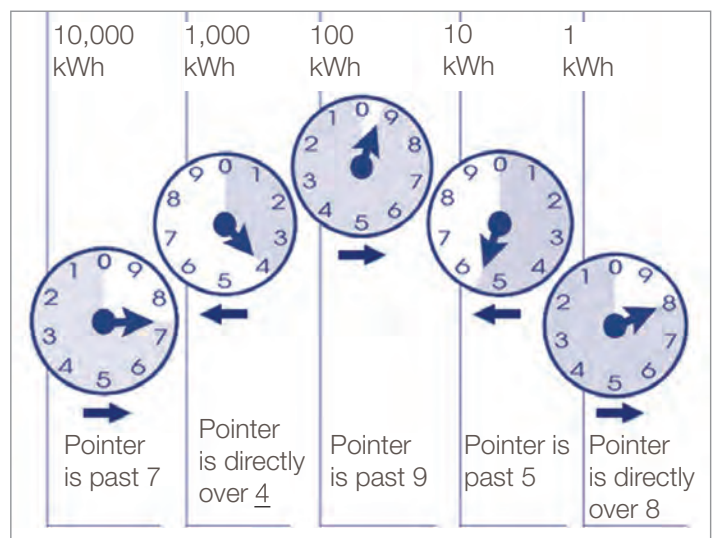
- 03 or 003 – for the Peak electricity meter reading
- 07 or 007 – for the Off Peak electricity meter reading

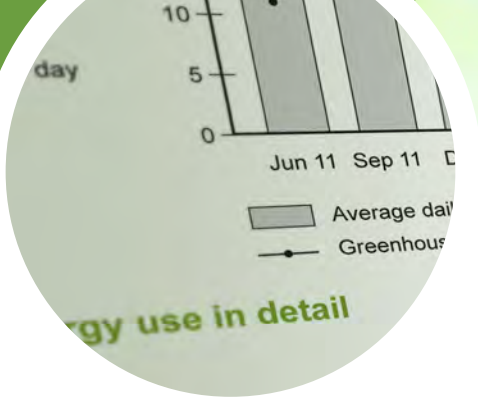
Most organisations with solar panels installed will have an import/export meter installed. The reading for the power generated by solar panels and exported back into the grid will be indicated with an 09 or 009 on these meters. Refer to the manufacturer's instruction manual or contact SA Power Networks to find out how to read this type of meter.



Dial or clock face electricity meters

- Always read the dials from left to right, ignoring the dial marked 1/10 as it is only for testing.
- Each dial revolves in a different direction to the one next to it, eg anti-clockwise, then clockwise
- Always note the number the pointer has just passed – eg if it is between 7 and 8, write down 7.
- If the pointer is directly over a number, underline that number when you write it down.
- If any of the underlined numbers are followed by an 8 or 9, reduce the underlined number by one. In the example, because the 4 is underlined and followed by a 9, we change the 4 to a 3, so the meter reading is 73,958 kWh.





Digital gas meters

Digital gas meters, also known as metric meters, are read from left to right. You only need to read the black and white digits, ignore any red numbers – these are used for testing purposes.

Digital meters record the amount of gas used in cubic metres.

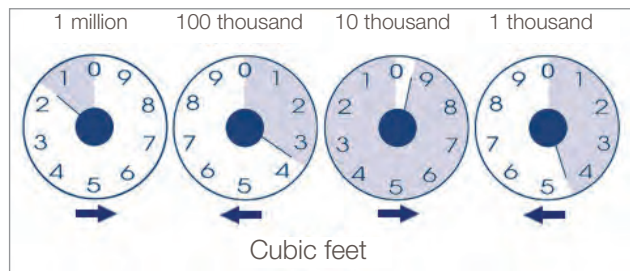
To find out how to convert cubic meters to megajoules, see the right column of this page.



Dial or clock face gas meters

Imperial or clock face meters have a number of dials. The hands rotate in different directions. Standing directly in front of the meter:

- Only read the four dials closest to the left.
- Read the dials from left to right and record the number the clock hand is pointing to.



- Each dial revolves in a different direction to the one next to it, eg anti-clockwise, then clockwise
- If a hand is between two numbers, note the lower number except when the hand is between 0 and 9, in which case read 9.
- The reading given by the clock face meter is the amount of gas used in cubic feet or metres as indicated below the dials.

The example above gives a reading of 1,394 cubic feet. For how to convert cubic feet to megajoules, read on...

How to convert cubic metres to megajoules

First you need to find out the number of cubic meters used by subtracting the current reading from the previous reading.

Then multiply the number of cubic meters by 38.61
 eg: 14 cubic meters x 38.61MJ/cubic meter = 540.54MJ of gas.

How to convert cubic feet to megajoules

First you need to find out the number of cubic feet used by subtracting the current reading from the previous reading.

Then multiply the number of cubic feet by 1.09
 eg: 320 cubic feet x 1.09 MJ/cubic feet = 348.8MJ of gas.



Further Information

What is a Green Hub?

Through the Green Hubs program Conservation Council SA assists community organisations to reduce their overheads and become more environmentally sustainable. These organisations then become 'hubs' for sustainability, providing an example for other community organisations and the people who visit them.

Interested organisations can apply to become a Green Hub and receive a free professional energy audit and ongoing support to achieve cost saving changes.

Want advice on saving energy at home?

Contact the Government of South Australia's Energy Advisory Service: on 8204 1888 or 1800 671 907 (Freecall from fixed lines)

Open: Monday to Friday 9am – 5pm

www.sa.gov.au/energysmart

Who is the Conservation Council SA?

Conservation Council SA is the peak environmental organisation in South Australia, representing over 40 member groups. It is known for its success in developing long-term community development, education and on-ground environmental restoration programs.

The Conservation Centre
Level 1, 157 Franklin St
Adelaide SA 5000

Ph. +61 8 8223 5155

www.conservation.sa.gov.au

Energy Industry Ombudsman

The Ombudsman can investigate and resolve disputes between customers and energy and water suppliers. The Ombudsman is an independent, free service available to domestic and business customers.

Call 1800 665 565 or visit website www.ewosa.com.au

Further Resources

www.energymadeeasy.gov.au

Compare energy offers in your area and get information on energy efficiency.

www.yourhome.gov.au

Technical advice on many areas from insulation to hot water. Most information is readily transferable to commercial buildings.

www.energyrating.gov.au

Energy rating guide - find the most efficient appliances or heating and cooling systems.

www.environment.nsw.gov.au/sustainbus/energyefflight.htm

NSW Government energy efficient lighting report, lots of useful information.

www.livinggreener.gov.au

Practical tips on sustainable living - including energy efficiency.

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The views expressed herein are not necessarily the views of the Commonwealth of Australia or the Government of South Australia and the aforementioned do not accept responsibility for any information or advice contained herein.

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Australian Government
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