

be energy smart



Government  
of South Australia

# Do your own business energy audit

Find out how your business uses energy and  
what you can do to save money



# What uses energy in a business?

**Did you know that there are over 140,000 small and medium businesses in South Australia?**<sup>1</sup>

They range in purpose, scope, operations, location, employee numbers, industry, and importantly, energy use.

With so many small and medium businesses in South Australia, it is no surprise that they operate in a diverse range of industries. From construction, agriculture, retail, office-based services, and manufacturing, to hospitality, transport, publishing, and horticulture, they provide a wide range of products and services.

The Australian Bureau of Statistics defines Small to Medium Enterprises (SMEs) as those with less than 200 employees. For the purpose of this guide, SMEs include all businesses and organisations with an annual energy consumption of less than 160 mega-watt hours (MWh).

## Businesses are not identical

No two businesses use energy the same way. The equipment and appliances that each business uses are different, as is the time and ways that they use them.

These differences are important. Therefore, this DIY Energy Audit is not a one size fits all energy audit. It aims to provide some general questions you can ask about your business to determine energy saving opportunities.

**We recommend that you engage a professional energy auditor to undertake a personalised energy audit for your business.**

However, we understand that professional audits come at a cost. If a professional energy audit is not viable at this time, this DIY Energy Audit will help you start to consider ways that you can lower your energy use and bills.

This DIY Energy Audit will help you to identify where and how your business uses energy, and suggest actions you can take to reduce energy use.

## Costs

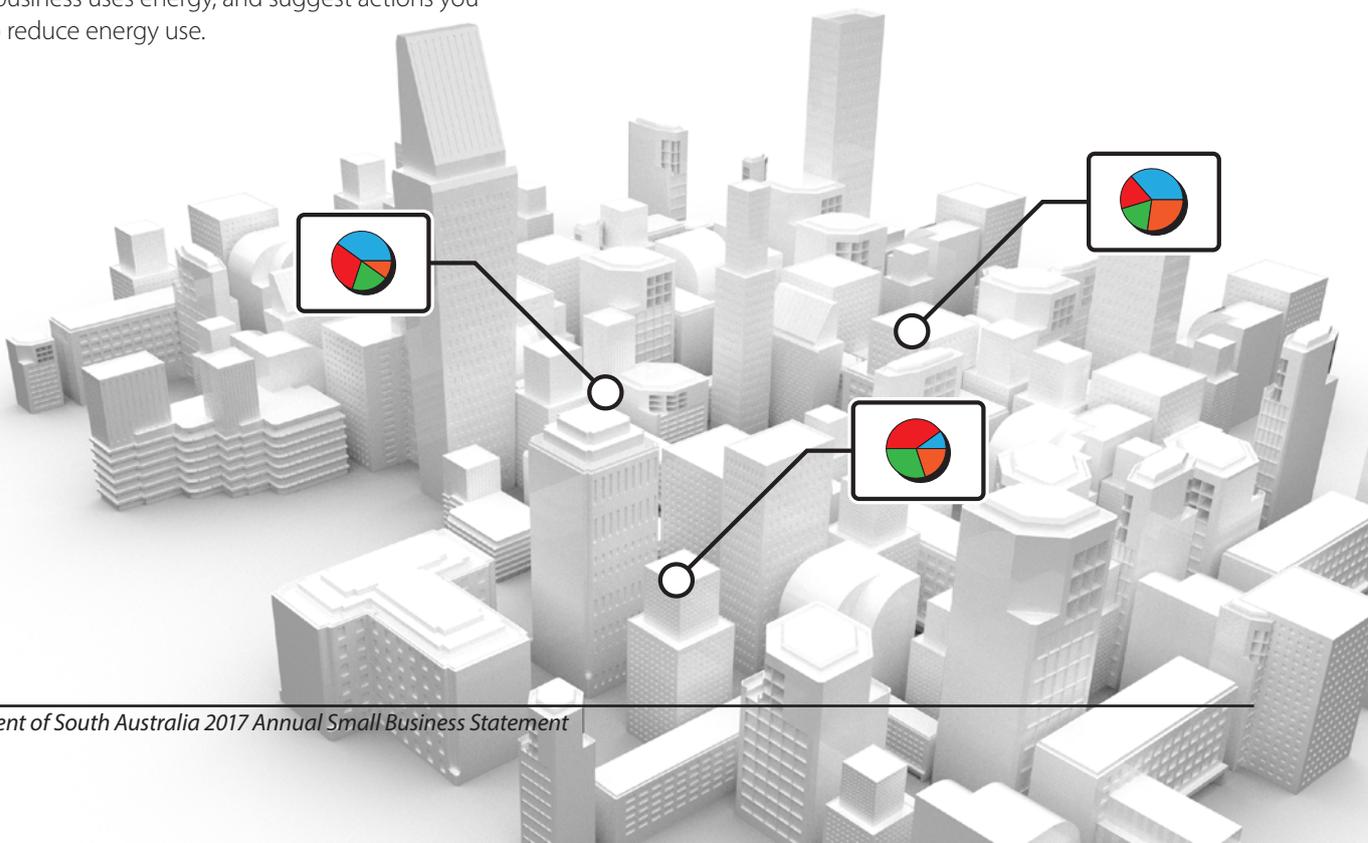
You may be faced with some upfront investment costs in order to make ongoing and long-term energy savings. It is recommended that you consider the pay-back periods and return on investment percentages on various energy saving options to help you make investment decisions.

## Do I need anything else?

Before you start, you may want to collate any existing information you have. This could include:

- your energy bills for the last 12 months
- metering and sub-metering data
- maintenance schedules
- equipment manuals
- purchase dates of equipment
- any equipment replacement quotes.

**“No two businesses use energy the same way. The equipment and appliances that each business uses are different, as is the time and ways that they use them.”**



<sup>1</sup> Government of South Australia 2017 Annual Small Business Statement

# How to complete your DIY business energy audit

## Completing the audit is easy!

Read the questions in the 'What do you do in the workplace?' column and tick off your answers in the yes or no arrow boxes. If you answer no, follow the advice in the 'What you can do to save energy' column. Be realistic with what measures you can implement.

Yes



Continue to the next question.

No



Follow the advice in the 'What you can do to save energy' column.



A walk-through audit outside of business hours should also be completed to identify equipment left on during these times (for example overnight or on the weekend) or vary the times you do walk-throughs as the pattern of energy use may differ throughout the day.

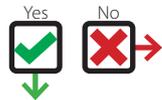
Saving energy includes the actions of you and your staff, so you may want to get staff on board early to ensure they are committed to any required changes. You also may wish to include key staff members or managers in the actual audit itself. They know their areas of responsibility the best and can help identify areas of energy waste and savings opportunities.

**“Saving energy includes the actions of you and your staff, so you may want to get staff on board early to ensure they are committed to any required changes.”**

# Heating, Ventilation and Cooling (HVAC)

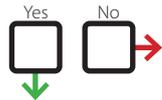


## What do you do in the workplace?



## What you can do to save energy

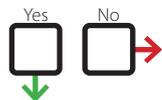
Do you maintain your heating and cooling appliances to ensure they operate efficiently?



Follow the manufacturer's maintenance instructions and have your appliances serviced regularly.

This may include regularly cleaning filters, fan blades, grills and condenser coils.

Is your heating or cooling appliance new and/or been carefully selected for your building/situation?



If your heating or cooling appliance is old or needing replacement, think about the:

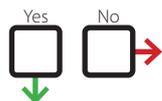
- most appropriate type of appliance
- size of the appliance
- running cost or energy star rating of the appliance.

The most appropriate type and size of a heating or cooling appliance will depend on what you are trying to heat or cool and whether you are heating or cooling a small or large space. Generally, the larger the heating or cooling requirement, the higher the running cost.

Talk to a heating or cooling specialist to determine the best arrangement for your business.

When looking at a new heating or cooling appliance, look at the energy rating label. The more stars, the more energy efficient it is. For more information on energy rating labels, see [page 23](#).

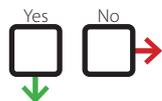
Do you only heat or cool areas that are being used?



Consider closing doors to unused rooms so you only heat or cool the smallest possible area or creating the ability to close off areas.

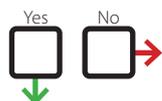
If you have a ducted system, it may already be divided into zones. Make use of zones to only heat or cool required areas.

Are air-conditioned spaces effectively zoned to enable appropriate temperature control?



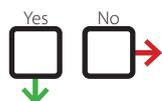
Changes to workspaces (such as office dividers) can lead to air-conditioning vents no longer servicing intended areas. Ensure vents and thermostats are considered when spaces are reconfigured.

Are ventilation fans turned off when bathrooms are not in use?



Consider having timers or motion detectors installed to reduce unnecessary energy use.

Are windows or doors closed and sealed in air-conditioned spaces?



If you have a reverse cycle air conditioner installed, ensure all external doors and windows are closed. Sealing gaps around doors and windows and using draught excluders under doors will reduce wasted energy.

You can check for draughts and gaps by:

- looking for daylight around the edges of doors or windows
- looking for gaps around skirting boards
- feeling for draughts with a wet finger.

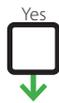
For larger openings, consider installing automatic door closers, vinyl strip doors, high-speed insulated or rapid roll doors, or PVC impact doors.

## What do you do in the workplace?



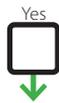
## What you can do to save energy

Does your heating or cooling appliance have a thermostat or the ability to set a temperature?



Consider installing a plug-in electronic thermostat that will automatically turn the unit off when the desired temperature is reached.

Is the temperature on your heating or cooling appliance correctly set?



Check the temperature your heating or cooling appliance is set to.

In winter, most people find a temperature between 18°C and 21°C comfortable for heating.

In summer, most people find a temperature between 24°C and 27°C comfortable for cooling.

Every 1°C warmer in winter and cooler in summer may increase the running costs of your appliance by up to 10%.

Also consider minimising access to temperature controls so individual heating and cooling preferences are not selected.

Are thermostats placed in appropriate locations?



Ensure thermostats are located away from draughts, direct sunlight, areas of low air movement, external walls and heat sources. They may interfere with the temperature reading of the area being heated or cooled.

Have timers been connected to heating or cooling appliances?



Timers can be installed and appliances can be set to run only when required. Remember to adjust these or switch off for times when the building is unoccupied (for example, on weekends and public holidays).

Alternatively, motion detectors can automatically start or shut down heating or cooling appliances depending on whether the area is being used or not.

Do facilities managers or cleaning staff have a night-time air-conditioning switch-off process to follow?



Cleaning staff may manually override air-conditioning timer for out-of-hours work. If so, ensure a switch-off process is followed.

Are you on flat rate pricing tariffs?



If on a time-of-use tariff, where possible, shift heating and cooling use to periods when you are being charged at a lower tariff.

If you are on a peak demand tariff, consider automated scheduling to reduce your peak demand.

In summer, do you shade windows to keep the building cool?



In summer, close curtains and shade windows facing the sun to minimise heat entering the premises. External shading is also an effective way of reducing unwanted heat from entering the building.

Additionally, consider installing reflective screens or transparent low-emissivity coatings to reduce heat transfer.

Are the outside units of heating and cooling appliances shaded?



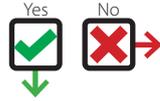
Protecting external heating and cooling units from external elements, such as direct sunlight in summer, can help to reduce the amount of energy they need to run. Ensure airflow around the unit is maintained.

Are your ducts insulated?



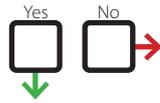
Insulating ductwork can reduce energy loss, making your heating or cooling appliance more effective and cost less to run. This is particularly important when ducts are located in un-airconditioned areas (for example the roof cavity).

## What do you do in the workplace?



## What you can do to save energy

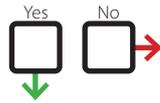
Have you installed variable speed drives (VSD)?



Motors that operate heating or cooling system often run at a constant speed, while a business' heating or cooling load changes depending on factors such as weather and occupancy. A VSD will adjust the speed of the motors to match the load required. Talk to a specialist about whether a VSD can be installed into your existing system.

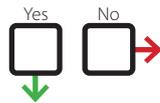
If you are looking at a new heating or cooling system, inverter air conditioners generally use VSDs.

Is the area in front of the heating or cooling appliance clear?



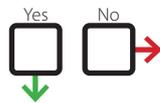
Ensure that the space around the heating or cooling appliance vents are not obstructed so that the air can flow freely.

Do staff refrain from using personal heating appliances?



Consider asking staff to stop using personal heating appliances, or request timers are installed to ensure they are not left on when staff have left. Personal heaters can be expensive to run, so if individual heating units are being used, find out why and attempt to resolve the need for them.

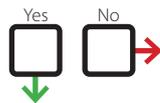
Are ceiling or portable fans used to complement heating or cooling appliances?



Ceiling and portable fans (for example desk and pedestal) are the cheapest types of cooling appliance to run. While they do not specifically cool the air, they create air movement resulting in a wind-chill effect.

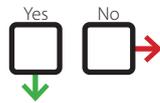
In winter, ceiling fans can help by pushing warm air down from the ceiling.

Do you make the most of natural cool breezes?



If it is cooler outside, for example at night, it is more cost-effective to turn your cooling system off and open windows and doors to allow natural breezes to cool your site. Use window and screen door locks to keep the site secure.

Do you use the economy cycle (if available) on your air-conditioning unit?



The economy cycle uses outside air to cool when external temperatures are in-line with desired set temperatures, as well as purging the hot air.

This results in reduced energy consumption as well as fresh air into the building, which is important for employee wellbeing.

**“Every 1°C higher in winter and lower in summer may increase the running costs of your heating or cooling appliance by up to 10%”**

# Water heating



## What do you do in the workplace?

Yes  No

## What you can do to save energy

Do you maintain your water heating appliance and fittings?

Yes  No

Follow the manufacturer's maintenance instructions and have your appliance serviced regularly. This will help them operate more efficiently.

Have dripping taps fixed as soon as possible. Not only do they waste water, leaking hot water taps waste energy too.

Have you considered different energy sources to heat the water?

Yes  No

There are many different technologies and associated fuel sources (for example gas, solar, electric, heat pumps) that provide water heating. Investigate the options available to your business for when your current water heater needs replacing.

See [sa.gov.au/energy/waterheaters](http://sa.gov.au/energy/waterheaters) for more information, including a water heater calculator that helps you compare up-front costs, annual running costs and life-cycle costs.

Have energy saving devices been fitted to save hot water?

Yes  No

Water saving taps, shower heads, flow restrictors, temperature controls (instant gas) and timers all help reduce the amount of hot water being used.

South Australian businesses may be eligible for free or discounted energy efficiency activities — see [energymining.sa.gov.au/rebs](http://energymining.sa.gov.au/rebs) for more information.

Are hot water saving practices encouraged?

Yes  No

Ask staff to use cold water instead of hot water whenever possible.

If staff take showers at the site, promote shorter showers to reduce the amount of water and energy needed to heat the water. If it is possible to select the temperature, it should be set between 39°C and 41°C.

Are external water heater pipes insulated?

Yes  No

Insulate pipes with foam tubing, known as lagging, to prevent heat loss.

Is your water heater set to the correct temperature?

Yes  No

If you have an instantaneous water heater with a temperature controller, many installers automatically set the temperature to 50°C. Consider turning down the hot water temperature to one that is comfortable and appropriate for the job, to save energy.

If you have a storage water heater, the stored water must be kept at a minimum temperature of 60°C. Lower temperatures may allow harmful bacteria (Legionella) to grow, while higher temperatures use more energy.

Is your water heater sized appropriately?

Yes  No

If you use a storage water heater, consider if the size of the tank matches the hot water demand. Continuously heating a large tank when only a small amount of hot water is required will increase your energy use.

If you have a commercial or industrial boiler, is it energy efficient?

Yes  No

Talk to a commercial water heating expert about ways to make your hot water system more efficient or options to replace it.

# Lighting



## What do you do in the workplace?

Yes  No

## What you can do to save energy

Are work areas appropriately lit?

Yes  No

Consider asking a lighting expert to check that the existing number and type of lights are appropriate for the work areas. Alternatively, you may consider hiring a lux meter, a device that measures the amount of light distributed over a particular area.

If areas are over-lit, solutions could include having a licensed electrician de-lamp light fittings, or installing dimmer controls. For example, if a light fitting contains two fluorescent tubes and one tube provides sufficient light, remove the other one.

Ensure staff or maintenance personnel are aware of these changes so they are not replaced.

Is task lighting used where appropriate?

Yes  No

Task lighting allows staff to set the lighting level to what is needed for a particular job or workspace. This can help to avoid lighting large areas unnecessarily.

Alternatively, consider if photosensors are appropriate for your workplace. They can detect the amount of natural light in a room and adjust artificial lighting accordingly.

Have fluorescent lamps been replaced by more energy efficient options?

Yes  No

T5 fluorescent and LED tubes are more energy efficient than the standard T8. Consider replacing the fluorescent tubes and the fittings in your workplace to reduce energy use. Any work must be completed by a licensed electrician.

Have halogen or standard lamps and downlights, including emergency or other signage, been replaced with more energy efficient lamps like LEDs?

Yes  No

The more energy efficient the lamps, the less energy you will use. Changing your lights to LEDs or other energy efficient options will save energy.

Make sure you check with a licensed electrician about which downlights can be changed by you and which need to be professionally changed.

Have ballasts used in fluorescent lighting been upgraded to more energy efficient options?

Yes  No

Ballasts control how much electricity goes into the fluorescent tubes. Consider having energy efficient options such as low loss or electronic ballasts installed.

Have low and high bay lights been upgraded to more energy efficient ones?

Yes  No

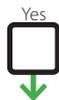
Upgrading high and low bay lights will provide longer life lighting in your business and reduce the need and cost to maintain and replace them.

## What do you do in the workplace?



## What you can do to save energy

Is natural light used during the day to make the most of the natural light?



Natural light should be maximised and utilised as much as possible. Consider ways to increase the use of natural light such as moving workspaces closer to the windows.

Ensure windows are cleaned and clear of shading, when appropriate, to let the light in. You might consider installing skylights or transparent roof panels to maximise natural light. Skylights are rated with a U-value and SHGC-value. You should look for the lowest values for each.

It is important to consider the amount of heat transfer these options carry.

Deciduous trees can provide shading in summer while allowing natural light in winter.

Are lights in unused areas turned off?



Turn-off lights whenever possible to reduce energy use. Consider installing motion sensors in rooms so lights are automatically turned off when the area is vacant.

Is your lighting zoned?



If large areas are controlled by a single light switch, consider asking a licensed electrician to split it into smaller zones so that parts of the area can be lit individually only when needed.

Is appropriate signage installed around the workplace to remind staff to turn lights off when no longer required?



If lighting is not already automated, simple and clear signs put near accessible light switches can remind staff to turn lights off when they are finished in the area or at the end of the day.

Consider running the CitySwitch Green Office 'switch-off' campaign with your team. Visit [cityswitch.net.au](http://cityswitch.net.au) for further information.

Do facility managers or cleaners have a night time lighting switch off process to follow?



Arrange for lights to be turned off at the end of the day by cleaners or facilities managers, depending on who is last in the workplace.

If you have a freezer or cool room, are lights switched off overnight or when not in use?



Leaving these lights on overnight is wasted energy. Turn them off, if possible, when not required.

For cool rooms, have a sensor so lights only come on if the door is open.

Are lamps and fittings cleaned and maintained regularly?



Where it is safe to do so, regularly clean your light fittings and lamps to ensure light output is maximised.

Have you put controls on external lighting to limit the amount of time they are on?



If outdoor lights are regularly left on, consider installing sensor lights or motion detectors. That way they will only come on with movement and turn off after a set period.

Timers can also be installed to reduce the amount of time outdoor lights are left illuminated.

Have you looked at power factor correction as a way to reduce your lighting energy use?



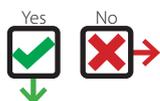
Power factor correction is a way to synchronise the voltage and current supplied to a load. It is commonly used in lighting to improve energy efficiency and reduce energy use.

Speak to a licensed electrician about whether this is an option for your business.

# Refrigeration, cooking and kitchen

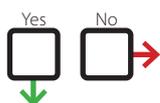


## What do you do in the workplace?



## What you can do to save energy

When you purchase a new appliance or machine (for example a fridge, freezer, oven, dishwasher or other kitchen or cooking appliance), will you choose an energy efficient model that is appropriately sized?

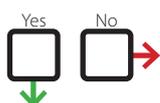


Some common electrical products come with an energy rating label that also provides information on average energy use. The more stars, the more energy efficient. For more information on energy rating labels, see [page 23](#).

Where the appliance does not have an energy rating label, talk to an expert about what equipment will use the least amount of energy for the job it needs to fulfil.

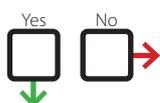
Also consider how big or small the appliance needs to be. A large oven that only does small batches of cooking may result in wasted energy.

Have older, smaller appliances been replaced with energy efficient ones?



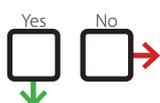
Where budgets permit, smaller appliances like kettles could be replaced with more efficient ones before the existing one fails.

Are fridges and freezers turned off when not needed?



If there are extended periods where appliances are not being used (for example shut down periods or holidays), turn them off to save energy.

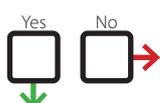
Is appropriate signage installed around the workplace to remind staff to turn appliances off when not required?



During periods of low production, unused and backup equipment (for example deep fryers, microwaves, bain-maries, hotplates) can be turned off.

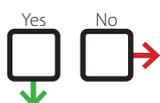
Simple and clear signs can remind staff to turn appliances off when not in use.

Are timers installed on equipment used for set time periods?



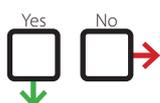
Timers can help reduce energy consumption for equipment used for set periods of time. Plug-in timers are inexpensive and suit items such as coffee machines and water coolers.

Do facility managers or cleaners have a night time switch off process to follow?



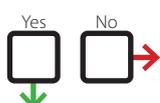
Arrange for appliances that have not been already turned off by staff to be turned off at the end of the day by cleaners or facilities managers, depending on who is last in the workplace.

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



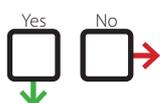
Fridges and freezers placed in hotter locations need to work harder to keep cool. Providing air circulation and shade can reduce energy use.

Are fridges and freezers serviced and maintained?



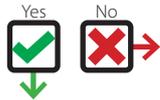
Keep condenser units and fridge coils clean. Defrost your freezer regularly, especially if frost build-up is greater than 5 mm. An auto defrost function should do this automatically.

Do the door seals of ovens, fridges, freezers and cold rooms seal properly?



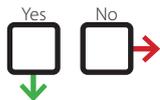
Door seals that make the appliances air tight prevent cool or heat losses. Replace door seals if they are ineffective.

## What do you do in the workplace?



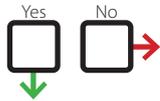
## What you can do to save energy

Is other kitchen and cooking equipment and surfaces kept clean and maintained?



Ensure components of appliances such as door latches and burners are kept in good working condition for optimal energy efficiency.

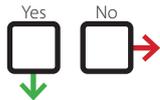
Is your fridge temperature set between 3°C and 5°C?



Adjust your fridge temperature to between 3°C and 5°C. Higher temperatures can promote bacteria growth, while lower temperatures use more energy.

Consider calibrating the thermostat to ensure it is reading the correct temperature.

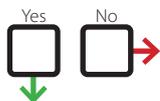
Is your freezer temperature set between -15°C and -18°C?



Adjust your fridge temperature to between -15°C and -18°C.

Consider calibrating the thermostat to ensure it is reading the correct temperature.

Have you considered whether natural refrigerants can be used for your refrigeration equipment?

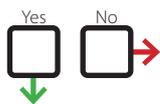


If your refrigeration equipment currently uses a synthetic refrigerant, consider switching to a natural refrigerant. Natural refrigerants are more energy efficient and can reduce your energy costs.

Talk to a refrigeration expert to see if your existing refrigeration equipment can make the switch.

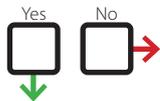
If you have any point-of-sale refrigeration units (for example drink fridges), talk to the supplier to see if they are now offering ones that use natural refrigerants.

Are fridges kept full?



A full fridge is easier to keep cool than an empty one. Jugs of water make good fillers.

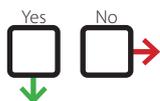
Are energy efficient kitchen practices encouraged and followed?



Reduce kitchen energy use by:

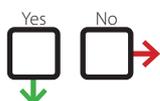
- only opening fridge, freezer and oven doors for the minimum time required
- using smaller appliances — for example, instead of using a stove top you may be able to use a:
  - microwave
  - kettle
  - slow cooker
  - electric fry pan
  - sandwich press
- limiting preheating times
- cooking in large batches
- using equipment to their fullest capacity
- cooking at the lowest temperature possible for the task
- using pot lids to keep heat in
- only boiling the amount of water needed for the job
- defrosting food overnight.

Is the cooking equipment insulated?



Some appliances (for example warming cabinets, fryers, coffee machines) come with insulation to help keep the heat in. Consider whether you can replace existing non-insulated equipment with more insulated alternatives.

Are food display cases covered overnight?



Using well-fitted blinds or thermal covers at night or while the business is closed can help reduce the amount of energy used.

## What do you do in the workplace?



## What you can do to save energy

If your business has different energy price tariffs for different times of the day, are appliances run at the time associated with the lowest energy tariff?



By running appliances (such as ovens or dishwashers) at off-peak times where you are charged a lower energy tariff, you can save on energy costs. If its overnight, see if the appliance has a delay time option.

Have you investigated installing Variable Speed Drives (VSD) for cooking equipment (for example commercial mixers and refrigeration) or support equipment (for example exhaust fans) that use motors?



A VSD will adjust the speed of the motors to match the load required. Talk to a specialist about whether a VSD can be used with existing equipment.

Do you usually run your dishwasher with a full load and at the lowest temperature?



Washing a full load means fewer washes overall, reducing the amount of energy and water being used. You can further reduce energy use and costs by reducing the temperature the water is heated to.



**“Servicing at the manufacturer’s recommended interval not only prolongs the life of equipment, it helps it to run more efficiently!”**

# Factory and warehouse equipment



## What do you do in the workplace?



## What you can do to save energy

Are motors, fans, pumps and compressors serviced and maintained?



Regularly check equipment to ensure it is in good working order. Effective management of equipment will improve reliability and minimise overall operating costs.

Checks may include:

- ensuring equipment is clean, aligned correctly and that wiring connections are not loose
- ensuring moving parts and bearings are still functioning and appropriately lubricated
- finding and repairing leaks, cracks or other damage.

Have you investigated the most energy efficient equipment to replace existing equipment, when needed?



Develop an equipment upgrade plan. Researching total life-cycle costs (i.e. energy costs, maintenance costs and upfront purchase costs) in preparation for equipment failure can help reduce replacement delays and ensure the most cost-effective and energy efficient models are selected.

Where an air compressor is used, is the lowest possible air pressure used and is distance between compressor and outlet short?



The lower the air pressure, the less energy is consumed. To reduce air losses and energy use, shorten the distance between the compressor and outlet.

Are air compressors kept in cool environments?



Cool air is easier to compress. If they can be located in cooler areas, less energy will be needed to compress the air.

Are motors, pumps and fans correctly sized?



The size of equipment should be matched appropriately to the task it is performing. Over and under-sizing may result in more energy being used than needed. A licensed electrician or specialist can help determine whether or not the size of your equipment is suited to your needs.

Is equipment, such as pumps, fans or compressors, turned off when not in use?



Leaving equipment on when not needed wastes energy. Encourage staff to turn them off when no longer in use or have shut down lists for the end of the day.

Alternatively, see if sensors or timers can be installed, or if existing controls can be programmed to automatically turn equipment off when not required or after a set time of inactivity.

Where fans are used, are they set the lowest speed required?



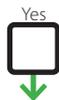
By using the lowest fan speed for the job, you will use less energy overall.

## What do you do in the workplace?



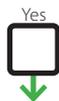
## What you can do to save energy

Have variable speed drives (VSD) been installed to help match motor demand for equipment such as pumps, fans, precision tools?



A VSD will adjust the speed of the motors to match the load required and save energy. Talk to a motor specialist about whether a VSD can be used with your existing equipment.

Has upgrading or replacing existing motors with more efficient motors been investigated?



The more energy efficient a motor is, the less energy it will use to do its job. In Australia, some motor types are covered by Minimum Energy Performance Standards (MEPS). For more information see Electric Motors on [energyrating.gov.au](http://energyrating.gov.au) or speak with a licensed electrician or specialist for advice on making the right purchase.

Has power factor correction been considered on appropriate equipment and appliances?



Power factor correction is a way to synchronise the voltage and current supplied to a load. It can be used on large equipment to improve energy efficiency and reduce energy use.

Speak to a licensed electrician about whether this is an option for your business.

Is the tension on belt drives examined regularly and adjusted if needed?



If the belt drive tension is too loose or tight, the compressor and motor may be using more energy than needed to operate.

Look at having the belt drive adjusted if needed.

Have the electric motor belt drive types been reviewed to ensure the most energy efficient and suitable option is being used for the job?



Belt drives transmit power and can provide flexibility in the positioning of the motor relative to the load.

There are different types of belt drives available (for example V-belt, cogged belt, notched belt). The type of task the equipment is undertaking may determine which type of belt drive is suited.

Installing a different type of belt drive or retrofitting an existing one may lead to energy savings.

Is equipment that will be adversely affected by heat gains or losses, such as suction lines, insulated?



Insulation will reduce the amount of heat loss or gain, making the overall system work more efficiently.

Look at having equipment hoses and pipes insulated where appropriate.

Are energy efficient cleaning methods used?



Hand sweeping is an energy efficient way to clean, however, if not suitable, look at the best option for your business that uses the least amount of energy. Electric powered cleaners such as a blower may be most cost effective for this job.

Have other ways to optimise motors been investigated and implemented?



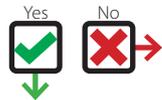
Investigate ways to effectively manage the motors being used in your business. This could include :

- reducing or eliminating the need for a motor
- switching motors off when not needed
- implementing process control devices
- replacing components of the motor with energy efficient alternatives
- using smart motors or multi-speed motors.

# Computers, printers and other IT equipment

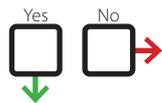


## What do you do in the workplace?



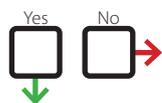
## What you can do to save energy

Does all IT equipment have energy savings features enabled?



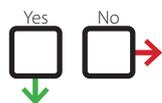
Activate automatic sleep mode on printers, personal computers, monitors, and copiers to reduce the amount of energy being used.

Is IT and other equipment regularly serviced and maintained?



Regular servicing any machine or appliance can make them work more efficiently and use less energy.

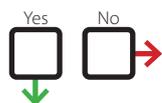
When new IT equipment is purchased, is energy efficiency considered?



When buying a new piece of equipment, try to buy the most energy efficient model that will get the job done.

Remember to look at the energy rating label, if it carries one. The more stars, the better. For more information on energy rating labels, see [page 23](#).

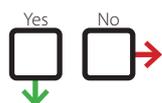
Is the use of standby power minimised by turning equipment off at the power point?



Make it easier to turn equipment off at the source. For example, power boards can be used for hard to reach switches, or plug-in timers can be used to switch equipment off at a set time.

A smart power board that can turn off slave appliances when the master appliance is turned off can also help turn a number of appliances off at once. For example, the computer can be the master and the monitor, printer and scanner can be the slaves.

Are computers, monitors and other equipment turned off when not in use (for example overnight/weekends?)

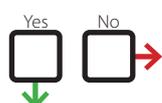


Screen savers do not save energy. Ask staff to ensure their computers and monitors are turned off when not in use to save energy.

Alternatively, see if the equipment can be configured to automatically turn off or go into sleep mode after extended periods of non-use.

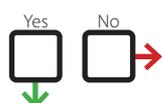
Consider an out of hours energy audit to find out what is being left on when the building is unoccupied.

Are laptops used instead of desktops?



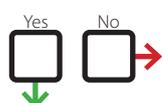
Laptops generally use less energy than desktops. Consider changing any computers over where possible.

Are photocopiers, printers and multi-function devices located in a well-ventilated area?



These types of equipment can generate heat, especially when completing large runs. If not managed appropriately, the additional heat may require your air conditioning to work harder to maintain the overall temperature. Placing this equipment in areas that are well-ventilated can help reduce the need for additional cooling to compensate for the additional heat.

Are the number of printers and photocopiers matched to occupancy?



Try consolidating the number of printers and photocopiers available. This can often be done without affecting productivity.

## What do you do in the workplace?



Yes



No



## What you can do to save energy

Is printing only used when needed?



Yes



No



Consider introducing a paperless environment to reduce the amount of printing required and associated energy used.

Alternatively, introduce access codes that staff enter at the printer to start their printing and reduce the amount of wasted printing.

Are battery chargers for phones, tablets and other personal devices disconnected once the device is charged?



Yes



No



Most chargers can still use a little bit of power once the device is fully charged. Encourage staff to disconnect their device and turn charger off once device is charged.

# Staff engagement for behaviour change

**A comprehensive energy efficiency plan includes involving the people that use equipment and appliances in your business.**

This may involve just a couple of people or it may involve quite a few. Getting these people 'onboard' with your plans will help your efforts to save energy, either directly (for example, when staff switch off equipment before they leave) or via great suggestions you can implement.

There are many ways to actively engage your staff. For more information and some ideas about how to do this in your business, refer to CitySwitch's *Beginner's Guide to Staff Engagement for Behaviour Change* available at [cityswitch.net.au](http://cityswitch.net.au)



# Clothes washers and dryers



## What do you do in the workplace?

Yes  No

## What you can do to save energy

Do you usually run your washing machine with a full load?

Yes  No

Washing a full load means fewer washes overall, reducing the amount of energy and water being used.

Do you usually run your washing machine at the lowest temperature?

Yes  No

If you can reduce the temperature the water is heated to, you can reduce energy use and costs.

Can you dry washed fabrics (for example clothes, towels, sheets, blankets) naturally?

Yes  No

Dry items on a washing line or clothes airer when possible. Clothes dryers can use a lot of energy.

If you do use one, make sure you clean the lint filter often, to ensure it is operating efficiently. It is also important to ensure clothes driers are used in a well-ventilated space.

Do you use the energy and water rating labels to compare running costs when you purchase new clothes washers and dryers?

Yes  No

Consider the ongoing running costs when choosing a new appliance. Energy and water efficient models will cost you less over the life of the appliance.

Also consider the size of the appliance – larger units will cost more to run.

A heat pump clothes dryer may also be worthwhile considering. They may save a lot of energy and cost less in the long term.

Use the energy rating labels to help make your decision. For more information on energy rating labels, see [page 23](#).

## Make sure you're getting the best energy deal

Use the Australian Government's free energy price comparison website.

If your business uses less than 160 MWh annually, visit [energymadeeasy.gov.au](http://energymadeeasy.gov.au) or call 1300 585 165 to check you are getting the best deal for energy.

To get the best results, use information from your last four energy bills to make sure all seasons are included.



# Building materials

## What do you do in the workplace?

Yes  No

## What you can do to save energy

### Does the building have insulation?

Yes  No

Consider having insulation installed in your ceiling, walls and floor if you don't have it. Most building insulation is measured by an R-value. Window insulation is measured by its U-value.

Talk to a licensed installer to determine the best insulation option for you.

### Are windows kept shaded in summer to keep the site cool?

Yes  No

In summer, close curtains and shade windows facing the sun to minimise heat entering the premises.

External shading is also an effective way of reducing unwanted heat from entering the building.

### Are windows kept unshaded in winter so the sun can heat the site?

Yes  No

Use the sun as free heating in cooler months, particularly through windows facing the sun.

It can also be used as a free source of natural light.

### Have you sealed up gaps around doors or windows?

Yes  No

Uncontrolled gaps make it harder to manage your heating and cooling costs.

Use weather stripping, gap filler or draught excluders to prevent draughts. Ensure what you choose will withstand wear and tear associated with its location and any temperature changes.

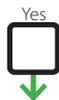
“Deciduous trees can provide shading in summer while allowing natural light and free heating in winter.”

## What do you do in the workplace?



## What you can do to save energy

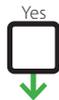
Are other areas draught proofed?



To avoid unwanted heat gain or loss, shut or turn off openings such as vents and exhaust fans when not in use.

Make sure any unused chimneys are also sealed. Installing a reusable chimney balloon means you can remove the seal if you wish to use the chimney again.

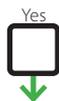
Is the building's roof a light colour and does it have adequate ventilation?



Dark roofs absorb heat. Painting a roof white or a pale colour will help reflect heat from the strong summer sun.

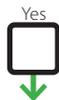
Installing a whirlybird or vent in the ceiling may also reduce the heat build-up in your roof cavity. Vents that can be closed in the winter are ideal.

Do you have a building management system?



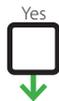
A building management system can help you set the temperature of heating and cooling systems. If you already have one or have one installed, ensure temperatures are set according to the season and its performance is regularly reviewed.

Have you incorporated energy efficiency design principles for renovations or new builds?



Employing energy efficiency design principles and using building materials that help with its energy performance will impact on the amount of energy the building will use.

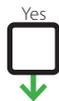
Do external doors automatically close?



Maintain external doors to reduce the amount of heat loss or gain. Consider installing automatically closing doors. Factories or warehouses can consider installing 'rollfast' doors or clear plastic strips.

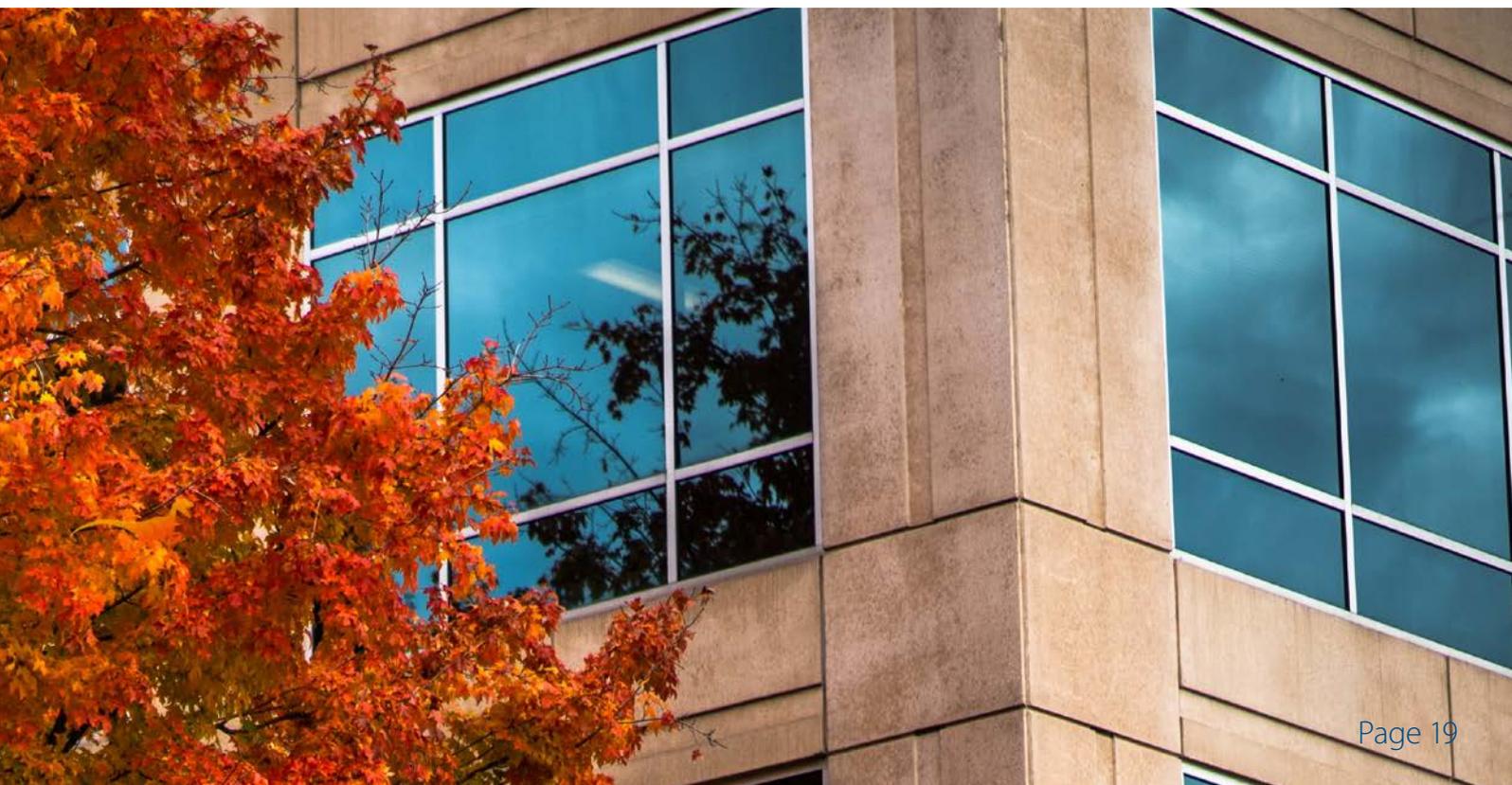
Check door latches and gaskets are working and consider installing automatic door closers or strip curtains to walk-in doors.

Do you own the building site?



If you are leasing, work with the building owner to make the building more energy efficient.

Inform the owner about the Building Upgrade Finance mechanism that helps building owners access cost-effective loans to improve the energy, water and environmental efficiency of existing commercial buildings.



# Metering and billing



## What do you do in the workplace?

Yes  No

## What you can do to save energy

Have you reviewed your metering and determined if any large energy consuming equipment can be sub-metered?

Yes  No

By reviewing your meters, you may be able to consolidate how many you have, upgrade to a smart meter, or even add a sub-meters to equipment that consumes large amounts of energy so they can be more closely monitored.

Note: installation of a distributed energy resource or metering may trigger an automatic change in your demand tariff. Be aware of the impact demand charges may have on your energy costs prior to implementation.

Do you keep your own meter readings?

Yes  No

Taking regular meter readings can help you keep track of how much energy is being used and see how any energy saving changes you make affect your energy use.

There may be different types of meters being used in the sector. Talk to your retailer to understand how to read your meter.

Remember gas meters record in cubic feet (ft<sup>3</sup>) or cubic meters (m<sup>3</sup>), however you are billed in megajoules (MJ).

Have you connected your meters to an app or a display so energy use can be easily monitored?

Yes  No

Smart meters can be linked to energy monitoring apps or a display located on site.

You may be able to have your meter retrofitted with an energy monitoring system. Talk to a licensed electrician to determine if this is an option for your business.

Alternatively, talk to your retailer about upgrading your meter to a smart meter. Check with them about any costs to make this upgrade.

Are you getting the best out of your energy offer for your needs?

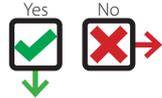
Yes  No

The plan you are on now may not be the best for your business or the cheapest. If your business is classed as a small energy customer (uses less than 160 MWh per year), you can use the Australian Government's Energy Made Easy website, [energymadeeasy.gov.au](http://energymadeeasy.gov.au) to compare different energy offers available.

Things to consider include:

- Are you on the best electricity and gas tariffs?
- Do you need a change in meter to take up the offer and will this cost you anything?
- How can you make the most of different pricing models and components such as demand charges or time-of-use pricing?
- Can you request your demand charge level be reset if you are consistently using less energy?
- Has shifting electricity use to off-peak periods been considered to take advantage of cheaper tariffs?
- What is the billing cycle?
- Are there any discounts and can you meet the conditions to receive them?
- Are there any additional fees to consider?
- How long is the offer for and what happens when it finishes?
- What happens if you add solar generated energy to the business?

## What do you do in the workplace?



## What you can do to save energy

Has heat recovery been investigated to save energy?

Yes  No

If you can collect and reuse waste heat that is generated through your business operations (for example refrigeration and air-conditioning units) you may be able to generate power or preheat combustion air for ovens, boilers and furnaces.

Have you considered alternative energy sources?

Yes  No

There are alternative energy sources, such as bio-fuels, that might be appropriate for your business.

Consider engaging an energy expert to look at the options and associated costs for you.

Have you considered generating your own energy?

Yes  No

Solar photovoltaic systems are now a viable and worthwhile long-term investment for many businesses.

If you rent the site, or your site is not suitable for solar panel installation, a power purchase agreement may be another opportunity to access renewable energy.

Consider engaging an energy expert to look at the options and associated costs for you.

Note: installation of a distributed energy resource or metering may trigger an automatic change in your demand tariff. Be aware of the impact demand charges may have on your energy costs prior to implementation.

Have you considered energy storage options to help manage your demand?

Yes  No

Energy storage, such as batteries, are becoming a more affordable option for businesses to manage their energy demand and associated supply charges.

Thermal storage may also be an option for businesses that manage larger quantities of hot or cold liquid or ice (for example liquid storage tanks).

# Using licensed tradespeople

## Did you know that it is illegal to do your own electrical, gas and plumbing work?

Only licensed electricians, gas fitters and plumbers can do work on electrical, gas and plumbing appliances, or electrical, gas and plumbing installations. This applies to most work on your property, whether it is your business, home, rental property, caravan or boat.

If you do electrical, gas and plumbing work without a license, you may receive a fine. It can also be extremely dangerous for you and result in serious injury, or even death. Insurance companies may not cover fire or personal injury claims caused by do-it-yourself electrical, gas or plumbing work.

Licensed tradespeople have the equipment, training and knowledge to do the necessary work safely and in accordance with appropriate regulations and rules. When using a licensed tradesperson you should ensure they:

- hold an appropriate South Australian trade licence
- provide you with an electrical, gas or plumbing certificate of compliance for work they do for you.

You should keep your certificate of compliance and the invoice for the work, as proof that the work was done correctly, for at least five years.

For further information visit [sa.gov.au/energysafe](http://sa.gov.au/energysafe)



# Using meter readings to monitor your energy use

**Electricity and gas meters record the total amount of electricity or gas consumed over the life of the meter (similar to the odometer in a car).**

To find out how much electricity or gas you have used during a period of time, you can subtract the earlier reading from the later reading.

## Keeping a meter diary

You can use regular meter readings to keep track of how much energy you're using, and see how much of a difference your energy saving changes are making. By regularly recording readings in a meter diary, you can see the weekly (or even daily) impact of your changes.

Changing the way you use high-energy consuming appliances, for example a reverse-cycle air conditioner, will make the most obvious differences to your average daily energy consumption.

Changes to lower consumption appliances, for example using a cold clothes washing cycle, will take longer to show a difference (possibly a few weeks or more).

If your household is connected to gas, use a gas meter diary to see how much impact changes you make (such as keeping doors closed when using the heater) have on your gas use.

## Calculating average daily use

$$\frac{\text{Use since last reading}}{\text{Days between readings}} = \text{Average daily use}$$

For example:

$$13 \text{ kWh} \div 2 \text{ days} = 6.5 \text{ kWh/day}$$

## Comparing apples with apples

The amount of energy within the gas you're supplied changes over time. It's important to compare the MJ values of your readings to ensure a fair comparison.

Gas meters record volumes of gas (in ft<sup>3</sup> or m<sup>3</sup>), but you're billed in megajoules (MJ) — see below for details on how to convert the measurements.

## Converting gas meter readings to megajoules

$$\text{Megajoules} = \text{Volume} \times \text{Pressure factor} \times \text{Heating value}$$

where:

- **Volume** is the number of cubic feet (ft<sup>3</sup>) or cubic metres (m<sup>3</sup>) you wish to convert — for example, the current meter reading minus the previous meter reading.
- **Pressure Factor** and **Heating Value** are values listed on your bill (may be different for different periods).

Example 1:

$$14 \text{ m}^3 \times 1.0139 \times 38.61 \text{ MJ/m}^3 = 548.05 \text{ MJ of gas used}$$

Example 2:

$$320 \text{ ft}^3 \times 1.0139 \times 1.09 \text{ MJ/m}^3 = 353.65 \text{ MJ of gas used}$$

It is important to note that the heating value on the bill will vary with time and based on whether the meter measures ft<sup>3</sup> or m<sup>3</sup> — check that you use the value from a bill associated with the meter in use.

Measurements		Calculations			Notes
Date	Meter Reading	Days between readings	Use since last reading	Average daily use	Notes
1-Feb	24,318	—	—	—	First reading
3-Feb	24,331	2	13	6.5	Moderate weather, no Air Conditioner. Standard day of pie warmer use.
4-Feb	24,339	1	8	8	Extremely hot days, ran air-con for approx 9 hours. Minimal pie warmer use. Freezer was found left open for approx 4 hours
6-Feb	24,353	2	14	7	Both days similar to previous entry (but freezer not left open)
8-Feb	24,362	2	9	4.5	Cool day - no Air Conditioner required. Large coffee/cake order near end of second day (approx 40 coffees + warmed muffins).

Figure 1 - Example of a meter diary from a cafe

# What to do next...

By now you should have an idea of some ways in which your business can improve.

## Before making any changes

Before making any changes you should take note of your current energy profile. It's important to record your current ('before') energy consumption and monitor your energy use as a baseline when seeing if the changes you make are having the anticipated impact.

## Making changes

Many of the identified improvements can be made without specialist tools or knowledge, however some will require licensed, qualified specialist or tradesperson. See page 21 for more information.

A range of programs, finance and information exists to assist businesses with their energy issues. Visit [sa.gov.au/energy](http://sa.gov.au/energy) for more info.

## After making changes

### After completing the DIY energy audit you choose to make some changes.

Begin by re-measuring your energy consumption and monitoring your energy use. Compare the 'before' and 'after' measurements to see if the changes you've made are having the anticipated impact.

### Further changes

In some cases, you may need to make some further changes (for example, reinforce behaviour changes to support new energy efficient equipment) to get the most out of your investments or changes.

### Communication

Be sure to keep staff informed about any changes you are making and raise awareness of your energy use. You may find that the more engaged your staff are, the more they'll support energy saving opportunities.

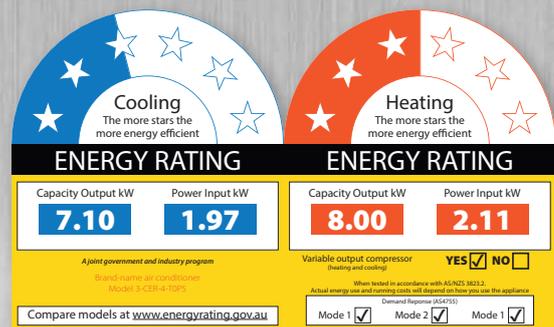
Don't forget to celebrate your wins! Where savings are made, ensure those who helped make it happen are recognised.

# Energy rating labels

Some appliances will have an energy rating label like the ones pictured.

You can use these to compare the energy use and efficiency of similar sized appliances — the more stars the better. Knowing how much your appliance costs to run will help you keep track of your energy costs.

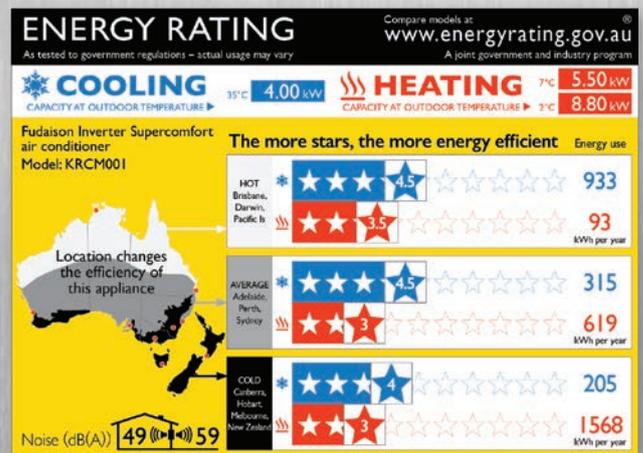
Find out more about running costs online at [sa.gov.au/energy/runningcosts](http://sa.gov.au/energy/runningcosts) or call the Government of South Australia's Energy Advisory Service on 8204 1888.



## Zoned energy rating labels

From April 2020, energy rating labels for air conditioners will change. Zoned energy rating labels will feature different energy efficiency ratings, depending on which of the three climate zones (hot, average or cold) an air conditioner is used in.

The labels will help consumers make meaningful energy efficiency comparisons and enable retailers to promote air conditioners better suited to different regions.



You can find out more about energy rating labels at [energyrating.gov.au](http://energyrating.gov.au)

## Acknowledgement of Country

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The Department for Energy and Mining (DEM) acknowledges Aboriginal people as the First Nations Peoples of South Australia. We recognise and respect the cultural connections as the Traditional Owners and occupants of the land and waters of South Australia, and that they continue to make a unique and irreplaceable contribution to the State.

## Feedback

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This guide has been developed using information from a wide variety of sources and we believe the information is accurate at the time of printing. Any errors or omissions are unintentional and will be amended in further editions.

The Energy Advisory Service welcomes continuous improvement suggestions and feedback by email to [energyadvice@sa.gov.au](mailto:energyadvice@sa.gov.au)

## Contact the Energy Advisory Service for free energy saving advice

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Online: [sa.gov.au/energy](https://sa.gov.au/energy)

Email: [energyadvice@sa.gov.au](mailto:energyadvice@sa.gov.au)

Phone: 8204 1888 or 1800 671 907 (free call from fixed lines)

Interpreting or translation assistance is available on request.



**Government of  
South Australia**